

## LINCOLN/LANCASTER COUNTY PLANNING STAFF REPORT

for August 19, 2015, PLANNING COMMISSION MEETING

**PROJECT #:** Text Amendment No. 15009

**PROPOSAL:** Amend the County zoning regulations, Section 13.018, Commercial Wind Energy Conversion Systems, to revise the special permit conditions for wind turbine projects regarding decommissioning, shadow flicker, impact on environmental resources and view corridors, setbacks, noise, noise studies and other conditions.

**CONCLUSION:** The goal of the changes is to allow alternative energy development in the County but also stress providing for the protection of nearby property owners. Large commercial wind turbine projects have successfully located in other counties in Nebraska. However, the land use characteristics in Lancaster County are not like most other counties in Nebraska. There is significant residential development on smaller lots scattered throughout Lancaster County. In addition, wind turbines which are generally less than 275 in height in other counties, now could range up from 400 to 500 feet or more in height. So while wind energy is a worthy goal, the impact on adjacent properties could be substantial. The requested amendments permit commercial wind turbines in Lancaster County while addressing the potential negative impacts on adjacent properties.

**RECOMMENDATION:**

Approval

### **GENERAL INFORMATION:**

#### **HISTORY:**

Mar 2011 Commercial Wind Energy Conversion Systems are included as a specially permitted use in the AG Agricultural District by the County Board through TX11003.

Jan 2015 TX14014 submitted by Volkswind USA was withdrawn prior to Planning Commission public hearing.

Spring 2015 The Lincoln/ Lancaster County Planning Department & Lincoln/ Lancaster County Health Department hosted a series of meetings with a Working Group to help staff revise the current regulations regarding Commercial Wind Energy projects. The Working Group of 12 people included persons with various viewpoints and interests, including industry representatives, environmental interests along with landowners and residents of various

viewpoints about wind turbines. The Working Group was joined by 8 members from Gage County who are working on the same topic.

## **COMPREHENSIVE PLAN SPECIFICATIONS:**

### **Lincoln and Lancaster County: One Community**

*Lincoln and Lancaster County contain a rich mosaic of households, living in a variety of urban and rural settings. But we share a common bond and work cooperatively to promote future growth that offers new opportunities for living and working while conserving our local environmental and cultural resources for future generations. (Page 1.2)*

*The importance of building sustainable communities — communities that conserve and efficiently utilize our economic, social, and environmental resources so that the welfare of future generations is not compromised — has long been recognized. This concept has grown in importance with increased understanding of the limits to energy supplies and community resources, the likelihood that energy costs will continue to increase in the future, the climatic impacts of energy consumption, and the impacts on the physical and economic health of the community. LPlan 2040 describes a community that values natural and human resources, supports advances in technology, and encourages development that improves the health and quality of life of all citizens. (Page 1.4)*

### **Vision and Plan: Environmental Stewardship and Sustainability**

*Efforts are made to attract new and expanding industries that serve the emerging market for more sustainable products and services. (page 1.5)*

### **Guiding Principles:**

*The 400-foot State Capitol is the key historic, architectural, and geographic landmark of the city and surrounding countryside. Views to the Capitol are highly valued by the people of Lancaster County and the State of Nebraska and should be protected and enjoyed for generations.*

*Major entryways to Lincoln including Interstate 80 and its exits (especially I-180), Highways 77 and 34 from the north, Cornhusker Highway from the east and from the Airport on the west, O Street from the east and west, Homestead Expressway/Highway 77/Rosa Parks Way from the southwest and west, and Highway 2 from the southeast, should be studied, protected, and enhanced to create and express community pride. (Page 4.6)*

### **Energy and Utilities: Energy Guiding Principles**

*Promote renewable energy sources.*

### **Energy and Utilities: Strategies for Renewable Energy:**

- *Continue to encourage and expand wind and solar access to buildings and other land uses.*
- *Incorporate the use of alternative fuels into local government and institutional operations.*
- *Incorporate the use of alternative fuels when feasible. (Page 11.6)*

**ANALYSIS:**

History

1. The original text of the Special Permit conditions of approval for Commercial Wind Energy Conversion Systems (CWECS) was developed by County staff in 2011. At that time a wind developer was interested in siting these structures in Lancaster County, although no applicant stepped forward with proposed text for the Special Permit. County staff developed conditions that addressed issues regarding operations and potential impact on adjacent properties. These conditions were developed by reviewing the regulations in other counties and municipalities around the country, as well as the scientific information available at the time. As understanding of these machines has progressed over the past four years, and after an wind developer requested an additional review of the information available, it became apparent that these conditions are in need of review and updating.
2. In summary, the requested changes would:
  - a. alter the way the setback to dwellings is measured,
  - b. change the noise requirement thresholds and outline noise monitoring requirements,
  - c. provide for protection for properties which do not yet have a dwelling on them but may be substantially impacted by wind turbines, and
  - d. allow for CWECS that are being developed as part of a larger plan for a wind farm to be included in a single special permit area provided they are separated only by public right-of-way.
3. The goal of the Working Group process was to develop a text amendment that permits commercial wind energy projects provided there is adequate protection of adjacent property owners and residents. Six meetings were held between March 12<sup>th</sup> and May 21<sup>st</sup>, 2015 at the Roca Community Center or the Cortland Community Center in Gage County. The communities of Cortland and Roca graciously donated the use of their space for the meetings. The meetings were open to the public and typically 30 to 40 people attended. At the end of each meeting there was an open comment period for the general public. All of the information and presentations from the Working Group process is available on the Planning website at: <http://www.lincoln.ne.gov/city/plan/dev/wind/index.htm>

