

# Wind Siting Issues and Policies in PJM States

**Prepared for:**  
West Virginia Division of Energy  
and  
Wind Powering America

November 2011



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### **Acknowledgements:**

This report was supported by a grant from Wind Powering American via the West Virginia Division of Energy.

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### Motivation

The U.S. Department of Energy (USDOE) has stated that increasing the uniformity of regulatory requirements across regions would greatly facilitate the increased deployment of wind projects necessary to reach its national goal of 20 percent wind generation by 2030 (USDOE: EERE 2008). If this goal is to be met, wind development must occur quite rapidly in the next few years. Implementing increased uniformity of facility siting would fall to federal and State entities. The states of Washington and Oregon are considered by some to have induced greater levels of installed wind capacity due to their centralized siting policy compared to states with siting approaches with heavy local decision making (Bohn and Lant 2009). However, due to significant differences in geography, demographics, wind resources and access to electricity markets it appears that State policy is only one of several influencing factors.

### State policy may accomplish goals faster than local policy.

State wind siting policy is sometimes looked to as a means to expand wind development faster than what occurs in the absence of specific State laws with that intent. Faster wind development is seen by some to be important because wind may be the resource most likely to meet the objectives of renewable portfolio standards. Although State portfolio standards do not require that wind resources be used to comply, a future need to use renewable energy could make wind development more of a public necessity.

It is not easy to site a wind facility. A recent report completed by TeleNomic Research for the U.S. Chamber of Commerce states that it is just as difficult to site a wind facility as it is to site conventional power plants. The report lists the three primary reasons for siting difficulty as “Not In My Back Yard” (NIMBY) activism, a broken permitting process, and a system that allows limitless challenges by opponents of development (TeleNomic Research, LLC 2011).

Most wind siting decisions are made by the localities where the facilities will be placed. This is logical as it is contended that localities receive a large share of the impacts of a wind facility, both positive and negative, and should have the dominant role in a siting process. However, in some cases states may feel that policy goals may be usurped by communities with wind resources that do not want to host wind. States may then consider using policy that bypasses local decision-making to allow greater and quicker facility siting. Such policy may not produce the most desirable results. For one, it is clear that even in states such as Washington wind developers are choosing to utilize local siting processes when given an option to use a pre-empting state process. One of the primary concerns regarding wind facility siting is aesthetic impacts, which are unique to each project and locality and are frequently inadequately addressed by regulatory review processes (National Research Council of the National Academies 2007).

Few states have an official position on wind siting. Maine is one exception. The State of Maine's wind energy act states that “it is in the public interest to reduce the potential for controversy regarding siting of grid-scale wind energy development by expediting development in places where it is most compatible with existing patterns of development and resource values when considered broadly at the landscape level” (OLR Research Report 2011).

Wind development can be promoted by establishing renewable energy zones where development is “pre-approved,” e.g. in parts of the Columbia Gorge, or by disallowing passage of local ordinances that restrict development, e.g. Delaware (NC State University 2011). States and localities can also discourage wind development by passing ordinances that indirectly disallow turbine erection, such as height restrictions or setback distances that remove large quantities of windy land from developer access. Most often, when localities pass wind ordinances it is to discourage wind (Environmental Law Institute 2011).

Several states have developed model siting ordinances that provide voluntary recommendations for wind siting. Such ordinances are typically developed by a collaborative process involving both industry and government. Having an ordinance doesn't necessarily mean any wind development occurs. The North Carolina Wind Working Group created a model ordinance, but the state has not yet developed any commercial wind capacity due to local ordinances that restrict ridge-top development.

A “wind overlay zone” such as the Columbia Gorge Bi-State Renewable Energy Zone (CCBREZ) seeks to attract wind development to a specific area determined to be ideally suited to host turbines. The CCBREZ is a local effort that markets itself to wind developers and wind component manufacturers and offers assistance in identifying potential location incentives.

