

**CITY COUNCIL  
CITY OF PORTLAND  
Ionia County, Michigan**

Council Member VanSlambrouck, supported by Council Member Fabiano, made a motion to adopt the following ordinance:

**ORDINANCE NO. 175 Z**

**WIND ENERGY CONVERSION SYSTEMS ORDINANCE**

**SECTION 1: PURPOSE & INTENT**

The purpose of this Ordinance is to regulate **Wind Energy Conversion Systems (WECS)** constructed in the City of Portland to (1) promote the safe, effective, and efficient use of a **WECS** to reduce fossil-fuel consumption in energy production, and (2) preserve and protect public health, safety, welfare, and quality of life by minimizing the potential adverse impacts of a **WECS**.

**SECTION 2: DEFINITIONS**

- A. An **Anemometer** is a temporary wind speed indicator constructed to analyze the potential for utilizing a WECS at a given site. An **Anemometer** includes, but is not limited to, the **Tower**, base plate, anchors, cables and hardware, wind direction vanes, booms to hold equipment, data logger, instrument wiring, and any telemetry devices used to monitor or transmit wind data.
- B. **Decibel** is the unit of measure used to express the magnitude of sound pressure and sound intensity. **Decibels** are measured on the dB(A) weighted scale as defined by the American National Standards Institute.
- C. **Decommissioning** is the process of terminating operation and completely removing a WECS and all related buildings, Structures, foundations, access roads, and equipment.
- D. A **Large Wind Energy Conversion System (LWECS)** is a **Tower-mounted WECS** that exceeds 100 feet in **Total Height**.
- E. A **Medium Wind Energy Conversion System (MWECS)** is a **Tower-mounted WECS** with a **Total Height** of not more than 100 feet.
- F. An **Occupied Building** is a residence, or a school, hospital, church, public library, business, or other building used for public gatherings.
- G. **Operator** is the individual or entity responsible for the day-to-day operation and maintenance of a **WECS**.
- H. **Owner** is any individual or entity with an equity interest in the **WECS**.
- I. **Rotor Diameter** is the cross-sectional dimension of the circle swept by the rotating blades of a **WECS**.
- J. **Shadow Flicker** is the moving shadow created by the sun shining through the rotating blades of an **MWECS** or **LWECS**.
- K. A **Small Tower-Mounted Wind Energy Conversion System (STMWECS)** is a **Tower-mounted WECS** with a **Total Height** of not more than 35 feet.
- L. A **Structure** is any building or other structure, such as a municipal water tower, that is at least 12 feet high at its highest point of roof and is secured to frost footings or a concrete slab.
- M. A **Small Structure-Mounted Wind Energy Conversion System (SSMWECS)** is a **WECS** with a **Total Height** of not more than 15 feet and that is attached to a **Structure's** roof, walls, or other elevated surface.
- N. **Total Height**

1. **LWECS, MWECS, STMWECS: Total Height** is the vertical distance measured from the ground level at the base of the **Tower** to the maximum height reached by any part of the **WECS**.
  2. **SSMWECS: Total Height** is the distance measured from the highest point of the roof, excluding chimneys, antennae, and other similar protuberances, to the furthest outward extension of any part, unless specifically provided otherwise.
- O. A **Tower** is a freestanding monopole that supports a **WECS**.
- P. A **Wind Energy Conversion System (WECS)** converts wind energy into electricity through the use of equipment that includes any base, blade, foundation, generator, nacelle, rotor, **Tower**, transformer, vane, wire, inverter, batteries, or other components used in the system. A **WECS** includes any **LWECS, MWECS, STMWECS, or SSMWECS**.

