FEBRUARY 2020

Model Site Plan Regulations and Conditional Use Permits to Support Solar Energy Systems in Maine Municipalities

This document describes and models two land-use tools Maine municipalities may use to permit small-, medium-, and large-scale solar energy systems, including both ground-mounted and roof-mounted solar installations. The purpose of this document is to assist Maine municipalities in supporting development of solar energy systems in ways that address the needs of their community. Communities will need to carefully consider how model language may be modified to suit local conditions and where it should be inserted into an existing zoning ordinance, if applicable. Further, it is highly recommended that any language adapted from these models be reviewed by municipal counsel prior to adoption.



Selecting a Land-Use Tool

Several land-use tools are available to accommodate solar energy systems, including overlay zones, floating zones, conditional-use permits, and site plan regulations. The two land-use tools addressed here, site plan regulations and conditional-use permits, were selected to respond to the variations in planning resources across Maine municipalities. Site-plan regulation may be more appropriate for municipalities that do not have a zoning ordinance in place; a combination of Site Plan Review and conditional-use permits may be appropriate for municipalities that have an existing zoning ordinance. That said, municipalities with an existing zoning ordinance that wish to allow solar may not need to amend their ordinance in advance of development; the model site-plan regulation standards may be sufficient to meet a community's needs in the short-term as they consider amending their ordinance for development over the long-term.

Furthermore, roof-mounted and small-scale ground-mounted solar energy systems may not require any regulatory or permitting changes, or additional oversight by a municipal planning authority, at all. Many communities allow these land uses as-of-right, for example, if they meet standards such as accessory structure requirements in the case of small ground-mounted systems. This means that development may proceed without the need for a conditional use permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner, or local inspector. See page 7 for model definitions (including square footage) for small-, medium-, and large-scale solar energy systems, as well as definitions for roof- and ground-mounted solar energy systems.

Navigating This Document

The document contains model site plan regulations and conditional use permit language. Model site plan regulation language begins on page 3 and model conditional use language begins on page 7. Content in the yellow boxes includes additional context and information for readers to consider as they contemplate how the model language may suit their municipality. Content in brackets should be modified to fit a municipality's particular resources and nomenclature. This content, a long with the model language, may also provide municipalities the information they need to create different land use tools to guide solar development in their community.

Readers may also want to consider a Maine-based Frequently Asked Questions document that addresses solar power development from a community and municipal perspective and recommended Best Practices for Low Impact Siting, Design, and Maintenance from some of Maine's leading natural resource and agricultural organizations. These documents can be found at maineaudubon.org/solar.

For More Information

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I. MODEL SITE PLAN REGULATION LANGUAGE

Site Plan Review and Performance Standards

Site Plan Review may be appropriate when medium-scale ground-mounted systems are sited within natural resource protection districts. Site Plan Review may be appropriate for large-scale ground-mounted systems when they are sited anywhere within the community.

Site Plan Review procedures and requirements may stand alone or as a separate section of a municipality's zoning ordinance. There are also instances when communities that have a zoning ordinance have separate Site Plan Review provisions and procedures pertaining to a particular use or development type.

As discussed previously (see 'Selecting a Land-Use Tool', above), performance standards are generally sufficient for roof-mounted and small-scale ground-mounted solar energy systems.

Standards for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems

(a) Roof-mounted and building-mounted solar energy systems and equipment are permitted by right, unless they are determined by the [Code Enforcement Officer, with input from the Town Engineer and the Fire Chief] to present one or more unreasonable safety risks, including, but not limited to, the following:

  (i) Weight load;

  (ii) Wind resistance;

  (iii) Ingress or egress in the event of fire or other emergency; or

  (iv) Proximity of a ground-mounted system relative to buildings.

(b) All solar energy system installations shall be installed in compliance with the photovoltaic systems standards of the latest edition of the National Fire Protection Association (NFPA1) adopted by [Town].

(c) All wiring shall be installed in compliance with the photovoltaic systems standards of the latest edition of the National Electrical Code (NFPA 70) adopted by [Town].

(d) Prior to operation, electrical connections must be inspected and approved by the Electrical Inspector.

