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REVIEW OF WIND ENERGY SETBACKS: COMMONALITIES AND DIFFERENCES AMONG THREE STATES

BY LU NELSEN WITH ASSISTANCE BY LAUREN TAYLOR | MARCH 2020

I. INTRODUCTION

The wind energy industry remains one of the fastest growing in the United States. In 2018, U.S. wind capacity increased by 8 percent, bringing total installed capacity to 96,433 megawatts (MW). An additional 35,135 MW of capacity were under development at the end of 2018—including projects that had started construction or were in earlier stages. This capacity, in part, led to several markets setting new records for electricity generated from wind energy, with the Southwest Power Pool and the Electric Reliability Council of Texas receiving 24 percent and 19 percent of electricity from wind energy, respectively. Notably, several states now produce more than 20 percent of electricity from wind energy, including Iowa, Kansas, Maine, North Dakota, Oklahoma, and South Dakota.¹

While the growth of wind energy has provided consumers and utilities with clean energy, projects have also created additional economic benefits across the U.S. Development helped to support 114,000 jobs in manufacturing, planning,

development, siting, and construction related to wind energy by the end of 2018, with nearly 8,500 jobs created in that year alone. Landowners who hosted turbines directly benefited from development as well, with \$289 million paid in land lease payments in 2018. Projects also represent an opportunity to provide a new source of revenue for states and counties, especially in rural areas that host more than 99 percent of U.S. wind projects. In 2018, wind energy facilities generated approximately \$761 million in tax revenue, although this only reflects the amount from projects and not the entirety of the wind industry supply chain.²

Wind energy has proven to be an economic driver that can reliably meet demand for electricity from a clean, renewable resource. Many communities have responded to new development by implementing wind energy ordinances or revising existing ordinances. Zoning plays an important role in setting clear standards for developers and protecting the interests of local residents, but ordinances should be carefully tailored so they do not restrict development and the resulting economic benefits.

1 “U.S. Wind Industry Annual Market Report.” American Wind Energy Association, 2019, awea.org/resources/publications-and-reports/market-reports. Accessed January 2020.

2 Ibid.

One of the most common pieces of a wind energy ordinance is setbacks for turbines and projects. Setbacks offer officials an opportunity to address a variety of potential concerns or issues with a single standard.³ Additionally, setbacks are typically much easier to enforce compared to other requirements, such as noise standards.

However, there is often significant variability in the implementation of setbacks from county to county, or even within a single ordinance. As more communities and counties seek to create or revise zoning for wind energy systems, they must be aware of the commonalities and differences in setbacks, and the considerations that go into determining the appropriate standards.

II. METHODOLOGY

We reviewed wind energy ordinances from three states for setback information. Criteria for selection included existing or proposed development as well as local zoning authority. Iowa and South Dakota emerged as good candidates for review due to both states surpassing the 20 percent of electricity produced from wind energy benchmarks. The third state selected was Nebraska, which was ranked first for wind capacity growth rate in 2018.⁴ All three states also share borders, making them convenient choices to control for potential regional differences that may arise by selecting states in different parts of the country.

After states were selected, counties were sorted based on the status of zoning—those that had no zoning, comprehensive plans but no zoning for wind energy systems, and those with zoning in place for wind energy. Counties were also sorted by those that currently have wind projects within their borders and those without any wind development. Wind energy ordinances were then

3 Setbacks create restrictions on the distance between a development to a set point, such as a building, property line, or road. “Setback.” West’s Encyclopedia of American Law, edition 2, 2008, legal-dictionary.thefreedictionary.com/Setback. Accessed December 2019.

4 “U.S. Wind Industry Annual Market Report.” American Wind Energy Association, 2019, awea.org/resources/publications-and-reports/market-reports. Accessed January 2020.

gathered from counties, and setback information was sorted by property or location indicated by standards, such as dwellings or public roadways. Data was then analyzed to identify trends in setbacks as well as unique features.

