

## **Solar Energy Facilities and Systems**

### **Section 1. Definitions**

**ALBEDO** – The ratio of reflected radiation from a surface to the incident radiation upon the surface (i.e. the reflection coefficient). Albedo is a measure of the reflectivity of a surface and may be used to quantify the amount of solar glare from a solar energy system.

**BUILDING INTEGRATED PHOTOVOLTAIC (BIPV) SYSTEM** – A BIPV system forms part of the structure to which it is affixed. Typically integrated into a roofing system (e.g. solar shingles), BIPV systems can provide architectural interest and/or an unobtrusive solar energy system installation.

**INTERCONNECTION AGREEMENT** – A legal document between a customer and an electric utility authorizing the connection of the customer's on-site electricity generating system to the utility's electric grid.

**NET METERING** – An approach for interconnecting and metering on-site electricity generating facilities. The means of measuring the difference between electricity supplied by an electric utility, electric distribution company, or electric generation supplier and the electricity generated by a customer-generator using alternative energy sources. Net metering allows customers to use excess on-site generated electricity to offset utility-purchased electricity on a monthly or annual basis.

**NET METERING AGREEMENT** – An agreement with a customer-generator and an electric utility, electric distribution company, or electric generation supplier and the electricity generated by a customer generator that allows customers to receive a credit at the retail price of electricity for surplus electricity generated on-site. Under net metering agreement, a bidirectional electric meter is used to measure and record the flow of electricity in both directions from and to the customer-generator.

**POWER PURCHASE AGREEMENT (PPA)** – A contract to purchase energy. A PPA is usually established between a party that generates electricity and a party that purchases electricity. A PPA may also be a contract written between a building owner that wants to generate electricity on site and a third-party developer who will install, maintain and own the system used to generate the electricity, and then sell the electricity produced by the system to the building owner at a pre-determined rate.

**SOLAR HOT WATER SYSTEM** – Uses solar energy to heat water. The most common types of solar water heaters are evacuated tube collectors and glazed flat plate collectors generally used for domestic hot water; and unglazed plastic collectors used mainly to heat swimming pools.

**SOLAR MODULE** – A device containing one (1) or more receptive cells equal to or greater than two (2) square feet, the purpose of which is to convert solar energy into electrical or thermal energy.

**SOLAR ACCESS** – The ability of sunlight to shine on a property owner's land, or more specifically, the owner's solar energy facility or solar energy system, without the sunlight being blocked by structures, vegetation, or other obstructions on neighboring land.

SOLAR EASEMENT – A legal agreement that protects access to sunlight, or solar access, on a property.

SOLAR ENERGY FACILITY– An alternative energy facility that consists of one or more ground mounted, free-standing, or building mounted or integrated solar collection devices, solar energy related equipment and other associated infrastructure with the primary intention of generating electricity or otherwise converting solar energy to a different form of energy for primarily commercial or other off-site use *in accordance with applicable law and regulation*.

SOLAR ENERGY SYSTEM – An alternative energy system that consists of one or more ground mounted, free-standing, or building mounted or integrated solar collection devices and solar energy related equipment and other associated infrastructure with the primary intention of generating electricity or otherwise converting solar energy to a different form of energy to reduce on-site consumption of purchased power, when a property upon which the system is installed also receives electricity supplied by a utility company, excess electricity generated and not presently needed for on-site use may be used off-site by a utility company *in accordance with applicable law and regulation*.

SOLAR GLARE – The effect produced by light reflecting from a solar module with intensity sufficient to cause annoyance, discomfort, or loss in visual performance and visibility. See ALBEDO definition.

## **Section 2. Legislative Intent**

The purpose of this ordinance is to provide a regulatory framework for the construction and operation of Solar Energy Systems and Solar Energy Facilities in Upper Merion Township, subject to reasonable restrictions, which will preserve the public health, safety, and welfare, while also maintaining the character of Upper Merion Township.

