December 10, 2004

Comments on the Bureau of Land Management's
Draft Programmatic Environmental Impact Statement (DPEIS) on Wind Energy Development on BLM-Administered Lands in the Western United States

In summary, there are serious problems with the draft Programmatic Environmental Impact statement (PEIS). The comments that follow are focused primarily on the portions of the draft that deal with the economics of wind energy development.[1] The data and conclusions reflected in those parts of the draft are invalid because:

- Major elements of the true costs of producing and delivering electricity from wind energy have not been taken into account.
- The "economic model" underlying the economic analysis is defective.

It is important that Department of the Interior (DOI) and Bureau of Land Management (BLM) officials recognize that much of the information relied on by those drafting the statement has come from organizations that promote wind energy development.[2] This information is often biased and should not be relied on as a basis for BLM decisions.

The net effect of the deficiencies is that the draft PEIS grossly overstates the potential benefits of wind energy while grossly understating the true costs. In fact, it is far from clear that the PEIS justifies *any* development of wind energy on BLM-administered lands. Any conclusions in that regard will have to await correction of the fundamental deficiencies in the economic analysis.

DOI and BLM officials should also be aware that much of the information distributed during the past decade by the wind industry and other supporters of wind energy development is biased. However, as development of wind energy has occurred in US and other countries, problems with its development and facts about its true costs have begun to emerge.

Even a casual review of the literature about wind energy from around the world reveals information about problems caused and costs incurred when wind energy is developed. There does not appear to be any valid reason why those who have developed the draft PEIS should ignore the problems and the true costs and chose to rely on only the literature, economic models, and data that are favorable to wind energy development.

Clearly, DOI and BLM officials have a responsibility to act in the public interest, and not limit their consideration to information favorable to the development of wind energy. In particular, DOI and BLM officials should note that the draft PEIS largely ignores the interests of electricity customers and taxpayers who would bear the burden of higher cost of electricity from wind energy and taxpayers who would bear the burden paying for the tax breaks, other subsidies and other economic benefits achieved by "wind farm" developers and owners.

In addition to the primary focus on the economic deficiencies of the draft PEIS, the detailed comments that follow also mention one key safety problem that has been ignored and identify an omission in the sections on decommissioning. Further, DOI and BLM officials should be aware

that the two studies cited as justification for the draft PEIS conclusion that property values are not adversely affected by wind energy development have been publicly discredited because of deficiencies in methodology, assumptions and factors considered.

Before proceeding, BLM needs to do a complete and objective economic analysis, avoid reliance on biased information from wind energy advocates, and take into account the full, true environmental, energy and economic costs of wind energy development.

Detailed comments

A. Economic Analysis Deficient. The PEIS Executive Summary (page ES-1) states, in part, that "The objectives of the draft PEIS are to (1) assess the environmental, *social*, *and economic* impacts associated with wind energy development on BLM-administered land….." (Emphasis added). This certainly is a valid and necessary objective but it has not been pursued adequately in the PEIS. Critical deficiencies, as detailed below, include:

- Failure to consider key elements of cost that would be borne by the public (particularly electric customers and taxpayers),
- Reliance on "economic models" that are demonstrably flawed, including economic models developed by or for DOE's National Renewable Energy Laboratory (NREL).[3]

The JEDI or Wind Industry Model developed for and distributed by NREL for use in calculating state or local economic impacts, which model is referred to in the draft PEIS is demonstrably deficient in that it grossly overstates economic benefits and understates some economic costs and ignores other real economic costs. Attachment #1 to these comments is a paper describing and demonstrating deficiencies and errors in that model. That paper should be considered an integral part of these comments on the BLM's draft PEIS

BLM has an obligation to represent the public interest, not the interests of the wind industry or other wind energy supporters.

1. **The concept of the *economic cost* of electricity from wind energy reflected in the PEIS is incomplete.** The wind industry and its supporters (including DOE[4] and NREL) typically ignore large elements of the full, true costs of electricity from wind energy and, unfortunately, this basic error has been perpetuated in BLM's draft PEIS. Only during the past year or two has the truth about the full, true costs of wind energy begun to emerge in public discussions.