III. FINDINGS AND DISCUSSION

A. OVERVIEW

1. TOTAL COUNTIES CONSIDERED: 258

- 44 of 258 counties (17.05 percent) had no zoning or relied only on a comprehensive plan.⁵
- 45 of 258 counties (17.44 percent) had zoning in place but no wind energy ordinance.
- 154 of 258 counties (59.69 percent) included a wind energy ordinance or zoning for wind energy systems.
- 15 of 258 counties (5.81 percent) did not have ordinances posted online and did not respond to requests for copies of zoning documents.

2. COUNTIES WITH ESTABLISHED WIND ENERGY SYSTEMS: 78

- 24 of 90 counties (26.67 percent) without any identified wind energy ordinance or zoning have established wind energy systems.
- 54 of 154 counties (35.07 percent) with wind energy ordinances have a wind energy system within their borders.

3. IOWA (99 TOTAL COUNTIES):

- 58 of 99 counties (58.59 percent) have wind ordinances.

5 A comprehensive plan is a document that sets out long-term goals or priorities for a community. Plans may include guidance on land use, future development, or expenditure of funds. “The Purpose of the Comprehensive Land Use Plan.” Community Planning and Zoning, U.S. Department of Agriculture, National Cooperative Extension, July 26, 2019, community-planning.extension.org/the-purpose-of-the-comprehensive-land-use-plan/. Accessed January 2020.

- 19 of 99 counties (19.19 percent) do not have zoning.
- 14 of 99 counties (14.14 percent) have zoning regulations but do not include standards for wind energy generation.
- 8 of 99 counties (8.08 percent) had no available ordinance online and did not respond to requests.
- 28 of 58 counties (48.28 percent) with wind ordinances also have wind projects in operation in the county.
- 13 of 33 counties (39.39 percent) without wind ordinances have confirmed wind projects.
- 45 of 99 total Iowa counties (45.45 percent) have confirmed wind projects.
- 18 of 66 counties (27.27 percent) have zoning regulations but do not include standards for wind energy generation.
- 11 of 33 counties (33.33 percent) with wind ordinances also have wind projects in operation in the county.
- 6 of 33 counties (18.18 percent) without a wind ordinance have a wind project within the county.
- 17 of 66 South Dakota counties (25.76 percent) have confirmed wind projects.

4. NEBRASKA (93 TOTAL COUNTIES):

- 63 of 93 counties (67.74 percent) have wind ordinances.
- 10 of 93 counties (10.75 percent) do not have zoning.
- 13 of 93 counties (13.98 percent) have zoning regulations but do not include standards for wind energy generation.
- 7 of 93 counties (7.53 percent) could not be reached.
- 15 of 63 counties (23.81 percent) with wind ordinances also have wind projects in operation in the county.
- 5 of 24 counties (20.83 percent) without wind ordinances have wind projects within the county.
- 20 of 93 total Nebraska counties (21.51 percent) have confirmed wind projects.

5. SOUTH DAKOTA (66 TOTAL COUNTIES):

- 33 of 66 counties (50 percent) have wind ordinances.
- 15 of 66 counties (22.73 percent) do not have zoning.

In total, 258 counties were considered across the three states. While setbacks varied significantly between counties and states, there were similar themes in the application of setbacks and standards employed in ordinances. For example, most ordinances made distinctions in the setbacks between participating and non-participating landowners, in particular to dwellings found on property. Additionally, many ordinances employed setbacks that used a fixed or set distance from a turbine, along with a variable distance setback that was based on the height of the turbine or diameter of the blades. A commonality found the greatest of the distances used as a setback from a wind energy system.

One key difference that emerged among the states was the presence of setbacks in relation to wetlands or wildlife management areas. Nebraska counties feature significantly more setbacks to these areas than counties in Iowa and South Dakota. In Nebraska, 42 out of the 63 counties (66 percent) that had zoning for wind energy also featured setbacks from wind energy systems and these managed or protected areas. In Iowa, only 8 of the 58 counties (13.79 percent) with wind energy ordinances featured some kind of setback to a wetland or wildlife management area. No county in South Dakota included a specific setback to these areas in their ordinance, although this could be due to private land ownership or other regulations that may act as setbacks for wind energy systems from these areas.

