

March 6, 2006

Office of Electricity Delivery and Energy Reliability, OE-20,
Attention: EPAct 1221 Comments
U.S. Department of Energy
Forestall Building, Room 6H-050
1000 Independence Avenue, SW.
Washington, DC 20585

Re: Comments of the American Wind Energy Association, Wind on the Wires, Interwest Energy Alliance, The Wind Coalition, the Center for Energy Efficiency and Renewable Technologies, and The Renewable Northwest Project on the Department of Energy's "Considerations for transmission congestion study and designation of National Interest Electric Transmission Corridors"

The American Wind Energy Association (AWEA), Wind on the Wires (WOW), Interwest Energy Alliance, The Wind Coalition, the Center for Energy Efficiency and Renewable Technologies, and The Renewable Northwest Project appreciate this opportunity to respond to the Department of Energy's Notice of Inquiry¹ concerning its plans for a congestion study and possible designation of National Interest Electric Transmission Corridors (NIETCs). We believe that with high and volatile fuel prices, climate change and air quality concerns, water conservation needs, and threats to security from importing fuel, our Nation's vast resources of wind in the middle of the country can and should be tapped. As President Bush stated recently on his Advanced Energy Initiative tour, "areas with good wind resources have the potential to supply up to 20 percent of the electricity consumption of the United States." In this comment we address the proposed criteria for corridors in response to questions in the Department's inquiry, describe studies to add to the list of relevant studies in Appendix A of the notice, and identify specific corridors from the set of relevant studies that we believe will qualify as NIETCs.

I. WHO WE ARE

AWEA is a national trade association representing a broad range of entities with a common interest in encouraging the expansion and facilitation of wind energy resources in the United States. AWEA's 780 members include wind turbine manufacturers, component suppliers, project developers, project owners and operators, financiers, researchers, renewable energy supporters, utilities, marketers, customers and their advocates. Many of AWEA's members are interested in developing wind projects in wind-rich areas but are currently prohibited from doing so because of a lack of transmission.

Wind on the Wires works on solving the technical (transmission) and regulatory barriers to interconnecting and delivering new wind power to market in the Upper Midwest. WOW

¹ Department of Energy, Considerations for Transmission Congestion Study and Designation of National Interest Electric Transmission Corridors, Federal Register notice Vol. 71, No. 22, February 2, 2006, page 5660.

members include nationally prominent wind developers and wind turbine manufacturers, AWEA, non-profit sustainable energy advocacy organizations, and other stakeholders. WOW has been actively involved in transmission planning with utilities and the Midwest Independent System Operator since 2001. WOW members have a substantial interest in the resolution and advancement of the issues in DOE's Notice of Inquiry.

The Renewable Northwest Project is a non-profit renewable energy advocacy organization whose members include environmental and consumer groups, and energy companies. RNP works in Oregon, Washington, Idaho and Montana to increase the development of clean renewable energy resources.

West Wind Wires is a wind industry advocacy program under the auspices of Western Resource Advocates that represents wind in transmission planning and operational forums throughout the Western Electricity Coordinating Council region.

The Wind Coalition is a non-profit corporation advocating for the expansion of wind energy use in Texas and the Southwest Power Pool. The Wind Coalition's members are: AES; Babcock & Brown, LP; Gamesa Energia Southwest; GE Energy, LLC; Horizon Wind Energy; PPM Energy; Renewable Energy Systems (USA); Siemens; Superior Renewable Energy; Trinity Structural Towers, Inc.; Vestas-Americas, Inc.; Environmental Defense; Public Citizen; Texas Renewable Energy Industries Association; and AWEA.

The Interwest Energy Alliance is a trade association that brings the nation's wind energy industry together with the West's advocacy community. The Alliance's members support state-level public policies that harness the West's abundant renewable energy and energy efficiency resources in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming.

The Center for Energy Efficiency and Renewable Technologies is a not for profit public-benefit organization founded in 1990 in Sacramento. CEERT's board and host of affiliates is comprised of concerned scientists, environmentalists, public interest advocates and individuals involved in developing innovative energy technologies that share a vision to benefit the environment with sustainable solutions to California's growing appetite for energy.

