State and federal policymakers in the past could be confident that America's energy demands would increase every year. Now the future isn’t as clear.

Barbara Tyran, director of Washington, D.C., and state relations with the Electric Power Research Institute, said the Great Recession, a greater use of locally produced power, a growing interest in energy efficiency and the unprecedented increase in the natural gas supply have turned once staid assumptions about the future of energy on their head. Tyran was one of the featured speakers at a CSG policy academy about natural gas development last week and noted that all three branches of the federal government are currently engaged in shaping energy and environmental outcomes that will impact the future electricity and natural gas sectors.

Since EPRI’s research portfolio embraces all fuels and technologies, she emphasized the breadth of research and development underway -- from generation to end-use -- to prepare for an unknown future. Tyran noted that significant infrastructure investment has been made and will continue to be required to meet the challenges ahead. The deployment of new advanced technologies offers an opportunity to begin an important dialogue around utility business/regulatory models and their possible evolution.

“Electricity generation is changing fundamentally from historical trends,” Tyran said.

In 2012, she said, the electric utility industry saw:

- The most new power plant capacity additions since 2003;
- A record number of announcements of new natural gas-fired projects since 2001;
- The highest level of retired electric power capacity recorded, with two-thirds from coal-fired units;
- A record number of cancelled and postponed projects approaching a 10-year high, mostly due to new renewable energy projects.

U.S. power demand peaked in 2007, then took a precipitous drop during the economic turmoil of the Great Recession, which was expected. But huge paradigm shifts since the recession make future electricity demand predictions murky at best, Tyran said.

Increased energy efficiency and ramp-ups in renewable energy production through tax incentives and state policies have played a significant role in changing the makeup of the nation’s generation portfolio.
Combine those factors with weak power demand, a power delivery system that is moving to the SmartGrid and the rapid increase in natural gas supplies may make electricity markets continue to look uneven and uncertain for years to come. Tyran said some utility analysts expect demand to remain flat or notch small increases at such slow rates that they may not reach 2007 levels until the 2020s.

These changes truly represent a paradigm shift in Tyran’s estimation. Less than 10 years ago, coal-fired power generation made up more than 50 percent of the nation’s electricity use. The Energy Information Administration expects coal to make up only 40 percent of the nation’s electricity mix in 2013. Considering power plants are expensive, long-lived assets and the U.S. consumes large amounts of energy, this reduction represents a significant change.

Natural gas is filling a large portion of that capacity void. An April 2013 report by the Potential Gas Committee—comprised of industry representatives, consultants and the Colorado School of Mines—estimated the U.S. has 2,384 trillion cubic feet of gas. That is more than 90 times the total amount of natural gas consumed domestically each year.

Adding complexity to the current market situation are compliance actions by the Environmental Protection Agency designed to improve air quality that also could lead to the retirement of more coal plants.

The EPA’s New Source Performance Standard for Greenhouse Gases, if finalized, essentially would prohibit new coal plants unless they employ carbon-capture and sequestration technology in addition to placing new greenhouse gas limits on existing coal units. Up to 40 percent of the nation’s coal plants could be impacted by the rule, Tyran said. This is just one of many air quality rules before the EPA that could have major implications for baseload power generation in both the near and long-term.

As of July 2012, roughly 30 gigawatts of coal-fired power—approximately 10 percent of total capacity—was retired. An October 2012 discussion paper issued by an economic consulting firm called the Brattle Group estimated that 59 to 77 gigawatts of coal retirements could occur if the entire suite of EPA’s regulatory proposals, such as the Mercury and Air Toxics Standards or if a replacement for the Cross State Air Pollution Rule, go into effect and market trends continue.

“Over the long term, advanced technologies for the power delivery system will transform the electricity infrastructure with intelligent systems, enabling network communications,” Tyran said. Ultimately, she added, “the Power System of the Future is emerging over the horizon.”

CSG Resources

• [Barbara Tyran’s Policy Academy Presentation: “Natural Gas and Electricity Trends”](#) [3]

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