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Pumping up the power grid

New plants will barely meet demand for electricity

By Gargi Chakrabarty, Rocky Mountain News
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A new coal-burning electricity plant is under construction in Pueblo. To the north, in Frederick, work is under way on another electricity plant, this one fired by natural gas. Solar and wind farms are cropping up in Lamar, Peetz, Grover and the San Luis Valley.

An unprecedented billion-dollar Colorado energy construction boom will add 1,886 megawatts of power through 2012 - barely enough electricity to serve the state's burgeoning population. The good news is, Xcel Energy's customer base is growing, and the cost will be spread out among more homes over the next few years.

"We have a good operational plan to meet demand on the hottest day all the way through 2012," said Kurt Haeger, Xcel's managing director of wholesale planning.

The utility recently came under fire for not having enough power on Feb. 18, one of the coldest days this winter, and that led to rolling outages in many areas. State regulators are investigating the occurrence, although Xcel has blamed failed power plant units, distribution glitches, natural gas supply constraints and extreme weather conditions.

Haeger said the additional electricity will not only serve more customers - 12,000 more a year in the metro area - but also replace Xcel's supply contracts with private power producers that are slated to expire in the next few years.

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Construction continues on a new coal-burning power plant in Pueblo that is expected to cost $1.4 billion and come online in 2010. It will generate 750 megawatts of electricity, two-thirds owned by Xcel. Intermountain Rural Electric and Holy Cross Electric will own the rest.

Xcel also plans to diversify its fuel sources to reduce its exposure to the volatile natural gas market. In the past four years, natural gas prices have more than doubled in the wholesale market because of supply crunches - forcing utilities to increase the electricity rates paid by customers.

By 2012, Xcel plans to cut its natural gas-based generation nearly in half, from 30 percent to 17 percent of total power generation. During the same time, it will triple its wind-based generation to 9 percent from 3 percent and hike its coal-based electricity to 73 percent from the current 66 percent of total generation.

"Those numbers show three important trends," said Jim Sims, who runs the Golden-based Western Business Roundtable and lobbies for energy and mining industries. "First, a greater reliance on renewable resources. Second, less reliance on natural gas for electricity generation.

"The third trend is the resurgence of clean coal," Sims said. "And that's being driven by two things: technological leaps in advanced coal technologies and the realization that we need to rely more on domestic resources for our energy rather than rely on imported energy."

Powering the growth

Once every four years, Xcel submits a resource plan to the state Public Utilities Commission. In that plan, Xcel forecasts the increase in demand for electricity during the next few years and how it intends to meet that demand.

The forecast is based on several factors: the growth of homes and businesses in its service area, the increase in the use of electrical appliances such as air conditioners and the effect of energy-saving programs.

For this summer, Xcel predicts demand will peak at 6,550 megawatts - about 100 megawatts lower than last summer's peak on July 19. One megawatt serves the electricity needs of 1,000 households. Xcel made the lower forecast because it will lose a wholesale customer. Even if actual demand exceeds the forecast, Xcel could dip into a reserve of another 1,048 megawatts.

"This year, our supply and demand is exactly balanced," said David Eves, Xcel's vice president of resource planning and acquisition. Looking ahead, Xcel estimates it will need a total capacity of 7,843 megawatts in 2012, 245 megawatts more than this year.

That long-term forecast assumes Xcel customers will save more than 500 megawatts over the next six years through energy-saving programs. It also factors in that demand will be tempered by the expiration of some sales contracts with wholesale customers.

But that's not the whole picture. Between now and 2012, Xcel will lose about 1,300 megawatts of generation because many of its supply contracts will expire. Currently, Xcel buys 3,372 megawatts, or nearly half of its total generation, in long-term contracts from private power producers. It also won't have 212 megawatts in short-term contracts that it is counting on this year.

Including the demand growth and supply loss, Xcel figures it will need to add 1,816 megawatts by 2012. To plug that shortfall, Xcel has projects in the works that will generate 1,886 megawatts by 2012 - a mere 70 megawatts more than the predicted demand.

The new projects include a $1.4 billion coal-fired plant under construction in Pueblo that will go online in 2010. The plant will generate 750 megawatts of electricity, two-thirds owned by Xcel. The rest will be owned by Intermountain Rural Electric and Holy Cross Electric.

