

## GUIDANCE FOR CREATING A SOLAR FRIENDLY ORDINANCE

The purpose of this Sustainable Jersey Guidance document is to assist municipalities in crafting a solar ordinance that meets the objectives outlined in the Make Your Town EV Friendly Action and that is best suited to each community's character and land use objectives.

Discussion and sample language regarding the following areas is included in this guidance:

### **Intent/Background/Purpose**

- Address goals and benefits of solar/renewable energy

### **Definitions**

- Define solar technologies and terms

### **General Regulations**

- Address issues such as height, size, setbacks, and lot coverage

### **Permitting Fees**

- Establish permitting fees for residential rooftop solar PV installations

## INTENT/BACKGROUND/PURPOSE

- The purpose will generally highlight the benefits of solar for the community: environmental, energy security, economic, etc.
- If the ordinance is a "stand-alone" ordinance, the municipality may wish to tie the regulations back to New Jersey's Municipal Land Use Law by referencing applicable language that may apply to solar (e.g., health, safety, welfare).

### **This section should:**

- Clarify a municipality's rationale for establishing a solar energy ordinance in language that is compatible with existing local land use plans and zoning code.
- Clarify the types of solar systems the municipality is protecting through the ordinance (small-scale, utility scale, etc.).

### **Sample Language for Intent/Background/Purpose:**

*The purpose of this Ordinance is to provide a clear-cut regulatory system for solar energy, a renewable and non-polluting energy resource that reduces fossil fuel emissions, including greenhouse gases that contribute to global climate change. The specific goals of the [Master Plan/Climate Plan] of [Municipality] support renewable energy and the use of solar energy is encouraged by New Jersey legislation.*

OR

*The purpose of the Ordinance is to facilitate the construction, installation and operation of Solar Energy Facilities in [Municipality] in a manner that protects public health, safety and welfare and avoids significant impacts to protected resources such as important agricultural lands, endangered*

*species, high value biological habitats and other protected resources. It is the intent of this ordinance to encourage solar facilities that reduce reliance on fossil fuels, increase local economic development and job creation, reduce greenhouse gas emissions, assist New Jersey in meeting its Renewable Portfolio Standards, and/or promote economic development diversification.*

OR

*The purpose of this ordinance is to provide a regulatory framework for the construction of Solar Energy Systems in [Municipality], subject to reasonable restrictions, which will preserve the public health, safety, and welfare, while also maintaining the character of [Municipality].*

OR

*The purpose of this ordinance is to provide for the use of solar energy, including specifications related to the land development, installation and construction of solar energy systems in [Municipality], subject to reasonable conditions to protect the public health, safety, and welfare. This section applies to solar energy systems to be installed and constructed on any property.*

### **What NOT to do**

Purpose sections should not:

- include specific goals such as number of megawatts (MW) or number of projects;
- make reference to specific types of technology that could quickly become outdated or impractical.

Not specifying PV system size and/or technology allows for innovation and advancement in PV technology where a smaller amount of land or roof space could result in a larger capacity system (as measured in W or kW).

## **DEFINITIONS**

- Each municipality should consider its requirements for the types of solar facilities it envisions for its community when considering which definitions to utilize in the Ordinance.
- Any term used in the text of the ordinance must be defined. The definition of each term can greatly impact how an ordinance is enforced; providing accurate definitions of these terms will ensure clarity in the enforcement of the ordinance. Definitions may be included in the body of the alternative energy ordinance, if it is a stand-alone ordinance, or may be incorporated into the Definitions section of the solar ordinance.

### **This section should:**

- Clearly define each term specific to solar energy systems included in the ordinance.
- Provide separate definitions for small scale accessory use (Solar Energy System) and utility scale principal use (Solar Energy Facility) so that they can be regulated distinctly.
- Provide definitions of solar energy system types such as: roof-mounted, ground-mounted, and building-integrated.

**Sample Language for Definitions:**

- **Solar Energy System – Accessory Use**

*An energy system that consists of one or more solar collection devices, solar energy related “balance of system” equipment, and other associated infrastructure with the primary intention of generating electricity, storing electricity, or otherwise converting solar energy to a different form of energy. Solar energy systems may generate energy in excess of the energy requirements of a property only if it is to be sold back to a public utility in accordance with the NJ Net Metering law [see Note below on net-metering in New Jersey].*

OR

*A solar energy system – accessory use consists of one (1) or more photovoltaic, concentrated solar thermal, or solar hot water devices either free-standing ground, building integrated or roof mounted, as well as related equipment which is intended for the purpose of reducing or meeting the energy needs of the property’s principal use.*

These definitions include physically what a solar energy system is (can be solar hot water or PV), how it is to be used.