4. The first five meetings focused on sharing information about wind energy. Topics ranged from the economic benefits of wind energy to health and noise impacts. Staff prepared a discussion draft which was released in early May and was reviewed page by page with Working Group members at the final meeting.
5. The next draft of the text was released on June 8<sup>th</sup>, 2015. The public was encouraged to provide comments on this draft. Over 40 unique comments were received from the public which are included at the end of this report. The Audubon Society also submitted one comment from over 70 of it's members which is included as well.
6. After reviewing all the comments, the draft was revised for the Planning Commission public hearing and was released on July 9<sup>th</sup>, 2015. Comments received as of August 4<sup>th</sup>, 2015 are included at the end of the report as well.

Proposed Text

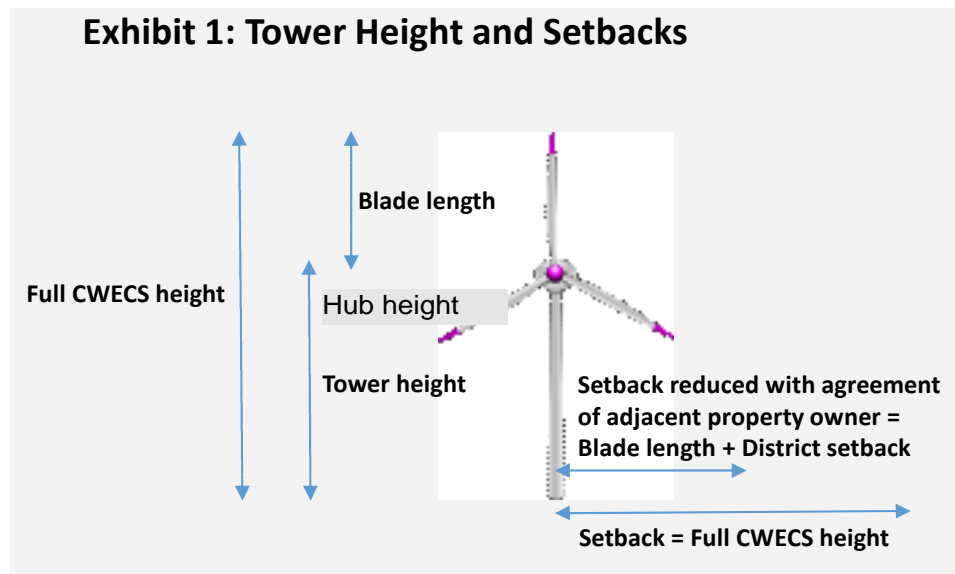
7. The proposed changes have different standards in some cases between participating and non-participating properties. A "participating" property has "entered into a contractual agreement with the CW ECS owner/operator." A contractual agreement may be in the form of a lease, easement, or letter of agreement signed by the legal owners of the property. This does not necessarily mean the property must be within the area of the special permit, but may have a separate agreement with the property owner.
8. There currently are no noise regulations in the County jurisdiction, although noise is mentioned in the conditions for Airfield, dwellings within 1320' of a public lake, race track and drag strip, and CW ECS. Airfields and dwellings near a lake do not mention specific noise standards, only that noise should be considered. Race tracks and drag strip have specific requirements based upon the pre-construction Noise Pollution Levels and allowing noise levels to exceed this baseline by 10 dB between 10 am and 6 pm, and 6 dB between 6 pm and 10 am, but in no case to exceed 81 dBA. (Note: dB or decibels is a measure of loudness of sound. dBA, decibels measured on the "A" scale, is often used because it approximates how the human ear responds to noise at moderate levels.)
9. Current standards in the County Zoning Resolution require the wind turbine to be rated at 35 dBA. There are currently no commercial wind turbines that are rated at 35 dBA. The majority are rated between 95 and 110 dBA. This means that currently a wind turbine could not be located in Lancaster County. Additionally, the value of the noise rating at the turbine is not as important as the experience of noise by residents in the area. This reference to the rating of the machine is recommended to be removed.
10. Typical noise emitted by common sources is reported differently by different sources of the information. The following is a sampling of typical noise levels as

compiled from those reported by Temple University Department of Civil/Environmental Engineering, the Noise Pollution Clearing House, Center for Human Performance & Health, Ontario, Canada, the US Environmental Protection Agency, and the 3M Occupational Health and Environmental Safety Division.

|  |              |
|--|--------------|
| Just audible to most people            | 10 dBA       |
| Quiet Rural Area                       | 30 dBA       |
| Quiet whisper at 3 ft                  | 30 dBA       |
| Ambient noise in a wilderness area     | 35 dBA       |
| Rural Residential                      | 39 dBA       |
| Agricultural Crop Land                 | 44 dBA       |
| Typical living room in a quiet house   | 35 - 45 dBA. |
| Quiet neighborhood in an urban setting | 40 - 45 dBA  |
| Refrigerator                           | 40 to 45 dBA |
| Wooded residential area                | 50 dBA       |
| Window air conditioner                 | 50 dBA       |
| A quiet conversation                   | 55 - 65 dBA  |
| An air conditioning unit at 100'       | 60 dBA       |
| Vacuum cleaner                         | 80 dBA       |
| Blender                                | 90 dBA       |
| Motorized lawn mower                   | 105 dBA      |

