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Stimulus for smart grids is welcome, but faces challenges

As money starts flowing from the economic stimulus package passed by Congress and signed by President Obama, there is plenty of good news for supporters of energy conservation and renewable energy, but also some challenges. The American Recovery and Reinvestment Act of 2009 contains several provisions for increased funding, extended tax incentives, or outright grants to encourage renewable energy projects, energy savings and green jobs. One key feature of the bill is \$30 billion in funding to upgrade the power transmission system and develop so-called smart grid technology. While funding is certain to help, upgrading an overburdened power grid and implementing smart technology both come with issues that money alone may not solve.

Our demands for energy, with bigger houses and more appliances and electronic gadgets, have consistently outpaced the growth in the system's ability to transmit that electricity over an aging power grid. State requirements add further strain. Washington's renewable portfolio standard says utilities should obtain more of their electricity from wind, solar, and geothermal sources. Getting the energy from the renewable source to the user has become a significant issue because many of the optimal locations for large scale renewable projects often are located in rural areas, well away from the urban markets where the power is used, and those projects either lack access to existing transmission lines or the lines cannot handle the additional loads. The forecast in the coming years is for twice as much new generation supply as new transmission to carry that supply.

One solution might be to build more power lines, but that is no simple task. The costs of a new transmission line can be significant, running well over a million dollars per mile. Although the stimulus package certainly provides a partial answer with new funding, it does not address the other major issue with new transmission — the seven to 10 years it takes to obtain permits and build new towers and lines, far longer than permitting for a renewable power project.

A primary reason for the extended development period is that new transmission projects frequently encounter significant local opposition. The experience of Green Path North in California is one of the latest examples. The Los Angeles Department of

GUEST OPINION



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Water and Power (LADWP) proposes to develop a two- to five-mile wide corridor running from Desert Hot Springs to Hesperia, Calif. The project designers envision a 500-kilovolt transmission line for access to as-yet undeveloped geothermal resources in the Imperial Valley, and shared use of the corridor by other oil, gas, and water line projects. Opponents of Green Path North, including the cities of Riverside and Desert Hot Springs and San Bernardino County, along with numerous residents and environmental groups, cite the project's impacts to the fragile desert, including Joshua Tree National Park; increased fire hazards, illegal dumping and trespass; adverse impacts to property values; and concerns about whether LADWP instead will use the line for coal-fired power generated across the border in Mexico. Green Path North, at least in terms of its 85-mile length, is fairly modest compared to proposals for 1,000-mile long projects in the Rocky Mountain and Midwest states, but it serves as a cautionary tale for the permitting and siting issues that arise in proposing new transmission lines.

Proposals to have the Federal Energy Regulatory Commission take over transmission line project permitting have met with strong opposition from local and state regulators.

The stimulus bill also provides for smart grid technologies, which represent a shift away from building more generation and transmission to addressing demand in ways that could help utilities and consumers. Smart grid encompasses strategies ranging from remote monitoring, time-of-use pricing, and managing demand; to distributed generation, such as rooftop solar or individual wind turbines; to fuel cells and other storage media. Unlike traditional conservation programs that require consumers to do something, such as turn off lights and appliances, smart grid promises to be largely passive by having software and hardware do most of the work.

The U.S. Department of Energy ran a small-scale smart grid experiment in 2006 with the Pa-

cific Northwest Gridwise Demonstration Project on the Olympic Peninsula. In one phase, participants received new electric meters, thermostats, water heaters, and dryers, together with software to monitor and customize their electricity use. During peak demand periods, the software lowered thermostats or shut off water heaters to levels pre-set by homeowners. Participants received constant pricing information over the internet so they could adjust their electricity use. By the end of the study, participants' electricity bills had declined by an average of 10 percent.

The DOE has outlined \$4.5 billion in funding for smart grid development and demonstration projects. The Bonneville Power Administration is asking Pacific Northwest utilities to participate in a demonstration project to determine if smart grid models will work "at a scale that can be readily adapted and replicated around the country."

Taking smart grid from demonstration to national scale can be a hard sell because it requires both a new mindset and new technology. The production and delivery of electricity over the past hundred years has provided utilities with little financial incentive to depart from the familiar flat pricing model that produced more revenue as people used more electricity. As the cost of new generation and transmission has made addressing the demand side more attractive, the challenge will be to ensure that utilities can obtain a reasonable return on investments even as smart grid enables consumers to cut their usage and bills.

Another issue is that the considerable investment for smart grid technology is made more difficult by lack of uniform standards for the technology. Early adopters face a significant risk of guessing wrong on systems that might become outmoded. The National Institute of Standards and Technology is holding summits of industry leaders this month and next to develop standards.

While there still is a long way to go to full implementation of smart grid, the stimulus package provides a major shot in the arm and, consequently, takes some important steps toward reaching the promise of a more efficient grid.

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