Technology and the Aging Electric Grid

By Lisa McKinney [1]

Monday, September 12, 2016 at 01:25 PM

During The Council of State Governments' eCademy webcast, "Building the Grid of the Future: How Technology Can Help," panelists discussed the aging electric grid, how new technologies can help meet energy reliability and affordability objectives, and how policymakers can help ensure the grid continues to meet consumer demands.

“Change in the electric industry is inevitable—just as it was in the telephone industry as technological advances occurred and customers were able to change their usage, change the type of equipment they were using to communicate, and the proliferation of options and opportunities,” said Kansas state Rep. Tom Sloan.

Sloan said that although legislators don't directly make investments in the electric grid or make the ultimate decisions about what technologies will be deployed, they do establish the policies by which customers and utilities interact and are responsible for ensuring affordable and reliable energy options for consumers. Legislators should establish policies that encourage utility project developers to propose transmission projects that incorporate advanced technologies such that cost-effectiveness can be compared to conventional technologies, said Sloan.

The Clean Power Plan and other federal and state requirements are driving the need for renewable energy technology; however, opportunities to monetize new technology will propel generation and grid development and help meet the increased demand for renewable energy from customers and shareholders—even if the Clean Power Plan is overturned. According to Sloan, utilities need to be more efficient to offset customer losses and flat growth in the industry, and replace and upgrade aging grid infrastructure.

“More importantly we need to help utilities and the customers address the opportunities customers have to—in whole or in part—leave the grid,” he said. “One way we do that is by helping utilities to become more efficient.”

The demand for more efficient and clean energy sources has the potential to increase the cost of electricity; however, “The increased cost of electricity as we make these transitions can be overcome a little bit by the use of technological advances,” said Sloan. For example, transactive energy system capabilities, distributed generation, instantaneous communication between customers and utilities can keep costs down.

“While we encourage development in our own states, we also have to recognize that it is important to maintain a really strong, high-voltage interstate transmission system so we are able to move the electricity from the low-cost production areas to the higher-cost consumption areas to maintain electric rates at the current rates or hopefully reduce them,” said Sloan.
The pressures on the electric grid also include an aging infrastructure—in many cases it is more than 50 years old—which can cause reliability issues and energy inefficiency. Crowded utility corridors leave little room for expansion and there are often prohibitions on new rural corridors and viewshed concerns that prevent development.

Sloan said there are a variety of technological and legislative solutions that have the potential to address these issues. For example, more efficient use of rights-of-way through live wire reconductoring “is an eye-opener,” said Sloan. “Essentially while the electricity is flowing through the lines, the linemen are working to upgrade the capacity. They are one with the system.”

Sloan listed several questions legislators can take to the regulatory and utilities sectors in their state to learn about grid efficiency and reliability. Does your public utilities commission, or PUC, have regulatory tools to address new customer options, such as the ability to require project developers to show a performance and cost comparison of conventional and advanced technologies? Does your PUC reward customer options, while protecting non-participating customers and the utility companies?

“If someone can put a solar panel on their roof and reduce their electric costs, the utility still has its overhead,” said Sloan. “They still have to maintain wires, they still have to maintain generation, they still have to maintain customer service and we don’t want all those costs to fall on people who can’t self-generate.”

Are utility companies prepared to meet requirements as “provider of last resort?” “If the sun doesn’t shine, I’m still going to rely on the utility for my electricity,” said Sloan.

Breakthrough Overhead Line Design, or BOLD, is one advanced technology that electricity providers and policymakers can explore as an example of a new technology that may address concerns surrounding energy affordability and reliability. “It would be terrific if, as an example, the benefits and costs of this new technology could be evaluated at the state level,” said Paul Loeffelman, managing director of corporate external affairs at American Electric Power, or AEP. AEP announced the new technology in October 2015 and it is now being built in Indiana and in Texas after gaining regulatory approval.

New or upgraded transmission lines using BOLD technology at 230kV or 345kV move more electric power over greater distances more efficiently than traditional lines. “While we will be adding much more renewables, we’ve got to make sure that the transmission grid is capable of reliably handling the new generation,” said Loeffelman.

Costs for BOLD differ depending on design standards, but estimates range from -10 percent to +25 percent compared with conventional designs. Fewer lines are required to achieve the same level of capacity and it uses lower towers for less visual impact. Additionally, higher voltage lines experience lower energy losses, particularly over long distances or when lines are heavily loaded. “As an example, we can save enough energy to power an additional 7,000 homes annually,” said Loeffelman.

BOLD is an example of how important legislation in the states is to project developers who are willing to take a risk proposing projects with innovative technologies, according to Sloan. How you help utilities improve system efficiency, provide monetization opportunities to utilities and customers, and help both embrace technological innovations will determine your electric system’s affordability, reliability, resiliency, and your state’s economic health, he added.

“For those of you not as immersed in energy technologies and policies as you’d like to be ... convene a meeting of utilities executives, public utilities commissioners and staff, consumer advocates,
university faculty, third-party people, innovators, and ask what needs to be done in order to ensure long-term grid reliability, long-term economic viability from the customer and the utility perspectives, and the long-term benefits of developing the energy resources that we have nationally as well as within our communities and states,” said Sloan.

The full webcast is available here [2].

Tags:
The Current State [3]
Content Type [7] Publications [8]