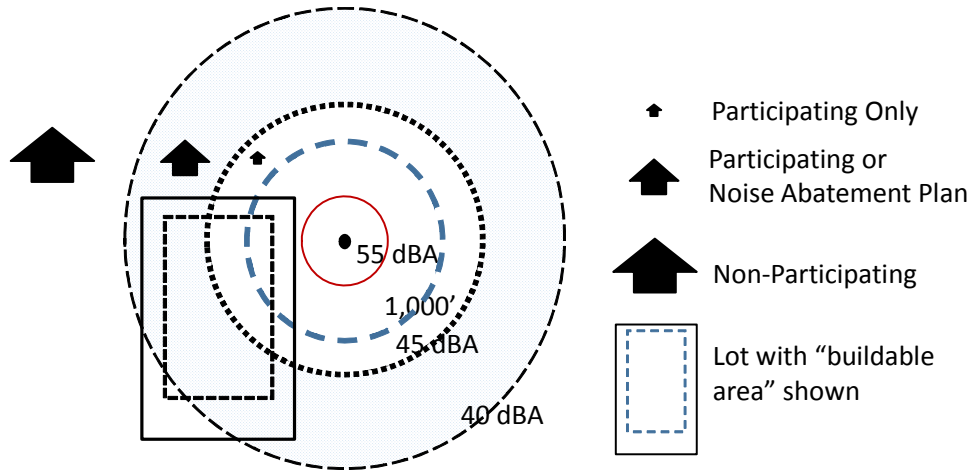
In addition to the perceived “loudness” of noise, it is important to understand that sound also has qualitative aspects and can be more disruptive to people when it is irregular, has higher or lower pitch, or has an impulsive character.

- The turbine height is defined as the hub height plus the rotor radius.



12. The following exhibit is for the review of setbacks and noise on non-participating lots.

Exhibit 2: Noise Contours and 1,000 foot Setback Affect on Unbuilt Lot.



Wind Turbine (center) with noise contours and 1,000 foot setback from dwellings shown. Lot with "buildable area" (area within the required district setbacks) demonstrates there is only a small area in the lower left corner that would remain outside the noise and 1,000 foot setback.

13. The Lincoln/ Lancaster County Health Department basis for recommendations regarding noise and noise monitoring are found in the attached document. The Health Department notes that these "recommendations are based on the most recent research and review reports cited on the next pages. Of particular importance to the updated recommendations were findings in studies published in late 2014 and early 2015. These studies expanded and improved the knowledge on the potential health risk posed by wind turbine noise, the percentage of people exposed to wind turbine noise that will be annoyed or extremely annoyed, and found that self-reported annoyance was statistically significantly associated with sleep disturbance, and human physiological responses of stress levels (as measured by cortisol) and increased blood pressure (directly measured in exposed individuals)."
14. The following pages review the various aspects of CWECs and the recommendations regarding the County zoning:

| Review Topic  | Action Recommended for Text Amendment   |
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| <b>Economic Implications for land owners &amp; County</b>   |   |
| <p>There are many positive economic benefits of wind turbines. Leaseholder receive substantial monthly income over a long period of time. Construction brings work and spending within the County as well as long term employment for a few employees to monitor the turbines. The owner of a wind energy generation facility must pay a nameplate capacity tax equal to the total nameplate capacity of the commissioned wind energy generation facility multiplied by a tax rate of \$3,518 per megawatt. In Custer County, a facility with 50 turbines, this amounted to \$280,000 per year divided among the various tax jurisdictions in the county. The state does not retain any of the proceeds for administration.</p> | <p>No specific text.<br/><br/>(Lancaster County and its residents will benefit by permitting commercial wind energy projects if there is adequate protection of adjacent property owners and residents.)</p>  |
| <b>Processing of Multiple Turbines over a Large Area</b>  |   |
| <p>Currently, for a large project with 40 or 50 or more turbines, the special permit rules could require 20 or more separate special permit applications. This would make processing difficult. The proposed text allows turbines in one project, but which are separated from one another only by the presence of public right-of-way may be combined into one special permit application. When a CW ECS special permit covers multiple premises, the lease or easement holder may sign the application rather than the lot owner.</p>   | <p>New proposed text:<br/><u>(a) In cases where CW ECS wind turbines are part of a unified plan, parcels which are separated from one another only by the presence of public right-of-way may be combined into one special permit application. When a special permit covers multiple premises, the lease or easement holder may sign the application rather than the lot owner.</u></p> |
| <b>Applicable codes</b>   |   |
| <p>CW ECS must meet all applicable electrical, building utility tie in codes and other local, State and Federal rules and regulations.</p>  | <p>Delete previous text (e). It is not necessary to note that CW ECS must all applicable electrical, building codes and other local, State and Federal rules and regulations.</p>   |

