City of Biddeford
Mayor's Sustainability Committee

October 21, 2024 at 5:30 PM

City Hall Second Floor Conference Room & Zoom

Join Zoom Meeting Online
Or call in by phone: +1 312 626 6799
Meeting ID: 924 0273 7841
Passcode: 397008

1. Roll Call
2. New Business
   - 2.a Discussion - New Sustainability Commission Appointments and Meeting Dates/Times
   - 2.b Discussion - How to pursue the mission of the new commission (priorities)
3. Discussion/Review
   - 3.a EPA Change Grant Update - Will
   - 3.b Solar Ordinance - Discussion of Revised Draft
4. Adjourn

Article VI. Performance Standards
Section 79. Solar Energy Systems

A. Purpose

1. This ordinance is to encourage the development and use of solar energy systems and protect solar access, to increase local renewable energy production, to decrease our reliance on fossil fuels to produce electricity, and to reduce carbon emissions.

2. This promotion of commercial solar photovoltaic installations is to be accomplished pursuant to the standards set forth herein for the placement, design, construction, operation, monitoring, modification and removal of such installations that address public safety, scenic, natural resources, especially the protection of wildlife habitat and significant wildlife corridors, and historic resources, and provide adequate financial assurance for the eventual decommissioning of such installations.

B. Definitions

1. **Building-Integrated Photovoltaic (BIPV) Systems**. A solar energy system that consists of integrating photovoltaic modules into the building structure, such as the roof or the façade and which does not alter the relief of the roof.

2. **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).

3. **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.

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

5. **Pole-Mount System**. 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 foundation in the ground, and wired underground to an attachment point at the building's meter. 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.

6. **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.

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

8. **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.

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9. **Solar Energy System**. A device or structural design feature, a substantial purpose of which is to provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

10. **Solar Energy System, Ground-Mounted**. An Active 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).

11. **Solar Energy System, Large-Scale**. An Active Solar Energy System whose physical size based on total airspace projected over the ground is equal to or greater than 20,000 square feet.

12. **Solar Energy System, Medium-Scale**. An Active Solar Energy System whose physical size based on total airspace projected over the ground is equal to or greater than 2,001 square feet but less than 20,000 square feet.

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

14. **Solar Energy System, Small-Scale**. An Active Solar Energy System whose physical size based on total airspace projected over the ground is less than 2,000 square feet.

15. **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.

16. **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.

17. **Solar Panel (or module)**. A device for the direct conversion of sunlight into useable solar energy (including electricity or heat).

18. **Solar Thermal System (Solar Hot Water or Solar Heating Systems)**. A solar energy system that directly heats water or other liquid, or air, using sunlight.

19. **Tilt**. The angle of the solar panels and/or solar collector relative to horizontal. 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

C. Applicability

1. Notwithstanding the provisions of 1 M.R.S.A. § 302 or any other law to the contrary, the requirements of this Section shall apply to all roof-mounted, small-, medium-, and large-scale ground-mounted solar energy systems modified or installed 30 days after the approval of this ordinance.

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

3. 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 Article.

D. Performance Standards

1. Roof-mounted and building-mounted solar energy systems and equipment are permitted by right unless they are determined by a Code Enforcement Officer, with consultation from the City Engineer and/or the City Fire Chief to present one or more unreasonable safety risk including, but not limited to the following:
   a. Weight load;
   b. Wind resistance;
   c. Ingress or egress in the event of fire or other emergency, or;
   d. Proximity to ground mounted systems relative to buildings.

2. Roof-Mounted Solar Energy Systems must comply with the Dimensional Requirements applicable to structures within the zoning district in which such systems are to be located and the standards in Part III of this Ordinance.

3. Small-Scale Ground Mounted Solar Energy Systems must comply with the Dimensional Requirements applicable to structures within the zoning district in which such systems are to be located and the standards in Part III Land Development Regulations of this Ordinance.

   In addition to the standards in Part III of this Ordinance, Small-Scale Solar Energy Systems shall comply with the following standards:

   a. The Solar Energy System shall be less than 25 feet in Height.
   b. The Solar Energy System shall be operated and located such that not disruptive electromagnetic or radio frequency interference with signal transmission or reception is caused beyond the property lines of the site.
   c. The Solar Energy System shall be located and designed to avoid, minimize, or mitigate any glare onto abutting properties or roadways.
   d. The Solar Energy System shall be located and designed to consider the visual character of the neighborhood in which it is constructed.

4. Medium-Scale Ground-Mounted Solar Energy Systems shall comply with all requirements as stated in Part III Land Development Regulations of the Code of Ordinances. Such developments also shall require a Conditional Use Permit and Site Plan Review approval by the Planning Board. In addition to submission requirements in Article VII, Conditional Uses; Article XI Site Plan Review; and Article XII Floodplain Management, an application for solar energy system development must also include:

   a. A description of the major components of the Solar Energy System proposed to be used, including manufacturer's specifications and cut sheets, if available.

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b. Erosion and sedimentation control narrative with plans and details.

c. Site plan(s) indicating all proposed construction and alteration of the project site, including changes to the landscape of the project area, filling, grading, earthmoving, vegetation clearing and planting, screening, fencing, Solar Energy System components, utilities (above and/or below ground) and all other aspects of the project.

d. Site plan(s) indicating water bodies, wetlands, flood hazard areas, and vernal pools.

e. A landscaping plan, prepared by a licensed forester, landscape architect or arborist, demonstrating compliance with all applicable landscaping and vegetated buffering requirements. At minimum, the landscaping plan must specify the locations, elevations and height above finished grade of all vegetation, berms, and plantings, and must identify the plant species and other materials that will comprise the elements used to establish any vegetated buffers and substantially screen the Solar Energy System from view from abutting residential properties, public roads, and public vantage points.

f. A long-term operations and maintenance plan providing for ongoing monitoring and inspections of all site improvements. The plan must provide a method for maintaining sufficient financial resources for performing ongoing maintenance and repair of the Solar Energy System.

g. A proposed decommissioning plan for the removal of the Solar Energy System, disposal of system components, and stabilization of the site, which meets the requirements in Section 79 (g) of this Ordinance, and a written statement of the applicant's intent concerning the following:

   i. Physical removal of any Solar Energy System components, structures, foundations, supports, fencing, or security barriers from the site.
   ii. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal laws and rules.
   iii. Stabilization or re-vegetation of the site as necessary to minimize erosion and return the site to substantially its pre-construction state.

h. A description of any proposed dual-use or co-location of the property, including but not limited to agrivoltaics. If no dual-use is proposed or intended on the property, an explanation as to why such dual-use or co-location is not practicable.

i. A visual impact assessment that includes a line-of-sight profile analysis that illustrates what is visible and what is obstructed along a straight line running from the Solar Energy System and each Public Vantage Point. The Planning Board may require additional visual impact assessments, including digital view shed maps, if it determines in its sole discretion that such assessments are necessary for the Planning Board to evaluate the Solar Energy System's compliance with the scenic impact standards in Section 75 (e) (viii) of this Ordinance.

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5. In addition to the application requirements for Medium-Scale Ground Mounted Solar Energy Systems for Site Plan Review and to obtain a Conditional Use Permit, the application for Large-Scale Ground Mounted Solar Energy Systems shall also include:

    a. Written confirmation form the Utility to which the Solar Energy system will be connected confirming the solar operator has conditional or final approval to interconnect the Solar Energy System to the Utility Grid.

    b. Evidence of financial capacity to construct, operate, and decommission the Solar Energy System.

    c. Impact study prepared by a qualified consultant, hired by the City, but paid for by the developer, to determine all impacts on the environmental, including, but not limited to wetlands, native vegetation, and wildlife and water quality.

    d. Site Plan(s) indicating "prime Farmland," and "Farmland of Statewide Importance," and locations of local or National Historic Districts or landmarks.

6. Additional Standards for Medium-Scale Ground-Mounted Solar Energy Systems

    a. Siting of Solar Energy Systems on unproductive land and previously disturbed land to the greatest extent possible shall be encouraged.

    b. The Solar Energy System shall be operated and located such that no disruptive electromagnetic or radio frequency interference with signal transmission or reception is caused beyond the property lines of the site.

    c. The Solar Energy System shall be located and designed to avoid, minimize, or mitigate any glare onto abutting properties or roadways.

    d. Wildlife Habitat: The Solar Energy System shall have no undue adverse effect on any portion of the property designated by the Maine Department of Inland Fisheries and Wildlife as Rare, Threatened, or Endangered Wildlife, Essential Wildlife Habitat, or Significant Wildlife Habitat. The applicant shall assess the potential impacts of the Solar Energy System on any such designated species or habitat, including any adjacent areas that are important to the maintenance of the affected species or habitat, and shall take measures to avoid, minimize, or mitigate impacts of the Solar Energy System on the habitat and the species that the area supports. The Planning Board may require the applicant to consult with the Maine Department of Inland Fisheries and Wildlife or a wildlife biologist preapproved by the Board in conducting such an assessment.

    e. Natural Areas: The Solar Energy System shall have no undue adverse effect on any portion of the property designated as a unique natural area or a Rare or Exemplary Plant and Natural Community in the City's Comprehensive Plan or by the Maine Natural Areas Program. The applicant shall assess the potential impacts of the Solar Energy System on any

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such designated natural area or community, including any adjacent areas that are important to the maintenance of the affected area or community, and shall take measures to avoid, minimize, or mitigate impacts of the Solar Energy System on the natural area or community. The Planning Board may require the applicant to consult with the Maine Natural Areas Program in conducting such an assessment.

f. Historic or Archaeological Resources: The Solar Energy System shall have no undue adverse effect on any portion of the property that has been identified as containing a significant historic or archaeological resource in the City's Comprehensive Plan or on the National Register of Historic Places, or is considered by the Maine Historic Preservation Commission or other pertinent authority as likely to contain a significant historic or archaeological resource. The applicant shall assess the potential impacts of the Solar Energy System on any such resource, including any adjacent areas that are important to the preservation of the resource, and shall take measures to protect these resources, including but not limited to, modification of the proposed location and design of the Solar Energy System, timing of construction, limiting the extent of excavation, physical or legal protection, or by archaeological excavation or mitigation. The Planning Board may require the applicant to consult with the Maine Historic Preservation Commission in conducting such an assessment.

g. Revegetation: Any disturbed ground cover on the site shall be revegetated with pollinator friendly, native, and non-invasive vegetation.

h. The Solar Energy System must be located and designed for minimal visual impact on the surrounding area, particularly when viewed from abutting residential properties or any Public Vantage Point.

   i. A vegetated buffer that is at least half the width of the minimum setback requirement in Section 75 (f) (ii) of this Ordinance shall be maintained along any property boundary line of a Solar Energy System that abuts a residential dwelling or a public road, except where necessary to accommodate a driveway entrance to the site.

   ii. Existing vegetation must be used to the greatest practical extent. If there is insufficient existing vegetation to create a vegetated buffer, the applicant shall plant and maintain native species of conifers and evergreens to adequately screen the Solar Energy System from view.

i. Security Fencing: All components of the Solar Energy System, excepting overhead utility and communication lines and poles, shall be completely enclosed by a minimum 6-foot-high fence. The fence shall be elevated an minimum of 6 inches above the ground to accommodate crossings by small terrestrial animals. Functional alternatives to chain-link style fencing is encouraged.

j. Operations and Maintenance: The applicant must provide for the long-term operation of the Solar Energy System and maintenance of the Solar Land Area, including ensuring that

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vegetation buffers are maintained, inspections are performed as needed, and the site is accessible to emergency responders in the event of an emergency.

7. Additional Standards for Large-Scale Ground Mounted Solar Energy Systems

    a. Agricultural Resources: The Solar Energy System shall have no undue adverse effect on any portion of the property containing prime agricultural soils or soils of statewide importance. The applicant shall assess the potential impacts of the Solar Energy System on any such soils, and shall take measures to avoid or minimize impacts to such soils. The Planning Board may require the applicant to consult with the Department of Agriculture, Conservation, and Forestry, Agricultural Resource Development Division, in conducting such an assessment. No topsoil or prime agricultural soil shall be removed from the site for installation of the Solar Energy System. All stockpiled topsoil shall be retained on site and reused in the landscaping plan for the site.

    b. Utility Connections: All on-site utility transmission lines and piping associated with the Solar Energy System shall be placed underground to the greatest extent practicable. The Planning Board may waive this requirement if the applicant can demonstrate that satisfying this requirement is not practicable based on requirements of the utility provider or specific site conditions.

8. Dimensional requirements for medium-scale and large-scale Solar Energy Systems:

    a. The Solar Energy System shall be less than 25 feet in Height.

    b. Minimum Setbacks: The following minimum setback requirements must be met, regardless of the zoning district in which the Solar Energy System is located, unless the minimum setback requirement in the applicable zoning district is more restrictive, in which case the more restrictive requirement shall apply:
        i. Front Lot Line 75 feet
        ii. Side and Rear Lot Line 75 feet
        iii. Street Right-of-Way 100 feet

    c. The Solar Land Area of a Solar Energy System must not exceed 50 acres.

9. Post-Approval Requirement for Medium-Scale Solar Energy Systems and Large-Scale Solar Energy Systems: Prior to the start of construction of a Medium-Scale Solar Energy System or Large-Scale Solar Energy System, the permit holder must submit to the Code Enforcement Officer a decommissioning plan and financial assurance approved by the Maine Department of Environmental Protection, in accordance with the requirements of 35-A M.R.S.A. Sections 3491-3496, as may be amended, for all costs associated with decommissioning the Solar Energy System.

10. Post-Construction Requirements for Medium-Scale Solar Energy Systems and Large Scale Solar Energy Systems: After completion of construction and prior to commercial operation of a

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permitted Medium-Scale Solar Energy System or Large-Scale Solar Energy System, the permit holder must:

a. Submit to the Code Enforcement Department as-built drawings prepared by a Maine licensed professional land surveyor or engineer. The as-built drawings shall include the actual locations of the Solar Energy System and its components, any structures and their components, above and underground utilities, roads, swales, ditches, detention/retention facilities, areas of filling and grading, vegetated buffers, fencing, land and landscaping alterations, and any other infrastructure and facilities, all as actually constructed on the site. The as-built drawings must be accompanied by a letter signed by the surveyor or engineer certifying that the Solar Energy System had been constructed in accordance with all Planning Board approvals, including any conditions of approval and any accompanying plans and specifications.

b. Provide a written manual to the Biddeford Fire Department and Code Enforcement Department, which provides clear response information and instructions, including lock box details and disconnection locations necessary for a fire/emergency response at the site.

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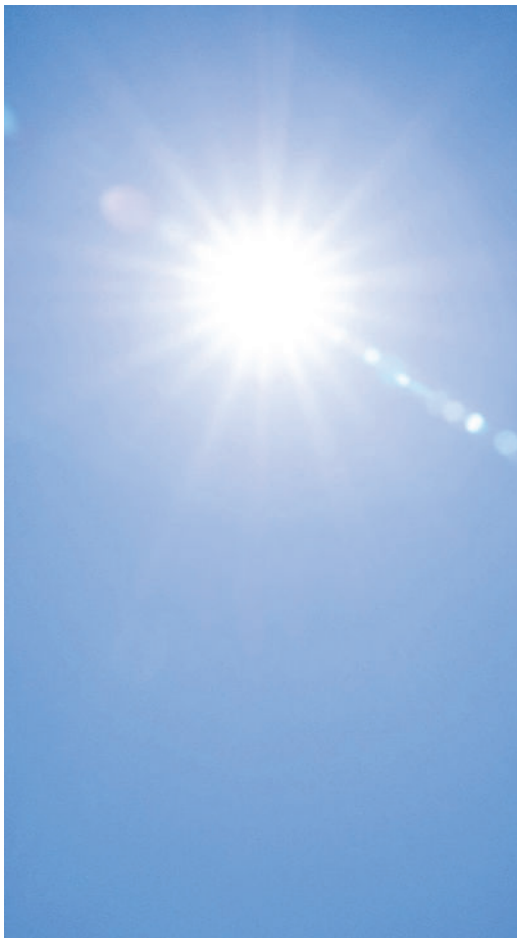

SOLAR IN MAINE

Frequently Asked Questions

for Siting and Hosting Solar Projects at the Municipal Level

Today, Maine is on the cusp of a new era of solar power development. With the passage of a suite of new statewide laws in 2019, Mainers are beginning to experience what other states have been experiencing: a swelling opportunity for more solar installations, more solar jobs, and more solar customers including large customers like municipalities—that are using solar to lower energy costs. That opportunity brings questions about what solar means for Maine cities, towns and people.

This document was created to provide answers to common questions about solar development that have been raised by municipal officials, landowners, and others considering larger solar projects for their own use or in their communities.

The questions and answers are organized under three general themes:

- **General background on solar energy projects in Maine**
- **Physical features of solar development**
- **Considerations for municipalities, landowners, and neighbors**

A companion document from Maine-based conservation organizations provides guidance to developers on how to responsibly site solar projects in Maine. If you have follow-up questions, there is contact information at the end of this document.

GENERAL ENERGY PROJECTS IN MAINE

What are the different types of solar development?

Broadly speaking, there are large, "grid-scale" projects and small or medium-sized "distributed generation" projects that are more dispersed across the grid. Breaking that down further, there is a range of solar projects.

On one end of the spectrum are projects located on a consumers' property to provide power directly to a home, business or government entity, called "behind the meter" projects. Excess electricity from a behind the meter project may flow onto the grid in exchange for net metering credits on future utility bills. These projects may be on a roof or on the ground, scaled to power a house (4-10 kilowatts) or a superstore (several megawatts).

On the other end of the spectrum are grid-scale projects that provide power to consumers across the electricity grid like a traditional power plant, not specific individual customers. These ground-mounted projects may be as small as 10 megawatts (MW) or more than one hundred MW.

In between these two ends of the spectrum are projects that provide power for specific customers (i.e. credits on electricity bills like behind the meter projects) but are not located on the property where the power is consumed. These projects are most likely to be 1-5 MW and include community solar farms and projects serving a single customer. A landfill solar project providing power for a local school or municipal government is an example. Another example could be a project providing power to dozens of individual people who live in different places.

Municipalities have several options available to them along this spectrum:

- Leasing their land for solar development
- Ensuring land use ordinances and permitting processes encourage solar
- Entering into a contract for behind the meter projects or on landfills and other sites
- Hosting community solar projects and/or becoming an anchor tenant

Cities and towns that have invested in these types of solar projects have successfully been able to reduce electricity costs or receive revenue that contributes to municipal budgets.

How well does solar work in Maine?

Solar works great in Maine and the state has an excellent solar energy resource. For example, a solar panel in Portland will generate 90-95% as much energy in a year as an identical panel located in Atlantic City, Savannah, or Houston. This is why an increasing number of companies are competing to install solar here in Maine.

Each year corporations, utilities, government and individuals around the world invest billions of dollars in solar photovoltaics (PV) projects because it is a mature, reliable, affordable technology. New England states like Massachusetts and Vermont are already national leaders in solar development and now Maine has the opportunity to catch up.

Why is there so much activity developing solar now in Maine?

After years of efforts and discussion, new laws passed in 2019 helped bring Maine's energy policy up to date by recognizing and encouraging both grid-scale and distributed solar.

- LD 1711 directed the Maine Public Utilities Commission (PUC) to initiate a competitive bidding process amongst solar developers and approve long-term contracts for 375 MW of distributed solar (projects under 5 MW), mostly through community solar. The PUC will offer contracts for distributed solar projects starting in July 2020. To qualify for a contract, projects must have federal, state and local permits, an interconnection agreement with the utility, and meet other substantive requirements. There will be stiff competition to develop projects, meet these requirements in time and get a contract.
- The bill also expanded net metering to more easily allow municipal/commercial or community solar projects up to 5 MW. Those projects can be developed at any time.
- LD 1494 directs the PUC to solicit and approve long-term contracts for grid-scale renewables, including solar, for an estimated 1.175 MW. Those projects are likely in development now to bid for two rounds of contracts in 2020 and 2021.

Who gets the power from solar projects in Maine?

It depends which type of solar project it is (see Question 1). It might be the town or business that works with an installer or developer on an individual project, or it might be all utility consumers for a grid-scale project. Grid-scale projects located in Maine can provide power to consumers in other states, however all of New England shares a common electricity grid, so power generated and consumed anywhere within the region affects all of us to some degree.

What is community solar?

Any customer can get direct bill savings from participating in a community solar project, including homeowners, renters, municipalities, nonprofits, and corporations.

There are different financial arrangements used by community solar projects. In general, participants subscribe to a project and then receive a credit on their utility bill from their share or subscription with the community solar project. The most common arrangement is likely to be large community solar projects where a third-party owns the project. Subscribers would pay no upfront costs to participate and will then pay an amount which is equal to or less than their current electricity bill over the course of their subscription.

The new law requires 10% of each community solar project that gets a long-term contract from the state to serve low to moderate income households. Only large electricity consumers (including municipalities) are likely to be able to sign onto community solar projects before the projects are awarded contracts (starting July 2020). Smaller consumers such as households and small businesses will be able to sign on later in the development process, and several thousand will have an opportunity to sign up.

How does solar power benefit Maine's electricity customers?

Solar provides significant benefits to the grid, to electricity consumers, and to the environment, benefits that accrue to all Mainers.

- Solar arrays produce a lot of their power at the times of the day and the year when the electric grid needs power the most, displacing the need for some of the most expensive and polluting fossil-fuel power plants that would otherwise operate at those times.
- Because there are no volatile fuel costs, solar provides a very stable and predictable source of power that can last for decades.
- Distributed solar also represents a shift from centralized to distributed generation, which reduces the strain on the electricity grid and lowers the costs ratepayers must pay over time for wires, poles, and substations.
- All solar power, especially distributed solar, makes our energy system more resilient.
- To the extent connecting a solar project imposes costs on the electricity grid, those are borne by the developer or owner of the project, not other consumers.
- The environmental benefits of solar are well established, including major reductions in carbon and other pollutants from conventional fossil fuel power plants. Add resiliency benefits.

How does solar development benefit Maine's economy?

The development of solar PV systems directly benefits the state's economy by creating jobs for engineers, electricians, construction workers, site maintenance crews, etc. Maine currently has the lowest number of solar jobs per capita of any state in the region, but that is poised to change as the industry grows. Solar also provides electrical rate stability and savings for consumers, which generally translate into more spending in the rest of the Maine economy. Solar projects may also create a valuable source of revenue for landowners that host projects.

PHYSICAL FEATURES OF SOLAR DEVELOPMENTS

How big are solar projects?

Solar projects can range from several kilowatts (i.e. enough to power a home or two) to many megawatts. The projects being considered under the new law will typically range from 2 to 5 MW's, which would require 12 to 30 acres.

The largest solar installation in operation in Maine is currently Cianbro's 10 MW project in Pittsfield, on 57 acres. There are two dozen larger grid-scale projects in planning across Maine, a few of which would be over 100 MW.

Why is solar sometimes installed on rooftops and sometimes on the ground?

In many cases, rooftops are suitable for solar and provide a ready, unused surface area that may not be as available on the ground. However, many roofs are incapable of hosting larger scale solar projects due to the roofs load bearing capacity, orientation, and obstructions such as air handling equipment. Ground mounted systems are typically the lowest cost to install if there is land available.

How close do solar projects need to be located to the electricity grid?

Project sites less than a mile from an existing electricity connection point will be most competitive for solar projects. This has a positive side effect of keeping distributed solar generation closer to existing development, not sprawling into Maine's North Woods. Placing systems far from substations is cost prohibitive for distributed solar projects. The cost of connecting a solar project to the electricity grid quickly increase based on circuit size or distance from a substation. Upgrading connection lines can exceed $500,000 per mile. Natural limitations in options for grid connection also are likely to significantly limit the number of multi megawatt-scale projects in any given town.

Does the equipment create noise and glare?

Solar arrays have virtually no moving parts to make noise. Inverters and other electrical equipment make some noise, but solar systems generate little, if any, detectable noise outside of the project area. The noise generated is similar to that of a modern air conditioning unit--if standing next to it you'll hear a subtle "hum" but if further away there should be no noise disturbance.

Sunlight that is reflected as glare is sunlight not producing electricity, so solar modules are constructed to minimize glare by using low glare glass to maximize absorption. Because glare is not an issue, there are now many solar projects located near or at airports.

Are there hazardous materials present in solar panels or other equipment?

The solar projects installed in Maine present no meaningful risk from hazardous materials. Panel materials don't dissolve into water or vaporize into the air, so there is little, if any, risk of chemical releases to the environment. At the end of their 30+ year lifespan, solar panels--like everything else--should be recycled to the greatest extent possible.

Transformers used at solar installations are similar to the ones used throughout the electricity grid all along the streets of Maine towns and cities. Modern transformers typically use non-toxic coolants, such as mineral oils, and have encasements to control leaks. Potential releases from transformers using these coolants at solar installations are not expected to present a risk to human health, and release of any toxic materials from solid state inverters is unlikely when properly installed.

Thin-film solar panels, which are less common and not currently being used in Maine, contain materials like cadmium, which can present health and environmental problems if it burns at a high temperature or are disposed of improperly.

Do solar developments impact wildlife habitat or water quality?

Solar arrays are generally a low impact form of development, if they are sited and maintained thoughtfully. Maine's largest environmental and agricultural non-profit organizations have published a brief set of recommended siting practices that can be followed to minimize impacts to natural and agricultural resources. Go to www.maineaudubon.org/solar for more information.

Rooftop solar projects should have virtually no negative environmental impacts. Larger ground mounted projects (i.e., 5 MW or more) almost always perform some environmental review, including for sensitive wildlife habitat and wetlands, but additional care can be taken to avoid and minimize all natural resource impacts, including for smaller ground-mounted projects. Solar development should not significantly change watershed conditions, although this must be evaluated for individual projects above a certain size (see state permitting below). In some cases, wildflowers and other native plants have been planted around ground mounted solar projects to support bees, butterflies, and other wildlife.

MUNICIPAL, LANDOWNER, AND NEIGHBOR CONSIDERATIONS

How will towns and cities benefit from hosting a solar project?

Towns and cities can directly benefit from solar in two primary ways:

- By receiving annual property tax payments from solar development, without increasing the need for additional services.
- By getting power from a solar project, either as the sole owner or through a community solar project. Solar power offers affordable electricity costs that are stable or fixed for very long terms (sometimes more than 20 years), which eases strain on municipal budgets. In the case of community solar projects, residents and local businesses can also participate. Solar projects can be located on areas without other productive uses, such as rooftops or landfills.

How should a municipality or large customer start the process of getting solar installed for their own use?

Large customers can solicit quotes or bids from multiple developers or installers in several ways. Local governments may want to issue a Request for Proposals, others may solicit project quotes in less formal ways. Municipalities may receive unsolicited proposals or inquiries from developers. While those may serve to educate and inspire municipalities about the potential to participate in solar power, it is likely that towns will want proposals from multiple developers. To get the most from a competitive bid or quote, it is important to identify the goals and key parameters for a solar project, including to make apples-to-apples comparisons. For example, is there a specific piece of land in mind or should the solar developer propose one? Could the solar project serve multiple units of government (e.g. the school and the town hall)? Are you trying to achieve environmental or emission reduction goals or financial goals?

Towns may want to use a standing committee or ad hoc committee to guide the process, potentially the expertise of residents to augment that of municipal officials. In some cases, towns or larger businesses may hire an independent engineer or consultant to assess the potential for benefiting from solar or site-specific considerations (e.g. landfill suitability.) It is a good idea to seek advice from other towns or businesses that have gone through the process.

What land use issues or impacts are likely to be regulated at the state level?

Solar projects above a certain size or impacting certain natural resources will require a permit from the Maine Department of Environmental Protection, known as a Site Location of Development (or "Site Law") permit, which typically coincides with a related Natural Resources Protection Act (NRPA) permit. These permits prohibit significant negative impacts to sensitive wildlife habitat, wetlands, water quality, groundwater, soil erosion/stormwater, noise, and scenic character. Site Law permits are required for all projects occupying 20 acres or greater. NRPA is trigger if the project is located in certain high-value natural resource areas.

What municipal services do solar projects require?

Unlike many types of development that require additional services such as increased enrollment at schools, water and sewer services, road use, or constituent services generally, solar projects require almost no additional services except a small amount of ordinary fire and police protection.

Solar project owners will be responsible for operations and maintenance costs. Those costs will vary based on the type of project. Rooftop projects may require virtually no maintenance for a decade or more, and even more complex ground projects have low operations costs. A municipality, landowner or business that hosts or contracts for power from a solar project should clarify with the developer or installer which party has responsibility for operations and maintenance.

Should towns adopt solar ordinances or make solar an allowed use in zoning?

Solar-specific ordinances or permitting requirements are not necessary for well-sited solar projects to be developed, however they can be a tool to encourage appropriate solar development over time. Some of Maine's municipalities have adopted solar ordinances making it explicit that solar is an allowed use in most zones. Model site plan regulations and conditional use permits, along with additional land use guidance, can be found at maineaudubon.org/solar.

How can ground-mounted solar developments be decommissioned?

Most medium and large-scale solar projects have a decommissioning plan built into a lease agreement with a landowner. These plans often include language that states that all equipment that was installed for the solar farm will be removed at the time the system is shut-down.

How will a solar array impact neighborhood property values?

Solar projects make good neighbors. There is little evidence to suggest that solar projects affect nearby property values one way or the other. Once a ground-mounted solar project is installed, it means no other form of development--most of which would have greater impacts--will be located on that land for thirty years or more. This may be a benefit to neighbors, however it is unlikely to be reflected in property values.

Do solar projects generate property tax revenue?

The laws regarding property taxes on solar differentiate between grid-scale projects and solar projects that provide power for individual customers. Grid-scale projects are assessed and taxed like other forms of development, either traditionally or through Tax Increment Financing (TIF) agreements. Under new Maine laws, consumer-oriented solar projects (where the customer receives a bill credit, such as under net metering and community solar projects) do not pay property taxes on solar equipment. Instead municipalities will receive reimbursement from the state for 50% of the tax value. Maine Revenue Service is in the process of developing guidance for fair and consistent valuation of solar projects.

What are the added benefits and challenges of solar development on brownfields?

Locating solar arrays on brownfields, including landfills or former industrial sites, is an excellent way to make use of property that might not have any other feasible use. If a municipality is purchasing the solar output (or one of the parties in a community solar farm), then land such as a landfill is essentially free. Re-using brownfields to the greatest extent possible is an efficient use of land and will help Maine achieve its solar energy goals with minimum conversion of forests, farms or other open space.

However, developing on these sites often comes with greater costs of installation, and/or greater technical, legal, or financial complexity. For example, traditional post-mounted solar panel racks cannot be installed on a capped landfill. Sites with hazardous waste contaminants may require additional permits or insurance, which create development risk. Solar should be pursued where a brownfield is located close to an interconnection point with the grid and site challenges are relatively minimal.

For more information or to request a copy of the final version of this FAQ, contact:

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"Solar in Maine: Frequently Asked Questions"
developed by:

Natural Resources Council of Maine

Maine Audubon

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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

Please contact Eliza Donoghue, Director of Advocacy and Staff Attorney for Maine Audubon, at edonoghue@maineaudubon.org.

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.

use marijuana operation that is the subject of such approval. Furthermore, by accepting a permit issued pursuant to this ordinance, all adult use marijuana operators, agree to indemnify, defend and hold harmless the Town, its officers, elected officials, employees, volunteers and agents, insurers and self- insurance pool from and against all liabilities of any kind that result from any arrest or prosecution of business owners, operators, employees, clients or customers for a violation of federal, state or local laws and regulations. This obligation to indemnify, defend and hold harmless shall include the obligation to reimburse the party so indemnified, defended and held harmless for any and all attorney's fees reasonably incurred by that party in defense of such liabilities, claims and demands.

A.A. Solar Energy Systems

1. Purposes:

    a. Solar energy is a local, renewable 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 utility grid, with benefits for system owners and electricity consumers.

    b. The use of solar energy for the purpose of providing electricity and energy for heating and or cooling is an important part of the Town of Fryeburg's sustainability goals.

    c. The standards herein enable the accommodation of Solar Energy Systems in appropriate locations and in a manner that protects the public health, safety, and welfare while still allowing the quiet enjoyment of property and supporting the goals of the Comprehensive Plan, including goals related to natural resources and historical and archeological preservation.

2. Applicability: Notwithstanding the provisions of 1 M.R.S.A. Section 302 or any other law to the contrary, the requirements of this Section 17.AA shall apply to (a) all Roof-Mounted Solar Energy Systems installed on or any time after the date that the legislative body of the Town adopted this Section 17.AA, and (b) all proceedings and applications for the construction or installation of any other Solar Energy Systems (including any expansion, upgrade, modification, or structural change that materially alters the size, placement, or output of such systems) that are pending before any municipal reviewing authority on or any time after the date that the legislative body of the Town adopted this Section 17.AA.

3. Permitting Requirements:

    a. Roof-Mounted Solar Energy Systems and Small-Scale Solar Energy Systems must comply with the Dimensional Requirements applicable to structures within the zoning district in which such systems are to be located and the standards in Section 16 of this Ordinance. Small-Scale Solar Energy Systems must also comply with the standards in Section 17.AA.5 of this Ordinance. Roof-Mounted Solar Energy Systems and Small-Scale Solar Energy Systems must obtain a Building Permit from the Code Enforcement Officer in accordance with the procedures set forth in Section 2.C of this Ordinance.

b. Medium-Scale Solar Energy Systems and Large-Scale Solar Energy Systems must obtain Land Use Authorization from the Planning Board in accordance with the procedures set forth in Section 2.F of this Ordinance.

4. Additional Application Submissions Required for Medium-Scale Solar Energy Systems and Large-Scale Solar Energy Systems:

   An application for Land Use Authorization for a Medium-Scale Solar Energy System or a Large-Scale Solar Energy System must be submitted in accordance with Section 2.D of this Ordinance. In addition to the submission requirements in Section 2.D, the applicant must submit the following:

   a. Written confirmation from the public utility to which the Solar Energy System will be connected confirming that the solar operator has conditional or final approval to interconnect the Solar Energy System to the utility grid.

   b. Evidence of financial capacity to construct, operate, and decommission the Solar Energy System.

   c. Erosion and sedimentation control narrative and plans with details.

   d. Site plans showing all proposed construction and alteration of the project site, including changes to the landscape of the Solar Land Area, filling, grading, earthmoving, vegetation clearing and planting, screening, fencing, Solar Energy System components, utilities (above and/or below ground), and all other aspects of the project.

   e. Site plans showing water bodies, wetlands, flood hazard areas, and vernal pools.

   f. A description of the major components of the Solar Energy System (including arrays) proposed to be used, including manufacturers' specifications and cut sheets if available.

   g. A landscaping plan, prepared by a licensed forester, landscape architect, or arborist, demonstrating compliance with all applicable landscaping and vegetated buffering requirements. At minimum, the landscaping plan must specify the locations, elevations, and height above finished grade of all vegetation, berms and plantings, and must identify the plant species and other materials that will comprise the elements used to establish any vegetated buffers and substantially screen the Solar Energy System from view from abutting residential properties, public roads, and Public Vantage Points.

   h. A long-term operations and maintenance plan providing for ongoing monitoring and inspections of all site improvements. The plan must provide a method for maintaining sufficient financial resources for performing ongoing maintenance and repair of the Solar Energy System.

i. A proposed decommissioning plan for the removal of the Solar Energy System, disposal of system components, and stabilization of the site, which meets the requirements in Section 17.AA.8 of this Ordinance, and a written statement of the applicant's intent concerning the following:

i. Physical removal of any Solar Energy System components, structures, foundations, supports, fencing, or security barriers from the site.

ii. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal laws and rules.

iii. Stabilization or re-vegetation of the site as necessary to minimize erosion and return the site to substantially its pre-construction state.

j. A description of any proposed dual-use or co-location of the property, including but not limited to agrivoltaics. If no dual-use is proposed or intended on the property, an explanation as to why such dual-use or co-location is not practicable.

k. A visual impact assessment prepared by a landscape architect or other professional with expertise in evaluating visual impacts, which identifies the visual impacts of the Solar Energy System on any Public Vantage Point within a one-mile radius of the project area, and on abutting properties. At minimum, the assessment must include a line-of-sight profile analysis that illustrates what is visible and what is obstructed along a straight line running from the Solar Energy System and each Public Vantage Point. The Planning Board may require additional visual impact assessments, including digital viewshed maps, if it determines in its sole discretion that such assessments are necessary for the Planning Board to evaluate the Solar Energy System's compliance with the scenic impact standards in Section 17.AA.6.f of this Ordinance.

