

Misplaced State Government Faith in “Wind Energy”

-- This Time by the Kansas Energy Council

A recent report by the “Kansas Energy Council” illustrates how government officials in many state capitals and in Washington create bad government policy by relying on misinformation, bowing to lobbyists, and failing to look at the true costs and benefits of their proposed actions and recommendations.

This report provides facts about wind energy and explains how current federal and state policies on wind energy are:

- Transferring hundreds of millions of dollars annually from ordinary electric customers and taxpayers to a few large companies, and
- Misdirecting the nation’s investment dollars into energy facilities that produce a small quantity, low quality product and that negatively impacts our environment.

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An Analysis and Report

By

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Preface

This report is for the people of Kansas and other states where government officials dealing with energy issues fail to protect the interests of consumers and taxpayers.

In particular, this report is for those people who end up paying higher monthly electric bills and higher taxes when government officials make bad choices by promoting energy sources that do not provide the benefits that are promised and that cost a lot more than their promoters admit.

This report provides a rather harsh, but well deserved, criticism of a report, "Kansas Energy Report 2005," issued by the Kansas Energy Council (KEC) on December 21, 2004. This report cites three fundamental problems with the KEC report and explains why it does not provide a sound basis for public policy decisions. This report then provides a detailed discussion of "wind energy" to demonstrate that the KEC report is unsound.

As this report explains, the KEC apparently has been misled by false and misleading information about wind energy. Such information is widely available from the wind industry, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (DOE-EERE), DOE's National Renewable Energy "Laboratory" (NREL) and other wind advocates. Sadly, much of this misinformation is paid for with tax dollars flowing through DOE-EERE and NREL.

These organizations have consistently overstated the environmental and energy benefits of wind energy and understated the environmental, energy reliability and economic costs. In so doing, they have misled the public, the media and government officials and promoted policies that are lucrative for the wind industry but are not in the public interest.

While the KEC has erred, it is not the only state government body to do so. Governors, legislatures, executive branch agencies, and regulators in other states have also been misled by false and misleading information from wind energy advocates.

The KEC's may be somewhat unique since representatives of various special interests that would benefit from adoption of the KEC's recommendations apparently were permitted to be *members* of the Council. It appears, on the other hand, that the interests of consumers and taxpayers -- the people who would bear the cost of the KEC's recommendations -- were not well represented.

Unfortunately, it takes a long report (this one) to dissect the claims of wind energy advocates that the KEC has accepted as facts -- and to present the real facts and analysis that demonstrates that those claims are untrue. This report goes beyond the KEC report in that it also provides recommendations for actions that the State governments could take to help protect the interests of their people when they are faced with proposed "wind farms."

For the length of the report, I apologize in advance.

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Misplaced State Government Faith in “Wind Energy” -- This Time by the Kansas Energy Council

- Executive Summary -

The Kansas Energy Commission’s report, Kansas Energy Report 2005, issued on December 21, 2004, does provide useful historical data on the state’s energy production and consumption and descriptions of challenges faced by some of State’s established energy industries. However, it falls short of providing a sound basis for energy policy decisions, because it:

- Provides no evidence that the Council evaluated objectively the benefits, risks and costs associated with the actions that it has recommended.
- Provides no evidence that the Council analyzed the economic impact of its recommendation, particularly the impact on consumers and taxpayers.
- Shows, in the case of *wind energy*, that the Council accepted as facts and relied on the false and misleading information from the wind industry, apparently without checking the validity of that information.

Advocates for various energy sources may be pleased with the report, but consumers and taxpayers who would pay for the recommended actions should not be pleased.

Because the shortcomings of the report are particularly evident in the KEC’s treatment of “wind energy,” this report treats in considerable detail the facts about this energy source that should have been discovered and disclosed by the Kansas Energy Council, including the following:

- Wind energy in Kansas does NOT really have the potential to supply a large share of electricity demand or provide a significant export potential.
- Wind turbines are huge facilities, but they produce very little electricity.
- The electricity produced by wind turbines has less value than electricity produced by reliable generating units.
- Adding wind turbines would not take the place of building reliable, dispatchable generating capacity in Kansas if electricity demand continues to grow.
- Wind energy advocates often overstate the environmental benefits of “wind farms” and understate the true environmental costs.
- Wind energy advocates consistently understate the true costs of electricity from wind.
- Recent evidence shows huge tax avoidance benefits for “wind farm” owners; specifically:
 - Tax breaks provide 2/3 of economic value of a “wind farm.”
 - FPL Group – the parent of wind energy giant, FPL Energy – apparently paid NO income tax in 2002 or 2003, despite over \$2 billion profits.

- Current government policies distort capital investments and transfer wealth from ordinary taxpayers and electric customers to a few big “wind farm” owners.
- Wind energy has not been the great success in other countries that wind advocates claim.

This report then reviews in detail the economics of wind energy, pointing out that it is a great deal for “wind farm” owners but a bad deal for the people of Kansas and other states including the facts that:

- Very generous tax breaks and other subsidies make “wind farms” highly profitable, with the result that tax avoidance – not environmental or energy benefits—is the primary motivation for building “wind farms.”
- Wind energy advocates overstate the local and state economic benefits of “wind farms.”
- “Wind farms” create “Winners” and “Losers.”
- “Wind farms” in Kansas (or other states) owned by out-of-state companies will almost certainly result in a new economic loss to the state.
- Wind energy advocates falsely claim that wind energy does not get its “fair share” of tax breaks and other subsidies

The KEC’s recommendation with respect to wind energy are not in the public interest, but there are steps that state government officials *could* take to protect the interests of the people of the state when a “wind farm” is proposed or, preferably, before. These include:

- Reorienting state utility commissions to the protection of consumers’ interests.
- Taking specific action to protect citizens, landowners, and state and local government officials from aggressive “wind farm” developers.

In its conclusions, the full report that follows points out that:

- Without question, the wind industry, with help from government wind energy advocates have been successful in selling “wind energy” to the public, media and Congress.
- Most political leaders, without knowing the facts, now speak favorably about wind energy.
- However, the truths about wind energy have begun to emerge – largely as a result of:
 - Citizen groups that have sprung up in the US, UK, Continental Europe, Australia and New Zealand to fight wind energy threats to environmental, scenic and property values.
 - Electric customers in Europe who are seeing large increase in electricity prices caused by government efforts to force more use of wind energy.
 - Electric companies in Europe that are faced with additional transmission capacity and grid management cost due to increased use of wind turbines.
 - Government officials in Europe who now realize that greater reliance on “renewable energy” will not help significantly in meeting their Kyoto commitments.
- Citizens, consumers and taxpayers face an uphill fight to reverse government policies that unwisely promote “wind energy,” but these underrepresented interest groups have strong reasons for pressing their representatives at all levels of government to do just that.

Misplaced State Government Faith in “Wind Energy” -- This Time by the Kansas Energy Council

Introduction

Kansas is one of many states where political and business leaders have become increasingly aware that an adequate supply of energy at reasonable prices is essential for their state’s economic growth and for the well being of all Americans. These leaders are also recognizing that meeting the increased demands for energy presents significant challenges.

Kansas Governor Sebelius issued Executive Order 04-05 in June 2004, establishing a reconstituted Kansas Energy Council (KEC). According to its web site, the KEC is charged with “...formulating and coordinating a comprehensive state energy plan and making recommendations on long-term energy policy to the Governor, Legislature, Kansas Corporation Commission, and other appropriate entities.

The Council consists of government officials and representatives of organizations that would benefit from adoption of the Council’s recommendations. As detailed in this report, the interests of consumers and taxpayers were not represented effectively in the KEC’s recommendations.

On December 21, 2004, the reconstituted KEC issued its report, “Kansas Energy Report 2005.” Various energy issues are addressed, but the report places heavy emphasis on wind as a source of energy to produce electricity for use in Kansas and for export.

In the case of wind, it recommends adopting a state “Production Tax Credit” that would be in addition to four major federal and state tax breaks already available to “wind farm” owners. It recommends additional subsidies for “wind farm” owners in the form of (a) “state financing” via Industrial Development Bonds and (b) state consideration of “renewable portfolio standards.” It also recommends legal protection for “wind farm” developers to discuss potential payments in lieu of taxes with local officials without being subjected to bribe statutes.¹

The report does provide useful historical data on Kansas’ energy production and consumption and descriptions of challenges faced by some of the State’s established energy industries. However, the report falls short of providing a sound basis for energy policy decisions, because it:

- Provides no evidence that the Council evaluated objectively the benefits, risks and costs associated with the actions that it has recommended.²
- Provides no evidence that the Council analyzed the economic impact of its recommendation, particularly the impact on consumers and taxpayers.
- Shows, in the case of wind energy, that the Council relied on misleading information from advocates, apparently without checking the validity of that information.

Those advocating particular energy sources may be pleased with the report, but ordinary consumers and taxpayers who would pay the bill for the recommendations should not be pleased.

I. Facts about Wind Energy that should have been Discovered and Disclosed by the Kansas Energy Council

The Council's treatment of "wind energy" illustrates the shortcomings listed above. The pages that follow present many of the facts about wind energy that should have been discovered and divulged by the KEC. Instead, the KEC seems to have limited its consideration to false and misleading claims about benefits of wind energy that have been circulated widely during the past decade by the wind industry and other wind energy advocates. That information has misled the public, media and government officials and has resulted in faulty government policies, overly generous tax breaks and other subsidies that have misdirected investments into low value activities, increased costs for electric customers and shifted tax burden to ordinary taxpayers.

The pages that follow demonstrate that wind energy advocates have greatly overstated the benefits of wind energy and understated the true costs. Admittedly, members of the KEC are not alone in having been misled and in proposing policies favorable to "wind farm" owners but detrimental to the interests of consumers, taxpayers or a state's economy. Such policies have been adopted by other states and by the federal government.

Only recently, as "wind farms" have proliferated in several countries including the US, have facts begun to emerge and "catch up with" the misleading claims made by wind energy advocates. The KEC apparently was not aware of or chose to ignore this growing body of factual information.

This paper is longer than would normally be desirable, but it seems necessary to increase the chances that government officials will understand the extent to which they have been misled.

A. Wind energy in Kansas does NOT really have the potential to supply a large share of electricity demand or provide a significant export potential. The following statement at the beginning of the discussion of wind energy in the KEC report demonstrates vividly how badly some have been misled by false and misleading claims from wind energy advocates:

"Kansas' wind-energy potential ranks somewhere between the first and third in the nation and is at least 10 times greater than the state's current electrical demand. Midwestern states, including the Great Plains, have enough potential in the windiest sites alone to meet the entire nation's electricity needs. Should Kansas or any of the Plains states choose, electricity from wind power could become another exportable resource, much like grain, beef, and airplanes."³

These oft-cited claims are simply not true. They incorrectly assume that a *potential resource* -- wind blowing over Kansas and the Great Plains -- is an *actual, practicable, marketable resource* -- something that can be turned into electricity, transmitted to a place where electricity is needed and can be sold.⁴

Furthermore, these false claims create a *false expectation that electricity from wind would be a viable export product for Great Plains states.*

Wind blowing over Kansas and the Great plains is not a practicable, marketable resource for producing electricity for several critically important reasons that were ignored by the KEC:

1. The number of turbines required would be huge. Even assuming a high capacity factor⁵ of 40%, nearly 21,000 turbines of the 650 kilowatt (kW) size used at the Gray County “wind farm” or nearly 9,000 of the 1.5 megawatt – MW (1,500 kilowatt – kW) turbines planned for the Elk River project would be required to produce the number of kilowatt-hours of electricity generated in Kansas during 2002; i.e., 47,188,446,000 kWh.⁶

It would take about 734,000 of the 1,500 kW size wind turbines operating at an unlikely 40% capacity factor to produce the same number of kWh produced in the US during 2002; i.e., 3,858,452,000,000 kWh.⁷ But, the *number* of kWh is not all that is important. Relative *value* and *usefulness* of the kWh of electricity from wind is also critically important.

