

May 6, 2010

## **Highly Misleading ACORE Report on Potential for Wind Energy**

A friend recently asked for my comments on the May 2009, “*ACORE 20 GW Plan for Kansas,*”<sup>1</sup> report, which claims that Kansas could get 20,000 megawatts (MW) of electric generating *capacity* from “renewable” energy sources (more than 18,000 MW coming from wind) and enjoy economic benefits.

I had heard of the ACORE report when it was issued but had not taken the time to read it since ACORE reports generally are biased and designed to promote the interest of ACORE members – as opposed to being objective and useful in advancing the national and public interest.

However, my friend claimed that the Governor of Kansas and other political leaders believe the report was useful so I downloaded it from ACORE’s web site and read it from cover to cover.

In summary, and as detailed below, the ACORE report:

- Is highly biased, totally lacking in objectivity, based on unrealistic and often undisclosed assumptions, and certainly is not useful as a basis for public policy decisions.
- Is highly misleading, particularly in its exaggerated claims of economic and job benefits.
- Ignores the high cost that its recommendations would impose on the people of Kansas.
- Fails to identify and consider arguments *against* building a massive transmission system advocated by some electric transmission system owners and planners.
- Raises questions about the discernment skills of political leaders if they have taken the ACORE report seriously.
- Demonstrates the arrogance of the highly subsidized special interest groups that use misleading “reports” to influence the public, media, and government officials, and force high cost wind and other renewable generation into the nation’s energy mix and citizens’ tax and electric bills.

### **Highly biased report**

As you may know, ACORE is a Washington DC based lobbying organization that promotes the interests of its members. According to its website, “the American Council on Renewable Energy (ACORE), works to bring all forms of renewable energy into the mainstream of America's economy and lifestyle.”<sup>2</sup>

*The report is a highly biased and misleading document intended to promote the interests of the wind and other “renewable” energy industries. It is based on unrealistic and often undisclosed assumptions. Quite likely, it was intended as something that would capture attention of reporters, editors, and uninformed political leaders – thus adding to the prevailing false popular wisdom about renewable energy.*

The possibility that the report has actually been relied on by Kansas political, business, and media leaders, including the Governor, is disturbing. This suggests that these people are unable to distinguish between facts and propaganda. Or, perhaps your political leaders have been unduly influenced by the lobbying prowess and large campaign contributions for which the wind and other renewable industries have become known.

## **In what ways is the ACORE report highly misleading?**

Unfortunately, there are far too many deficiencies in the ACORE report to permit commenting on each. In fact, hours could be spent addressing the numerous false and misleading claims -- but the report really doesn't deserve that much time. However, described below are a few of the key reasons why ACORE's Kansas report -- and similar reports that deal with the economics of wind and other renewable energy are misleading and should never be used as the basis for public policy or investment decisions.

1. **Interests of Taxpayers and Consumers are Ignored.** Electricity produced from renewable energy sources, particularly including wind, has much higher true cost than electricity from existing, traditional sources of energy. The higher true cost of electricity from wind and other renewables is paid for by taxpayers (through massive subsidies now in place) or by electric customers through their monthly electric bills.<sup>3</sup>

This fact is simply ignored by ACORE, despite the fact that higher taxes and higher electric prices offset most if not all the economic "benefits" for Kansas claimed by ACORE. ACORE's arrogance in ignoring the adverse economic impacts is highlighted by:

- a. The absence of any serious discussion of the higher true cost of electricity from renewables, and
  - b. ACORE's claim that "stakeholders" helped prepare the report<sup>4</sup> when there apparently was NO involvement of THE most important stakeholders -- i.e., the taxpayers and electric customers who would bear the higher cost of electricity, or the citizens (particularly neighbors of "wind farms") who bear most directly the adverse environmental, ecological, scenic, and property value impacts.
2. **The report fails to disclose the NET economic impacts of its various proposals.** One of the easiest ways of identifying a biased "economic analysis" of any proposal to spend millions on capital investments is whether the report admits and takes fully into account BOTH the estimated *positive* economic and job impacts and the associated *negative* job and economic impacts.

