

 <p>Oklahoma <i>owpi</i> Wind Power Initiative</p>
<p>For More Information contact:</p> <p>Tim Hughes The Environmental Verification and Analysis Center University of Oklahoma 3200 Marshall Ave, Suite 110 Norman, OK 73072-8032 Phone: (405) 447-8412 E-mail: thughes@ou.edu</p>

ENERGY POLICY

Recommendations for an Energy Strategy in Oklahoma

Oklahoma has tremendous potential for wind energy development, yet we lag behind our neighboring states and stand to lose ground in this evolving competitive market if public and private sector interests do not take steps to support development. OWPI offered the following recommendations for strategies to State Secretary of Energy Robert Sullivan to consider as he prepared his Oklahoma Energy Strategy Report in late 2002.

Recommendations

1) First, we strongly urge that Oklahoma support and promote in-state development and ownership of wind power generation facilities (wind farms). We estimate that one megawatt of wind energy generation owned by in-state interests returns more direct economic benefit to the state than 10 megawatts owned by out-of-state interests. When one takes into account economic multipliers, the favorable returns of in-state ownership are even greater.

We see the following as important incentives for in-state ownership and development.

- Encourage Oklahoma oil and gas companies to diversify their energy portfolios to include wind power. Many facets of wind farm development - financing, permitting, land leasing, and construction, to name a few - involve aspects that oil and gas industry professionals are well equipped to handle. Furthermore, many in the energy industry foresee hydrogen as the fuel of the future, and wind farms can become a major source of energy needed to produce this fuel. Transport of hydrogen to markets will call for the expertise and infrastructure that those in the oil and gas industry already possess. Oil and gas will benefit Oklahoma's economy for many years to come, but many with vision in the industry already see that diversification is important to keep their companies, and the state, thriving over decades to come.
- Encourage the development of locally and cooperatively owned wind farms. This model is common in Europe but rare so far in the United States. With the help of state tax incentives for small wind farms, this model is proving a success in Minnesota. Cooperative owners there can realize \$20,000 to \$30,000 per turbine per year in returns (compared to \$2000 per turbine per year for typical land-leases) - with up to \$80,000 per turbine per year expected when debts are retired after about 10 years [1]. Prices for electricity from conventional sources can naturally be expected to rise while ongoing improvements to wind turbine technology will continue to lower wind generated electricity costs. We are confident this model will work someday soon in Oklahoma as well; indeed, with proper planning it may already. Further study can determine this.

- Encourage the further development of renewable energy assessment information and studies of economic returns of state incentives. For example, state supported work to continue studying Oklahoma's wind and bioenergy resources, and to develop and maintain resources to facilitate sharing that information will aid in-state developers. Also, A cost/benefit study of Minnesota's state tax incentives and benefits to cooperative owners may be useful to determine the value of such a practice in Oklahoma.

2) Study transmission issues and support upgrades (either new transmission lines or the upgrade of existing lines) that will benefit Oklahoma's ability to move wind generated electricity to markets both in-state and out-of-state. Not only is this critical to promote development of wind in areas with the richest resource (and greatest benefit to rural communities), we feel the advent of national - even global - renewable energy credits (RECs) is imminent. Clearly, states with the largest production of wind power (and bioenergy) stand to gain the most from these credits. Right now, Oklahoma lags behind all of its neighbors with significant wind resource - Texas, Kansas, Colorado, and New Mexico - in planned or on-the-ground wind farms. If we are to compete in the coming markets for renewable energy and RECs, Oklahoma must both encourage the in-state transmission owners to upgrade with wind resource areas in mind, and it must fight for regional upgrades in transmission connectivity in order to export large amounts of wind power to out-of-state markets. We estimate that current transmission constraints in our state will limit development of wind farms to less than 1000 megawatts. OWPI estimates that many times this amount can be developed, based on wind resource availability alone [2].

3) Distinguish between energy markets in Oklahoma and in the country, and between short-term needs and long-term. One argument against developing wind power in Oklahoma has been that we already have excess generation capacity; hence there is no need for more at this time. Those who hold this position would have us wait until the in-state market creates an unambiguous incentive for development. Meanwhile, neighboring states will be cornering the regional and US markets for clean energy and RECs, and they will have huge advantages when restructuring and transmission improvements facilitate sale of electricity and RECs across broad regions.

Moreover, Oklahoma ratepayers will likely be subject to spikes and long-term rises in natural gas prices over the coming years due to inclement weather and the ever-growing demand for natural gas. Wind power can provide a hedge against such spikes and rises. A recent study puts the long-term hedge value of wind power at about \$5 per megawatt-hour (MwH) [3]. This is a significant amount when multiplied by the millions of MwH our state could produce every year.

