



Getting Smart About Grid Modernization

TECHNOLOGY CAN HELP MAKE ELECTRICITY DISTRIBUTION MORE EFFICIENT

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Smart grid officially hit the mainstream in 2009, with a General Electric ad during the Super Bowl featuring a scarecrow dancing around transmission lines singing, "If I Only Had a Brain." Although smart grid programs have been rolled out in some parts on the country, here in Connecticut the average customer may still be wondering what smart grid is. Based on recent experience, some may be wondering whether grid modernization could help shorten the types of outages we've been experiencing.

What Is Smart Grid?

The term "Smart Grid," also referred to as "Grid Modernization," is used generally to refer to an advanced electric or telecommunications grid that incorporates sensors and other "smart" devices. These devices can be used to link all aspects of the grid, from generator to consumer. At the end-user level, where much consumer attention has been focused, advanced, or "smart," metering can be used to provide consumers with information on energy use and pricing, while other "smart" devices within the home, such as appliances or thermostats, can reduce load in response to that information.

At the transmission and distribution level, grid modernization technology can help improve grid efficiency, and allow for better integration of renewable energy and storage technology. Proponents note that grid modernization can enhance reliability by allow-

ing for self- and remote repair, as well as protection from cyber and natural attacks.

Grid modernization was an expressed policy in the Energy Independence and Security Act of 2007, and the 2009 American Recovery and Reinvestment Act included more than \$4 billion in funding for smart grid technology investment. At the same time, many states have taken steps to incorporate smart grid technologies into their transmission and distribution systems and customer meters. During this period, as well, policymakers at both the state and federal level have grappled with the legal and policy issues raised by grid modernization.

Policy Issues

One issue that has received a great deal of attention at both the federal and state level is data privacy. Smart meters collect and retain more information about customers' energy use, raising concerns about how to protect that information.

After examining this issue last year, the Department of Energy concluded that state and local governments should still play leading roles in deploying smart grid technologies and regulating consumer privacy, and proposed ways to avoid the duplicative or conflicting requirements that could delay the growth of responsible third-party energy management services. The Smart Grid Pol-



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icy Framework issued by the White House this summer advises state and federal regulators to consider methods "to ensure that consumers' detailed energy usage data are protected in a manner consistent with Fair Information Practice Principles." In August of this year, California became the first state to adopt privacy and security requirements for customer smart grid data.

Policymakers have also focused a great deal on the issue of smart grid interoperability, or how smart grid technology and devices will work together to enable efficient and secure exchanges of information within and across smart grid domains. The National Institute of Standards and Technology (NIST) released standards in 2010, to be implemented by the Federal Energy Regulatory Commission (FERC), but the FERC earlier this year declined to institute a rulemaking proceeding to adopt those standards, citing lack of consensus. NIST continues to work on interoperability standards, recently issuing revised standards with a broader view of the smart grid and cybersecurity enhancements, among other improvements.

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Smart Grid Deployment

As noted above, deployment of grid modernization technologies has been taking place at the state level. And, although many agree that smart grid offers potential benefits of grid modernization, there is much disagreement over how and when actual deployment makes sense. While smart grid proponents tout the efficiency benefits of grid modernization, consumer advocates are concerned about whether these benefits justify the significant costs customers are being asked to bear. Similarly, while some smart meter advocates point out that time-of-use pricing combined with advanced metering use information will allow customers to reduce their energy bills by shifting high-use activities to periods when prices are low, others are skeptical that average customers will alter their high-peak energy use, and fear that the result will be higher bills.

Backlash following smart meter installation in California and Texas has fueled the concerns of consumer advocates. Following smart meter roll-outs in those states, some customers were unpleasantly surprised by

increased bills. Whether such increases were coincidental based on weather conditions, caused by a lack of customer education about time-of-use rates, or resulted from faulty meters, the resulting problems faced by utilities in those states highlighted the need for careful consideration of smart meter deployment issues at the state level.

Here in Connecticut, we have been taking a measured approach to grid modernization. Public Act 07-242, An Act Concerning Electricity and Energy Efficiency, required each of the two state electric utilities to submit a plan to deploy an advanced metering system. The Public Utility Regulatory Authority (PURA, then the DPUC) approved the United Illuminating Co.'s plan, which proposed to use its existing metering system to support net metering, time-of-use rates and certain real-time rate structures, along with certain enhancements in communications, billing and metering. PURA initially rejected the proposal of Connecticut Light & Power Co., which would have required more significant up-front investment, opting instead to have CL&P study the techni-

cal capabilities of advanced metering and customer responses to alternatives to rate design through pilot programs.

The results of these pilot programs were examined by PURA recently in a re-opened proceeding, and PURA again rejected CL&P's plan in a draft decision. Before the final decision was issued, however, the newly formed Department of Energy and Environmental Protection (DEEP) requested that the proceeding be suspended while DEEP's Bureau of Energy and Technology Policy establishes the state's smart meter policy, as described in Public Act 11-80. The PURA granted that request on Aug 18. It also granted a similar request made in the UI smart metering docket, which had been closed in March 2008.

In coming years, grid modernization will likely be more prevalent throughout the country, including in Connecticut. Careful consideration of the important policy and legal issues raised by this new technology may allow consumers to experience the benefits that it can provide without the shock of greatly increased bills or decreased privacy. ■