## **Section 3. Solar Energy Systems**

### **A. Applicability.**

Solar energy systems, as defined by this ordinance, are a permitted accessory use in all zoning districts.

### **B. General Regulations**

1. Solar energy systems shall be installed in compliance with all applicable state and federal building, construction and fire codes, including regulations with respect to stormwater management.
2. Solar energy systems shall be operated in compliance with all federal, state and local laws and regulations.

### **C. Setbacks**

1. Solar energy systems must meet the applicable accessory use setbacks for the zoning district in which the system is located. *Solar energy system components are also prohibited between primary buildings and any street frontage unless the applicant can prove such installation would be impossible otherwise and can be installed meeting all other requirements.* Solar energy

system components shall not encroach upon any stormwater management facility or right-of-way or easement, including but not limited to water, stormwater, sanitary sewer, natural gas, telephone, and electrical easements.

2. A ground mounted or freestanding solar energy module or array may not extend into any applicable yard setback when oriented at minimum design tilt.
3. Setbacks for building-mounted solar energy systems shall meet the following requirements.
  - a. Solar energy systems mounted on a pitched roof must meet the following requirements; or an alternative design that provides safe access to the roof, and roof ridge, that is approved by the Chief Building Official:
    - i. The design must provide at least three (3) access ways from the edge of roof to the ridge of the roof that are a minimum of two (2) feet wide. A side of a pitched roof which does not carry a solar energy system may count as two (2) access ways as long as the roof is more than five (5) feet wide.
    - ii. A two (2)-foot minimum setback from the roof ridgelines shall be provided for roof-mounted solar modules to allow available space for firefighters to penetrate the roof to create ventilation. Solar modules may be installed along the roof slope up to the ridge when an adequate alternative smoke ventilation method is provided and approved by the Chief Building Official.
    - iii. A one and a half (1.5)-foot setback from all roof hips and valleys shall be provided if solar modules are installed on both sides of the roof hip or valley.
  - b. Solar energy systems mounted on a flat roof must meet the following requirements; or an alternative design that provides safe access to the roof that is approved by Chief Building Official:
    - i. A three (3)-foot setback from a minimum of two (2) roof edges shall be provided for roof mounted solar modules to ensure that firefighters may access the roof in a quick and safe manner.

#### D. Height

1. For a building-mounted system installed on a sloped roof, the highest point of the system shall not exceed the highest point of the roof to which it is attached as allowed by setback requirements.
2. For a building-mounted system installed on a flat roof, the highest point of the system shall be permitted to exceed the district's height limit by up to six (6) feet above the rooftop which it is attached.
3. Ground-mounted or freestanding solar energy systems shall not exceed applicable maximum accessory structure height in the zoning district in which the solar energy system is located. In districts where no such maximum accessory height exists, ground-mounted or freestanding solar energy systems shall not exceed 14' in height.
4. *A solar energy system may exceed the applicable maximum accessory structure height if it will cover an impervious surface parking area, but the system height may not exceed the maximum height allowed for the primary structure that the parking area serves.*

