The following is based upon

Montrose, Michigan - Code of Ordinances, Ch. 104 Solar and Wind Energy

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DRAFT Zoning language for SOLAR AND WIND ENERGY INSTALLATIONS for Hancock, MI

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Ver. 1 28 June 2022; ver. 2 16 Sept. 2022;

FINAL Planning Council ver. 22 Nov. 2022

Purpose and Intent

The purpose of this chapter is to establish guidelines for the promotion, appropriate placement, and use of solar energy systems, including solar energy panels, and wind energy systems, including turbines. The chapter differentiates accessory use and industrial use for both types of systems.

Solar and Wind Energy System Types

Accessory Use: An ***ACCESSORY*** SOLAR OR WIND ENERGY SYSTEM is a small unit that is incidental and subordinate to the primary use on the same parcel, used to supply power primary for on-site consumption (net metering is allowed if the energy company participates). Solar or wind accessory-use systems are permitted in all districts, subject to setback and height restrictions for accessory structures in their respective districts, and siting limitations as set out below. Accessory-use systems of either type shall not be erected, constructed, installed, or modified unless a building permit has been issued to the owner(s) or operator(s).

Industrial Use: All other energy systems whose purpose is the generation of power for power generation itself (*i.e*., a "solar farm" or "wind farm") intended to produce electricity for sale to a utility and/or other customers for off-site consumption is considered an solar or wind ***INDUSTRIAL*** ENERGY SYSTEM.

- Industrial-use **solar** systems shall be a permitted *only* in I-1 Industrial districts and with a Special Use Permit and full site review.
- Industrial-use **wind** systems (*i.e.*, utility grid wind energy system) are not permitted in any district.

A section for the zoning tables

P=permitted; C=Conditional; X=not permitted

TYPE	ACCESSORY USE	INDUSTRIAL USE
SOLAR energy systems	**P** in all districts *Building permit required*	**C** in I-1 district only *Special Use Permit and Site Review* ***required***
WIND energy systems	**P** in all districts *Building permit required*	**X** in all districts

General Requirements

The design of wind or solar energy systems shall, to the extent reasonably possible, use materials, colors, textures, screening and landscaping that will blend the facility into the natural setting and existing environment.

All applications for a wind or solar energy system shall conform to the provisions of any ordinance requirements with respect to tree removal. An applicant shall locate a wind or solar energy system so that tree removal is minimal to the extent practical.

The installation of a wind or solar energy system shall conform to the State of Michigan Electrical Code.

The installation of a wind or solar energy system is subject to all State of Michigan requirements for interconnection.

Solar and Wind Energy System Permit Application Requirements

All solar and wind energy system construction projects must submit a complete site plan and other necessary documents and drawings set and then receive approval for a Solar and Wind Zoning Permit Application.

Fees for an on-site use solar or wind energy system, anemometer tower, and utility grid solar energy system permit application and for site plan review shall be established and, from time to time, amended by city council approved resolution.

Accessory Solar Energy System Requirements

Ground-mounted solar energy systems should be located in the side or rear yards, subject to all property setback requirements of accessory structures.

Solar panels shall be permitted as a rooftop installation in any zoning district and shall be set back from the building edge at least a distance equal to its height *(e.g.,* a set of panels 6 inches above the roof should be set back from the eaves at least 6 inches). No part of a solar energy system, including solar panels, shall exceed a height of ten (10) inches from the rooftop.

In no event shall the placement of the solar panels result in a total height including building and panels than what is permitted in the zoning district which they are located for the principle building.

Solar energy systems are permitted to be located on any side or rear building facade provided they do not directly face and are not visible from any right-of-way or public easement, and provided they are architecturally integrated with the building upon which they are attached.

The Zoning Administrator may approve alternative site-specific placement if these restrictions cannot be reasonably met.

Solar energy systems shall be permitted as ground arrays in accordance with the following:

(1) Ground arrays shall be located so that any glare is nonintrusive and is directed away from any other properties.

(2) Ground arrays shall not exceed a height of 15 feet. Single-stalk solar trackers (AKA "Smartflowers") shall not exceed a height of 20 feet.

(3) Solar collectors shall be placed so as not to shade any existing solar collector or adjoining property.

(4) Solar energy systems shall not be used for displaying any advertising except for reasonable identification of the manufacture or operator of the system. In no case shall any identification be visible from a property line.

