

## SECTION 152. 267 DEFINITIONS

**SOLAR ENERGY SYSTEM:** A system that collects or stores solar radiation or energy for the purposes of transforming it into any other form of usable energy, including, but not limited to the collection and transfer of heat created by solar energy to any other medium by other means.

**ROOF OR BUILDING MOUNTED SOLAR ENERGY SYSTEM:** A solar energy system attached to or mounted on any roof or exterior wall of any principal or accessory building primarily to meet the needs of on-site users.

**GROUND-MOUNTED SOLAR ENERGY SYSTEM:** A solar system that is not attached to or mounted to any roof or exterior wall of any principal or accessory building to meet the needs of on-site users.

**ON-SITE WIND ENERGY SYSTEM:** Any device such as a wind charger, windmill, or wind turbine system that converts wind energy to a form of electrical energy greater than one (1) kilowatt to service the needs of only the structures and uses on the same lot or parcel.

**COMMERCIAL WIND ENERGY SYSTEM:** Any device such as a wind charger, windmill, or wind turbine system that converts wind energy to a form of electrical energy greater than one (1) kilowatt to provide electricity for commercial use.

**SHADOW FLICKER.** Alternating changes in light intensity caused by the moving blades of a wind energy system casting shadows on the ground and stationary objects, such as but not limited to a window at a dwelling.

## SECTION 152. xxx ALTERNATIVE ENERGY SYSTEMS

**INTENT:** It is the intent of the Village of Pinckney to promote the effective and efficient use of alternative energy sources such as wind and energy by regulating the placement, design and installation of these systems to protect the public health, safety and welfare of its residents.

### A. ON-SITE WIND ENERGY SYSTEMS (WES)

On-site wind energy systems are designed to primarily serve the needs of a home, small business, or any other existing or permitted use on a parcel of land. These systems are permitted in all zoning districts, subject to the requirements of this chapter and all county, state and federal regulations and safety requirements as well as applicable industry standards.

#### (1) General Requirements

- a) Minimum Lot Area Size. The minimum lot size for a property to be eligible to have an on-site wind energy system shall be two (2) acres.
- b) Setbacks: All wind energy systems must be setback from property lines at a distance equal to or greater than the height of the structure, measured from the base of the structure to the highest reach of its blade.
- c) One wind energy device shall be permitted per lot and located in the rear of side yard.
- d) Local, State and Federal Construction and Electrical Requirements. On-site wind energy systems shall comply with all applicable state construction and electrical codes and local building permit requirements. The support system, footings and tower shall be constructed in accordance with all applicable building codes governing structural integrity and wind loads
- e) It shall be the responsibility of the applicant to obtain the appropriate FAA permits for the structure, or to obtain a determination of no significant impact to air navigation from the FAA
- f) In the case of a wind energy system to be interconnected with the power grid of the local electric utility, the applicant shall provide proof of written notice to the utility of the proposed interconnection and the utility's response thereto. The applicant shall comply with all

requirements of the servicing utility if the wind energy system is interfaced with the utility grid. The utility will install appropriate electric metering and the customer will be required to install a disconnecting device adjacent to the electric meter(s).

- g) The applicant must provide a copy of the Manufacturer's Material safety Data Sheet(s) which shall include the type and quantity of all materials used in the operation of all equipment including, but not limited to, all lubricants and coolants.
- h) Braking System. The wind energy system shall have an automatic braking, governing, or feathering system to prevent uncontrolled rotation or over speeding.
- i) Lightning Protection. The wind energy system shall have lightning protection.
- j) Labeling. The following information shall be provided in a visible, easily read, and easily accessible location:
  - k) Maximum power input (kilowatt-kW), rated voltage (volt-V), and rated current output (ampere) of the generator, alternator, etc. A visible warning sign of High Voltage as required by the State Construction Code shall be placed at the base of the structure.
  - l) Manufacturer's name and address, Model number and Serial number
  - m) Emergency and normal shutdown procedures; and
  - n) Emergency contact name and telephone number.
- o) Accessibility. Towers shall be designed and constructed in such a manner that integrated tower climbing devices are a minimum of twelve (12) feet above the base of the tower and only accessible by using a separate climbing device.
- p) Visibility of Guy Wires. If an on-site wind energy system is supported by guy wires, the wires shall be clearly visible to a height of at least eight (8) feet above the guy wire anchors.
- q) Color. Towers and blades shall be a non-reflective, non-obtrusive neutral color such as white, off-white, or gray.
- r) Minimum Ground Clearance. For both horizontal and vertical axis turbines, a wind energy system rotor shall be located on the tower or support such that the minimum blade clearance above ground level is fifteen (15) feet.
- s) Noise. The maximum level of audible noise permitted to be generated by a wind energy system shall be fifty (50) decibels, as measured on the dBA scale, measured at the property lines nearest the system. An application for a wind energy system shall not be approved unless the Applicant demonstrates that the proposed project complies with all noise regulations.
- t) Placement. Wind Energy systems shall be located in such a manner so as to not generate shadow flicker on any habitable buildings.
- u) Removal. When a system has not been used for one hundred (180) days or more, the removal of equipment or the cessation of operations (transmission of electrical power) shall be required. The property owner shall immediately apply for any required demolition or removal permits, proceed with, and complete the demolition/removal. If the removal has not been lawfully completed within sixty (60) days, and after at least thirty (30) days written notice, the Village may remove or secure the removal of the facility or required portions thereof, with its actual cost and reasonable administrative charge to be draw, collected and/or enforced from or under the security posted at the time of application.
- v) Permit required: A Land Use Permit is required per Section 152.023

