

KEENE TOWNSHIP

ORDINANCE NO. 10-9-18

Adopted Date 10-9-18

AN ORDINANCE TO AMEND THE ZONING ORDINANCE

ARTICLES II, XII, XV

THE TOWNSHIP OF KEENE ORDAINS:

Section 1: Add new definitions below

Article II Definitions, section 2.02

Solar Energy Systems - A system capable of collecting and converting solar radiation into heat or mechanical or electrical energy and transferring these forms of energy by a separate apparatus to storage or to point of use, including, but not limited to, water heating, space heating or cooling, electric energy generation, or mechanical energy generation. This definition shall include Solar Thermal, Photovoltaic, and Passive Solar Systems. Related definitions are listed below:

- a. Battery Back-Up - A battery system that stores electrical energy from a solar PV system, making the electricity available for future use. Battery Back-Up systems are common in Off-Grid Systems and Hybrid Systems.
- b. Grid-tied Solar - A solar PV system that is interconnected with the utility grid via net metering and interconnection agreements with the utility.
- c. Electricity Generation (aka production, output) - The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).
- d. Electrical Equipment - Any device associated with a solar energy system, such as an outdoor electrical unit/control box, that transfers the energy from the solar energy system to the intended on-site structure.
- e. Grid-tied Solar Photovoltaic Systems (aka grid-tied PV, on-grid, grid-connected, utility-interactive, grid-intertied, or grid-direct) - Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage. Any excess electricity generated is sent to the electric utility grid, credited via a customer's net metering agreement with their local utility. Grid-tied are typically installed without battery back-up system to store electricity. As such, these systems provide no power during an outage. Typical system components: PV panels, inverter(s), and required electrical safety gear.
- f. Ground-Mount System - A solar energy system that is directly installed on specialized solar racking systems, which are attached to an anchor in the ground

and wired to connect to an adjacent home or building. Ground-mount systems may be applicable when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.

- g. Hybrid Solar Photovoltaic Systems (aka grid-tied PV with battery back-up) - Solar photovoltaic electricity generation systems designed to serve the electricity needs of the building to which it is connected, thus offsetting a home's or business's electricity usage, while also utilizing a battery back-up in the event of a power outage. This is the only system that provides the ability to have power when the utility grid is down. Typical system components include: PV panels, inverter(s), and required electrical safety gear, battery bank, and a charge controller.
- h. Inverter - A device that converts the Direct Current (DC) electricity produced by a solar photovoltaic system is converted to useable alternating current (AC).
- i. Kilowatt (kW) - Equal to 1000 Watts; a measure of the use of electrical power.
- j. Kilowatt-hour (kWh) - A unit of energy equivalent to one kilowatt (1 kW) of power expended for 1 hour of time.
- k. Mounting - The manner in which a solar PV system is affixed to the roof or ground (i.e. roof mount, ground mount, pole mount).
- l. Megawatt (MW) - Equal to 1000 Kilowatts; a measure of the use of electrical power.

Megawatt-hour (MWh) - A unit of energy equivalent to one Megawatt (1 MW) of power expended for 1 hour of time.
- m. Net Meter - On-grid solar PV systems connected to the utility grid use a net meter, typically provided and installed by the local utility, to measure the flow of electricity from the solar system for the purposes of net metering.
- n. Net Metering - A billing arrangement that allows customers with grid-connected solar electricity systems to receive credit for any excess electricity generated on-site and provided to the utility grid.
- o. Off-Grid Solar Photovoltaic Systems with battery back-up - Solar photovoltaic electricity systems designed to operate independently from the local utility grid and provide electricity to a home, building, boat, RV (or remote agricultural pumps, gates, traffic signs, etc.). These systems typically require a battery bank to store the solar electricity for use during nighttime or cloudy weather (and/or other back-up generation). Typical system components include: PV panels, battery bank, a charge controller, inverter(s), required disconnects, and associated electrical safety gear.
- p. Orientation (or Azimuth) - In the northern hemisphere, true solar south is the optimal direction for maximizing the power output of solar PV. Proper orientation and access to sun are critical for achieving maximum energy production potential

(ideally, the orientation of the solar energy system ensures that solar access is not obstructed by other buildings, shade trees, chimneys, HVAC systems, or other equipment).