Additional Standards for Medium- and Large-Scale Ground-Mounted Solar Energy Systems

In addition to the standards in [Sec. __], medium- and large-scale ground-mounted solar energy systems shall comply with the following:

(a) Utility Connections: Overhead or pole-mounted electrical wires shall be avoided to the extent possible within the facility.

(b) Safety: The solar system owner or project proponent shall provide a copy of the Site Plan Review application to the [Fire Chief] for review and comment. The [Fire Chief] shall base any recommendation for approval or denial of the application upon review of the fire safety of the proposed system.

(c) Visual Impact: Reasonable efforts, as determined by the [Planning Board], shall be made to minimize undue visual impacts by preserving native vegetation, screening abutting properties, or other appropriate measures, including adherence to height standards and setback requirements.

(d) Land Clearing, Soil Erosion, and Habitat Impacts: Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances. Ground-mounted facilities shall minimize mowing to the extent practicable. Removal of mature trees shall be avoided to the extent possible. Native, pollinator-friendly seed mixtures shall be used to the extent possible. Herbicide and pesticide use shall be minimized. No prime agricultural soil or significant volume of topsoil shall be removed from the site for installation of the system.

Solar Energy System Fencing

The National Electric Code requires fencing for certain sized, ground-mounted solar energy systems. To allow for wildlife passage, fences should be elevated by a minimum of 5 inches. To maximize wildlife's ability to permeate fencing, municipalities may consider requiring the use of 'Solid Lock Game Fences'. Such fencing would start with 8 by 12-inch openings at the bottom (ground) with progressively smaller openings at the top of the fence. This type of fencing meets the National Electric Code for human safety. Additionally, municipalities may consider requiring the placement of five-inch or larger diameter wooden escape poles in two or more corners of the perimeter fence as an alternative means for wildlife to escape the enclosed area.

(e) Fencing: Where fencing is used, fences should be elevated by a minimum of 5 inches to allow for passage of small terrestrial animals.

(f) Removal: Solar energy systems that have reached the end of their useful life or that has been abandoned consistent with this ordinance shall be removed. The owner or operator shall physically remove the installation no more than 365 days after the date of discontinued operations. The owner or operator shall notify the [Code Enforcement Officer] by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

(i) Physical removal of all solar energy systems, structures, equipment, security barriers, and transmission lines from the site.

(ii) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.

(iii) Stabilization or re-vegetation of the site as necessary to minimize erosion. Native, pollinator-friendly seed mixtures shall be used to the maximum extent possible.

(g) Abandonment:

(i) Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, a large-scale ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than one year.

(ii) If the owner or operator of the solar energy system fails to remove the installation within 365 days of abandonment or the proposed date of decommissioning, the [Town] retains the right to use all available means to cause an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system to be removed.

Additional Standards for Large-Scale Solar Energy Systems

(a) Large-scale ground-mounted solar energy systems shall not be considered accessory uses.

(b) Operations and Maintenance Plan: The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar energy system, which shall include measures for maintaining safe access to the installation as well as other general procedures for operational maintenance of the installation.

(c) Signage: A sign shall be placed on the large-scale solar energy system to identify the owner and provide a 24-hour emergency contact phone number.

(d) Emergency Services: The large-scale ground-mounted solar energy system owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the [Fire Chief]. Upon request, the owner or operator shall cooperate with the [Fire Department] in developing an emergency response plan. All means of shutting down the system shall be clearly marked. The owner or operator shall provide to the [Code Enforcement Officer] the name and contact information of a responsible person for public inquiries throughout the life of the installation.

Site Plan Application and Review

(a) Applicability:

(i) Roof-mounted systems and small-scale ground- mounted systems are not subject to Site Plan Review.

(ii) Medium-scale ground-mounted solar energy systems are not subject to Site Plan Review, except in natural resource protection districts and as may be required if conditional use permits are needed.

(iii) Large-scale ground-mounted solar energy systems are subject to Site Plan Review.

