

SHIAWASSEE COUNTY ZONING ORDINANCE
ARTICLE 4
SPECIFIC USE REGULATIONS
RECOMMENDED AMENDMENTS TO SECTION 4.3.76

Section 4.3.76 Wind Energy Conversion Systems (“WECS”)

1. Purpose

- A. The provisions herein are set forth to establish regulations for the siting, design, and installation of wind energy conversion systems and testing facilities and to protect the general public health, safety, and welfare in the implementation of the use.

2. Definitions

- A. Ambient Sound Level shall mean the decibel measurement or dB(A) of background sound pressure level exceeded 90% of the time or L90 at a given location prior to the installation of a WECS.
- B. Decibel shall mean the unit of measure used to express magnitude of sound pressure and sound intensity.
- C. dB(A) shall mean the sound pressure level in decibels in the “A” weighted scale defined by ANSI. A method for weighting the frequency spectrum to mimic the human ear.
- D. Height is defined as the vertical distance measured from the ground level at the base of the tower to the uppermost vertical extension of any blade, or the maximum height reached by any part of the WECS whichever is greater.
- E. Hub Height shall mean the vertical distance measured from ground level to the center of the turbine hub.
- F. LAMax shall mean the maximum sound level at an instant in time.
- G. Manual and Automatic Controls are mechanical measures to limit rotation of WECS blades so as not to exceed the designed limits of the conversion system.
- H. Professional Engineer shall mean a licensed structural and/or mechanical engineer registered in the State of Michigan.
- I. Participating and Non-Participating Parcels:
1. Participating Parcel shall mean a parcel of record that is to be used, occupied, maintained, let, leased or authorized to be used for purposes of implementing, providing access to, or to meet setback requirements for WECS.
 2. Non-Participating Parcel shall mean a parcel of record that is not in any manner used, occupied, maintained, let, leased or authorized to be used for WECS or any part of such systems.
- J. Shadow Flicker shall mean the alternating changes in light intensity caused by the moving blade of a WECS casting shadows on the ground and/or structures.

- K. Sound Pressure shall mean the average rate at which sound energy is transmitted through a unit area in a specified direction. The pressure of the sound measured at a receiver.
- L. Sound Pressure Level shall mean the sound pressure mapped to a logarithmic scale and reported in decibels.
- M. Wind Energy Conversion System (“WECS”) shall mean any structural device (such as a wind generator, windmill, or wind turbine) that converts wind into electricity through the use of specialized equipment. Includes both horizontal axis wind energy system design in which the shaft is parallel to the ground and the blades are perpendicular to the ground; and vertical axis wind energy system design where the rotating shaft is perpendicular to the ground and the cups or blades rotate parallel to the ground. Also included in the definition are the associated improvements for the transmission of electrical energy to the electrical utility grid. Forms of WECS include:
1. Agricultural WECS shall mean any WECS that is accessory to a permitted farm or agricultural operation, and is designed and built to directly and immediately serve the needs of the farm or agricultural operation.
 2. Private WECS shall mean any WECS that is accessory to a principal non-agricultural use located on the same lot, and is designed and built to serve the principal use. Excess electricity generation may be sold to a utility but shall not exceed fifty (50) percent of the principal uses monthly electricity use or such WECS shall be considered a Commercial WECS.
 3. Commercial WECS shall mean any WECS and associated accessory structures that are designed and built to exclusively provide electricity to the electric utility’s power grid. The Commercial WECS is a principal use of property and may occupy the same property as another principal use.
 4. Commercial WECS Farm shall mean an electricity generating operation consisting of one or more Commercial WECS under common ownership, control or operation, and includes substations, testing facilities, transmission lines and other buildings accessory to such operation, whose main purpose is to supply electricity to the energy grid and off-site customers or consumers.
- N. WECS Testing Facility shall mean the structure and equipment, temporarily erected and used to determine the potential for the placement of one or more WECS improvements and contains instrumentation, such as anemometers or other meteorological devices, designed to provide wind and other data.

3. Approval Required

- A. It shall be unlawful to construct, erect, install, use or locate a test facility or WECS within the zoning jurisdiction of Shiawassee County unless a special use permit, final site plan, administrative site plan, or a zoning permit has been approved pursuant to this Ordinance and Section.