## **B. COMMERCIAL WIND ENERGY SYSTEM (WES)**

Commercial Wind Energy Systems are designed and built to provide electricity for commercial use. These systems are permitted in the RTO district subject to Special Land Use (Section 152.240) and Site Plan (Sections 152.385-152.397) approvals by the Planning Commission and subject to the requirements of this chapter and all county, state and federal regulations and safety requirements as well as applicable industry standards.

### **(1) Site Plan Requirements**

- a) All requirements for a site plan contained in Sections 152.385 through 152.397 of this chapter, including the area and dimensions of the area to be purchased or leased for the WES;
- b) A decommissioning plan must be submitted for review by the Village Attorney

- c) A location map of the proposed WES sufficient to show the character of the area surrounding the proposed WES;
- d) Location and height of all existing and proposed buildings, structures, boundary lines, electrical lines, towers, guy wires, guy wire anchors, security fencing and any other above-ground structures proposed or existing for the parcel or parcels containing the WES;
- e) Distances from the WES structures to all other buildings, structures, boundary lines and above ground utilities on the parcel or parcels upon which the WES is proposed to be located;
- f) Distance from the proposed WES to the nearest occupied dwelling unit on a parcel which does not contain the WES;
- g) Location of all existing overhead and underground electrical transmission or distribution lines, located on the lot or parcel(s) upon which the WES or is proposed to be located, as well as within 300 feet of the boundaries of the parcel(s). The applicant shall also provide evidence to the township that easements have been obtained from the property owners for the construction of the transmission and distribution lines. The applicant shall also provide as-built drawings to the township of all electrical transmission lines constructed to serve the WES;
- h) Location, height and type of all buildings and structures within one mile of the exterior boundaries of the lot or parcel where the WES is proposed to be located;
- i) Contour elevations of at ten-foot intervals of the parcel(s) upon which the WES is proposed to be located;
- j) Land uses within one mile of the parcel(s) containing the WES;
- k) A description of the routes to be used by construction and delivery vehicles and of any road improvements that will be necessary in the township to accommodate construction vehicles, equipment or other deliveries;
- l) Access drives to the WES, including dimensions and composition, with a narrative describing proposed maintenance of the drives;
- m) All lighting proposed for the site, including diagrams of lighting fixtures proposed if requested by the Planning Commission;
- n) Security measures proposed to prevent unauthorized trespass and access;
- o) Standard drawings of the structural components of the WES, including structures, towers, bases and footings. A registered engineer shall certify drawings and any necessary calculations that show that the system complies with all applicable local, state and federal building, structural and electrical codes;
- p) Maintenance and construction schedule. The applicant shall provide a written description of the maintenance program to be used to maintain the WES, including a schedule of types of maintenance tasks to be performed and the anticipated construction schedule;
- q) The Planning Commission may waive or modify some of the above requirements at the request of the applicant if it is determined that those items would not be needed to properly review the project.