These definitions apply only to accessory use systems. These definitions do not allow utility-scale use.

Note on net-metering in New Jersey:

- Net metering helps customers maximize their renewable energy investments. It enables customers to obtain full retail credits on their utility bill for each kWh of electricity their system produces up to 100% of their electricity usage over the course of a year.
- When a renewable energy system produces more electricity than the customer actually uses, the customer will be compensated with credits at the full retail value of the electricity for the production over and above what they use. For example, on a typical sunny day at moderate temperatures, a customer with a solar system may use less electricity than the system actually generates. When electricity production exceeds usage, the utility meter will spin backwards and provide the customer with credits for the excess energy produced. These credits can be used by customers as needed.
- For more information, see: <http://www.njcleanenergy.com/renewable-energy/programs/net-metering-and-interconnection>

- **Solar Energy Facility – Principal Use**

*An alternative energy facility that consists of one or more ground-mounted, free-standing, or building-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 off-site use.*

OR

*An area of land or other area (e.g. parking lot canopy, landfill, brownfield, etc.) used for a solar collection system principally used to capture solar energy, convert it to electrical energy or thermal power and supply electrical or thermal power primarily for off-site use. Principal solar energy systems consist of one (1) or more free-standing ground, or roof mounted solar collector devices, solar related equipment and other accessory structures and buildings including light reflectors, concentrators, and heat exchangers, substations, electrical infrastructure, transmission lines and other appurtenant structures.*

- This definition applies to ordinances that choose to address utility-scale solar energy facilities. Such facilities would be considered a principal use.

- **Ground-Mounted Solar Energy System**

*A solar energy system that is directly installed on solar racking systems, which are attached to an anchor in the ground and wired to connect to an adjacent home or building. Ground-mounted systems may be appropriate when insufficient space, structural and shading issues, or other restrictions prohibit rooftop solar.*

- A ground mounted solar energy system is a subset or particular type of solar energy system that may require additional restrictions or review. Municipalities may wish to impose specific regulations on ground-mounted solar energy systems, in which case, a definition would be important to include.

- **Solar Farm or Solar Garden**

*A set of solar collection devices designed to capture sunlight and convert it to electricity primarily for offsite consumption and use; some electricity may be used by an onsite building or structure.*

- Solar gardens can be designed as community solar systems in which community members can own shares in the solar system; subscribe to receive the generated solar power; or can purchase the output of the solar system to offset their own utility bills. [Sample language for solar gardens from: Southern NH Planning Commission. Solar Friendly Best Planning Practices, p. 4: [snhpc.org/pdf/FinalSolarResourceGuide2015.pdf](http://snhpc.org/pdf/FinalSolarResourceGuide2015.pdf)]

### **What NOT to do**

- Definition section should not specify the electrical size of the PV system (i.e. defining a small scale system as equal to or less than 100 kW). Not specifying PV system size allows for innovation and advancement in PV technology where a smaller amount of land or roof space could result in a larger capacity system (as measured in W or kW).
- Definitions sections should not address concerns about system siting; these concerns should be addressed through appropriate use, setback, or height restrictions to ensure that the land use and siting goals are met no matter the system size. This allows more flexibility to those who wish to site or install solar on their roof.

## GENERAL REGULATIONS

The general regulations are guidelines or added requirements that may be integrated into the local review process. This section of the ordinance can present regulations that the municipality may include in the ordinance, such as height, setbacks, aesthetics/screening, and impervious coverage.

### **This section should clarify approval standards that:**

- may be imposed upon specific types of solar energy systems (i.e., ground-mounted/freestanding versus roof-mounted);
- may be imposed upon specific districts; or
- may be generally applied to all solar energy systems.

### **Setbacks**

**Ground-Mounted:** For ground-mounted solar energy systems, setback requirements can help alleviate aesthetic and safety concerns, yet overly restrictive setback requirements can limit the available space in which a solar PV array can be sited. Since solar PV panels rely on adequate access to sunlight, municipalities may want to consider easing setback requirements for ground-mounted solar PV systems.

