

SECTION 1036 – ALTERNATIVE ENERGY SYSTEMS

(Ord. 2010-03, 07/28/10)

SECTION:

- 1036.01: Purpose
- 1036.02: Geothermal Systems
- 1036.03: Solar Energy Systems
- 1036.04: Wind Energy Conversion Systems (WECS)

1036.01: PURPOSE: It is the goal of the City to provide a sustainable quality of life for the city's residents, making careful and effective use of available natural, human and economic resources and ensuring that resources exist to maintain and enhance the quality of life for future residents. In accordance with that goal, the city finds that it is in the public interest to encourage alternative energy systems that have a positive impact on energy production and conservation while not having an adverse impact on the community. Therefore, the purposes of this section include:

- (a) To promote rather than restrict development of alternative energy sources by removing regulatory barriers and creating a clear regulatory path for approving alternative energy systems.
- (b) To create a livable community where development incorporates sustainable design elements such as resource and energy conservation and use of renewable energy.
- (c) To protect and enhance air quality, limit the effects of climate change and decrease use of fossil fuels.
- (d) To encourage alternative energy development in locations where the technology is viable and environmental, economic and social impacts can be mitigated.

1036.02: GEOTHERMAL SYSTEMS:

Subd. 1. Zoning districts. Geothermal systems in accordance with the standards in this section are allowed as a permitted accessory use in all zoning districts.

Subd. 2. Standards.

- 1. System requirements.
 - a. Only closed loop geothermal systems utilizing heat transfer fluids as defined in Section 1001.02 are permitted. Open loop geothermal systems are not permitted.
 - b. Geothermal systems in public waters may be permitted in business, industrial or R-3 Districts as an interim use in accordance with Section 1010 subject to approval from the Minnesota Department of Natural Resources.
 - c. Geothermal systems in water bodies owned or managed by the City of Big Lake may be permitted in business, industrial or R-3 Districts as an interim use in

accordance with Section 1010 subject to approval from the Minnesota Department of Natural Resources.

2. Setbacks.
 - a. All components of geothermal systems including pumps, borings and loops shall be set back at least 5 feet from interior side lot lines and at least 10 feet from rear lot lines.
 - b. Above-ground equipment associated with geothermal systems shall not be installed in the front yard of any lot and shall meet all required setbacks for the applicable zoning district.
3. Easements. Geothermal systems shall not encroach on public drainage, utility roadway or trail easements.
4. Noise. Geothermal systems shall comply with Minnesota Pollution Control Agency standards outlined in Minnesota Rules Chapter 7030.
5. Screening. Geothermal systems are considered mechanical equipment and subject to the requirements of Section 1027.04.

Subd. 3. Safety. Geothermal systems shall meet the requirements of the State Building Code.

Subd. 4. Abandonment. If the geothermal system remains nonfunctional or inoperative for a continuous period of one year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The owner shall remove the abandoned system at their expense after a demolition permit has been obtained in accordance with the following:

1. The heat pump and any external mechanical equipment shall be removed.

Subd. 5. Permits. A building permit shall be obtained for any geothermal system prior to installation.

1036.03 SOLAR ENERGY SYSTEMS:

Subd. 1. Zoning districts. Solar energy systems in accordance with the standards in this section are allowed as a permitted accessory use in all zoning districts.

Subd. 2. Standards.

1. Exemption. Passive or building-integrated solar energy systems are exempt from the requirements of this section and shall be regulated as any other building element.

2. Minimum lot size. In the R-5, Residential Redevelopment District, a minimum lot size of 12,000 square feet is required for ground-mounted solar energy systems. Standard minimum requirements apply for other zoning districts.

3. Height.

- a. Roof-mounted solar energy systems shall comply with the maximum height requirements in the applicable zoning district.
- b. Roof-mounted solar energy systems exceeding the applicable zoning district height may be approved with a conditional use permit.
- c. Ground-mounted solar energy systems shall not exceed 15 feet in height.