II. A "CORRIDOR" SHOULD BE BROADLY DEFINED

The first question raised in the notice is essentially "what is a corridor?" AWEA agrees with the Department that corridors should be identified as "generalized electricity paths between two (or more) locations, as opposed to specific routes for transmission facilities."² We believe this generalized approach is consistent with standard transmission planning practice and with the intent of the law. The approach avoids the obviously unworkable approach of finding that a specific route is of national interest while other routes connecting two areas are not. Congress and the Administration presumably chose the term "corridor" over other terms like "route" for a reason and we believe it was with this consideration in mind.

² DOE Federal Register notice, page 5661.

Specifically we believe that a corridor should be defined as follows: “a corridor connects two geographic areas, defined as utility service territories, control areas, resource production areas, or points on the electric transmission system which are separated by transmission limitations.”

III. CRITERIA FOR CORRIDOR IDENTIFICATION

AWEA generally supports the proposed criteria but respectfully submits that they do not sufficiently address the criteria required by EPAct §1221. We suggest specific modifications below. We do not advocate wind-specific provisions but rather generally applicable provisions that we believe are required by the law.

Draft Criterion 1: Action is needed to maintain high reliability.

AWEA supports this criterion and notes that there are reliability benefits of accessing wind generators. The smaller unit sizes of individual wind turbines make them more reliable than a single large generator. Many types of failures can and do take large generators off line. Aggregations of wind machines do not suffer from a similar vulnerability. Reliability is composed of security and adequacy. Transmission corridors that access generation fueled by domestic resources, especially domestic renewable resources, should be recognized as improving both security and adequacy and enhancing the reliability of the overall power system. We suggest adding the following provision: “an area that would lead to supply from greater numbers of geographically dispersed small generating units that are less vulnerable to large sudden outages due to plant failure, natural disasters or malicious acts than large generating stations.”

Draft Criterion 2: Action is needed to achieve economic benefits for consumers.

AWEA supports this criterion as far as it goes. However it does not address the statement in EPAct § (B)(i) that “economic growth in the corridor, or the end markets served by the corridor, may be jeopardized by reliance on limited sources of energy.” Economic growth can be enhanced by the rural economic development associated with wind farms in the many regions of the country. We suggest the following clarification: “an area that promotes rural economic development through generation development in rural areas such as on farms and ranches.” This provision of the act should be included in Criterion 2 or as an additional criterion.

Draft Criterion 3: Actions are needed to ease electricity supply limitations in end markets served by a corridor, and diversify sources.

We suggest that this criterion be clarified to specifically state that supply diversification both at the local level (power used to serve load in a particular area) and national level are covered by the criterion. In other words, a corridor to an area that would increase national consumption of wind even if the particular state or region already has significant wind usage, would qualify given the low percentage of wind currently in the national electricity portfolio. We note that the criterion as written does not address the criterion in EPAct (B)(ii), “a diversification of supply is warranted.” Supply diversification should be clarified in this criterion or added as another criterion.

Draft Criterion 4: Targeted actions in the area would enhance the energy independence of the United States.

AWEA supports this provision and finds it to be consistent with EPAct criterion (C), “the energy independence of the United States would be served by the designation.” We agree with the specific metrics of fuel diversity, improved domestic fuel independence, and reduced dependence on energy imports.

Draft Criterion 5: Targeted actions in the area would further national energy policy.

We support this criterion and find it to be consistent with EPAct criterion (D) “the designation would be in the interest of national energy policy.” However we note that the notice provides no clarifying language or metrics for this criterion unlike all of the other criteria. The Department should not and cannot shy away from implementing this provision of the law.

Metrics for this criterion should be based on the Advanced Energy Initiative in the President’s State of the Union speech,³ the Western Governors Association’s (WGA) unanimous clean energy resolution,⁴ the Midwestern Governors’ Association (MGA) Regional Electric Transmission Protocol⁵, and any other recent multi-state or national law or policy statement on energy policy. Together the State of the Union speech and the governors’ associations resolutions provide clear criteria that are consistent with initiatives in states across the country and with initiatives in Congress.

