

**Kansas Senate Select Committee on Wind Turbine Lighting**

**October 27, 2022**

**Written testimony of:**

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Chair Bowers and members of the Committee, thank you for the opportunity to submit testimony on state legislative action related to wind turbine lighting. My name is Aaron Ray. I am the Associate Director for Energy at the National Conference of State Legislatures (NCSL), where I lead NCSL's Energy Program.

NCSL is the only bipartisan organization serving all state legislators and legislative staff in the 50 states, commonwealths and territories. NCSL does not take positions on state policy but submits this written testimony for informational purposes.

**Background**

According to the U.S. Department of Energy, 13.4 gigawatts of new wind capacity were installed in the U.S. in 2021, bringing the cumulative total installed wind capacity to nearly 136 gigawatts.<sup>1</sup> As of the end of 2021, Kansas had 8.2 gigawatts of cumulative installed capacity, the fourth highest total of any state.

As wind energy generation expands, appropriate precautions must be taken to reduce the potential hazard wind turbines may present to safe air navigation. The Code of Federal Regulations (14 C.F.R. § 77) describes the standards used for objects in the navigable airspace and specifies the requirements for notice to the Administrator of the Federal Aviation Administration (FAA) of proposed construction or alteration of projects. In 2020, the FAA issued Advisory Circular 70/7460-1M which describes the FAA's standards for marking and lighting structures to promote aviation safety.

I will not speak for the FAA nor go into detail on the particular federal standards nor their application. However, the FAA does define Aircraft Detection Lighting Systems as "systems designed to detect aircraft approaching a single obstacle or group of obstacles and automatically activate the appropriate obstruction lights until the aircraft has departed the area and the lights are no longer needed." The FAA

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<sup>1</sup> U.S. Department of Energy. 2022. Land-Based Wind Market Report: 2022 Edition. Available: [https://www.energy.gov/sites/default/files/2022-08/land\\_based\\_wind\\_market\\_report\\_2202.pdf](https://www.energy.gov/sites/default/files/2022-08/land_based_wind_market_report_2202.pdf)

suggests that this technology reduces the impact of nighttime lighting on nearby communities and migratory birds and extends the life expectancy of obstruction lights.

On the state level, states may choose to adopt more stringent wind turbine lighting system rules as long as those rules comply with FAA regulations. There are only a few states that specifically mandate the use of particular lighting systems. Among those are states that have enacted requirements that wind turbines have lighting systems that mitigate the impact of these lights by turning on only when aircraft are in the area. This type of lighting is referred to in state statutes as “light mitigation technology” or “aircraft detection lighting systems” or “radar-controlled” lighting systems. I will briefly review relevant state statutes and regulations related to wind turbine lighting and aircraft detection lighting systems. I will note that this survey is not exhaustive.

### **State Action**

*Colorado:* Colorado enacted SB22-110 (*Equip Wind Turbine Aircraft Detection Lighting System*) in 2022 to require owners or operators of new wind-powered energy generation facilities to install light mitigating technology for projects that began construction on or after April 1, 2022. The law defines light mitigating technology as a sensor-based system that is designed to detect approaching aircraft, that keeps the lights off when it is safe to do so, and that meets FAA requirements. The owner or operator is responsible for obtaining FAA approval for the installation of approved technology. The owner or operator may request an extension of time up to 24 months if it can demonstrate that the technology was not available. The law allows county commissioners in the county in which a facility is located to impose civil penalties of \$1,000 per day if the board determines that the owner or operator has failed to comply with the requirement.

*Minnesota:* Minnesota statute (*Chapter 216F.084: Wind Turbine Lighting Systems*) regulates wind turbine lighting systems. Under that statute, wind energy facilities must be equipped with a “light-mitigating technology” that meets FAA requirements. Light-mitigating technology is defined as a “sensor-based system that reduces the duration or intensity of wind turbine lighting systems” by detecting approaching aircraft and automatically activating appropriate lights until the lights are no longer needed by the aircraft and are turned off or dimmed.