Specifically, the ACORE report alleges large potential positive benefits, without mentioning that its proposals would also have negative economic impacts. For example, pages 16 -- 20 of the ACORE report are filled with claims about the large capital investments that would be made by "wind farm" owners and about alleged direct, indirect, and induced job and economic benefits. It ignores the negative economic and job impacts that would result if the projected "wind farms" were actually built. Three examples:

- a. **The first negative economic impact that ACORE ignores is the impact of higher electricity prices and tax burden that falls on ordinary citizens when there is greater reliance on electricity from wind and other renewable energy sources.** The full, true cost of electricity from wind and other renewable sources is significantly higher than for electricity from existing generating units using traditional fuels. These higher costs would, of course, be passed on to taxpayers and/or electric customers.

Higher tax and/or electricity bills mean that ordinary consumers have less money to spend for other purposes including spending for food, clothing, shelter, education, medical expenses and the hundreds of other things that people need in their daily lives. As our current economic conditions demonstrate, less money for consumer spending means fewer jobs in local stores and other business establishments, as well as in the firms that produce the goods and services that consumers will buy if they have the disposable income to do so.

The importance of this issue can be demonstrated by taking any one of ACORE's various "scenarios." Take, for example, ACORE's claim of big local economic benefits from "landlease" payments which ACORE estimates (page 18 of report) as "more than \$20 million" in the year 2030 if the Kansas had 7,013 MW of wind turbine capacity.

Now, consider the impact on Kansas electric customers of the added cost of electricity from wind. Specifically, if that same 7,013 MW of wind turbine capacity were able to operate with a 35% capacity factor, and the electricity cost electric customers only \$0.02 per kilowatt-hour more than electricity from traditional sources, the added cost imposed on Kansas electric customers in 2030 would be more than \$430 million<sup>5</sup> – *or more than 20 times the claimed benefits from "landlease" payments in the same year. So there are a few "winners" and thousands of "losers."*

- b. **Opportunity Costs Ignored.** A fundamental, elementary error made by ACORE – if it had wanted to present an objective economic analysis -- is its failure to take *opportunity costs* into account. That is, it ignored the fact that the money that ACORE claims would be spent for buying, erecting, and operating wind turbines would, instead, be spent for other economic activities.

"Wind farms" have very high capital costs and relatively low operating costs compared to generating units using traditional energy sources. They also create far fewer jobs, particularly long-term jobs, and far fewer local economic benefits. "Wind farms" are simply a poor choice if the goals are to create jobs, add local economic benefits, or hold down electric bills.

- c. **Would there be fewer jobs and less economic benefit from existing generating units?** ACORE would have readers believe that electricity produced by wind turbines and other renewable energy sources would displace existing generating capacity in Kansas. Two points are important here that must be taken into account in a serious, objective economic analysis:
- i. First, as explained below, wind turbines are intermittent, volatile, and unreliable producers of electricity which means that they must be "backed up" by reliable generating capacity so that electric grids are kept in balance. Therefore, building wind turbines doesn't mean that reliable generating units are not needed.
  - ii. Second, if a large number of wind turbines were built in Kansas, they could displace some generation from existing generating units during the time that wind was strong enough to power the wind turbines. If so, this could reduce jobs, fuel requirements, and other economic benefits for Kansas associated with existing generating units.

3. **ACORE discusses the potential for adding wind turbines to "generating capacity" – rather than electricity generated -- apparently to avoid dealing with the serious intermittence and unreliability limitations of electricity from wind.** The ACORE report is misleading in that it fails to note that huge wind turbines produce relatively little electricity since they produce electricity only when the wind is blowing in the right speed range.<sup>6</sup> Therefore the electricity they produce is intermittent, volatile, difficult to predict, and unreliable. They must be "backed up" with reliable generating units to keep electric grids in balance and assure that customers have reliable electric service.
4. **The "economic model" – NREL's JEDI model – typically leads to overstatement of state and local economic benefits.** A crucial issue explaining why the ACORE report is grossly misleading –

and perhaps where I should have started this paper – is the fact that those using NREL’s JEDI model typically produce significant overestimates of job and economic benefits.

In the case of the ACORE report, this means that the dozens of claims about the job and other economic benefits – whether direct, indirect or induced – should not be taken seriously.