Also notable among the findings is the majority of wind projects are located in counties that have zoning for wind energy in place. This could be a reaction to proposed development within these counties, or the construction of projects in neigh-

boring or nearby counties. No matter the reason for this correlation, the existence of zoning standards and setbacks for wind energy generation do not appear to present a barrier to development in and of themselves. Although numerous factors may affect the successful siting and operation of wind energy systems, these findings highlight the possibility of creating setbacks and other standards that allow developers to proceed with projects while ensuring that the interests of residents are protected. Further research may identify that population density and other qualities, combined with established setback distances, limit project development in counties.

IV. RECOMMENDATIONS

Setbacks play an important role in zoning ordinances, creating clear standards for future development. Each state, county, and community has unique features that should be carefully considered by planning and zoning officials, and these considerations should lead to zoning that addresses the needs of residents. While identifying standards that will operate effectively in every county is difficult, recommending broad principles that communities and officials can employ when creating or revising an ordinance is a possibility.

A. FIXED VERSUS VARIABLE DISTANCE SETBACKS

Setbacks are an ever-present part of zoning for wind energy systems, and are a useful tool for officials seeking to put standards in place for development. Officials may choose to use setbacks to address a wide variety of concerns—visual impact, ice throw, noise, general safety related to system failure—in this convenient and expedient manner, rather than creating separate standards for every potential concern or issue related to wind energy.⁶ Additionally, because much of the wind development in the U.S. is located in rural areas, setbacks themselves may not present

a barrier to the placement of generating systems unless they are too restrictive.⁷

Counties in the three states employed a combination of two types of setbacks—fixed distance and variable distance. Each of these approaches have benefits and drawbacks that are important to consider prior to implementation by a county. Many ordinances employ both fixed and variable distance setbacks to different locations, often defaulting to whichever setback is the greater distance.

Fixed distance setbacks are advantageous because they present a clear, well-defined standard for the siting of wind turbines. There is little additional information necessary to determine whether a turbine or wind energy system is in compliance with a fixed distance setback, allowing county staff to quickly address any concerns from nearby residents. A clear drawback of a fixed distance setback, however, is they can become outdated as systems grow in size or may be inappropriate for systems that are smaller than an average turbine. This inflexibility means that fixed distance setbacks may require specific variances or frequent updating from officials to ensure the goal of the setback is being achieved.

Conversely, setbacks that use variable distances based on the height of a turbine or some other measure of a wind energy system will likely not require updates to remain effective. These standards are extremely adaptive to changes in technology and variance in height of turbines or component size. But, unlike fixed distance setbacks, determining compliance with a variable distance setback would entail access to specific wind energy system information to ascertain the specific distance being measured. This may create a burden for residents concerned about projects meeting standards and county staff who are charged with assessing compliance with zoning standards. Additionally, officials must carefully select the variable that will regulate the setback distance of a system, as using one single variable may not be appropriate for every property or loca-

6 Stanton, Tom. “Wind Energy & Wind Park Siting and Zoning Best Practices and Guidance for States.” The National Association of Regulatory Utility Commissioners, January 2012, pubs.naruc.org/pub.cfm?id=539BA6EE-2354-D714-5157-359DDD67CE7F. Accessed January 2020.

7 Rynne, Suzanne, et al. “Planning for Wind Energy.” American Planning Association, 2011, planning-association.org/uploaded-media/s3.amazonaws.com/publication/online/PAS-Report-566.pdf. Accessed January 2020.

tion that is the target of a setback. For example, the setback from a property line may be based on the diameter of a turbine blade, while the setback to a dwelling could be based on the height of the turbine.

As noted previously, many of the ordinances considered used a combination of fixed and variable distance setbacks. This approach may allow counties to set a minimum setback by assigning a fixed distance, but including a variable distance that will provide zoning standards with flexibility. Perhaps the most important factor for officials to consider when selecting setback distances is the availability of viable project locations that will remain in a county. Setback distances should not prohibit development in a county, but rather reduce the impact to local stakeholders while permitting the development of wind energy resources.

