Draft Siting Principles and Policy Options for Wind Development on the Great Lakes
April 23 Draft
Target completion: June 30, 2009

1. Wind energy development on the Great Lakes should be located in areas that are compatible with specific resource values, including protecting areas of critical environmental concern and major shipping lanes. Other areas may be excluded on the basis of predictions of resource impacts that cannot be mitigated.

2. To the extent possible, wind energy projects should be developed in a manner that is compatible with other uses of the Lakes.

3. Companies seeking to develop projects on the Lakes should consult with all appropriate state and federal regulatory and resource management agencies as early in the planning process as possible.

4. As the likely lead agency, the Corps of Engineers should initiate, as early in the planning process as possible – for a proposed wind turbine project on any of the Great Lakes – intergovernmental consultation with all government agencies who might be directly and substantially involved (in any capacity) to ensure that issues and concerns at all phases of the project are identified and adequately addressed.

5. Developers should consider the visual and scenic resource values of the Lakes and shores affected by proposed wind energy development projects. The developer should apply visual design criteria in the planning and design of wind energy projects to minimize potential adverse impacts. In evaluating the visual impacts of wind-energy projects, the focus should, be on: 1) the characteristics of the "lakescape" in which the project will be located that contribute to scenic quality, 2) the relative sensitivity of viewing areas, and 3) the potential for degradation of documented scenic resource values, rather than on personal aesthetic opinions of the project.

6. Regulatory agencies should consider the positive effects (especially conventional pollutant and CO2-reductions) of wind-energy projects in comparison to the equivalent power generation by fossil-fueled sources, in (a) evaluating the trade-offs between those benefits and potential impacts on environmental, visual, and socio-economic resources, (b) making approval decisions , and (c) establishing any non-statutory fees, payments, and mitigation requirements.

7. Regulatory agencies and the industry should develop and require adaptive management strategies to ensure that potential adverse impacts of wind energy development are addressed by avoiding (if possible), minimizing, or mitigating them to appropriate levels.

Pre-Construction Planning

8. Developers should minimize the area disturbed by pre-construction site monitoring, testing activities and equipment installed for such purposes

9. Developers should minimize necessary infrastructure by considering joint planning and facilities – such as substations and collecting cables – to serve all projects (or the likely build-out capacity) in an area wherever possible.

10. Developers should plan for a monitoring program to ensure that environmental conditions are tracked during all phases of a project. Regulatory agencies should develop and enforce consistent standards for monitoring impacts of wind projects on the Great Lakes during all phases of a project. Potential impacts to be considered during monitoring should be identified on a consensus basis with project developers. These requirements, including adaptive management strategies, should be established in the project approval process to ensure that any actual adverse impacts are mitigated. The program should identify the monitoring required for each environmental resource that may be adversely affected, set threshold impact levels for action, identify potential mitigation measures, and establish protocols for incorporating responses to monitoring results, and additional mitigation measures into standard operating procedures.

Lake Floor Habitats

11. Developers, in consultation with regulatory agencies, should conduct lakebed mapping and pre-siting surveys in the early phases of a project to ensure the wind development is sited appropriately to avoid or minimize potential impacts associated with sensitive lakebed habitat, instability, and other topographic features.

12. Developers should avoid locating facilities or anchoring vessels near known sensitive lakebed habitats, such as spawning areas.

13. Developers should minimize lakebed disturbance during construction and installation of the facility and associated infrastructure.

14. Developers should use best practical technology and a single-operation process for underwater cable installation to minimize lakebed disturbance and sediment dispersion and employ appropriate measures for underwater cables to minimize the intensity of electromagnetic fields to avoid effects on fish populations.

15. Developers should address scouring action by currents around foundations and effects on lakebed contours by using scour protection devices and conducting periodic routine inspections to ensure structural integrity.

16. Developers should minimize the duration of construction to minimize disturbance.

Fish Resources & Habitat

17. Developers should conduct pre-siting surveys – specified by a regulatory body – to identify any important, sensitive, and unique fish habitats in the vicinity of a project and design the project to avoid, minimize, or mitigate significant impacts to these habitats.

18. Developers should minimize construction activities in areas containing anadromous fish during migration or spawning periods identified by appropriate regulatory or advisory bodies.

19. Developers should avoid locating facilities near known sensitive fish habitats, such as those designated as protected areas, unless enhancement of fish habitat is planned in advance in coordination with appropriate regulatory bodies.

20. Developers should minimize lakebed disturbance during construction of towers and installation of underwater cables. Avoid or minimize activity near known spawning beds and nursery habitats when eggs and fry are expected to be present – as communicated by appropriate regulatory or advisory bodies.

Avian Impacts

21. Developers should evaluate current avian use of the project area and design the project to minimize or mitigate the potential for bird strikes, exclusion and habitat loss. Avian use surveys should be scientifically rigorous; and the amount and extent of ecological baseline data required shall be determined on a project basis.

22. Standardized studies should be conducted before siting, review and construction, as well as after construction to evaluate the potential and actual impacts on avian species. Post-construction studies and monitoring should focus on comparing actual impacts to predicted risks, establishing causal mechanisms of impact, and applying effective mitigation measures to reduce risk. Studies and monitoring should also document compliance with avian species protection laws, such as the Migratory Bird Treaty Act.

