

Submitted via email.
June 22, 2015

Members of the Planning Commission and County Commissioners:

This is in response to the Draft of a Commercial Wind Energy Conversion System. In my opinion, this draft is inadequate to protect the citizens of Lancaster County. Good policy starts with safeguarding its residents. Health and safety of the people come before the assets to the county from taxes. This letter will address setbacks (for audible noise, low frequency noise, infrasound [inaudible, but having a huge effect!], shadow flicker, ice throw and blade throw.)

For a model of an ordinance for wind systems, I would refer you to an ordinance produced by the Town of Union, Rock County Wisconsin, Ordinance No. 2008-06, Wind Energy systems Licensing Ordinance (Town of Union Large wind Ordinance pdf 5.9M): <http://betterplan.squarespace.com/wind-siting-ordinances>. The Ordinance is 56 pages, and not perfect, but I consider it a "must" reading for an example of a more acceptable ordinance regarding wind towers. The "Union" ordinance has been used as a model for other towns in Wisconsin.

Setbacks regarding maximum audible noise: Although the Lincoln-Lancaster County Health Department felt that 40 dBA is low enough, a sound engineer at the April 16, 2015, meeting of the "Working Group" stated that children's hearing is more sensitive than adults' hearing. Therefore, it would surely be even more prudent to be cautious regarding upper limits of dBA. (Is consideration given to stay-at-home moms with children, homemakers, farmers who are at home during the day?)

On page 7 of the "Union" ordinance, "The International Standards Organization recommended community noise limits for rural areas be set at a SPL (sound pressure level) of 35 dBA during the day, 30 dBA during the evening and 25 DBA at night. (See Table 9: ISO 1996-1971 Recommendations for Community Noise Limits as cited by Acoustic Ecology Institute and Daniel Alberts of Lawrence Technological University)" I would hope that the Planning Commission and County Commissioners would agree with this recommendation.

On page 8 of the "Union" ordinance, they state that "...a setback of 2650 feet from large wind turbines to the nearest residence or other inhabited structure is necessary to protect the health and safety of Town of Union residents..."; however, I feel that even farther setbacks should be in place from what the Town of Union proposed for reasons you'll note below.

In a personal letter dated 4-30-15, from a friend and "neighbor" who used to live in Oklahoma near where a wind farm was constructed, he stated, "Once the project was in operation we realized the fully intrusive nature of the industrial plant that had just been dropped on our horizon.....The most intrusive aspect of living near these structures was the constant noise. When the breeze was out of the NW-NE, the constant drumming noise that the towers produce penetrated into our home. Closing doors and windows offered no relief. It was an intrusion from which you could not escape." Recently he Googled the distance from where he

used to live in Oklahoma to the nearest wind tower, and the distance was 6,311.86 feet. Therefore, it is imperative that an even farther setback should be in an ordinance to protect the people of Lancaster County.

Regarding low frequency noise: On page 9 of the "Union" ordinance, "A dBC requirement is needed to minimize adverse health effects from low frequency noise. A dBC requirement will likely result in setbacks between large wind turbines and nearby dwellings of 1 km (.62 miles) or GREATER (emphases mine) for 1.5 to 3 MW wind turbines if wind turbines are located in rural areas where L90A background levels are 30 dBA or lower. (See Kamperman & James; WHO 1999; Bajdek Noise-Con 2007; Pedersen and Waye 1/11/2008)"

Regarding infrasound: On page 14-15 of the "Union" ordinance, "The most significant exterior noise-induced dwelling vibration occurs in the frequency range between 5 Hz and 50Hz. Moreover, even levels below the threshold of audibility can still cause measurable resonances inside dwelling interiors. Conditions that support or magnify resonance may also exist in human body cavities and organs under certain conditions."
Infrasound has been described as being "sensed" and has been indicated as a "pressure."

Regarding setbacks: On page 8 of the "Union" ordinance, "Minimum setbacks from dwellings are necessary to mitigate noise impacts not predicted with sound models. Pre-construction sound models fail to accurately predict wind turbine noise impacts due to factors such as atmospheric conditions, temperature inversions, wind layers, geography and low frequency noise which travels further (should be farther) with less loss of intensity than higher frequency noise. In addition, at night when air stabilizes, wind turbine noise can travel further (should be farther) than expected and can be 5-15 db(A) louder than predicted. (See Kamperman & James; Acoustic Ecology Institute Special Report: Wind Energy Noise Impacts 2008)"

While on page 10 of the "Union" ordinance, "At a distance of approximately 1.62 km (1 mile) from wind turbines, the percent of highly annoyed people is expected to drop to 4%." To allow 4% of people to be highly annoyed is still unacceptable. An even FARTHER setback should be incorporated into an ordinance for Lancaster County, in my opinion. I feel that one and one-half miles should be a minimum for setbacks, and even farther setbacks as larger towers are constructed! Twenty times the hub height is not out of the question.

Regarding shadow flicker: On page 7 of the "Union" ordinance, "Shadow flicker can cause some people to become dizzy, nauseated or lose their balance when they see the movement of the shadow. Shadow flicker from wind turbines at greater than 3Hz poses a potential risk of inducing photosensitive seizures." Also, "If placed too close to a road, the movement of the wind turbine blades and resulting shadow flicker can distract drivers and lead to accidents. (See NRC May 2007 report, pg. 263)" Please make sure that setbacks are sufficient so that no shadow flicker is allowed to enter occupied structures of non-participating land owners. My husband is 84 years of age and already has a problem with balance. If shadow flicker were allowed to invade our home, he would likely fall and be seriously injured!

Regarding ice and blade throw: On page 5 of the "Union" ordinance, "Wind turbine accidents have occurred involving ice throws, blade disintegration, fire and tower failure." Using mathematics, Professor Terry Matilsky, Department of Physics & Astronomy, Rutgers University has shown that ice could be propelled 1680 feet from the hub of a wind turbine. <http://xray.rutgers.edu/~matilsky/windmills/throw.html> The potential of harm to or of causing the death of adults and/or children who may be outside, not to mention the potential of harm to non-participating land owners' properties; non-participating farmers' crops, machinery and/or animals, should be cause for extending setbacks well beyond such a distance!....not from a dwelling, but from a property line!

Here is a quote from an article entitled, "Safety of Wind Systems" copyright M. Ragheb, 2/20/2014: "With more experience in wind power production, the more experienced Europeans require a one mile siting offset for utility-scale wind turbines from human dwellings, and the state of California in the USA requires an even larger 2 miles offset."

Much more could be said, but please give serious consideration to these opinions.

Sincerely,

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