| Review Topic   | Action Recommended for Text Amendment   |
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| <b>Color, Finish and Lighting</b>  |   |
| <p>Most ordinances have some standard prohibition against turbines being used for advertising or bright colors to attract attention. Additional text is proposed to state that there shall be no advertising, logo, and that each turbine shall have onsite a name plate which contains contact information of the operator.</p> <p>Concern was expressed about flashing lights on top of a turbine. Any structure above 200 feet tall must be reviewed by the Federal Aviation Administration for obstruction analysis. The FAA, and other relevant Federal agencies, make a determination if the structure impacts private or commercial airspace. If it is determined the project constitutes no-hazard to air navigation, it will also analyze the project as a whole and provide its recommended lighting requirements. Prescribed lighting is typically a slow blinking red light. In addition, newer technology is in development with radar-activated lighting, which detect aircraft presence and thus vary the lighting according to the need.</p> | <p>Proposed revised text:<br/> <u>(b) Turbines shall meet all FAA requirements, including but not limited to lighting and radar interference issues. Strobe lighting shall be avoided if alternative lighting is allowed. Color and finish shall be white, gray or another non-obtrusive, non-reflective finish. There shall be no advertising, logo, or other symbols painted on the turbine other than those required by the FAA or other governing body. Each turbine shall have onsite a name plate which is clearly legible from the public right-of-way and contains contact information of the operator of the wind facility</u></p> |
| <b>Decommissioning of wind towers</b>  |   |
| <p>A decommissioning plan already requires removal of structures and restoration of land, as well as a requirement to post bonds that will assure the restoration work is accomplished. In a review of other jurisdictions, the requirements varies widely. Decommissioning plans are also often a part of the private lease agreements entered into with land owners.</p> <p>The revisions continue to require decommissioning plans for the removal of the tower itself but adding that four feet of soil is required between the ground level and cement base. Also add allowing up to one year before requiring removal to allow time for consideration of options after turbines cease operation. Removal of the access roads on private property would be left to the developer and property owners. Some property owners may wish to retain the access roads on private property.</p>   | <p>Proposed revised text:<br/> <u>(c) Each application shall have a decommissioning plan outlining the means, procedures and cost of removing the turbine(s) and all related supporting infrastructure and a bond or equivalent enforceable resource to guarantee removal and restoration upon discontinuance, decommissioning or abandonment. Each tower shall be removed within one year of decommissioning or revocation of the special permit. Upon removal of the tower, there shall be four feet of soil between the ground level and former tower's cement base.</u></p>   |



| Review Topic   | Action Recommended for Text Amendment  |
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| <b>Shadow Flicker</b>  |  |
| <p>Shadow flicker is the phenomenon caused by the moving shadow of the wind turbine blades moving over a point. The area where flicker is experienced moves as the sun's position relative to the ground changes throughout the day and season to season. It would be at the peak in winter months.</p> <p>One change to the July 9<sup>th</sup> draft is to address what happens if a turbine violates this standard on a dwelling unit constructed after the turbine is approved. In this case, the turbine becomes a non-conforming, but can remain subject to the zoning regulations for non-conforming uses.</p>  | <p>New text proposed:<br/> <u>(d) Any proposed turbine which is within half mile of any non-participating dwelling shall provide shadow flicker modeling data showing the expected effect of shadow flicker on non-participating properties. Shadow flicker shall not fall upon any non-participating dwelling, or other building which is occupied by humans, for more than 30 minutes in any one day, nor a total of 30 hours per any calendar year. If shadow flicker exceeds these limits, measures shall be taken to reduce the effects of shadow flicker on buildings, which may include shutting the turbine down during periods of shadow flicker. If a turbine violates this standard on a non-participating dwelling unit, constructed after the turbine is approved, then the turbine becomes a non-conforming use.</u></p> |
| <b>Environmental implications</b>  |  |
| <p>There is no significant impact on air or water resources. Footprint of any one turbine on land is relatively small. The University of Nebraska and the Nebraska Game and Parks Commission have developed a Nebraska Wind and Wildlife map which identifies the relative sensitivity of biological populations in Nebraska. Lancaster County is shown as an area of low sensitivity, however there are biologically unique areas within Lancaster associated with the Eastern Saline Wetlands which should be protected. Wind turbines do result in bird deaths, but it is relatively less nationally compared to cars, buildings, power lines, communication towers, agricultural chemicals and cats.</p> | <p>New text proposed:<br/> <u>(e) Construction and operation shall not adversely impact identified State or Federal threatened or endangered species such as saline wetlands, or rare natural resources such as native prairie and grasslands.</u></p>   |

