

# **ARTICLE 16 - WIND ENERGY CONVERSION FACILITIES**

## **SECTION 1601 Wind Energy Installation**

In any zoning district, a conditional use permit or building permit may be granted to allow a wind energy conversion system, including such devices as a wind charger, or wind turbine; subject to the regulations established in this section.

## **SECTION 1602 Small Wind Energy Systems**

### **1602.1 Purpose**

It is the purpose of this regulation to promote the safe, effective and efficient use of small wind energy systems installed to reduce the on-site consumption of utility supplied electricity in Custer County.

### **1602.2 Definitions**

The following are defined for the specific use of this section.

1. *Small Wind Energy System* shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power.
2. *Tower Height* shall mean the total height of the Wind Energy Conversion System from grade to the center of the hub.

### **1602.3 Requirements**

Small wind energy systems shall be permitted as an Accessory Use within any district. Certain requirements as set forth below shall be met:

1. Tower Height
  - A. For property sizes between ½ acre and one acre the tower height shall be limited to 80 feet.
  - B. For property sizes of one acre or more, there is no limitation on tower height, except as imposed by FAA regulations.
2. Setbacks
  - A. No part of the wind system structure, including guy-wire anchors, may extend closer than the building setbacks of the appropriate zoning district to the property lines of the installation site.
3. Noise
  - A. Small wind energy systems shall not exceed 50 dBA, as measured at the closest neighboring inhabited dwelling unit.
  - B. The noise level may be exceeded during short term events such as utility outages and/or severe wind storms.

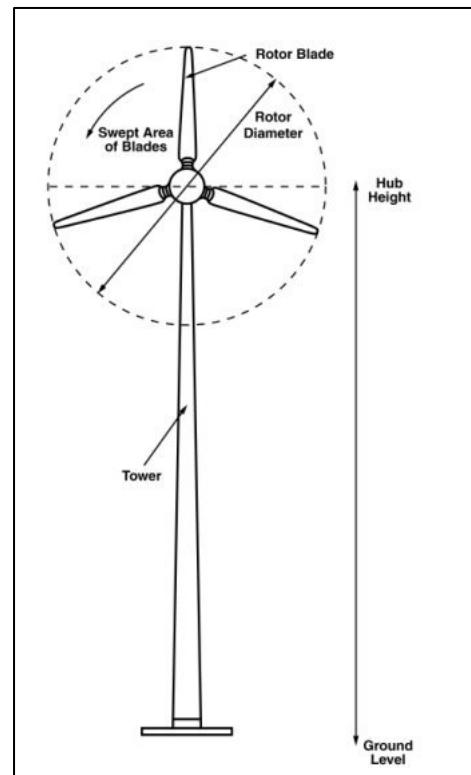


Figure 1

4. Approved Wind Turbines
  - A. Small wind turbines must have been approved under the Emerging Technologies program of the California Energy Commission or any other small wind certification program recognized by the American Wind Energy Association.
5. Compliance with Building and Zoning Codes
  - A. Applications for small wind energy systems shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.
  - B. An engineering analysis of the tower showing compliance with official building code of the governing body and/or the State of Nebraska certified by a professional engineer licensed and certified in Nebraska shall also be submitted. The manufacturer frequently supplies this analysis.
  - C. Wet stamps shall not be required.
6. Compliance with FAA Regulations
  - A. Small wind energy systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.
7. Compliance with National Electrical Code
  - A. Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code.
  - B. The manufacturer frequently supplies this analysis,
8. Utility Notification
  - A. No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator,
  - B. Off-grid systems shall be exempt from this requirement.

## **Section 1603 Commercial/Utility Grade Wind Energy Systems**

### **1603.1 Purpose**

It is the purpose of this regulation to promote the safe, effective and efficient use of commercial/utility grade wind energy systems within Custer County.

### **1603.2 Definitions**

The following are defined for the specific use of this section.

1. *Aggregate Project* shall mean projects that are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also part of the aggregate project.
2. *Commercial WECS/utility grade* shall mean a wind energy conversion system of equal to or greater than 100 kilowatts (KW) in total name plate generating capacity.
3. *Feeder Line* shall mean any power line that carries electrical power from one or more wind turbines or individual transformers associated with individual wind turbines to the point of interconnection with the electric power grid. In the case of interconnection with the high

voltage transmission systems the point of interconnection shall be the substation serving the wind energy conversion system.