## **(2) General Requirements**

- a) Minimum Lot Area Size. The minimum lot size for a property to be eligible to have a commercial wind energy system shall be two (10) acres.
- b) The height of a WES for which a special use is required shall not exceed 500 feet.
- c) Commercial WES systems shall be set back from all property lines, road rights-of-way, gas transmission lines, railroads rights-of-way, communication and electrical lines a distance of not less than one and one-half times the WES height
- d) The separation of one WES from another WES shall be based on industry standards and manufacturer certification. At a minimum, there shall be a separation between adjacent WES of not less than three times the rotor diameter of the WES.
- e) A Commercial WES shall have a minimum of 30 feet of clearance over, above and from any structure, adjoining property or tree.
- f) A WES shall be mounted on tubular towers, painted a non-reflective, white, off-white or gray color. The appearance of the WES and buildings shall be maintained throughout the life of the wind energy facility pursuant to industry standards.

- g) The design of the WES's buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening and landscaping that will blend facility components with the natural setting and the existing environment.
- h) A WES shall not be artificially lighted, except to the extent required by the FAA or other applicable authority, or otherwise necessary for the reasonable safety and security thereof.
- i) There shall be no advertising on the WES or any of its components.
- j) Local, State and Federal Construction and Electrical Requirements. On-site wind energy systems shall comply with all applicable state construction and electrical codes and local building permit requirements. The support system, footings and tower shall be constructed in accordance with all applicable building codes governing structural integrity and wind loads
- k) It shall be the responsibility of the applicant to obtain the appropriate FAA permits for the structure, or to obtain a determination of no significant impact to air navigation from the FAA
- l) The applicant must provide a copy of the Manufacturer's Material safety Data Sheet(s) which shall include the type and quantity of all materials used in the operation of all equipment including, but not limited to, all lubricants and coolants.
- m) Lightning Protection. The wind energy system shall have lightning protection.
- n) Labeling. The following information shall be provided in a visible, easily read, and easily accessible location:
  - Maximum power input (kilowatt-kW), rated voltage (volt-V), and rated current output (ampere) of the generator, alternator, etc. A visible warning sign of High Voltage as required by the State Construction Code shall be placed at the base of the structure.
  - Manufacturer's name and address, Model number and Serial number
  - Emergency and normal shutdown procedures; and
  - Emergency contact name and telephone number.
- o) Accessibility. Towers shall be designed and constructed in such a manner that integrated tower climbing devices are a minimum of twelve (12) feet above the base of the tower and only accessible by using a separate climbing device.
- p) Visibility of Guy Wires. If an on-site wind energy system is supported by guy wires, the wires shall be clearly visible to a height of at least eight (8) feet above the guy wire anchors.
- q) Minimum Ground Clearance. For both horizontal and vertical axis turbines, a wind energy system rotor shall be located on the tower or support such that the minimum blade clearance above ground level is fifteen (15) feet.
- r) Noise from a wind energy system shall not exceed 43 dBA Leq over a ten-minute period measured at the property line located closest to the WES for any adjacent non-participating parcel.
- s) The allowable shadow flicker measured at the nearest external wall or walls of inhabited structures shall be limited to a maximum of 20 hours per year. The applicant shall provide evidence to the township that this requirement will be met.
- t) A WES shall not be installed in any location where its proximity with existing fixed broadcast, retransmission or reception antennas for radio, television, or wireless phone or other personal communication systems would produce electromagnetic interference with signal transmission or reception. A WES shall not be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operation.
- u) Each WES shall be equipped with both a manual and automatic braking device capable of stopping the WES operation in high winds so that the rotational speed of the rotor blade does not exceed the design limits of the rotor.
- v) Every WES must be kept and maintained in good repair and condition at all times and shall not pose a potential safety hazard. The applicant shall keep a record of all maintenance performed on each WES and any repairs made to and replacement of equipment and parts for each WES. On or about the anniversary date of the approval by the Planning Commission of the special land use permit, the applicant shall provide a summary of this maintenance record to the Village Zoning Administrator.
- w) All distribution lines from the WES shall be located and maintained underground, both on the property where the WES will be located and off-site. The Planning Commission may waive the requirement that distribution lines for the WES that are located off-site (such as, are not located

on or above the property where the WES will be located) be located and maintained underground if the Planning Commission determines that to install, place or maintain such distribution lines underground would be impractical or unreasonably expensive.