4. Location. For ground-mounted solar energy systems:

- a. Residential Districts Rear yard
- b. Business/Commercial Front, side or rear yard
- c. Industrial Front, side or rear yard
- d. TOD Midway or Transition Zones
- e. Downtown Design District Not allowed in Central Business District Zone

5. Setbacks. Ground-mounted solar energy systems including any appurtenant equipment shall be set back a minimum of 15 feet from all property lines and a minimum of 30 feet from all buildings located on adjacent lots. Shoreland District setbacks shall apply. Roof-mounted systems shall comply with all building setbacks in the applicable zoning district and shall not extend beyond the exterior perimeter of the building on which the system is mounted.

6. Easements. Solar energy systems shall not encroach on public drainage, utility roadway or trail easements.

7. Screening. Solar energy systems shall be screened from view to the extent possible without reducing their efficiency, but are exempt from the strict requirements of Section 1027.04. Screening may include walls, fences or landscaping.

8. Maximum area. In residential zoning districts, ground-mounted solar energy systems shall be limited to a maximum area consistent with the accessory structure limitations in Section 1020 or no more than 25 percent of the rear yard, whichever is less.

9. Aesthetics. All solar energy systems shall use colors that blend with the color of the roof or other structure. Reflection angles from collector surfaces shall be oriented away from neighboring windows. Where necessary, screening may be required to address glare.

10. Feeder lines. The electrical collection system shall be placed underground within the interior of each parcel. The collection system may be placed overhead near substations or points of interconnection to the electric grid.

Subd. 3. Safety. Solar energy systems shall meet the requirements of the State Building Code.

Subd. 4. Abandonment. If the solar energy system remains nonfunctional or inoperative for a continuous period of one year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The owner shall remove the abandoned system at their expense after a demolition permit has been obtained. Removal includes the entire structure including transmission equipment.

Subd. 5. Permits. A building permit shall be obtained for any solar energy system prior to installation.

1036.04: WIND ENERGY CONVERSION SYSTEMS (WECS):

Subd. 1. Residential zoning districts.

1. Wind energy conversion systems shall be permitted as an accessory use, which conditions shall include, but are not limited to the following:

- a. For lots under two acres in size wind energy conversion systems shall be roof mounted.
- b. Height shall be limited to that of applicable zoning district regulation.

2. Conditional use permit required for any wind energy conversion systems, which conditions shall include, but are not limited to the following:

- a. For lots under two acres in size, any roof mounted wind energy conversion system exceeding the allowed zoning district height regulation.
- b. For lots over two acres and under 20 acres in size wind energy conversion systems shall be roof mounted or attached to a monopole in the rear yard that is under 100 feet in height.
- c. For lots 20 acres and over, wind energy conversion systems shall be roof mounted or attached to a monopole that may be over 100 feet in height.
- d. Lot line setbacks shall be equal to maximum turbine blade height. If over 100 feet in height the setback shall be as follows: for each foot over 100, add an additional 0.5 feet to the setback from residentially zoned lot line (example, a 150-foot tall tower would need to be setback 175 feet from the lot line).
- e. Shoreland District setbacks shall apply.

Subd. 2. Nonresidential zoning districts.

1. Permitted accessory use if under 100 feet in height.
2. Conditional use if over 100 feet in height and/or more than one pole mounted on a lot.
3. Lot line setbacks shall be equal to maximum turbine blade height. If over 100 feet in height the setback shall be as follows: for each foot over 100, add an additional 0.5 feet to the setback from residentially zoned lot line (example, a 150-foot tall tower would need to be setback 175 feet from the lot line).
4. Shoreland District setbacks shall apply.
5. No limit on the number of roof mounted turbines.

