

Coal-fired power has some big question marks ahead of it



The 1920s-era photo at left shows an original coal-fired steam plant built on the ground where the Neil Simpson I plant was later built. The massive Wyodak plant is in the center. And, at right, the WyGen II plant, completed at the end of 2007, releases a thin stream of steam. — Campbell County Rockpile Museum photo-News-Record photo-News-Record photo by Nathan Payne

By **PETER GARTRELL**, News-Record Writer pgartrell@gilletteNewsRecord.net

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Three years ago, everything coal seemed so sure, so absolute, so ready, set, go.

The mining industry was busy hiring and preparing for huge capital investments at its mines. The railroads were slammed, scrambling to make up for shipments lost after spring derailments snarled coal deliveries.

And everyone's eyes were on utilities across the nation, who had combined to make plans for more than 100 new coal-fired power plants in the coming years.

"Six-hundred million tons," Powder River Basin producers screamed as residents in this oasis of carbon-based energy dreamed of power plants everywhere. The coal-to-wire mantra of building more power plants here that started in the 1960s seemed to grow louder.

In all likelihood, coal growth will continue.

But looking back into that crystal ball that seemed so clear just a few short years ago, that clarity has been replaced with murkiness as the greenhouse gas debate comes to a boil.

Vern Schild, director of power generation for Black Hills Power at the Wyodak/Neil Simpson complex, has been immersing himself in research about how to sequester or reduce the release of greenhouse gases as the company considers construction of a sixth coal-fired plant after WyGen III is finished in 2010.

Carbon controls are part of the considerations as the company considers a site on the north side of the existing Wyodak Resources mine, putting the plant into what Schild describes as a "major unknown."

"It's going to use about a third of the power to sequester carbon," he said. "So to get another 100-megawatt (net capacity) plant, we'll have to build a 150-megawatt (gross capacity plant)."

WyGen III, by contrast, will generate 110 megawatts, 100 of which will be able to go onto wires.

And, while Black Hills Power and the State of Wyoming are generally bullish about the construction of coal plants, not everyone is.

"The rate of coal cancellations accelerated during 2007 to the point that over 50 percent of coal capacity announced since 2000 have now been canceled."

It was the grim assessment of a February report by the well-respected Wood Mackenzie consulting group as it explored the future of natural gas prices as utilities turn to the cleaner fuel to bring power to its customers.

Coal plants still will be built in the coming years, but the numbers being thrown around in 2005 — more than 100 during the next decade — have dwindled significantly.

Wood Mackenzie counted 35 coal plants with a combined 18,200 megawatts under construction with completion dates ranging between 2008 and 2014. Another 50,000 megawatts of capacity has been announced, but less than 10 percent of that total has gained permits. Wood Mackenzie expects only about 9,500 megawatts of the announced capacity to be built between 2012 and 2017.

Big though the numbers may be, it's not 100 and many power producers are skittish about the prospect of building more coal capacity past too far into the future.

Why?

"A new coal project faces the combined hurdles of escalating costs, opposition from environmentalists, long lead times and cost recovery challenges," the Wood Mackenzie report concluded.

There's no mention of the cloud hovering over Washington, D.C., where a bipartisan greenhouse gas cap-and-trade bill is tentatively scheduled for June debate in the Senate. Even if the bill is not passed and signed into law, it certainly won't be the last bill of its type to come through the halls of Congress and end up on the President's desk.

"Right now there is a lot of uncertainty about what will be enacted," said Jeff Hymas, a spokesman for PacifiCorp-owned Rocky Mountain Power.

In addition to being the largest electricity provider in Wyoming, the company operates the Wyodak plant east of Gillette, part of an 800-plus-megawatt energy campus that runs almost entirely on coal.

The company is not panicking or shuttering the doors on its plants. There are upgrades to reduce nitrogen oxide and mercury emissions scheduled for the Wyodak plant in 2011. But like so many other utilities, it's not volunteering to put its neck on the block either, shelving a program of proposed coal-fired plants last fall.

"We're in the same boat as everyone else, just waiting to see what Congress will do," Hymas said.

At work are huge question marks that go beyond Congress. Many have their eyes on the growing list of states pushing for renewable energy portfolios, although some critics say they have loopholes you could drive a haul trucks through. But without money, no loophole can be big enough, and at least four of the nation's largest banks have pledged to look at carbon emissions for future coal projects.

