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Pictures from Wisconsin's
Rustic Roads

Policy Statement

Wind Energy Turbines on Towers

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In recent years there has been a movement to encourage creation of electrical power systems that are driven by “clean” or “renewable” energy sources, that is, sources that don’t emit undesirable gases or particles into the air like coal-fired power plants. One renewable energy source is wind, a source expected to become significant in the future. Power systems using turbines with large rotor blades on tall towers are now being built in large numbers, and they are becoming noticeable in the landscape.

Background

The use of wind produces no direct by-products, so there are no pollutants emitted that could dirty the air, water or soil. No greenhouse gases are released to the air. The only draw-backs are the intermittent nature of wind, and the large outdoor areas that must be allocated to harvest the wind.

The number of wind turbines required to produce a practical amount of power has not been well publicized. The large “industrial” wind turbine, the most common size in wind farms, produces 500 kilowatts (kw) of electrical power. (These turbines can produce 2,000 kw at peak speed, but the average amount of power sent to the “grid” is 500 kw, due to the intermittent nature of wind.) In comparison, a normal-sized coal-fired power plant produces 500 megawatts (mw) of electrical power continuously. Thus a single conventional power plant produces 1,000 times the power of one wind turbine. It takes 1,000 wind turbines to replace just one power plant!

At 500 to 600 feet tall to the top of a vertical rotor, a turbine can be seen from as far away as a power plant. Three or four turbines placed in close proximity are about as visually intrusive as a power plant. 1,000 wind turbines are very many times as intrusive as a power plant.

The large areas of landscape being altered by a multitude of wind turbines on tall towers has serious consequences. Bucolic farmland is being greatly disturbed, hectic with spinning rotors among barns and silos. The horizon as seen across Lake Winnebago from Fond du Lac is no longer a peaceful bluff but a long row of churning mechanical arms. In Horicon, rotors near the marsh threaten birds and change the setting, replacing peaceful open air with rotary motion.

How appropriate it is to install wind turbines, essentially industrial equipment, on land originally intended for ordinary agricultural use? It’s allowing a farm to become a utility, and it has an immediate impact on nearby homes. It’s almost like allowing an electric utility plant next to residential neighborhood.

The Department of Agriculture, Trade and Consumer Protection has determined that wind turbines on farms is “compatible agricultural use” of the land. However, homeowners can feel the presence of towers many times the height of their houses, and notice the twirling motion and the shadows of the rotors. Some people will want to move away, and when they sell their house they will find that its value is less than it was before the turbine was there.

There is need for thoughtful regulation of the placement of Wind turbines. Written with the intent to promote new energy sources, however, [Wisconsin Statutes \(66.0401\)](#) restrict regulation of wind energy unless the objective is “. . . to preserve and protect the public health and safety.” Dangers include the possibility of a tower being blown down by a storm, so ordinances can require that towers

be “set back” far enough from inhabited buildings. Whether the law allows taking into account shadow flicker is unclear. It doesn’t intend to allow taking into account aesthetics and property values.

Policy Recommendations

Advance Thoughtfully. Wind power is a great idea as a renewable energy source. However, like all things, it must be managed well. At this time of global warming, wind power has captured the imagination of many of our business and political leaders and they are pushing it zealously.

- It’s a new technology and we need to proceed thoughtfully, otherwise, we will have turbines in places that, in a few years, we will realize we don’t want them. Wind turbines need to be placed in appropriate settings. Generally this means where they are inconspicuous, not in towns or residential areas, or in pristine natural areas.
- Since electrical power only amounts to about four percent of all the energy used in the state, even if we produced all electric power by wind, the reduction in burning of fossil fuels would not be a lot - not enough to justify cluttering our landscape with towers.
- Let’s not rush to put up a lot of large structures that may prove to be objectionable in the near future. It would be a contentious and costly process to remove them. This is especially true if technology advances and turbines and towers become smaller and less noticeable.
- It’s not even proven that wind power will provide enough benefit without state tax incentives.