2. A kWh of electricity from a wind turbine has less practical value than a kWh of electricity from a reliable (“dispatchable”) generating unit. Electricity from a wind turbine has less value than electricity from reliable (“dispatchable”)⁸ generating unit because the output from a wind turbine is intermittent, highly volatile, and largely unpredictable except in the very short term. The output is available only when the wind is blowing in the right speed range. Depending on the specific turbine, it may begin producing with a wind speed of about 6 miles per hour (MPH), achieve rated capacity about 33 MPH and shut down to prevent equipment failure around 56 MPH.

The real value of a kWh of electricity produced by a wind turbine is also limited by the fact that winds tend to be stronger at night and in winter months, but in most areas the demand for electricity tends to be highest during the day and in summer.

3. The places where the turbines would be built are often a long distance from the places where electricity is used. This simple fact places several limitations when considering the real value of electricity from wind turbines in the Great Plains:

- Transmission lines would have to be available or built to move the electricity to places where it is needed. This would require thousands of miles of transmission lines and more thousands of transmission line towers.
- Some electricity is lost when it is moved over transmission lines. These “line losses” occur when electricity is moved from one location to another. Line losses are significant but the amount of the electricity lost depends on distance and on the conditions and characteristics of transmission lines and transformers. Serving distant markets would mean that more kWh would have to be generated and the amount of income expected would be reduced because of line losses. (Even more turbines would be required than shown by the calculations above!)
- Electricity from wind turbines is an inefficient user of transmission capacity. Transmission capacity must be available to accommodate the full rated capacity of a “wind farm” but that full capacity is not used effectively because – as explained earlier -- the output from wind turbines is intermittent, volatile and largely

unpredictable. The practical result is that inefficient use of transmission capacity in effect increases the unit cost of that electricity – adding to the already high cost of the electricity from wind turbines.

4. The KEC has contributed to false expectations about the potential for an export market for electricity generated from wind in Kansas and other Great Plains states. Electricity generated from wind is high in cost – a point discussed in more detail later. When the high cost of transmission and line losses are added, it is unrealistic to expect that electricity generated by wind in Kansas would be competitive in distant metropolitan areas. It must be kept in mind that dispatchable generating units built closer to “load centers” (i.e., where electricity is needed) are likely to produce electricity that is more reliable and less costly to customers. For example:

- A gas-fired combined-cycle generating unit of, say, 500 MW in base load service (e.g., perhaps a 75% capacity factor) and occupying a few acres of land could supply 3,285,000,000 kWh of electricity each year *when that electricity was needed* (that is, 500,000 kW x 8760 hours x .75).
- It would take 625 turbines of the size planned for the Elk River “wind farm” in Butler County, KS, and 1442 of the turbines the size of those used in the Gray County “wind farm” – all scattered over hundreds of acres of land – to produce the same number of kilowatt-hours (kWh). This calculation does not take into account line losses. Furthermore, as pointed out earlier, electricity from “wind farms” is unreliable and cannot be counted on to be available when needed.

Limited “export” of electricity is feasible to nearby areas. For example, Empire District Electric Company (EDEC), Joplin, MO, has announced its plans to purchase the output of the planned Elk River “wind farm” in Butler County, KS. According to its web site, EDEC serves some 157,000 customers in Southeastern Kansas, Northwestern Oklahoma, Northeastern Arkansas, and Southwestern Missouri. These areas are relatively close to the planned “wind farm” in Butler County, KS. Whether EDEC actually plans to use the electricity from the “wind farm” for its customers and/or sell “renewable credits” comparable to the output from the Elk River project is unclear from public announcements.

- B. Wind turbines are huge facilities, but they produce very little electricity.** Wind energy advocates often give the impression that wind turbines produce a significant amount of electricity. The towers and turbines are huge, with those apparently planned for the Elk River “wind farm” reaching a height of nearly 400 feet – roughly the height of a 30-40 story building.

The KEC appears not to understand how little electricity the huge facilities produce, or that the electricity has less real value than electricity from reliable, dispatchable generating units. For example:

1. Elk River project in Butler County. If the planned Elk River “wind farm” were to achieve a 40% capacity factor, it would produce about 525,600,000 kWh of electricity each year. This sounds like a lot of electricity but that amount would be equal to 1.1% of the electricity generated in Kansas in 2002 (47,188,446,000 kWh).
 2. All existing wind turbines in the US. The American Wind Energy Association (AWEA) reports that wind energy generating capacity in the US totaled 6,740 MW (6,740,000 kW)⁹ at the end of 2004 – consisting of more than 15,000 windmills scattered across thousands of acres of land in 30 states.¹⁰ If those thousands of windmills average a generous 25% capacity factor, the total amount of electricity produced annually would be 14,760,600,000 kilowatt-hours.¹¹ That, too, sounds like a lot of electricity. However, that amount of electricity would be:
 - Equal to 38/100 of 1% of the 3,858,422,000,000 kWh of electricity produced in the US during 2002.
 - Significantly less than the 17,651,763,000 kWh of electricity produced during 2002 by just two of Kansas’ generating plants (9,041,702,000 kWh by the Wolf Creek nuclear plant and 8,610,061,000 kWh by the LaCygne coal-fired plant).
 3. Potential additional “wind farms.” Even with the generous tax breaks and subsidies that are currently available, the US Energy Information Administration (EIA) forecasts in its Annual Energy Outlook that wind energy will still be producing less 1% of US electricity by 2025!¹²
- C. **The electricity produced by wind turbines has less value than electricity produced by reliable generating units.** As noted on page 3, above, electricity from wind is intermittent, volatile and largely unpredictable. Therefore, it deserves repeating that wind turbines *cannot be counted* on to provide reliable generating capacity whenever customers need electricity. In electric industry jargon, wind turbines have little if any “capacity value.”¹³
- D. **Adding wind turbines would not take the place of building reliable, dispatchable generating capacity in Kansas if electricity demand continues to grow.** The fact that wind turbines cannot be counted to produce electricity whenever customers need it (i.e., have significant “capacity” value) has another important implication. That is, if Kansas experiences significant increases in electricity demand during peak demand periods, reliable (“dispatchable”) generating capacity would have to be added. “Wind farms” simply will not provide that reliable capacity. In fact, electric customer will, in effect, end up “paying twice”; first for the electricity from wind and then for the reliable generating capacity needed to meet peak electricity demand.
- E. **Wind energy advocates often overstate the environmental benefits of “wind farms” and understate the true environmental costs.** Based on its report, the KEC appears not to recognize that wind energy advocates typically overstate its environmental benefits and understate its true environmental costs.

1. Overstating environmental benefits of wind energy. The principal environmental benefits claimed by electricity-from-wind advocates is that such electricity will offset a like amount of electricity (kWh) that would have been produced by fossil-fueled generating units and would avoid the emissions associated with the displaced kWh. The advocates often overstate the “emission avoidance” benefits in 4 ways:
 - a. *Using old data.* They have often used old emissions data in their calculations.
 - b. *Ignoring emission reductions that are underway.* They have not taken into account the reductions in emissions that will be achieved as existing fossil-fueled generating units are brought into compliance with existing environmental statutes and regulations.
 - c. *Basing emission assumptions on wrong generating units.* They often assume that a kWh “avoided” would have been generated by a coal-fired or other relatively high emission generating unit when, in fact, any kWh “avoided” may have been produced by a lower emission fossil-fuel unit (e.g., gas-fired) or a hydro or a nuclear powered unit. Except in areas with substantial hydro capacity, any “avoided kWh” would likely have been generated by a gas-fired unit.
 - d. *No emissions displaced when “cap and trade” systems in place.* They ignore the fact that, in there is NO real displacement of ANY emissions in the case of pollutants covered by “cap and trade” systems, such as those covering sulfur dioxide (SO²) and nitrogen oxides (NO^x). If the electricity from wind turbines happens to displace the need for electricity from a fossil-fueled generator that is within a “cap and trade” system, the owner of that fossil-fueled unit has the right to sell the “emission credit” to the owner of some other generating unit who is then free to use it. On balance, there would be no emission “avoided” or “displaced.”
 - e. *Generating units serving in backup role for wind generators continue to emit.* Finally, they have failed to take into account the fact that, when wind turbines – with their intermittent, volatile, and largely unpredictable output – are connected to an electric grid, some reliable, dispatchable generating unit must be immediately available to serve as backup for the wind turbines and keep the grid in balance (supply-demand, voltage, frequency). That means that one or more reliable units must be connected to the grid and either (i) operating at less than full, efficient capacity¹⁴ or (ii) operating in a spinning reserve mode. When operating in either mode, a fossil-fuel unit will be giving off emissions with the result that a kWh of electricity from a wind turbine does not offset a kWh from another generating unit on a one-to-one basis.

2. Understating or ignoring the environmental costs of wind. Wind advocates often understate or try to ignore the adverse effects of wind energy, particularly the adverse environmental effects. As more “wind farms” have been built in various countries around the world, the adverse impacts on environmental, ecological, scenic and property values as become much clearer. A full description of the adverse implications

is beyond the scope of this paper. However, it should be noted that those impacts causing complaints and growing citizen opposition include bird kills; interference with bird migration patterns; disruption of natural areas, terrestrial habitat and wildlife; noise; scared mountain ridges, shadow flicker or “strobing” effect of rotating blades; reflected light (blade glint); “light pollution” from aircraft warning lights on turbines, towers and, possibly, blades; scenic impairment, and reduced property values for neighbors.¹⁵ Wind energy advocates also tend to ignore health and safety risks, including the risks of blade and ice throw in a significant area around the wind turbines.

These adverse effects have not had much attention in the general media or energy trade press where reporters are more inclined to take their cues from wind industry press releases and government wind advocates. However, the facts are getting additional attention as the result of dozens of citizens groups that have sprung up around the world and increased coverage of the facts in “the new media.” The growing body of literature dealing with these adverse environmental effects of wind energy seems to have been completely ignored by the Kansas Energy Council.

F. Wind energy advocates consistently understate the true costs of electricity from wind.

Wind energy advocates in the US Department of Energy (DOE), the National Renewable Energy “Laboratory” (NREL), other DOE contractors and grantees, and the wind industry are fond of claiming that the cost of electricity from wind has declined by some 80% since 1980 to less than five cents per kWh and will continue to decline as technology improves.¹⁶

This mantra has been used often to support DOE’s spending of additional millions of taxpayer dollars each year on “wind energy R&D” even though wind turbines are offered in commercial markets by General Electric and several European and Japanese owned companies.

As explained below, The FACTS are that:

- No one knows the true long-term costs per kWh of electricity from today’s wind turbines.
- Wind advocates ignore large shares of the *true cost* of wind energy when they make their claims about cost per kWh of electricity from wind.

Unfortunately, the advocates’ false and misleading claims are picked up and repeated as if they were true by dozens of well-meaning people in the public, media and government.

1. No one knows the true long term costs per kWh of electricity from today’s wind turbines. All claims about the cost per kWh of electricity from wind turbines are based on assumptions, particularly because there has not been enough long term experience with today’s wind turbines to know:

- How long they will last (i.e., their useful lifetime).
- How much electricity they will produce (i.e., capacity factor).
- How much their performance will deteriorate over time.
- What their maintenance, repair and replacement costs will be as facilities age.

Yet, all of these factors must be known to make a valid claim about the actual costs of electricity from a wind turbine. In fact, none of the turbines now being installed (e.g., of the 1.5 MW size) have been in operation long enough to provide actual data.

The critical role of assumptions in wind energy advocates' claims is easily illustrated. Specifically, wind advocates often assume that turbines will last 20 years (or sometimes 25 or 30 years) and that they will have a capacity factor¹⁷ that is estimated from data on wind conditions at the site where turbines will be installed.