- q. Passive Solar - Techniques, design, and materials designed to take advantage of the sun's position throughout the year (and the local climate) to heat, cool, and light a building with the sun. *Passive solar* incorporates the following elements strategically to maximize the solar potential of any home or building (namely, maximizing solar heat gain in winter months and minimizing solar heat gain in summer months to reduce heating/cooling demand; and maximizing the use of daylighting to reduce demand for electricity for lighting): strategic design and architecture, building materials, east-west and building lot orientation, windows, landscaping, awnings, ventilation
- r. Photovoltaic (PV) System - A solar energy system that produces electricity by the use of semiconductor devices, called photovoltaic cells, which generate electricity when exposed to sunlight. A PV system may be roof-mounted, ground-mounted, or pole-mounted.
- s. Pole-Mount Systems - A solar energy system that is directly installed on specialized solar racking systems, which are attached to pole, which is anchored and firmly affixed to a concrete foundation in the ground, and wired underground to an attachment point at the building's meter. Unlike ground-mount systems, pole-mount systems are elevated from the ground. Pole-mounted systems can be designed to track the sun (with single-axis or dual-axis tracking motors) and maximize solar output throughout the year.
- t. Power - the rate at which work is performed (the rate of producing, transferring, or using energy). Power is measured in Watts (W), kilowatts (kW), Megawatts (MW), etc.
- u. PV-Direct Systems - The simplest of solar photovoltaic electric systems with the fewest components (no battery back-up and not interconnected with the utility) designed to only provide electricity when the sun is shining. Typical system components include: PV panels, required electrical safety gear, and wiring.¹
- v. Racking - Solar energy systems are attached securely and anchored to structural sections of the roof-mounted or pole-mounted systems. Specially designed metal plates called flashings prevent leaks and are placed under shingles and over bolts to create a water-tight seal.
- w. Roof-Mount System (aka rooftop mounted, building mounted) - A solar energy system consisting of solar panels are installed directly on the roof of a home, commercial building, and/or an accessory structure, such as a garage, pergola, and/or shed. Solar panels are mounted and secured using racking systems specifically designed to minimize the impact on the roof and prevent any leaks or structural damage. Roof-mount systems can be mounted flush with the roof or tilted toward the sun at an angle.

- x. Solar Access - the ability of one property to continue to receive sunlight across property lines without obstruction from another's property (buildings, foliage or other impediment). Solar access is calculated using a sun path diagram.
- y. Solar Array - Multiple solar panels combined together to create one system.
- z. Solar Collector - A solar PV cell, panel, or array, or solar thermal collector device, that relies upon solar radiation as an energy source for the generation electricity or transfer of stored heat.
- aa. Solar Easement - An easement recorded for the purpose of which is to secure the right to receive sunlight across the real property of another for the continued access to sunlight necessary to operate a solar energy system. Parties may voluntarily enter into written solar easement contracts that are enforceable by law. An easement must be created in writing and filed, duly recorded and indexed in the office of the recorder of the county in which the easement is granted. A solar easement, once created, runs with the land and does not terminate unless specified by conditions of the easement.
- bb. Solar Glare - The potential for solar panels to reflect sunlight, with an intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility.
- cc. Solar Photovoltaic (Solar PV) System – Solar systems consisting of photovoltaic cells, made with semiconducting materials, that produce electricity (in the form of direct current (DC)) when they are exposed to sunlight. A typical PV system consist of PV panels (or modules) that combine to form an array; other system components may include mountain racks and hardware, wiring for electrical connections, power conditioning equipment, such as an inverter and/or batteries. For the purposes of this Ordinance, a solar PV system is defined as generating capacity of not more than 25 kilowatts for residential facilities and not more than two megawatts for non-residential facilities.
- dd. Solar Panel (or module) - A device for the direct conversion of sunlight into useable solar energy (including electricity or heat).
- ee. Solar Process Heat technologies provide industrial specific applications, including ventilation air preheating, solar process heating, and solar cooling.
- ff. Solar-Ready - The concept of planning and building with the purpose of enabling future use of solar energy generation systems. Solar-ready buildings, lots, and developments make it easier and more cost-effective to utilize passive solar techniques and adopt active solar technologies in the future. Solar-Ready Buildings are built anticipating future installation of active solar energy systems (including structural reinforcement, pre-wiring or plumbing for solar, and east-west building orientation). Solar-Ready Lots are oriented to take maximal advantage of a location's solar resource. Solar-Ready Developments expand this concept to entire subdivisions.

