

Siting Issues for Wind Power Plants

Like any other major energy project, a wind power plant must go through a siting review process to acquire the permits and approvals needed to allow construction and operation to proceed. The basic goal of this process -- which can occur in a variety of federal, state and local jurisdictions -- is to ensure that the plant will be safe, environmentally sound and make appropriate use of land. This report reviews issues arising in the siting of wind power plants and describes some of the key elements of a sensible siting review process.

Background

Siting power plants and transmission lines used to be a relatively straightforward process. A utility submitted to the appropriate agency a request describing the presumed need for the facility and its claimed benefits for utility customers. The agency, after reviewing the documents and conducting a hearing, usually granted the request. While there was sometimes public opposition to this process, it was rarely effective in stopping projects.

Siting such facilities today is far more difficult because governments have become more sensitive to the potential effect of projects on the environment and nearby communities. The regulations and laws governing siting have become more complex, state and federal siting agencies are not as likely to approve power company projects without extensive review, and various interest groups have become more effectively involved in siting proceedings.

Large wind energy projects raise many of the same siting issues as other energy projects. For example, there may be concern about truck traffic during construction and operation, the health effects of electromagnetic fields caused by transmission lines, and social justice and equity issues. (An example of the last might be a proposal to build a plant in a low-income area or an area of religious or cultural value to Native Americans.) In addition, wind projects present some unique siting challenges that require special consideration, including the following:

- **Visual and noise impacts in scenic areas or near residential communities.** Wind turbines are highly visible structures that often are located in conspicuous settings, such as ridges and hillsides. They also generate noise that can be disturbing to nearby residents. These problems often can be mitigated through sensitive design practice (such as tubular towers), appropriate setbacks, noise abatement and other measures.

Wind energy projects are subject to the same laws and regulations that govern siting of other power plants.

- **Potential impacts on birds and other wildlife.** In some locations, wind turbines and associated electrical equipment have killed or injured birds such as hawks and eagles. Pre- and post-construction studies may be needed to measure wildlife impacts and devise strategies for mitigating or offsetting them, and some locations may be ruled off-limits to wind development. Soil erosion is another potential problem that may be raised in the siting process.
- **Land owners' rights.** Wind power plants often pay substantial rents and royalties for the use of land. This can be a boon to land owners, but also may raise concerns about whether their rights are being sufficiently protected. For example, a wind turbine on one person's land may interfere with the ability of a neighboring land owner to develop a wind project. Land owners also may be concerned about fair compensation for use of land.
- **Staged development.** Unlike most conventional power projects, wind plants can be built in multiple stages, so that a 25 megawatt (MW) plant today can grow to 500 MW in the future. This characteristic can complicate siting proceedings, since the economic feasibility of the first increment may depend upon the developer's ability to build the rest.

It is in both the developer's and the public's interest that the siting process address all legitimate issues in an open, fair and unbiased fashion, while minimizing costs for the participants and delays in reaching a decision. In some cases, the result of the process may be to rule out a proposed site for wind development. In other cases, it may be determined either that the issues raised are not of serious concern, or that specific measures can be taken to address them.

Who is involved?

Many different groups and individuals may be involved in the siting of a wind power project. One key to developing a sensible siting process is to understand the differing roles, interests and priorities of the various stakeholders. The major participants usually include the following.

- **The wind developer.** The wind project developer, typically an independent power company or a utility, usually initiates the siting review process by submitting a request for a permit to the appropriate agency. The developer's immediate interest in the process is clear: to win approval for the project as quickly and as cheaply as possible. Long, expensive proceedings with an uncertain outcome wreak havoc on a developer's ability to secure financing. Beyond the success of any one project, the developer wants to demonstrate a successful project record to maintain its credibility with investors, policy makers and the general public.
- **State government.** Most siting process activity occurs at the state and local levels. At the state level, siting boards, land commissions, environmental quality boards or similar bodies often have the authority to grant construction and operating permits for power projects that are above a certain size. In some states, the state public utility commission or siting board must grant a certificate of need to permit a power project to be built. If a transmission line is needed, that also can trigger state involvement. Often, an environmental impact assessment will be required. This can be a formal process in itself, requiring an analysis of environmental impacts, an often detailed comparison of alternatives to the proposed project, and opportunities for public comment.
- **Local government.** County-level planning and zoning boards often are heavily involved in providing siting approval. Wind

Participants that may be involved in siting a wind power project

- *The wind developer*
- *State government*
- *Local government*
- *Federal agencies*
- *Community groups and activists*
- *Environmental organizations and activities*
- *The general public*

developers usually must demonstrate compliance with applicable land use designations and zoning ordinances. As with most state-level proceedings, several hearings may be required; these hearings may involve an administrative judge, lawyers, rules of discovery and other legalities.

