

## CHAPTER 28

### WIND ENERGY CONVERSION SYSTEMS (WECS)

#### SECTION:

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**10-28-1: PURPOSE:** This ordinance is established to regulate the installation and operation of Wind Energy Conversion Systems within the City not otherwise subject to regulation and oversight by the State of Minnesota. No person shall construct or operate a wind energy conversion system (WECS) without having fully complied with the provisions of this section.

**10-28-2: APPLICATION:** Wind conversion systems may be allowed as an accessory use by a conditional use permit within specified zoning districts of the City, subject to the regulations and requirements of this Section, provided the property upon which the system is at least five (5) acres in size.

**10-28-3: DECLARATION OF CONDITIONS:** The City Council may impose such conditions on the granting of SWECS conditional use permit as may be necessary to carry out the purpose and provisions of this Section and to maintain compatibility.

**10-28-4: SITE PLAN DRAWING:** All applications for WECS conditional use permit shall be accompanied by a detailed site plan drawn to scale and dimensioned, displaying the following information:

- A. Lot lines and dimensions.
- B. A description of the project, including:

1. Number;
  2. Type;
  3. Name plate generating capacity;
  4. Tower Height;
  5. Rotor diameter; and
  6. Total Height.
- C. Location and height of all buildings, structures, above ground utilities, and trees on the lot, including both existing and proposed structures and guy wires anchors.
- D. Locations and height of all adjacent buildings, structures, above ground utilities and trees located within three hundred (350) feet of the exterior boundaries of the property in question.
- E. Existing and proposed setbacks of all structures located on the property in question.
- F. Sketch elevation of the premises accurately depicting the proposed WECS and its relationship to structures on adjacent lots.

**10-28-5: COMPLIANCE WITH STATE BUILDING CODE:** Standard drawings of the structural components of the wind energy conversion system and support structures, including base and footings shall be provided along with the engineering data and calculations to demonstrate compliance with the structural design provisions of the State Building Code especially with regards to wind and icing loads. Drawings and engineering calculations shall be certified by a registered engineer.

**10-28-6: COMPLIANCE WITH NATIONAL ELECTRICAL CODE:** WECS electrical equipment and connections shall be designed and installed in adherence to the National Electrical Code as adopted by the City.

**10-28-7: MANUFACTURER WARRANTY:** The applicant shall provide documentation or other evidence from the dealer or manufacturer that the WECS has been successfully operated in atmospheric conditions similar to the conditions within the City. The WECS shall be warranted against any system failures reasonably expected in severe weather operation conditions.

**10-28-8: DESIGN STANDARDS:**

- A. **Height:** The permitted maximum height of a WECS shall be determined in one of two ways. In determining the height of the WECS, the total height of the

system shall be included. System height shall be measured from the base of the tower to the highest possible extension of the rotor.

1. A ratio of one (1) foot to one (1.5) foot between the distance of the closest property line to the base of SWECS to the height of the system.
2. A maximum system height of one hundred (100) feet.

The shortest height of the two above mentioned methods shall be used in determining the maximum allowable height of a SWECS system. The height of a WECS must also comply with FAA Regulation Part 77 "Objects Affecting Navigable Air Space" and/or MnDOT Rule 14, MCAR 1.3015 "Criteria for Determining Obstruction to Air Navigation."

**B. Setbacks:**

1. Property Lines. One and one-half (1.5) times the total height.
2. Principle Structure: One and one-half (1.5) times the total height.
3. Other structures: One and one-half (1.5) times the total height.
4. Neighboring Dwellings: Three hundred (300) feet.
5. Rights of Way: One and one-half (1.5) times the total height.
6. Other existing WECS = To be considered, based upon:
  - a. Relative size of the existing and proposed WECS;
  - b. Alignment of the WECS relative to the predominant winds;
  - c. Topography;
  - d. Property line setback of existing WECS; and
  - e. Other setbacks required.

No WEC may be erected in any required yard (except a rear yard) or within a public or private utility and drainage easement.