Subd. 3. TOD District

1. For lots within the Station Zone, roof mounted wind energy conversion systems shall be permitted as an accessory use and subject to zoning height restrictions. Limit one roof mounted turbine per building.
2. For lots within the Midway and Transition Zone,
 - a. Permitted accessory use if under 100 feet in height.
 - b. Conditional use if over 100 feet in height and/or more than one pole mounted on a lot.
 - c. Lot line setbacks shall be equal to maximum turbine blade height. If over 100 feet in height the setback shall be as follows: for each foot over 100, add an additional 0.5 feet to the setback from residentially zoned lot line (example, a 150-foot tall tower would need to be setback 175 feet from the lot line).
 - d. Shoreland District setbacks shall apply.
 - e. Limit one roof mounted turbine per building allowed in Midway Zone. No limit on the number of roof mounted turbines in the Transition Zone.

Subd. 5. Downtown Design District

1. Roof mounted wind energy conversion systems shall be permitted as an accessory use and subject to zoning height restrictions. Limit one roof mounted turbine per building.

Subd. 6. For all zoning districts.

1. Free standing towers, where permitted, shall be of monopole design.

2. All wind energy conversion systems shall be equipped with an automatic overspeed control device as part of the design.
3. All wind energy conversion systems shall comply with Minnesota Pollution Control Agency noise standards outlined in Minnesota Rules Chapter 7030.
4. Minimum blade clearance to ground of 30 feet for pole mounted horizontal turbines.
5. Setbacks along public land may be waived or reduced at the discretion of public body in ownership of said land, subject to the review and approval of the city council.
6. All applicable provisions of chapter 9 of this Code, including, but not limited to, the applicable provisions of the state building codes therein adopted, shall be complied with, in addition to those requirements set out in this article and chapter 10.
7. Prior to the issuance of a permit, the applicant shall provide, among other things, to the city documentation or other evidence from the dealer or manufacturer that the wind energy conversion system has been successfully operated in atmospheric conditions and is warranted against any systems failures under reasonably expected severe weather operating conditions as established by the director of fire and building inspection services. The applicant shall also provide, among other things, to the city documentation that the tower structure for the system has received a professional engineer's certification.
8. Wind energy conversion system tower foundations shall be designed to resist two times the wind uplift calculated pursuant to the Uniform Building Code as adopted by the city and shall have a professional engineer's certification.
9. No wind energy conversion system tower shall be constructed within 20 feet laterally of an overhead electrical power line (excluding secondary electrical service lines or service drops). The setback from underground electric distribution lines shall be at least five feet.
10. No wind energy conversion system or support tower of any kind shall be erected anywhere within the city without first making an application for and obtaining from the city a permit therefore which shall not be granted unless all requirements of this article are met and the proposed use will not be harmful to the public health, welfare and safety.
11. Wind energy conversion systems and towers shall be adequately grounded, as determined by the city engineer, for protection against a direct strike by lightning and shall comply, as to electrical wiring and connections, with all applicable federal regulations, state statutes, regulations, and standards, as well as city codes.
12. For all wind energy conversion system towers, effective measures shall be taken to prevent public interference and to place the tower in a substantially non-climbable condition. Effective measures include removal of climbing rungs or ladders from the

bottom eight feet of the tower. The intention shall be to prevent climbing of the tower by unauthorized persons.

13. Except for illumination devices required by FAA regulations and residential lighting in compliance with city codes, no wind energy conversion system or tower shall have affixed or attached to it in any way any sign (does not include equipment labels), banner, or placard of any kind, except for one sign, not to exceed two square feet, which displays suitable warning of danger to unauthorized persons, the system's manufacturer, and emergency shut-down procedures.

14. All wind energy conversion systems shall comply with all applicable Federal Communications Commission regulations, as amended.

15. All wind energy conversion systems shall comply with all applicable Federal Aviation Administration regulations, as amended.

16. The interface of a wind energy conversion system with the consumer's electric service shall be pursuant to all applicable federal and state regulations. The city encourages the owner to notify his local electric utility company in advance and requests that both parties regulate their activities in a cooperative manner.

17. If the wind energy conversion system remains nonfunctional or inoperative for a continuous period of one year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The owner shall remove the abandoned system at their expense after a demolition permit has been obtained. Removal includes the entire structure including mechanical equipment.