B. IDENTIFY LOCATIONS FOR SETBACKS

The effectiveness of setbacks is not only linked to the distance of these requirements, but the locations that are the subject of specific setbacks. Ordinances typically identify several locations that will be the subject of setbacks from wind energy systems. While residences and property lines are the most common areas specific in wind energy ordinances, local officials and stakeholders may identify additional locations that should have setbacks from wind projects. For example, several counties in Nebraska include setbacks from conservation areas and many ordinances make a clear distinction between participating and non-participating properties in setbacks.

County officials should be able to obtain guidance from comprehensive plans or similar documents in the county. As most of these plans provide long-term goals or priorities for a county, officials should consult them to ascertain areas that should receive particular focus when an ordinance and setbacks in particular are being set or updated. Additionally, local residents and stakeholders should have the opportunity to assist in identifying locations within the county that may require a setback from a wind energy setback.

An important item to note, however, is that officials should carefully consider the necessity and impact of competing setbacks. Potential overlap in setbacks could pose a substantial barrier to wind energy development in a county. Once setback locations and distances have been proposed, counties should review the space that would still be available for a wind energy project to ensure that regulations will not eliminate the possibility of future development.

C. WAIVERS

Although setbacks play an important role in a zoning ordinance and address several siting issues, the presence of a large number of setbacks can significantly limit available space for the development of a wind energy project. Ordinances may be tailored to limit the overlap of included setbacks, but future wind development can still be hindered due to lack of land to site a project. A possible solution to this problem is for officials to include a waiver provision in a county wind energy ordinance. These waivers allow for the reduction of certain setbacks or for them to be disregarded in specific instances.

Waivers are typically acquired by a developer seeking a diminished setback from a non-participating landowner adjacent to a proposed project. Permission is obtained through negotiations between developers and landowners, and agreements may include classifying a landowner who has agreed to a waiver as a participating landowner and an offer of compensation. Once an agreement has been reached, developers submit written proof of an agreement to the county for review and to obtain a waiver. The inclusion of setback waivers provides developers with the opportunity to work with landowners in a county to increase the viability of a project, and reduces the impact setbacks may have on the growth of wind energy.

V. BEST PRACTICES

A. EARLY AND FREQUENT OUTREACH

The best opportunity for developers and stakeholders to identify concerns or issues is during the early stages of the planning process. Local community members should play a key role in the development of new wind energy projects, and providing a platform to engage early and often in a project timeline empowers residents while allowing them to assist in shaping the project to fit with their community.⁸ Early outreach and engagement on projects may also limit feelings of unfairness in the development and approval process for projects.⁹

Research has shown that perceived fairness of these processes can significantly impact attitudes toward wind energy projects.¹⁰ Stakeholder perception of unfairness may also lead to a reactionary effect to proposed projects, reinforcing beliefs that very restrictive standards are necessary despite any evidence to the contrary. Setback distances are often used as a tool by opponents to wind energy to restrict development, limiting the available areas for siting turbines to the point that projects are no longer viable. Effective engagement with community members by public officials and developers should seek to educate stakeholders, particularly with planning tools that can offer insight into the effects

of different setbacks and zoning standards.¹¹ For example, maps of dwellings and other locations that may be the subject of setbacks and potential turbine locations may reveal that proposed setback distances would eliminate the possibility of projects in a county.

While developers often make efforts to hold informal meetings with landowners and other stakeholders, likely relying primarily on these types of meetings could lead to greater feelings of unfairness. Public meetings with more formal presentations to the community may require significantly more effort from developers, but open meetings provide the greatest opportunity to address questions and concerns prior to hearings or official proceedings on the approval of projects. Additionally, these interactions may allow developers, officials, and community members to determine best practices that could be implemented on a case-by-case basis rather than blanket standards that may be enshrined in ordinances. Pursuing these opportunities may reduce barriers to wind energy development from restrictive setbacks or zoning—such as increased costs or risks to deployment of systems—which can impact the viability of projects.¹²

B. LANDOWNER OR COUNTY WIND ASSOCIATIONS

In addition to early and frequent outreach, landowners and other stakeholders may seek to form county wind energy associations to represent their interests. These associations are most often comprised of landowners in a county, although other community members may be allowed to participate in some capacity. County wind energy associations offer several advantages to participants—they provide participants with collective bargaining power in negotiations with developers, offer a platform for developers to meet with a

8 Costani, Mike, et al. “Wind Energy Guide for County Commissioners.” U.S. Department of Energy, Energy Efficiency and Renewable Energy, October 2006, nrel.gov/docs/fy07osti/40403.pdf. Accessed January 2020.

