

10.12 RENEWABLE ENERGY SYSTEMS

10.12.1 Wind Energy Conversion Systems (AS AMENDED 19 September 2006) (AS AMENDED 6 April 2010)

10.12.2 Solar Energy Systems (SES)

A. Purpose:

This ordinance aims to promote the accommodation of distributed, on-site residential and non-residential solar energy systems (SES) and associated equipment, as well as provide adequate access to sunlight necessary for such systems. This ordinance does not address utility-scale SES.

This ordinance permits SES as either primary or accessory uses, while protecting the safety and welfare of adjacent and surrounding land uses through appropriate zoning and land use controls. Where general standards and specific criteria overlap, specific criteria shall supersede general standards.

Types of Solar Energy Systems (SES):

1. **Accessory (<250 kW):** Accessory to the primary use of the land, designed to supply energy for onsite residential use.
 - a. Rooftop SES:
 - i. These systems are allowed accessory uses in all districts in which buildings are permitted.
 - ii. No land use permit is required.
 - b. Ground-mount SES:
 - i. Ground-mount systems are permitted accessory uses in all districts in which buildings are permitted.
 - ii. Ground-mount systems require a land use permit and are subject to the standards for the district in which it is located, including setback, height, and impervious surface coverage limits.
 - iii. The collector surface of a ground-mount system is not considered impervious surface, but any foundation, compacted soil, or other component of the solar installation that rests on the ground is considered impervious surface.
2. **Solar Garden (250 kW – <10 MW):** Roof or ground-mount SES, may be either accessory or primary use.
 - a. Rooftop SES are permitted in all districts in which buildings are permitted. No land use permit is required.
 - b. Ground-mount Solar Gardens require a conditional use permit in all districts.
 - c. All structures must comply with setback, height, and coverage limitations for the district in which the system is located.

- d. Ground-mount Solar Gardens must comply with all required standards for structures in the district in which the system is located.
3. **Solar Farm (10 – <50 MW):** Roof or ground-mount SES, generally a primary use, designed for export to the wholesale market or connection to the electric transmission grid.
 - a. Rooftop SES are permitted in all districts in which buildings are permitted.
 - b. Ground-mount Solar Farms require a conditional use permit in all districts.
 - c. All structures must comply with setback, height, and coverage limitations for the district in which the system is located.
 - d. Ground-mount Solar Farms must comply with all required standards for structures in the district in which the system is located.
4. **Utility (≥ 50 MW):** Large scale SES of equal to or greater than 50 MW, these systems are reviewed and permitted by the State.

B. Definitions:

The following words, terms and phrases, when used in this Section, shall have the meaning provided herein, except where the context clearly indicates otherwise:

1. **Accessory Use:** A use customarily incidental and subordinate to the primary use or building and located on the same lot therewith. A use which dominates the primary use or building in area, extent, or purpose shall not be considered an accessory use.
2. **Administrator:** The Administrator is the Director of the Pope County Land & Resource Management department and unless otherwise indicated, the word “Administrator” as it appears in section 10.12.2 of the Land Use Controls Ordinance means the Director of the Pope County Land & Resource Management department.
3. **Building-Integrated Solar Energy System:** An active SES that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems are contained within roofing materials, windows, skylights and awnings.
4. **Electricity Generation:** (aka production, output) The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).
 - a. **Kilowatt-hour (kWh):** A unit of energy equivalent to one kilowatt (1 kW) of power expended for 1 hour of time.
 - b. **Megawatt-hour (MWh):** A unit of energy equivalent to one Megawatt (1 MW) of power expended for 1 hour of time.
5. **Electrical Equipment:** Any device associated with a SES, such as an outdoor electrical unit/control box, that transfers the energy from the SES to the intended on-site structure.
6. **Mounting:** The manner in which a solar PV system is affixed to the roof or ground (i.e. roof mount, ground mount).