- If they are making an estimate for a 1.5 MW (1,500 kW) turbine with “overnight” capital cost of \$1.5 million and assume that it will have a useful life of 20 years and an annual average capacity factor over the 20 years of 35%, the arithmetic would show a per kWh overnight capital cost of \$0.01087 per kWh.
- If, however, the turbine lasts only 10 years (or it was abandoned after 10 years because all the tax benefits had been captured, performance had deteriorated, or maintenance costs became prohibitive), the overnight capital cost would be twice as much; i.e., \$0.02174 per kWh.¹⁸

This simple example deals only with the useful life of a wind turbine. It ignores all the other factors that would actually have to be taken into account, such as cost of capital; maintenance, repair and replacement costs; cost of other equipment and facilities such as substation, transmission, control and data acquisition, and more. Also, if the capacity factor did not achieve 35% or if performance deteriorated over time (e.g., fouling of blades) calculations would yield even higher costs per kWh.

2. Wind energy advocates typically underestimate or ignore significant parts of the true costs of wind energy in the U.S. Among those costs are:

- *The cost of tax breaks and subsidies* (more on this below) which shift tax burden and costs from “wind farm” owners to ordinary taxpayers and electric customers.
- *The cost of providing backup power to balance the intermittent and volatile output from wind turbines.* Adequate capacity is available on some grids to meet this requirement, but there are costs of providing the service, whether it is a unit running in automatic generation control mode, otherwise at less than full capacity, or in spinning reserve. Ramping up and down to balance volatile wind turbine output may add to wear and tear costs on the backup units. If adequate capacity is not available, backup capacity would have to be constructed resulting in additional costs that are, at some point, passed on to customers.
- *The full, true cost of transmitting electricity from “wind farms” to electric customers.* As indicated earlier, “wind farms” are inefficient users of transmission capacity. Transmission capacity must be available to accommodate their total rated output but, because the output is intermittent and volatile, that transmission capacity is used only part time, with the result that the true unit cost of transmitting

the electricity is high. The wind industry seeks to avoid these costs by shifting them to electric customers.

- *The extra burden on grid management.* There is no doubt that these costs occur. They differ widely among “wind farms” and grids depending on many factors, such as the energy source mix of generating capacity in the control area, the amount of wind generation and its volatility, and electricity demand. Unfortunately for consumers, some grid operators and utility commissions have allowed “wind farms” to escape these costs by shifting them to electric customers.

G. Recent evidence of huge tax avoidance benefits for “wind farm” owners. Two recent developments confirm that subsidies for wind generation are extremely attractive, particularly to large organizations that have income to shelter from taxation.

1. Tax breaks provide 2/3 or wind project value. On December 15, 2004, an official from the firm of Milbank, Tweed, Hadley & McCloy, LLP, pointed out to the American Bar Association’s Renewable Energy Committee that 2/3 of the value of a wind energy project comes from two federal tax breaks.¹⁹
2. FPL Group. Parent of FPL Energy, paid no income tax in 2002 and 2003. A September 22, 2004, report by Citizens for Tax Justice (CTJ)²⁰ claims that the FPL Group paid no federal income tax in 2002 or 2003 despite having profit of \$2.2 billion during those years. FPL Group is the parent of FPL Energy, which organization made large investments in “wind farms” during those years and now claims to be the nation’s leading wind energy producer.

The CTJ claim appears to be supported by the financial statements in the FPL Group annual report.²¹ Large investments in wind during 2002-2003 would have qualified FPL Energy for large accelerated depreciation deductions from taxable income and significant wind production tax credits. Those deductions and credits could have been used by FPL Group, assuming that FPL Energy was a part of an FPL Group consolidated tax filing.

H. Current government policies distort capital investments and transfer wealth from ordinary taxpayers and electric customers to a few big “wind farm” owners. Tax breaks and other subsidies for wind energy, justified by their sponsors as being necessary to encourage investments in a relatively new, “environmentally friendly” energy, have:

- Become a multi-million dollar tax shelter, particularly for a few large companies.
- Resulted in the “transfer” of hundreds of millions of dollars from the pockets of ordinary taxpayers and electric customers to “wind farm” owners (as explained later).
- Permitted the “wind farm” owning companies, using relatively little of their own equity (which they can recapture quickly), to determine where hundreds of millions of dollars are invested - and to spend that money on wind energy facilities that produce small amounts of electricity that has relatively low real value.

Companies that are eligible for more tax breaks than they can use are even able to “sell” those tax breaks to other taxable entities that can use them to reduce their taxes.

It is possible, of course, that federal and state government officials do not even understand how generous they have been with tax breaks and subsidies for wind energy or that they are making it possible for large, highly profitable companies to escape paying any taxes.

Once profitable tax breaks and other subsidies are adopted, those who benefit from them are highly effective in keeping them alive – even when they are not in the national and public interest and even though they adversely affect environmental, ecological, scenic and property values. Companies benefiting from such tax breaks and subsidies often underwrite substantial lobbying forces and contribute heavily to politicians who preserve, protect and extend the benefits. Furthermore, many in the public, media and government have not yet grasped the fact that much of what they have been told about wind energy is simply not true.

In the case of wind energy, Senator Grassley (R-IA), Chairman of the tax-writing US Senate Finance Committee, is probably the leading advocate in Congress for keeping alive the wind Production Tax Credit. Substantial wind energy generating capacity has been built in Iowa and “wind energy” is strongly supported by the people of Iowa – even though it is virtually certain that any Iowa “wind farm” owned by an out-of-state company results in a net economic loss for the state (as explained later).

However, what has proven acceptable to Iowans has proven to be quite unacceptable to many people in other states, particularly those who object to the environmental damage caused by “wind farms.” Ideally, those who value the scenic beauty of the mountains in the East and West, the Tall Grass Prairie of Kansas, the shores of the Great Lakes, the bird and bat populations throughout the country, or the serenity and value of their homes should not have to accept the damage resulting from the Senator Grassley’s largess with others’ money.

I. Wind energy has not been the great success in other countries that wind advocates claim. Wind energy advocates often claim that other countries, such as Denmark and Germany, have had great success in their programs to subsidize and force use of wind energy.

Those claims are false but an objective analysis and presentation of the facts about foreign wind energy programs would greatly lengthen this overly long report. However, facts about the problems being experienced in European countries can be found easily on various web sites.²² Among the problems with wind energy being experienced in Europe are:

- The extraordinary high costs that are loaded on electric customers, particularly in Germany and Denmark and expected in the United Kingdom.
- The adverse impacts on environmental, ecological, scenic and property values, which has become more and more evident in the UK, Spain, Australia and New Zealand as well as in the US.
- The fact that electricity from wind turbines, particularly in Denmark, tends to be generated at times when it cannot be used. Apparently, the excess wind-generated electricity is “dumped” on surrounding grids at night at very low prices, and then

electricity commanding a higher market price is purchased from surrounding grids to satisfy customer requirements when demand is higher during daytime hours.²³

- The fact that the intermittent, volatile and largely unpredictable electricity output from wind turbines has added to the burden of grid management and created the need for expensive additions to transmission systems, particularly in Germany.²⁴

II. Economics of Wind Energy: A great deal for “wind farm” owners – which the KEC would make even better -- but a bad deal for the people of Kansas and other states

Wind energy advocates often claim that “wind farms” provide a variety of economic benefits, including income for landowners who allow turbines to be built on their property, other economic benefits in areas where “wind farms” are located, such as more jobs and higher tax revenue, local purchases, and various “indirect” economic benefits. (As explained later, advocates greatly overstate these benefits.)

Wind advocates seldom mention that “wind farms” are fabulous deals for “wind farm” owners, particularly because of enormous tax breaks and subsidies (detailed below) available to the owners – the costs of which are borne by ordinary taxpayers and electric customers. Neither do they admit that landowners who lease their land for wind turbines are indirectly helping to push up their neighbors’ electricity prices.

Despite the tax breaks already available, the wind industry continues to press for more (also detailed below) and the Kansas Energy Council has acceded to their requests.

It is not possible without having access to data from owners, regulators, tax authorities, and others to *quantify* specifically *all* the economic benefits and costs associated with a “wind farm.” However, some benefits and costs can be quantified and others can be identified and described but cannot be quantified with the information now publicly available. Two spreadsheets are attached to this report which quantify those costs and benefits that can be estimated and list others that cannot be quantified for the existing “wind farm” in Gray County, KS, and the planned “wind farm” in Butler County, KS.

A. Very generous tax breaks and other subsidies make “wind farms” highly profitable with the result that tax avoidance -- not environmental, energy or economic benefits – is the primary motivation for owning “wind farms.” The KEC report does not show any appreciation for the facts that:

- Multiple federal and state tax breaks and other subsidies for “wind farms” are already in place.
- “Wind farms” are now profitable ventures, without the *additional* tax breaks and subsidies recommended by the KEC.
- All the tax breaks and subsidies shift costs and tax burden from “wind farm” owners to ordinary taxpayers and electric customers and hide them in tax bills and monthly electric bills.
- Tax breaks and subsidies are in addition to – and may exceed – the income that “wind farm” owners get from the sale of the electricity that is produced.

This section of the report describes:

- The four principal tax breaks available to Kansas “wind farm” owners:
 - Federal accelerated depreciation
 - Federal Production Tax Credits
 - Reduction in Kansas Corporate Income Tax (due to accelerated depreciation).
 - Elimination of property taxes on wind energy equipment.
 - Other subsidies already available to the wind industry and/or “wind farm” owners.
 - Additional subsidies proposed for “wind farms” by the Kansas Energy Council.
 - Income received from the sale of electricity generated by the “wind farm.”
 - Potential additional income from the sale of “green energy” credits and “greenhouse gas” avoidance credits.
 - Additional subsidies being sought by the wind industry, nationally.
1. Federal Accelerated Depreciation. One very generous subsidy available to companies with income to shelter is 5-year double declining balance accelerated depreciation (5-yr.; 200% DB) that can be used to calculate depreciation for tax purposes. This is one of the depreciation schemes permitted by IRS under the label “MACRS,” Modified Accelerated Cost Recovery System.”²⁵ Five-year 200% DB can be used for capital costs of facilities using wind to produce electricity for sale. Nearly all other electric generating facilities²⁶ must use 20-year depreciation, so “wind farm” owners are receiving a tremendous benefit.

Five-year double declining balance (5-yr. 200% DB) depreciation deductions from otherwise taxable income are shown in the first table below. The table below is based on an assumption that the capital costs of a “wind farm” is \$190,000,000 -- which is the estimate of the capital cost of the planned Elk River “wind farm” in Butler County, KS.²⁷ Specifically, the table shows for each year:

- The percentages and amounts of capital costs that could be deducted from otherwise taxable income.
- The reduction in federal income tax liability, assuming a 35% marginal corporate income tax rate.
- The last column shows the reduction in Kansas state income tax, which is explained later.

<u>Year</u>	<u>% of investment Recovered</u>	<u>Income that could be sheltered</u>	<u>Reduction in Federal Tax Liability (assuming 35% marginal rate)</u>	<u>Reduction in Kansas Tax Liability (assuming 7.35% marginal rate)</u>
First	20%	\$ 38,000,000	\$13,300,000	\$2,793,000
Second	32%	\$ 60,800,000	\$21,280,000	\$4,468,800
Third	19.2%	\$ 36,480,000	\$12,768,000	\$2,681,280
Fourth	11.52%	\$ 21,888,000	\$ 7,660,800	\$1,608,768
Fifth	11.52%	\$ 21,888,000	\$ 7,660,800	\$1,608,768
Sixth	5.76%	\$ 10,944,000	\$ 3,830,400	\$ 804,384
Total	100%	\$ 190,000,000	\$66,500,000	\$13,965,000

If the “wind farm” were sold to a new owner after the accelerated depreciation allowances were used,²⁸ the new owner would also be able to utilize the generous accelerated depreciation benefits to “recover” its capital investment.

2. Federal Production Tax Credit. The second generous federal subsidy available to “wind farm” owners is the Production Tax Credit of \$0.018 per kWh of electricity generated during the first 10 years of a wind project’s life. At the current rate of \$0.018 per kWh, owners of the proposed 150 MW Elk River “wind farm” in Butler County would receive a tax credit (i.e., a direct deduction from its federal income tax bill) of \$9,460,800 per year if the turbines produce at an average 40% capacity factor (i.e., 150,000 kW x 8760 hrs. x .40 x \$0.018). The rate, originally set at \$0.015 per kWh, has been adjusted upward for inflation.²⁹

Organizations owning “wind farms” must have substantial taxable income from other sources to take advantage of the two federal tax shelters described above.³⁰ That is one reason why small “wind farm” development companies often sell off their projects to larger companies or find ways to “sell” the tax benefits.