- C. **Rotor Size:** All WECS rotors shall not have rotor dimensions greater than twenty-six (26) feet in diameter.
- D. **Rotor Clearance:** Blade-arcs created by the WECS shall have a minimum of thirty (30) feet of clearance over any structure or tree within a two hundred (200) foot radius.
- E. **Rotor Design:** The blade design and materials are to be designed and constructed to ensure safe operation in an urban/rural area.

- F. **Rotor Safety:** Each WECS shall be equipped with both a manual and automatic braking device capable of stopping WECS operation in high wind (forty [40] MPH or greater) or in conditions of imbalance.
- G. **Lightning Protection:** Each WECS shall be grounded to protect against natural lightning strikes in conformance with the National Electrical Code as adopted by the City.
- H. **Component Compatibility:** The Wind turbine and wind turbine tower are to be designed and constructed to be compatible.
- I. **Tower Access:** To prevent unauthorized climbing, WECS towers must comply with one of the following provision:
1. Tower climbing apparatus shall not be located within twelve (12) feet of the ground.
  2. A locked anti-climb device shall be installed on the tower.
  3. Tower capable of being climbed shall be enclosed by a locked, protective fence at least eight (8) feet high.
- J. **Signs:** WECS shall have one sign, not to exceed two (2) square feet at the base of the tower and said sign shall contain the following information:
1. Warning high voltage.
  2. Manufacturer's name.
  3. Emergency phone number.
  4. Emergency shutdown procedures.
- K. **Lighting:** Unless otherwise required by state or federal regulation, no lighting or illumination of a WECS shall be permitted.
- L. **Electromagnetic Interference:** WECS shall be designed and constructed so as not to cause radio and television interference.
- M. **Noise Emissions:** All WECS shall comply with all applicable local, state, and federal regulations governing noise.
- N. **Utility Company Interconnection:** No WECS shall be interconnected with the local electrical utility company until the utility company and the City Engineer have commented upon such proposal. The interconnection of the WECS with the utility company shall adhere to the National Electrical Code as adopted by the City.

- O. **Color and Finish:** All wind turbines and towers shall be white, grey, or another non-obtrusive color. Finishes shall be matte or non-reflective.
- P. **Electrical Wires:** All electrical wires installed as part of a WECS shall be buried whenever reasonably possible.
- Q. **Interference:** Steps shall be taken to minimize or mitigate interference with electromagnetic communications, such as radio, telephone, microwaves, or television signals, caused by any WECS.
- R. **Overspeed Controls:** All WECS shall be equipped with a redundant braking system. This includes both aerodynamic (including variable pitch) overspeed controls and mechanical brakes. Mechanical brakes shall be operated in a fail-safe mode, whereby they are engaged in the case of load loss on the generator. Stall regulation shall not be considered a sufficient braking system for overspeed protection.
- S. **Fail Points:** All WECS shall have fail points so as to assure that the structure will collapse on the subject site and not extend to and jeopardize life or adjacent property.
- T. **Guy Wires:** If it is determined that guy wires or guy wire anchors are needed, guy wires or guy wire anchors shall not be erected within public or private utility and drainage easements or required buffer yards and shall be set back a minimum of five (5) feet from all lot lines.
- U. **Lightning Protection:** All WECS shall be grounded to protect against natural lightning strikes in conformance with the National Electrical Code as adopted by the City.

**10-28-9: ORNAMENTAL WIND DEVICES:** Ornamental wind devices that are not a WECS shall be exempt from the provisions of this Section and shall conform to other applicable provisions of this Chapter and the City Code including height.

**10-28-10: BUILDING PERMIT:** A building permit must be obtained prior to construction accompanied by the information required in this Ordinance. The building official must approve the plans before installation.

**10-28-11: INSPECTION:** The City hereby reserves the right upon issuing any WECS conditional use permit to inspect the premises on which the WECS is located. If a WECS is not maintained in operational condition and poses a potential safety hazard, the owner shall upon written notice from the City, take expeditious action to correct the situation.

**10-28-12: ABANDONMENT:** The use of a WECS shall be considered discontinued after one hundred eighty (180) days without energy production. All WECS and accessory facilities shall be removed within ninety (90) days of the discontinuation of use.