

Wind Energy Planning

November 15-16, 2011
Nebraska Wind Power 2011



Nebraska Public Power District

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How to Best Position Your County for Wind Development

- **Developers (and their lenders) want to know the rules, they don't want surprises as they develop wind farms**
- **Developers want flexibility when they place wind turbines within a footprint**
- **Your county can and should look at what other counties have done so you remain competitive**

Nebraska's Unique Wind Planning Challenge - 1

- **Nebraska has a very high number of center pivot irrigation systems**
- **Planning bodies in other states could ignore center pivot irrigated acreage and not impact wind development – this is not true in Nebraska**

Nebraska's Unique Wind Planning Challenge -2

- Using a setback of 1.1 times the structure height (tower and blade - common planning setback from right-of-way) eliminates a significant portion of farms throughout Nebraska because of center pivot irrigation
- Simple Math Example:
 - Using a quarter-mile radius circle to depict a center pivot, the distance from the corner of the quarter-section to the circumference of the circle is 547 feet
 - Tower heights today range from 60 –105 meters, blade diameters range from 80-90 meters
 - Using a 105 meter tower and a 90 meter diameter blade (an option today) results in a total height of 492 feet; multiplying that times 1.1 yields 541 feet
 - Bottom line, if 1.1 setback requirement is used, it doesn't fit on the corner of the center pivot irrigated quarter

Why Wind Towers Are Different



Ainsworth 70 meter hub height



**ETR 66 meter
transmission
towers**

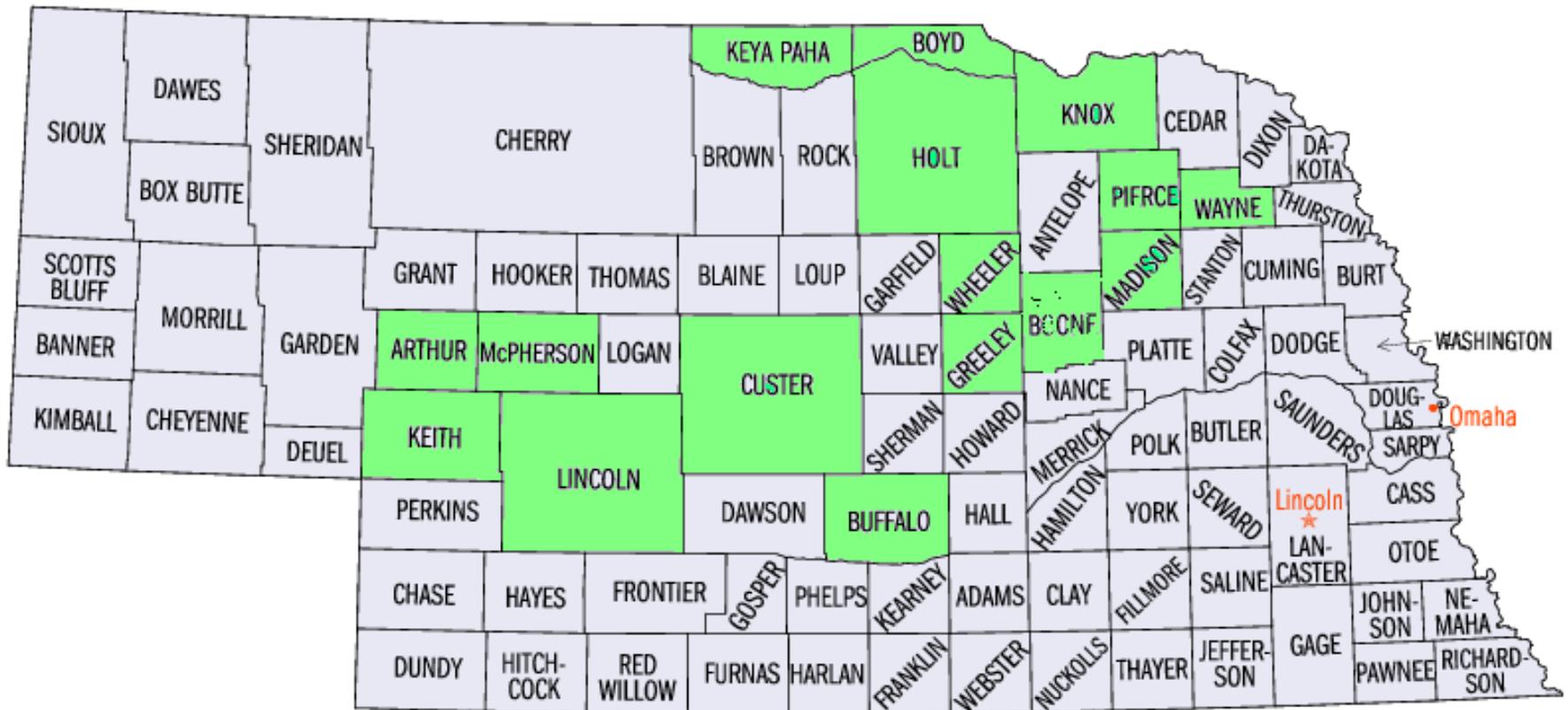
Why Wind Towers Are Different

- **Treating a wind tower the same as a building structure ignores the fact that wind towers are fundamentally different than structures the planning and zoning officials may normally encounter**
- **Treating a wind tower like a utility structure commonly found right on the property line makes more sense**
- **Using this logic makes center pivots and wind towers compatible**