### **Sample Language for Ground-Mounted:**

*The location of the Ground-Mounted System shall meet all applicable accessory-use setback requirements of the zoning district in which it is located.*

OR

*All Ground-Mounted Systems shall be set back a distance of \_\_\_\_ feet from any property line in a residential zoning district or in conformance with the area and bulk standards for accessory structures in commercial districts as provided herein.*

OR

*Ground-Mounted Systems shall not be permitted in a front yard unless the applicant demonstrates that the rear yard locations will not result in acceptable solar access.*

**Roof-Mounted:** Setback regulations for roof-mounted systems can ensure that adequate pathways exist for access along roof edges and ridge lines for first responders in case of a fire or for maintenance crews in the case of system repair. The minimum construction requirements can be found in the NJ Editions of the National Electrical Code, International Building Code (and by reference, International Fire Code), and International Residential Code, as applicable. Items not covered within these codes may be added to a local ordinance.

### **Sample Language for Roof-Mounted:**

*The design of the solar energy system shall conform to applicable local, state and national solar codes and standards. A building permit reviewed by department staff shall be obtained for a*

*solar energy system. All design and installation work shall comply with all applicable provisions in the National Electric Code (NEC), the International Residential Code (IRC), International Commercial Building Code, State Fire Code, and any additional requirements set forth by the local utility (for any grid-connected solar systems). [Sample language from: Solar Simplified, p. 9: [solarsimplified.org/zoning/solar-zoning-toolbox/solarzoningordinance](http://solarsimplified.org/zoning/solar-zoning-toolbox/solarzoningordinance)]*

**Height:** Height regulations can help alleviate local land use concerns over aesthetics (e.g. how much of the system can be seen from the street). However, height restrictions can prevent a solar PV system from being installed if the building on which it is sited is already at maximum allowed height if the municipality does not specify an exemption for the system in its ordinance. Separate height language options are provided for sloped and flat roofs. In communities with both sloped and flat roof types, it may be most appropriate to include separate regulations by roof type.

#### **Sample Language for Height Regulations:**

##### ***Height – Sloped Roof***

*For a roof-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.*

##### ***Height – Flat Roof***

*For a roof-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 fifteen (15) feet above the rooftop to which it is attached.*

##### ***Height – Ground-Mounted***

*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.*

##### ***Height – Parking Canopies***

*A solar energy system may exceed the applicable maximum accessory structure height if it will cover an impervious surface parking area. Height may not exceed the height of the primary structure that the parking area serves. Minimum height of the parking canopy must allow clearance for emergency service and service vehicles.*

#### **What NOT to do**

If an ordinance is designed and enforced properly, the height and setback restrictions should alleviate aesthetic concerns about solar PV systems. Therefore, municipalities should not over-regulate for aesthetic concerns such as:

- conspicuous panels that are visible from the street,
- conspicuous equipment tied to the panels, or
- glare.

## SPECIAL CONSIDERATIONS: HISTORIC DISTRICTS

Municipalities with historic districts should work with their Historic Preservation Commission to determine whether there will be restrictions on solar PV installations in historic districts that will require review. If design guidelines, siting restrictions, or review requirements exist, they should be laid out explicitly in the ordinance to ensure that a clear and understandable review process is known to the applicant. Review processes add time and added labor cost through delayed installations, so municipalities should attempt to make solar provisions for historic districts minimally restrictive. Below are two examples of design guidelines for installing solar on historic properties.

- **Implementing Solar PV Projects on Historic Buildings and in Historic Districts**, National Renewable Energy Laboratory:  
[www.nrel.gov/docs/fy11osti/51297.pdf](http://www.nrel.gov/docs/fy11osti/51297.pdf)
- **Installing Solar Panels on Historic Buildings**, North Carolina Solar Center:  
[nccleantech.ncsu.edu/wp-content/uploads/Installing-Solar-Panels-on-Historic-Buildings\\_FINAL\\_2012.pdf](http://nccleantech.ncsu.edu/wp-content/uploads/Installing-Solar-Panels-on-Historic-Buildings_FINAL_2012.pdf)
- **Solar Panels on Historic Properties**, National Park Service:  
[www.nps.gov/tps/sustainability/new-technology/solar-on-historic.htm](http://www.nps.gov/tps/sustainability/new-technology/solar-on-historic.htm)