Xcel will contract out smaller projects, including one natural gas-fired plant and four wind farms, to private producers. "Whenever we add a large plant, (power) generation takes time to adjust to demand," said Xcel's Haeger, explaining the future supply surplus.

"While waiting for a big plant to come online, we are short of supply in the preceding years," he said. "Once the plant is added, we are long on supply over the next couple of years."

For instance, when the Pueblo plant comes online in 2010, Xcel's power generation that year will exceed demand by 419 megawatts. But by 2012, that surplus likely will be narrowed to 70 megawatts. Xcel could sell the excess power to other utilities and share the profit with customers.

Old-school projects

Xcel is being criticized for investing a lot of money on large, costly projects such as the Pueblo plant that take a long time to become operational and might not be needed in the future.

"There is always uncertainty about load growth in the future because we don't know if we are going into a recession," said Howard Geller, the executive director of the Southwest Energy Efficiency Project who frequently intervenes in Xcel's regulatory cases.

"It is better to concentrate on smaller-scale, less costly resources like renewables or energy-efficiency programs that can be added as you need them," Geller said, "rather than big, lumpy resources like a 750-megawatt coal plant that you have to commit to for many years and cost more than $1 billion."

By 2012, Xcel will draw nearly three-fourths of its total electricity from coal and the rest from a mix of natural gas, wind, solar and hydroelectric power. Xcel argues that coal is a stable fuel, given that the West has enough coal deposits to supply the nation for a few hundred years.

"In general, there is danger in rushing to any single fuel choice because fuel diversity is very critical to a rational energy policy," Sims cautioned. "But each state and each utility needs to decide what diversity means in that locality."

For Xcel, the use of natural gas will be cut in half and will account for only 17 percent of total generation by 2012. With that in mind, Xcel has hired only one private producer to build a new natural gas-fired plant in the next couple of years.

The 269-megawatt plant in Frederick will be owned and operated by Chicago-based Invenergy Wind LLC. Xcel will deliver natural gas to the plant and buy electricity from it in long-term supply contracts. The plant will have the option of running on fuel oil in case there's a blip in natural gas supply, said Doug Carter, Invenergy's vice president of development.

"Xcel is a better buyer of natural gas," Carter said. "They can bear the fuel risk and better manage the portfolio."

Xcel also will renew supply contracts with other producers totaling 964 megawatts. Most of that generation will be from natural gas. The utility plans to add 775 megawatts in wind power from four different farms. Of that, only 78 megawatts will be counted as firm generation since wind is inconsistent. Three of the farms will be built in Peetz, Lamar and Grover; the fourth has yet to be finalized. In six years, wind capacity will triple to 9 percent of generation.

"We are adding a layer of insulation for customers by producing more in coal-fired generation," said Xcel spokesman Tom Henley, "and reducing our exposure to volatility in the natural gas market."

In order to comply with Amendment 37, which voters passed in November 2004, Xcel is planning an 8-megawatt solar project in the San Luis Valley. The utility encourages a matching generation from customers by offering rebates for solar panel installations at homes and businesses.

The amendment directs Colorado's top seven utilities to obtain a portion of their electricity from the sun, wind, and plant and animal waste.

Clean energy options

Utilities would have to get 3 percent of their electricity from renewable sources in 2007 and up to 10 percent by 2015, including at least 4 percent from solar.

That means Xcel is mandated to sell 18 megawatts of solar energy by the end of 2007, half of which must come from customer homes or businesses. Xcel already is in compliance on wind generation.

John Neilsen of Western Resource Advocates said Xcel's fuel mix, especially the dramatic increase in wind, is "encouraging."

Neilsen and other environmental activists are pushing Xcel to build a clean coal plant using gasification technology. House Bill 1281, which gives Xcel $3 million each year for three years to study the feasibility of coal gasification in Colorado, has passed both the House and Senate, and Gov. Bill Owens is expected to sign it this legislative session.

"We certainly are concerned about over-reliance on coal-fired generation and strongly believe that any coal plants in the future need to be gasified coal technology," Nielsen said. "We are working with Xcel to move toward that direction."

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