(b) In addition to the [Town's] site plan application requirements, the Applicant shall submit the following supplemental information as part of a site plan application:

(i) A site plan showing:

(1) Property lines and physical features, including roads, for the project site;

(2) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;

(3) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;

(4) Documentation of the major system components to be used, including the panels, mounting system, and inverter(s);

(5) Name, address, and contact information of the proposed system installer, the project proponent, project proponent agent, and all co-proponents or property owners, if any; and

(6) A one- or three-line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods.

If the following are not addressed in existing Site Plan Review regulations, then the community may wish to include them:

(7) Locations of important plant and animal habitats identified by the Maine Department of Inland Fisheries and Wildlife or [Town of], or rare and irreplaceable natural areas, such as rare and exemplary natural communities and rare plant habitat as identified by the Maine Natural Areas Program.

(8) Locations of wetlands and waterbodies.

(9) Locations of "Prime Farmland" and "Farmland of Statewide Importance".

(10) Locations of floodplains.

(11) Locations of local or National Historic Districts.

(12) A public outreach plan, including how the project proponent will inform abutters and the community.

Review Processes

(a) For projects that are subject to permitted uses, [Town staff] will review the application and make final determination within 5 days of receipt.

(b) For all projects that require Site Plan Review, the following administrative procedures shall take effect:

(i) Prior to submitting an application and the start of the review process, a pre-application conference is recommended. The conference is initiated by the Applicant and is scheduled with the Applicant and a member of the planning staff to discuss pertinent requirements.

(ii) The Applicant shall submit the required number of copies of their application at least seven days in advance of the meeting when the project is scheduled for a [Planning Board] agenda.

(iii) Applications are processed in the order in which they are received.

(iv) Within 10 days of receipt of the application in the [Department of Planning and Development], the Applicant will be notified if their application is complete or incomplete. If it is incomplete, a list of outstanding items will be included in the notification letter. Each time revisions are submitted on an incomplete application, the [Town] has another 10 days to review the revised materials to make a determination of completeness.

(v) Once an application is deemed to be complete, the project will be reviewed by [Town staff] for compliance with the ordinance standards. The Applicant will be notified of staff comments regarding the project and the Applicant may make revisions to address these comments.

(vi) When the project is scheduled for a [Planning Board] agenda, the planning staff will prepare a written report that discusses the project and makes a recommendation to the [Planning Board] as to a decision. The report is available to the Applicant on the [___ day] preceding the [Planning Board] meeting. The [Board] will hold the public hearing on the application within 30 days of receipt of a complete application and make a decision within 10 days of that hearing. A decision may be postponed, with agreement of the applicant, to allow time for revisions to a plan.

(vii) The applicant or a duly authorized representative should attend the [Planning Board] meeting to discuss the application.

II. MODEL CONDITIONAL-USE PERMIT LANGUAGE

Purpose

(a) Solar energy is a local, renewable and non-polluting energy resource that can reduce fossil fuel dependence and emissions. Energy generated from solar energy systems can be used to offset energy demand on the grid, with benefits for system owners and other electricity consumers.

(b) The use of solar energy equipment for the purpose of providing electricity and energy for heating and/or cooling is an important component of the [Town's] sustainability goals.

(c) The standards that follow enable the accommodation of solar energy systems and equipment in a safe manner while still allowing the quiet enjoyment of property.

(d) This ordinance is intended to balance the need for reasonable standards and expedited and streamlined development review procedures.

Within a Zoning Ordinance the definition section usually stands alone, but may be included in a subsection within other sections of the Zoning Ordinance.

Definitions

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 location.

Electricity Generation (production, output):
The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).

Height of building: The vertical measurement from grade to the highest point of the building, except that utility structures such as chimneys, TV antennae, HVAC systems, and roof-mounted solar energy systems shall not be included in this measurement, nor shall any construction whose sole function is to house or conceal such structures.

Mounting: The manner in which a solar PV system is affixed to the roof or ground (i.e., roof mount, or ground mount.

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. in Alternative Current (AC).

Solar Array: Multiple solar panels combined together to create one system.

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 of electricity or transfer of stored heat.

Solar Energy System: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means. It may be roof-mounted or ground-mounted, and may be of any size as follows:

1. Small-scale Solar Energy System is one whose physical size based on total airspace projected over a roof or the ground is less than 15,000 square feet (approximately one-third of an acre);
2. Medium-scale Solar Energy System is one whose physical size based on total airspace projected over a roof or the ground is equal to or greater than 15,000 square feet but less than 87,120 square feet (two acres); and
3. Large-scale Solar Energy System is one whose physical size based on total airspace projected over a roof or the ground is equal to or greater than 87,120 square feet (two acres).

Solar Energy System, Ground-Mounted: A Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).

Solar Energy System, Roof-Mounted: A Solar Energy System that is mounted on the roof of a building or structure; may be of any size (small-, medium- or large-scale).

Tilt. The angle of the solar panels and/or solar collector relative to horizontal. Tilt is often between 5 and 40 degrees. Solar energy systems can be manually or automatically adjusted throughout the year. Alternatively, fixed-tilt systems remain at a static tilt year-round.

Use Regulations

Within a Zoning Ordinance, the Use Regulations describe which land uses are allowed within different zoning districts of the community, as well as which permits are required. The Use Regulations typically include a Use Table and/or narrative description of the principal and accessory uses that are allowed, prohibited, and/or allowed only through a conditional use permit or are subject to Site Plan Review within each zoning district.

The example provided in this section demonstrates how roof-mounted, small-scale ground-mounted, medium-scale ground-mounted, and large-scale ground-mounted solar energy systems can be incorporated into a municipality's Use Regulations as a Use Table. A town may elect instead to list uses.

In this model, roof-mounted solar energy systems, regardless of size, are allowed as-of-right throughout the community. This means that development may proceed without the need for a conditional-use permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner, or local inspector.

Ground-Mounted Systems

For ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via Site Plan Review, or by conditional use permit. The model zoning allows small-scale ground-mounted systems as-of-right throughout the community except for in natural resource protection zones, in which a conditional use permit is required. These are of a size that would service a house, small businesses, or small municipal building. The model zoning allows medium-scale ground-mounted systems in all districts except as a principal use in natural resource protection zoning districts; in these or similar districts, medium-scale ground-mounted systems are only allowed as an accessory use through Site Plan Review.

As drafted, the model zoning requires Site Plan Review for all large-scale ground-mounted systems and prohibits such systems in natural resource protection districts. Alternatively, a municipality may choose to prohibit large-scale ground-mounted systems in residential districts, due to housing or other growth or land use needs. Site Plan Review is discussed in more detail earlier in this document (see page 3), but in general it establishes criteria for the layout, scale, appearance, safety, and environmental impacts of certain types and/or scales of development. Typically, site plan approval must be obtained before the building permit is issued.

Siting Best Practices

"Low Impact Solar Siting, Design, and Maintenance", a resource created by Maine-based environmental and agricultural NGOs, describes how Maine communities can realize solar energy systems' climate and economic benefits while avoiding or significantly reducing undue impacts to wildlife, farming, and critical natural resources. This resource can be found at maineaudubon.org/solar. The practices described in the resource, coupled with the standards outlined in the model site plan regulation language, can ensure that solar energy systems are thoughtfully sited within a community.

Applicability

(a) Notwithstanding the provisions of 1 M.R.S.A section 302 or any other law to the contrary, the requirements of this [Chapter] shall apply to all roof-mounted and ground-mounted solar energy systems modified or installed after the date of its enactment.

(b) All solar energy systems shall be designed, erected, and installed in accordance with all applicable codes, regulations and standards.

(c) Any upgrade, modification or structural change that materially alters the size, placement or output of an existing solar energy system shall comply with the provisions of this [Chapter].

(d) For the purpose of this [Chapter], the [Town's] zoning districts are mapped and categorized as follows:
[see Use Table on next page].

Permitting

(a) A solar energy system or device shall be installed or operated in the [Town] provided it is in compliance with this ordinance.

(b) Permitting shall be determined by the locational zone within the [Town], type of solar system, and proposed size. The [Town] has designated the proper permitting process for each solar system in the attached matrix entitled "Permitting Required for Solar Energy Systems."