It is believed by some that having a formal State position on local wind siting authority is important because of the quantity of land that wind facilities occupy compared to conventional power plants (ELI 2011). As stated by the Environmental Law Institute “*in the absence of state legislation defining local government powers and setting standards, wind siting may labor under a handicap as each locality independently works out its own approaches* (ELI 2011).” However, some counties with heavily developed wind have no zoning at all, e.g. Somerset County, PA and Grant County, WV. In West Virginia most counties do not have zoning authority.

Many elements of an application to acquire a permit are not well-defined.

Permitting is an important step in the wind development process that is directly correlated with ability to get project financing. A site permit must be acquired before a project will be financed (Reilly 2011).

Most of the process of acquiring a permit to site a wind facility is no different than what is required for other types of power plants. Elements of a permit application require the following issues to be addressed in some combination: economic impact, environmental impact, wildlife impacts (may be voluntary), viewshed impacts, cultural impact, noise impact, shadow flicker, historical preservation, construction impacts, public health, e.g. setbacks from roads, homes or property lines (state or local), electromagnetic interference. Some elements such as shadow flicker, setbacks and certain wildlife impact assessments are specific to wind turbines but the majority of requirements apply to all electric generators.

Many application requirements, particularly those related to wildlife and viewshed, do not specify what impacts are acceptable and what will lead to permit denial, and may frustrate permit seekers. Viewshed impact is an evaluation element that can involve subjectivity because it must often be done on a case-by-case basis. Especially for the initial wind facility applications, few states and developers had experience with viewshed evaluation and no standards were in place. The National Academy of Sciences states that many project reviewing boards possess a “lack of understanding of visual methods for landscape analysis and a lack of clear guidelines for decision making (National Research Council of the National Academies 2007).”

In Oregon, a state known for having wind-friendly siting policy, law was created to protect scenic values that local or federal land use plans have identified as important (Oregon Department of Energy, Energy Facility Siting Council n.d.). Because the standard only considers applicable land use plans, such plans must be formally in place to be determined to be affected or not. When plans are not in place, evaluation may become more subjective and difficult to ascertain whether a developer has submitted enough information with which to make a decision.

Some of the most controversial aspects of wind turbine siting are setbacks from houses. Few homeowners would choose to reside within a quarter mile of a turbine if given the choice, but setbacks of more than a quarter-mile often make projects impossible to build due to the greatly restricted land area. This is especially true in the East and Midwest as rural communities are more prevalent in windy areas, contrary to the Northwest where windy areas are less populated.

In a recent nationwide study of the effects of 1,345 wind turbines on property values, 70 of 125 observed property transactions within one mile of a wind turbine were in PA and NY (Hoen, et al. 2009). The study concluded that there is no evidence of wind facilities causing a negative impact on residential property values. The study illustrates some of the differences in siting conditions between the East and the West as none of the observed transactions within one mile of a turbine were in Washington or Oregon, and only four were in Texas. For transactions between one and three miles from a wind turbine only 20 of 2,019 transactions were in Oregon and Washington. Of the 1,345 turbines evaluated in total, 582 were in Oregon and Washington but very few were actually close enough to homes to be a nuisance. While this study is not a

complete picture of geographic diversity and the proximity of turbines and homes, it illustrates the importance of geography in creating different conditions between states, specifically the differences that exist between wind development options in the Eastern vs. Western U.S. and shows that it is not appropriate to compare these areas in terms of the siting process.

Some developers have stated that the biggest obstacle the wind industry is facing when it comes to developing renewable energy projects, specifically on public lands, is uncertainty relating to permitting created by the U.S. Fish & Wildlife Service's 2011 "Eagle Guidance" language (Reilly 2011). Due to the expertise required to accurately evaluate wildlife impacts this is an area of decision-making that determination should be made by State and federal entities that specialize in biology. Until final decisions are made this issue will continue to cause uncertainty for development.

Reducing uncertainty for developers and for potential investors is a positive goal. Developers in general desire clearly specified requirements and waiting periods that define a clear path that if followed will lead to the approvals necessary for development. This is the objective behind laws such as Virginia's Permit by Rule (PBR) (Virginia General Assembly 2009).