   The true cost of electricity from wind energy borne by the public is NOT the price claimed by wind energy supporters OR that charged by "wind farm" owners. Key elements of the full, cost that are typically omitted (and not considered adequately in BLM's document) include the following:

   a. **Real costs ultimately borne by electric customers not considered in BLM PEIS, but which show up in monthly electric bills**.
      1) Backup power costs. Wind turbines produce electricity only when the wind is blowing in the right speed range.[5] Their output is intermittent, highly volatile

from minute to minute, and largely unpredictable (except in the very short term). Because of these limitations, reliable ("dispatchable") generating units must be kept immediately available to keep the grid in balance (supply-demand, voltage, frequency). These back up units must be running in automatic generation control (AGC) mode, at less than full or optimum capacity, or in spinning reserve mode.

Providing this backup power involves costs and those costs (in whole or part) are properly attributed to the cost of wind energy. Also, recognize that ramping generating unit output up and down tends to add to unit wear and tear cost on those backup units

2) Costs of providing reliable generating capacity. Because wind turbines cannot be counted on to be available when needed to satisfy electricity customer demand (that is, they have little, if any, "capacity value"), sufficient reliable generating capacity must be built and maintained to assure that adequate capacity is always available. This, too, involves costs for building and maintaining that capacity even if it is not fully utilized. Those costs must be recovered in some way and are almost certain to end up in monthly electric bills. Wind generating capacity does not replace the need for reliable generating capacity.

3) Higher cost of providing transmission capacity for electricity from wind turbines. Transmission costs are inherently higher for electricity from wind turbines for at least three reasons:
   - The first reason is due to the intermittence of wind generation. In practice, enough transmission capacity must be available to handle the full rated output of a "wind farm." However, that full capacity is not used efficiently and effectively because of the intermittent availability of the electricity output
   - The second reason is that windmills, because of their large size, noise and other factors, tend to be found acceptable in areas that are remote from populated areas. The practical effect is that electricity from wind is likely to have to travel over longer distances and, therefore, "line losses" tend to be higher than for generating units that are located near load centers.
   - The third reason is that areas where siting of windmills may be acceptable tend to be in areas where adequate transmission capacity is less likely to be available. At least two states (Minnesota and Texas, as well as other countries such as Denmark and Germany) have found it necessary to add expensive transmission capacity to serve "wind farms." Such costs are appropriately counted as part of the full, true cost of electricity from wind. In any case, these costs end up in electric customers' monthly bills even if this is not clearly admitted by the wind industry, regulators, or advocacy groups.

4) Grid management costs to maintain reliability. Because of intermittence, volatility and unpredictability, "wind farms" tend to detract from grid reliability and, therefore, require greater care to assure integration into electric grids. This is an additional cost factor.

5) Mandated "Renewable Portfolio Standards" (RPS) add to consumer costs. RPS requirements specify minimum shares of electricity that must come from "renewables" have been adopted by some states and applied to government buildings and activities in other states. Electricity from wind is inherently more costly than alternative existing sources of electricity. These costs are passed on to consumers. The fact that RPS create artificial, high cost markets also helps push up customers' costs.

6) "Green energy" programs mandated or encourage for electric utilities also add to electric customer costs. Typically, these programs provide that electric customers are to be given the option of purchasing "green" electricity – i.e., electricity produced from certain renewable energy sources – if they are willing to pay a premium price for that electricity.