| Review Topic  | Action Recommended for Text Amendment   |
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| <b>Ice Throw</b>  |   |
| <p>Ice throw is the phenomenon of ice, which builds up on turbine blades during particular meteorological conditions, being “thrown” from the blades as they turn or being blown from the blades as they are stationary. Most modern turbines are able to detect vibration of turbine blades that can be caused by a build-up of ice and are programmed to shut down in such conditions in order to address safety issues and to protect equipment from damage.</p> <p>Turbine condition monitoring (for example, torque and vibration sensing) will detect changes to the performance of the blades by damage or by ice accumulation and shut them down. In addition, the change to the shape of blade from ice changes the lift and thus the performance of the machine, in relation to its “ice-free” state, and this would also be detected. While safety is the top priority, such measures are also in the interest of machine longevity as operating with ice loads would add to torque loads, mechanical wear, reduced performance, etc.” The minimum setback of 1,000 feet provides sufficient space from all dwellings to protect from many of the impacts of the turbines.</p> | <p>No specific text.</p> <p>(New turbines are better designed to minimize and monitor ice on the blades. In addition, setbacks to the property line and right-of-way are substantial so no separate setback for ice throw is proposed.)</p>   |
| <b>Important view corridors</b>   |   |
| <p>Concern was expressed about wind turbines blocking the view to the State Capitol. Also concern about views from the Homestead National Monument (in Gage Co.), Nine Mile Prairie or Spring Creek prairie. There were opinions for and against having wind turbines along entryways into Lincoln. Some stated that they didn’t want their personal view from their house diminished by views of turbines. However, views from personal property can be altered by an adjoining property owner erecting accessory buildings or antennas or planting trees on their own property, though these would not be near the size of a wind turbine.</p>  | <p>New text proposed:<br/> <u>(f) No turbine shall obstruct or impair an identified view corridor or scenic vista of public value, as mapped on the Capitol View Corridors map in the Lincoln/Lancaster County Comprehensive Plan. The views from prominent environmental areas, such as Nine Mile Prairie and Spring Creek Prairie, shall also be protected from adverse visual or noise impacts. Any application which, upon initial review, poses a possible impact to these views will be required to be relocated or provide view shed mapping, and visual simulations from key observation points for review.</u></p> |

| Review Topic  | Action Recommended for Text Amendment  |
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| <b>Setback to Dwelling</b>  |  |
| <p>Current language requires a 1,000 foot setback to the property line of existing dwellings not associated with the project. The large variation in lot sizes in the AG district means some dwellings may sit on a large parcel with the dwelling at the far end while others are on a smaller parcel with the dwelling close to the property line. Measuring to the dwelling is a more consistent method.</p> <p>A setback of specific distance does not take into account differences in height of the turbines. For example, the visual impact of a 260 foot turbine is different than a 475 foot turbine. So many communities have include both a minimum setback and a setback based on height and used the greater distance. The increased distance reduces the visual impact, shadow flicker impact and the risk of ice throw. While distance does reduce noise, the primary measure for noise should be a noise standard which is addressed separately. The setback assists in noise reduction, but it will only be pertinent for noise reduction where the ambient background noise might be higher already, such as along a highway. The noise standard will be the primary measure for addressing any noise impacts.</p> <p>This setback is necessary for circumstances where there is not an existing dwelling on the adjacent non-participating property. If the adjacent lot is primarily for residential use (less than 10 acres) then the setback to the vacant lot should be larger. Ten acres was chosen as the dividing line between residential and farm lots. Lots of 10 acres or more can be created without a final plat because they are considered agricultural in use.</p> | <p>New text proposed:</p> <p>(g) <u>Setbacks to the turbine base:</u></p> <ol style="list-style-type: none"> <li>1) <u>For a non-participating lot of less than 10 acres, the setback shall be 1,000 feet or 3 times the turbine height (hub height plus the rotor radius), whichever is greater, measured to the property line.</u></li> <br/> <li>2) <u>For non-participating lot of 10 acres or greater, when there is a dwelling unit on the lot, the setback shall be 1,000 feet or 3 times the turbine height, whichever is greater, measured to the closest exterior wall of the dwelling unit.</u></li> <br/> <li>3) <u>For participating dwelling units, the setback shall be 1,000 feet to the closest exterior wall of the dwelling.</u></li> </ol> |

| Review Topic   | Action Recommended for Text Amendment   |
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| <b>Setback to Right of Way</b>   |   |
| <p>The purpose of this requirement is to provide for a “worst case scenario” of a tower falling over as a tree does when felled. In general towers are highly unlikely to fall over in this manner, and when failures have occurred they rather occur as a collapse of the tower. There are over 45,000 turbines in the U. S. and there are less than a dozen incidents of a complete collapse event, according to industry experts. The setback of the full turbine height is recommended by the County Engineer to be maintained when adjacent to public right-of-way in order to assure public safety and clear passage of traffic.</p>   | <p>New text proposed:<br/> <u>(g) Setbacks to the turbine base:</u><br/>                     4) <u>The setback to any public right-of-way or private roadway shall be no less than the turbine height.</u></p>  |
| <b>Setback to Special Permit Boundary</b>  |   |
| <p>In addition to the setbacks for streets or to lots with adjacent dwellings, the proposed text includes a standard setback along the perimeter of the special permit. This setback would apply to properties without a dwelling unit.</p>  | <p><u>(g) Setbacks to the turbine base:</u><br/>                     5) <u>Setbacks to the external boundary of the special permit area shall be no less than the turbine height, except that the owner of the adjacent property may sign an agreement allowing that setback to be reduced to the rotor radius plus the setback of the zoning district.</u></p> |
| <b>Impact on property value of adjacent land</b>   |   |
| <p>There is considerable debate about the impact of wind turbine projects on adjacent land values. There are so many factors that go into the value of a house and land that it is difficult to isolate individual elements. Certainly not everyone wants to live near to a wind turbine, so the number of potential buyers would be significantly reduced for small acreage lots. Particularly in an area with many available lots or homes, some buyers will not want a lot nearer to a wind turbine.</p> <p>Many acreage owners specifically moved onto an acreage to be further from the urban environment. However, even in a rural area, adjacent owners have the right to run machinery, build large accessory buildings that obstruct views and conduct farm operations late at night. So an acreage lot doesn't guarantee a quiet setting and unobstructed views.</p> | <p>Wind turbines can have more of an impact on the enjoyment and market for small acreage lots when compared to large farm parcels. Thus, the setback to a nonparticipating residential acreage lot under 10 acres should be larger than the setback to a farm property of more than 10 acres.</p>  |

