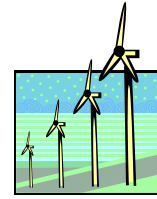


**WIND POWER EDUCATION PROJECT**  
*A collaborative of*  
Pace Law School Energy Project  
Citizens Campaign for the Environment  
New York Public Interest Research Group



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## Sight & Sound Wind Power

New York has many areas with ideal wind speeds for generating clean, renewable wind energy. There are many factors to consider in the review process for siting wind farms, including environmental impacts and benefits, access to transmission lines and the impacts on the local community including potential aesthetic and audio effects. Fortunately, the extent of visual and sound impacts can be determined before a project is built. Project developers should work with the permitting agency (often the town) and community groups to provide detailed information and minimize any potential negative impacts.

**AESTHETICS:** The aesthetics of wind are like the old saying, “beauty is in the eye of the beholder.” Some individuals see wind turbines as kinetic art, but others do not. While it is nearly impossible to create clear guidelines with something so subjective, there are steps that can be taken to provide factual information to inform the public during the decision-making process.

A project developer should provide visual simulations and line-of-sight profiles, to help determine the extent of the visual impacts from various vantage points and areas of concern<sup>1</sup>. Flying test balloons representing the wind turbines may also provide residents and decision-makers with actual visuals to use in the proposal’s review. Another, more hands-on and personal approach is to visit operating wind farms. In fact, many people have had positive attitudes towards wind farms after they have visited a wind farm.



In areas where visual impacts remain an issue, there are ways to obscure the structures. Several strategies have been employed to decrease visual impacts, including the relocation of one or more turbines when possible, the use of certain materials to reduce glare, and using visual barriers such as trees and shrubs to reduce visibility, which is known as screening<sup>2</sup>. The state Department of Environmental Conservation (DEC) has developed a Visual Assessment Policy, which includes methods for determining the impacts, as well as several strategies for mitigation and the pros and cons of each<sup>3</sup>. The full policy can be found on the web<sup>4</sup> and by contacting the regional DEC office<sup>5</sup>.

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<sup>1</sup> NYS Department of Environmental Conservation (DEC), Visual Assessment Policy, [www.dec.state.ny.us/website/dcs/policy/visual2000.pdf](http://www.dec.state.ny.us/website/dcs/policy/visual2000.pdf), 2000

<sup>2</sup> NYS DEC, Visual Assessment Policy, [www.dec.state.ny.us/website/dcs/policy/visual2000.pdf](http://www.dec.state.ny.us/website/dcs/policy/visual2000.pdf), 2000

<sup>3</sup> Ibid.

<sup>4</sup> <http://www.dec.state.ny.us/website/dcs/policy/visual2000.pdf>

<sup>5</sup> <http://www.dec.state.ny.us/website/about/abrull3.html>

**SOUND:** Similar to equipment on a farm or traffic on a local road, wind turbines create some noise. There are two kinds of sound produced by wind turbines. Aerodynamic sound is created when the turning blades cut through the air, making a *whoosh*<sup>6</sup>. Mechanical sound is created by the movement of the gears and other mechanical components<sup>7</sup>. New technology has already helped to diminish the sound impacts of wind turbines. For example, the blades have been altered in size, rotation speed and direction to reduce aerodynamic sounds; better acoustic insulation is used to reduce mechanical sounds<sup>8</sup>.

The potential impact of sound from a proposed wind project can be predicted. Project developers can provide a site-specific audio impact assessment. By using turbines that meet the international standard for sound levels set by the International Electrotechnical Commission (IEC)<sup>9</sup>, developers can predict sound levels at various areas of concern using sound modeling systems<sup>10</sup>.



In 1999 the World Health Organization drafted community noise guidelines and estimated that outside noise above 55dbA for a period of 16 hours is considered a “serious annoyance”<sup>11</sup>. A wind turbine at 750-1000 feet is estimated at 35-45 dbA<sup>12</sup>, or about the sound of a new household refrigerator<sup>13</sup>. It is also important to note that wind turbines are located in windy areas, which often “masks” the sound produced by the turbine<sup>14</sup>. Furthermore, a “setback” or required buffer zone between the proposed project and homes, schools, or other buildings, can eliminate any potential negative audio impact on the neighboring communities.

About twenty towns in New York State have established noise restrictions for wind power projects of 50 dbA, usually measured at residences but sometimes at property lines. Another option is to measure pre-project noise levels and restrict increment from a wind project to a specific level.

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<sup>6</sup> Global Energy Concepts, “Other Environmental Impacts,” October 2005.

[http://www.powernaturally.org/Programs/Wind/toolkit/5\\_otherpotenviroimpactsrevised.pdf](http://www.powernaturally.org/Programs/Wind/toolkit/5_otherpotenviroimpactsrevised.pdf).

<sup>7</sup> Ibid.

<sup>8</sup> Global Energy Concepts, “Other Environmental Impacts,” October 2005. 8.

[http://www.powernaturally.org/Programs/Wind/toolkit/5\\_otherpotenviroimpactsrevised.pdf](http://www.powernaturally.org/Programs/Wind/toolkit/5_otherpotenviroimpactsrevised.pdf).

<sup>9</sup> Renewable Energy Research Laboratory (RERL), “Wind Turbine Acoustic Noise,” page 23, June 2002, amended January 2006.

<sup>10</sup> Ibid.

<sup>11</sup> World Health Organization, “Guidelines for Community Noise” 1994.

<http://whqlibdoc.who.int/hq/1999/a68672.pdf>

<sup>12</sup> The Scottish Office, Environment Department, Planning Advice Note, PAN 45, Annex: Wind Power, A.27, Renewable Energy Technologies, August 1999.

<sup>13</sup> Ibid.

<sup>14</sup> American Wind Association, “Facts About Wind Energy and Noise”,

[http://www.awea.org/pubs/factsheets/WE\\_Noise.pdf](http://www.awea.org/pubs/factsheets/WE_Noise.pdf)