The Answer is Not Blowing in the Wind
By Tim Carr

You cannot help but be impressed by the power and mechanical beauty of the twin wind turbines at Western Resources' Jeffry Energy Center just north of St. Marys, Kansas. Each turbine stands on 175-foot towers with three rotating 75-foot blades, and at full capacity generates 750 kilowatts of electricity. FPL Group Inc., a subsidiary of Florida Power and Light, and Utilicorp United, announced plans to build and operate 170 similar wind turbines at a site in Gray County in southwestern Kansas. As the largest wind-powered project in Kansas with a generating capacity of 110 megawatts, it has received abundant press from Liberal to Kansas City. Is this a significant contribution to meeting our growing electric energy demand? The answers are a surprising NO!

Kansas is called ground zero for developing wind energy, and wind energy is touted as the fastest growing source of energy in the world. However, wind turbines have a significant drawback. Actual power output depends on the availability and speed of the wind. Electricity is produced only when the wind speed is within a certain range. The full "rated" output occurs only at wind speeds of 30 to 35 mph and no power is produced at wind speeds below 9 mph. The potential contribution of an energy facility, whether it is a wind turbine or a coal-fired boiler, is not an advertised capacity. Citing a 110-megawatt capacity for a wind farm, such as that planned by FPL is not a useful number.

The meaningful number is kilowatt-hour of electricity actually produced and delivered to Kansas' electric consumers. A capacity factor is used to estimate the net electricity output (in kilowatt-hours) over a period of time (generally a year). Wind turbines have low capacity factors (typically 15 to 30%). In contrast, fossil-fueled and nuclear plants, which Kansas currently depends on for the vast majority of its electricity, can operate at capacity factors well over 80 percent. In addition, since traditional electric generation is not dependent on the vagaries of the wind, shutdowns are scheduled.

Because very few Kansas consumers will tolerate unpredictable supplies of electricity provided by wind turbines, other sources of electric power must be immediately available. Due to the need for immediate availability these "back-up" sources must be traditional facilities either operating below full capacity and efficiency, or in synchronized "spinning reserve". These "back-up" generating units give off emissions and incur costs that decrease the net contribution of wind generation.

In 2000, Kansas' utilities generated 44,442 million kilowatt-hours of electricity, an increase of 2,442 million kilowatt-hours from 1999. Assume FPL's wind project operated at maximum capacity of 30% over an entire year, and that this electricity was available not when the wind was blowing at the right speeds, but when Kansas' citizens needed electricity. In addition, assume the intermittent power provided requires no backup-generating capacity. The estimated amount of power produced in one year by the FPL project would be 289 million-kilowatt hours. This amount of energy while appearing large is only 6/10's of 1 percent of our annual electric demand. The FPL project will not even begin to address the annual increase in electricity demand resulting from the growth of Kansas' population and economy. Under these generous assumptions, it would require the annual construction of approximately 2,000 wind turbines in Kansas just to keep pace with th4e annual growth in demand for electric power. Based on these numbers, wind resources in the next couple of decades cannot provide enough energy to represent a significant component of our electric energy system. Exaggeration concerning the near-term supply potential of renewable energy distorts regulatory and tax structures, and retards development of future energy forms on which we will all one day depend.

FPL states that the Gray County wind project, which covers several square miles of southwestern Kansas, can provide enough electricity to power 33,000 homes. They don't tell us that it is only over unpredictable periods of time covering only a small portion of the year. An addition of a single gas turbine approximately the size of a small building can power 170,00 homes for more than 80% of

a year.

In the longer term we will require new energy resources that might include wind energy. However, Kansas and our country cannot rely on wind and other renewable sources to meet a significant share of our present and near term energy needs. Wishful thinkers ask state and national governments to make potentially economically ruinous decisions that attempt to force renewable energy toward a significant percentage of the energy mix. Based on long-term projections from the federal government, the amount of energy from renewable sources will increase 26% from 1999 to 2020. An impressive number, but the overall energy market is expected to grow at a faster rate (32%). The result – compared to today renewable energy is predicted to decrease as a contributor to our total energy budget in 2020. What is more, forecasted growth in renewable energy is the result of state and federal mandates not market forces.

Over the immediate future, the share of Kansas' energy that comes from renewable wind energy is, and will remain, miniscule. The economic and societal-well being of Kansas and the US depends on the wise and prudent use of our abundant traditional energy resources, as we make a slow transition to new methods of energy production sometime after 2020. Our present and impending energy problems are not the result of a shortage of resources. They are the result of energy policies and perceptions based in part on wishful thinking.

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