### Sample Language for Historic Districts:

*Solar energy systems within a historic district or on a historic resource property are not permitted unless written approval or a Certificate of Appropriateness has been granted by the Historic Preservation Commission as established by [historic preservation ordinance].*

OR

*All solar energy systems/facilities within [historic district/overlay/etc.] or on a historic resource property as defined by [the municipal inventory/register/etc.] must follow the administrative procedures required by [historic preservation ordinance].*

## SPECIAL CONSIDERATIONS: TREES

While it is true that shade of any kind interferes with a solar energy system's ability to operate, removing trees to install solar technology is generally not recommended. However, there are legitimate arguments for and against removing trees to accommodate solar panels. There is no clear right answer and much of the calculus depends on the values and objectives of each community. Municipalities are encouraged to consider if this is an issue warranting local regulation. If there is an existing tree protection ordinance, for example, the municipality can determine if solar panels should be given any special consideration and amend the ordinance accordingly.

## PERMITTING FEES

Using a flat-fee method instead of a value-based method to assess permit fees streamlines the process and ensures that larger residential solar energy systems are not arbitrarily penalized. Fees should fairly reflect the time needed for city staff to review and issue a permit as these costs to the municipality remain constant regardless of system size for standard residential roof-mounted arrays.

### **The permitting fee ordinance should:**

Establish reasonable residential permit fees in line with NJAC 5:23-4.20:

*NJAC 5:23-4.20 (c) 2. iii. (13) For photovoltaic systems, the fee shall be based on the designated kilowatt rating of the solar photovoltaic system as follows:*

- (A) One to 50 kilowatts, the fee shall be \$ 65.00;*
- (B) Fifty-one to 100 kilowatts, the fee shall be \$ 129.00; and*
- (C) Greater than 100 kilowatts, the fee shall be \$ 640.00.*

The municipality should strive to set a fee that covers the cost of average plan review and inspections. To set the fee, the municipality can multiply the billable hourly rates for staff involved in the review process that can be expected for 80% of permit submittals. Examples of these calculations are provided in the Department of Energy SunShot document *Best Management Practices for Solar Installation*, which can be found at: [marc.org/Environment/Energy/pdf/BMP-Process-Step-2-1-A-Standardize-Permit-Fees.aspx](http://marc.org/Environment/Energy/pdf/BMP-Process-Step-2-1-A-Standardize-Permit-Fees.aspx)

### **What NOT to do**

Fees based on the size or value of the solar PV installation unfairly penalize homeowners even though the cost to process the permit application for both systems is approximately the same. For example, the permit application for a smaller residential solar PV system costs the municipality approximately the same amount to process as a larger residential solar PV system, but a value-based fee structure can result in higher fees being assessed for the larger system. Fees should be set that reflect the time needed for staff to process the application.



## Resources

### Zoning and Permitting Background Documents

American Planning Association (APA). Briefing Papers #3: Integrating Solar into Local Plans.  
[www.planning.org/research/solar/briefingpapers/localplans.htm](http://www.planning.org/research/solar/briefingpapers/localplans.htm)

American Planning Association (APA). Briefing Papers #4: Integrating Solar into Local Development Regulations.  
[www.planning.org/research/solar/briefingpapers/localdevelopmentregulations.htm](http://www.planning.org/research/solar/briefingpapers/localdevelopmentregulations.htm)

American Planning Association (APA). Briefing Papers #5: Balancing Solar Energy Use with Potential Competing Interests. [includes guidance on historic districts and trees]  
[www.planning.org/research/solar/briefingpapers/potentialcompetinginterests.htm](http://www.planning.org/research/solar/briefingpapers/potentialcompetinginterests.htm)

Delaware Valley Regional Planning Commission. Renewable Energy Ordinance Framework for Solar PV.  
[www.dvrpc.org/EnergyClimate/ModelOrdinance/Solar/pdf/2016\\_DVRPC\\_Solar\\_REOF\\_Reformatted\\_Final.pdf](http://www.dvrpc.org/EnergyClimate/ModelOrdinance/Solar/pdf/2016_DVRPC_Solar_REOF_Reformatted_Final.pdf)