- B. Agricultural WECS that are accessory to established farm and agricultural operations are permitted by right and shall be exempt from the general standards, provisions and requirements of this section. Agricultural WECS projects shall otherwise conform to the regulations of the zoning district for an agricultural accessory structure, including maximum height and minimum setback standards with the provisions of Section 5.6.4. Such compliance shall be verified upon application of a zoning permit.
 - C. Private WECS are permitted by right with conditions and are subject to administrative site plan review and approval to determine compliance with the general standards, provisions and requirements of this section and this Ordinance.
 - D. Commercial WECS are permitted by issuance of a special use permit and approval of a final site plan by the Planning Commission. Multiple WECS or WECS as part of a Commercial WECS Farm may be applied for under a single special use permit as long as all properties under application are located within a single Township under the County's jurisdiction. If a multiple WECS or Commercial WECS Farm project involves siting WECS in multiple townships, a special use permit is required for those WECS within each Township under the jurisdiction of this Ordinance. An application for special use permit and final site plan shall contain information required pursuant to Article 12 for special use permit approval, Article 14 for final site plan approval, and other information as required in this Section and in this Ordinance.
 - E. Testing Facilities are permitted by issuance of a special use permit and approval of a final site plan. Testing Facilities preceding implementation of multiple WECS shall be considered temporary improvements and temporary shall be considered to be less than two (2) years. Continuation of operation beyond two (2) years shall require a new special use permit to be reviewed and approved.
 - 1. In the event that multiple WECS are proposed as a coordinated development and it is necessary that a temporary Test Facility be erected to monitor meteorological conditions for the life of a WECS project, such facility shall be included as part of the special use permit and final site plan approval process for the Commercial WECS Farm. The Testing Facility is assumed to be placed to provide satisfactory evidence that a potential WECS project is feasible.
 - 2. The applicant shall provide general information regarding the extent of the area under study that will be served by the test results from the Testing Facility. An application for special use permit and final site plan shall contain information required pursuant to Article 12 for special use permit approval, Article 14 for final site plan approval, and other information as required in this section and in this Ordinance.
4. General Standards. The following requirements and standards shall apply to all Testing Facilities and WECS unless specifically excluded:
- A. Noise Levels.
 - 1. An applicant for a Commercial WECS shall provide a study and report declaring the ambient and potential noise impact created by a Commercial WECS. The study should specifically address noise at non-participating property boundaries and along property lines between participating and non-participating property(ies). The study and report must be produced with the most current protocol for ANSI S12.9, Part 3, ANSI S12.100 and other applicable ANSI standards and methodology for the

measurement of sound to the extent that those standards and methods are applicable to providing accurate and substantive information for review by the County. This study and report must be certified by an acoustician acceptable to the County and include the following:

- a) A description and map of the existing land uses and structures including any residences, hospitals, libraries, schools, places of worship, and parks within one (1) mile of the proposed WECS parcel boundaries. Said description shall include the location of the structure/land use, distances from the source of sound or WECS and ambient decibel readings (including the date and time when measurements are taken) for each identified land use and structure described and mapped.
 - b) A description and map of the project's sound producing features, including the range of decibel levels expected (measured in dB(A)) and the basis for the expectation.
 - c) A description of the project's proposed sound control features shall be described in detail, including specific measures to minimize noise impacts.
2. An applicant for a private WECS shall provide documentation from the manufacturer in lieu of the above study and report.
 3. The noise generated from a private or Commercial WECS shall not exceed forty-five (45) dB(A) LAMax as measured at the closest non-participating property line to the private or Commercial WECS.

B. Height.

1. Private WECS shall not exceed one hundred (100) feet in height.
2. Commercial WECS and Test Facilities are to be limited to height of five hundred (500) feet. The Planning Commission may permit a Commercial WECS in a Commercial WECS Farm to be constructed at a height of no more than six hundred (600) feet if the applicant can show that the increased height is necessary to meet industry standards and that the number of WECS able to be implemented will be substantially lower than under the standard five hundred (500) feet limitation. The Planning Commission may require additional information from the applicant to substantiate the applicant's assertion of industry standard and reduction in the number of WECS.
3. The Planning Commission may restrict height based on the location of facilities, determined impact on adjacent land uses, and general satisfaction of standards set forth to protect public health and safety as set forth in this Ordinance. Compliance with FAA regulations, the Michigan Airport Zoning Act and the Michigan Tall Structures Act shall be verified by the applicant.