9 Firestone, Jeremy, et al. “Reconsidering barriers to wind power projects: community engagement, developer transparency and place.” *Journal of Environmental Policy & Planning*, 2018, 20:3, 370-386, DOI: 10.1080/1523908X.2017.1418656.

10 Hoen, Ben, et al. “Attitudes of U.S. Wind Turbine Neighbors: Analysis of a Nationwide Survey.” *Energy Policy*, Volume 134, November 2019, [sciencedirect.com/science/article/pii/S0301421519305683?via%3Dihub#sec3](https://www.sciencedirect.com/science/article/pii/S0301421519305683?via%3Dihub#sec3). Accessed January 2020.

11 Zayas, Jose, et al. “Enabling Wind Power Nationwide.” U.S. Department of Energy, May 2015, static1.squarespace.com/static/564236bce4b00b392cc6131d/t/564b860ae4b0ecdccdd93f64/1447790090057/Enabling+Wind+Power+Nationwide_18MAY2015_FINAL.pdf. Accessed January 2020.

12 Tegen, Suzanne, et al. “An Initial Evaluation of Siting Considerations on Current and Future Wind Deployment.” National Renewable Energy Laboratory, U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, July 2016, nrel.gov/docs/fy16osti/61750.pdf. Accessed January 2020.

Saline County, Nebraska

Landowners in Saline County, Nebraska, began the process of forming a wind association after they were approached by companies considering the county for wind projects. Through collaboration with University of Nebraska-Lincoln Extension, landowners organized and elected representatives for the Saline County Wind Association. The association provided educational opportunities for area landowners, and members of the association were able to collectively meet with a developer, review contracts, and work together to identify voluntary easements. At one point, the association had 273 members that represented 66,000 acres.¹³

large group of stakeholders rather than on an individual basis, allow for the sharing of information on zoning and siting among association members and the community, and present an opportunity for landowners willing to host wind projects to submit their properties as potential locations for wind energy systems. Combining properties in this way is an advantage to developers, as this land grouping provides an already identified project area with willing participants, potentially reducing some of the costs associated with planning and land acquisition.¹⁴

13 Ibid.

14 Pryor, Randy. "Wind Energy Education and Forming Landowner Associations." University of Nebraska-Lincoln Extension, 2011, extension.unl.edu/statewide/saline/Ag%20at%20Crossroads%20Value%20of%20Wind%20Energy%20Landowner%20Associations%2011-3-09.pdf. Accessed January 2020.

VI. CONCLUSION

Review of county wind energy ordinances has shown that zoning for projects themselves do not limit development. Developers appear to frequently comply with the standards set by local officials, successfully deploying projects across Iowa, Nebraska, and South Dakota. This review also revealed a large variance in approaches to one of the most common zoning standards for wind energy projects, with many counties employing hybrid approaches to setback distances.

Local officials must provide clear standards for developers, creating clear expectations not only for those who will site and plan projects, but for the stakeholders who will ultimately live near wind energy systems. This will require careful consideration of the effects of standards, such as setback distances on development, and a concerted effort to avoid eliminating the potential for the placement of wind energy within a county. To avoid this pitfall, officials and developers will have to embrace approaches that allow them to communicate with local stakeholders throughout the planning, siting, and development of new wind energy generation.

The continued growth of wind energy will require developers and local officials to work closely with stakeholders. Identifying and addressing concerns is key to the successful deployment of projects, as are reasonable setbacks and zoning standards. As more wind energy is developed across the nation, landowners and community members must play a role in determining how projects can best fit within their communities. Setting clear zoning that allows for development while protecting the interests of the local community will be crucial to capturing the full benefits of wind energy development without burdening residents.

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