Our energy, CAN WE

With the United States facing a record half-trillion dollar deficit for the first time in history, Americans long for the good ol' days. When energy was cheap. When transportation was affordable. And energy was cheap. When living well was within our means. And energy was cheap.

Yes, we've all figured out by now that escalating energy costs translate to skyrocketing costs for everything else. The problem of energy has emerged as one of the defining—and most difficult—challenges of the 21st century. Providing affordable, sufficient energy that also suits the environment may just be one of the most challenging problems we as a civilization have ever faced.

That challenge confronts us not only on a global or national scale. It hits us right here at home—at your local electric cooperative.

Yes, we, as a member of the Basin Electric Power Cooperative system (which includes 126 cooperatives in nine states), have a great history of providing you with abundant and affordable energy. For decades now, we have been able to supply you with electricity generated right here at home, from the coal fields or harnessed water resources of western North Dakota. Your benefit of our development of homegrown energy: some of the lowest electric rates in the nation!

More recently, we have added to your generation mix with the most plentiful source of renewable energy possible: wind energy. Since the late 1990s, members supplied by distribution co-ops of the Basin Electric system have received energy partially derived from four wind turbines and three wind farms in North and South Dakota. Sometime within the next five years, this wind supply will be expanded to include electricity generated from the largest cooperative-owned wind farm in the nation. Basin Electric's 115.5-megawatt, 77-turbine Prairiewinds project is being built near Minot and is expected to go online in 2010.

And we have augmented our generation mix with more unconventional sources. Besides electricity generated from wind and coal-based resources, Basin Electric member cooperatives like Northern Plains have been distributing electricity generated from natural gas-fueled peaking plants.

Eye on innovation

More recently, Basin Electric has developed, or is in the process of developing, other unconventional sources. It is now generating electricity by recovering heat from natural gas compressors. With other partners, such as the North Dakota State University North Central Research Extension Center at Minot, it has developed a hydrogen vehicle fueling station that will be powered by wind turbines.

Add it all up, and Basin Electric's development of a more diverse generation mix has been impressive. Based on a membership resolution passed in 2005, Basin Electric has made a pledge to produce 10 percent of its members' needs from renewable resources by 2010.

Impressive as it is, however, it is not

A look at the Basin Electric carbon capture and storage demonstration project

PROJECT GOAL: To commercially demonstrate carbon dioxide (CO2) capture technology for conventional power-based power plants.

SCOPE OF PROJECT: Largest in the world, the project will capture 1 million tons of carbon from a portion of the exhaust of Unit 1 at Antelope Valley Station. Captured carbon would then be delivered by pipe to an existing compressor station at the adjacent Dakota Gasification Plant (DGC) and then injected into a 205-mile pipeline system.

PROCESS: Carbon is captured using an ECO2 process after emissions of sulfur dioxide, mercury and fine particulate matter are captured. Once the carbon is captured, an ammonia-based solution is regenerated to release carbon and ammonia. The ammonia is recovered and sent back to the scrubbing process, and the carbon is in a form that is ready for geological storage.

PARTNER: Powerspan, a Portsmouth, N.H., technology company engaged in the development and commercialization of proprietary multi-pollutant control technology for the electric power industry.

LOCATION: Basin's Antelope Valley Station, Beulah

TIME LINE: Construction to begin late 2009; completion 2012.

our future, our co-op

CONTINUE TO COUNT ON COAL?

enough. Like people and industries all over the world, members of Basin Electric's 126 cooperatives are increasing their consumption of and demand for electricity. The need for baseload energy (which is the minimum level of demand on a power supply system) continues to grow on the Basin system. Recent projections by Basin call for the development of about 1,700 megawatts of additional baseload generation by 2021. That is enough energy to power 1.4 million average-sized homes.

Clean coal not enough

Today, the Basin Electric system relies on three coal-based power plants (two in North Dakota and one in Wyoming) and five "peaking" stations in South Dakota, Wyoming and Iowa to supplement power generated by its baseload facilities. Basin Electric's cooperatives take great pride in all their coal-based power plants. They are efficient and clean and have become the touchstone for the industry—providing low-cost energy while surpassing stringent government environmental standards.

Recently, one of those coal-based power plants—the Antelope Valley Station near Beulah—was chosen for a demonstration project that is being carefully watched by the energy world. The $200-$300 million project will be the first of its kind to commercially capture and store approximately 1 million tons of carbon from the exhaust of a coal-based power plant. It is looked upon as the defining "21st century moment" of coal-based power plants, as the technology to capture and store carbon is presently far, far from being perfected to the point of commercialization.

Upon successful completion of this demonstration project, Basin Electric and its research partners will have saved a critical spot on the world map for coal-based power plants. In recent years, plants using coal as a generation source have come under extreme public scrutiny from environmentalists in both the government and public sectors who are concerned about carbon emissions. The result is that no electric generator, Basin Electric included, is able to plan a coal-based power plant with assurance the project wouldn't be stalled or derailed before completion.

Are THESE the good ol' days?

With clean coal's back to the wall—and while Basin Electric works diligently to perfect the storage and capture of carbon from coal-based plants—all electric utilities are on the hunt for other ways to generate electricity affordably.

Their search should concern all of us now. Because we—and our pocketbooks—will all feel the effects of their success in the future. Hopefully, tomorrow's "good ol' days" of affordable energy aren't as distant as we might perceive them to be today.