3. Reductions in “wind farm” owners’ Kansas Corporate Net Income tax liability. Kansas taxes corporate income at a basic rate of 4% with a 3.35% “surtax” for income over \$50,000. The starting point in computing Kansas taxable income is the federal taxable income of the corporation. Thus the generous federal accelerated depreciation deduction described in paragraph 2, above, reduces the taxable income basis used before applying Kansas’ 7.35% marginal income tax rate.

The exact amount of Kansas income tax that can be avoided by “wind farm” owners due to the federal accelerated depreciation benefit cannot be determined accurately without having details about the owners and their parent and affiliate organizations. However, the impact on the owners’ Kansas income tax liability could be as much as 7.35%, which is shown in the last column of the table in paragraph 2, above.

4. Property tax exemption for “wind farm” equipment in Kansas. Since January 1, 1999, all wind and other “renewable” energy equipment used to produce electricity in Kansas has been fully exempt from property tax.³¹ Estimating the true value of this exemption for a “wind farm” owner is not attempted in this paper because the valuation process for utility assets (which a “wind farm” probably would be considered if it were not exempt) is quite complex. Perhaps tax experts in the Kansas Department of Revenue could make a reasonable estimate of the true value of the exemption.

In some cases, “wind farm” owners make voluntary payments in lieu of taxes to offset part of the revenue lost by state and local governments as a result of the exemption. Such payments may or may not be adequate to cover the costs that will be incurred *because of* the facility; e.g., for road construction and repair, and police and fire protection. Typically, such payments are offered only in the early years of a project to help gain public and political support for permits and approvals needed to proceed with

construction and operation, whereas property taxes would continue for the life of the facility. Information on any such payments in Gray County or proposed in Butler County is not readily available.

5. Other Subsidies for “wind farms” and/or the wind industry. A wide variety of other subsidies accrue to the benefit of the wind industry and/or specific “wind farms.” These include:
 - a. U.S. Department of Energy (DOE) funding for wind energy R&D. As indicated earlier, several hundred million in tax dollars have already been spent by DOE for wind energy R&D. This funding is continuing even though several companies sell wind turbines commercially and those companies – at least US leader, General Electric – should be able to finance their own R&D without “corporate welfare’ at taxpayer expense.
 - b. “Renewable Portfolio Standards” (RPS). Such standards, in a variety of forms, have been adopted by about 17 states. The KEC has announced that it will “Direct a team to enact a study of the economic, environmental and energetic effects associated with the enactment of a statewide renewable portfolio with Tradable Energy and Environmental Credits.”³²

Renewable Portfolio Standards (RPS) help increase consumers’ electric bills.

- First, they provide artificial, guaranteed markets for high priced electricity produced from renewable energy facilities, including “wind farms” assuring the owners of these facilities that they will not have to compete with prices of electricity produced from traditional energy sources, such as coal, natural gas, oil, hydropower or nuclear energy.
- Second, a RPS typically establishes some minimum percentage of electricity sales that must come from “renewable” energy sources. The company selling the electricity to end use customers (often an electric distribution utility) can either generate the electricity from “renewable” sources, buy it from some firm that generates such electricity, or, perhaps, buy “renewable energy credits” (i.e., the scheme contemplated by the KEC.) covering the amount of electricity needed to meet the percentage standard.

The higher cost of the electricity from “renewable” sources and/or the credits that the electric distribution company is forced to pay (instead of the lower cost electricity from traditional sources) is, in one way or another, passed on to electric customers in the form of higher bills for electricity – with the blessing of state public utility commissions.

Governors, state legislators, and utility commissions that participate in establishing these programs typically escape the blame for the higher cost because:

- The amount added to each customer's monthly bill may be quite small – even though the total borne by all customers will be large,
- The programs are described (falsely) as providing significant environmental benefits,
- The adverse environmental effects of “wind farms” are not admitted, and
- In any case, interests of real consumers get little attention and little protection in state legislatures, executive departments and public service commissions.

The KEC report demonstrates the above. Apparently, staff from the state public utility commission – an organization charged with defending interests of electric customers – participated in the activities leading to the KEC report. (The electric customers of Kansas should be outraged!)

Quite understandably, “wind farm” owners and other renewable energy producers like Renewable Portfolio Standards (RPS) and have lobbied hard to have them mandated by states and the federal government. In those states with RPS, millions of dollars are transferred annually from the pockets of ordinary electric customers to owners of “wind farms” and other renewable projects.

- c. Mandated “green energy” purchases. Other artificial “markets” are created for the benefit of “wind farm” and other renewable energy producers by federal and state executive actions and, in some cases, by state statutes. In these cases, federal or state government agencies and state funded colleges are required to obtain certain portions of the energy they use from “renewable sources” even though the energy requires payment of above market prices.

Such “green energy” programs are popular in Washington and state capitals because the person or agency ordering the action gets credit for being an enlightened, environmentally conscious leader while hiding the added costs in the complying agency's or university's budget and ignoring the adverse environmental impacts.

The “green energy” producers benefit by selling their high cost product and taxpayers (or students and their parents) bear the cost. Agencies and institutions required to buy the higher priced “green electricity” often must offset the higher cost that they are forced to pay by reducing spending elsewhere; e.g., forced purchases by the military services mean less money is available for training, weapons and other equipment.

- d. “Voluntary” programs offering “green” electricity at a premium price. Utilities in many states now have programs where customers are permitted to volunteer to pay a higher monthly bill when the utility assures them that the electricity they are paying extra for is generated from a “renewable” energy source. In some states these programs are required by law, in others utilities are “encouraged” to create them by state utility commissions, governors or legislators. In still other cases, such programs are created by a utility as a way to show customers, the public,

media or government officials that they are “environmentally conscious” – efforts that have become known as “green washing.”

Typically, relatively few electric customers volunteer to pay the required premium price, particularly if they realize that (i) their decision to do so would be largely symbolic and/or (ii) that other actions, such as using more energy efficient light bulbs, are much more cost effective and environmentally meaningful.

Some local and state governments volunteer to pay higher prices for so-called “green” electricity for government buildings but these, too, are largely pseudo-environmental, done with someone else’s money (taxpayers) and done for “image building” purposes. Similarly, a few business firms have made “high publicity” decisions to buy “green” electricity. Many colleges and universities, usually stimulated by student activists who do not concern themselves with cost effectiveness, have signed up to buy “green” electricity.

Quite likely, few of the people “volunteering” – whether with their own money or someone else’s – take into account the environmental damage caused by the “wind farms” that produce the electricity they are paying for. They, too, have been misled by the false and misleading claims from the wind industry, DOE, NREL and others.

A fundamental problem with these “voluntary” premium priced electricity programs – from an electric customer point of view -- is that the extra revenue generated by the premium price is generally not sufficient to cover the higher cost of the electricity and the cost of the staff that must be maintained by a utility to administer the programs. The net result is that any of the utility’s costs that are NOT recovered through the premium price are then passed on to all of the utility’s customers. Since the amount for any one customer is small, this insidious practice continues.

- e. State utility commission actions that subsidize “wind farms.” As pointed out earlier, “wind farms” are inefficient users of electric transmission capacity because the output from wind turbines is intermittent, volatile and largely unpredictable. The wind industry has worked hard to shift the cost of building transmission capacity from “wind farm” owners to electric customers. Some utility commissions have been quite willing to help achieve this additional subsidy for “wind farms.”

For example, the Minnesota Public Utility Commission approved a \$148 million transmission capacity increase that Excel said was necessary to serve proposed “wind farms” in Southwest Minnesota. Apparently the cost of this project will be passed along to all the utility’s electric customers even though it is really for the benefit of the “wind farms.” A somewhat similar situation occurred in Texas where adding electric transmission capacity was necessary to handle the intermittent, volatile and unpredictable output from wind turbines in west Texas.

Apparently the wind industry is also seeking transmission capacity in Kansas that would be paid for by shifting the cost of that capacity from wind farm owners to

electric customers (and hiding it in their monthly bills). The KEC report notes³³ that requests for transmission capacity additions in Kansas total 2,843 MW and that 1,943 MW or 68% of the total is for “wind energy demands.” Kansas’ electricity customers should not have to pay the cost of transmission that is built to serve “wind farms,” particularly when wind energy’s use of transmission is inefficient, the amount of useful electricity is small, and its value is limited.

- f. ISO and RTO actions to subsidize “wind farms.” Special arrangements have also been made by grid managers (e.g., Independent System Operators -- ISOs and Regional Transmission Organizations - RTOs) that have the effect of providing additional subsidies to “wind farms.” For example, the PJM Interconnection has assigned arbitrarily established “capacity values” for “wind farms” even though these facilities have virtually no capacity value.
6. Additional tax breaks and subsidies recommended by the Kansas Energy Commission. Recognizing the enormous subsidies already available for wind energy (as well as the adverse impacts on the Kansas economy which will be discussed later), there would appear to be no compelling reason for the wind industry to demand, or the KEC to recommend, additional subsidies. However, the KEC has recommended 3 additional measures favorable to “wind farm” owners and also is considering a “public benefit fund.” Such “funds” are usually financed by adding a new charge (in effect, a tax) on monthly electricity bills.

The principal rationale offered by the KEC for providing more subsidies for “wind farms” is “to keep Kansas competitive with other nearby states.”³⁴ This logic is less than convincing since the KEC report makes clear³⁵ that various organizations have already advanced more than a dozen proposals to build “wind farms” in the state. The KEC’s “rationale” suggests that it has taken a “follow the herd” approach and has no analytical support for its recommendations.

- a. *A state Production Tax Credit.* The KEC has recommended³⁶ that “wind farm” and other renewable energy producers be given a state Production Tax Credit of \$0.005 for each kWh of electricity produced during the first 10 years of the facility’s operation. If the proposed 150 MW Elk River “wind farm” in Butler County, KS, were to operate at a 40% capacity factor, this PTC would be worth \$2,628,000 per year to the owners (i.e., 525,600,000 x \$0.005).
- b. *Industrial Development Bonds to Finance “wind farms.”* The KEC has also recommended³⁷ that Kansas Development Finance Authority (KDFA) be authorized to allow “wind farm” owners to finance their projects using state backed bonds (“industrial development bonds”). Such bonds have interest rates that are lower than commercial financing, particularly because of their favorable tax treatment. While the bonds are not backed by “the full faith and credit of the State of Kansas,”³⁸ bonds issued by state development authorities tend to enjoy lower interest rates because of a perception that measures might be taken by the state to prevent default.

Since most of the “wind farms” proposed for Kansas would be owned by out-of-state companies, any bonds issued by KDFA would benefit those companies, not the people of Kansas. Also, tax burden that is escaped through the use of industrial development bonds is shifted to ordinary taxpayers who cannot take advantage of such tax shelters.

- c. *Protection from “Bribe” charges.* The KEC has recommended that the State Legislature “...adopt language clarifying that negotiations and discussions between wind-energy developers and local governments regarding voluntary payments for wind projects are legal.”³⁹ This recommendation is explained as necessary to overcome a Butler County court ruling that indicated such payments during a zoning process could be considered a bribe.

The KEC has failed to recognize that the State’s decision to exempt “wind farm” equipment from property taxes sets up a situation where local government officials are made vulnerable to “generous” offers from “wind farm” developers. Because of the property tax exemption, local governments and school districts are denied any tax revenue to help them cover the local costs imposed by a “wind farm” (e.g., road construction and maintenance; police and fire protection).

Since they are then starting from \$0 dollars, anything offered as a “payment in lieu of taxes” has an immediate attraction. The “wind farm” developer can play the role of a generous benefactor and “laugh all the way to the bank” because he has escaped payment of property taxes which would have cost much more. When local officials are put into such unfair situations, a contribution (i.e., a “payment” in lieu of taxes), however small, appears to be better than nothing and a reason to give the developer whatever he may want. Ordinary citizens in the areas affected end up “paying twice.” They pick up the property tax burden escaped by the “wind farm” developer and they end up with huge wind turbines “in their front yard.”