23. The scope of post-construction monitoring should be based on the anticipated level of avian activity. For instance, a nearshore project in an area with significant bird activity should be treated differently than a project in the middle of a lake when avian studies have indicated very minimal potential conflict.

24. Developers should conduct surveys of offshore areas to identify important feeding, resting, and wintering areas, and avoid siting facilities in or near those areas.

25. Developers should minimize the use of bright lights to reduce the attraction of birds. Developers should follow the recommendations of the USFWS' Communication Tower Working Group, including low-intensity strobe lights, consistent with FAA lighting guidelines.

Acoustic Environment

Note to document reviewers: Two sets of comments below feel this section is singling out the wind industry when acoustic issues are abound in other industry activities in the lakes. Shall we eliminate this section?

Pile driving and underwater construction is an ongoing activity in the Great Lakes. Is there a need for a separate set of additional rules for offshore wind? Has noise from pile driving and other construction activities to date affected fish populations?

Can we point to guidance or rules for other industries? If not, the wind industry shouldn't be singled out. There's lots of noise in the Lakes. Has this been shown to be an issue?

26. Developers should perform acoustic modeling of underwater operational sound at the proposed site of a wind farm project to determine the baseline and predicted underwater sound levels from operation of the project.

27. Developers should minimize the use of seismic surveys for site characterization, instead employing geophysical means to obtain measurements for characterization of the lake bottom.

28. The developer should time major noise-generating activities, such as pile driving and cable trenching, to avoid periods when birds are courting and nesting.

29. Developers should minimize disruption and disturbance to aquatic life from sound produced during construction activities. that generate very high sound pressures.

30. Developers should reduce the effects of sound pressure in the water by using proven means to deter fish (such as horn blasts, strobes, electric seines), avoiding migration and spawning periods, and increasing noise levels gradually.

31. During installation of foundations and pilings, developers should minimize impacts to fish from underwater sound levels from pile driving by using a "soft start" of the pile driving equipment.

32. Developers should employ, to the extent practicable, state-of-the-art, low noise turbines to minimize operational sound effects.

Comment [u1]: Is this needed in the lakes, which don't have any marine mammals?

Fisheries

33. Developers should avoid installing facilities and cables near known sensitive fish habitats and within known high-use fishing areas.

34. Developers should work cooperatively with commercial/recreational fishing interests to ensure that construction and operation of a project will minimize potential impacts to those fisheries.

35. Developers should review planned activities with potentially affected fishing organizations to prevent unreasonable fishing gear conflicts. Developers should minimize conflict with commercial fishing activity and gear by notifying registered fisherman of the location and timeframe of project construction activities well in advance of mobilization, with updates throughout the construction period.

36. Developers should implement measures that reduce the likelihood of vessel accidents and fuel spills.

37. Developers should avoid or minimize impacts to the commercial fishing industry by ensuring that operators and organizations are aware of the location and dimensions of the projects, and applying U.S. Coast Guard-approved lighting recommendations to ensure safe vessel operation.

38. Developers should avoid or minimize impacts to the commercial fishing industry by burying cables to a safe level in the lakebed to avoid conflict with fishing vessels and gear operation (adhering to applicable electrical codes). This depth should be determined through a detailed review on this issue and an understanding of specific project circumstances. Developers should inspect cable burial depth periodically during project operation to ensure adequate coverage is maintained to avoid interference with fishing gear/activity.

Lake Shore Habitats (shoreline, or near shore projects)

39. Developers should implement turbidity reduction measures to minimize effects to shorelines and vegetation from construction activities.

40. Developers should minimize impacts to adjacent wetlands by maintaining buffers around wetlands, by implementing best management practices for erosion and sediment control, and by maintaining natural surface drainage patterns. Federal and applicable state wetland laws must be adhered to as with all types of development.

Transportation & Vessel Traffic Safety

41. Wind park siting should avoid interference with major ports and shipping lanes.

42. Developers shall use proper lighting and signage on wind park structures to aid navigation and air traffic safety in and around the wind park.

43. Developers should not prohibit vessels from entering, operating, or anchoring in the designated wind park area or establish exclusionary zones in the wind park area, except as necessary for security and safety reasons.

Comment [u2]: I don't think this is possible, given the requirement of open navigation, and that they will only be leasing the lakebed, not controlling the water column or airspace.

44. Developers should work with USCG and NOAA to ensure that wind parks are quickly added to NOAA nautical charts covering the area.

Visual Resources

45. Design of wind projects should address key visual elements including consistency, effects of tower designs, proportion and color of turbines, and avoidance of visually-disruptive commercial markings.

46. Developers should use state-of-the-art viewshed mapping, photographic and virtual simulations, computer simulation and field inventory techniques to document with reasonable accuracy the visible aspects of the proposed project. Simulations should evaluate effects at sensitive and scenic viewpoints[1].

47. Minimizing lighting should be a high priority, to the extent allowed by the FAA. Daytime lighting should be avoided if possible by use of clearly visible WTG colors.

48. Developers should inform and consult the public when evaluating the visual site design elements of proposed wind energy facilities.

[1] These would include parks and other locations where the appearance of wind turbines could substantially diminish the aesthetic appearance of the view of the lake, and the enjoyment of the view.