### SECTION 3: REQUIREMENTS FOR ALL WECS

- A. Visual Appearance
1. A **WECS** must be non-reflective and non-obtrusive in color (e.g. white or gray), and its design must conform to all applicable industry standards. The appearance of the turbine, **Tower**, and any ancillary facility must be maintained throughout the life of the **WECS**.
  2. A **WECS** may not include artificial lighting, except as necessary for reasonable safety and security, including as required by the FAA or other authority.
  3. A **WECS** may not be used to display any advertising, except for unobtrusive identification of the turbine manufacturer.
- B. Ground Clearance: The lowest extension of any blade or other exposed moving component of a **WECS** must be at least 15 feet above the ground and at least 15 feet above any outdoor surface intended for human use, such as a balcony or roof garden located directly below the **WECS**.
- C. Noise
1. **Ambient Sound Level** is the amount of background noise at a given location before the installation of a **WECS**. **Ambient Sound Level** may include, but is not limited to, traffic, machinery, lawnmowers, human activity, and the interaction of wind with the landscape. The **Ambient Sound Level** is measured in **Decibels**. For purposes of this Ordinance, **Ambient Sound Level** is measured between 9:00 p.m. and 9:00 a.m.
  2. Noise emanating from the operation of a **WECS** in a residential-use parcel, an agricultural-use parcel, or a park, school, hospital, or church may not exceed the lowest **Ambient Sound Level** present at any property line.
  3. Noise emanating from the operation of a **WECS** in all other parcels may not exceed the lowest **Ambient Sound Level** plus 5 dB(A) present at any property line.
- D. Vibration: A **WECS** may not produce vibrations that are humanly perceptible beyond the property on which the **WECS** is located.
- E. Guy Wires: A **WECS** may not include guy wires.
- F. Safety Requirements:
1. A **WECS** must be equipped with an automatic braking or governing system to prevent uncontrolled rotation, over-speeding, and excessive pressure on the **Tower, Structure, rotor, blades, or other components** unless the manufacturer certifies that a braking system is not necessary.
  2. All spent lubricants, cooling fluids, and any other hazardous materials must be properly and safely removed in a timely manner.
  3. Each **WECS** must have one warning sign, not to exceed two square feet in area. For an **LWECS, MWECS, STMWECS**, the sign must be posted at the base of the **Tower** and on the security fence if applicable. For an **SSMWECS**, the sign must be posted at the base where the **WECS** is attached to the **Structure**. The sign must contain at least the following:

- a. “Warning: high voltage”
- b. Manufacturer’s, Owner’s, and Operator’s names
- c. Two or more emergency contact numbers
4. The structural integrity of a **WECS** must conform to the design standards of the International Electrical Commission, specifically, the following or any similar successor standards: IEC 61400-1, “Wind Turbine Safety and Design”; IEC 61400-22, “Wind Turbine Certification”; and IEC 61400-23, “Blade Structural Testing.”
5. A **WECS** must not interfere with communication systems, including, but not limited to, radio, telephone, television, satellite, or emergency communication systems.
6. All electrical controls, control wiring, grounding wires, power lines, and system components for an **STMWECS** must be placed underground within the boundary of each parcel, at a depth designed to accommodate the existing land use to the maximum extent practicable. Wires necessary to connect the wind generator to the **Tower** wiring are exempt from this requirement.
7. The City reserves the right to inspect any **WECS** to ensure Ordinance compliance.

#### **SECTION 4: NET METERING**

- A. **Net-Metering** is a special metering and billing agreement between utility companies and their customers, which facilitates the connection of renewable energy-generating systems to the power grid.
- B. A **WECS** that is connected to a public utility system for **Net-Metering** purposes must meet all requirements set forth in the utility’s regulations for wind-power generation facilities and must meet all City of Portland Ordinances that govern the connection.

#### **SECTION 5: TEMPORARY USE OF AN ANEMOMETER**

- A. An **Anemometer** is permitted in all zoning districts as a temporary use, subject to all Ordinance requirements for the **WECS** that is proposed to be constructed on the site.
- B. An **Anemometer** is not permitted for more than 3 years for an **LWECS** or more than 13 months for an **MWECS**, **SSMWECS**, or **STMWECS**. The Planning Commission may grant an extension for good cause.

#### **SECTION 6: ZONING**

- A. Zoning Districts
  1. An **SSMWECS** and an **STMWECS** is a Permitted Land Use in all zoning districts.
  2. An **MWECS** and **LWECS** is a Special Land Use in Commercial zoning districts, Industrial zoning districts, and PUDs.
- B. Setbacks
  1. A **WECS** must meet the minimum setbacks provided in the chart below.
  2. Property-line setbacks for an **LWECS** or **MWECS** may be reduced as part of the application or Special Land Use process if the applicant provides a registered engineer’s certification that the **WECS** is designed to collapse, fall curl, or bend within a distance or zone shorter than its height.
  3. The setback for an **LWECS**, **MWECS**, or **STMWECS** is measured from the base of the tower to the closest point of the Occupied Building, property line, underlying right-of-way of the public road, or existing communication or power line.
  4. The setback for an **SSMWECS** is measured from the closest extension of a moving part of the **SSMWECS** to the closest point of the **Occupied Building**, property line, underlying right-of-way of the public road, or existing communication or power line.