- d. *Establishing a “public benefit fund.”* The KEC also indicted that it will study “the costs and benefits of implementing a public benefit fund to support strategic energy activities in Kansas, and options to fund it.” While considering “costs and benefits” is laudable, no one should be fooled by the “public benefit fund” label. Such funds have been established in other states by adding a “charge” or “fee” on electric customers’ monthly bills -- with the proceeds dispensed by government officials for a variety of often wasteful projects. Hopefully, the Kansas Legislature will consider the way such funds have been used in other states (e.g., MA, NY, WI, MN, CA) before taking more money from the pockets of consumers with a thinly disguised *tax*.
7. Income for “wind farm” owners from the sale of the electricity. The value of all the federal and state subsidies for “wind farm” developers and owners is *in addition to* the revenue received by the “wind farm” owner for the sale of electricity.

Owners of the existing and proposed “wind farms” in Kansas apparently do not disclose publicly the selling price of the electricity that has been or will be produced, so only rough estimates are possible. For example:

- If FPL Energy’s Gray County, KS, 112.2 MW “wind farm” were to operate at an average annual capacity factor of 40%, it would produce 393,148,800 kWh of electricity each year. If that electricity was sold at an average price of \$0.03 per kWh, the annual income would be \$11,794,464.
- If Scottish Power–PPM’s proposed 150 MW “wind farm” in Butler County, KS, wind farm were to operate at an average annual capacity factor of 40%, it would produce 525,600,000 kWh of electricity each year. If that electricity was sold at an average price of \$0.03 per kWh, the annual income would be \$15,768,800.

8. Potential additional income for “wind farm” owners. There are two other potential sources of income that “wind farm” owners may be able to capture though not enough is known to reach a conclusion at this time:

- Some states are allowing utilities to satisfy “Renewable Portfolio Standards” minimums by purchasing “renewable energy credits” or RECs. Under some RPS and REC trading schemes, a “wind farm” owner could derive income from such credits *in addition to* selling the electricity from wind turbines.⁴⁰
- Owners of “wind farms” built in the US may be able to derive additional income or value by claiming that these “wind farms” avoid or displace emissions of “greenhouse gas.” Such claims might be made by foreign owners or by US owners operating in countries subject to the Kyoto Protocol. Some bills pending in the US Congress that call for a carbon trading scheme in the US may also permit income from selling both electricity and credits.

9. Additional subsidies being sought by the wind industry nationally. Undoubtedly, wind industry lobbyists will continue pushing for more subsidies from federal, state and local governments. Two such subsidies that the wind industry appears to consider high priority are:

- Construction of transmission lines that would serve “wind farms” but would be paid for by someone else.
- Exemptions from or reductions in charges that are imposed by transmission providers, ISOs or RTOs to compensate for system costs when “wind farms” do not deliver the electricity they promise when it is promised.

B. Wind energy advocates overstate the local and state economic benefits of “wind farms.” The wind industry, DOE, NREL and other wind energy advocates have long claimed that “wind farms” produce significant state and local economic benefits. Those claims are always exaggerated and, frankly, wrong. Those organizations overstate economic benefits and understate economic costs.

Those who prepare economic “studies” and “analyses” that claim significant local and state economic benefits typically make two fundamental mistakes:

- Most important, they start with incorrect assumptions which lead to overestimating both “direct” benefits and “indirect” or “induced” job creation and other economic benefits.
- They fail to consider the *costs* of having a “wind farm” in the state or locality.

In an earlier paper,⁴¹ I analyzed in detail an “economic model” developed for and promoted by one of the US Department of Energy’s (DOE) national “laboratories,”⁴² NREL. This “model” is called, “Jobs and Economic Development Impact” (JEDI) model, and is sometimes referred to as the “Wind Impact Model” (WIM).

That model, applied in the manner prescribed, produces exaggerated estimates of economic benefits and low estimates of economic costs. A close look at the “model” will show that:

- Acceptance of its “default” assumptions produces unrealistically high estimates of economic benefits in both potential jobs and potential economic activity.
- Key factors affecting net state or local economic benefits and costs are not reflected in the model and, if taken into account, further reduce the net local economic benefits.

In the previous paper referred to above, a demonstration of the JEDI-WIM model -- comparing the results of NREL’s “*default*” assumptions with the results when using *more realistic assumptions* -- shows that:

- NREL’s “default” recommendations produce estimates of local economic benefits and jobs that are more than 200% higher than estimates based on reasonable assumptions.
- If costs resulting from a “wind farm” that are ignored by the JEDI-WIM model are taken into account, total economic costs would almost certainly exceed benefits.

To be more specific, the following basic errors are often made in economic “analyses” that are compiled for or used by wind energy advocates:

1. Overestimating the number of jobs that will be created and filled by local residents.⁴³
These overestimations occur at both the construction and permanent operation states.

- a. *During Construction.* Experience at other “wind farms” demonstrates that few jobs during construction are filled by local residents. In fact, most are filled by imported workers. For example, data on the 80-megawatt Top of Iowa “wind farm” (consisting of eighty-nine 900 kW turbines collected by the Iowa Department of Natural Resources (DNR) indicates that only 20 of 200 jobs created during the construction period (which lasted about 6 months) were filled by local people.⁴⁴

This low number of jobs for local workers is quite understandable since workers with specialized skills required during construction – such as erection of towers, installing turbines and electronic controls – often would not be available locally.

- b. *Permanent jobs.* Also typically overstated are the total number of permanent jobs that would be created and the number of these jobs that would be filled by local

residents -- rather than by workers who would travel to the site (e.g., technicians skilled in repairing and maintaining turbines, electronic equipment) only when needed, rather than remaining in the area continually.

2. Overstating local economic benefit by counting full price of goods and services rather than value added.⁴⁵ Faulty economic analyses often assume incorrectly that the full price paid by the “wind farm” owners or employees for goods and services purchased in a state or locality results in state or *local* economic benefits.⁴⁶

Such assumptions are incorrect because they ignore the fact that part – generally a large part -- of the price paid to a local supplier has to be paid out by that local supplier to someone else, often located outside the local area. The money paid out is a part of the local supplier’s cost of acquiring the goods (e.g., the purchase of fuel, wiring, cement) that the local supplier is reselling to the “wind farm.”

The only portion of the price paid by the “wind farm” that should be counted is the difference between the local supplier’s cost and the price he or she charges; i.e., the “value added” portion. Furthermore, it should be noted that if the local business providing the goods and services to a “wind farm” is not locally owned, the portion of the “value added” that is profit to the owner may also flow outside the local area and, therefore, not contribute to any local economic benefit.

3. Overstating local value of land rental payments. Faulty analyses often assume incorrectly that all land rental payments (i.e. land for turbines, substation, lines) should be counted as a local economic benefit. This assumption could be justified only if the land is locally owned AND the income from the rental payments is spent locally. There would be little or no local economic benefit from the land rental payments if:
 - a. The payments go to an absentee land owner, OR
 - b. The money is spent or invested outside the area (e.g., in a mutual fund managed in some distant city that invests in stocks or bonds having no local connection).
4. Failure to consider costs that offset benefits. The model focuses only on potential *benefits* and fails to consider *costs* that will be borne in the state or locality if a “wind farm” is constructed. Three examples of such costs deserve particular attention:
 - a. *Counting state and/or local taxes without counting costs incurred by state and local governments because a wind farm is constructed.* Faulty economic analyses count as an economic benefit state or local taxes that may be paid by a “wind farm” owner. However, analyses often fail to offset that revenue with costs incurred by state or local governments because a “wind farm” is built. Without question, governments will incur costs to provide facilities and services required by the “wind farm,” or its owner and employees, or local people, if any, filling the jobs that would be created “indirectly” or “induced.” Such costs would include:

- 1) Building and/or repairing roads required to transport equipment, materials and supplies to the site. A lot of heavy equipment, materials (e.g., tons of rebar, crushed stone, and cement) must be hauled to the site. (Materials that are produced locally and jobs filled by local workers – such as truck drivers – would legitimately be counted as potential economic benefits during the construction period.⁴⁷⁾
 - 2) Police and fire protection.
 - 3) Education and social service costs for workers and their families.
5. Potential adverse impact on environmental, ecological, scenic and property values, business income and other factors because of the existence of a “wind farm.” Reports from areas with “wind farms” in the US and Europe increasingly show concerns about adverse impacts on scenic and property values, and strong adverse citizen opposition to having to live near “wind farms” because of lights, noise, “blade flicker” and other annoyances. Environmentalists are also concerned about adverse impacts on birds, bats, wildlife and other ecological values. Some people are also concerned about the potential loss of business and adverse impact on tourism and retirement or second home purchases in areas affected by “wind farms.” Economic “analyses” touted by wind advocates seldom consider any of these costs.
6. Higher electricity costs imposed on electric customers via monthly bills. No one disputes the fact that the true cost of electricity from wind is higher than the cost of electricity produced from traditional energy sources. Those higher costs are passed through in some way to electric customers via monthly bills.

As indicated earlier, if the 150 MW “wind farm” being considered for Butler County, Kansas were to be built and it achieves a capacity factor of 40%, it would produce 525,600,000 kilowatt-hours (kWh)⁴⁸ electricity each year (i.e., 150,000 kW x 8760 hours in year x .40 capacity factor). If the final delivered price of that electricity for electric customers was only \$0.02 per kWh more than electricity from other sources, the added cost to consumers annually would be \$10,512,000 per year.

When consumers are required to pay higher electricity bills they have less money to spend on other needs such as food, shelter, clothing education or health care. They will have less to spend in hardware stores, dry cleaners, movies, and appliance stores. These are costs and adverse economic impacts that should be considered in a legitimate, objective economic analysis.

C. “Winners” and “Losers.” “Wind farms’ create economic “winners” and “losers.” That is, significant amounts of wealth (money) and tax burden are transferred from one organization or group of people to others. Specifically, when a “wind farm” is built:

1. “Wind farm” owners are the overwhelming “winners” due, primarily, to the enormous tax benefits and other subsidies summarized earlier in this paper – which are in addition to income the owners receive from the sale of electricity that is produced.

2. Landowners who lease land for wind turbines are, generally, “small” “winners” because they receive income that they would not otherwise have. However:
 - The amount of lease income they receive is overwhelmed by the higher electricity prices that are imposed on electric customers who pay for the “wind farm” output. (In effect, a “beggar thy neighbor” benefit.)
 - The landowners may be subject to onerous contract provisions that they do not recognize when they sign the lease agreements. Also, landowners may find themselves responsible for the costs of removing (“decommissioning”) the huge structures if they are no longer useful to or are abandoned by the “wind farm” owner (as occurred in California). These risks will be discussed in more detail later in this report.
3. Electric customers are big “losers” because they end up paying the higher cost of electricity produced from the “wind farms.”
4. Ordinary taxpayers are big “losers” because they end up bearing the burden of taxes that are escaped by “wind farm” owners because of all the available tax breaks and subsidies.

D. “Wind farms” in Kansas (or other states) owned by out-of-state companies will almost certainly result in a net economic loss to the state. State government officials in states that have encouraged “wind farms” have, probably unknowingly, done a large disservice to the people of their states because they have not understood the real economic implications of “wind farms.” One Kansas official⁴⁹ has even been quoted as claiming that a “wind farm” will provide large economic benefits for a state.

It is amazing, with all the brain-power available in colleges and universities in states where “wind farms are proposed (particularly in their economics departments), that no one has done the relatively simple analyses that would show the real economic implications of “wind farms” and help the people in state governments (executive departments, legislatures and, public utility commissions) understand the economic facts.

When the facts – listed below -- are considered carefully, it will be seen that any “wind farm” owned by an out-of-state company (and, probably, some owned by in-state companies) will result in a net economic loss to the state’s economy. To make this point clear, some of the points made in section II. B., above, will be repeated here.