- x) A decommissioning plan shall be submitted by the applicant for approval. The plan shall consist of a written description of the anticipated life of the system and facility; a description as to how the useful life of the system will be determined and who will make this determination; the estimated cost of decommissioning; the method of ensuring that funds will be available for decommissioning and restoration of the site; and removal and restoration procedures and schedules that will be employed if the WES becomes obsolete or abandoned. The plan shall also describe any agreement with the landowner regarding equipment removal upon termination of the lease.
- y) Upon a determination by the Village that a WES should be decommissioned or that the WES has been abandoned and within 90 days of receipt of written notification from the Village, the owner/operator shall begin to remove any wind energy system. The restoration process shall comply with all state, county or local erosion control, soil stabilization and/or runoff requirements or ordinances and shall be completed within one year of the above noted written notification from the township. Failure to begin to remove a wind energy system within the 90-day period provided in this section shall be grounds for the township to remove the wind energy system or anemometer tower at the owner's expense. The cost of removal and site restoration is the full responsibility of the landowner and the applicant and/or owner/operator.

## **C. SOLAR ENERGY SYSTEMS**

Building or ground mounted private solar energy systems that generate up to but do not exceed the manufacturer's rating of 100kW to primarily meet the needs of a home, small business, or any other existing or permitted use on a parcel of land are permitted as a permitted accessory use in all zoning districts, subject to the requirements of this chapter and all county, state and federal regulations and safety requirements as well as applicable industry standards.

### **(1) General Requirements**

- a) The exterior surfaces of solar energy systems shall be generally neutral in color and substantially non-reflective of light.
- b) A unit shall be installed or located such that reflected solar radiation or glare shall not be directed onto adjacent building, properties or roadways.
- c) Solar energy systems must be installed in compliance with the National Electric Safety Code, the manufacturer's specifications, and all other applicable codes. A copy of the manufacturer's installation and maintenance instructions must be submitted for review.
- d) If the applicant's intent is to install a customer-owner system that will be interconnected to the power grid, written evidence that the area's electrical utility provider has been notified shall be submitted. Off-grid systems are exempt from this requirement.
- e) A solar energy system shall be permanently and safely attached to the building, structure, or ground. Proof of the safety and reliability of the means of such attachment shall be submitted to the Zoning Administrator/Livingston County Building Department prior to installation.
- f) There shall be no signs on the unit, other than a sign or logo identifying the manufacturer with an area no greater than three (3) square feet, and any necessary safety information signs.

### **(2) Building Mounted Solar Systems**

- a) Such system may only be attached to a principal building or an accessory building serving the principal use such as a barn, garage, or shed.
- b) No part of the solar energy system erected on a roof shall extend beyond the peak of the roof and not closer than three feet from the edges of the roof or peak in order to maintain accessibility.

- c) If the solar energy system is mounted on a building in an area other than the roof, no part of the system shall extend beyond the wall on which it is mounted.
- d) No part of a solar energy system mounted on a roof shall extend more than two (2) feet above the surface of the roof. When such units are mounted to a flat roof they shall not project higher than three (3) feet above the building height and shall be screened with a wall at least one (1) foot taller than the unit. In no instance shall a roof-mounted unit exceed the maximum allowable height for the zoning district in which it is located.
- e) A solar energy system shall be only of such weight as can safely be supported by the structure. Proof thereof, in the form of certification by a professional engineer or other qualified person shall be submitted to the Zoning Administrator/Livingston County Building Department prior to installation.
- f) A wall-mounted solar energy system shall not extend further than ten (10) feet from the building wall, may not extend into a required yard and may not exceed the height of the building wall to which it is attached. Such units may only be attached to one (1) side or rear building façade.
- g) In the event that a roof or building mounted solar energy system has been abandoned (not in operation) for a period of one year, it shall be removed by the property owner within six months from the date of abandonment.

### **(3) Ground Mounted Solar Energy Systems**

- a) Ground-mounted solar energy systems shall be located only in the rear yard and shall meet the side and rear yard setback requirements applicable in the zoning district in which the solar energy system will be located.
- b) A ground-mounted solar energy system shall not exceed fifteen (15) feet in height, measured from the ground at the base of the unit.
- c) Ground-mounted solar energy systems may not occupy more than five (5) percent of the parcel upon which it is located up to one thousand five hundred (1,500) square feet.
- d) All power transmission lines shall be underground.
- e) There shall be a greenbelt screening around any ground-mounted solar energy system and equipment associated with the system to obscure the solar energy system from adjacent residences. The greenbelt shall consist of shrubbery, trees or other noninvasive plant species that provide a visual screen. In lieu of a planting greenbelt, a decorative fence (meeting the requirements of this chapter applicable to fences) may be used.
- f) In the event that a ground mounted solar energy system has been abandoned (not in operation) for a period of one year, it shall be removed by the property owner within six months from the date of abandonment.