Develop a Comprehensive Plan. There should be an overall plan for where it is appropriate to place wind energy systems in the state of Wisconsin. This plan would identify certain areas which have outstanding scenery, wildlife or history and are therefore an asset for recreation and tourism. The [Wisconsin Land Legacy Report](#) prepared by the state Department of Natural Resources provides an inventory of places that should be protected to meet Wisconsin’s future conservation and recreation needs. These places should be off-limits to wind turbines. The regional planning commissions would be instrumental doing the necessary studies and producing this plan.

- The plan should also identify the major flyways of migratory birds and disallow or limit the placement of wind turbines in those flyways. It is well known that great numbers of birds are killed each year by moving rotors. Bird-watching is an important recreational activity that local people as well as tourists participate in. Turbines put additional risk on endangered species.
- The plan should also set standards for placement of towers, including “set-back” distances from buildings, occupied and unoccupied. Set back distances would take into account not only public safety, but also disturbing visual effects in residential areas.
- The important items in the plan should be adopted as a state law so that they are enforceable in communities throughout the state.

Allow Aesthetics as a Basis for Regulation. In addition to state law based on a Comprehensive Plan, state law should be changed to allow local governments freedom to regulate wind turbines for the well-being of their community. The inescapable reality is that turbines have an impact on scenery and ambience, and this affects tourism and property values. So far property values have not been affected much according to some studies. This is likely to change as more turbines go up. Local governments need the authority to control turbines for the highest possible quality of life for their citizens.

Conserve Energy. We encourage people to reduce consumption of electrical power so that fewer power plants and wind systems are needed. Ways by which this can be done are using energy efficient light bulbs and making sure appliances are turned off when not in use.

To make a significant improvement, we encourage people to conserve energy in all ways that they can – for example, by driving less and acquiring efficient automobiles and by insulating their home and reducing the temperature in their home whenever possible.

Enact Local Ordinances. While we prefer the establishment of statewide guidelines, community leaders may feel an urgency to manage the effects wind turbines. Here are some guidelines for preparation of local ordinances to mitigate health and safety concerns in accordance with current state law.

Physical Dangers. Physical dangers include the possibility of a falling tower (for example blown down by a storm), the possibility of rotor blades breaking off and flying some distance before hitting the ground (This can happen if the propeller is not perfectly balanced. Under conditions of high winds and high propeller speed, the propeller can vibrate, chatter and crack) and the possibility of chunks of ice being thrown off rotor blades to the ground. (Ice can accumulate on the blades under certain conditions and it slides and flies off as propellers speed up.)

To counteract these physical dangers, towers must be placed or “set back” far enough from where someone may get hurt. Based on a preliminary review of regulations in the US and Europe, we believe a setback from any neighbor’s property line be at least 3 times the height of the tower measured to the tip of a rotor pointing up. Measuring set-back from the property line protects the right of a neighbor to safely use his entire property, including building a house or doing other development near the property line.

Adverse Side Effects. Adverse side effects include noise, “shadow flicker” and light pollution.

- An ordinance should call for noise not to exceed the present noise standards for the community. This is probably adequate, but may not cover the pulsing/throbbing nature of the turbines.
- Flickering shadows should not be a problem if the tower is placed 3 times its height from a neighbor. Otherwise, moving shadows cast across a neighboring property by rotating turbine blades could be a nuisance.
- Lights on blades, placed there to warn aircraft, move with a circular motion and disturb the peacefulness of a dark night sky and this constitutes a nuisance. Again, sufficient set-back mitigates this disturbance.

Mental Health. There are certain other effects which are hard to quantify, but which cannot be ignored because people’s lives will be affected. Allowing a tower that is 500 feet tall near a neighbor’s residence is an imposition on the neighbor. It would become the most dominant object in the vicinity of his house. There’s no way the homeowner could not notice it and feel the presence of a structure many times the height of his house. He’d see it before he saw his own house every time he came home from work. A family could find the gigantic moving rotors visible from windows in several rooms of their house to be disturbing. Having a giant moving blade distracting you in your living room or bedroom unless you keep the shades pulled down can’t be good for your state of mind. We can only hope that towers set back three times their height alleviates the disturbance.