- gg. Solar Thermal System (aka Solar Hot Water or Solar Heating Systems) - A solar energy system that directly heats water or other liquid using sunlight. Consist of a series of tubes that concentrate light to heat either water or a heat-transfer fluid (such as food-grade propylene glycol, a non-toxic substance) in one of two types of collectors (flat-plate collectors and evacuated tube collectors). The heated liquid is used for such purposes as space heating and cooling, domestic hot water, and heating pool water.
- hh. Tilt - The angle of the solar panels and/or solar collector relative to their latitude. The optimal tilt to maximize solar production is perpendicular, or 90 degrees, to the sun's rays at true solar noon. True solar noon is when the sun is at its highest during its daily east-west path across the sky (this is also known as 0° Azimuth). Solar energy systems can be manually or automatically adjusted throughout the year. Alternatively, fixed-tilt systems remain at a static tilt year-round
- ii. Watts (W) - A measure of the use of electrical power (power (Watts) = voltage (volts) X current (Amps)).

Section 2: Add “Solar Energy Systems” as a new special use to Article XII Special Uses

Section 12.27 – Solar Energy Systems

This ordinance aims to promote the accommodation of on-site residential and non-residential solar energy systems installed to reduce on-site energy consumption and associated equipment, as well as adequate access to sunlight necessary for such systems. This ordinance permits solar energy systems, while protecting the safety and welfare of adjacent and surrounding land uses through appropriate zoning and land use controls. Small scale solar energy systems shall be permitted in any zoning district as an accessory use, subject to specific criteria as set forth below. Ground or pole mounted and commercial scale solar energy systems require a special land use application. Where general standards and specific criteria overlap, specific criteria shall supersede general standards.

- A. This ordinance applies to all solar energy systems installed and constructed after the effective date of this Ordinance. For purposes of this Ordinance, “solar energy system” means a solar energy system as defined in section 2.02 Definitions. Solar energy systems constructed prior to the effective date of this ordinance shall not be required to meet the requirements of this ordinance. All solar energy systems shall be designed, erected, and installed in accordance with applicable manufacturer’s instructions, local, state, utility, and national codes, regulations, and standards.
- B. The installation and construction of a **roof-mount solar energy system** shall be subject to the following development and design standards:
 - 1. A roof or building mounted solar energy system may be mounted on a principal or accessory building in all zoning districts. No zoning permit is required. An Ionia County Building Permit may be required.
 - 2. Any height limitations shall not be applicable to solar collectors provided that such structures are erected only to such height as is reasonably necessary to

accomplish the purpose for which they are intended to serve, and that such structures do not obstruct solar access to neighboring properties. The panels shall not extend past the roofline.