Accessory Wind Energy System Requirements

All on-site use wind energy systems and towers, including small structure-mounted wind energy turbines (SSMWETs), are considered as accessory use if they meet the following criteria:

(1) All wind systems shall be designed to primarily serve the needs of a home or small business.

(2) Accessory wind systems in residential (R-1, R-2) districts shall be of the bladeless type or vertical axis turbines.

(3) Accessory wind systems in the industrial (I-1) district may employ blades subject to a ground clearance of at least 20 feet above the ground (at the highest point of the natural grade within 30 feet of the base of the tower) and, in addition, at least 20 feet above any outdoor surfaces intended for human use, such as balconies or roof gardens.

(4) All wind systems structures should meet the minimum setbacks for on-site accessory structures. The setback shall be measured from the furthest outward extension of all moving parts.

(5) Wind turbines, bladed or otherwise, shall be permitted as a rooftop installation with engineered verification of roof load calculations.

(6) No more than one wind turbine shall be permitted per property, except for industrial district (I-1) zoned properties, which may have more than one wind turbine per property, subject to required standards.

(7) SSMWETs shall not be permitted in any front yard.

(8) All SSMWETs shall conform to height restrictions for accessory structures within their district.

(9) Visual appearances of on-site use wind energy systems and structures shall be a nonreflective, non-obtrusive color (e.g., steel, white, gray, black). The appearance of the turbine, structure, and any ancillary facility shall be maintained in good order routinely throughout the life of the on-site use wind energy systems and supporting structures. All on-site use wind energy systems and structures 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. No advertising (including flags, streamers, or decorative items) are permitted on these structures, except for the identification of the manufacturer.

(10) Noise emanating from an on-site use wind energy system and tower shall not shall not exceed dB(A) readings at all property lines as per zoning sound ordinance sound levels.

(11) Vibrations shall not be produced which are humanly perceptible beyond the parcel of property on which the on-site use the wind energy system is located.

(12) All wind energy systems, including support structures, shall comply with all applicable state construction, electrical, and mechanical codes and building permit requirements. On-site use wind energy systems shall comply with Federal Aviation Administration (FAA) requirements, the Michigan Airport Zoning Act, the Michigan Tall Structures Act, and all other airport overlay zoning regulations.

(13) An interconnected on-site use wind energy system shall comply with Michigan Public Service Commission and Federal Energy Regulatory Commission standards.

(14) All wind energy system connected to a public utility system for net-metering purposes shall meet requirements for interconnection and operation as set forth in the public utility's then-current service regulations meeting federal, state, and industry standards applicable to wind power generation facilities, and the connection shall be inspected by the appropriate public utility to ensure compliance.

(15) The structural integrity of an accessory wind energy system shall conform to the design standards of the International Electrical Commission standards or any similar successor standards.

(16) All wind energy system, including anemometers, shall not interfere with any electromagnetic communication signals (transmission or reception) such as, but not limited to, radio, telephone, television, satellite, or emergency communications systems.

Solar and Wind Energy System Public Inquiries and Complaint Resolution

The Planning Commission shall approve a process to respond to public inquiries and resolve complaints from nearby residents concerning the site location selection, construction, and operation of an on-site use solar or wind energy system, including anemometer towers. The public inquiries and complaints resolution process established by the Planning Commission shall require an aggrieved nearby property owner or renter of real estate alleging that an on-site use solar or wind energy system or anemometer tower is not in compliance with the requirements of this chapter, including noise provisions, to notify the city manager, in writing, regarding public inquiries and/or the concerns and complaints regarding the alleged ordinance violation. The City Manager may require the assistance of the Zoning

Administrator and/or Police Department officers to investigate if the complaint filed by the aggrieved party warrants an investigation be performed to determine if an ordinance violation is deemed sufficient to file a formal complaint with the city attorney for law enforcement prosecution action purposes.

Solar and Wind Energy System Abandonment and Decommissioning

Accessory-use solar and wind systems do not require a decommissioning plan.

Industrial-scale solar systems shall have a decommissioning plan in place at the time of application. Upon removal of a ground array solar energy system, the site shall be cleaned, restored to blend with the existing surrounding vegetation at the time of removal.

The Planning Commission shall be responsible for approving decommissioning plans indicating:

(1) The anticipated life of the project.

(2) The estimated decommissioning costs net of salvage value in current dollars.

(3) The method of ensuring that funds will be available for decommissioning and restoration of the site location.

(4) The anticipated manner in which the project will be decommissioned and the site location restored.