- **Federal agencies.** If a wind project is planned on federal land, then the agency owning or managing the land (such as the Bureau of Land Management or Forest Service) probably will be involved in siting approval. Even on state or privately owned land, federal agencies may participate in some fashion. For example, the U.S. Fish and Wildlife Service may want to consider whether a project poses an unacceptable hazard to birds or other wildlife under its protection. Federal agencies also can provide advice, comments or testimony in state- and local-level proceedings.
- **Community groups and activists.** Community groups and activists also frequently participate in siting processes to ensure their concerns are heard. Their views can carry considerable weight with state and local officials. Some groups may support wind projects because of the jobs and tax revenues generated, while others may be skeptical because of concerns about wind turbine noise, visual impacts, traffic disturbance during construction and other issues. Local land owners may play an especially important role, since wind plants can pay substantial royalties for land and wind rights and, therefore, affect property values.
- **Environmental organizations and activists.** Like community groups, environmental organizations and activists can greatly influence siting processes. A wide diversity exists in the kinds of groups and the issues that concern them. Local groups often are concerned about issues such as soil erosion, conflicts with birds, and impacts on scenic or environmentally sensitive areas. Regional and national organizations also may focus on such issues, or they may stress wind power's benefits to air pollution and global warming. Community and environmental organizations and developers sometimes challenge siting processes or decisions in the courts if they believe laws and procedures were not properly followed.
- **The general public.** The general public sometimes is perceived to be a passive observer of the siting process, but this viewpoint underestimates the role public opinion can have in swaying the views and actions of the central participants. Ultimately, wind power can succeed only if it wins public support both in the abstract, as an alternative to polluting fossil fuels, and as a technology that can be sited and built responsibly and effectively.

Guidelines for wind facility siting

Siting a wind power project involves negotiation between the various participants to determine whether a project will be allowed to proceed and, if so, under what conditions. This negotiation often focuses on striking a balance between competing issues and concerns, such as social equity and the environment. Federal agencies and state and local governments have powerful roles to play in determining the goals, schedule, procedures and decision criteria that govern the siting process. While the details of siting processes will vary widely, several general guidelines can be suggested:

The siting process should address all legitimate issues in an open, fair and unbiased fashion, yet minimize participant costs and delays in reaching a decision.

- **Significant public involvement.** A critical feature of a sound siting process is that it provide opportunities for significant and early public involvement. The public has a right to have its interests considered in siting major power plants; without public involvement, a much greater likelihood exists for later opposition and costly litigation. Public involvement provides an opportunity for affected groups and individuals to learn about the project and to express their

concerns. At a minimum, the public— in particular any residents living near a proposed project -- should be notified of a siting application, the siting agency should hold public meetings and accept public comments, and the agency's draft and final decisions should be made available for public review.

- **Reasonable time frames.** A legitimate concern of wind developers is that an open siting process, in which a large number of issues are raised, can result in long delays in reaching a final decision. One way to address this concern is to establish reasonable time frames in which the application for siting is to be reviewed, hearings held and a final decision reached. Deviations from this schedule should be rare and justified only in special circumstances. The definition of a reasonable schedule will depend upon the situation, but it must include adequate time for public notification and preparation of comments by stakeholder groups.
- **Clear decision criteria.** An efficient and fair siting process requires that the siting agency establish in advance the criteria to be used in making its decisions. The agency should: (1) list all the factors to be considered in the decision, (2) specify how the factors are to be weighed against one another and (3) set minimum requirements to be met by the project. The factors for consideration will depend upon the circumstances. A state siting board, for example, might consider such factors as whether the project meets an identifiable need for power, the effects it will have on the environment and land use, and whether it will put a significant burden on local services and infrastructure. The final decision should consist of the best balance among the criteria established by the board. This process inevitably will involve some subjective judgment, but, in general, the more clarity in the decision criteria, the better.
- **Coordinated siting process.** Another way to make the siting process more efficient is to allow developers to obtain all the permits they need from one state agency -- or otherwise to coordinate the processes of different agencies, such as those at the state and local levels -- to prevent duplication and delay. It is important to recognize that state and local governments may have different but complementary responsibilities. Consideration should be given to identifying the roles for each agency in any particular siting area, their methods for exchanging information and expertise, and how the agencies might be involved productively in different stages of the siting review process.
- **Expedited judicial review.** It should be the goal of any siting process to follow procedures and produce decisions that are acceptable to the participants and, consequently, do not prompt a court challenge. Should a challenge occur, however, it is important that the judicial review process proceed efficiently and reach a decision in a reasonable amount of time. In designing a siting process with expedited judicial review, some factors to consider include: defining who should have legal standing, setting reasonable time frames in which a suit can be filed, setting clear standards for review and specifying the award of costs. Ideally, any appeal of a court decision should be made directly to the state's highest court.
- **Advance site planning.** In many cases it will be useful for a siting agency to define in advance the general geographic areas that would be acceptable for wind projects. This would not eliminate the need for a siting review process, but it would help wind developers select sites and design projects that have the maximum chance of success.

General siting guidelines

- *Significant public involvement*
- *Reasonable time frames*
- *Clear decision criteria*
- *Coordinated siting process*
- *Expedited judicial review*
- *Advance site planning*

Wind siting considerations

States and communities that are interested in wind energy should develop, in advance, laws, ordinances and regulations for siting wind projects. The advantage of this planning for developers and the public is that many important questions can be discussed and resolved without arguments over specific elements of a proposal. In addition, the existence of rules and procedures will increase the confidence of developers in being able to win approval of suitably designed projects, while reassuring other stakeholders that wind projects will not be rushed through without full, fair and open hearings.

Siting a wind power project involves negotiation between the various participants to determine if the project will be allowed to proceed and under what conditions. One useful step is for communities such as towns and counties to implement zoning amendments for wind plants. For each type of zone, whether commercial, industrial or agricultural, standards could be set in the following areas:

- **Wind turbine size**, including maximum rotor size, minimum and maximum height, tower height and base.
- **Installation and design**, including tower, rotor and electrical safety, utility notification, warning signs and tower access.
- **Siting**, including setbacks from plant boundaries and neighboring facilities, aesthetic design (such as tubular or lattice towers) and clearances from electrical lines.
- **Nuisance concerns**, such as noise regulations and television or radio interference.
- **Other regulations**, including insurance, public access to wind facilities, and repair, maintenance and decommissioning requirements.

Often, such regulations can be based on similar statutes (regarding radio towers, for example). In addition, regulations developed by other communities can serve as a guide for discussion among wind developers, community and environmental groups, and state and local planners.

Another element of wind power siting that deserves special mention is the kind of environmental impact study, mitigation and potential remediation that should be required. In recent years, the effects of wind power projects on birds, in particular, have attracted considerable publicity and controversy. Siting agencies should discuss their concerns with wind power developers and establish some rules and procedures before specific project proposals are considered.

The National Wind Coordinating Committee is preparing a handbook that will help states and communities address wind siting issues and develop appropriate wind siting review processes.

Conclusions

The successful siting of wind power projects is one of the most critical challenges facing the wind industry today. Developers, state and local planners, federal agencies, and community and environmental activists all are interested in implementing an efficient and fair siting process. Although further discussion and study are needed, some guidelines can be suggested for the development of such a process. Following these guidelines cannot guarantee successful siting in all cases, but it can significantly ease the barriers to wind energy development while assuring continued public support for wind energy.

References

NWCC wind siting handbook.

Model State Certification and Siting Code for Electric Transmission Facilities (Keystone, Colo.: Keystone Center, 1994).

Best Practice Guidelines for Wind Energy Development (London: British Wind Energy Association, 1994).

Rules and procedures for siting wind projects assure success for both developers and stakeholders.

National Wind Coordinating Committee

The content and form of the papers in this series have been reviewed and approved by the National Wind Coordinating Committee. Committee members include representatives from investor-owned utilities, public utilities, state legislatures, state utility commissions, state land commissions, consumer advocacy offices, state energy offices and environmental organizations. The purpose of the National Wind Coordinating Committee is to ensure the responsible use of wind power in the United States. The committee identifies issues that affect the use of wind power, established dialogue among key stakeholders and catalyzes appropriate activities.

The Wind Energy Series is a product of the National Wind Coordinating Committee (NWCC). The NWCC is a collaborative endeavor that includes representatives from electric utilities and support organizations, state legislatures, state utility commissions, consumer advocacy offices, wind equipment suppliers and developers, green power marketers, environmental organizations, and state and federal agencies.

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