

Electricity Prices Going Up!

Why and What Can You Do?

(Editor's note: Following is the fourth in a series of articles being published over several months in an effort to address the reasons behind the extremely large increases in energy rates that have recently been experienced. The goal of these articles is to provide informational and educational material for readers to be able to better understand the historical background of energy issues in the Tennessee Valley, take a look at energy supply and demand issues and anticipate to the best of our ability the potential impact of the environmental issues and proposed legislation being considered by Congress. The articles will also assess the latest technology advancements, and give you suggestions and recommendations on what action you can take to lower your energy use and have an impact on "our energy future.")

Fourth In A Series

Can Technology Advancements Meet The Challenge?

As discussed in prior articles in this series, America is facing some of the toughest energy issues in its history as the demand for energy is growing at a rate faster than supply, concerns for the environment are driving discussions regarding our future energy policies, the price of energy, although down somewhat, spent most of last year at historic highs and we are looking to technology advancements to meet our growing energy needs. This article will focus on technology advancements in energy production, environmental controls and the challenges these technologies face as the nation and the world strive to meet the growing demand for energy.

For decades, the United States has relied on abundant domestic fuels to provide electric power. As a nation, the sources of electricity generation are 49 percent coal, 22 percent natural gas, 18 percent nuclear, 6 percent hydro, 2 percent petroleum and about 3 percent non-hydro renewable and other sources.

Natural gas is the default baseload electricity fuel when coal and nuclear aren't available. Electric baseload generation fueled by natural gas is expected to rise over the next decade because it produces less than one-half the greenhouse gas emissions of traditional coal plants. And because nuclear generating plants are so expensive (current estimates are that a single new nuclear plant could cost as much as \$12-\$15 billion or even more) and take so long to be permitted, licensed and built, natural gas is expected to fill that time gap. Gas is also used to balance out wind's intermittency because gas units can be fired up quickly when the wind slows or stops.

So why not rely exclusively on natural gas? Many experts say America no longer has enough domestic natural gas to support its current growth needs. Increasing dependence on natural gas could fundamentally shift the energy picture for the United States and create new economic strains. The U.S. will have to compete for gas in the volatile global market and rising natural gas costs will hit electricity bills immediately.

It is reported that America has more coal reserves than any other nation, with reserves projected to last more than 200 years. And to this point in time, coal has largely been responsible for the low cost and solid reliability of the nation's electricity supply. But because coal is carbon-intensive, construction of new coal-fired generating plants is being met with strong resistance, and in many cases stopped completely.

Discussions continue regarding research for clean coal technologies and carbon capture and sequestration (CCS). Peabody Energy, the world's largest private-sector coal company, recently awarded \$10 million in grants to academic institutions to advance clean coal research and mining technologies:

- \$5 million to Washington University in St. Louis to establish the Consortium for Clean Coal Utilization, which will develop carbon capture and storage technologies, oxyfuel combustion and other approaches to reduce carbon dioxide emissions
- \$2 million to the University of Wyoming to support the Clean Coal Technology Center
- \$2 million to the University of Arizona to create the Institute of Mineral Resources

- \$1 million to support other related educational studies at other universities

Early versions of proposed energy policies being considered by members of Congress and supported by President Obama focus heavily on carbon capture and sequestration to meet environmental concerns about greenhouse gas emissions from coal-fired plants. The U.S. Government Accountability Office (GAO), however, recently issued a report on the status of CCS technology. In general, it concluded that the technology faces grave technological, regulatory, economic and legal barriers that must be overcome before it is ready for large-scale commercial deployment. CCS is composed of five process steps, each of which has its own technological challenges, risks, development schedule and cost implications:

- Capture carbon and compress it into liquid carbon dioxide (CO₂)
- Transport the liquid CO₂ to a storage location
- Inject and store it deep underground
- Monitor it over the long term to verify that the CO₂ stays in the ground
- Conduct remedial measures in case leakage occurs

Nuclear power generation offers the promise of meeting goals of reliable power and reduced greenhouse gas emissions, however not in the short term and at an uncertain cost. The Electric Power Research Institute estimates four new plants will need to come on-line each year from 2015 to 2020 for nuclear power to make the contribution needed to meet electricity needs and reducing carbon emissions to 1990 levels by 2030. Current construction forecasts say this target cannot be met. In fact, none are expected to be on-line before 2020 because of public and political opposition and financial risks. Experts suggest that in order to move past the obstacles nuclear plant construction face, policy makers must recognize:

- The need for innovative funding which minimizes risks
- That safe, on-site waste storage and reprocessing are possible for the next century until long-term storage is available

Renewable energy production is an important part of electricity generation, but often creates misperceptions from those that think renewable can meet the short-term growing demand for electricity. Including hydropower, renewable generation is currently only 8 percent of the overall total portfolio of generation resources. Non-hydro renewable generation (primarily bio-mass and wind, with smaller contributions from solar and geothermal) is only 2.5 percent of the overall portfolio.

Polls show that many mistakenly believe that renewable energy alone can satisfy increased demand for power and that currently non-hydro renewable energy is a large percentage of the nation's electricity generation. Even wind generation, the primary source of recent renewable energy additions, is a tiny fraction of overall U.S. generation – an estimated 0.8 percent in 2007.

Renewable energy generation growth faces large hurdles in the next decade. Without large federal subsidies, investment virtually comes to a stop. Power line capacity is inadequate to deliver renewable power from remote areas where renewable resources are located to the population centers where power is needed. And since wind and solar are intermittent resources, current projects are only commercially viable where conventional generation resources, usually gas, are sufficient to back them up during times of no wind or sun. The need for this capacity redundancy is, of course, a major component in the true costs of renewable energy resources. In addition public opposition to offshore wind farms and farms on public land has stopped many renewable developments.

Glenn English, CEO of the National Rural Electric Cooperative Association (NRECA), an organization of electric cooperatives across the United States, was quoted in a recent article, saying, "Technology will help us meet ambitious goals for producing sufficient amounts of electric power while reducing carbon dioxide emissions. But until breakthroughs are achieved, both electric reliability and affordability may be compromised as our industry struggles to bring adequate generating capacity on-line during a time of economic uncertainty."

Obviously many obstacles lie ahead and President Obama and Congress have a monumental task as they consider all the options, obstacles and challenges each of our power generation sources of the future provide, and as we strive to reduce greenhouse gas emissions.

Cooperative members are encouraged to read and study about the issues being debated and become actively involved in expressing your interests and concerns with legislators.

NRECA has launched an aggressive grassroots campaign to allow cooperative members to weigh in on the issues, entitled "Our Energy, Our Future: A Dialogue With America." To date, more than 1.5 million e-mail messages and letters have been sent to members of Congress, attempting to encourage legislators to consider ways America can achieve energy solutions that are both economically and politically sustainable over the long term.

Jack Wolfe, Jr., president of NRECA, perhaps summarized the issues best when he recently wrote in a commentary message, "We have many tough issues in play, and they all require attention: building new generation to keep the lights on, dealing with high cost of fuel and materials, improving consumer energy efficiency, and coping with carbon constraints. And all of these wrap into upcoming energy debates. We must make sure lawmakers strike the right balance, one that meets environmental objectives while limiting the impact on electric bills."

Duck River Electric encourages its members to visit the Internet Web site: www.ourenergy.coop to learn more about the campaign and take the time to send your legislators a message about your feelings on the issues. Doing so will extend the grassroots efforts by cooperative members all across America to have input into "Our Energy, Our Future."

The next article in this series will deal with suggestions on how you can lower your energy use and influence the outcome of "Our Energy Future." This article will appear in the March issue of The Tennessee Magazine.