   To the extent that customers volunteer to pay premium prices, there should be no objection. However, nationally less than 1% of the customers of 100+ electric utilities offering such programs "volunteer" to pay the premium prices. The premium revenue collected by the utilities is not enough to cover the utilities' costs of buying the high cost renewable-generated electricity and the cost of administering the programs. The result is that the costs that are not recovered through premium payments are passed on to all the utilities' customers, adding to their monthly bills.

b. Real costs borne by ordinary taxpayers that have not been taken into account in BLM's draft PEIS "economic analysis." Wind energy is now one of the most heavily subsidized sources of electricity in the US *when considered in light of its existing and potential contribution toward supplying US electricity requirements.*

The tax breaks and other subsidies currently available for commercial-scale wind energy have led to a situation where the principle motivation for building "wind farms" is tax avoidance – not their environmental, energy or economic benefits. BLM should not be encouraging misallocation of resources. The federal, state and local tax breaks and other subsidies which run in the hundreds of millions annually include:

1) Federal five-year double-declining balance accelerated depreciation (MACRS[6]) which permits "wind farm" owners to deduct 20% of the capital cost[7] of a "wind farm" from otherwise taxable income in the 1st tax year, another 32% in the 2nd tax year, and the remainder over the succeeding four tax years.[8]

2) A ten-year, $0.018 per kilowatt-hour (kWh) Production Tax Credit which permits the owners of "wind farms" or their parent companies to deduct additional millions of dollars each year from their tax liability.

3) In states that conform their corporate income tax system to the federal system, the five-year double declining balance accelerated depreciation also serves to reduce "wind farm" owners' income that would otherwise be subject to state corporate income tax. *This loss of revenue has not been taken into account in the BLM draft PEIS.*

4) Dozens of state and local government tax breaks, enacted in response to wind industry lobbyists, including (depending on the state) state production tax credits, reductions in or exemptions from business and occupation taxes, sales and use taxes, and state and local property taxes. In some states, some of the taxes have been eliminated and in others have been reduced substantially. *These losses of revenue have not been taken into account in the BLM draft PEIS.*

5) Direct DOE subsidies (via contracts, grants and subcontracts) for wind energy R&D and for wind promotional activities carried out by DOE "national laboratories," trade associations and numerous "non-government organizations" that have been created to promote expensive "renewable" energy. These, too, are a real economic cost and money involved almost certainly could have been used more effectively elsewhere, particularly if left in the private economy.

6) Similar state subsidies (e.g., in California), some of which are paid from appropriated funds and some provided from funds collected via consumers' monthly electricity bills and often labeled as "public benefit funds." These also are a real economic cost.

2. The "economic analysis" in BLM's PEIS has another fundamental deficiency. The higher true costs of electricity from wind energy – including the hidden costs for electric customers and taxpayers described above -- that less money is available for other uses and is, therefore, a net "drag" on those sectors of the local, state or national economy where those incremental funds would otherwise be spent or devoted to savings.

For example, the higher true cost of wind energy borne by electric customers and taxpayers means that less money is available for other uses including, for residential customers, spending on food, clothing, shelter, medical expenses, education, and other purposes (e.g., spending in local hardware stores, dry cleaners and other retail establishments). Also, less money is available for savings.

B. Claims of costs per kWh of electricity from wind generation distributed by the US Department of Energy (DOE) and DOE's NREL are not valid or reliable. DOE, NREL, the wind industry and other wind advocates often distribute information purporting to show the costs per kWh of past, current and potential future wind turbine generation.

Apart from all the real costs that are excluded from the DOE and NREL calculations, it must be recognized that the DOE[9] and NREL numbers are not valid or reliable.

The principle reason the numbers are invalid, unreliable and, really, quite meaningless is that they are based on three assumptions that have no basis in fact; specifically:

- That the useful life of the wind turbines is known. Often it is assumed that the useful life will be 20 or 30 years. Keep in mind that "wind farms" require very large capital cost compared to other generating sources. In fact, there is no long-term experience with the large (1+ MW) turbines now being installed to predict their life expectancy. If those turbines turn out to have a useful life of 10 years rather than 20, the actual costs per kWh of the electricity they produce over the 10 years would be nearly double the cost estimates based on a 20 year useful life assumption.
- Actual costs of operating, maintaining, repairing and replacing wind turbines over their useful life is unknown for the same reason noted above; i.e., no long term experience. Some "wind farms" have experienced many unexpected turbine failure problems.[10]
- Actual performance – in terms of kWh output -- over their useful life is unknown, again, because there is no long term experience with today's turbines and blades. It is known that performance of wind turbines deteriorates over time for a variety of reasons, including blade fouling.

