

## State of knowledge on wind turbine view shed distances and cumulative impacts

### Visual distance

- **National Academy of Sciences. 2007. Environmental Impacts of Wind-energy Projects. National Academy of Sciences National Research Council, Washington, DC.**  
*"The size of the area for analysis may vary from location to location depending on the particular geography of the area and on the size of the project being proposed. Modern wind turbines of 1.5-3 MW can be seen in the landscape from 20 miles away or more (barring topographic or vegetative screening), but as one moves away from the project itself, the turbines appear smaller and smaller, and occupy an increasingly small part of the overall view. The most significant impacts are likely to occur within 3 miles of the project, with impacts possible from sensitive viewing areas up to 8 miles of the project. At 10 miles away the project is less likely to result in significant impacts unless it is located in or can be seen from a particularly sensitive site or the project is in an area that might be considered a regional focal point. Thus, a 10-mile radius provides a good basis for analysis including viewshed mapping and field assessment for current turbines. In some landscapes a 15-mile radius may be preferred if highly sensitive viewpoints occur at these distances, the overall scale of the project warrants a broader assessment, or if more than one project is proposed in an area."*

The NAS review was based on turbines in use before 2007, which were well less than 400 feet in height.

- **Vissering, Jean. 2011. A Visual Impact Assessment Process for Wind Energy Projects. Clean Energy States Alliance, Montpelier, VT. (<http://www.cleanenergystates.org/assets/2011-Files/States-Advancing-Wind-2/CESA-Visual-Impacts-Methodology-May2011.pdf>.)**  
*"The overall size of the project (height, number of turbines, and geographic footprint) will also make a difference in selecting the area of analysis. Modern wind projects using 2.0+ MW turbines are easily visible at 15-20 miles' distance in clear weather conditions, but the most significant impacts are likely to occur in closer proximity, in most cases within 5-8 miles in northeastern landscapes. However, a larger study area provides a more comprehensive understanding of the resources involved within the region, and 10 miles may provide a good guideline for analysis in northeastern regions".*

Today's turbines are over 3 MW.

- **R.S. Sullivan, et al. 2013. Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes. Argonne National Laboratory.**  
*An Argonne National Laboratory study on renewable energy found that under favorable viewing conditions, wind facilities were judged to be major foci of visual attention at up to 12 miles and likely to be noticed by casual observers at 23 miles. They concluded that a conservative interpretation suggests that for such facilities, an appropriate radius for visual impact analyses would be 30 miles, that the facilities would be unlikely to be missed by casual observers at up to 20 miles, and that the facilities could be major sources of visual contrast at up to 10 mi.*

- **United States Department of the Interior. 2013. Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands. Bureau of Land Management. Cheyenne, Wyoming. 342 pp., April.**

*The 2013 US Bureau of Land Management (Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands) now considers 15 miles as a reasonable distance for wind farm visual analysis. The required array of blinking red lights required by the Federal Aviation Administration is designed to visually carry for distances upwards to 20 miles.*

- **Other States**

*Vermont currently uses 10 miles, and West Virginia uses 20 miles for visual analysis.*

- **MAINE WIND ENERGY DEVELOPMENT ASSESSMENT Report & Recommendations – 2012 (Prepared by Governor’s Office of Energy Independence and Security, March 2012)**

*Recommendation #18 is "Amend the wind law to require scenic impact evaluations to eight miles, with a fifteen mile standard option and provisions made for review to greater distances".*

*Recommendation #19, "Support a clear statutory authority for permitting agencies to consider cumulative visual impacts."*

### **Cumulative Impacts**

- **See recommendation 19 (above)**
- **Maine Report of OEIS Assessment of Cumulative Visual Impacts from Wind Energy Development (2012) (CVI Assessment)**

Maine recognized the problem of cumulative visual impacts. The legislatively mandated study on cumulative visual impacts recommended three pathways to address this impact (CVI).

1. *Establish a system for identifying landscape types in the area surrounding a project,*
2. *establish a process for deciding how much shift in landscape type is acceptable over time from one or more projects, and/or*
3. *better identify in existing law which types of cumulative impacts (e.g. combined, successive, sequential), if any, the primary siting authority may consider in individual permit proceedings.*

### **Conclusion**

- *Maine’s 8 mile limit for visual analysis of wind farms, developed in 2008 when turbines heights were less than 400 feet, is now outdated by technological changes. Typical turbine heights today are 500 feet and built prototypes now exceed 700 feet. Today’s turbines now dwarf Maine’s topography and highpoints. Analyzing visual impacts to 15 miles with today’s wind technology is both warranted and supported by numerous studies.*
- *As more wind farms are proposed and built in Maine, cumulative visual impacts (CVI) are known and represent an increasing impact. Through a legislative initiative, Maine examined pathways to review cumulative visual impacts. Legislation is now needed to both recognize and address cumulative visual impacts during an application review process.*