



The Smart Grid: What It Means for Arkansas

Energy supply has become one of the most challenging issues facing Americans in the Twenty-first Century. Growing populations, more homes and businesses and a myriad of new appliances have caused energy demand to skyrocket in every part of the country.

The growing demand has further taxed an energy infrastructure that has already seen increased brownouts, blackouts, and reduced reliability over the past decade. This is not merely an inconvenience in the lives of citizens; there are also health and safety concerns and potentially devastating financial impacts. According to the Department of Energy, reliability challenges “are estimated to cost American business more than \$100 billion on average each year.”¹

New innovative approaches to energy supply need to be employed in order to address reliability concerns and meet our growing energy needs. Governor Mike Beebe’s Commission on Global Warming (GCGW) recently focused much of its attention and recommendations on greater energy efficiency to help address environmental and financial concerns. One approach is the implementation of the smart grid, which is currently being studied by the Sustainable Energy Resource Inquiry by the Arkansas Public Services Commission.

Smart grid uses digital technology to deliver energy to consumers rather than the alternating current technology currently used by our existing grid. Much of the existing energy infrastructure can be used to deliver energy using smart grid technology, but communication between the consumer and provider will be much more efficient and effective—and therefore less expensive and more reliable. In attempt to harmonize the descriptions and goals of smart grid technology, the U.S. Department of Energy’s smart grid Task Force brought together leading research groups in 2008, who agreed upon the seven characteristics of a smart grid:²

1. Enable active participation by consumers
2. Accommodate all generation and storage options
3. Enable new products, services, and markets
4. Provide power quality for the range of needs in a digital economy
5. Optimize asset utilization and operating efficiency
6. Anticipate and respond to system disturbances in a self-healing manner
7. Operate resiliently against physical and cyber attacks, and natural disasters

¹ http://www.oe.energy.gov/DocumentsandMedia/DOE_SG_Book_Single_Pages.pdf

² http://www.oe.energy.gov/DocumentsandMedia/Smart_Grid_Workshop_Report_Final_Draft_08_12_08.pdf

The Smart Grid and Peak Demand

The energy transmission infrastructure that currently delivers electricity to our homes and businesses was created in a time when energy demands were exponentially lower. Energy was so cheap that little thought was given to efficiency. Also, environmental concerns were not at the forefront of the conversation. Today, energy supply and transmission can no longer be discussed without factoring in environmental and efficiency issues. Smart grid can help in both areas, along with many others.

Utilities are required to be prepared to meet the highest level of demand, or peak demand, at any given time. To accomplish this, utilities are left with expensive options, such as bringing smaller “peaker” plants online to meet reliability needs during times of high (“peak”) demand. Because the usage data is not precise, utilities are left with educated guesses as to when peak demand will hit, which is inherently inefficient—and therefore expensive for both utility companies and energy consumers.

It is during times of peak demand, such as hot summer days when all air conditioners are in use, that a state or region is in the most danger of blackouts and brownouts. The Smart Grid can help solve those concerns by providing a much more precise and real time exchange of energy usage information between the consumer and utility. Monitoring usage in real time, even down to an individual appliance, can provide a more exact picture about how much energy is being used where, therefore allowing the utility to allocate energy more efficiently.

Throughout the country, energy outages are becoming more and more common. In fact, 41 percent more outages affected 50,000 or more customers in the second half of the 1990s than in the first half of the decade.³ A more precise means of measuring when a city or state will reach peak use will enable utility companies to better manage costly and potentially dangerous electric service disruptions.

The Smart Grid and the Environment

Renewable and sustainable fuel sources will almost certainly become more widespread in the coming years. The greater flexibility will allow the smart grid to accommodate these energy sources, just as easily as it can accommodate traditional sources such as coal and natural gas. The smart grid is also able to integrate “any and all better ideas and technologies (e.g. energy storage technologies), as they are market-proven and ready to come online.”⁴ This will not only help from an environmental standpoint, but using numerous sources of generation will help decentralize the energy grid, boosting overall reliability.

The state and its citizens will also benefit from the smart grid in other ways. For example, it will allow consumers to better understand when they are using the most energy and on what appliances. This knowledge will empower the consumer to make better choices about their energy use both economically and environmentally.

In addition, the smart grid can play an important role in emerging transportation technologies. For example, it will help provide a system of charging stations for plug-in hybrid electric vehicles (PHEVs) as they become more widely used. These technologies coupled with the increased efficiency will help alleviate some of the environmental concerns presented by our current energy system.

³ http://www.oe.energy.gov/DocumentsandMedia/DOE_SG_Book_Single_Pages.pdf

⁴ Ibid.

The Smart Grid and Arkansas

The current electric infrastructure and regulatory framework in Arkansas date back to the 1930s, when energy supply and demand issues looked wholly different than they do today.

The smart grid and other efficient energy technologies cost utilities up-front money to research, design and implement. Under the current framework in Arkansas, utilities cannot recoup that money until all design and construction is complete. The most effective way to address this to facilitate investment in our state's energy infrastructure is for the state to modernize its ratemaking framework through the adoption of a Formula Rate Plan (FRP).

A FRP allows for annual adjustments to rates, which gives utilities the flexibility to concurrently recover construction costs and incorporate new technologies on a yearly basis. It makes sense for utilities to be given the opportunity to earn a return on investments in energy efficiency and smart grid technologies, just like they earn on investments in power plants. This in turn will help modernize Arkansas' utility infrastructure by facilitating new investment, and allow consumers to quickly take advantage of more efficient technologies as they come online.

Conclusion

The smart grid has been called a silver buckshot solution rather than a silver bullet solution, because it incorporates numerous technologies and ideas in making energy transmission and consumption more efficient. Smart grid technologies are already in use in different parts of the country and around the world, and have been used successfully in European countries, most notably Italy. In the United States several cities including Austin, TX and Boulder, CO have begun to implement the technology.

As with most new technologies, there is an up front financial cost. However, the economic recovery package recently passed by the U.S. House of Representatives included \$4.5 billion for smart grid technology. It is encouraging that the federal government will likely help fund smart grid technology, but Arkansas must position itself to take full advantage of this opportunity

Here are some initiatives that are critical to accomplishing this:

- ❖ Regulatory framework reform, including a Formula Rate Plan to allow for annual adjustments to rates.
- ❖ Construction work in progress recovery to allow utilities to invest in more efficient energy technologies as they become available.
- ❖ Regulatory reform that allows earnings on Smart Grid investments for utilities.
- ❖ Provide the Arkansas Public Services Commission with the authority to offer incentives where appropriate to promote sustainable energy over traditional fossil energy investments.

Progress Arkansas' mission is to build consensus and support for economic, energy, and environmental policies that will support growth and prosperity for the State of Arkansas. Our membership is comprised of business and community-based leaders dedicated to promoting key solutions that will benefit Arkansas. www.progressarkansas.com

For more information on smart grid technology, view the links below.

U.S. Department of Energy - Office of Electricity Delivery and Energy Reliability
<http://www.oe.energy.gov/smartgrid.htm>

U.S. Department of Energy - "*The Smart Grid - An Introduction*"
<http://www.oe.energy.gov/1165.htm>

Energybiz Magazine - January/February 2009 - "*Changing How the World Works - The Elements of a Smart Grid.*"
http://energycentral.fileburst.com/EnergyBizOnline/2009-1-jan-feb/Tech_Front_World_Works.pdf

Energy Central - Smart Grid News, Articles, Blogs and Announcements
<http://www.energycentral.com/intelligentutility>