EnergizeCT. Connecticut Rooftop Solar PV Permitting Guide.  
[www.energizect.com/sites/default/files/uploads/%281%29%20CT%20Rooftop%20Solar%20PV%20Permitting%20Guide%20v1.0.pdf](http://www.energizect.com/sites/default/files/uploads/%281%29%20CT%20Rooftop%20Solar%20PV%20Permitting%20Guide%20v1.0.pdf)

Grow Solar. Creating “Solar Ready” Communities: Three State Regional Analysis (Minnesota, Wisconsin, Illinois). [www.growsolar.org/wp-content/uploads/2015/05/Three-State-Regional-Analysis.pdf](http://www.growsolar.org/wp-content/uploads/2015/05/Three-State-Regional-Analysis.pdf)

Interstate Renewable Energy Council (IREC) and VoteSolar. Project Permit: Best Practices in Residential Solar Permitting.  
[projectpermit.org/wp-content/uploads/2013/05/Solar-Permitting-Best-Practices\\_May2013.pdf](http://projectpermit.org/wp-content/uploads/2013/05/Solar-Permitting-Best-Practices_May2013.pdf)

Interstate Renewable Energy Council (IREC). Simplifying the Solar Permitting Process: Residential Solar Permitting Best Practices Explained.  
[www.irecusa.org/publications/residential-solar-permitting-best-practices-explained/](http://www.irecusa.org/publications/residential-solar-permitting-best-practices-explained/)

Massachusetts Department of Energy Resources. Questions and Answers: Ground-Mounted Solar Photovoltaic Systems.  
[www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf](http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf)

Metropolitan Area Planning Council (MAPC, Massachusetts). Guide to Streamlining the Solar PV Permitting Process and Developing Supportive Zoning Bylaws.  
[www.mapc.org/system/files/bids/Solar%20Permitting%20and%20Zoning%20Bylaws.pdf](http://www.mapc.org/system/files/bids/Solar%20Permitting%20and%20Zoning%20Bylaws.pdf)

Minnesota. Local Government Solar Toolkit: Planning, Zoning, and Permitting.  
[www.cleanenergyresourceteams.org/sites/default/files/MinnesotaPZPToolkit1.pdf](http://www.cleanenergyresourceteams.org/sites/default/files/MinnesotaPZPToolkit1.pdf)

State of Washington Department of Commerce. Planning and Zoning: Opportunities for Local Governments to Support Rooftop Solar.  
[nwsolarcommunities.org/wp-content/uploads/2013/05/ESSP\\_PlanningZoning.pdf](http://nwsolarcommunities.org/wp-content/uploads/2013/05/ESSP_PlanningZoning.pdf)

U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy (EERE). Solar Powering Your Community: A Guide for Local Governments.  
[www1.eere.energy.gov/solar/pdfs/47692.pdf](http://www1.eere.energy.gov/solar/pdfs/47692.pdf)

### ***Sample Zoning Ordinances***

Borough of Glassboro (Gloucester County, NJ). Chapter 107. Development Regulations. Article IV. Design and Performance Standards. § 107-72. Solar energy systems. [Added 9-8-2009 by Ord. No. 09-45]  
[ecode360.com/12606957](http://ecode360.com/12606957)

City of Chicago Solar Zoning Ordinance.  
[www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable\\_Development/Publications/City\\_of\\_Chicago\\_Solar\\_Zoning\\_Policy\\_Updated.pdf](http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/City_of_Chicago_Solar_Zoning_Policy_Updated.pdf)

Southern New Hampshire Planning Commission. Solar Friendly Best Planning Practices for New Hampshire Communities: A Quick Resource Guide for Planning Boards and Municipal Officials in Crafting Solar Friendly Regulations and Developing Solar Friendly Communities in New Hampshire.  
[www.snhpc.org/pdf/FinalSolarResourceGuide2015.pdf](http://www.snhpc.org/pdf/FinalSolarResourceGuide2015.pdf)

Utah Clean Energy. Solar Simplified Model Solar Zoning Ordinance.  
[www.solarsimplified.org/permitting/solar-zoning-toolbox](http://www.solarsimplified.org/permitting/solar-zoning-toolbox)

Western Pennsylvania Rooftop Solar Challenge. Solar Installation Guidebook.  
[www.pennfuture.org/Files/News/SunSHOT\\_Guide.compressed.pdf](http://www.pennfuture.org/Files/News/SunSHOT_Guide.compressed.pdf)