While the development of the “JEDI model” was financed with tax dollars flowing through the US Department of Energy (DOE) and the National Renewable Energy “Laboratory” (NREL), no one should assume that it produces valid and reliable estimates.<sup>7</sup>

The *extent* of the overestimates is difficult to quantify here because ACORE has not provided (a) the key assumptions and estimates that it “fed into” the model that resulted in the outputs – i.e., local and state jobs and other economic benefits – that it claims, or (b) the data from the input-output model (IMPLAN) that underlies the JEDI model. Without disclosure of this information, there is no basis for either ACORE to claim validity for its report or for readers of the report to assume it is valid or reliable.

Unfortunately, the derisive old adage is quite true in the case of all economic and engineering models, including JEDI: “Garbage in, garbage out.”

While ACORE has withheld the data that are needed to quantify the extent of its overstatements of job and economic benefits, there has been enough experience with other applications of JEDI to identify the typical causes of the overestimates. In the case of wind energy, typical flaws and faulty assumptions include the following:

- a. Ignoring the fact that much of the capital cost of “wind farms” is for equipment purchased elsewhere, often imported from other countries. About 75% of the capital cost of “wind farms” is for turbines, towers and blades – many of which are imported and add to the outflow of wealth from the US.
- b. Assuming that employment during project construction results in new jobs for local workers -- when most “wind farm” construction jobs are short term (6 months or less) and the overwhelming share of them are filled by specialized workers who are brought in temporarily by the supplier of turbines and other equipment.
- c. Assuming that the very few permanent “wind farm” jobs are new jobs filled by local workers – when, in fact, these few permanent jobs are also often filled by people brought in for short periods. Many “wind farm” owners contract with suppliers of wind turbines and other equipment for maintenance work with the result that no “new” jobs for local workers are added.
- d. Assuming that temporary workers who are brought in for short periods live and spend their pay checks -- and pay taxes -- locally when, in fact, these workers spend most of their wages where they and their families have permanent residences -- where the workers spend most of their weekends and where they pay nearly all of their taxes.
- e. Assuming that the *full purchase price* of the goods and services purchased locally (often minimal in any case) has a local economic benefit. In fact, only the local value added may have a local economic benefit. This truth is illustrated by the purchase of a gallon of gasoline -- let's say for

\$3.00. Only the wages of the service station employees, the dealer's margin, and the taxes paid locally or to the state will have a local or state economic benefit. Economic benefits from the share of the \$3.00 that pays for the crude oil (much of it imported), refining, wholesaling, and transportation generally flows elsewhere.

- f. Assuming that land rental payments to land owners for allowing wind turbines all have local economic benefit. In fact, these payments will have little or no local economic benefit when the payments are to absentee landowners OR if the money is *spent* or *invested* elsewhere or is used to pay income taxes that flow to Washington DC or state capitals.
- g. Using "input-output" models that spit out "indirect" job and other economic benefits that, in effect, magnify (i) all of the overestimates identified above, and (ii) use unproven formula and data to calculate alleged "multiplier" effects.
- h. Ignoring the environmental and economic COSTS imposed by "wind farm" development, which include but are not limited to (a) the environmental and ecological costs associated with the production of the equipment, (b) constructing and operating the "wind farm" (e.g., site and road clearing, wildlife habitat destruction, noise, bird and bat kills and interference with migration and refuges), c) scenic impairment, (d) neighboring property value impairment, and (e) local infrastructure costs.
- i. Ignoring the fact that electricity produced from wind turbines, has less real value than electricity from reliable generating units -- because that output is intermittent, volatile and unreliable. Also, the electricity is most likely to be produced at night in colder months, not on hot weekday late afternoons in July and August when demand and economic value of electricity are high.
- j. Ignoring the "backup power" costs; i.e., the added cost resulting from having to keep reliable generating units immediately available (often running at less than peak efficiency) to keep electric grids in balance when those grids have to accept intermittent, volatile and unreliable output from "wind farms."
- k. Ignoring the fact that electricity from "wind farms" located in remote areas generally results in high unit costs of transmission due to (i) the need to add transmission capacity, (ii) the environmental, scenic and property value costs associated with transmission lines, (iii) the electric transmission "line losses" (i.e., the electricity that is produced by generating units but is lost during transmission and never reaches customers or serves a useful purpose), and (iv) inefficient use of transmission capacity because "wind farms" output is intermittent and unpredictable and seldom at the capacity of the transmission line that must be built to serve the "wind farm."

