Summary of Holcomb Issues

By Craig Volland, Chair, Air Quality Committee, Kansas Sierra Club, Feb. 16, 2008

History of the Holcomb Project

The current Holcomb expansion project is not new. In 2000 Sunflower proposed the first big expansion at Holcomb, a 660 MW plant called Sand Sage. Like the current proposal it was designed far in excess of their own needs. Sunflower planned to sell the project to Enron or other energy marketers. They received a construction permit in 2002. It was extended in 2004 but expired in October 2005. The project fell through when Enron went bankrupt, the utility industry deregulation craze died, and Sunflower couldn't find a buyer. Next they came up with the current scheme, three times larger (2100 MW), which was later downsized to 1400 MW.

Sunflower was recently described by the US Justice Department, representing the USDA Rural Utility Service, as a "financially troubled borrower."[1] They already owe $200 million to the RUS. This project was conceived because Sunflower has been unable to accrue equity and raise capital on their own. They plan to use money obtained from their partners to finance their small 125 MW share of the project. The only other power going to Kansas is 75 MW to Midwest Energy Inc.

Global Warming Impacts

Holcomb 2 & 3 will together emit 11 million tons/year of carbon dioxide, and that doesn't count the emissions from burning diesel fuel to haul in 6.2 million tons of coal per year… for at least 50 years.[2] According to the world's leading scientists in the field, the Intergovernmental Panel on Climate Change, the existence of human-caused global warming has become virtually certain, and it is accelerating. The IPCC's 2007 report shows that, if we do not change course, we will see a very significant increase in summer heat and heat waves in Kansas toward the end of the century. This increase may be attenuated somewhat by evaporative cooling if rainfall increases. On the other hand, densely populated urban areas are likely to get hit extra hard from the well known urban heat-island effect where extensive pavement and inappropriately designed buildings greatly increase heat absorption and retention. See
http://kansas.sierraclub.org/Wind/KansasGlobalWarming.htm

Sunflower's Promises on CO2

As opposition to the Holcomb expansion has grown, Sunflower has proposed carbon emission capture and offset plans. None of these are credible at present. Their algae reactor is in its early experimental stages. At best it works only about 40% of the time when sunlight is adequate. It's one thing to build a small pilot plant; it's quite another to design a system to handles millions of tons of algae. First results from a pilot project at Arizona Gas and Electric were disappointing and suggest that Sunflower's facility would need 35 square miles of surface area to remove only 40% of the carbon. The cost is estimated at some $9 billion. See
http://kansas.sierraclub.org/Wind/AlgaeReactors.htm

Carbon capture and sequestration is acknowledged to be at least a decade away. Lately Sunflower has been telling legislators they will shut down other plants to compensate. However they have not made public the names and age of these plants so we can evaluate just how much carbon would be offset over the next 50 -75 years. This also contradicts their longstanding claims that they need the huge Holcomb expansion because of increasing loads.

In any event Sunflower did not address CO2 in their Holcomb permit application. Thus once the Supreme Court ruled in April, 2007 that CO2 was a pollutant under the Clean Air Act, Secretary Bremby was given no basis for a different decision. In effect Sunflower is asking that we let them go ahead and build while they figure out what to do about carbon dioxide. A better plan is to *stop* building coal plants while they figure out what to do about carbon dioxide.

Costs of Energy

When Sunflower first started thinking about their Holcomb expansion it probably made financial sense. The price of natural gas had soared and coal was cheap, though supplies were far away in Wyoming. But in the past year, one of the bedrock beliefs of the utility industry has crumbled. Burning coal is no longer cheap! Fifty eight coal plants have been shelved or abandoned by the utility industry in the past year. In Kansas, Westar shelved their coal plant proposal and turned to wind power and energy efficiency programs. The CEO of Westar recently noted that the cost of coal plants "has nearly doubled in recent years."[3] Just in the past month the US Department of Energy cancelled the FutureGen advanced coal-burning technology project because of massive cost increases.

In recent KCC testimony Westar said that a new coal plant for start-up in 2016 would cost from 7.5 to 8.0 cents/kw-hr.[4] Adjusting for plant size and a 2013 start date, Holcomb will likely cost about 6.7 cents/kw-hr. That doesn't include the cost of impending carbon regulation by the US Congress. Experts estimate that this regulation will add about $25 per ton of CO2, or an increase of over 35% for a coal plant like Holcomb.[5] The Wisconsin Public Service Commission estimated a cost of $22/ton in a decision last year.[6] So now we are up to 9.2 cents/kw-hr. That's *wholesale cost* which exceeds the 8.1 cents Midwest Energy, Inc. is charging their retail customers.[7] Wall Street is so alarmed that they announced recently that they would make it harder to finance coal plants.[8]

Non-Coal Options – wind power and energy conservation

The CEO of Sunflower wrote recently that Secretary Bremby's decision altered long standing energy policy in Kansas which he said *was reliable power at least cost*.[9] Aside from the fact that the Secretary was supposed to base his decision on health and environment, not cost, he didn't actually change any so-called Kansas energy policy. That's because *burning coal is no longer the least cost option*. The new least cost option is a combination of wind power and extensive energy savings and conservation programs.

