Poyner Spruill LLP
ATTORNEYS AT LAW

What's So Smart About Smart Grids?

12.28.2010

Christopher J. Ayers

Keith H. Johnson

You may have heard the phrase "smart grid" in the news recently and wondered what it means. The smart grid is the next generation electric transmission grid that delivers electricity from power plants to homes and businesses. It is called "smart" because the new grid incorporates the use of data, in addition to delivering electricity, that will help electric providers plan and electric users manage their electric consumption.

The smart grid overlays and incorporates digital technology into the electric transmission and distribution grid and allows two-way communication between electric suppliers and consumers. The smart grid will allow electric utilities to collect data with respect to individual customers' electric use, such as the amount of electricity a customer is using at any given time. Once integrated with smart meters and smart appliances, the electric company will be able to determine how often you use your microwave and washing machine, when you open your garage door and whether you left the refrigerator door ajar.

Impacts on the Consumer

Implementation of the smart grid will impact electric customers in a variety of ways.

Electric suppliers' ability to monitor customers' electric usage will assist power producers in planning generation and transmission projects. Since a power company must have sufficient generation capacity to power the last watt of electric demand, more precise demand data will help ensure accurate planning. Smart grid technology will facilitate integration of renewable energy resources, such as wind and solar, by helping power companies shift generation sources when renewable sources are unavailable.

Additionally, data derived from customers also enhances the potential for time-of-use electric rates, which vary the cost of electricity depending upon the time of day. Time-of-use rates are similar to peak and off-peak cell phone minutes—electricity is more expensive during times when more people are using electricity. As electric companies look to reduce demand in order to avoid construction of costly generation facilities, time-of-use rates force the electric consumer to pay closer attention to their usage patterns.

The smart grid also gives power companies the ability to control some aspects of customers' electric use. For example, some power companies currently offer customer discounts in exchange for the ability to shut off customer air conditioners when the demand for electricity is high. Integration of your thermostat with smart grid technology could allow the electric company to adjust your temperature settings. Electric companies can use this ability to reduce electric demand during peak periods, thus reducing the need to construct more generation facilities.

The smart grid gives electric customers greater knowledge and control over their electric

301 Fayetteville St., Suite 1900, Raleigh, NC 27601/P.O. Box 1801, Raleigh, NC 27602-1801 P: 919.783.6400 F: 919.783.1075

usage. A smart meter allows consumers to identify which appliances in their home use the most electricity, thus allowing them to make better energy-efficient decisions. With such information, customers may replace the horribly inefficient 30 year-old freezer in the garage or shut off the flood lights outside their house that rival runway lights at the airport. As utilities move toward time-of use rates (Progress Energy and Duke Energy have optional time-of-use rates for residential customers), the smart grid will allow customers to proactively lower their electric bills by shifting the bulk of their electric usage to periods when electric rates are lower. With peak electric usage occurring during the day, especially between the hours of noon and 8:00 pm, time-of-use rates mean you will pay more for electric usage during these time periods. If a customer knows the cost of electricity at a particular time, he can adjust his electric usage. For example, he can program the dishwasher to run at 3:00 am when electricity is the cheapest rather than right after dinner during a peak time when rates are the highest.

Consumer Concerns

While the smart grid has many benefits, there are several areas of concern. First, many consumers are uncomfortable with the idea that the electric company may be able to remotely control their thermostat or cut off their air conditioner on a hot day. Consumers are historically loathe to surrender control of day-to-day functions that impact their convenience or comfort. Second, utilities could potentially collect significant quantities of data about personal energy consumption, giving rise to information security and privacy concerns. Consumers have expressed concerns ranging from third party marketing (such as utilities selling data on energy consumption to third parties who may use it to direct ads to consumers) to personal safety (such as hackers accessing data on patterns of consumption that indicate when consumers are away from their homes, thus exposing

them to potential burglaries). Data could be sold or released to third parties, thus potentially exposing the personal electric usage behavior of individual customers. Finally, smart grid components require financial investment, which will ultimately be incorporated into rates and spread across a utility's customer base. This will likely create upward pressure on electric rates in the short term as initial investment is required to bring the smart grid into full reality.

The smart grid has the potential to benefit electric producers, suppliers and customers by promoting more efficient, cost-effective energy production and consumption. It will afford customers more information and control over their electric usage, thus giving them greater control over their energy bills. However, there are issues that must be addressed along the way. Significant investment in technology and equipment will impact rates, making appropriate planning and cost-benefit analysis necessary. Information and privacy concerns need to be addressed by policy-makers to ensure that data collected from consumers and shared with the electric company is protected. Finally, while smart grid and related technology will empower consumers, it also opens the door for regulation of individual energy usage by the electric utility and governmental entities.

301 Fayetteville St., Suite 1900, Raleigh, NC 27601/P.O. Box 1801, Raleigh, NC 27602-1801 P: 919.783.6400 F: 919.783.1075