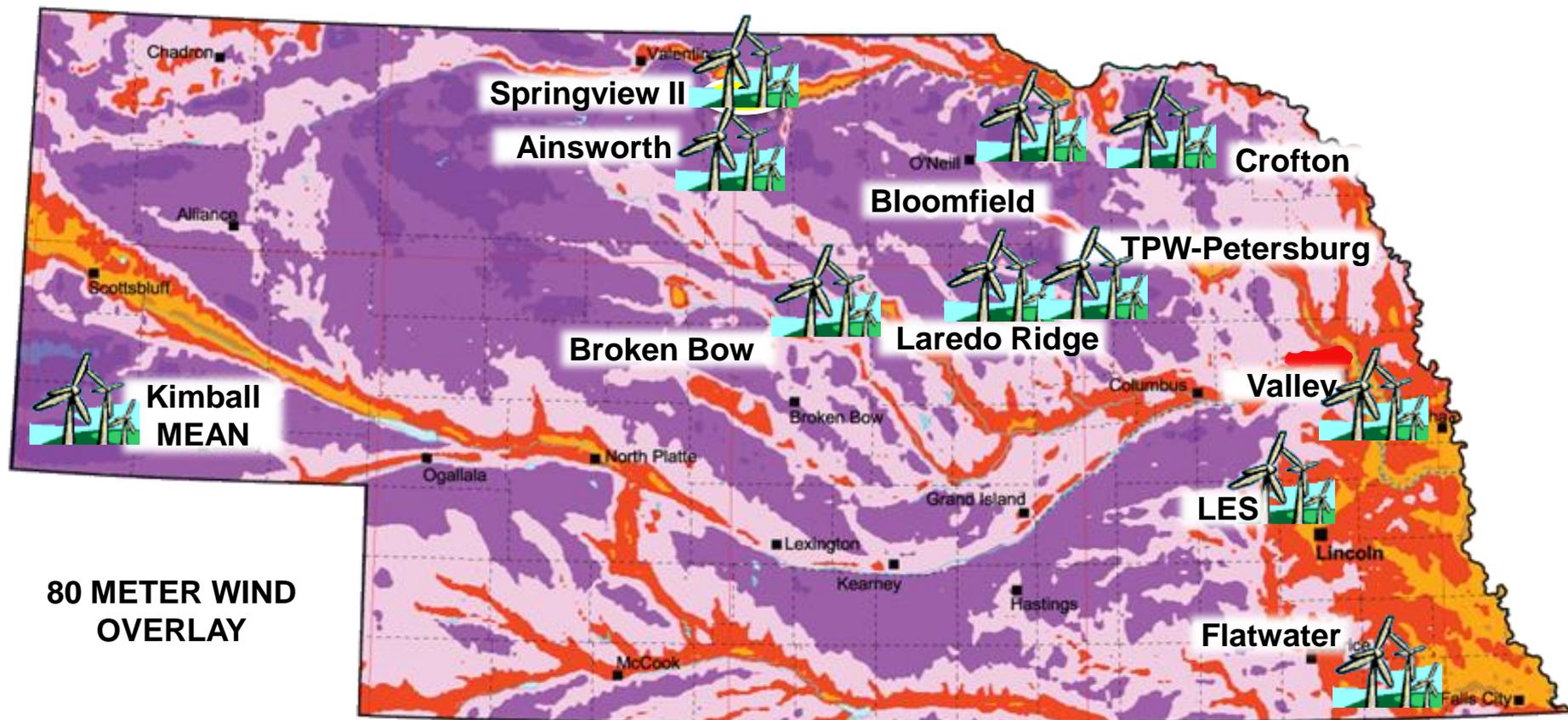
Why Should Wind Towers Be Treated Differently?

- Wind turbine structures are built similar to electric transmission line structures
- A 3 megawatt wind turbine would cost between 5 and 6 million dollars to construct
- The tower would generate electricity worth \$600,000 per year
- They are built to withstand Nebraska weather
- The landowner benefits from leasing the land
- Counties benefit from economic development

Some of the Counties where NPPD has provided input to planning and zoning committees



Existing and Planned Wind Facilities in Nebraska



Suggestions

- **Setbacks equal to $\frac{1}{2}$ blade diameters**
- **Heavily traveled roads may deserve separate considerations**
- **Quality of wind on adjacent property could be affected – this may need to be factored in**

Other Considerations

■ Noise

- Typical for wind turbine: 45-55 decibels (dB) at 1000 feet

- dB for common noises: Whispering~20 dB, Home~55 dB, Office~60 dB, Inside car~80 dB, Industrial noise~105 dB, Pneumatic drill~125 dB, Plane~140 dB

- Counties can specify a permitted sound level at the nearest occupied residence

■ Light Flicker (sunlight shining through blades in early morning or late evening)

- Wind farm tools can predict flicker occurrence

- Counties may require flicker report for permit

■ There may need to be decommissioning requirements

Other Considerations (cont.)

- **Visiting a wind farm is a good way to understand the issues and provide good judgment**
- **Retirement of Wind Farm**
 - **Counties can require escrow or bonding to account for costs to remove inactive wind facilities**
 - **Counties can specify how long inactive periods can be before a turbine is declared out-of-service and must be retired**

Questions?

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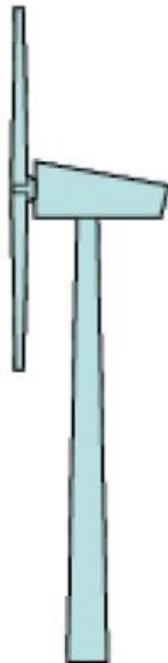


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x – Wind Speed



y – kW