4) Consider differences in short-term and long-term rewards for clean energy development. Another argument often heard against developing wind is that it just isn't competitive against coal. However, wind's short-term value is as a hedge against gas prices, as wind power allows utilities to store gas energy when wind is present or to divert that gas to potentially more rewarding markets. In the long-term, one must look at the direct and indirect costs to our state in burning coal, since we now import almost 100% of that fuel-source and coal accounts for over half of our electricity. The benefit of using Oklahoma wind and bioenergy to cut the quantity of imported coal is clear. Over \$300 million left Oklahoma to pay for Wyoming coal in 2000 [4] and this trend continues. Reducing that flow of dollars out of state is beneficial. Additionally, when one looks at the long-term potential value of wind and bioenergy in 'carbon credits', one

can also clearly see the growing economic advantage of renewable resources over coal. OWPI firmly believes carbon-credits will be well-established within even just a few years and estimates for the 'carbon-credit' value of clean energy are up to \$3.50 per MWh [5].

5) Consider the value to Oklahoma of other technologies that will grow in market value along with renewable energy technologies. The most obvious of these will be fuel cells. Research, development, manufacturing, and service of fuel cells as they proliferate in homes, businesses, and vehicles will represent a large sector of the emerging international energy economy. States that promote the facilities and infrastructure for production and transport of the primary fuels for fuel-cells (be it natural gas, methanol, hydrogen, and so on) will gain advantages. In contrast to earlier periods of technology change and innovation in energy systems, the hydrogen economy has been targeted as a global growth opportunity by the transportation and the fuels industry, thus reducing any uncertainty about how resource-rich regions such as Oklahoma can plan for and participate in the transition to cleaner fuels and energy systems. States such as Texas have already seen this opportunity and have begun discussing strategies to improve their participation in this growth area [6].

We feel the following points help highlight the future economic value of wind power to our state.

- ◆ OWPI estimates that Oklahoma has potential to develop 14,000 to 17,000 MW (nameplate capacity) of wind power, representing a capital investment of over \$12 billion [2]. With existing transmission constraints, less than 1000 MW will be developed and much less than that will be built if utilities do not have incentives to buy and transport green power. Meanwhile, development in Texas is expected to reach 2000 MW, well ahead of its 2009 goal [7]. Yet, Oklahoma has over twice Texas' potential for wind energy, per square mile.
- ◆ Regardless of wind's contribution to electricity production over the coming years, it is the potential over the coming decades for wind power to be *the* energy source for hydrogen production that poses great opportunities for economic development. Consider the potential needs for tens of millions of automobiles, buses, and trucks depending on fuel cells, within a couple of decades. While natural gas will likely be the fuel of choice for fuel cell powered vehicles in the short-term, dwindling supplies and rising costs of natural gas will drive economics to quickly favor bio-fuels and hydrogen as the long-term energy sources for vehicles. (The environmental consequences of generating so much hydrogen from coal-burning power plants are unimaginable - hence wind and bio-fuels must win out.)
- ◆ Technological advances in fuel cells (and hence lowering of capital costs) will lead to more efficient and economic long-term means to store wind energy, obviating wind's intermittent nature as an argument against its use. In effect, wind energy can become a dispatchable energy source, just as much as gas is today, within a decade.
- ◆ Renewable energy technologies - foremost wind power - will lead to opportunities for energy technology development on which Oklahoma can capitalize.

- ◆ Renewable energy credits and carbon credits are coming - it is only a matter of time, and those states with a strong foothold on renewable energy development will reap the greatest economic benefits.

NOTES:

1. 'Progressive Farmer', January, 2002, pp 14-16
2. OWPI's Briefing Paper No. 4: "Economic Analysis of Oklahoma's Wind Resource", available at www.seic.okstate.edu, under "Policymakers Information".
3. <http://eetd.lbl.gov/ea/EMS/reports/50484.pdf> - "Quantifying the Value that Wind Power Provides as a Hedge Against Volatile Natural Gas Prices", Lawrence Berkeley National Laboratory.
4. <http://www.eia.doe.gov/cneaf/electricity/cq/t22p4.html> - Destination and Origin of Coal by State, 2000, Energy Information Administration.
5. <http://www.pewclimate.org/projects/trading.pdf> - The Emerging International Greenhouse Gas Market, Pew Center on Global Climate Change.
6. <http://www.seco.cpa.state.tx.us>
7. <http://www.seedcoalition.org/pdf/TxEnergyPowerhouse.pdf> - "Renewable Resources: The New Texas Energy Powerhouse", A report by the SEED Coalition and Public Citizen's Texas Office.