The end of useful life for decommissioning purposes shall be defined as when no electricity is generated for a continuous time period of 12 months.

The owner of solar and wind energy systems shall then complete decommissioning within 12 months after the end of the useful life of the project. The Zoning Administrator or Planning Commission may issue a "Notice of Abandonment" to the owner. The notice shall be sent via regular mail to the property owner of record. Upon request of the owner(s), operator(s) or assignees of the energy system, and for good cause, the Planning Commission may grant a reasonable extension of time for completing the decommissioning.

All decommissioning expenses shall be completely the responsibility of the owner(s) or operator(s). Failure by the owner(s) or operator(s) to complete decommissioning within the 12-months time period, after violation may result in the city council designating a contractor to complete decommissioning with all the expenses thereof charged to the violator and to become a lien against the premises.

Penalties

Anyone violating the provisions of this chapter shall be deemed guilty of a misdemeanor with penalty to be determined and listed in the city's schedule of fines.

Definitions (keep those that are eventually relevant)

Ambient means the sound pressure level exceeded 90 percent of the time or L90.

Ambient sound level is the amount of background noise at a given location prior to the installation of a wind energy turbine which may include, but not limited to, traffic, machinery, lawnmowers, human activity, and the interaction of wind with landscape. The ambient sound level is measured on the dB(A) weighted scale as defined by the American National Standards Institute.

Anemometer is a temporary wind speed indicator constructed for the purpose of analyzing the potential for utilizing a wind energy turbine at a given site. This includes the tower, base plate, anchors, cables and hardware, wind direction vanes, booms to hold equipment, data logger, instrument wiring, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics over a period of time for either instantaneous wind information or to characterize the wind resource at a given location.

Anemometer tower means a freestanding tower containing instrumentation such as anemometers that is designed to provide present moment wind data for use by the supervisory control and data acquisition (SCADA) system which is an accessory land use to a utility grid wind energy system is an aggregation of parts including the base, tower, anemometer or wind speed recorder, wind direction vanes, data logger, and accessory equipment such as any telemetry devices, etc., in such configuration as necessary to monitor or transmit wind speed and wind flow characteristics over a period of time.

ANSI means the American National Standards Institute.

dB(A) means the sound pressure level in decibels. It refers to the "A" weighted scale defined by ANSI. A method for weighting the frequency spectrum to mimic the human ear.

Decibel is defined as the unit of measure used to express the magnitude of sound pressure and sound intensity. Decibels shall be measured on the dB(A) weighted scale as defined by the American National Standards Institute.

Decommissioning is the process of terminating operation and completely removing a wind energy turbine system and all related buildings, structures, foundations, access roads, and equipment.

FAA means the common acronym for the Federal Aviation Administration.

IEC means the International Electrotechnical Commission.

Industrial district (IND) means property parcels zoned industrial district with the intent to provide areas for low density industrial facilities in accordance with the applicable adopted zoning ordinance provisions.

IOS means the International Organization for Standardization.

Lease unit boundary means the boundary around property leased for purposes of a wind energy system, including adjacent parcels to the parcel on which the wind energy system tower or equipment is located. For purposes of setback, the lease unit boundary shall not cross public street rights-of-way.

Nacelle means the component of a wind energy system that stops atop the tower and houses the turbine.

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.

Occupied building is a residence, school, hospital, church, public library, business, or other building used for public gatherings.

On-site use wind energy system and tower means a land use for generating electric power from wind and is an accessory use that is intended to primarily serve the needs of the consumer at that site~~, except for those located on industrial district zoned parcels~~.

Operator means the individual or entity, including their respective successors and assigns that have equity interest in the on-site use wind energy system and tower as a lessee of the real property parcel on which the wind energy turbine (WET) is located on in accordance with this chapter.

Owner is the individual or entity, including their respective successors and assigns that have equity interest or own the on-site use wind energy turbine (WET) in accordance with this chapter.

Rotor means an element of a wind energy system that acts as a multi-bladed airfoil assembly, thereby extracting through rotation, kinetic energy directly from the wind.

Rotor diameter is the cross-sectional dimension of the circle swept by the rotating blades of a wind energy turbine (WET) with a multiple-bladed airfoil assembly of a wind energy system that extracts through rotation kinetic energy directly from the wind.