| Review Topic   | Action Recommended for Text Amendment   |
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| <b>Impact on development and subdivisions</b>  |   |
| <p>It is possible that a non-participating vacant parcel could be significantly impacted by the noise of the turbines and fall within the turbine setbacks. The owner of the vacant parcel could still legally build on their lot, but the enjoyment of the parcel, particularly a smaller parcel could be reduced.</p> <p>The proposed text would require that lots, which because of the location of a CWECS are left with little land outside of the CWECS setbacks or the noise impact area, must be part of a contractual agreement with the CWECS owner/operator. There should be a standard that for vacant farm lots over 10 acres so that the area of the lot outside of the noise contours and setbacks is substantial. This will allow the owner of vacant land to have some choices in location on which to build a house outside of the setbacks and noise contours if they wish.</p> | <p>New text proposed:<br/> <u>(h) Any single turbine shall not impact a non-participating lot, (vacant or occupied; of any size), to the extent that, because of the location of turbine, the lot owner is left with less than 3 acres of land outside of the CWECS setbacks or the noise impact area in Section (l) below, unless they are part of an agreement with the CWECS owner/operator.</u></p> |
| <b>Emergency Response to turbine fire</b>  |   |
| <p>Some have suggested banning crops under turbines due to potential for lightning strikes and fires. This would significantly reduce the cropland area around a turbine. The risk of lightning strike and crop fire is not significantly more than other lightning strikes to warrant the significant increase in cost of wind turbines and resulting loss of crop land.</p>  | <p>No specific text necessary</p> <p>(Local volunteer fire departments and wind turbine operators should meet to discuss plan for if a turbine caught fire.)</p>  |
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| Review Topic  | Action Recommended for Text Amendment   |
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| <b>Noise</b>  |   |
| <p>Noise from wind turbines has been shown to be a significant concern and source of investigation. Recent research papers and studies on wind turbine noise and potential health impacts indicate that noise from wind turbines causes annoyance which can lead to sleep disturbance. In considering how to establish wind turbine noise level limits for dwellings, the Lincoln/Lancaster County Health Department (LLCHD) only considered potential negative public health impacts. In addition, the LLCHD believes that all persons should be afforded, regardless of lease agreements, the same level of public health protection.</p> <p>See attached report from Health Department on noise studies and noise recommendations.</p> <p>One change to the July 9<sup>th</sup> draft is to address what happens if a turbine violates this standard on a dwelling unit constructed after the turbine is approved. In this case, the turbine becomes a non-conforming, but can remain subject to the zoning regulations for non-conforming uses.</p> | <p><u>New text proposed:</u><br/> <u>(l) Noise: No CWECS or combination of CWECS turbine(s) shall be located as to cause an exceedance of the following as measured at the closest exterior wall of any dwelling located on the property. If a turbine violates a noise standard on a dwelling unit, constructed after the turbine is approved, then the turbine becomes a non-conforming use.</u></p> <p><u>For both participating and nonparticipating properties:</u><br/> <u>(1) From the hours of 7 am to 10 pm:</u></p> <p><u>* Forty (40) dBA maximum 10 minute Leq or;</u></p> <p><u>* Three (3) dBA maximum 10 minute Leq above background level as determined by a pre-construction noise study. The background level shall be a Leq measured over a representative 15 hour period.</u></p> <p><u>(2) From the hours of 10 pm to 7 am:</u></p> <p><u>* Thirty-seven (37) dBA maximum 10 minute Leq or</u></p> <p><u>* Three (3) dBA maximum 10 minute Leq above background level as determined by a pre-construction noise study. The background level shall be a Leq measured over a representative 9 hour period.</u></p> |

| Review Topic  | Action Recommended for Text Amendment  |
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| <b>Noise Studies &amp; Monitoring</b>   |  |
| <p>The purpose of noise studies is to provide data that will be used to assess potential public health impacts and compliance with the noise limits established in the county resolution.</p>   | <p><u>New text proposed:</u><br/>                     (j) <u>A professional pre-construction noise study shall be conducted which includes all property with a dwelling within one mile of a tower support base. The protocol and methodology for such studies shall be submitted to the Lincoln-Lancaster County Health Department for review and approval. Such studies shall include noise modeling for all four seasons and include typical and worst case scenarios for noise propagation. The complete results and full study report shall be submitted to the Lincoln-Lancaster County Health Department for review.</u></p> <p>(k) <u>Prior to the commencement of construction of any turbine, pre-construction noise monitoring may be conducted to determine ambient sound levels in accordance with procedures acceptable to the Lincoln-Lancaster County Health Department.</u></p> |
| <b>Public road improvements needed for construction</b>   |  |
| <p>In some jurisdictions, wind developers have rebuilt bridges, roads and intersections, under government supervision, in order to carrying the required loads during CWECS construction. This was the experience in Gage County where the developer worked in advance with government officials on the routing of construction equipment and necessary improvements. After the towers are built, the impact on the roads is minimal.</p> | <p><u>New text proposed:</u><br/>                     (l) <u>Prior to the commencement of construction of any turbine, the applicant shall enter into an agreement with the County Engineer regarding use of County roads during construction.</u></p>   |