Natural variation in the regulation of wind power output requires some back-up by natural gas generators, but recent industry studies peg that cost at no more than 10% for penetrations of wind power far in excess of anything contemplated in Kansas in the near future.[10] Cost estimates from the recent Westar wind farm KCC docket pegged the cost of wind power at 4.4 cents per kw-hr, net of the production tax credit and including grid back-up and integration costs.[11] The production tax credit is expected to be extended by the US Congress. The cost of energy efficiency and conservation programs (EE&C) vary with intensity but have recently been estimated by the Union of Concerned Scientists at about 4 cents/kw-hr.[12] As with wind power, this is far less than the cost of burning coal.

Natural gas costs

Natural gas prices are highly volatile and could increase in the future. However, utilities who commit to large amounts of wind farm capacity actually insulate themselves against these cost increases. That's because winds generally blow well at the same times most natural gas is normally used to meet intermediate and peak loads. See http://kansas.sierraclub.org/Wind/Wind%20Study.htm

Thus wind farms will displace much more natural gas than they use for back up. In their 2006 Annual Report the Empire District Power Company, which takes all the output from the Elk River wind farm in Butler County, noted the following, "The amount and percentage of electricity generated by natural gas decreased significantly in 2006 compared to 2005 due to energy we purchased from the Elk River Windfarm, LLC in 2006." The American Wind Energy Association recently estimated that if the country committed to 20% penetration of wind power, natural gas usage would be reduced by 11% and prices by 12%.[13]

Reliability

The Southwest Power Pool (SPP)), which regulates the regional transmission system of Kansas and parts of six other states, requires that utilities keep capacity in reserve equal to 12% of peak demand. The utility industry likes to point out that they can apply only about 10% of a wind farm's rated capacity (25% of actual output) toward this standard. However if a utility commits to aggressive energy efficiency and conservation programs (EE&C), normal demand growth can be "flat-lined" so there is no need to add this "dispatchable" capacity. In exceptional cases where load cannot be entirely flat lined, then the utility can purchase power off the grid or obtain NG-fired combustion turbines for reliability purposes.

Sunflower has claimed that they will need to back up any wind power they buy with such gas turbines, and that makes wind much more expensive. That's incorrect. First we have the EE&C programs that will greatly slow growth of peak demand. Secondly Sunflower has the option to buy power off the grid when they need it. In fact the SPP inaugurated an Energy Imbalance Trading System in February of 2007. Or they can use a combination of purchased power and their own natural gas fired capacity. Keep in mind though it would be incorrect for Sunflower to apply the full or even a major part of the cost of such back-up power sources to their wind power capacity. Here's why.

The 12% SPP reserve requirement was around long before wind farms came along. This reserve capacity requirement is determined when the SPP studies scenarios where two or three of the largest, most critical components of the transmission system fail at the same time. This might be a combination of a large nuclear plant, coal fired plant complex and a major transmission line component.

The bigger and more centralized the power components are, the larger is the need for backup if several components fail at once. For example the entire 2200 MW Jeffrey Energy Center in Kansas failed in December of 2007 due to ice on nearby transmission lines.[14] One or more units of a similarly sized power station in Texas broke down *26 times* in 2007 almost always to fix boiler tube leaks.[15] *So conventional generators are just as dependent on the grid as wind farms*. Thus the cost of NG combustion turbines, which can be fired up quickly to meet unexpected demand, and purchased power, must be spread over the entire system, not just wind farms.

Base load Capacity

Historically the utility industry has met incremental load increases in the short term with purchases of power off the grid and by the use of relatively expensive natural gas fired generators. Then when conditions are right they add a big chunk of what they call *base load capacity*. These plants are very big to obtain economies of scale. The idea is to replace the short-term high-cost sources with the cheapest new source. In the past, based on the regulatory environment and whatever fuel looked the least expensive, either nuclear, coal or natural gas fired (combined cycle) plants have been selected as new base load capacity.