1. The high capital cost of a “wind farm” – such as the \$190 million project planned for Butler County -- is not a \$190 million contribution to the economy of Kansas. An overwhelming share of that \$190 million (perhaps 75-85%) will be spent outside Kansas for turbines, blades, towers, electronics, cables and other equipment. Very little of the equipment and material will be produced, or have value added, in Kansas. There are a few exceptions (e.g., sand and gravel for the concrete foundations for the towers).

2. Kansas exempts wind energy equipment from property taxes. Any voluntary contributions or payments made in lieu of taxes are likely to have less value than the foregone property taxes. However, the state or local governments will incur costs due to a “wind farm” construction and operation (e.g., road construction and repair, police and fire protection).
3. Few of temporary jobs during the 6-12 month “wind farm” construction period would be filled by Kansans. The higher paid jobs will be filled by people imported temporarily. There will be some jobs for local people (e.g., truck drivers, laborers). Iowa's Department of Natural Resources found that, in the “Top of Iowa Wind Farm” only 20 of 200 temporary construction jobs were filled by local residents.
4. Few permanent jobs would be created. Probably less than 15 for the Butler County project, with some skilled workers brought in temporarily for maintenance and repair work.
5. Temporary workers who are imported probably will be paying income tax on their wages in their home states.
6. There will be little “indirect” or continuing economic benefits. Jobs (e.g., in restaurants, motels) and economic activity during construction will be temporary. Few of the materials and supplies required on a continuing basis will be produced in Kansas and the value added in Kansas will not provide a significant economic benefit.
7. The rental income for landowners who lease land for wind turbines will be very small compared to the added cost of electricity that will be passed along to electric customers. The arithmetic demonstrating this is simple:
 - a. Assume, that the owner of the 150 megawatt (MW) Butler County “wind farm” will pay rent of \$5,000 per MW of turbine capacity each year or a total of \$750,000 in annual land rental income (i.e., $150 \times \$5,000$).
 - b. Assume also that the wind turbines would produce electricity equal to 40% of their “rated” capacity (i.e., a 40% “capacity factor”). The annual electricity output for the “wind farm” would be 525,600,000 kilowatt-hours (i.e., $150,000 \text{ kW} \times 8760 \text{ hours per year} \times 40\%$).
 - c. The true cost of electricity from wind is higher than electricity from other energy sources in Kansas. If the electricity produced by the Butler County project when delivered to electric customers costs only \$0.02 per kWh more than they would otherwise pay, the annual *addition* to the electric bills of the people of Kansas will be \$10,512,000 (i.e., $525,600,000 \text{ kWh} \times \0.02 per kWh).

That \$10,512,000 per year addition to electric bills is more than 14 times the annual rental income received by the few fortunate landowners.

That \$10,512,000 in higher electric bills also means that the people of Kansas have \$10,512,000 less to spend in Kansas on food, clothing, shelter, medical expenses, education, or in the local hardware store, gas station, or other retail establishment.

8. Perhaps most important, it appears that all the “wind farms” proposed in Kansas would be owned by out-of state companies. That means that the out-of-state companies – not companies or people in Kansas -- would benefit from the extremely generous tax benefits for “wind farms” listed earlier (Section II.A.). Remember that the federal tax benefits alone have been estimated as providing to their owners 2/3 of the value of “wind farm” projects.⁵⁰ Of course, the money paid for the electricity produced by the “wind farm” also flows to the out-of-state owner.
9. Finally, an out-of-state “wind farm” owner may pay Kansas very little corporate income tax. Apparently, the generous federal deduction from corporate income for accelerated depreciation also serves to reduce the amount of income subject to the Kansas corporate income tax.

When all the true economic costs and benefits are added up, a “wind farm” in Kansas almost certainly results in a net economic loss for Kansas.

- E. Understanding wind energy requires following the “wind farm” money.** A lot of information and assumptions are necessary to do a comprehensive and detailed analysis of the true state and local impact of a “wind farm.” Unfortunately, such a complete analysis cannot be done as a part of this report. However, as indicated earlier, two spreadsheets are attached to this report – one for the Gray County Wind Farm and another for the proposed Elk River project in Butler County, KS.

Only those numbers that can reasonably be estimated from available data are shown on these spreadsheets. The numbers that are shown are quite overwhelming. The spreadsheets provide a framework that could be used by government officials in Kansas to fill in the missing information and then have in one place all the essential data on the flow of money during the first 10 years of a “wind farm.” Similar tables could be compiled on projects in other states.

- F. Wind energy advocates falsely claim that wind energy does not get its fair share of tax breaks and other subsidies.** As explained earlier, federal, state and local tax breaks have made “tax avoidance” the primary motivation for building “wind farms.” Also, explained earlier was the fact that tax breaks and subsidies generally distort economic decisions by steering investment dollars into low productive investments and transfer wealth from ordinary taxpayers and electric companies to “wind farm” owners.

The wind industry, DOE-EERE, NREL and the organizations they fund with our tax dollars claim otherwise. They claim, falsely, that wind energy still does not get its “fair share” of tax breaks and other subsidies.

Ideally, all federal, state and local subsidies that distort investments and transfer wealth from ordinary taxpayers to special interests would be abolished but, unfortunately, those special interests seem to have a strangle hold on politicians at all levels of government.

In any case, it is important to recognize that the wind industry's claim is false when tax breaks and subsidies for various energy industries are evaluated objectively. The facts on this comparison are presented in a separate paper.⁵¹ In summary, *when considered in light of either its existing or potential contribution to US energy requirements*, wind energy is among the most – if not THE most heavily subsidized of all energy sources in the US. For example, preliminary analysis shows that:

- Wind energy tax breaks and subsidies probably exceeded \$300,000,000 during 2002.
- EIA projects that wind energy's contribution will grow but will be less than 1% of US energy requirements by 2025.
- EIA projects that fossil fuels will, by 2025, still provide more than 200 times the energy for the US economy that wind will provide.
- Fossil energy sources would need to receive tax breaks and subsidies totaling \$60,000,000,000 (i.e., \$60 billion) annually to be “treated equally” with wind energy (i.e., 200 x \$300,000,000).

III. What SHOULD State government officials be doing to protect The interests of the people of the state when “wind farms” are proposed?

When considering the actions taken by many state governments to encourage construction of wind energy facilities, it becomes very clear that many government officials have been “taken in” by the false and misleading information distributed during the past decade or more by the wind industry, DOE-EERE, NREL and other wind advocates.

This has led to the enormous tax breaks and other subsidies that were catalogued earlier in this report. Surprisingly, the Kansas Energy Commission has recommended *even more* subsidies.

State government officials need to know that they are acting contrary to the interests of electric customers and taxpayers when they push to increase the use of “wind energy.” They also need to know that there are a number of steps that *could* be taken to protect the people of their states. Among the steps that should be taken are the following:

- A. Reorienting state utility commissions to the protection of consumers' interests.** A principal reason for the initial creation of state public utility commissions was to help protect consumers against unreasonably high prices and other practices that might be imposed by utilities that had monopoly power over their customers. Some state commissions seem to have forgotten this fundamental purpose and have focused heavily on other objectives, including those that increase customers' costs. Forcing or encouraging utilities to provide high-cost electricity generated from “renewable” energy sources is one such action.

In addition, it appears that some commission members and staff simply are not equipped to understand the economic and technical (let alone the environmental and ecological)

implications of “wind energy” and, therefore are easily misled by the false information and half-truths distributed by the wind industry, DOE-EERE, NREL and other wind advocates.

B. Provide protection against aggressive “wind farm” developers. Developers of “wind farms” have proven to be highly aggressive in:

- Lobbying state legislatures, governors and state agencies (in addition to their demonstrated influence in Washington, DC, with members of Congress, DOE-DDRE, and NREL).
- Dealing with local government officials who have authority to approve the location of “wind farms” and associated facilities.
- Dealing with owners of land where wind turbines and related facilities would be built.
- Confronting citizens who oppose the proposed locations of “wind farms.”

There are actions that state governments could take to help protect the interests of citizens, consumers and taxpayers in each of these cases. In some cases, the report of the Kansas Energy Commission (KEC) illustrates a problem needing attention but, clearly, Kansas is not the only state where deficiencies exist.

1. Actions at State Government level. The highly favorable treatment that the wind industry has already obtained at state government levels illustrates the power of wind advocates. However, it is not too late for governors and legislators to begin protecting the interests of ordinary citizens, consumers and taxpayers when “wind farms” are proposed. Actions that could be taken include:

- *Strengthening state level analytical capabilities.* The report submitted by the Kansas Energy Council (KEC) demonstrates that members of the Council and its staff do not understand the facts about and implications of wind energy.
- *Requiring cost benefit analyses.* As noted earlier, the KEC report provides no evidence that benefits, risks and costs of the KEC recommendations were analyzed.
- *Tightening conflict of interest measures.* Again, the KEC report is an illustration. Representatives of various interests that would benefit from the adoption of KEC recommendations served as members of the Council.
- *Protecting citizens from state government staff biases.* State employees in some states appear to be more interested in aiding certain *special interests* and/or their own *personal philosophies* than they are in protecting the interests of ordinary citizens, consumers and taxpayers. For example, the problem of staff biases has appeared particularly significant in some Wisconsin state government agencies.
- *Assisting local governments, landowners and other citizens,* as outlined below.

2. Assisting local governments in dealing with “wind farm” developers. Clearly, most local governments are not equipped to deal with the aggressiveness of “wind farm” developers or to evaluate the technical, economic, environmental and energy implications of “wind farms.” This is particularly true when wind industry lobbyists have already pushed tax breaks, subsidies, and other measures favorable to “wind farm” owners through state legislatures.

“Wind farm” developers may be especially aggressive in dealing with local government officials who are unfamiliar with the issues presented and don't have the resources to retain people who could help in their evaluations. In some cases, developers work “behind the scenes” to secure a local government official's support before details of the project are made public and the implications understood. Once committed, a local government official may be unwilling to change his or her position.

Local governments and school districts are especially vulnerable in states like Kansas where “wind farm” equipment has been exempt from property taxes. Some local government officials have approved permits for “wind farms” in return for special payments or contributions from “wind farm” owners. Such payments may be “one time only” and generally are significantly less than the tax revenue foregone by the tax breaks given to developers.

Some state and local officials may believe that “wind farms” will provide significant local or state economic benefits. However, as explained earlier, any such benefits have been greatly overestimated by the wind industry, DOE-EERE, NREL and other wind energy advocates.

State government should take action to protect citizens' interests with such measures as the following:

- *Adopting and/or strengthening zoning laws.* Some areas where “wind farms” are proposed are not protected by zoning laws.
- *Providing assistance in the evaluation of “wind farm” proposals.* Most local government officials cannot reasonably be expected to have the expertise to deal with the complex technical, economic, environmental and legal issues presented by proposed “wind farms.” State financial assistance should be made available to local governments confronted by proposals so that objective expertise can be retained.
- *Requiring open meetings.* Many states have “open meeting” laws to help assure that citizens are not “kept in the dark” and/or denied due process by government officials who may, as individuals or a group, meet out of public view with “wind farm” developers or who meet as a group to discuss proposals. Experience in several states demonstrates that such laws, perhaps with much stiffer penalties, are needed in the case of “wind farm” developers to protect citizens' interests.
- *Requiring open records, on a timely basis.* In some cases, local officials (e.g., town clerks) are slow in providing full public access on a timely basis to all pertinent records, again denying due process. State laws could be tightened to help protect citizens' interests, perhaps with tougher penalties for town clerks and other officials if they do not make records available in a timely matter.

- *Tightening conflict of interest laws.* Some “wind farm” developers have demonstrated a special ability to create conflict of interest situations for local government officials. In Wisconsin, a “wind farm” developer pleaded “no contest” and paid a fine because one of the developer’s agents had attempted to influence a local election where action on the developer’s permit was a key factor distinguishing the positions of competing candidates.

There have been cases where a “wind farm” developer offered to lease land for erection of one or more wind turbines from a member of a local government body that has jurisdiction over permits and approvals required by the developer. When this occurs, the local official has a personal financial interest in the decisions that the local government body makes on the “wind farm” developer’s proposals.