Shadow flicker is the moving shadow, created by the sun shining through the rotating blades of a wind energy turbine (WET) and means alternating changes in light intensity caused by the moving blade of a wind energy system casting shadows on the ground and stationary objects, such as, but not limited to, a window at a dwelling. The amount of shadow flicker created by a wind energy turbine (WET) is calculated by a computer model that takes into consideration turbine location, elevation, tree cover, location of all structures, wind activity, and sunlight.

Small structure-mounted wind energy turbine (SSMWET) converts wind energy into electricity through the use of equipment which includes any base, blade, foundation, generator, nacelle, rotor, tower, transformer, vane, wire, inverter, batteries, or other components used in the system. A SSMWET is attached to a structure's roof, walls, or other elevated surface. The SSMWET has a nameplate capacity that does not exceed ten kilowatts. The total height does not exceed 15 feet as measured from the highest point of the roof, excluding chimneys, antennae, and other similar protuberances.

Solar cell means any device that directly converts solar radiation into thermal, chemical, or electrical energy through the process of photovoltaics and usually is mounted on solar panels.

Solar collector means a photovoltaic cell, panel or array, or a heated air or water collection device, which relies on solar radiation as an energy source for the generation of thermal, chemical, or electrical energy, i.e., solar cells or solar panels.

Solar energy system means a solar energy system and all associated equipment which converts solar energy into a usable electrical energy, heats water, or produces hot air or other similar function through the use of solar panels as an aggregation of parts including any base, mounts, tower, solar collectors, and accessory equipment such as utility interconnections and solar storage batteries, etc., in such configuration as necessary to convert solar radiation into thermal, chemical, or electrical energy, i.e., solar cells or solar panels.

Solar panel means a structure containing one or more receptive cells, the purpose of which is to convert solar energy into usable electrical energy by way of a solar energy system.

Solar storage battery means a device that stores energy from solar radiation and makes it available in the form of thermal, chemical, or electrical energy.

Sound pressure means an 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.

Sound pressure level means the sound pressure mapped to a logarithmic scale and reported in decibels (dB).

Structure is any building or other structure, such as a municipal water tower that is a minimum of 12 feet high at its highest point of roof and is secured to frost-footings or a concrete slab.

Total height is 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 wind energy turbine (WET).

Turbine means the rotating component of a wind energy system that converts kinetic energy from the wind into mechanical or electrical energy, or the generator.

Wind energy system means a land use for generating power by use of wind; utilizing use of a wind turbine generator and includes the turbine, blades, and tower as well as related electrical equipment. This does not include wiring to connect the wind energy system to the grid.

Wind energy turbine (WET) is any structure-mounted, small, medium, or large wind energy conversion system that converts wind energy into electricity through the use of a wind generator and includes the nacelle, rotor, tower, and pad transformer, if any.

Wind site assessment means an assessment to determine the wind speeds at a specific site and the feasibility of using that site for construction of a wind energy system.

The following are suggestions for developing a form for zoning permit:

—FOR CONSIDERATION ONLY; to be developed after this ordinance is passed by City Council—

The following information shall be disclosed and submitted to the city building inspector/zoning administrator on the permit application for an Accessory wind energy system:

(1) Name of property owner(s), address, and parcel identification number.

(2) A site plan that shall include maps (drawn to scale) showing the proposed location of all components, ancillary equipment and shadow flicker of the Accessory wind energy system and towers, including small structure-mounted wind energy turbines, property lines, physical dimensions of the property parcel, existing buildings, setback lines, right-of-way lines, public easements, overhead and underground utility lines, sidewalks, nonmotorized pathways, streets and contours. The site plan shall also include all adjoining or abutting properties as well as the location and the primary use of all structures on those properties.

(3) The proposed type and height of the on-site use wind energy systems and towers proposed to be constructed, including the manufacturer and model names, product specifications, including maximum noise output as measured in decibels, total rated generating capacity, dimensions, rotor diameter, and a description of all ancillary facilities, components, and equipment.

(4) Documented compliance with the noise requirements as set forth is this chapter.

(5) Documented compliance with applicable national, state, and local regulations, including, but not limited to, all applicable safety, construction, environmental, electrical, mechanical, communications, and FAA requirements.

(6) Proof on applicant's liability insurance certificate.

(7) Written evidence that the utility company has been informed of the customer's intent to install an interconnected, customer-owned generator and that such connection has been approved by that utility company. Off-grid systems shall be exempt from the requirement of providing written evidence from the utility company.

(8) Other relevant information as may be reasonably requested by the zoning administrator and/or planning commission.

(9) Signature of applicant owner or duly authorized operator.