#### E. Design and Installation Requirements

1. The design and installation of solar energy systems shall conform to applicable industry codes and standards, including, but not limited to, those of the International Code Council (ICC), American National Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), and other similar certifying and professional organizations such as the American Society of Civil Engineers and the American Society of Mechanical Engineers.
2. All exterior electrical and/or plumbing lines shall be buried below the surface of the ground and shall be placed in conduit.
3. All solar energy system components shall be clearly labeled with a warning concerning voltage and other important electrical safety information. The universal isolation switch, or equivalent device, shall be easily accessible by first responders and clearly labeled.
4. For purposes of determining compliance with impervious coverage standards of the applicable zoning district, the total horizontal projection area of all ground-mounted and freestanding solar collectors, including solar photovoltaic cells, modules, arrays, inverters and solar hot air or water collector devices, shall be considered pervious coverage so long as pervious conditions are maintained underneath the solar photovoltaic cells, modules, arrays and solar hot air or water collector devices.
5. For purposes of determining compliance with building coverage standards of the applicable zoning district, the total horizontal projection area of all ground-mounted and freestanding solar collectors, including solar photovoltaic cells, modules, arrays, inverters and solar hot air or water collector devices, shall not be considered additional building coverage.
6. An applicant shall locate a solar energy system so that tree removal is not required to the extent practical and shall be subject to any applicable tree replacement regulations found in the Subdivision and Land Development Ordinance.
7. Installed solar modules shall be constructed with at least one anti-reflective layer to reduce reflectivity.
8. Roof-mounted solar energy systems shall be exempt from rooftop equipment screening requirements.
9. Solar energy systems shall not be used to display advertising or decoration, including signage, streamers, pennants, spinners, reflectors, ribbons, tinsel, balloons, flags, banners, lights, or similar items. Manufacturers and equipment information, safety warnings, and ownership information may be displayed on solar energy system equipment provided such information complies with applicable sign regulations.
10. Owners of solar energy systems are encouraged but not required to obtain solar easements from neighboring landowners to ensure solar access. The Township does not guarantee and will not protect any individual property rights with respect to solar access.

#### F. Decommissioning Requirements

1. If a solar energy system remains nonfunctional or inoperative for a continuous period of one year, the system may be deemed to be abandoned and may constitute a public nuisance as

determined by the Township Zoning Officer, with the exception of BIPV systems. If deemed abandoned or a public nuisance, the owner shall remove the system within six (6) months of abandonment after a demolition permit has been obtained in accordance with the following:

- a. Any aboveground mechanical equipment, wiring, and structural components shall be removed.
  - b. Underground wiring and structural components shall be removed and the resulting void space filled.
2. When a ground-mounted or freestanding solar energy system is removed, any disturbed earth as a result of the removal of the system shall be restored, graded and reseeded.

#### **Section 4. Solar Energy Facilities**

##### **A. Applicability**

1. Solar energy facilities are permitted as a conditional use on parcels over ten (10) acres in all zoning districts. The conditional use regulations, requirements and restrictions set forth below in this Article shall apply to solar energy facilities in addition to the Conditional Use requirements of §165-219.1 and those regulations, requirements and restrictions of the underlying zoning district:

##### **B. General Regulations**

1. Solar energy facilities shall be installed in compliance with all applicable state and federal building, construction and fire codes, including regulations with respect to stormwater management.
2. Solar energy facilities shall be operated in compliance with all federal, state and local laws and regulations.

##### **C. Setbacks**

1. Solar energy facilities must meet the applicable primary use setbacks for the zoning district in which the facility is located. Solar energy facility components shall not encroach upon any stormwater management facility or right-of-way or easement, including but not limited to water, stormwater, sanitary sewer, natural gas, telephone, and electrical easements.
2. Setbacks for building-mounted solar energy facilities shall meet the following requirements.
  - a. Solar energy facilities mounted on a pitched roof must meet the following requirements; or an alternative design that provides safe access to the roof, and roof ridge, that is approved by the Chief Building Official:
    - i. The design must provide at least three (3) access ways from the edge of roof to the ridge of the roof that are a minimum of two (2) feet wide. A side of a pitched roof which does not carry a solar energy facility may count as two (2) access ways as long as the roof is more than five (5) feet wide.
    - ii. A two (2)-foot minimum setback from the roof ridgelines shall be provided for roof-mounted solar modules to allow available space for firefighters to

penetrate the roof to create ventilation. Solar modules may be installed along the roof slope up to the ridge when an adequate alternative smoke ventilation method is provided and approved by the Chief Building Official.

- iii. A one and a half (1.5)-foot setback from all roof hips and valleys shall be provided if solar modules are installed on both sides of the roof hip or valley.
3. Solar energy facilities mounted on a flat roof must meet the following requirements; or an alternative design that provides safe access to the roof that is approved by the Chief Building Official:
    - a. A three (3)-foot setback from a minimum of two (2) roof edges shall be provided for roof mounted solar modules to ensure that firefighters may access the roof in a quick and safe manner.