| Review Topic   | Action Recommended for Text Amendment   |
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| <b>Noise Complaints</b>  |   |
| <p>The Building and Safety Department is the primary zoning enforcement agency. The County Board can revoke any special permit if the conditions of approval are not being met. Building and Safety often relies upon complaints received from the public to determine when investigative action needs to take place and possible enforcement action taken. In some cases, permit holders must make annual reports to Building and Safety providing specific information on the operation and activities of the permit site. The proposed process for handling noise complaints is to forward them to the Board for their consideration. The Board would then decide if noise monitoring is necessary.</p> | <p><u>New text proposed:</u><br/> <u>(m) At the discretion of the County Board, post-construction noise level measurements may be required to be performed in accordance with procedures acceptable to the Lincoln-Lancaster County Health Department.</u><br/> <u>(n) All noise complaints regarding the operation of any CWECS shall be referred to the County Board. The County Board shall determine if noise monitoring shall be required to determine whether a violation has occurred.</u></p> |
| <b>Interference</b>  |   |
| <p>A CWECS must not interfere with established radio or microwave signals. Most wind projects hire a company which maintains a database to report on potential impact of the project on any non-federal government microwave systems. In addition, projects provide their layout to the United States Department of Commerce – National Telecommunications and Information Administration, for review by appropriate federal agencies to identify any concerns regarding blockage of radio transmissions.</p>  | <p>No specific text.<br/><br/>                     (No need for local regulations since this concern is handled at federal level.)</p>  |
| <b>County Liability for approval of wind turbines</b>  |   |
| <p>The County Attorney’s Office determined that was no case law that would indicate a cause of action would exist against a County for issuance of a special permit for a wind turbine site that has a later accident. Additionally, the Political Subdivision Tort Claims Act enumerates an exemption to political subdivision liability if the claim is based on “the issuance, denial, suspension, or revocation of or failure or refusal to issue, deny, suspend, or revoke any permit, license, certificate, or order.” In the event the County was ever named in the type of law suit mentioned, this would undoubtedly be raised as a defense.</p>  | <p>No specific text necessary.</p>  |



15. Volkswind USA, was the applicant of the first proposed amendment in September 2014 to the Commercial Wind Energy regulations. Their application, Text Amendment #14014, was withdrawn in February 2015 prior to the Planning Commission public hearing. Volkswind has submitted alternative language to the proposal in this Text Amendment #15009. The alternative is attached.

Conclusion:

Given the amount of acreage development within Lancaster County, it will be difficult to meet the proposed regulations and still have a large scale wind operation. While wind energy is a goal of the Comprehensive Plan, it does not mean that should come at the cost to adjacent non-participating property owners. Lancaster County has numerous residents on smaller lots enjoying a quality of life in a rural setting. The “rural lifestyle” does come with noise and odors from agricultural operations. It also comes with large outbuildings and farm machinery. But none of these aspects of rural life compare to the potential impacts of a 250 to 500 foot wind turbine.

The changes to Section 13.018 provide for protection of the health, safety and welfare of the community while providing for the opportunity for the development of alternative energy in Lancaster County.

Prepared by

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13.018 Commercial Wind Energy Conversion System (CWECS).

A Commercial Wind Energy Conversion System (CWECS) may be allowed in the AG District by special permit under the conditions listed below:

(a) In cases where CWECS wind turbines are part of a unified plan, parcels which are separated from one another only by the presence of public right-of-way may be combined into one special permit application. When a special permit covers multiple premises, the lease or easement holder may sign the application rather than the lot owner.

~~(a) Each CWECS machine shall be no less than 1,000 feet from any property line of a dwelling unit not associated with the project.~~

~~(b) The distance from all external boundary lot lines and/or right-of-way lines of the special permit to any tower support base of the CWECS shall be equal to the height of the tower plus the rotor radius.~~

~~© Each CWECS machine, including all equipment, shall have a sound emission rating of no more than 35 dBA. Noise levels caused from the CWECS turbine(s) shall not exceed 35 dBA at the property line of any dwellings within a one mile radius of a CWECS turbine. A noise study, incorporating both A and C weighted noise impacts on property within one mile may be required. Noise rating shall conform to International Electrotechnical Commission (IEC) standards unless otherwise directed by a government agency.~~

~~(d) (b) Turbines shall meet all FAA requirements, including but not limited to lighting and radar interference issues. Strobe lighting shall be avoided if alternative lighting is allowed. Color and finish shall be white, gray or another non-obtrusive, non-reflective finish. There shall be no advertising, logo, or other symbols painted on the turbine other than those required by the FAA or other governing body. Each turbine shall have onsite a name plate which is clearly legible from the public right-of-way and contains contact information of the operator of the wind facility.~~