The President’s Advanced Energy Initiative includes the following: “replacing more than 75 percent of our oil imports from the Middle East by 2025,” reducing demand for natural gas, diversifying energy sources, developing “cleaner,” “cheaper,” and “more reliable alternative energy sources.”⁶

The WGA resolution states “To ensure that newer, clean energy sources play an important role in meeting this goal [of a clean, secure energy future], this resolution is specifically concerned with identifying ways to increase the contribution of renewable energy, energy efficiency, and clean energy technologies within the context of the overall energy needs of the West.” It further states “the Western Governors will examine the feasibility of and actions that would be needed to achieve a goal to develop 30,000 MW of clean energy in the West by 2015 from resources such as energy efficiency, solar, wind, geothermal, biomass, clean coal technologies, and advanced natural gas technologies.” The resolution identifies wind in particular: “Western Governors also believe there is long term wind energy potential in the western plains and mountain states but that a more aggressive effort to develop this energy resource is needed. Western Governors believe that a comprehensive study of the development and transmission of the West’s wind energy resources is necessary. This study should build on the numerous subregional plans

³ <http://www.whitehouse.gov/news/releases/2006/01/20060131-6.html>

⁴ <http://www.westgov.org/wga/policy/04/clean-energy.pdf>

⁵ <http://www.midwestgovernors.org/issues/Protocol.pdf>

⁶ <http://www.whitehouse.gov/news/releases/2006/01/20060131-6.html>

underway, such as the Rocky Mountain Area Transmission Study, but should emphasize policies that can facilitate wind development throughout the region.”⁷

The Midwestern Governors’ Association Regional Electric Transmission Protocol recognizes that additional investment in transmission is needed. The Protocol also states that the Midwest could become a substantial provider of wind-generated electricity, but the power needs to be moved to where it is needed. The Protocol also acknowledges that the benefits of additional infrastructure include more reliability, access to low-cost generation, diversity of supply, and economic development opportunities.

To derive metrics from the policy statements of the President, the MGA and the WGA, AWEA proposes that the following features from each be used. From the President’s initiative metrics should include increasing supplies of clean, low cost, reliable, and domestic energy that diversifies the nation’s energy portfolio. The WGA initiative includes these same metrics plus the development of “energy efficiency, solar, wind, geothermal, biomass, clean coal technologies, and advanced natural gas technologies.” The MGA statement includes “low cost,” “more diverse supplies leading to lower cost,” “environmental benefits from improved access to renewable generation,” “economic and job growth,” and an “expanded tax base.” Together, AWEA suggests that DOE adopt the following metrics for Criterion 5: “an area that allows for the development of clean, low cost, reliable, and domestic energy that diversifies the nation’s energy portfolio including a demonstration that a corridor will increase the use of some or all of the following: energy efficiency, solar, wind, geothermal, biomass, clean coal technologies, and advanced natural gas technologies.”

Draft Criterion 6: Targeted actions in the area are needed to enhance the reliability of electricity supplies to critical loads and facilities and reduce vulnerability of such critical loads or the electricity infrastructure to natural disasters or malicious acts.

AWEA suggests the following metric for this criterion as well as Criterion 1: “an area that would lead to supply from greater numbers of geographically dispersed small generating facilities that are less vulnerable to large sudden outages due to plant failure natural disasters or malicious acts than large generating stations.”

Draft Criterion 7: The area’s projected need (or needs) is not unduly contingent on uncertainties associated with analytic assumptions, e.g., assumptions about future prices for generation fuels, demand growth in load centers, the location of new generation facilities, or the cost of new generation technologies.

AWEA notes that this criterion is not identified in EPAct. The demonstration of whether corridors meet the other criteria should consider the issue identified here so this proposed criterion is at best redundant. Moreover, the undefined term “unduly contingent” provides little or no real guidance in selecting corridors.

Draft Criterion 8: The alternative means of mitigating the need in question have been addressed sufficiently.

