

STATE OF NEW YORK  
DEPARTMENT OF STATE  
OFFICE OF RENEWABLE ENERGY SITING

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**COMMENTS ON  
Draft Regulations  
Chapter XVIII, Title 19 of NYCRR Part 900  
Subparts 900-1 – 900-14**

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On Behalf of Save Ontario Shores, Inc.  
and named signatories across upstate, western and  
the Southern Tier of New York

**Appendix D**

- Review and comments regarding the need for additional protections from shadow flicker, the highly annoying strobing of sunlight through moving wind turbines. Prepared by Gary A. Abraham, attorney
- Review and comments regarding design drawings and visual impact prepared by Kate Kremer, VP of Save Ontario Shores, Inc.

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Draft ORES regulations, to implement Section 94-c of the New York State Executive Law  
*Comments on behalf of Save Ontario Shores, Inc.*

## **SHADOW FLICKER**

The Draft regulation at §900-2.9(d)(6) limits shadow flicker “to thirty (30) hours per year at any non-participating residence” but does not limit the time of exposure per day. A per-day limit on exposure has been adopted in many jurisdictions, and some limit the per-year exposure to less than 30 hours. The regulation should limit exposure to 30 minutes per day, consistent with other jurisdictions. As with noise and setbacks, the limitations on shadow flicker should extend to the property line of residential property.

Unavoidable shadow flicker, caused by the shadows of moving wind turbine blades between the sun and a receptor at sunrise and sunset, is bright enough to pass through closed eyelids, and can affect illumination inside a building.<sup>1</sup> Shadow flicker is a concern within 10 rotor diameters of a wind turbine.<sup>2</sup> Except for photosensitive epilepsy, expected to affect a small fraction of one percent of any community, primary research showing that shadow flicker directly affects health is lacking. However, it is generally recognized that shadow flicker causes annoyance among those exposed to it for excessive durations. The New York State Department of Health has testified in Article 10 proceedings that annoyance from shadow flicker is a public health issue.<sup>3</sup>

No New York or national standard exists limiting the long-term and short-term exposures to shadow flicker based on health impacts. Conclusive research has shown that shadow flicker increases the annoyance response to wind turbine noise.<sup>4</sup> The State of New Hampshire has adopted a long-term exposure limit of eight hours per year, within one mile of a wind turbine, based on public health concerns.<sup>5</sup> Germany, Wales, Belgium, Austria,

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<sup>1</sup> Jeffrey RD, Krogh CM, Horner B. Industrial wind turbines and adverse health effects, 19 *Can. J. Rural Med.* 21 (2014), available at <<https://www.ncbi.nlm.nih.gov/pubmed/24398354>>.

<sup>2</sup> Parsons Brinckerhoff (for UK Department of Energy and Climate Change), *Update of UK Shadow Flicker Evidence Base* (2011), available at <<https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-base>>.

<sup>3</sup> Case 17-F-0282, Direct Testimony Henry M. Spliethoff, M.S., New York State Department of Health (September 2019), 18-19.

<sup>4</sup> Pedersen E, Larsman P., The impact of visual factors on noise annoyance among people living in the vicinity of wind turbines, 28 *J. Environ. Psychol.* 379 (2008); Pedersen E, Persson Waye K, Wind turbines: low level noise sources interfering with restoration? 3 *Environ. Res. Lett.* 15002 (2008), available at <[http://www.iop.org/EJ/article/1748-9326/3/1/015002/erl8\\_1\\_015002.pdf](http://www.iop.org/EJ/article/1748-9326/3/1/015002/erl8_1_015002.pdf)>; Pedersen E, Persson Waye K, Wind turbine noise, annoyance and self-reported health and well-being in different living environments, 64 *Occup. Environ. Med.* 480 (2007).

<sup>5</sup> New Hampshire, RSA 162-H:10-a (Wind Energy Systems) (2014). Pursuant to that law, the New Hampshire Public Utilities Commission has adopted siting rules, N.H. Code of Admin. Rules, Site 310.14(f)(2)(b) (“With respect to shadow flicker, the shadow flicker created by the applicant’s energy facility during operations shall

Serbia, India, and Australia limit allowable exposure to 30 minutes per day, and 30 hours per year.<sup>6</sup> The Danish Energy Agency classifies shadow flicker as a “nuisance”.<sup>7</sup> The National Association of Regulatory Utility Commissioners recommends limiting exposure to 30 hours per year and 30 minutes per day.<sup>8</sup>

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not occur more than 8 hours per year at or within any residence, learning space, workplace, health care setting, outdoor or indoor public gathering area, or other occupied building.”).

<sup>6</sup> Knoppen E., Gunuru M., Chester A., “International Legislation and Regulations for Wind Turbine Shadow Flicker Impact”, *7th Int’l Conf. on Wind Turbine Noise* (May 2017), available at <<https://www.slideshare.net/ErikKoppen/wtn-2017-international-legislation-and-regulations-for-wind-turbine-shadow-flicker-impact>>.