C. BLM's PEIS does not adequately reflect the fact that electricity from wind turbines has less value than electricity from reliable generating sources and detracts from, rather than adds to, electric system reliability. As pointed out above electricity form wind turbines is available only when the wind is blowing in the right speed range – with the result that the electricity produced is intermittent, volatile and largely unpredictable.[11]

Because of these limitations, wind turbines have little, if any, "capacity value" as that term is used in the electric industry and the *electricity has less real value than electricity from reliable generating units that can be called upon whenever needed to supply electricity users demands*.

Those responsible for assuring the reliability of electric systems and grids must assure that *reliable ("dispatchable") generating capacity is available at all times to satisfy electricity demands and keep control areas and grids in balance.* The practical effect of the limitations of wind energy is that reliable generating capacity must be built and available for use *even if wind turbines are built and are available at some times (when the wind is blowing at the right speed) and the reliable capacity is not fully utilized. The cost of building and maintaining the reliable capacity – which may not be used at full capacity or peak efficiency -- is also borne by electric customers, in addition to the high costs of the electricity from wind.*

D. Overestimation of emission reduction impacts. BLM's PEIS overestimates the potential reduction in emissions from fossil-fueled electric generation. For example, the draft PEIS does not reflect adequately the fact that emissions are produced when dispatchable fossil-fueled generating units continue to produce emissions when they are run in "spinning

reserve" mode or run at less than peak efficiency to "back up" intermittent, volatile, unpredictable output from wind turbines. BLM should not assume that each kilowatt-hour of electricity produced by a wind turbine offsets emissions associated with an equal number of kWh produced by a fossil-fueled generating unit. Furthermore, no emissions are offset if the electricity displaced by a wind turbine (if any) would have been produced by a hydropower generating unit. Also, any emissions that are avoided are far different if the electricity would have been produced by, for example, an efficient gas-fired combined cycle generating unit rather than an old coal-fired generating unit that does not yet meet new source performance standards.

E. **"Studies" relied on by BLM's draft PEIS to claim that property values are not adversely affected are invalid.** The draft PEIS cites two studies to justify its conclusion that property values are not adversely affected by construction of windmills in the area. Both studies funded and were prepared by organizations known to be advocates of wind energy development and both have been publicly discredited because of basic deficiencies in their methodology, assumptions and data. The fact that they have been discredited is no secret and should have been know to those developing the draft PEIS. Any assertion that the value of property, particularly residential property, near "wind farms" is not adversely affected in quite absurd.

F. **Those preparing the draft PEIS seem to have carefully ignored the growing literature that challenges the claims of the wind industry and other wind energy supporters, such as DOE-EERE, NREL, and NWCC and has largely ignored the interests of electric customers and taxpayers.** These comments from the introductory summary of these comments are repeated here so that they will not be overlooked when BLM officials undertake a more complete analysis that covers all the true costs and benefits of wind energy development.

G. **BLM's PEIS fails to consider a key decommissioning risk.** While the draft PEIS discusses some decommissioning issues, it does not deal adequately with a key economic risk associated with decommissioning. That risk is whether a financially viable and responsible owner will be available to carry out decommissioning and restoration responsibilities.

In particular, BLM officials need to be aware that:

1. **Most "wind farms" in the US are "owned" by Limited Liability Companies (LLCs),** many of which have only a single physical asset (i.e., the "wind farm") and, perhaps, a contract for the sale of some or all of the electricity for some period of time. When it comes time for decommissioning and restoration of lands affected the LLC or whoever owns the "wind farm" at the time may not have the financial resources to pay the costs involved and may resort to bankruptcy or other measures to escape liability.

2. **The tax incentives and other subsidies available from federal, state and local governments[12] are heavily "front-end" loaded, creating strong financial incentives for "wind farm" owners to sell or abandon the facilities once the value tax benefits**

and subsidies have been captured and/or when maintenance, repair and replacement costs begin to climb as facilities age. Note, for example, that the tax avoidance value of federal and state accelerated depreciation is fully captured in the first 6 tax years from start of operation, and the production tax credits are captured in the first 10 years.