Ken Lewis, chairman and CEO of Bank of America, one of the banks that has pledged to follow the so-called Carbon Principles, told a conference at North Carolina State University that the bank has actually put a price of \$20 to \$40 per ton of carbon emitted.

"The coal industry will be with us for a long time," Lewis said in his Feb. 12 speech. "But the competitive and regulatory environments for coal in particular ... and energy in general ... are changing. And so will the risk formulas banks use to finance the industry."

And it's not just banks — the Department of Agriculture's Rural Utility Service even has backed off on coal plants. This is an unabashedly pro-coal administration we're talking about.

All that said, the coal industry is not dead and the Grim Reaper is likely somewhere in the next town, maybe the next county, and walking slowly. There has been growth in both the production and consumption of coal that will have sticking power for years to come.

Since 1997, electric utilities have increased their use of coal by 125 million tons, a 13 percent increase to more than 1.1 billion tons in the course of a decade, according to the Energy Information Administration. Much of that increase has been filled by coal being shipped out of Campbell County and that number will likely rise more in 2008 if the first two months of the year are any indication.

Simply put, energy demand will grow dramatically as the U.S. population hurtles toward 400 million people and beyond, a point Lewis touched on in his speech.

"The fact is that coal provides half of all electric power in the U.S.," he said. "And with energy demand rising by as much as 50 percent over the next 25 years, coal is projected to increase its share of the market ... even accounting

for the rapid growth of renewable.”

But all is not rosy. In its annual “Energy Outlook” set to be released this month, the Energy Information Administration has dramatically downgraded coal consumption and production forecasts from the numbers that were being projected just one year ago.

Consider these nuggets:

In April 2007, domestic coal production was expected to hit 1.704 billion tons by 2030. By the time projections were released this year, the number had been lowered to 1.467 billion — a 14 percent drop.

That’s a deep plunge, a little more than half of the Powder River Basin’s current production levels — or Black Thunder, North Antelope-Rochelle, Jacobs Ranch production combined last year, with a few million tons to spare.

Producers here remain confident that a huge chunk of the utility coal capacity that comes online will be burning local coal. That’s good for the local economy. What’s harder to say is if those plants get off the ground or if utilities go with other options such as biomass, nuclear or natural gas, all of which federal estimates project as filling gaps left should coal use decline.

The coming Senate debate will tell us a lot.

November elections may tell us more.

In the meantime, it could be awhile before that crystal ball gets any clearer.

NOT JUST ELECTRIC UTILITIES

Electric utilities are often unfairly targeted as being the only contributors to greenhouse gas emissions.

The sector is not the only greenhouse gas emitter but it did account for 41 percent of the 5,640 gigatons of carbon dioxide equivalents released in the United States in 2006, according to the Environmental Protection Agency.

Coal accounts for almost 2,000 gigatons of utility emissions.

The next closest sector is transportation, with just over 33 percent or 1,860 gigatons of those 2006 emissions.

In a November study released by the consultant group McKinsey & Co., utilities also were tagged as the sector where the most greenhouse gas reductions could be seen by 2030.

Options included more renewable energy, nuclear power, improved efficiency at existing plants and carbon-capture and storage at coal plants.

Obstacles remained though:

“Options in the power sector were among the most capital-intensive ones evaluated. These options also tend to have the longest lead times given bottlenecks in permitting, materials and equipment manufacturing, and design engineering and construction.”

IT’S NOT JUST CARBON DIOXIDE

Carbon dioxide and greenhouse gases are often used interchangeably when people and the press talk about climate change or global warming. There are actually several greenhouse gases. Here’s a list from the Environmental Protection Agency:

- Carbon Dioxide (CO₂): Enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Part of the carbon cycle sees CO₂ absorbed by plants.

-Methane (CH₄): Emitted during the production and transport of coal, natural gas and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

- Nitrous Oxide (N₂O): Released during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

-Fluorinated Gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs and halons). Though typically released in low quantities, their potency have led them to be known as High Global Warming Potential gases.

— For a breakdown of plants at the Wyodak/Neil Simpson complex, who owns them and where the juice goes, see Sunday's News-Record