C. Setbacks

1. Property Line Setbacks.
 - a) Testing facilities and WECS shall not be subject to property line setbacks between participating parcels.

- b) All Testing Facilities shall maintain a setback from a non-participating property line a distance equal to or greater than one hundred (100) percent of its height (as defined herein) as measured from the base of the structure to the nearest non-participating property line.
 - c) All Private WECS shall maintain a setback from a non-participating property line a distance equal to or greater than one hundred fifty (150) percent of its height (as defined herein) as measured from the base of the structure to the nearest non-participating property line.
 - d) All Commercial WECS shall maintain a setback from a non-participating property line a distance equal to or greater than three hundred (300) percent of its height (as defined herein) as measured from the base of the structure to the nearest non-participating property line.
2. Principal and Accessory Structure Setbacks on Participating Properties.
- a) All testing facilities and WECS shall maintain a setback one hundred (100) percent of its height as measured from the base of the structure to the exterior wall of a principal structure on a participating property that is used for residential, commercial or assembly purposes.
 - b) For accessory structures, the Planning Commission may, at its discretion, allow a setback that is less than one hundred (100) percent of a testing facility or WECS height as measured from the base of the structure to the exterior wall of accessory structures on a participating property, depending on the current use of such accessory structures and potential impact to the use of those accessory structures.
3. Public Rights-of-Way. All testing facilities and WECS must be setback a distance equal to or greater than one hundred (100) percent of the height of the WECS from the base of the structure to a public road or railroad right-of-way. No setback is required from a drain right-of-way.
4. Existing Utility Lines. All testing facilities and WECS must be setback a distance equal to or greater than one hundred (100) percent of the height of a WECS from the base of the structure to an above-ground public electric power line, telephone line and/or gas transmission line unless said utility owner provides a waiver of such setback.
- D. Shadow Flicker.
- 1. Private and Commercial WECS shall be designed, sited and operated in such a manner as to prohibit shadow flicker on any non-participating properties and public roadways.
 - 2. Shadow Flicker Impact Analysis. That applicant shall provide a study identifying the potential impact of shadow flicker that may be caused by a WECS development (including but not limited to all habitual principal structures, roadways, and non-participating properties) and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall identify problem areas where shadow flicker may impact habitable structures and non-participating

properties. The analysis shall result in a description of measures to be taken to eliminate or mitigate potential impacts.

3. Site plans and other documents and drawings for WECS shall show mitigation measures to prevent or minimize potential impacts from shadow flicker, as identified in the Shadow Flicker Impact Analysis. Mitigation measures can include, but not be limited to:

- a) Turn off the WECS (so the rotor(s) are not moving) during the period of time a habitable structure, non-participating property, or roadway could experience shadow flicker; or
- b) Screening (such as forest, other building(s), topography, etc.) identified as existing or implemented to shield the habitable structure from shadow flicker.

- E. Decommissioning. Testing Facilities and Commercial WECS considered under this Section must contain a Decommissioning Plan acceptable to the Planning Commission to ensure that structures and appurtenances are properly decommissioned upon the end of their operational life, inoperability or improvement abandonment.

1. A Decommissioning Plan shall be submitted for review and approval detailing how the improvements will be decommissioned, a Professional Engineer's estimated cost of decommissioning, the financial resources to be used to accomplish decommissioning, and the surety bond holder with which the financial resources shall be deposited.
2. Any WECS or Testing Facility that is not operated or found to be inoperable due to disrepair for a continuous period of ninety (90) days shall be considered abandoned. If it is found that a WECS or Testing Facility is abandoned, the Planning Commission upon notice by the Shiawassee County Zoning Administrator, or their assign, shall provide written notice to the applicant/owner/operator of a hearing before the Planning Commission to hear evidence that the WECS or multiple WECS should not be decommissioned.
3. If a WECS or Testing Facility is repaired, a Professional Engineer (hired at the expense of the owner or operator) shall certify the Testing Facility or WECS safety prior to the resumption of operation.
4. Within ninety (90) days of the hearing where the Planning Commission has determined that a WECS or Testing Facility is abandoned or inoperable, the owner/operator shall obtain a demolition permit to remove any WECS or Testing Facility.
 - a) Failure to obtain a demolition permit within the 90-day period provided in this subsection shall be grounds for the County to remove the WECS or Testing Facility at the Owner's expense.
5. Decommissioning shall include removal of all equipment associated with the WECS or Testing Facility including all materials above and below ground. The site shall be restored to a condition that reflects the specific character of the site including topography, vegetation, soils, drainage, and any unique environmental features.