3. **Assuring that money will be available to pay for decommissioning and restoration probably can be achieved only through cash bonds posted in advance of construction starts AND held by an independent third party.** Surety bonds probably will not provide adequate protection, particularly if periodic premium payments are required. Funds held in some sort of "trust" by the "wind farm" owner would not be secure because such funds would be part of the assets of the "wind farm" owner that would be available to all creditors in the event of bankruptcy.

In summary, BLM regulations should require that full cash bonds, held by an independent third party, be posted before a permit is granted for a wind energy facility on BLM-administered lands.

H. **BLM's PEIS fails to consider at least one key public safety risk.** The draft PEIS does not deal with the need for safety standards for the components, construction and operation of wind turbines in cold climates. This problem has been faced in European countries but continues to be neglected in the Untied States. BLM rules should address this issue before additional wind turbines are permitted on BLM-administered lands.

One final comment: The draft PEIS reflects an underlying presumption that wind energy is environmentally and economically advantageous. This probably reflects the fact that key participants in the preparation of the draft are avid wind energy supporters or, perhaps, reflects the political decisions inherent in the current Administration's "Energy Plan." When preparing an EIS, BLM has an obligation to rise above both personal views and political objectives and strive for objectivity.

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These comments are submitted in my role as a citizen, consumer and taxpayer and are not on behalf of any client or other interest. Nevertheless, BLM has a public interest responsibility to take them fully into account as it has in the case of the interests of the wind industry and other wind energy development proponents.

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Attachment #1: Errors and Excess in the NREL's JEDI-WIM Model that Provides Estimates of The State or Local Economic Impact of "Wind Farms"

Endnotes:

[1] Sections 2-31; 4.10 and subsections 1-7; 5-13 and its subsections; Subsection 6.1.1, 6.1.3, 6.2.1, 6.2.3, 6.3, 6.4.1.13, and Appendix B.

[2] Much of the data relied upon by those drafting the statement does not meet the basic standards established by the Data Quality Act and OMB regulations implementing that Act. Use of any such data is unwarranted.

[3] It is critically important that BLM officials recognize that NREL cannot be relied on for objective analysis and information about the costs and benefits of wind energy. Undoubtedly, some at NREL carry on research and development activities that follow scientific methods and engineering principles. However, much of what NREL does "in-house" or under subcontracts – particularly that relating to wind energy -- is more akin to the activities of a trade association. That is, it collects and distributes information that is favorable to wind energy and ignores information that is unfavorable to wind energy. Would BLM be comfortable with basing its findings about oil on information from the American Petroleum Institute, or on coal from the National Mining Association?

[4] Particularly DOE's Office of Energy Efficiency and Renewable Energy – DOE-EERE.

[5] Today's turbines begin producing some electricity when wind is about 6 MPH, achieve rated capacity when wind speed is about 33 MPH, and cut out around 56 MPH to avoid equipment damage or destruction.

[6] MACRS = Modified Accelerated Cost Recovery System.

[7] Whether financed with debt or equity.

[8] During the period ending December 31, 2004, "wind farm" owners have been able to deduct 60% of capital costs in the first tax year, 16% in the second tax year and the remainder over the succeeding 4 tax years – because of a "bonus" depreciation provision which apparently has not been extended.

[9] For example, DOE's publication, "Windpowering America," graph on page 4. <http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/wpa/35873_21century.pdf>

[10] Iowa Department of Natural Resources, "Top of Iowa Wind Farm Case Study." http://www.state.ia.us/dnr/energy/MAIN/PROGRAMS/WIND/documents/topofiaWindFarmCaseStudy.pdf

[11] Except, potentially, during a few hours before the electricity is actually produced and wind conditions can be predicted with some accuracy. These are well known facts and are widely acknowledged in the literature and demonstrated repeatedly.

[12] Described earlier in these comments.