3. Placement of solar collectors on flat roofs shall be allowed provided that panels do not extend horizontally past the roofline.
- C. The installation and construction of ***small collector systems*** *mounted on fences or poles, or ground mounted* with collector surface areas less than twelve (12) square feet and less than six (6) feet high are permitted as an accessory use in all zoning districts. A small solar collector panel shall be setback from all property lines a minimum of 15 feet and a minimum of fifty (50) feet from a street right of way. No zoning permit is required for small solar collectors. This section does not apply to repair and replacement of existing solar energy equipment, provided that there is no expansion of the size or coverage area of the solar energy equipment.
- D. The installation and construction of a solar ***large ground or pole mounted collector panel system*** will require a special land use permit (larger than 12 square feet) and be subject to the following standards.
1. The height of the solar collector and any mounts shall not exceed 30 feet when oriented at maximum tilt. A taller system structure may be approved if a need for more height can be demonstrated such as nearby trees, buildings or topography.
 2. The surface area of a ground or pole-mounted system, regardless of the mounted angle, shall be calculated as part of the overall lot coverage.
 3. The minimum solar energy system setback distance from the property lines shall be equivalent to the front lot line setback and accessory building side and rear setback requirements of the underlying zoning district.
 4. All power transmission lines from a ground mounted solar energy system to any building or other structure shall be located underground and/or in accordance with the building electrical code, as appropriate.
 5. A ground or pole mounted system may be up to a maximum size to provide electricity for the current and expected electricity use of the buildings on the property. An oversized system maybe approved if the applicant provides documentation that a larger system is needed. The maximum size of collector panels shall not exceed the energy amount as permitted by the local utility company.
 6. The minimum acreage to construct a ground or pole mounted system is two and a half (2.5) acres.
 7. A ground mounted or pole mounted solar energy system is permitted in all zoning districts.

- E. All electrical equipment associated with and necessary for the operation of solar energy systems shall comply with the following:
 - 1. Electrical equipment shall comply with the setbacks specified for front lot line and accessory structures in the underlying zoning district.
- F. Solar panels are designed to absorb (not reflect) sunlight; and, as such, solar panels are generally less reflective than other varnished or glass exterior housing pieces. However, solar panel placement should be prioritized to minimize or negate any solar glare onto nearby properties or roadways, without unduly impacting the functionality or efficiency of the solar system.
- G. A solar energy system shall not be used to display permanent or temporary advertising, including signage, streamers, pennants, spinners, reflectors, banners or similar materials. The manufacturers and equipment information, warning, or indication of ownership shall be allowed on any equipment of the solar energy system provided they comply with the prevailing sign regulations.
- H. A solar energy collector system shall be permanently and safely attached to the ground based on the manufactures installation guide. Solar energy collectors shall comply with building codes and other applicable Township, County, State and Federal requirements and permits.
- I. A solar energy system shall not be constructed until a zoning and building permit has been approved and issued along with the following requirements.
 - 1. Installation shall be constructed to the state codes, permits and manufactures instructions. Prior to operation, electrical connections must be inspected by the Ionia County Building Department Inspectors.
 - 2. Any connection to the public utility grid must be approved by the appropriate public utility.
 - 3. If solar storage batteries are included as part of the solar collector system, they must installed according to all requirements set forth in the National and State Electric Code and State Fire Code when in operation. When no longer in operation, the batteries shall be disposed of in accordance with the laws and regulations of the local and State and any other applicable laws and regulations relating to hazardous waste disposal.
 - 4. Unless otherwise specified through a contract or agreement, the property owner of record will be presumed to be the responsible party for owning and maintaining the solar energy system.
- J. If the ground mounted energy system is not used or abandoned for twelve (12) months then the following requirements will be applicable.
 - 1. If a ground mounted solar energy system is removed, any earth disturbance as a result of the removal shall be landscaped in accordance with the prior approval or local landscaping.