⁷ <http://www.westgov.org/wga/policy/04/clean-energy.pdf>

AWEA supports this criterion but emphasizes that the *option* of transmission should be preserved through corridor status while other options are considered. Therefore we suggest a criterion that more closely tracks the language of EPAct.§ 1221: “Any reasonable alternatives presented by interested parties have been addressed sufficiently to warrant preserving the transmission option, recognizing that alternatives to transmission facilities must be considered for approval of any specific project.”

IV. CONGESTION MODELING MUST ADDRESS NEW RESOURCES

The notice indicates that the initial electric transmission congestion study required by Federal Power Act subsection 216(a)(1) will be based on existing studies and congestion modeling of the Eastern and Western Interconnections. AWEA believes the study required by law must include the lack of transmission between supply resources like wind and electric load. Typical power system load flow and economic dispatch models take existing generators and load as given and therefore do not address this issue unless it is explicitly added. The Department’s modeling should include not only existing generators but new supply sources like pockets of wind.

V. RELEVANT TRANSMISSION PLANNING STUDIES

The Department’s notice indicates that it will publish its congestion study by August 8, 2006 and at that time it will invite interested parties to provide comments and recommendations concerning its needs assessments and potential corridors to address identified needs. Appendix A to the notice includes the list of transmission plans and studies the Department currently has under review for its congestion study. AWEA respectfully proposes the following five additional studies for use in the Department’s congestion study.

These five additional studies are:

- Southwest Power Pool’s (SPP) *Kansas/Panhandle Sub-Regional Transmission Study*, <http://spp oasis.spp.org/documents/swpp/transmission/studies.cfm>, January 26, 2006;
- *Report of the BPA Infrastructure Technical Review Committee* 2001 – 2004, <http://www.transmission.bpa.gov/planproj/ITRC.cfm?page=ITRC>;
- *Report of the Tehachapi Collaborative Study Group*, March 16, 2005, www.cpuc.ca.gov/Published/Graphics/48819.pdf;
- the *Report of the Imperial Valley Study Group*, September 30, 2005, www.energy.ca.gov/ivsg/; and
- Southwestern Area Transmission group planning for southeastern Colorado, <http://www.azpower.org/swat/meetings/pdf/aug2005/maps.ppt>.

The existing transmission studies, both those noticed by the Department and those studies suggested above, show Draft Criteria met with transmission expansions that serve large additions of wind. Below is a description of the studies that have specifically examined the potential to bring benefits to consumers through large amounts of wind development, or identified wind-rich regions and begun the planning for the development of the wind resource.

Southern Plains

The Southwest Power Pool *Kansas/Panhandle Sub-Regional Transmission Study*, also known as the “X-Plan” because of the shape of the new lines crossing from the Nebraska border through western Kansas and into Oklahoma and the Texas Panhandle, is an important study for the Department to include because it would diversify electricity supply by accessing an extraordinarily wind-rich region. This study was driven by requests from the developers of 2,500 MW of new wind generation currently seeking interconnection to transmission. SPP prepared this study during 2004 and revised it in 2005, showing \$80 million of production cost savings annually in the Southwest Power Pool, and annual total fixed charges costs of \$74 million.⁸ The plan uses new 345 kV line segments: Spearville-Mooreland-Potter-Tolk-Tuco, Spearville-Knoll-Pauline, and connections from Mooreland to the Northwest substation and to Wichita. These segments would allow new wind generation from western Kansas, southwestern Nebraska, western Oklahoma and the Texas panhandle to supply Kansas, Missouri, Arkansas and eastern Oklahoma immediately, and, with added transmission, Louisiana and Mississippi.

Desert Southwest

Several studies of proposed new transmission in Arizona, southern Nevada and Southern California detail congestion reduction and renewable energy development opportunities associated with the proposed facilities. These include the *Report of the Imperial Valley Study Group* (for export of 2,200 MW of renewable resources from California’s Imperial Valley); CAISO studies of the Palo Verde—Devers #2 project (to bring Southwestern resources to Southern California); the Report of the Phase III Study of the Central Arizona Transmission System; and the San Diego Gas & Electric Transmission Comparison Study (to provide a new 500 kV connection from the Southwest to San Diego County and Southern California). This collection of studies by regional utility companies, completed using WECC protocols, address reliability, congestion relief and new conventional and renewable generation supply for the region.