The Virginia PBR is an expedited permitting process used by its Department of Environmental Quality (DEQ) originally for certain solid waste facilities that now applies to wind and other renewable power generation facilities up to 100 MW. The rule lists the criteria that an applicant must meet and submit in order for a permit application to be evaluated. Other than the DEQ, no other state agencies need be directly involved, reducing the complexity of the process, although development must still comply with local ordinances (Wampler 2011). As of late 2011, the PBR process had not yet been utilized to site a wind project in Virginia.

A PBR-style "one-stop shopping" application via a central siting entity is a simpler process than many but does not mean a developer can by-pass local approval to get a siting permit. The original intent of many central energy facility siting boards is to serve all power generation facilities, so the need is based on the broader industry. The decision to have central siting is tied to state development histories and the relationships that evolved between state and local governments.

Most wind facilities are sited using local permitting rather than state permitting.

In most states, local authorities approve siting decisions. State permitting decisions officially override local decisions in a few states such as Washington, Oregon and West Virginia. Even in states with central authority local decisions are just as important for development. Ultimately, wind developers must work closely with local jurisdictions in all stages of development and more often than not choose to pursue local siting when given a choice. Local is important

because the presence of wind facilities primarily impacts the immediate area, contrasted with fossil plants with emissions and water consumption that impact a much larger area.

States with total local autonomy over wind siting can have high levels of installed wind (Texas) or none (North Carolina). States that want to encourage wind development generally do not allow local autonomy and instead define the scope of local siting decisions (Environmental Law Institute 2011). But even among states such as Washington that have state permitting not all development is approved by the state; in Washington most facilities are approved by county governments rather than via the central siting process (Environmental Law Institute 2011).

Siting requirements are also not the only factor influencing the rate of facility construction at the state level; proximity to demand centers and transmission, relative installation costs and topography are also very important factors. In spite of having relatively small amounts of developable wind, several PJM states have relatively high shares of that wind developed.

Table 1 compares state-by-state levels of installed wind capacity with estimates of potential capacity based on available windy land area for states that are at least partially within the PJM service territory. The data shows that Pennsylvania, where siting decisions are made entirely by localities and West Virginia, where siting decisions are made entirely by central authorities, had similar portions of their estimated potential wind developed at the end of 2010. Federal lands are not included as part of wind potential. This comparison focuses on states in the PJM region because PJM is one of the primary entities charged with implementing integration of wind energy into the regional electricity system. In 2011, additional wind facilities came online in Virginia, West Virginia and several other states. New projects were announced in several states including North Carolina.

**Table 1: Comparison of Installed Wind Capacity and Potential via Available Land Area, Selected States**

State	Population (2009)	Installed MW (2010)	Potential MW	Windy Land Area (km2)	% Windy Area Available	Ratio Installed/Potential	Installed KW per Capita	Installed KW/ sq mi	KW/km2 windy area
West Virginia	1,819,777	431	1,883	1,495	25.2%	22.9%	0.24	17.90	288.26
Pennsylvania	12,604,767	748	3,307	2,124	31.1%	22.6%	0.06	16.70	352.36
Delaware	897,934	2	10	37	5.1%	20.0%	0.00	1.02	54.05
Washington	6,664,195	2,206	18,479	11,933	31.0%	11.9%	0.33	33.15	184.87
Tennessee	6,296,254	29	310	360	17.2%	9.4%	0.00	0.70	80.52
Oregon	3,825,657	2,104	27,100	17,110	31.7%	7.8%	0.55	21.92	122.97
New Jersey	8,791,894	8	132	281	9.4%	6.1%	0.00	1.08	28.47
Maryland	5,773,552	70	1,483	568	52.2%	4.7%	0.01	7.16	123.24
Illinois	12,830,632	2,047	249,882	70,764	70.6%	0.8%	0.16	36.83	28.93
Indiana	6,483,802	1,339	148,228	46,255	64.1%	0.9%	0.21	37.33	28.95
Michigan	9,883,640	164	59,042	19,761	59.8%	0.3%	0.02	2.89	8.30
Ohio	11,542,645	11	54,920	17,190	63.9%	0.0%	0.00	0.27	0.64
Virginia	7,882,590	0	1,793	1,567	22.9%	0.0%	0.00	0.00	0.00
North Carolina	9,380,884	0	808	1,156	14.0%	0.0%	0.00	0.00	0.00
Kentucky	4,314,113	0	61	49	24.9%	0.0%	0.00	0.00	0.00

SOURCE: AWS TruePower and NREL estimates of windy land area and wind energy potential for areas with >= 30% capacity factor at 80m.