5. **The report ignores the fact that electricity from wind is intermittent, volatile, and unreliable, and must be backed up by reliable generating units to keep electric grids in balance.** This problem for electricity from wind is thoroughly documented<sup>8</sup> and explains why electricity from wind has less real value than electricity from reliable generating sources. As indicated earlier,, wind turbines produce electricity only when the wind is blowing in the right speed range. Depending on the area, winds tend to be strongest at night in colder months, not on hot weekday late afternoons when electricity demand tends to be highest.

Because they are intermittent sources of electricity, wind turbines can't be relied on when electricity demand reaches peak levels. Therefore, they do not replace the need for reliable generating capacity and, further, reliable generating capacity must always be immediately available to compensate for

the minute to minute, hour to hour, day to day, and season to season variations in output from wind turbines.

Electric grid managers in states such as California and Texas that have substantial wind turbine capacity – but lower percentage shares than ACORE suggests for Kansas -- have experienced serious problems in coping with the unreliable and volatile changes in output from wind turbines, particularly during times of peak electricity demand when output from wind turbines may be as low as 0% to 5% of their rated capacity.

**Failure to address the reasons why recommendation for building massive additions to the nation's transmission system to move electricity from the Midwest to the East are highly questionable.**

The ACORE report apparently assumes (pages 12 – 14) that the proposals to build huge high voltage transmission lines that could transmit electricity produced by “wind farms” in the Midwest to “load centers” (areas where electricity is needed) in the East is an inherently good idea. In fact, such proposals are highly questionable.

1. **Transmission owner and planner “dream.”** Building such a “backbone” system apparently is the dream of large electric transmission owners and utilities (such as AEP) and of transmission planners in the Southwest Power Pool (SPP), and regional transmission operators in the East (including MISO, PJM, TVA, MAPP). Typically, high voltage transmission systems are highly profitable ventures for the owners of the lines because they are regulated and generally are allowed a relatively high return on investment by FERC and/or state regulatory commissions.
2. **“Wind farm” owners’ “dream.”** Huge west to east transmission lines are also the “dream” of the wind industry which is well aware that (a) the best sources of wind tend to be in sparsely populated areas of the Midwest, (b) that “wind farms” are not welcome in most populated areas in the East because of their huge size, noise and other adverse environmental, ecological, scenic and property value impacts, (c) that areas where they are more likely to be accepted are distant from areas where electricity is needed in the East, and (d) as explained in paragraph 3.k., above, “wind farms” use transmission capacity inefficiently, resulting in high unit costs of transmission.
3. **High costs of transmission capacity imposed on electric customers.** However, the wind industry does not want to bear the cost of building transmission lines that are built to serve “wind farms.” Instead, they press federal and state regulators to allocate the huge cost of adding transmission capacity to electric customers. Unfortunately, regulators are often inclined to do so and they “get away with it” because they spread the incremental cost over all electric customers who will then experience a relatively small increase in their month bills – for which they will probably blame the electric distribution company that delivers the electricity to their homes – rather than the “wind farm” owners and regulators who are responsible for the increase in bills.
4. **Alternatives to building costly, intrusive transmission lines.** Those who seek to build transmission lines, especially in the East have learned that (a) they are seldom welcome, and (b) as a practical matter, there are alternatives that make more sense. The most commonly advanced alternatives are:
  - a. Improving the efficiency of electricity use to reduce electricity demand.
  - b. Shifting of electricity demand or voluntary demand reduction during peak demand periods to reduce the need for added transmission capacity and to use existing capacity more effectively.

- c. Building generating capacity near load centers to reduce the need for more transmission lines, and reduce “line loss” that occurs when electricity is moved over transmission lines.