*North Dakota:* North Dakota statute (*Chapter 49-22: Energy Conversion and Transmission Facility Siting Act; enacted 2017*) requires that the public service commission develop rules regarding the implementation of light-mitigating technology systems on wind energy facilities. Those rules mandate that wind energy facilities must be equipped with some form of “light-mitigating technology system.” That system can include an aircraft detection lighting system, which is defined in the state’s code as a “sensor-based system designed to detect aircraft as they approach a wind energy conversion facility [and] automatically activates obstruction lights until they are no longer needed.”

*South Dakota:* South Dakota statute (*49-41B-25.2: Wind energy facility to include aircraft detection lighting system; amended 2019*) requires wind energy facilities to be equipped with “aircraft detection

lighting systems.” The statute also notes that the system needs to comply with FAA requirements for obstruction marking and lighting.

*Vermont:* Vermont statute (30 V.S.A. § 248: *New gas and electric purchases, investments, and facilities; certificate of public good*) includes a requirement that wind turbines must have “radar-controlled obstruction lights” that comply with FAA standards. The statute states the purpose of radar-controlled obstruction lights is to “reduce the visual impact of wind turbine obstruction lights” and mitigate light pollution and negative environmental impacts. The radar-controlled obstruction lights are only illuminated when aircraft are detected in the area.

*Other state action:* In addition to the statutes cited above, other states have considered or adopted legislation or rules related to wind turbine lighting. In 2020, the Hawaii legislature considered Senate Bill 2802 which would have required all wind turbines that are equipped with obstruction lighting and located within five miles of a residential community to be equipped with aircraft detection lighting systems. That bill was not enacted. Ohio’s Administrative Code includes Rule 4906-4-09 which enumerates requirements for wind energy facilities and requires that structures required to be illuminated by the FAA “be lit with the minimum lighting required” and that lighting of other parts of the facility “be limited to that required for safety and operational purposes, and... be reasonably shielded from adjacent properties.” These examples highlight continued state action to address the need for appropriate safety measures while reducing the impact of wind turbine lighting.

### **Additional resources**

While not specific to lighting requirements, in 2020 NCSL published a guide to wind facility siting titled “State Approaches to Wind Facility Siting.”<sup>2</sup> That resource summarizes state and local requirements related to siting location and other project characteristics. In addition, the National Renewable Energy Laboratory (NREL) published a technical report in 2008 titled “An Overview of Existing Wind Energy Ordinances” focused on local government action.<sup>3</sup> That resource summarizes the lighting-related requirements of local ordinances. The overarching theme of those requirements is that lighting must comply with minimum FAA standards but should also minimize the impact on neighboring properties. For example, the NREL report cites a requirement from Henry County, Illinois, that whenever possible the lowest intensity lights allowed be used and that if more than one lighting alternative is available, the alternative that causes the least visual disturbance must be used. Similarly, the report cites an example from Riley County, Kansas, which requires “daytime white-nighttime red” lighting unless prohibited by law. These examples illustrate the balance governments are seeking between maintaining safety and minimizing visual impact of wind energy facilities.

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<sup>2</sup> National Conference of State Legislatures. 2020. State Approaches to Wind Facility Siting. Available: <https://www.ncsl.org/research/energy/state-wind-energy-siting.aspx>

<sup>3</sup> National Renewable Energy Laboratory. 2008. An Overview of Existing Wind Energy Ordinances. Available: <https://www.nrel.gov/docs/fy09osti/44439.pdf>

**Conclusion**

This concludes my testimony. Once again, I would like to thank Chair Bowers and the members of the Committee for the opportunity to submit testimony on state action related to wind turbine lighting. While NCSL does not take a position on the policies describe above, we do stand ready to assist the Committee in any way that we can. Please do not hesitate to reach out to me with any questions or requests for information. You can reach me either by email ([aaron.ray@ncsl.org](mailto:aaron.ray@ncsl.org)) or phone (303-856-1515). Thank you.