<sup>7</sup> Danish Energy Agency, *Wind Turbines in Denmark* (2009), available at <[http://www.ingdemurtas.it/wp-content/uploads/2015/11/wind\\_turbines\\_in\\_denmark.pdf](http://www.ingdemurtas.it/wp-content/uploads/2015/11/wind_turbines_in_denmark.pdf)>.

<sup>8</sup> NARUC, *Wind Energy & Wind Park Siting and Zoning Best Practices and Guidance for States*, 31.

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State of New York  
Department of State  
Office of Renewable Energy Siting

Subject: Comments on Behalf of Save Ontario Shores, Inc.  
Draft Regulations: Chapter XVIII, Title 19 of NYCRR Part 900, Subparts 900-1–  
900-14

Addressing the following Draft Regulations Sections:

900-2.6 Exhibit 5: Design Drawings.

900- 2.9 Exhibit 8: Visual Impacts

## **900-2.6 Exhibit 5: Design Drawings.**

All turbine setbacks must be measured from the closest part of the industrial wind turbine (including the blade) to the non-participating property line. All land on non-participating property must be as safe as the residence. The setbacks are listed as applying to “Wind Turbine Towers”. Setbacks must be listed for “Industrial Wind Turbines” (IWT) so that all parts of the turbines, including the blades are included in the setbacks. Rotating blades that can measure over 250 feet are part of the IWT and therefore must be included in the setback measurement.

The setbacks listed in the Table 1 are not defined as serving a specific safety purpose and are not supported by any scientific evidence. They are less stringent than those in existing projects in New York State. They are less stringent than the setbacks in the Lighthouse Wind project, for example. There is no justification listed for these setbacks. If they are to be minimums that protect residents then they must meet international standards and reference them. These setbacks must be annotated as to their purpose and references provided that they are appropriate. And as with all setbacks under the draft regulations, they must be to the property line and not to the residence.

*A substantial defect of the draft regulations is that Article 10 regulations 1001.6 Exhibit 6: Wind Power Facilities has been omitted.* The draft regulations must be amended to include the contents of this exhibit including an explanation of “the rationale for the setback distances for each type as required or recommended by (1) the manufacturer’s specifications; (2) the Applicant; and (3) any local ordinance or law.” and explain how the project has accommodated the setbacks listed (See Article 10 Appendix 1001.6 (a-b)).

Certification as required under draft regulation 900-10.2(d) specifies the international standard (International Electrotechnical Commission (IEC) 61400-1), however, the draft regulations must be modified to state that the certification will include type, component and project certification to be completed by an independent third party that is qualified to make such certifications as set forth in Article 10 Appendix 1001.6 (c).

An additional omission in the draft regulations is a demonstration of adequate wind conditions supporting the estimated capacity factor as required under Article 10 Appendix 1001.6 (d). The regulations must be amended to include this requirement. Failure to do so would diminish the State’s ability to determine the degree to which the project can contribute to state energy goals.

## **900- 2.9 Exhibit 8: Visual Impacts**

900- 2.9 (b)(1) As industrial wind turbine become taller their visual impacts are greater. 5 miles could be appropriate when a turbine was only several hundred feet tall. Industrial wind turbines that are 700 feet tall must have an increased viewshed map and survey. In order to protect the most impacted landscape with this standardized regulation there must be a minimum of two miles for every hundred feet or portion thereof. It is reasonable to increase the viewshed map and survey with height.

900- 2.9 (d)(9) (iii)(c) ADLS (Aircraft Detection Lighting System) eliminates a highly annoying aspect of industrial wind projects, nighttime flashing lights. Under the draft regulations these lighting systems are to be used unless FAA/DOD determines that ADLS (Aircraft Detection Lighting System) lighting options are not appropriate for the project or if these options are not technically feasible. The regulations should be amended to state that if these ADLS systems are not able to be used on the project, then the project must be altered or relocated so that they may be utilized. The annoyance and environmental light pollution of flashing lights all night long 365 nights per year is no longer a legitimate option when technology has more humane and environmentally sensitive lighting available. This must be an initial determination for the project that is pivotal to it obtaining a permit from New York State.

The standard technology of industrial wind turbines indicates that they will continue to increase in height. This amplifies the lighting concerns over larger areas of land. We can see flashing industrial wind turbine lights on the north side of Lake Ontario from the southern shoreline, over 40 miles away. The constant annoyance from living within 2000 feet of them is not reasonable for neighbors to bear and there must no longer be an excuse not to utilize it in all industrial wind projects. Given the rapid and extensive build out of industrial wind planned in New York State, residents should expect that they will receive cutting edge technology that will eliminate night time flashing lights in the darkness of our state's rural landscape.