- a. **Roof-Mount System (aka rooftop mounted, building mounted):** A SES consisting of solar panels installed directly on the roof of a home, commercial building, or an accessory structure, such as a garage, pergola, or shed. Solar panels are mounted and secured using racking systems specifically designed to minimize the impact on the roof and prevent any leaks or structural damage. Roof-mount systems can be mounted flush with the roof or tilted toward the sun at an angle.
 - b. **Ground-Mount System:** A SES that is directly installed on specialized solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home, building or agriculture structure. Ground-mount systems may be applicable when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.
7. **Power:** The rate at which work is performed (the rate of producing, transferring, or using energy). Power is measured in Watts (W), kilowatts (kW), Megawatts (MW), etc.
 - a. **Kilowatt:** (kW) Equal to 1000 Watts; a measure of the use of electrical power.
 - b. **Megawatt:** (MW) Equal to 1000 Kilowatts; a measure of the use of electrical power.
8. **Racking:** SES are attached securely and anchored to structural sections of the roof-mount or ground-mount systems. Specially designed metal plates called flashings prevent leaks and are placed under shingles and over bolts to create a water-tight seal.
9. **Solar Access:** the ability of one property to continue to receive sunlight across property lines without obstruction from another's property (buildings, foliage or other impediment). Solar access is calculated using a sun path diagram.
10. **Solar Array:** Multiple solar panels combined together to create one system.
11. **Solar Collector:** A device, structure, or part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.
12. **Solar Energy:** Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.
13. **Solar Energy System (SES):** A system capable of collecting and converting solar radiation into heat or mechanical or electrical energy and transferring these forms of energy by a separate apparatus to storage or to point of use, including, but not limited to, water heating, space heating or cooling, electric energy generation, or mechanical energy generation.
14. **Solar Glare:** The effect produced by light reflecting from a solar panel with an intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility.
15. **Substation:** Any electrical facility containing power conversion equipment designed for interconnection with power lines. Part of the electrical transmission system converting high voltage to low voltage or converting low voltage to high voltage for incorporation into the electrical power grid.

16. **Tilt:** The angle of the solar panels and/or solar collector relative to their latitude. The optimal tilt to maximize solar production is perpendicular, or 90 degrees, to the sun's rays at true solar noon. True solar noon is when the sun is at its highest during its daily east-west path across the sky. SES can be manually or automatically adjusted throughout the year. Alternatively, fixed-tilt systems remain at a static tilt year-round.

C. **Performance Standards**

1. **Setbacks:**

- a. Accessory SES must meet minimum structure setbacks for the corresponding zoning district.
- b. Non-residential Accessory SES, Solar Gardens and Solar Farms must meet minimum structure setbacks for the corresponding zoning district and be located a minimum of two hundred (200) feet from a residential dwelling not located on the property. Setbacks shall be measured to the nearest solar array or other structure within the SES, excluding security fencing, screening or berm.
- c. Solar Gardens and Solar Farms must be setback from the centerline of public roadways in all zoning districts as per the following:
 - i. Five hundred (500) feet from the centerline of Arterial, Major Collector and Minor Collector roads; and
 - ii. Two hundred fifty (250) feet from the centerline of Local roads.

2. **Maximum Height:** ground-mount systems shall not exceed twenty-five (25) feet in height at maximum ground tilt. Roof- mount SES shall not exceed the maximum allowed height in any zoning district. For purposes of height measurement, SES other than building-integrated SES shall be considered to be mechanical devices and are restricted consistent with other building-mounted mechanical devices for the zoning district in which the system is being installed, except that SES shall not be required to be screened.

3. **Impervious Surface:** Includes any foundation, poles, compacted soil and other impervious components of the solar installation that rests on the ground. Vegetated ground under the collector surface can be used to mitigate stormwater runoff.

4. **Vegetation:**

- a. All conditional use permit projects are required to meet the following vegetation standards.
- b. The project site design shall include the installation and establishment of ground cover meeting the beneficial habitat standards consistent with Minnesota Statutes, section 216B.1642, or successor statutes and guidance as set by the Minnesota Board of Water and Soil Resources, which includes but is not limited to:
 - i. The DNR *Prairie Establishment & Maintenance Technical Guidance for Solar Projects*, BWSR *Sample Specifications for the Establishment of Native Vegetation as Part of Habitat Friendly Solar Projects*, and/or any successor guidance shall be utilized.