4. *Meteorological Tower* shall mean, for purposes of this regulation, a tower which is erected primarily to measure wind speed and directions plus other data relevant to siting or operating a Wind Energy Conversion System. Meteorological towers do not include towers and equipment used by airports, the Nebraska Department of Roads, or other applications to monitor weather conditions.
5. *Public Conservation Lands* shall mean land owned in fee title by State or Federal agencies and managed specifically for conservation purposes, including but not limited to State Wildlife Management Areas, State Parks, federal Wildlife Refuges and Waterfowl Production Areas. For purposes of this regulation, public conservation lands will also include lands owned in fee title by non-profit conservation organizations. Public conservation lands will also include private lands upon which conservation easements have been sold to public agencies or non-profit conservation organizations.
6. *Rotor Diameter or Diameter* shall mean the diameter of the circle described by the moving rotor blades as shown in Figure 1.
7. *Small Wind Energy System* shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power.
8. *Substations* shall mean any electrical facility to convert electricity produced by wind turbines to a voltage greater than 35,000 volts (35 kV) for interconnection with high voltage transmission lines.
9. *Total Height* shall mean the highest point, above ground level, reached by a rotor tip or any other part of the Wind Energy Conversion System.
10. *Tower* shall mean the vertical structures that support the electrical, rotor blades, or meteorological equipment.
11. *Tower Height* shall mean the total height of the Wind Energy Conversion System from grade to the center of the hub.
12. *Transmission Line* shall mean the electrical power lines that carry voltages of at least 69,000 volts (69 KV) and are primarily used to carry electric energy over medium to long distances rather than directly interconnecting and supplying electric energy to retail customers.
13. *Wind Energy Conservation System* shall mean an electrical generating facility comprised of one or more wind turbines and accessory facilities, including but not limited to: power lines, transformers, substations and meteorological towers that operate by converting the kinetic energy of wind into electrical energy. The energy may be used on-site or distributed into the electrical grid.
14. *Wind Turbines* shall mean any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy using airfoils or similar devices to capture the wind.

### **1603.3 Requirements**

Commercial/Utility Grade wind energy systems shall be permitted as a Conditional Use within any district where the use is listed and allowed. The following requirements and information shall be met and supplied:

1. The name(s) of the project applicant.
2. The name of the project owner.
3. The legal description and address of the project.
4. A description of the project including; Number, type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnecting with the feeder lines.
5. Site layout, including the location of property lines, wind turbines, electrical grid, and all related accessory structures. This site layout shall include distances and be drawn to scale.
6. Engineer's certification that the wind turbines in the project comply with the National Electrical Code.
7. Documentation of land ownership or legal control of the property.
8. The latitude and longitude of individual wind turbines.
9. A USGS topographical map, or map with similar data, of the property and surrounding area, including any other Wind Energy Conversion System not owned by the applicant, within 1 mile of the proposed Wind Energy Conversion System.
10. Location of designated wetlands, designated scenic areas, and designated natural areas (including bluffs) within 1,320 feet of the proposed Wind Energy Conversion System.
11. An Acoustical Analysis that certifies that the noise requirements within this regulation can be met.
12. FAA letter of determination of no hazard to air navigation, if available.
13. Location of all known Communication Towers within five miles of the proposed Wind Energy Conversion System.
14. Decommissioning Plan consistent with Section 1603.6(10).
15. Description of potential impacts on nearby Wind Energy Conversion Systems and wind resources on adjacent properties not owned or leased by the applicant.

**1603.4 Aggregate Projects**

1. Aggregate projects may jointly submit a single application and be reviewed under joint proceedings, including notices, public hearings, reviews and as appropriate approvals.
2. Permits may be issued and recorded separately.
3. Aggregate projects will be assessed fees as one project.
4. Setbacks to property lines, not road rights-of way, may be less when adjoining property owners are within the same aggregate project.

**1603.5 Setbacks**

All towers shall adhere to the setbacks as measured from the nearest point of the base established in the following table:

	Wind Turbine – Non Commercial	WECS Wind Turbine – Commercial/Utility WECS	Meteorological Towers
Property Lines (other than right angle corners)	Diameter plus applicable building setback	Diameter plus applicable building setback	1.0 times the total height
Right angle corner property lines	Diameter plus applicable building setback from both property lines	Behind a line on the property lines drawn between two points 150’ from the property line intersection. Generator blades must not exceed the building setback lines on the non-road side, and shall not encroach on the right-of-way on the road side. (See Figure 2)	1.0 times the total height from both property lines
Occupied Dwelling Units (1) (2)	Diameter plus applicable building setback	¼ mile	1.0 times the total height plus applicable building setback
Road Rights-of-Way (3)	Diameter plus applicable building setback	Generator blades shall not encroach on the right-of-way.	1.0 times the total height plus applicable building setback
Other Rights-of-Way	Diameter plus applicable building setback	Generator blades shall not encroach on the right-of-way.	1.0 times the total height plus applicable building setback
Public Conservation Lands including Wildlife Management Areas and State Recreation Areas	Applicable building setback	Diameter plus applicable building setback	1.0 times the total height plus applicable building setback
Other structures not on the applicant’s project site	NA	Diameter	1.0 times the total height
River Bluffs of over 15 feet		Diameter	

- (1) The setback for dwelling units shall be reciprocal in that no dwelling unit shall be constructed within the same distance required for a commercial/utility Wind Energy Conversion System.
- (2) An easement between a landowner and a WECS developer reducing the setback distance between a turbine and a residence, is allowed.
- (3) The setback shall be measured from any future Rights-of-Way if planned changed or expanded right-of-way is formally being considered by the County.