2. A ground or pole-mounted solar energy system is considered to be abandoned or defective if it has not been in operation for a period of twelve (12) months. If abandoned, the solar energy system shall be repaired by the owner to meet federal, state, and local safety standards, or be removed by the owner within the time period designated by the municipal approval. If the owner fails to remove or repair the defective or abandoned solar energy system, the Township may pursue a legal action to have the system removed at the owner's expense.
- K. The installation and construction of a **commercial solar energy system (solar farm)** will require a special land use permit and be subject to the following standards.
1. A commercial solar energy system may be established as principal or accessory uses in the AG Agriculture, AR Agriculture Residential Districts and in the RR Rural Residential District on parcels 40 or more acres. The following requirements apply:
 - a. Minimum Setbacks shall be 100 feet minimum from all lot lines and road right of ways. However, as a condition of approval, the Township may require increased setbacks if it determined that greater separation would better protect adjacent residents and landowners.
 - b. Maximum height allowed is 30 feet, measured from the natural grade below the unit to the highest point at full tilt. A taller system structure may be approved if a need for more height can be demonstrated such as nearby trees, buildings or topography.
 - c. Minimum Acreage for a solar farm is five (5) acres in the AG and AR Districts.
 - d. Views of collectors and equipment from residential properties or public right-of-way may be required to be screened. Screening methods may include the use of materials, colors, textures, screening walls, fences and landscaping that will blend the facility into the natural setting and existing environment.
 - e. A small sign with emergency contact information shall be installed on or near the solar energy equipment.
 - f. The area where the solar panel structures are located shall be enclosed with a six (6) foot high fence to prevent trespassing or vandalism.
 2. A decommissioning plan signed by the responsible party and the landowner (if different) addressing the following shall be submitted prior to approval:
 - a. Defined conditions upon which decommissioning will be initiated (i.e. end of land lease, no power production for 12 months, abandonment, etc.)
 - b. Removal of all utility owned equipment and non-utility owned equipment, conduit, structures, fencing, roads, solar panels, and foundations. The land owner may request to allow some items to remain such as an access road, fencing or concrete if approved by the Planning Commission.
 - c. Restoration of property to condition prior to development of the system, except as approved in b above.
 - d. The timeframe for completion of decommissioning activities.

- e. Description of any agreement or lease with landowner regarding decommissioning, if applicable.
- f. The entity or individual responsible for decommissioning.
- g. Plans for updating the decommissioning plan.
- h. A performance guarantee shall be posted in the form of a bond, letter of credit, cash, or other form acceptable to the Township, to ensure removal upon abandonment. As a part of the decommissioning plan, the responsible party shall provide at least two (2) cost estimates from qualified contractors for full removal of the equipment, foundations, and structures associated with the facility. These amounts will assist the Township when setting the performance guarantee amount. The performance guarantee shall be valid throughout the lifetime of the facility. Bonds and letters of credit shall be extended on a regular basis with expiration dates never less than two (2) years from the annual anniversary of special land use approval.

Section 3: Add use reference to Article XV Supplemental Regulations Section 15.37 “Solar Energy Systems”

Section 15.37 – Solar Energy Systems

All regulations on “solar energy systems”, including permitted uses and special uses, are in Article XII section 12.27 of the Special Use article/chapter.

Section 4:

Validity and Severability. Should any portion of this Ordinance be found invalid for any reason, such holding shall not be construed as affecting the validity of the remaining portions of this Ordinance.

Section 5:

Repealer Clause. Any ordinances or parts of ordinances in conflict herewith are hereby repealed only to the extent necessary to give this Ordinance full force and effect.

Section 5:

Effective Date. This Ordinance shall be effective seven (7) days after publication.

ADOPTED:

Yeas: 5

Nays: 0

STATE OF MICHIGAN)

)

COUNTY OF IONIA)

I, the undersigned, the duly elected Clerk of Keene Township, Ionia County, Michigan, DO HEREBY CERTIFY that the foregoing is a true and complete representation of certain proceedings conducted by the Board of Trustees of said Township at a meeting held on this 9th day of October, 2018.

Nancy Feuerstein

Keene Township Clerk

Published Date: October 20, 2018

Note – original is signed