(c) Permitted Use: Roof-mounted solar energy systems are permitted in all zoning districts, subject to the dimensional standards of [Sec. 5] and the additional standards outlined in [Sec. 5] and [Sec. 6].

Permitting Required for Solar Energy Systems

	Commercial	Industrial	Residential	Rural Residential	Rural Farm and Forest	Natural Resource Protection
Principal Use						
Medium-scale Ground-mounted SES	**Y**	**Y**	**CU**	**CU**	**CU**	**N**
Large-scale Ground-mounted SES	**SPR**	**SPR**	**SPR or N**	**SPR**	**SPR**	**N**
Accessory Use						
Rooftop SES	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Small-scale Ground-mounted Solar	**Y**	**Y**	**Y**	**Y**	**Y**	**CU**
Medium-scale Ground-mounted Solar	**Y**	**Y**	**Y**	**CU**	**CU**	**SPR**

Y = Allowed; N = Prohibited; CU = Conditional Use; SPR = Site Plan Review

Dimensional Regulations

In most cases, the existing dimensional standards in a Zoning Ordinance will allow for the development of small-, medium-, and large-scale solar energy systems. However, if a municipality finds alternate dimensional standards are necessary to allow solar energy energy systems while protecting public health, safety, and welfare, it may impose them.

Height

It is recommended that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. Such an exemption can be stated in the definition of "Building Height" or through language similar to that provided in the following example.

Dimensional Standards

(a) Height: In mixed-use and non-residential commercial/industrial zones, solar energy systems shall be considered to be mechanical devices and, for purposes of height measurement, are restricted only to the extent consistent with other building-mounted mechanical devices.

(b) Height standards for ground-mounted solar energy systems are dependent on location and zoning district:

(i) In residential and mixed-use zoning districts, such systems shall not exceed twelve (12) feet in height when oriented at maximum tilt, except that the maximum height is twenty-two (22) feet for systems set back at least thirty (30) feet from any property line.

(ii) In all other zoning districts, such systems shall conform to the building height requirements of the zoning districts in which they are located.

Setbacks

It is recommended that small- and medium-scale ground-mounted solar energy systems that are accessory to a primary building or structure on a lot be provided with more flexible setback requirements than those that would typically apply to a primary structure. Many communities already provide some flexibility for "accessory structures" like sheds, allowing these to be closer to the lot line than the primary structure. For example, where a front/side/rear yard setback for the primary structure may be 50 feet, setbacks of 20 feet may be allowed for accessory structures. When ground-mounted solar energy systems are developed as accessory structures to a home, business or other building or structure, they should be afforded at least the same flexibility.

If a community does not have this type of reduced setback already built into the Zoning Ordinance, a provision could be added that effectively reduces the setback distance just for this use.

(c) Setbacks for Ground-Mounted Solar Energy Systems

(i) Notwithstanding any other provision of this ordinance to the contrary, the setbacks for ground-mounted solar energy systems shall be as follows:

(1) Minimum front yard: In residential zoning districts, fifty (50) feet. In mixed use and non-res idential zoning districts, whatever the front yard setback is for that zoning district, but in no event less than ten (10) feet.

(2) Minimum rear yard: Whatever the rear yard setback is for accessory buildings in that zoning district.

(3) Minimum side yard: Whatever the rear yard setback is for accessory buildings in that zoning district.

(ii) Additional setbacks may be required to mitigate visual and functional impacts.

Lot Coverage

A number of communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While it is clear that such features as driveways or buildings would be included in any calculation of lot coverage, many other features may be more ambiguous depending on how clearly the definition in the Zoning Ordinance is written. Regardless of the definition, it is recommended that solar energy systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. However, if the area is to be paved or otherwise rendered impervious then this land area should in fact count toward any coverage or impervious surface limit. For the purposes of municipal stormwater regulations, panels could have the effect of altering the volume, velocity, and discharge pattern of stormwater runoff, however, vegetated cover beneath arrays should not be considered fully impervious.

Example:

Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [Sec. __].

Created by

Maine Audubon, with significant review, feedback, and support from Maine-based solar developers, municipal planners, agricultural organizations, and solar advocates.

Please contact Eliza Donoghue at edonoghue@maineaudubon.org with questions.