- a) The restoration shall include: road repair, if any, and all re-grading, soil stabilization, and re-vegetation necessary to return the subject property to a stable condition consistent with conditions existing prior to establishment of the wind energy system.
 - b) 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 (1) year.
 - c) Extensions may be granted upon request to the Planning Commission prior to that expiration of the one (1) year requirement for completed decommissioning.
6. The decommissioning plan shall also include an agreement between the applicant and the County that includes, but is not limited to the following conditions:
- a) The financial resources for decommissioning shall be in the form of a surety bond with a replenishment obligation and shall be deposited by a bonding agent acceptable to Shiawassee County.
 - b) The financial resources for decommissioning shall be 125% of the estimated removal and restoration cost. The Planning Commission shall require independent verification of the adequacy of this amount from a Professional Engineer.
 - c) The Planning Commission shall annually review the amounts deposited for removal, site restoration, and administration costs are adequate for these purposes. If the Planning Commission determines that these amounts are not adequate, the County shall require the owner/operator to make additional deposits to increase the amount of the surety bond to cure such inadequacy.
 - d) The County shall have access to the surety bond funds for the expressed purpose of completing decommissioning. If decommissioning is not completed by the applicant within one (1) year of the end of project life, inoperability of individual WECS turbine or facility abandonment. Surety bond funds may be used for administrative fees and costs associated with decommissioning.
 - e) The County is granted the right of entry onto the site, pursuant to reasonable notice, to effect or complete decommissioning.
 - f) The County is granted the right to seek injunctive relief to effect or complete decommissioning, as well as the County's right to seek reimbursement from the applicant or applicant's successor for decommissioning costs in excess of the surety bond amount and to file a lien against any real estate owned by applicant or applicant's successor, or in which they have an interest, for the amount of the excess, and to take all steps allowed by law to enforce said lien.
- F. Enforcement: The enforcement of the Ordinance shall be the responsibility of the Shiawassee County Zoning Administrator, or their assign, or as otherwise appointed by the Board of Commissioners.
- 1. An owner/operator, landowner, firm, association, corporation or representative agent of any wind energy system that is found by Shiawassee County, or its designee, to be in violation of the special use permit, or to be abandoned, inoperable, or unsafe

as defined in this Ordinance, or to have a serious adverse impact as defined in this Ordinance:

- a) Shall provide abatement by shut down, repair, or removal of the wind energy system upon written notification from the Zoning Administrator (or other County designee).
 - b) Shall be subject to all enforcement mechanisms available to the County.
 - c) May be subject to revocation of the special use permit for excessive and continued violations.
 - d) May be required to reimburse Shiawassee County for cost(s) and expenses of obtaining other relief including a temporary or permanent injunction; such reimbursement may include costs and reasonable attorney fees.
2. Annual Inspection. All testing facilities and WECS shall be inspected annually by an Authorized Factory Representative or Professional Engineer to certify that it is in good working condition and not a hazard to the public. Such records shall be submitted to the Planning Commission and considered a part of the continuing special use permit.
3. Should an aggrieved Shiawassee County resident allege that a WECS is not in compliance with the requirements of this Ordinance, the procedure shall be as follows:
- a) Complaints must be submitted to the Zoning Administrator, or their assign, in writing from the affected resident, including their name, address, contact information and if the affected resident does not own the property allegedly being subjected to violations of the Ordinance, the name, address and contact information for the owner of that parcel.
 - b) Upon investigation by the Zoning Administrator, or their assign, if a complaint is deemed credible, the owner(s) and/or operator of the WECS shall be notified in writing. Within ten (10) calendar days of the date of notice, the owner(s) and/or operator of the WECS shall provide a statement of compliance or non-compliance. As part of the special use permit, an escrow account (reviewable on an annual basis) shall be established sufficient to pay for independent investigations conducted by qualified professionals acceptable to the County to determine compliance with the requirements of this Ordinance.
 - c) If the WECS is found to be in violation of the Ordinance and/or this Section, the owner(s) and/or operator shall take immediate action to bring the WECS into compliance. In the event the owner(s) and/or operator fails or refuses to bring the WECS into compliance within ten (10) days thereafter, the County may seek any relief by law afforded to it.

