

# Mason County Planning & Zoning Department

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September 15, 2015

Chairman Martin Honigberg  
New Hampshire Site Evaluation Committee  
21 South Fruit Street, Suite 10  
Concord, NH 03301

**Re: NH Site Evaluation Committee Rulemaking, Docket No. 2014-04**

Dear Chairman Honigberg:

Thank you for the opportunity to provide comments pertaining to New Hampshire's rulemaking for wind energy siting.

I serve as the Zoning and Building Director for Mason County, Michigan. In this capacity, I am responsible for administration and enforcement of the Mason County Zoning Ordinance, which includes all regulations governing utility-grid wind energy systems.

Mason County currently hosts the Lake Winds Energy Park (LWEP), a 100.8 MW (56 Vestas V100 1.8 turbines). The project was constructed by Consumers Energy and placed into service in November, 2012.

The purpose of this letter to inform your Committee of our experience addressing shadow-flicker from the operating project.

At the time the project was granted approval by the County, the zoning regulations limited shadow flicker on non-participating residences to 10-hours per year. According to shadow flicker modeling conducted by Consumers Energy, the project would operate within this limit. Consumers Energy voluntarily employed a policy where properties that were predicted to receive more than 8 hours of flicker would be mitigated to zero hours with the use of the Vestas Shadow Detection System (VSIDS). When operations started, 47 of 56 turbines had VSIDS system installed. Please note, the 10 hour amount is cumulative—flicker from all turbines impacting a non-participating parcel cannot exceed 10 hours per year.

Shortly after the turbines started to spin, complaints were filed with the Zoning office. It was then that we realized that turbines more than a mile away could cast shadows on properties. When the County (and the public) reported this to Consumers Energy, the modeling was recalculated from the original 1000 meter distance (10 X rotor diameter) to 1646 meters to be inclusive of flicker actually observed.

As the project operated through the winter we also came to learn that there were more hours of impact on some homes than originally expected. After field visits to verify the distance shadow flicker was being experienced as well as documenting the number of hours of impact, it became apparent that at least one property, there was a compliance problem and additional mitigation was required.

To its credit, Consumers Energy was engaged and willing to work with us to correct the problem. The final solution involved retrofitting an additional turbine with the VSIDS technology that could sense light conditions where shadow flicker may occur and shut down the turbines until the sun moved out of the predicted shadow flicker period. Staff field-tested the mitigation and found it worked very well. Shadow

flicker at the site in question has virtually been eliminated. At other locations, models were recalculated to reflect observed field conditions to see if there was the potential for a violation of the 10 hour limit.

With the success of this mitigation tool, the County recently adopted an amendment to the Mason County Zoning Ordinance that limits shadow flicker to zero-hours of impact for future wind farm installations. The practical difficulties related to enforcing a time-limit on flicker (whether 5, 10 or 30 hours) was also a motivation to adopt a zero-hour flicker rule.

I had the opportunity to describe our experience at the June 29 technical session moderated by your staff. I wanted to be sure the committee had the benefit of hearing our story.

The lessons Mason County learned in this process may be useful for others tasked with siting large wind projects. They are:

- (1) shadow flicker routinely occurs at distances beyond 1 kilometer (1000 meters) and may exceed 1-mile depending on terrain, obstructions, and location of the wind turbine in relation to the receptor; and
- (2) shadow flicker can occur more hours per year than predicted if modeling is based on the industry standard of 10 rotor diameters (again, terrain and obstructions can have a bearing on actual amounts); using a 1 mile limit (or up to 2KM) will produce more realistic modeling results.

The County was pleased that the VSIDS technology was available to mitigate shadow flicker at unique receptors throughout the LWEP. At the time, Vestas was the only turbine manufacturer with this solution. However, it is my understanding that other companies now offer a similar feature. I do not recall the exact incremental amount to add the VSIDS system to an additional turbine but do not sense that it was cost prohibitive based on Consumers Energy's willingness to employ the mitigation when necessary.

Thank you again for the opportunity to share our experience. If I can answer any further questions, please do not hesitate to contact me at (231)757-9272 or mreilly@masoncounty.net.

Respectfully Submitted,

  
Mary Reilly  
Zoning and Building Director  
Mason County, Michigan