Central California

The *Report of the Tehachapi Collaborative Study Group* is a result of work directed under a California Public Utility Commission (“CPUC”) order.⁹ The report details a plan to connect 4,500 MW of wind generation in the Tehachapi region to the state 500 kV grid. The study was led by a stakeholder collaborative that included the CPUC, the California ISO, the California Energy Commission, Southern California Edison, Pacific Gas & Electric, wind developers, and the Center for Energy Efficiency and Renewable Technologies. The Tehachapi conceptual development plan allows wind generation potential in the Tehachapi region to meet state renewable resource goals. Lack of transmission capacity has prevented the development of renewable generation supply in this region to serve the state’s well-known need for energy.

Pacific Northwest

⁸ Costs include underlying lower-voltage upgrades, and 15% cost of capital. Fuel cost assumed in 2005 study was \$5/ MMBtu natural gas at the burner. *Addendum to the Kansas/Panhandle Sub-Regional Transmission Study* November 4, 2005. Higher natural gas prices would increase the plan’s net benefits.

⁹ CPUC Decision 04-06-010 identified 4,060 MW of wind resource in Tehachapi in proceedings related to the implementation of the Renewable Portfolio Standard required by California law.

The Pacific Northwest has several wind-rich areas. Transmission planning in the region has focused on moving power from east of the Cascades to the coast, and from Montana to the Northwest more generally. Transmission planning to move wind power to load centers on the coast has emphasized the shorter distance transmission from the Columbia Gorge region than from Montana. These transmission reports are not included in the Department notice. The 2001 *Report of the BPA Infrastructure Technical Review Committee*, written by representatives of investor-owned utilities and publicly-owned utilities, highlight regional transmission needs. Annual updates of this inventory of unsolved congestion can be found at the BPA website <http://www.transmission.bpa.gov/planproj/ITRC.cfm?page=ITRC>.

There are three congestion bottlenecks identified in these reports that are most relevant to move wind resources from east of the Cascades to the load centers of Western Oregon and Washington: 1) McNary-John Day; 2) Paul-Allston and Allston-Keeler path; and 3) the Cross-Cascades North and South paths.

The Department notice also includes the *Montana-Pacific Upgrade Study*. This recent study by the Northwest Power Pool examined the addition of 750 MW of generation in eastern Montana, or the alternative of wind development closer to load, in western Montana near Great Falls, to serve the Puget Sound and Portland areas. The transmission options to incorporate significant new generation in Montana include one or more 500 kV circuits.

Intermountain West

In September 2003, Wyoming Governor Dave Freudenthal and Utah Governor Michael Leavitt created the Rocky Mountain Area Transmission Study (RMATS) as a multi-state effort to reduce congestion and increase transmission. This work recommended two priority transmission upgrade projects in the region: the Bridger Expansion Project, and the Tot 3 Upgrade Project. RMATS also explored transmission export options. The Bridger Expansion Project adds transmission from the Jim Bridger switchyard/coal plant in southwest Wyoming East to the wind resources in central Wyoming; southwest to Salt Lake City; and West to southern Idaho. Initially, these additions would support 1,375 MW of new wind generation in southwest/south central Wyoming. Larger additions for export to Nevada and the West Coast are also described. The Tot 3 Upgrade Project would add new 345 kV facilities to export supply resources from eastern Wyoming to the Colorado Front Range load center, including export of 1,200 MW of wind generation from excellent wind resources in eastern Wyoming to Denver. The RMATS study also outlined alternatives for exporting as much as 10,000 MW of Rocky Mountain generating resources to the Pacific Northwest, Nevada and California.