G. Safety Measures. The following safety measures are to be implemented for Testing facilities and WECS.

1. Controls and Brakes. All private and Commercial WECS turbines shall be equipped with manual and automatic controls to limit rotation of blades to a speed below the designed limits of the WECS. A Professional Engineer must certify that the rotor and

over-speed control design and fabrication conform to applicable design standards.

2. Building and Trade Codes. All testing facilities and WECS shall meet applicable state and national construction codes (where applicable).
3. Installation Certification. The Professional Engineer shall certify that the construction and installation of the Testing Facility or WECS meets or exceeds the manufacturer's construction and installation standards.
4. Climb Prevention. All Testing Facilities and WECS must be unclimbable by design or protected by anti-climbing devices.
5. Fire Risk. All Testing Facilities and WECS must adhere to all applicable electrical codes and standards, remove fuel sources, such as vegetation, from the immediate vicinity of electrical equipment and connections.
6. Interference. It shall be the responsibility of the applicant to submit acceptable documentation as part of the special use permit application to determine if the improvement would in any way cause interference with microwave transmissions, residential television reception or radio reception. The applicant shall also provide documentation that the location of the Testing Facility and WECS will not interfere with the operation of existing WECS.
7. Waste. All solid wastes, whether generated from supplies, equipment parts, packaging, operation or maintenance of the Testing Facility and WECS shall be removed from the site immediately and disposed of in an appropriate manner. All hazardous waste generated by the operation and maintenance of the improvement shall be removed from the site immediately and disposed of in a manner consistent with all local, state, and federal rules and regulations.
8. Liability Insurance. The owner(s) or operator(s) of the Testing Facility or WECS shall maintain a current insurance policy with a bond rating acceptable to the County to cover installation and operation. The amount of the policy shall be established as a condition of special use permit approval. For a private WECS accessory to a principal residence, proof of homeowner's insurance with specific coverage for the WECS shall satisfy this requirement.
9. The owner/operator shall notify the Shiawassee County Zoning Administrator in writing within twenty-four (24) hours of an occurrence of a tower collapse, turbine failure, fire, blade/hub failure, collector or feeder line failure, or injury to person or property.

H. Additional Considerations.

1. No WECS or Testing Facility shall have advertising or signage of any kind unless required by standards referenced in this Section for purposes of safety or operation.
 - a) No WECS or Testing Facility shall have lighting of any kind unless required by standards referenced in this Section or the Federal Aviation Administration ("FAA") for purposes of safety or operation.
2. Color and Appearance. Structures and improvements shall be painted a neutral color that is acceptable to Shiawassee County or otherwise required by law. The

main structure of any WECS shall be of a monopole (tubular) design.

J. Compliance with Federal Rules and Regulations.

1. It shall be the responsibility of the owner(s) or operator of the Commercial WECS to complete the proper FAA applications and obtain the proper permits for the WECS project. It shall also be the responsibility of the person in charge of the Commercial WECS to obtain a determination of "no significant impact" to air navigation from the FAA.
2. Compliance with Additional Regulations. It shall be the responsibility of the owner(s) or operator of the Commercial WECS to contact the FAA regarding additional permits necessary or any other applicable Federal or State regulations for the installation, prior to granting of a special use permit by the Planning Commission. Documentation that applicable permits have been obtained and requirements of these agencies have been met must be supplied to the County Building Department prior to the issuance of construction permits.

K. Studies.

1. Migratory and Game Birds. An avian study is required and is to be conducted by a qualified professional to determine any potential impacts a Commercial WECS may present to migratory and game birds. The study as part of the special use permit application must provide assurances that the Commercial WECS does not negatively impact the path of migratory birds or the viability of game birds.
2. Endangered Species. An endangered species study is required and is to be conducted by a qualified professional to determine any potential impacts the Commercial WECS may present to endangered species. The study as part of the special use permit application must provide assurances that the Commercial WECS do not negatively impact endangered species.

L. Administrative Provisions Following Approval.

1. An approved special use permit for a Commercial WECS shall expire if construction of the WECS facility has not commenced within thirty-six (36) months from the date of issuance.
2. Amendment Site Location Following Special Use Permit and Final Site Plan Approval. The Zoning Administrator may approve changes in location of Commercial WECS and Wind Test Facilities as minor site plan modifications so long as such site location is not altered more than one hundred (100) feet and the improvement remains on the same parcel.