Clearly, local officials or their families should not be permitted to profit personally from a decision made by the official while acting in his official capacity. If they do not already do so, state laws should be enacted to require local officials to recuse themselves in such situations, and should apply stiff penalties for violations.

Also, local governments should adopt procedures to preclude officials from accepting anything of value from “wind farm” developers or that might otherwise create an actual or perceived conflict of interest. State laws should be enacted or strengthened to impose penalties on “wind farm” developers who offer, and public officials who accept anything of value that might impair the official’s objectivity in carrying out official duties.

3. Protecting landowners from aggressive “wind farm” developer techniques. As explained earlier, landowners who lease land to “wind farm” developers for erection of wind turbines may be “winners” because they receive payments that would not otherwise be available – but they enter into such agreements at their neighbor’s expense. Further, they will be “winners” only if they receive fair compensation, recognize the risks and disadvantages as well as the advantages, and have adequate protection in the contracts they sign.

Landowners are significantly at risk because “wind farm” developers often are very aggressive, and highly skilled in dealing with landowners who are not familiar with the particular deals offered by the developers. “Wind farm” developers and owners have substantial financial resources available to them which permit them to retain lawyers, “land men” and consultants who can deal aggressively with landowners, local government officials, and those who would be adversely affected by a “wind farm.”

Ideally, the landowners would take the actions necessary to protect themselves but, almost certainly, they are not well equipped to deal with aggressive developers and may sign agreements that are detrimental to their own interests and the interests of their neighbors. State and/or local governments may want to provide help to landowners – particularly legal assistance.

The first thing that a landowner should consider is obtaining a GOOD contract lawyer who will work to protect his interest in his dealings with wind developers. Ideally, he would join with other landowners in retaining a lawyer so that he can minimize his legal costs. The landowner should insist on the right to consult with other landowners and refuse any attempt by the developer to restrict such consultations.

There are several ways a landowner may be seriously disadvantaged by agreeing to a “wind farm” developers’ proposals. Among the risks that a landowner needs to consider are the following:

- a. The organization that ends up owning the “wind farm” and who will be making the rental or royalty payments is almost certain to be a single asset LLC; i.e., a Limited Liability Company that has no assets other than the “wind farm.” This could be a problem if the LLC goes into bankruptcy.
- b. The huge tax benefits that are available to “wind farm” owners occur in the early years of the “wind farm’s” life (i.e., 5-6 years for accelerated depreciation; 10-years for the wind “Production Tax Credit.” The practical effect of this is that the incentive to sell or abandon the “wind farm” grows substantially as time passes, particularly if maintenance, repair and replacement costs grow.
- c. Unless the “wind farm” developer is a company with significant income to shelter from taxes, experience in the US demonstrates that the developer is likely to sell his interests to a company that can take advantage of all the tax breaks. Furthermore, the landowner should be aware that there is a good chance that the “wind farm” will be resold to a new owner after the initial owner captures the tax breaks. In fact, a new owner of an older “wind farm” can, under existing tax law, also take advantage of the 5-year accelerated depreciation tax break described earlier. “Churning” of ownership may occur.
- d. No one knows either (i) how long wind turbines now being installed will last or (ii) what their long-term maintenance, repair and replacement costs will be. Turbines of the types now being installed generally have not been in operation for even 5-years. Therefore, royalties and rents based on future wind turbine performance are speculative because long term operation and performance isn’t assured. Also, deterioration in wind turbine performance increases the chance that the owner will shut down one or more wind turbines that do not perform well or perhaps abandon the whole “wind farm.” Rental or royalty payments based on turbine performance may be worthless unless the “wind farm” owner commits to maintain a high level of performance (i.e., kilowatt-hours delivered).
- e. “Wind farm” developers may overestimate potential future “wind turbine” output (i.e., the kilowatt-hours that will be produced). Sometimes they base their claims on output achieved in winter months when winds tend to be strongest.

- f. Costs of removing wind turbines, blades, towers, and tower bases and restoring land – so-called “decommissioning costs” – are likely to be significant. In view of the risks listed above, probably the only way of assuring that money is available from the developer for that purpose is to require posting a CASH bond in advance that would be held by an independent third party in escrow. A cash bond held by the “wind farm” owner would likely be part of the assets available to all creditors if the LLC went into bankruptcy. A surety bond may be available only as long as premiums are paid.
- g. Payments offered by “wind farm” developers may be quite low. Landowners should be aware that annual payments of \$5,000 per megawatt (MW) are not uncommon and payments as high as \$15,000 may have been offered in at least one case. As explained earlier, “wind farms” can be highly profitable for their owners – particularly due to federal, state and local tax benefits. Thus, landowners shouldn't be reticent about insisting on fair compensation.
- h. Landowners need to be fully aware of what they are giving up when signing contracts or lease agreements. For example:
- At least one agreement offered by a developer would give the developer a 5-year option to lease the land, a 20-year lease, and a unilateral right for the developer to extend the lease for two additional 5-year periods. Some contracts may not even have ending dates. Whether the developer would pay for the options wasn't clear in the proposed contract.
 - Some contracts offered by developers/owners apparently would give the developer full “air rights” to many acres of property – not just the area covered by the “footprint” of the turbine and ancillary facilities. As a practical matter, the landowner might be prevented from undertaking or permitting any other development on his or her property.
- i. Landowners should not be misled by alleged small “foot prints” of wind turbines. Potential blade and ice “throw” should also be considered. Substantial setbacks are necessary from dwellings, other buildings, roads, parks, wildlife habitat and other valued land uses.
- j. Noise or other environmental or ecological impacts (e.g., bird and bat kills) of the wind turbines are real concerns. Some “wind farm” developers have sought “noise easements” so that landowners or their neighbors do not seek financial redress for lost property value.
4. Protecting the interests of citizens threatened by proposed “wind farms.” Clearly, citizens are at risk in states where officials have already acted to promote wind energy. This is particularly true in states that have adopted insidious “Renewable Portfolio Standards” that force electricity providers to assure some minimum percentage of the electricity that they sell has been generated by using “renewable” energy, thereby

guaranteeing a market and, usually, high prices for owners of renewable energy facilities.

In such states, state employees – paid with tax dollars – may openly support “wind farm” developers rather than the interests of the state’s citizens.

Several states – such as New York, Massachusetts, California, Minnesota and Wisconsin -- add a so-called “public benefit charge” (really, another tax, but collected via electric bills) to customers’ monthly electric bills and then use the customers’ money to assist “wind farm” developers in pushing through their projects over the objection of people who are concerned about adverse impacts on environmental, ecological, scenic or property values! In New York, millions of dollars have been offered to “wind farm” developers with those monies coming from the “public benefit” funds that are extracted from the pockets of ordinary electric customers.

As a minimum, state government should set provide funds for the exclusive use of citizen groups who wish to intervene in state or local proceedings where proposed “wind farms” are considered and who wish to retain lawyers and expert witnesses to help defend them against “wind farm” developers.

IV. Conclusions

Without question, the wind industry has been extremely effective in “selling” wind energy to the public, media and government officials. The wind industry has had significant help from the US DOE’s Energy’s Office of Energy Efficiency and Renewable Energy, the National Renewable Energy “Laboratory” (NREL), other DOE and NREL contractors, and other wind advocates.

Claims made by these organizations clearly have been false and/or misleading. “Half-truths” are common. Sadly, much of the misinformation has been financed by tax dollars flowing through DOE-EERE.

The promoters of wind energy have been so successful that the phrase “increase use of wind energy” has become a mantra spoken by politicians of all persuasions in federal and state administrations and legislatures. Speeches made by some members of Congress and other political leaders are little different from those made by wind industry leaders. Some probably have been written by wind industry lobbyists.

Quite likely, most political leaders who repeat the wind industry’s claims do not even recognize that the facts do not support the wind advocates claims. There is no evidence that political leaders are aware of the enormity of the subsidies that they have lavished on the wind industry.

Unfortunately, most political leaders in the federal and state governments and their staffs do not have the desire, expertise or the time to evaluate the veracity of wind industry claims. They merely accept the claims as fact (perhaps along with campaign contributions).

For years, most reporters in the general press and the energy press have tended to accept claims made by the wind industry, DOE-EERE, NREL and other wind advocates. Their “stories” essentially parrot the press releases and other information issued by these organizations. Only recently have a few investigative reporters and editorial boards begun to recognize that there are “two sides” to the story and that adverse effects - not just claimed benefits – should be reported.

On the other hand, a few political leaders *may* really understand the limited merits and adverse impacts of wind energy but find it easier or convenient to speak favorably of wind energy to escape political attacks by wind advocates and that portion of the “environmental community” that still favors wind energy. Other political leaders may speak favorably about wind energy to give an appearance of being “balanced” while they are working in support of meaningful and effective actions to increase energy supplies. Whatever the reasons, the current political support for wind energy results in bad public policy.

Citizens, consumers and taxpayers who understand the adverse impacts of wind energy must accept the fact that they face an uphill fight in getting political leaders to understand the truths about wind energy. Fortunately, the truths about wind energy have begun to emerge – largely as a result of:

Citizen groups that have sprung up in the US, UK, Continental Europe, Australia and New Zealand to fight wind energy threats to environmental, scenic and property values.

Electric customers in Europe who are seeing large increase in electricity prices caused by government efforts to force more use of wind energy.

Electric companies in Europe that are faced with additional transmission capacity and grid management cost due to increased use of wind turbines.

Government officials in Europe who now realize that greater reliance on “renewable energy” will not help significantly in meeting their Kyoto commitments.

Citizens, consumers and taxpayers face an uphill fight to reverse government policies that unwisely promote “wind energy,” but these underrepresented interest groups have strong reasons for pressing their representatives at all levels of government to do just that. Eventually, political leaders will be forced to face the truths about wind energy as the drum-beat of citizen-led grass roots voices get louder.

Citizens, consumers and taxpayers should not be deterred from pressing federal, state and local officials to (i) recognize the facts about wind energy, (ii) change government policies to protect the interests of consumers, taxpayers and the environment, and (iii) resist the demands of “wind farm” developers and owners.

Whenever possible they should confront their representatives personally. But they should also not stop writing, emailing and calling their representatives offices, even when the replies they receive are factually incorrect, make no sense at all, or sound like they were written by the wind industry, DOE-EERE, or NREL. (Perhaps they were.)

About the Author

GLENN R. SCHLEEDE is semi-retired after working on energy and related matters in government and the private sector for over 30 years. He now devotes a large share of his time to *self-financed* analysis and writing about (a) government policies and programs that are detrimental to consumers and taxpayers, and (b) government or private sector activities that are presented to the media, public and government officials in a false or misleading way.

From 1992 until September 2003, Schleede maintained a consulting practice, Energy Market and Policy Analysis, Inc. (EMPA), providing analysis of energy markets and policies. During that time he worked primarily on natural gas and electricity issues.

Prior to forming EMPA, Schleede was Vice President of New England Electric System (NEES), Westborough, MA, and President of its fuels subsidiary, New England Energy Incorporated. His time with NEES included responsibilities for procurement and transportation of coal, natural gas and oil for NEES facilities, NEEI's oil and gas exploration and coal shipping ventures, and NEES economic planning and budgeting functions.

Previously, Schleede was Executive Associate Director of the U.S. Office of Management and Budget (1981), Senior VP of the National Coal Association in Washington (1977-1981) and Associate Director (Energy and Science) of the White House Domestic Council (1973-1977). He also held career service positions in the U.S. OMB and the U.S. Atomic Energy Commission. He has a BA degree from Gustavus Adolphus College and an MA from the University of Minnesota. He is also a graduate of Harvard Business School's Advanced Management Program.

Schleede is the author of many papers and reports on energy matters. His articles appear in various journals and/or are covered in the energy trade press. Some appear in full text on various public policy group web sites. Since 2001, Schleede has analyzed and written a lot about wind energy. The facts (a) have convinced him that wind turbines are a niche technology that would never make a significant contribution toward meeting US energy requirements, and (b) demonstrated that the US DOE's Office of Energy Efficiency & Renewable Energy (DOE-EERE); the National Renewable Energy "Laboratory" (NREL) and other DOE contractors, *using tax dollars*, distribute false and misleading information on wind energy.