This concept is now out of date because *all three of these so-called base load options have become prohibitively expensive* compared to wind power and EE&C programs. As discussed previously, highly centralized coal and nuclear plants are as much the *cause* of the need for reserve capacity as the solution for it. In the near term, wind power backed up with a modest amount of natural gas can meet reliability needs. We should be getting off the base load treadmill by investing in widely dispersed wind farms and aggressive EE &C programs. In the long term, incentives are needed for *distributed generation* sources such as small residential and commercial solar panels and community wind farms

Transmission

Recent developments have put to rest concerns that the denial of the Holcomb permit and associated transmission lines will somehow restrict the development of the Kansas wind industry. The SPP has given the go ahead for several major projects and changed the rate structure to encourage transmission line developers to proceed.[16] For more detailed information see http://kansas.sierraclub.org/Wind/WindPowerTransmissionLinesGoingForward.pdf

Economic Impacts of the Holcomb Expansion

There's no doubt that a project of this size will greatly benefit the economy of a few counties in SW Kansas. The Gamble report commissioned by Sunflower noted that almost all the benefits from worker support facilities during construction and economic multipliers from permanent employees will accrue to Finney County and a couple of counties nearby. However 86% of the flow of funds for actual construction will go right back out of state to purchase the huge components of the coal plants, such as the boilers and steam turbines manufactured elsewhere and to pay specialists to install them. There will be some modest short-term gains for Kansas as a whole.

These gains must be balanced against the losses that will occur for the rest of Kansas long term. First and foremost is the huge sum of money that will flow out of Kansas to ship in 6.2 million tons of coal per year for at least 50 years. The spot price of coal from Wyoming has doubled over the past two years. Because of the abandonment of so many coal plants proposals I do not expect further "demand pull" on this price, but prices will continue to be very vulnerable to extraordinary inflation from rising diesel fuel costs and scarcity, and higher mining costs. Western Kansas will inevitably see large rate increases to cover a technology that is no longer economical and subject to increasing regulation.

Wind power and EE&C are a much better deal for Kansas. Wind power at good sites in Kansas is currently cheaper than burning coal. Like coal plants the major components of wind turbines will be purchased out of state, although that is gradually changing as the industry expands. However unlike coal plants there will be no huge annual fuel cost for 50 years or more. Wind is forever free. Also, local benefits, especially land lease fees for farmers, will be spread much more widely throughout western Kansas. Further, a recent study by the National Renewable Energy Laboratory showed that, for the same output of power, wind farms will generate 50% more in economic benefits than from building and operating coal plants.[17]

Energy efficiency and conservation programs cost half as much as a coal plant per megawatt, at least while there is so much "low hanging fruit" power wastage. Better yet, EE&C relies primarily on local brain power for planning and local staffing for execution and maintenance. There are few expensive components that must be purchased. There's also a good chance that such programs will spawn a number of new small businesses who will provide specialized services and even manufacture a myriad of tools and instruments locally.

Conclusions

A careful examination of the facts concerning the Holcomb Expansion shows that the project is uneconomical and poses a very serious long threat to human health and the environment. These impacts cannot be mitigated with current technology. Wind power and intensive energy efficiency and conservation programs offer a much better option with little or no environmental harm and higher economic benefits.

References:

1. US Dept. of Justice for USDA Rural Utilities Service, "Defendant's Motion to Dismiss," Civil Action No. 07-1860 (EGS), US District Court for the District of Columbia, Jan. 31, 2008, Introduction, page 3.
2. Sunflower permit application, stated coal usage assuming a 90% capacity factor.
3. Bill Moore CEO of Westar*, Lawrence Journal World*, Jan 11, 2008.
4. Michael Elenbass, Westar Energy, Direct Testimony, KCC Docket 08-WSEE-309-PRE, Oct 1, 2007.
5. D. Schlissel & E. Hausmann, Synapse Energy Economics, Inc., "New Coal Plants vs the Future," Jan. 21, 2008. Mid-case estimate in 2020 = $25/ton CO2, approx. equivalent to 2.5 cents kw-hr.
6. Wis. PSC ruling on Point Beach Nuclear plant ownership transfer. Ref.#82880. Sept. 25, 2007.
7. Kansas Legislative Research Department, "Comparison of Electrical Rates for Eastern & Western Kansas," Dec. 17, 2007.
8. Jeffrey Wall, "Wall Street Shows Skepticism Over Coal," *WSJ*. Feb. 4, 2008.
9. Earl Watkins CEO of Sunflower Electric Power Co., "Regulatory Process Needs to be Certain, Impartial," *Wichita Eagle*, Jan. 15, 2008.
10. NREL, DOE, "Annual Report on US Wind Power Installation Cost and Performance Trends: 2006. May 2006.
11. KCC Docket 08-WSEE-309-PRE
12. Steve Clemmer, Research Director, Clean Energy Program, Union of Concerned Scientists. Email Correspondence. Oct. 2007.
13. Rob Gramlich, AWEA, "Wind and Transmission in Kansas," Presented to the Kansas Transmission Summit V, Dec. 14, 2007.
14. Mathew Dalton, *Dow Jones newswires*, Dec. 11, 2007.
15. USDOE, *Energy Assurance Daily.*
16. *Salina Journal*, "New rate encourages transmission line construction," 2-07-2008.
17. Larry Flowers, NREL, "Wind Energy Update," Presented to Kansas Renewable Energy Conference, September 26, 2007.