Growing Pains

Building an Affordable, Reliable Energy Future

By Magen Howard

TIGHTER GOVERNMENT REGULATIONS – AND THE high cost to comply with new rules – may signal lights-out for many of the nation's older coal-fired power plants at a time when forecasters predict energy demand will eventually outpace supply.

"Americans could see power shortages by the end of the decade if new generation sources don't materialize," cautions Glenn English, CEO of the National Rural Electric Cooperative Association (NRECA), the Arlington, Va.-based service organization of the nation's more than 900 electric cooperatives.

To meet the challenge, electric co-ops are using energy efficiency measures and innovative technology to reduce electric demand. But these measures will only go so far. Eventually, the need to build new generation to "keep the lights on" will take center stage.

An investment of time, money

The North American Electric Reliability Corporation (NERC), the bulk power grid watchdog for the United States and most of Canada, estimates the country will need to build 135,000 MW of new generation by 2017 to meet demand. Facilities on the drawing board, though, will only deliver 77,000 MW – leaving an energy gap.

Planning, building and launching a baseload power plant is no small feat. Even if the permitting process is non-controversial – meaning there are no significant objections to a facility – a coal-fired generating station takes six to seven years from start to finish, a combined-cycle natural gas plant three to four years, while a nuclear plant requires 10 years at minimum, notes John Holt, NRECA senior manager for generation and fuels.

Wind farms and large solar projects, in many

cases, need a shorter amount of time to complete – about two years total – but they are handicapped by intermittency issues: even with good location and plenty of breezes, wind generation is available at most 40 percent of the time and seldom operates (due to a lack of wind) during periods of peak consumption on hot, humid summer weekday afternoons or cold weather below minus 22 degrees Fahrenheit and solar power systems operate only during daylight hours and are affected by cloud cover. Wind and solar resources must have back-up, or firming, generation, such as natural gas plants, ready to come on-line when the wind stops blowing or the sun stops shining, and that adds extra expense.

Above: Natural gas power plants, like Deer Creek Station under construction by Basin Electric Power Cooperative, are likely to fulfill our electricity needs in the short-term. Opposite Page: Tri-State Generation & Transmission Association, based in Colorado, is part of one of the largest solar projects in the nation, the Cimarron Solar Facility in New Mexico. Solar-powered generation is becoming more popular as states set renewable energy standards. Source: Tri-State Generation & Transmission Association

Federal rules impact energy prices

Rulemakings by the U.S. Environmental Protection Agency (EPA) will impact electric bills and put affordability and reliability at risk. According to the report, Potential Resource Adequacy Impacts of U.S. Environmental Regulations, commissioned by NERC, four pending EPA rules would place new and costly hurdles on power generators. In fact, regulations impacting cooling water intake, coal ash disposal, interstate transport of air pollutants, and using Maximum Achievable Control Technology (MACT) to curb emissions from power plants could force electric utilities to retire or retrofit 33,000 MW to 70,000 MW of generating capacity by 2015. A fifth hurdle, reducing power plant emissions of carbon dioxide, presents an even greater challenge since no viable, commercially tested solution exists.

The Electric Power Research Institute (EPRI), an electric utility research consortium that includes electric co-ops as members, contends if EPA designates coal ash, a residue produced by coal-fired power plants that is used as a Portland cement substitute, as hazardous, it could cost utilities – and consumer electric bills – between $5.32 billion and $7.62 billion annually.

"Because of these new rules, we're expecting a number of existing coal plants to be shut down," asserts Kirk Johnson, NRECA senior vice president of government relations. "The cost of compliance will simply be too much."

Only two alternate baseload generation options are currently available to meet America's demand for safe, reliable and affordable electric energy – natural gas, which is priced in a volatile commodities markets, or nuclear power, which requires a long lead time for construction and continues to bump up against ghosts of the Three Mile Island accident in 1979 and issues involving disposal of spent fuel.

Natural gas at present seems like an attractive option to satisfy our nation's energy appetite because the fuel is relatively cheap, power plants that use it can be brought on-line more quickly and burning gas produces less carbon dioxide than coal.

"But right now, we're in a natural gas price bubble," Holt cautions. "While economics today favor natural gas, my concern is just two or three years ago natural gas was three times as expensive. So it could easily and rapidly go up in cost. Over the long term, I expect nuclear power – since it only emits water vapor into the atmosphere – will make a comeback. But there are a lot of ifs."

Working to keep electric bills affordable

To reduce the need for new power plants, electric co-ops are fashioning a variety of innovative solutions to reduce load during times of peak demand – the electric utility industry's equivalent of rush-hour traffic when wholesale power costs skyrocket: direct control of electric water heaters, air conditioners, electric thermal storage units and other appliances in the homes of volunteer consumers; interruptible contracts with commercial and industrial accounts, such as irrigation pumps, large retailers and factories, that are able to temporarily shut down or run emergency generators; calling on consumer-owned (distributed) generation to start up; and the new kid on the block, personal energy management – notably in-home displays, web portals and smart thermostats that inform consumers, in real time, when load peaks are happening, allowing them to voluntarily decide when and how to curtail electric use to save money.

Most co-ops are also ramping up energy efficiency programs. According to NRECA Market Research Services, nearly all electric co-ops offer efficiency educational resources and 77 percent offer residential energy audits. Additionally, all Touchstone Energy® Cooperatives offer online energy audits through togetherwesave.com.

To find out about energy efficiency programs in South Dakota, visit the Database of State Incentives for Renewables and Efficiency at www.dsireusa.org.

Sources: North American Electric Reliability Corporation, U.S. Energy Information Administration, Electric Power Research Institute

Magen Howard writes on consumer and cooperative affairs for the National Rural Electric Cooperative Association, the Arlington, Va.-based service organization for the nation's 900-plus consumer-owned, not-for-profit electric cooperatives. Megan McKoy-Noe contributed to this article.