	<b>Occupied Building</b> on the same parcel	Property Line Setback	Public Road Setback	Above Ground Communications & Power Lines
<b>LWECS</b>	The greater of: (1) 1,000 feet, or (2) 2 times the <b>Total Height</b> of the <b>LWECS</b>	1.5 times the <b>Total Height</b> of the <b>LWECS</b>	The greater of: (1) 400 feet, or (2) 1.5 times the <b>Total Height</b>	
<b>MWECS</b>	The <b>Total Height</b> of the <b>MWECS</b>			
<b>STMWECS</b>	The <b>Total Height</b> of the <b>STMWECS</b>			
<b>SSMWECS</b> mounted directly on a roof or other elevated structure	1.5 times the <b>Total Height</b> of the <b>SSMWECS</b>			
<b>SSMWECS</b> affixed by any extension to the side, roof, or other elevated surface	2 times the <b>Total Height</b> of the <b>SSMWECS</b>			

C. A **WECS** must meet the height, separation, and location requirements in the chart below

System	<b>Total Height</b>	Quantity	Separation	Location Limits
<b>LWECS</b>	Limited by setback and separation requirements		Must comply with industry standards & manufacturer recommendations	Limited by setback and separation requirements
<b>MWECS</b>	No more than 100 feet	No more than 1 for every 2.5 acres of land included in the parcel.		
<b>SSMWECS</b>	No more than 15 feet	No more than 3 per parcel	<b>Total Height</b> of the highest <b>SSMWECS</b> must be maintained between the bases	May not be affixed to the wall on the side of a <b>Structure</b> facing a road
<b>STMWECS</b>	No more than 35 feet.	No more than 1 per parcel	N/A	Residential District: only in a rear yard

				of a property that has an <b>Occupied Building</b>
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**SECTION 7: APPLICATION, CERTIFICATION, & COMPLIANCE**

- A. A **WECS** and an **Anemometer** are subject to all State of Michigan Building Codes and may not be erected, constructed, installed, or modified without a building permit.
- B. Neither a **WECS** nor an **Anemometer** may be installed without an approved application. In addition, an **LWECS**, an **MWECS**, or an **Anemometer** for those uses requires a Special Land Use permit. The application requirements are listed in the chart below. An application for an **Anemometer** must comply with the **WECS** that is to be proposed on the site.

Description	LWECS	MWECS	SSMWECS & STMWECS
Name of property owner, address, and parcel number	√	√	√
A scaled site plan illustrating the proposed location of all <b>WECS</b> components and ancillary equipment, property lines, physical dimensions of the property, existing buildings, setback and right-of-way lines, public easements, overhead utility lines, sidewalks, non-motorized pathways, roads, and contours. The site plan must also include adjoining properties, including the location and use of all <b>Structures</b> .	√	√	√
A detailed site plan in accordance with the City of Portland Zoning Ordinance.	√	√	
The proposed quantity, type, and height of each <b>WECS</b> to be constructed, including the manufacturer, model, and product specifications, and including maximum noise output ( <b>Decibels</b> ), total rated generating capacity, dimensions, <b>Rotor Diameter</b> , and a description of ancillary facilities	√	√	√
Documented compliance with the Ordinance noise requirements	√	√	√
Documented compliance with applicable local, state, and federal regulations including, but not limited to, safety, construction, environmental, electrical, and communications requirements.	√	√	√
Documented compliance with Federal Aviation Administration (FAA) requirements, the Michigan Airport Zoning Act, the Michigan Tall Structures Act, and any applicable airport overlay zone regulations	√	√	
A description of the methods that will be used to maintain the <b>WECS</b> and the procedures for lowering or removing a <b>WECS</b> , if necessary, to conduct maintenance	√	√	√

If applicable, evidence that the utility company has been informed of a customer's intent to install an interconnected, customer-owned generator and that the connection has been approved	√	√	√
Documents from the developer or manufacturer, confirming specifications for <b>Tower</b> separation	√	√	
Documented compliance with the <b>Shadow Flicker</b> requirements set forth in this Ordinance, including an analysis on potential <b>Shadow Flicker</b> at any <b>Occupied Building</b> with direct line of sight to the <b>WECS</b> . The analysis must identify the locations of <b>Shadow Flicker</b> that may be caused by the project and the expected durations of the <b>Shadow Flicker</b> at these locations from sunrise to sunset over the course of a year. The analysis must identify situations where <b>Shadow Flicker</b> may affect the occupants of the buildings for more than 24 hours per year and must describe measures that will be taken to eliminate or mitigate the problems. <b>Shadow Flicker</b> on a building may not exceed 24 hours per year.	√	√	
Engineering data for construction of the <b>WECS</b> and its base or foundation, including, but not limited to, soil boring data	√	√	
A certified registered engineer's certification that the proposed installation meets or exceeds the manufacturer's construction and installation standards	√	√	
Anticipated construction schedule	√	√	
A maintenance and operation plan, including regular maintenance and parameters for performing unscheduled maintenance	√	√	
A written description of the anticipated life of each <b>WECS</b> , the estimated cost of <b>Decommissioning</b> , and the method of ensuring that funds will be available for <b>Decommissioning</b> and site restoration	√	√	
A <b>Decommissioning</b> plan that will be carried out at the end of the <b>WECS</b> 's useful life, and which includes removal and restoration procedures and schedules, and any agreement with the land owner regarding equipment removal on termination of the lease	√	√	
A description of the routes to be used by construction and delivery vehicles and of any road improvements necessary to accommodate vehicles, equipment, or other traffic, and an agreement, bond, or other approved form of surety guaranteeing repair of damage to public roads and other areas caused by construction	√		
Identification of hazardous materials that will be used and stored	√	√	

on the site			
Assessment of potential impacts on the natural environment, including, but not limited to, endangered species; eagles, birds, and other wildlife, and the land and fragile ecosystems. The assessment must conform to state and federal wildlife agency recommendations based on local conditions.	√	√	
Other relevant information as reasonably requested	√	√	√

- C. If the **WECS** is not owned by the property owner, the applicant must provide the City with a bond or other approved form of surety, to be used for the cost of **Decommissioning** each **WECS**. The City may also require a surety under other reasonable circumstances.
- D. An **LWECS** requires the construction of a private road to offer an adequate means by which the City may readily access the site in case of an emergency. Private roads must be constructed to the City’s private-road standards.
- E. If the ownership of property on which a **WECS** is located changes, the **Owner** or **Operator** must notify the City within 30 days.
- G. Within 90 days after an **LWECS** becomes operational, proof of compliance with the noise standards in this Ordinance must be provided to the City. A sound-pressure-level analysis, by a qualified third-party professional, must be conducted from a reasonable number of sampled locations at the perimeter and in the interior of the property containing the **LWECS**
- H. A **WECS Owner** or **Operator** must provide the City zoning administrator with a copy of the yearly maintenance inspection.

**SECTION 8: DECOMMISSIONING**

- A. Useful Life: A **WECS** is presumed to be at the end of its useful life if no electricity is generated for a continuous period of 12 months. All **Decommissioning** expenses are the responsibility of the **Owner** or **Operator**, and the City may require financial guarantees to assure compliance. Formal, written agreements may be required to ensure compliance with all **Decommissioning** requirements.
- B. Deadline: The **WECS Owner** or **Operator** must complete **Decommissioning** within 12 months after the end of the useful life.
- C. Extension: At the **Owner**’s request and on a showing of good cause, the City Council may grant a reasonable extension of time.
- D. Restoration
  - 1. The foundation for a **WECS** must be removed to a minimum depth of the lower of:
    - a. 60 inches below grade, or
    - b. the level of the bedrock
  - 2. During **Decommissioning**, the **Owner** must stabilize and grade the site and any disturbed earth, and must clear any debris from the site.
- E. Default
 

If the **WECS Owner** or **Operator** fails to complete **Decommissioning** within the period prescribed above, the City may do any or all of the following:

  - 1. designate a contractor to complete **Decommissioning**,
  - 2. charge the violator with the **Decommissioning** expense, or
  - 3. impose a lien against the premises.

**SECTION 10: PUBLIC INQUIRIES & COMPLAINTS**

- A. An aggrieved property owner may notify the City to allege that a **WECS** is not in compliance with the Ordinance noise or **Shadow Flicker** requirements. Notice must be in writing.
- B. Noise:
  - 1. If the City finds no violation and the aggrieved property owner requests further investigation, the City will request that property owner to deposit funds for a noise-level test to be conducted by a certified acoustic technician.
  - 2. If the test indicates that the noise level is within Ordinance noise requirements, the City will use the deposit to pay for the test.
  - 3. If the test indicates that the **WECS** violates the Ordinance noise requirements, the City will refund the deposit to the aggrieved property owner.
  - 4. If the City determines, through its own test or those conducted by an acoustic technician, that the **WECS** violates the Ordinance, the **Owner** must reimburse the City for the test.
- C. **Shadow Flicker**: If the City deems a complaint sufficient to warrant further investigation, the **Owner** must provide a **Shadow Flicker** analysis of the turbine as constructed.
- D. If a **WECS** violates the noise or **Shadow Flicker** requirements of the Ordinance, the **Owner** must take immediate action to bring the **WECS** into compliance, which may include ceasing operation of the **WECS** until the violations are corrected.

**SECTION 11. PUBLICATION & EFFECTIVE DATE.**

This Ordinance must be published and recorded as provided in the City Charter and takes effect on the date of publication, but not less than 10 days after its adoption by the City Council.

Ayes:

Nays:

Absent:

Abstain:

**ORDINANCE DECLARED ADOPTED.**

Dated: April 5, 2010

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James E. Barnes, Mayor

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Monique I. Miller, City Clerk

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Adopted: April 5, 2010

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