Many cities have blighted areas that could be restored with properly constructed generating plants – perhaps not as large as those plants would be if located at great distance, but still large enough to supply a significant amount of electricity for people in the urban area. Also, additional units could be added at some existing powerplant sites in or near urban areas. Still, another possibility is the construction of electric generating units at superfund sites in or near urban areas. All would likely be preferable to building high cost, environmentally intrusive transmission lines.

5. **Vulnerability of Transmission lines.** Unfortunately, it is now widely recognized that elements of the US electric grid system, including transmission lines and substations, are vulnerable to disruption through cyber attacks on grid control systems and by physical destruction of lines using conventional explosives and weapons. Those promoting an integrated “national grid” system including massive high voltage transmission lines have yet to explain convincingly how hundreds of miles of high voltage transmission lines would be protected from terrorists or how a major metropolitan area would be protected from extended blackouts if it were heavily dependent on a few high voltage transmission lines bringing electricity from distant sources.

It is far from clear that a “national grid,” such as is being proposed by large transmission owners and transmission planners in power pools and regional transmission owners (RTOs) would be superior to an electric system that focuses primarily on having generation located within or close to the areas where electricity is needed and relies much less on building huge, costly, environmentally disruptive transmission lines.

### **The arrogance of government officials and subsidized special interest groups**

Across the country, evidence is emerging that shows the growing revulsion on the part of ordinary citizens concerning the (a) arrogance of special interest groups and the extent of their influence over the actions of government officials, (b) the lack of ability and/or willingness of government officials and their staffs to discern the difference between facts and special interest propaganda, and (c) the apparent willingness of these government officials to ignore the interests of ordinary citizens, consumers and taxpayers while allowing special interests to dictate the terms of legislation and the allocation of resources so that tax dollars, tax breaks, credit programs, and regulations are for the benefit of special interests.<sup>9</sup>

These concerns deserve attention in the case of the ACORE report – and the events leading up to it. For example:

1. **ACORE’s claim that the Governor of Kansas requested the ACORE “analysis.”** This claim, stated on page 7 of ACORE’s report is astounding. Hopefully, the ACORE claim is incorrect or, at least, it is not a common practice for the governor of Kansas (then lieutenant governor) or other officials to turn to lobbyists for an analysis and recommendations which, if accepted, would have a major impact on the people and economy of Kansas.

The ACORE claim seems especially hard to believe because:

- a. It is not a secret that lobbying organizations such as ACORE, the American Wind Energy Association (AWEA), and other “trade” associations exist to promote the interest of their members, not to promote and protect the national and public interest or the interests of the people of Kansas.

- a. Agencies *within the Kansas government* have demonstrated considerable expertise in analyzing far more objectively and in the interests of the people of Kansas, the potential for wind and renewable energy sources; e.g., “A Benefit Cost Study of the 2015 Wind Challenge: An Assessment of Wind Energy Economics in Kansas for 2006–2034,” January 22, 2008, prepared by the Staff of the Kansas Corporation Commission.
2. **ACORE’s pretense that the people it chose to work in preparing its report are the true “stakeholders” for the matters discussed.** When considering the public interest and socially responsible behavior, the term “stakeholder” certainly includes the citizens, consumers, and taxpayers that are affected by a government or business organization’s actions. In developing its “report,” there is no evidence that ACORE included anyone representing the interest of Kansas’ citizens, consumers and taxpayers – all of whom would most certainly be affected if Kansas officials believed and attempted to follow the ACORE report’s recommendations.
3. **The NREL “JEDI model” used by ACORE as the basis for its “report.”** Development of this “model” was financed with tax dollars flowing through the DOE’s Office of Energy Efficiency and Renewable Energy (DOE-EERE) and NREL and prepared by a wind industry consultant. The fact that NREL’s JEDI model does not produce estimates of *net* economic and job impacts and typically results in overestimating local and state job and economic benefits has long been known.

Despite its deficiencies, the “JEDI Model” has been used by “wind farm” developers to overestimate the local job and economic impact of proposed “wind farms” when preparing environmental and economic impact statements while pursuing various permits. The “JEDI model” has, therefore, been used by developers to mislead local and state government officials, citizens, and media about the costs and benefits of “wind farms.” Some “wind farm” developers have even refused to disclose the assumptions and details that lie behind their JEDI model calculations of economic and job benefits.