#### D. Height

1. For a building-mounted facility installed on a sloped roof, the highest point of the facility shall not exceed the highest point of the roof to which it is attached as allowed by setback requirements.
2. For a building-mounted facility installed on a flat roof, the highest point of the facility shall be permitted to exceed the district's height limit by up to six (6) feet above the rooftop which it is attached.
3. Ground-mounted or freestanding solar energy facilities shall not exceed applicable maximum accessory structure height in the zoning district in which the solar energy facility is located. *A solar energy facility may exceed the applicable maximum accessory structure height if it will cover an impervious surface parking area, but the facility height may not exceed the height of the primary structure that the parking area serves.*

#### E. Design and Installation Requirements

1. The design and installation of solar energy facilities shall conform to applicable industry codes and standards, including, but not limited to, those of the International Code Council (ICC), American National Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), and other similar certifying and professional organizations such as the American Society of Civil Engineers and the American Society of Mechanical Engineers.
2. All exterior electrical and/or plumbing lines shall be buried below the surface of the ground and be placed in a conduit.
3. All solar energy facility components shall be clearly labeled with a warning concerning voltage and other important electrical safety information. The universal isolation switch, or equivalent device, shall be easily accessible by first responders and clearly labeled.
4. For purposes of determining compliance with building coverage standards of the applicable zoning district, the total horizontal projection area of all ground-mounted and freestanding solar collectors, including solar photovoltaic cells, modules, arrays, inverters and solar hot air or water collector devices, shall be considered pervious coverage so long as pervious conditions are maintained underneath the solar photovoltaic cells, modules, arrays and solar hot air or water collector devices.

5. An applicant shall locate a solar energy system so that tree removal is not required to the extent practical and shall be subject to any applicable tree replacement regulations found in the Subdivision and Land Development Ordinance.
6. Solar modules shall be positioned to prevent solar glare upon any neighboring properties or any public or private street, and to prevent additional heat load upon neighboring properties. The latest version of the Solar Glare Hazard Analysis Tool (SGHAT) shall be used per its user's manual to evaluate solar glare. The full report shall be sent to the municipality at least 30 days before the first public meeting that will discuss the project.
7. All equipment for solar energy facilities including any structure for batteries or storage cells shall be completely enclosed by a minimum eight (8) foot high fence with a self-locking gate.
8. The applicant will provide a stormwater management plan for the facility that will minimize the impact of stormwater leaving the site, and promote infiltration of stormwater on-site, through the use of stormwater BMPs.
9. Solar energy facilities shall not be used to display advertising or decoration, including signage, streamers, pennants, spinners, reflectors, ribbons, tinsel, balloons, flags, banners, lights or similar items. Manufacturers and equipment information, safety warnings, and ownership information may be displayed on solar energy facility equipment provided such information complies with applicable sign regulations.
10. Owners of solar energy facilities are encouraged but not required to obtain solar easements from neighboring landowners to ensure solar access. The Township does not guarantee and will not protect any individual property rights with respect to solar access.
11. The grazing of animals, to include but not be limited to sheep and goats, to control vegetation growing underneath solar arrays is permitted as customarily incidental to a solar energy facility principal use subject to the lot size requirements specified in this Chapter.

#### F. Decommissioning Requirements

12. If a solar energy facility remains nonfunctional or inoperative for a continuous period of two years, the facility shall be deemed to be abandoned and shall constitute a public nuisance, unless the owner demonstrates good faith intent to sell the facility. Within six months of abandonment, the owner shall remove the system after a demolition permit has been obtained in accordance with the following:
  - a. Any aboveground mechanical equipment, wiring, and structural components shall be removed.
  - b. Underground wiring and structural components shall be removed and the resulting void space filled.
  - c. When a solar energy facility is removed, any disturbed earth as a result of the removal of the system shall be restored, graded and reseeded.