- ii. BWSR *Solar Site Pollinator Habitat Assessment Form for Project Planning* must be completed and submitted, a minimum score of 70 must be attained to receive “Habitat Friendly Solar” status.
 - c. Beneficial habitat standards shall be maintained onsite for the duration of operations, until the site is decommissioned.
 - d. To ensure beneficial habitat standards are maintained the site shall be inspected by an independent, third-party professional each year until year 3, then on a triennial basis.
 - i. BWSR *Solar Site Pollinator Habitat Assessment Form for Established Plantings (after year 3)* shall be completed by an appropriately trained ecologist every 3 years to ensure maintenance of the beneficial habitat standards.
- 5. **Stormwater and Erosion Control:**
 - a. Systems shall be in compliance with Section 10.24 of the Pope County Land Use Controls Ordinance.
 - b. Best Management Practices shall be utilized for managing erosion control.
- 6. **Slope:** Structures may not be placed on slopes over 12%.
- 7. **Floodplain:** Structures may not be placed in the floodway. If the floodway is not shown on the official maps, an analysis is required to demonstrate the structures are outside the floodway.
- 8. **Signage:** The use of any portion of a SES for signs/placards other than warning, identification, or equipment information sign/placards is prohibited. Signs or placards for warning, identification, or equipment information shall not exceed six square feet or exceed 20 feet from ground.
- 9. **Aviation:** Solar panels shall not be placed in the vicinity of any airport in a manner that would interfere with airport flight patterns. Acknowledgement from the Federal Aviation Administration (FAA) may be necessary.
- 10. **Glare:**
 - a. Solar panels shall be placed such that concentrated solar radiation or glare shall not be directed onto nearby properties or roadways.
 - b. All SES using a reflector to enhance solar production shall minimize glare from the reflector that affects adjacent or nearby properties. Steps to minimize glare nuisance may include selective placement of the system, screening on the north side of the solar array, reducing use of the reflector system, or other remedies that limit glare.
- 11. **Other Standards and Codes:**
 - a. All power transmission lines from a ground-mount SES to any building or other structure shall be located underground.
 - b. Systems shall be designed and operated in a manner that protects public safety.

- c. Systems shall be in compliance with any applicable local, state and federal regulatory standards, including, but not limited to, the State of Minnesota Uniform Building Code, as amended, and the Minnesota and National Electric Code, as amended.
- d. Electric SES components that are connected to a building electric system must have an Underwriters Laboratory (UL) listing.
- e. The installation and ongoing maintenance of the SES shall conform to applicable industry standards, such as those of the American National Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), Institute of Electrical and Electronics Engineers (IEEE), or other similar certifying organizations, and shall comply with all other applicable fire and life safety requirements.
- f. Upon completion of installation, all components of the SES shall be maintained in good working order in accordance with standards of the codes under which it was constructed. Failure of the property owner to maintain the SES in good working order is grounds for appropriate enforcement.

D. Application Requirements:

The following requirements are for SES conditional use permit applications.

1. A site plan of existing conditions drawn at an Engineer's scale showing the following:
 - a. Existing property lines and property lines extending three hundred (300) feet from the exterior boundaries, including the names of the adjacent property owners and current use of those properties.
 - b. Existing public and private roads, showing widths of the roads and any associated easements.
 - c. Location and size of any existing or abandoned wells, and sewage treatment systems.
 - d. Existing buildings and any impervious surface.
 - e. Topography at two (2) foot intervals and source of contour interval. A contour map of surrounding properties may also be required.
 - f. Existing vegetation (list type and percent of coverage; e.g. grassland, pasture, plowed field, wooded areas, etc.).
 - g. Waterways, watercourses, lakes, public water wetlands and delineated wetlands.
 - h. The one Hundred (100) - year flood elevation and Regulatory Flood Protection Elevation, if applicable.
 - i. Floodway, flood fringe and/or general flood plain district boundary, if applicable.
 - j. The shoreland district boundary, if any portion of the project is located within a shoreland district.
 - k. In the shoreland district, the ordinary high water level and the highest known water level.