Table 2 compares wind-specific elements of permitting processes in PJM states with Washington and Oregon and indicates which states utilize local control of the process. These items exclude environmental compliance associated with construction, e.g. storm water runoff, fill placement, etc. and other elements of siting applicable to all power plants required by state public service or utility commissions. Washington and Oregon are included to compare the mandatory state requirements.

The permitting process can be improved by developing tools to evaluate aesthetic impacts.

Compared to even five years ago, wind developers now have good experience with obtaining permits and have successfully received permits in most PJM states. Localities that don't want wind are setting ordinances that effectively prevent development. In Eastern states, much of the undeveloped windy areas are located on Federal lands with uncertain approval processes.

Local is what matters most in wind siting. Counties and towns greatly influence the ability to site facilities. The goal of reducing uncertainty for developers behind the concept of "permit by rule" applies to many states and types of power plants. Assessing the visual impact of wind facilities must be done on a case by case basis, but processes exist that can reduce subjectivity. The National Research Council in a publication chapter titled "Impacts of Wind-Energy Development on Humans" has developed a site of questions that if asked could help evaluate the potential for negative aesthetic impacts. Examples of these questions are: "Are projects at scales appropriate to the landscape context?" and "How great is the offsite visibility of infrastructure?"

It has been recommended that policy-makers develop a better understanding of wind projects that have relatively widespread aesthetic acceptance relative to those that are less accepted. This type of understanding applies to historical and recreational sites as well as landscapes and would require guidance from experts in these areas (National Research Council of the National Academies 2007).

Imposition of centralized state wind siting authority that can override local decisions, particularly when local preferences are already in force or localities already have experience working with wind developers is likely to encounter opposition and be unproductive. Improving the permitting process through clarification of requirements, including mitigation and whether mitigation is sufficient, is a superior strategy to encourage investment. For some impacts, the ability to produce clarity is dependent on other decisions that may be outside the realm of local government, e.g. whether wind turbines threaten bat populations.

**Table 2: Comparison of Wind-Specific Siting Guidelines by State (PJM States + WA & OR)**

	<b>State Authority for Siting</b>	<b>Formal Land Use Guidelines at Local Level</b>	<b>Mandatory Wind-Specific State-Imposed Elements of Development Process</b>
<b>Delaware</b>	Delaware Department of Natural Resources and Environmental Control regulates offshore wind development but does not control onshore siting	Local regulation of onshore siting; zoning applies.	Law prohibits unreasonable restrictions on the installation of wind facilities that qualify for support under the state Green Energy Fund the State Energy Office. Law defines a set of restrictions that are permitted to be used including setbacks, noise, and appearance. <sup>12</sup>
<b>Indiana</b>	The Indiana Utility Regulatory Commission approves construction of all power plants. <sup>3</sup>	Local regulation only.	None.
<b>Illinois</b>	None.	Local regulation only. Wind facilities are often considered a “special use” in areas zoned for agriculture.	Law has set maximum setback limits for turbines installed for on-site end users. <sup>4</sup>
<b>Kentucky</b>	The Kentucky State Board on Electric Generation and Transmission Siting and Siting Board for power plants with a capacity of 10 MW or more.	Local regulation for projects smaller than 10 MW.	None.
<b>Maryland</b>	Maryland Public Service Commission for facilities of 70 MW and greater	Onshore wind facilities are permitted locally if smaller than 70 MW. Local zoning includes minimum setback restrictions in at least one county. <sup>5</sup>	Facilities are exempt from the MD PSC process only if public hearings are held. <sup>6</sup>
<b>Michigan</b>	None.	Local regulation only. Various local ordinances apply.	None.
<b>New Jersey</b>	New Jersey Department of Environmental Protection	Local regulation of onshore siting.	Law prevents placement of unreasonable limits on small wind energy systems related to height restrictions, setbacks and noise limits and allows wind projects to get variances from local ordinances due to consideration that wind generation is an “inherently beneficial use.” <sup>7</sup>
<b>North Carolina</b>	The North Carolina Utilities	Local regulation of onshore siting. Various	Law limits ridgeline development of structures

<sup>1</sup> (NC State University 2011)

<sup>2</sup> (U.S. Fish & Wildlife Service; Association of Fish & Wildlife Agencies 2007)

<sup>3</sup> (Great Lakes Wind Collaborative 2010)

<sup>4</sup> (NC State University 2011)

<sup>5</sup> (Planning & Zoning Commission of Allegany County 2009)

<sup>6</sup> (Public Service Commission of Maryland 2008)

<sup>7</sup> (NC State University 2011)

	Commission	local ordinances apply.	taller than 40 feet. Although the law lists “windmills” as being exempt there is disagreement as to whether this applies to modern turbines. <sup>8</sup>
<b>Ohio</b>	The Ohio Power Siting Board for facilities 5 MW or larger	Local regulation for projects smaller than 5 MW.	State siting law includes mandatory setback requirements. In addition to providing information required of all electricity generators the applicant must provide information on the impacts of: ice throw; blade shear; shadow flicker. <sup>9</sup>
<b>Oregon</b>	The Oregon Energy Facility Siting Council (EFSC) for projects greater than 105 MW. Developers have the option of seeking local approval or having the Council make the determination. <sup>10</sup>	Although the Council’s decision preempts local authority most projects are permitted locally. Local zoning includes various county-level setback requirements, flicker regulations, and noise standards. Local permitting triggers mandatory State environmental and wildlife impact studies.	Siting standards include requirements to prove the public is protected from turbine blade and electrical hazards, that the need for new access roads has been minimized, that artificial raptor habitat will not be created and that public access is restricted. Facilities up to 300 MW are eligible for expedited review.
<b>Pennsylvania</b>	None. Power plant development is considered a land use decision and siting approval lies primarily with local governments.	Local zoning varies by county and municipality. Some counties have no zoning.	None. State law enables local authorities to regulate development. <sup>11</sup>
<b>Virginia</b>	The Virginia State Corporation Commission (SCC). The VA Department of Environmental Quality (DEQ) has authority over PBR applications.	Local zoning applies, including maximum height restrictions in at least one county. Local government certification of compliance with land-use ordinances is a prerequisite for permit by rule coverage.	Projects with capacity of 100 MW or less that apply via permit by rule (PBR) are exempt from SCC authority. PBR applications can receive expedited approval. Law requires submission of the results of year-long raptor migration and bat acoustic surveys. Local ordinances must be consistent with state energy policy. <sup>12</sup>
<b>Washington</b>	The Energy Facility Site Evaluation Council (EFSEC) is a centralized siting agency for all power plants over 350 megawatts.	Most wind facilities are permitted locally. Local permitting triggers an automatic state-level environmental review.	Wind projects smaller than 350 MW are exempt from EFSEC jurisdiction unless they opt into the process. <sup>13</sup>
<b>West Virginia</b>	The West Virginia Public Service Commission approves development of all electricity generation facilities.	None.	Law requires applicant to file copies of the results of Spring and Fall avian migration studies including lighting studies and risk assessments. <sup>14</sup>

<sup>8</sup> (Kimrey 2008)

<sup>9</sup> (Great Lakes Commission 2009)

<sup>10</sup> (Oregon Department of Energy, Energy Facility Siting Council n.d.)

<sup>11</sup> (Pennsylvania Department of Conservation and Natural Resources)

<sup>12</sup> (U.S. Fish & Wildlife Service; Association of Fish & Wildlife Agencies 2007)

<sup>13</sup> (U.S. Fish & Wildlife Service; Association of Fish & Wildlife Agencies 2007)

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