**1603.6 Special Safety and Design Standards**

All towers shall adhere to the following safety and design standards:

1. Clearance of rotor blades or airfoils must maintain a minimum of 12 feet of clearance between their lowest point and the ground.
2. All Commercial/Utility WECS shall have a sign or signs posted on the tower, transformer and substation, warning of high voltage. Other signs shall be posted on the turbine with emergency contact information.
3. All wind turbines, which are a part of a commercial/utility WECS, shall be installed with a tubular, monopole type tower.
4. Consideration shall be given to painted aviation warnings on all towers less than 200 feet.

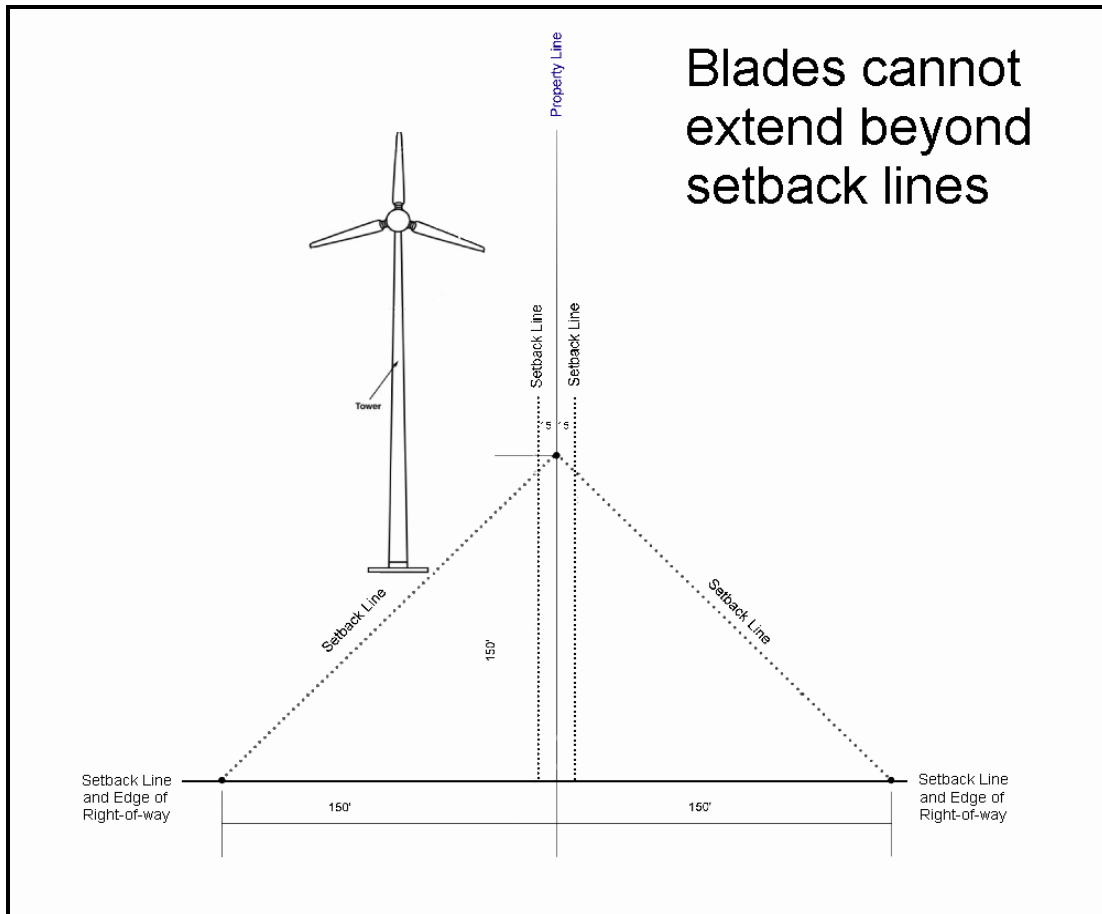


Figure 2

5. Color and finish:

All wind turbines and towers that are part of a commercial/utility WECS shall be white, grey, or another non-obtrusive color. Finishes shall be matte or non-reflective.

6. Lighting:

Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the FAA regulations. If required by FAA red strobe lights shall be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds. Red pulsating incandescent lights should be avoided.

7. Other signage:

All other signage shall comply with the sign regulations found in the Custer County Zoning regulations.

8. Feeder Lines:

All communications and feeder lines installed as part of a WECS shall be buried, where practicable.

9. Waste Disposal:

Solid and Hazardous wastes, including but not limited to crates, packaging materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site

promptly and disposed of in accordance with all applicable local, state and federal rules and regulations.

10. Discontinuation and Decommissioning;

A WECS shall be considered discontinued after one year without energy production, unless a plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service or unless non-production is caused by an event of Force Majeure. All WECS and accessory facilities shall be removed to four (4) feet below ground level within 180 days of the discontinuation of use. This period may be extended by the Zoning Administrator following a written request by an agent or the owner of the WECS.

Each Commercial/Utility WECS shall have a Decommissioning plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon being discontinued. The cost estimates shall be made by a competent party; such as a Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities.

11. Shadow/Flicker

A flicker study needs to be submitted in order to obtain a conditional use permit. Each study will contain the following input:

- Turbine location (latitude and longitude)
- Shadow Flicker receptor (dwelling) locations (latitude and longitude)
- U.S. Geological Survey (USGS) 1:24,000 topographic scale and USGS Digital Elevation Model (DEM) (height contours)
- Turbine rotor diameter
- Turbine hub height
- Wind speed and direction frequency distribution data
- Sunshine hours (long term monthly reference data)
- Identification of the model and turbine size

Output from the model must include the following information:

- Calculated shadow-flicker time at selected receptors
- Tabulated and plotted time of day with shadow flicker at selected receptors
- Map showing turbine locations, selected shadow-flicker receptors and iso-line contours indications projected shadow-flicker time (hours per year).

12. Noise:

No Commercial/Utility WECS shall produce noise levels that exceed 50 dBA, or the ambient sound pressure level plus five (5) dBA, whichever is greater at the nearest structure occupied by humans, applying commonly accepted measurement instruments and standards. Exception: a Commercial/Utility WECS may exceed 50 dBA during periods of severe weather as defined by the US Weather Service.

13. Noise assessment study:

When a wind turbine is proposed within a distance equivalent to three times the blade-tip height from an occupied residence, a 24 hour noise assessment study conducted by a qualified professional shall be required. That noise study then needs to be submitted in order to obtain a conditional use permit. Each study shall contain the following information:

1. An estimation or survey of the existing ambient background noise levels.

2. Prediction (or measurement) of noise levels from the turbine(s) at and near the occupied residence.
3. Identification of the model and turbine size for sound propagation (sound modeling software shall include a propagation model.)
4. Comparing calculated sound pressure levels from the wind turbines with the background sound pressure levels at the locations of concern.

14. Interference:

Any Wind Energy Conversion System or component thereof, shall not interfere with any existing electromagnetic communications, such as radio, telephone, or television signals. The applicant shall notify all communication tower operators within (5) five miles of the proposed WECS location upon application to the county for permits, and shall provide the contact list to the county zoning authority.

15. Roads:

Applicants shall:

- A. Identify all county, municipal or township roads to be used for the purpose of transporting WECS, substation parts, cement, and/or equipment for construction, operation or maintenance of the WECS and obtain applicable weight and size permits from the impacted jurisdictions prior to transportation of materials and equipment.
- B. Conduct a pre-construction survey, in coordination with the appropriate jurisdictions to determine existing road conditions. The survey shall include photographs and a written agreement to document the condition of the public facility.
- C. Be responsible for restoring the road(s) and bridges to preconstruction or better conditions.

16. Drainage System:

The applicant shall be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the WECS.

17. Enforcement:

If a complaint from a resident of a dwelling within or near a WECS project area has been filed with the Zoning Administrator, no enforcement action shall be taken until arbitration has taken place between the complainant and the WECS owner. Such arbitration shall take place within thirty (30) days of the complaint being filed. Once this step has been completed, the following shall apply:

If a commercial/utility wind energy conversion system is proven to be not in compliance with the regulations established in Article 16 of the Custer County Zoning Regulations, the commercial/utility WECS must discontinue operation of the turbine(s) in question. The turbine(s) in question will not be allowed to resume operation until compliance is met. An independent study to review the complaint will be conducted and is to be paid for by the complainant. If non-compliance is proven, Custer County shall reimburse the complainant 50% (not to exceed \$3000.00) of the cost of the study.

**1603.7 Easements**

Easements between a landowner and a WECS developer concerning setbacks, noise and shadow flicker shall be allowed.

**1603.8 Fees**

Permit Fees:



Fees for WECS shall be established by the County Board of Supervisors.