Schleede has been a frequent target of ad hominem attacks by officials from the wind industry as well as NREL and other DOE-EERE contractors. Their attacks seldom deal with the substantive issues he raises. AWEA and other DOE funded organizations (using tax dollars that flow through DOE-EERE) have claimed falsely that Schleede works for fossil-fuel industries. In response, Schleede notes that their claims are false and that ALL his work on wind energy has been self-financed. He has offered leaders of the attacking organizations (including NREL) the opportunity to review all his personal and business financial records, provided that (a) the work is done by an independent third party who can assure appropriate confidentiality of information and (b) the work is paid for by the individual and organization making the charges and is not reimbursed by DOE or otherwise paid for by using more tax dollars.

Endnotes:

¹ Key parts of the report addressing wind energy issues and recommended actions are found on pp.1, 3-4, 7-10, 18, 21, 27, 28, 29, 33, and 35-39.

² The report “leaps” *from* the presenting data on energy supply and demand, and perceived challenges *to* a set of specific recommendations without providing analysis that might support those recommendations.

³ Kansas Energy Commission report, “Kansas Energy Report 2005,” page 7. (For brevity, two footnotes citing the source of the claims have been omitted. Those footnotes cite reports from Pacific Northwest “Laboratory” (1993), “US Public Interest Research Group,” and the US General Accounting Office.

⁴ The false claim about wind in the Great Plains is similar to a once-popular assertion that oil shale in the US could supply US petroleum needs for decades.

⁵ The “capacity factor” of a wind turbine or other electric generating unit is determined by dividing its output, in kilowatt-hours (kWh), by the unit’s rated capacity (in kilowatts – kW) x the number of hours in a period (e.g., 8760 to calculate an annual capacity factor. The same calculation can be done using megawatt-hours (MWh) and megawatts of rated capacity (MW).

⁶ US Energy Information Administration (EIA), State Electricity Profiles 2002, p. 73, Table 1.

⁷ EIA, Electric Power Annual 2003, page 8, Table 1.1. About 1,045,000 of these turbines would be required to produce the number of kilowatts of generation (5,497,000,000,000) EIA expects in the US by the year 2025.

⁸ Electricity grids must be kept in balance (e.g., supply-demand; voltage, frequency). In effect, electricity is produced as it is used. An electric generating unit is considered “dispatchable” when it is needed to produce electricity and can be called upon by those managing an electric grid.

⁹ About 83% of the 6,740 megawatts (MW) of currently operable wind turbine capacity is located in nine states: California, Texas, Minnesota, Iowa, Wyoming, Oregon, Washington, Colorado and New Mexico

¹⁰ Over 15,000 windmills were built in California during the 1980s due to a generous federal investment tax credit. Many of those windmills have been abandoned and many have been torn down.

¹¹ That is, total capacity of 6,740,000 kW x 8760 hours per year x .25 capacity factor.

¹² The EIA forecast that wind will provide less than 1% of US electricity by 2025 is based on EIA’s Annual Energy Outlook. It should be noted that the staff of the US Senate Committee on Energy & Natural Resources – a long-time supporter of high subsidies for the wind energy industry, has indicated recently that EIA has estimated that extending the wind “production tax credit from 2005 to 2015 would result in “...42,000 1.5 MW windmills installed in the US by 2025, covering 3,750 square miles...[and]...would generate 206 billion kWh of electricity per year, meeting 3.7 percent of US’ electricity demand in 2025. A preliminary estimate of the addition to the national deficit of such an action is in the range of \$35 to \$40 billion. While those results might be produced by EIA’s National Energy Modeling System, they do not take into account the feasibility of installing that much wind generating capacity in the US – which would be virtually impossible, recognizing the growing opposition to “wind farms.”

¹³ The term “capacity value” – which is measured in MW or kW -- contrasts with electric industry use of the term “energy” – measured in MWh or kWh -- when referring to the two different potential values of a generating unit. “Energy” refers to the kWh produced and/or delivered to customers.

¹⁴ Perhaps, but not necessarily, operating under “automatic generation control” (AGC).

¹⁵ Two “studies” are often cited by wind advocates to support their claim that property values are NOT adversely affected; one by an organization in the Pacific Northwest that dealt with a “wind farm” proposed in Washington’s Kittitas Valley and the other by a group called the “Renewable Energy Policy Project.” Both of these studies have been thoroughly discredited because they used faulty methodology, were conducted and/or sponsored by organizations strongly favoring wind energy, and their claims defied common sense and experience of property owners that have been reported in several countries.

¹⁶ http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/wpa/wpa_update.pdf

¹⁷ “Capacity factor” of a wind turbine or “wind farm” is determined by dividing actual (measured) output in kilowatt-hours (kWh) from a turbine (or “wind farm”) by the rated capacity of the facility x the hours in the period being measured; e.g., 8760 hours when calculating an annual capacity factor.

¹⁸ 20 year overnight capital cost calculation: 1,500 kW x 8760 hours in a year x .35 average annual capacity factor x 20 years = 91,980,000 kWh. \$1.5 million divided by 91,980,000 = \$0.01087 per kWh. 10-year calculation: 1,500 x 8760 hours in a year x .35 x 10 years = 45,990,000 kWh. \$1.5 million divided by 45,990,000 = \$0.02174 per kWh.

¹⁹ Presentation on December 15, 2004, by Mr. Ed Feo to the Renewable Energy Resources Committee of the American Bar Association: <http://www.abanet.org/environ/committees/renewableenergy/teleconarchives/121504/>

²⁰ Citizens for Tax Justice, "Bush Policies Drive Surge in Corporate Tax Freeloading; 82 Big U.S. Corporations Paid No Tax in One or More Bush Years," September 22, 2004. <http://www.ctj.org/corpfed04an.pdf> A more detailed 68-page report on the organization's analysis can be found at <http://www.ctj.org/corpfed04an.pdf>

²¹ http://www.fplgroup.com/reports/contents/annual_reports.shtml

²² For example, www.countryguardian.net. A very useful narrative summary of problems experienced in other countries can be found on the web site www.GreenBerkshires.org.

²³ Apparently, a large amount, perhaps 20%, of the electricity generated in Denmark comes from wind turbines but production is greatest at night and in winter when competing electricity is available from combined heat and power (CHP) units. The wind-generated electricity is "dumped" on surrounding grids at very low prices and then more expensive electricity is bought during the day from surrounding grids but at higher prices. One study indicates that, in the final analysis, electric customers in Denmark get less than 4% of their electricity from wind.

²⁴ E.ON Netz, Wind Report 2004. http://www.eon-netz.com/frameset_reloader_homepage.phtml?top=Ressources/frame_head_eng.jsp&bottom=frameset_english/energy_eng/ene_windenergy_eng/ene_windenergy_eng.jsp

²⁵ See Internal Revenue Service (IRS) Publication 946 for details.

²⁶ Simple cycle combustion turbines use 15-year, 150% declining balance depreciation for tax purposes.

²⁷ The Wichita Eagle, "Kansas' next wind farm, a \$190 million project in Butler...", Dec. 27, 2004, p. 1.

²⁸ If the "wind farm" was sold by the original owner for an amount larger than the remaining undepreciated balance, if any, the original owner could be taxed on the difference at ordinary income rates.

²⁹ DOE did offer payments to non-profit organizations that own wind energy facilities but are not required to pay income taxes. Owners of eligible facilities could collect a per kWh payment for the first 10 years of production comparable to the wind Production Tax Credit (i.e., originally \$0.015 per kWh, adjusted for inflation). The program, called the Renewable Energy Production Incentive (REPI) expired for new projects on December 31, 2003, but projects previously qualifying continue to receive payments. Allegedly, these payments for non-tax paying organizations would provide a subsidy comparable to the PTC for profit-making companies.

³⁰ Often the desired result is achieved when doing accounting for tax purposes by consolidating the financials of parent organization, subsidiaries (including limited liability companies) and/or affiliates (e.g., shares of partnerships or joint ventures).

³¹ Kansas Statute 79-201.

³² KEC, Kansas Energy Report 2005," pp. 37-38.

³³ Ibid., p. 21.

³⁴ Ibid., p. 10.

³⁵ Ibid., pp. 8-10.

³⁶ Ibid., pp. 35-36.

³⁷ Ibid., p. 35

³⁸ <http://www.kdfa.org/pages/about.html>

³⁹ KEC, Kansas Energy Report 2005," p. 36.

⁴⁰ One analyst has reported that, in the UK, the value of "green energy" credits (called "Renewable Obligation Certificates" of ROC) may provide twice as much income as the electricity itself. <http://www.wind-farm.org/modules.php?op=modload&name=News&file=article&sid=20>

⁴¹ Schleede, Glenn R., "Errors and Excesses in NREL's JEDI-WIM Model that Provides Estimates of the State or Local Economic Impact of 'Wind Farms'," April 28, 2004.

⁴² DOE's government-owned, contractor-operated national "laboratories" undertake a variety of research, development and analytical activities. Virtually all of the activity is financed with tax dollars. Quite likely, the work in the "hard" sciences is objective, conducted in accordance with accepted scientific methods and engineering principles, and undergoes credible peer-review. Some of the national "laboratories," such as the National Renewable Energy "Laboratory" (NREL), also engage in analyses involving public policies, programs and regulations. Much of that work turns out not to be credibly objective, scientific or peer reviewed. Instead, these activities all too often appear biased and designed to promote a particular technology, policy, program, regulatory requirement, special interest, or perhaps even a personal philosophy. Such "analyses" often appear designed to support preconceived notions and conclusions. They are often driven by assumptions that virtually assure that the desired conclusion is reached. False claims are illustrated by NREL's "JEDI-Wind Impact Model" -- a "laboratory"

product that overstates economic benefits and understates or ignores costs -- in this case resulting in a faulty estimate of the potential local economic benefits of a “wind farm.” Similar problems can be so-called “analyses” and reports produced by other organizations receiving tax dollars that flow through DOE and those produced by organizations such as the U.S. Public Interest Research Group (PIRG). The Kansas Energy Commission was remiss for not evaluating and detecting the false claims in the reports that it apparently relied on.

⁴³ In addition to overestimating jobs that would be filled locally and, therefore, the compensation that would be paid to local residents, the model – in its calculation of indirect or induced effects – appears to assume that the taxes on income will flow to the state or locality. When workers are imported for temporary or intermittent work, revenue from any income tax that they pay generally will flow to the government(s) in the state or locality where they reside – not where they work temporarily.

⁴⁴ Iowa Department of Natural Resources, *Top of Iowa Wind Farm Case Study*, July 2003.

<http://www.state.ia.us/dnr/energy/MAIN/PROGRAMS/WIND/documents/topofiaWindFarmCaseStudy.pdf>

⁴⁵ Value added is defined by one economics textbook as “The difference between the value of goods produced and the cost of materials and supplies used in producing them. In a \$1 loaf of bread embodying \$0.60 worth of wheat and other materials, the valued added is \$0.40. Value added consists of the wages, interest and profit components added to the output by a firm or industry.” Samuelson, Paul A. and William Nordhaus, *Economics*, 14th Edit. p. 748.

⁴⁶ Unfortunately, this is a common mistake made in “input-output models” that purport to calculate state or local economic benefits.

⁴⁷ The total construction period reported in the *Top of Iowa Wind Farm Case Study* was less than 6 months.

⁴⁸ 565,600,000 kWh of electricity may sound like a lot but it is not. That amount of electricity is equal to 1.1% of the electricity produced in Kansas during 2002 (US Energy Information Administration data).

⁴⁹ Quotes from Kansas Governor’s energy adviser <http://www.kansas.com/mld/eagle/news/local/10503909.htm>

⁵⁰ See Endnote 19 for detailed reference.

⁵¹ Schleede, Glenn R., “Facing up to the True Costs and Benefits of Wind Energy,” June 24, 2004, pp. 16-17.