Significant additional wind development in southeastern Colorado for Denver and for export via the Bridger Expansion Project will rely on transmission from the southeastern part of the state. This added transmission has been discussed in the Southwest Area Transmission regional planning effort. The reports in this effort have not been noticed by the Department. See the maps for southeastern Colorado at the website:

<http://www.azpower.org/swat/meetings/pdf/aug2005/maps.ppt>

Midwest

The Midwest ISO prepared a 2003 Transmission Expansion Plan (MTEP) and the MTEP 2005 with the knowledge that this ISO serves a region with over 700,000 MW of “proven reserves” of wind power in its nine state region.¹⁰ MTEP 2003 and 2005 are listed in Appendix A of the Department’s notice. The economic analysis in the MTPEP 2003 study found transmission investments could reduce annual energy costs between \$304 million and \$1.6 billion when coupled with high amounts of wind, depending on natural gas price projections. 2003 MTEP includes an Exploratory Plan for Iowa and southern Minnesota for transmitting wind energy from this area (including the eastern edge of the Dakotas) to Minneapolis- St. Paul. When the study was performed, a gas price of \$3.24-\$3.85/mmBtu Natural Gas was the base case assumption, resulting in an annual benefit of \$304 Million.¹¹ In MTEP 2005, the Exploratory Plans are refined, with 3,500 MW of wind generation for Iowa and Southern Minnesota, as well a Northwest Exploratory Plan for the Eastern Dakotas and Western Minnesota providing 1,500 MW of new wind generation.

VII. PROPOSED CORRIDORS

Using the information and analyses from the studies the Department has noticed and the additional studies suggested in these comments, we believe the Department will find that the corridors identified below satisfy the criteria for National Interest Electric Transmission Corridors. We are not requesting early designation per the opportunity provided in the Department’s notice; rather we provide these as preliminary suggestions on corridors that we believe should be considered in the Department’s study.

1. Northern New Mexico to San Diego as a group identified in the *Report of the Imperial Valley Study Group*, Documents on the Palo Verde—Devers #2 project, and the *Report of the Phase III Study of the Central Arizona Transmission System*;
2. Eastern Oregon/ Washington to Portland/Seattle as identified in the *Report of the BPA Infrastructure Technical Review Committee*;
3. Tehachapi to Vincent Substation, identified in *Report of the Tehachapi Collaborative Study Group*;
4. Southern Wyoming to Denver, as identified in RMATS Recommendation 1;
5. Southern Wyoming to Las Vegas, as identified in RMATS Recommendation 2;
6. Eastern Colorado to Denver, as identified in RMATS Recommendation 2;
7. Western Kansas and Oklahoma to Kansas City, identified in SPP’s *Kansas/Panhandle Sub-Regional Transmission Study*;
8. Eastern North Dakota to Minneapolis, identified in Midwest ISO’s *MTEP 03*; and
9. South Dakota to Minneapolis, identified in Midwest ISO’s *MTEP 03*.

¹⁰ See *An Assessment of Windy Land Area and Wind Energy Potential*, Pacific Northwest Laboratory, 1991.

¹¹ Greater savings to consumers are shown for higher gas prices.

United States Transmission Corridors

Average Annual Wind Resource 50m (164 ft)

 Transmission Corridors

Wind Data Provided by NREL

Spatial resolution of high-resolution wind resource data 200m (656 ft)

Spatial resolution of low-resolution, 1986 wind resource data 20 mi (32.2 km)

Albers Equal Area Conic

Created by: Grant Brummels

Date of Creation: 3/5/2006

For more information contact:
Dr. Tom Acker
Tom.Acker@nau.edu

0 100 200 400 600 800 Miles

Sustainable Energy Solutions
INTERDISCIPLINARY

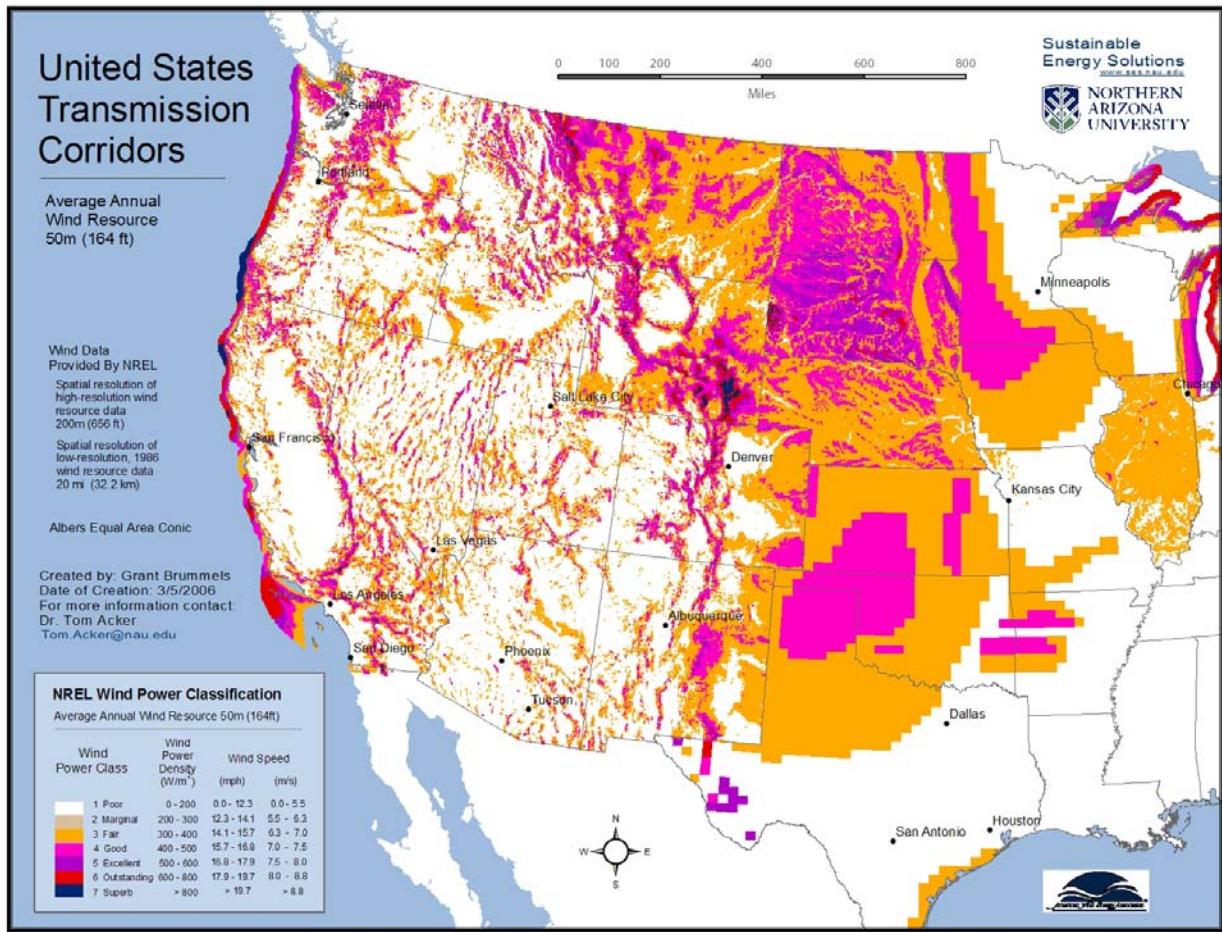


NREL Wind Power Classification

Average Annual Wind Resource 50m (164ft)

Wind Power Class	Wind Power Density (W/m^2)	Wind Speed (mph)	Wind Speed (m/s)
1 Poor	0 - 200	0.0 - 12.3	0.0 - 5.5
2 Marginal	200 - 300	12.3 - 14.1	5.5 - 6.3
3 Fair	300 - 400	14.1 - 15.7	6.3 - 7.0
4 Good	400 - 500	15.7 - 16.8	7.0 - 7.5
5 Excellent	500 - 600	16.8 - 17.9	7.5 - 8.0
6 Outstanding	600 - 800	17.9 - 19.7	8.0 - 8.8
7 Superb	> 800	> 19.7	> 8.8





9. APS, A Subsidiary of Pinnacle West Capital Corporation, Received Mon 3/6/2006 2:12 PM

Name: Bob Smith
 Title: Trans. Plng. Mngr.
 Department: Trans. Plng.
 Tel. 602-250-1144
 Fax 602-250-1155
 e-mail: robert.smith@aps.com
 PO Box 53999
 Mail Station 2259
 Phoenix, Arizona 85072-3999

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Office of Electricity Delivery and Energy Reliability, OE-20
 Attn: EPACT 1221 Comments