~~(e) All applicable electrical, building, utility tie-in codes and other government regulations shall apply.~~

~~(f) The distance from any tower base of a CWECS to any tower support base of another CWECS under other ownership shall be spaced a minimum of five (5) rotor diameters distance figured by the size of the largest rotor.~~

~~(g) © Each application shall have a decommissioning plan outlining the means, procedures and cost of removing the turbine(s) and all related supporting infrastructure and a bond or equivalent enforceable resource to guarantee removal and restoration upon discontinuance, decommissioning or abandonment. Each tower shall be removed within one year of decommissioning or revocation of the special permit. Upon removal of the tower, there shall be four feet of soil between the ground level and former tower's cement base.~~

~~(h) Said CWECS shall meet all Federal, State and local rules and regulations.~~

(d) Any proposed turbine which is within half mile of any non-participating dwelling shall provide shadow flicker modeling data showing the expected effect of shadow flicker on non-participating properties. Shadow flicker shall not fall upon any non-participating dwelling, or other building which is occupied by humans, for more than 30 minutes in any one day, nor a total of 30 hours per any calendar year. If shadow flicker exceeds these limits, measures shall be taken to reduce the effects of shadow flicker on buildings, which may include shutting the turbine down during periods of shadow flicker. If a turbine violates this standard on a non-participating dwelling unit, constructed after the turbine is approved, then the turbine becomes a non-conforming use.

(e) Construction and operation shall not adversely impact identified State or Federal threatened or endangered species such as saline wetlands, or rare natural resources such as native prairie and grasslands.

(f) No turbine shall obstruct or impair an identified view corridor or scenic vista of public value, as mapped on the Capitol View Corridors map in the Lincoln/ Lancaster County Comprehensive Plan. The views from prominent environmental areas, such as Nine Mile Prairie and Spring Creek Prairie, shall also be protected from adverse visual or noise impacts. Any application which, upon initial review, poses a possible impact to these views will be required to be relocated or provide view shed mapping, and visual simulations from key observation points for review.

(g) Setbacks to the turbine base:

- 1) For a non-participating lot of less than 10 acres, the setback shall be 1,000 feet or 3 times the turbine height (hub height plus the rotor radius), whichever is greater, measured to the property line.
- 2) For non-participating lot of 10 acres or greater, when there is a dwelling unit on the lot, the setback shall be 1,000 feet or 3 times the turbine height, whichever is greater, measured to the closest exterior wall of the dwelling unit.
- 3) For participating dwelling units, the setback shall be 1,000 feet to the closest exterior wall of the dwelling.
- 4) The setback to any public right-of-way or private roadway shall be no less than the turbine height.
- 5) Setbacks to the external boundary of the special permit area shall be no less than the turbine height, except that the owner of the adjacent property may sign an agreement allowing that setback to be reduced to the rotor radius plus the setback of the zoning district.

(h) Any single turbine shall not impact a non-participating lot, (vacant or occupied; of any size), to the extent that, because of the location of turbine, the lot owner is left with less than 3 acres of land outside of the CWECS setbacks or the noise impact area in Section (l) below, unless they are part of an agreement with the CWECS owner/operator.

(l) Noise: No CWECS or combination of CWECS turbine(s) shall be located as to cause an exceedance of the following as measured at the closest exterior wall of any dwelling located on the property. If a turbine violates a noise standard on a dwelling unit, constructed after the turbine is approved, then the turbine becomes a non-conforming use. For both participating and nonparticipating properties:

(1) From the hours of 7 am to 10 pm:

- o Forty (40) dBA maximum 10 minute Leq or;
- o Three (3) dBA maximum 10 minute Leq above background level as determined by a pre-construction noise study. The background level shall be a Leq measured over a representative 15 hour period.

(2) From the hours of 10 pm to 7 am:

- o Thirty-seven (37) dBA maximum 10 minute Leq or;
- o Three (3) dBA maximum 10 minute Leq above background level as determined by a pre-construction noise study. The background level shall be a Leq measured over a representative 9 hour period.

(j) A professional pre-construction noise study shall be conducted which includes all property with a dwelling within one mile of a tower support base. The protocol and methodology for such studies shall be submitted to the Lincoln-Lancaster County Health Department for review and approval. Such studies shall include noise modeling for all four seasons and include typical and worst case scenarios for noise propagation. The complete results and full study report shall be submitted to the Lincoln-Lancaster County Health Department for review.

(k) Prior to the commencement of construction of any turbine, pre-construction noise monitoring may be conducted to determine ambient sound levels in accordance with procedures acceptable to the Lincoln-Lancaster County Health Department.

(l) Prior to the commencement of construction of any turbine, the applicant shall enter into an agreement with the County Engineer regarding use of County roads during construction.

(m) At the discretion of the County Board, post-construction noise level measurements may be required to be performed in accordance with procedures acceptable to the Lincoln-Lancaster County Health Department.

(n) All noise complaints regarding the operation of any CWECS shall be referred to the County Board. The County Board shall determine if noise monitoring shall be required to determine whether a violation has occurred.