Unfortunately, it seems that local and state government officials do not have the will, resources, or expertise to challenge the calculations or force disclosure of the basis for “wind farm” developers claims – thus allowing developers to “get away with” unfounded claims.

Despite the above, DOE-EERE and NREL officials – all paid from tax dollars and, one would think, having the national and public interest rather than special interests as their primary responsibility -- have not acted to (a) prevent use of faulty assumptions, (b) prevent overestimates based on the JEDI model, and (c) force disclosure of details underlying the model or the input-output data relied upon by NREL and by others using the model.

4. **Why have the economists in Kansas universities and colleges not criticized the ACORE report?** Finally, it’s impossible to read and evaluate the February 2009 ACORE report without wondering why this report, particularly if it is being taken seriously by Kansas political leaders, has not been analyzed and openly criticized (if not derided) by economists from the colleges and universities in Kansas. Many of the false and misleading claims – as well as the factual and analytical omissions — reflected in the ACORE report are not hard to detect. However, as far as I know, economists from Kansas educational institutions have not criticized the report. Could it be the case that they are aware

of the strong political influence of the wind and renewable industries with political leaders and do not dare to speak out?

While ACORE's February 2009 "report" is focused primarily on Kansas, similar false and misleading are made by others in the wind industry, federal and state agencies, and other wind and renewable energy advocates for other states.

Hopefully, the comments above will be useful to others who are faced with false and misleading claims and who are concerned about the failure – or the inability -- of government and media officials to discern the difference between facts and propaganda from special interest groups and their lobbyists.

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Endnotes:

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<sup>1</sup> [http://www.acore.org/files/Kansas\\_Plan.pdf](http://www.acore.org/files/Kansas_Plan.pdf)

<sup>2</sup> <http://www.acore.org/about>

<sup>3</sup> See "The True Cost of Electricity from Wind is always Underestimated and its Value is always Overestimated," February 4, 2010. <http://www.windaction.org/documents/25496>; <http://www.wind-watch.org/documents/true-cost-of-electricity-from-wind-is-always-underestimated-and-its-value-is-always-overestimated/> In particular, see Point #4, beginning on page 6.

<sup>4</sup> ACORE 20 GW Plan for Kansas, [http://www.acore.org/files/Kansas\\_Plan.pdf](http://www.acore.org/files/Kansas_Plan.pdf) page 7.

<sup>5</sup> 7,013 MW (7,013,000 kW) of turbine capacity x 8760 hours per year x .35 capacity factor x \$0.02 per kWh = \$430,037,160.

<sup>6</sup> Depending on the specific turbine, wind turbines begin producing electricity when wind speed reach about 6 mph, achieve rated capacity around 32 mph, shut down (to prevent equipment damage) around 56 mph.

<sup>7</sup> Many incorrectly assume that NREL, which is called a National "Laboratory," can be relied on to provide objective information about wind and other renewable energy. This simply isn't true. While some employees of NREL engage in objective R&D following accepted scientific methods and engineering principles, other employees – also paid with our tax dollars -- are engaged in producing highly biased information promoting wind energy. JEDI, developed for NREL by a wind industry consultant, and promoted by NREL is one prominent example of NREL's lack of objectivity and failure to serve the national and public interest rather than the narrower interests of the highly subsidized wind and other renewable energy industries.

<sup>8</sup> See, for example, document cited in footnote 2, above; John Etherington's book, *The Wind Farm Scam*, 2009, Stacey International, London, ISBN 9781905299836; and "Key Industry Terms Important in Understanding the Limitations of Wind Energy," <http://www.wind-watch.org/documents/wp-content/uploads/schleede-terms.PDF>

<sup>9</sup> The US Energy Information Administration report, "Federal Financial Interventions and Subsidies in Energy Markets 2007," indicates that, on a kilowatt-hour of production basis, wind and solar energy, receive higher tax breaks and subsidies than any of the traditional energy sources. See: <http://www.eia.doe.gov/oiarf/servicerpt/subsidy2/pdf/chap5.pdf>, Table 35, page 106.