- l. In the shoreland district, the toe and top of any bluffs within the project boundaries.
 - m. Surface water drainage patterns.
 - n. Mapped soils according to the USDA NRCS Web Soil Survey.
2. A site plan of proposed conditions drawn at an Engineer's scale showing the following:
 - a. Topography at two (2) foot intervals and source of contour interval.
 - b. Location and spacing of solar panels.
 - c. Location of access roads.
 - d. Planned location of underground electric lines connecting the SES to the building, substation or other electric load.
 - e. New electrical equipment other than at the existing building or substation that is the connection point for the SES.
 - f. Sketch elevation of the premises accurately depicting the proposed SES and its relationship to structures on adjacent lots (if any).
3. To determine the existence of wetlands, a Level 2 wetland delineation is required. Other levels may be appropriate if approved by the Land & Resource Management staff.
4. Verification, by the local Wetland Conservation Act Specialist, that the proposed project will not negatively impact or be located in an identified wetland.
5. Manufacturer's specifications and recommended installation methods for all major equipment, including solar panels, mounting systems and foundations for poles or racks.
6. Number of Solar Collectors to be installed.
7. A description of the method of connecting the array to a building or substation.
8. Ground-mount system applications shall identify existing vegetation on installation site (list type and percent of coverage; e.g. grassland, plowed field, wooded areas, etc.), and provide a maintenance plan for controlling vegetative growth onsite upon installation of the SES.
9. **Stormwater Management:** A Preliminary Stormwater Pollution Prevention Plan (SWPPP) will be required, designed as per the Minnesota Stormwater Manual.
10. **Visual Impact Analysis:** An analysis of the potential visual impacts from the project including solar panels, roads and fencing along with measures to avoid, minimize or mitigate the visual effects shall be required. A plan may be required showing vegetative screening or buffering of the system from those items to mitigate for visual impacts.

11. **Aviation Analysis:** If the project is within two miles of an airport, the applicant must complete and provide the results of the Solar Glare Hazard Analysis Tool (SGHAT) for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or successor policy. The applicant must also complete the Air Space Case Analysis (Form 7460) and provide the results.
12. **Decommissioning Plan & Escrow:**
 - a. Solar Garden and Solar Farm scale SES require a Decommissioning Plan in accordance with the following section 10.12.2.E.
 - b. The Pope County Board of Commissioners requires the owner and/or operator of the Solar Garden or Solar Farm scale SES to provide financial surety by posting a bond, letter of credit or the establishment of a cash escrow in an amount equal to the cost estimate provided in accordance with section 10.12.2.E.1., or \$100,000 per megawatt when no cost estimate is provided as per section 10.12.2.E.1., or as approved by the Pope County Board of Commissioners, to ensure that decommissioning shall be completed if the applicant or operator for any reason fails to meet the requirements of section 10.12.2.E.
 - c. Any financial surety arrangement shall be approved by the Pope County Attorney as to form and issuing bank (the issuing bank must be an FDIC insured bank and must be available in its entirety to fulfill the obligations of Developer under the Agreement. Any letter of credit to the County shall contain language requiring its automatic renewal prior to December 31 of each calendar year, unless cancellation of the letter of credit is specifically approved in writing by the Pope County Board of Commissioners.

E. Decommissioning:

A decommissioning plan shall be submitted with all applications for Solar Garden and Solar Farm scale SES.

1. Decommissioning plans shall outline the anticipated means and cost of removing the system at the end of its serviceable life or upon it becoming a discontinued use. 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 salvage or resale value of the infrastructure shall not be used in calculating any offset or credit against the estimate of the total cost to remove the infrastructure and reclaim the property to its original condition. The plan shall also identify the financial resources that will be available to pay for the decommissioning and removal of the system.
2. Decommissioning of the system must occur within ninety (90) days of either of the following:
 - a. The end of the system's serviceable life; or
 - b. The system becomes a discontinued use.

3. A system shall be considered a discontinued use after one (1) year without energy production, unless a plan is developed and submitted to the Administrator outlining the steps and schedule for returning the system to service.
4. If a ground-mount SES is removed, any earth disturbance as a result of the removal of the ground-mount SES shall be graded and reseeded.
5. If a ground-mount SES has been abandoned (meaning not having been in operation for a period of six (6) months) or is defective or is deemed to be unsafe by the Administrator, the SES shall be required to be repaired by the owner to meet federal, state and local safety standards, or be removed by the property owner within the time period allowed by the Administrator. If the owner fails to remove or repair the defective or abandoned SES, the Administrator may pursue legal action to have the system removed at the owner's expense.

F. Effective Date

This Ordinance shall take effect [XX days] after the date of its enactment.

DULY ORDAINED AND ENACTED the _____ day of _____, 2020, by the Board of County Commissioners of Pope County, in the State of Minnesota, in lawful session duly assembled.

Board of County Commissioners of Pope County

ATTEST:
