

Scoping and Framing Social Opposition to U.S. Wind Projects

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Abstract



Local opposition to wind power projects has emerged as a market barrier and is likely to become increasingly important as wind energy's footprint grows. (PIX#17247)

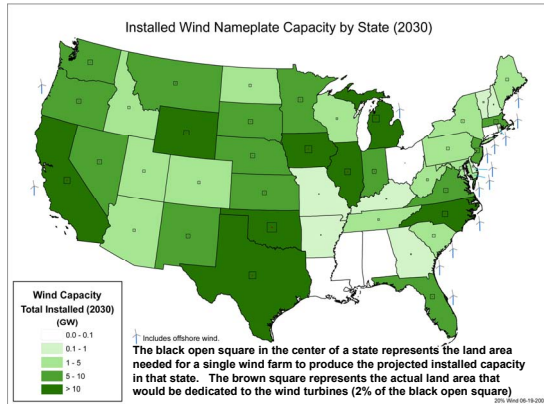
Historical barriers to wind power include cost and reliability. However, rapid growth has increased the footprint of wind power in the U.S., and some parts of the country have begun to observe conflicts between local communities and wind energy development. Thus, while questions of economic viability and the ability of grid operators to effectively manage wind energy have become less significant, community acceptance issues have emerged as a barrier to wind and associated transmission projects. Increasing community acceptance is likely to be a growing challenge as the wind industry seeks electricity sector penetration levels approaching 20%.

Objectives

This work highlights the perceived attributes of wind energy that are used as a basis to oppose wind energy and articulates strategies that have successfully resolved issues of social opposition. Coverage of broad societal perspectives is considered but the primary emphasis is on public acceptance at the project level.

Project Goals

- Identify the primary issues upon which individuals and organizations oppose wind energy projects
- Highlight current knowledge of wind energy impacts, as detailed in the latest technical reports and recent industry experience.
- Articulate development strategies and land use planning models that have been effective in mitigating social opposition to wind energy.
- Assess remaining questions and identify specific areas of study that could improve the industry's ability to address social acceptance barriers.



Wind energy's footprint will grow and a larger footprint means wind energy's impacts will be experienced by broader segments of the population, potentially complicating community acceptance challenges.

Wind energy footprint in 2030 under the U.S. Department of Energy's report 20% Wind Energy by 2030 (DOE 2008).

Methods

Funding for this work was provided by the U.S. Department of Energy Wind Technology Program. The work was carried out by NREL as part of the International Energy Agency (IEA) Wind Energy Task 28: *Social Acceptance of Wind Energy*.

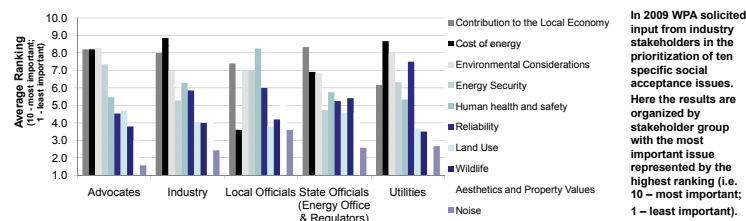
Research was conducted on three fronts. First, news sources and websites were searched for articles and content relevant to wind energy and social acceptance. Second, public reports and peer reviewed journal articles detailing wind energy's impacts and public perceptions were reviewed. Finally, input and contributions were solicited from a collection of stakeholders including:

- Academic researchers
- Municipal officials
- Project developers
- Industry consultants
- Advocacy groups

Results

Issues of Opposition

As a somewhat nascent industry, opposition to wind power projects varies and robust data are difficult to come by. In addition, a 2009 pilot questionnaire among the Wind Powering America network indicates that the relative importance of specific social acceptance issues varies among stakeholder groups.



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Results Continued

Despite variable perspectives among stakeholder groups and less than overwhelming data specific to U.S. projects, this research suggests that there are a common set of community level barriers that frequently appear in localities observing opposition to wind projects.

Widely recognized barriers include:

- Aesthetics
- Public safety (structural failure, ice throws)
- Public health (lights, sound, shadow flicker)
- Impacts on land or real estate values
- Impacts on local industry (e.g., tourism)
- Reduced quality of life (e.g., industrialization of an area or nuisance related to sound etc.)
- Wildlife/habitat impacts

Less commonly cited barriers include:

- An absence of public participation in the planning process
- Distribution of project benefits and costs
- Place attachment and the cultural value of landscape
- Public distrust of outside developers
- Exclusionary or misleading developer communication strategies

The industry has sought to address some of these issues and a robust body of knowledge can be used to inform communities where wind projects are under development.

Best Available Knowledge

- Wind turbine noise does not result in any known human disease however, noise from wind turbines may result in annoyance; other potential public health issues (e.g., shadow flicker) are manageable with existing industry best practices (Colby et al. 2009)
- Local ownership models increase local economic impacts (Lantz and Tegen 2009)
- Analysis of more than 7,000 real estate transactions occurring in a five mile radius of wind turbine installations shows no significant impacts on real estate prices (Hoen et al. 2009).
- Avian risks are generally risks to individual birds not species; Notable concerns remain with respect to bat fatalities and displacement of specific species including the sage grouse and prairie chicken habitat (Arnett et al. 2007, Shaffer and Johnson 2008).
- Non-participating project neighbors may bear a disproportionate share of wind energy's negative impacts and have little say in siting decisions; these conditions tend to contribute to negative feelings about wind energy (Pedersen et al. 2007).



Early engagement and community research can help to identify local champions, an important component of any successful mitigation strategy. (PIX#17248)

Strategies for Mitigating Opposition

Compiled from industry input and contributions
 January & February 2010

Meta-level strategies:

- Contribute to development of clear regulatory policy
- Allocate resources for society wide education
- Strive to improve upon industry best practices

Project-level strategies:



Conclusions and Remaining Questions

There is a robust body of knowledge detailing wind energy's impacts that can be used to inform and educate concerned citizenry and public officials. Continued implementation and improvement of best practices is suggested to assist in increasing community acceptance. Finally, there are successful models for engaging communities and stakeholders early and often in wind project (and transmission) planning.

Nevertheless, a few specific questions remain and continued study may be helpful. (1) Individual's living immediately adjacent to wind facilities (i.e., within one mile) appear to experience the greatest direct impact from operating wind turbines. Better understanding the impacts this group experiences will inform continued development of siting best practices. (2) Understanding of the impacts from specific turbines could assist in developing new standards for technology performance. (3) Establishing a stronger quantitative link between local ownership and levels of public acceptance could assist policymakers in developing new policy to mitigate project opposition. (4) Improving knowledge of public perceptions of transmission and developing a better understanding of the allocation of costs and benefits associated with transmission projects can facilitate development of the transmission that will be necessary for a robust wind future.

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