5. Additional Standards for Small-Scale, Medium-Scale, and Large-Scale Solar Energy Systems:

In addition to the standards in Section 16, a Small-Scale, Medium-Scale, or Large-Scale Solar Energy System must comply with the following standards:

a. The Solar Energy System shall be less than 25 feet in Height.

b. The Solar Energy System shall be operated and located such that no disruptive electromagnetic or radio frequency interference with signal transmission or reception is caused beyond the property lines of the site.

c. The Solar Energy System shall be located and designed to avoid, minimize, or mitigate any glare onto abutting properties or roadways.

6. Additional Standards for Medium-Scale and Large-Scale Solar Energy Systems:

In addition to the standards in Section 16 and Section 17.AA.5, a Medium-Scale or Large-Scale Solar Energy System must comply with the following standards:

a. Minimum Setbacks: The following minimum setback requirements must be met, regardless of the zoning district in which the Solar Energy System is located,

unless the minimum setback requirement in the applicable zoning district is more restrictive, in which case the more restrictive requirement shall apply:

Front Lot Line	75 feet
Side and Rear Lot Line	75 feet
Street Right-of-Way	100 feet

b. Wildlife Habitat: The Solar Energy System shall have no undue adverse effect on any portion of the property designated by the Maine Department of Inland Fisheries and Wildlife as Rare, Threatened, or Endangered Wildlife, Essential Wildlife Habitat, or Significant Wildlife Habitat. The applicant shall assess the potential impacts of the Solar Energy System on any such designated species or habitat, including any adjacent areas that are important to the maintenance of the affected species or habitat, and shall take measures to avoid, minimize, or mitigate impacts of the Solar Energy System on the habitat and the species that the area supports. The Planning Board may require the applicant to consult with the Maine Department of Inland Fisheries and Wildlife or a wildlife biologist preapproved by the Board in conducting such an assessment.

c. Natural Areas: The Solar Energy System shall have no undue adverse effect on any portion of the property designated as a unique natural area or a Rare or Exemplary Plant and Natural Community in the Town's Comprehensive Plan or by the Maine Natural Areas Program. The applicant shall assess the potential impacts of the Solar Energy System on any such designated natural area or community, including any adjacent areas that are important to the maintenance of the affected area or community, and shall take measures to avoid, minimize, or mitigate impacts of the Solar Energy System on the natural area or community. The Planning Board may require the applicant to consult with the Maine Natural Areas Program in conducting such an assessment.

d. Historic or Archaeological Resources: The Solar Energy System shall have no undue adverse effect on any portion of the property that has been identified as containing a significant historic or archaeological resource in the Town's Comprehensive Plan or on the National Register of Historic Places, or is considered by the Maine Historic Preservation Commission or other pertinent authority as likely to contain a significant historic or archaeological resource. The applicant shall assess the potential impacts of the Solar Energy System on any such resource, including any adjacent areas that are important to the preservation of the resource, and shall take measures to protect these resources, including but not limited to, modification of the proposed location and design of the Solar Energy System, timing of construction, limiting the extent of excavation, physical or legal protection, or by archaeological excavation or mitigation. The Planning Board may require the applicant to consult with the Maine Historic Preservation Commission in conducting such an assessment.

e. Agricultural Resources: The Solar Energy System shall have no undue adverse effect on any portion of the property containing prime agricultural soils or soils of statewide importance. The applicant shall assess the potential impacts of the Solar Energy System on any such soils, and shall take measures to avoid or minimize impacts to such soils. The Planning Board may require the applicant to consult

with the Department of Agriculture, Conservation, and Forestry, Agricultural Resource Development Division, in conducting such an assessment. No topsoil or prime agricultural soil shall be removed from the site for installation of the Solar Energy System. All stockpiled topsoil shall be retained on site and reused in the landscaping plan for the site.

f. Revegetation: Any disturbed ground cover on the site shall be revegetated with pollinator friendly, native, and non-invasive vegetation.

g. The Solar Energy System must be located and designed for minimal visual impact on the surrounding area, particularly when viewed from abutting residential properties or any Public Vantage Point.

h. A vegetated buffer that is at least half the width of the minimum setback requirement in Section 17.AA.6.a of this Ordinance shall be maintained along any property boundary line of a Solar Energy System that abuts a residential dwelling or a public road, except where necessary to accommodate a driveway entrance to the site. Existing vegetation must be used to the greatest practical extent. If there is insufficient existing vegetation to create a vegetated buffer, the applicant shall plant and maintain native species of conifers and evergreens to adequately screen the Solar Energy System from view.

i. Security Fencing: All components of the Solar Energy System, excepting overhead utility and communication lines and poles, shall be completely enclosed by a minimum 6-foot-high fence. The fence shall be elevated an minimum of 6 inches above the ground to accommodate crossings by small terrestrial animals. Functional alternatives to chain-link style fencing is encouraged.

j. Utility Connections: All on-site utility transmission lines and piping associated with the Solar Energy System shall be placed underground to the greatest extent practicable. The Planning Board may waive this requirement if the applicant can demonstrate that satisfying this requirement is not practicable based on requirements of the utility provider or specific site conditions.

k. Operations and Maintenance: The applicant must provide for the long-term operation of the Solar Energy System and maintenance of the Solar Land Area, including ensuring that vegetation buffers are maintained, inspections are performed as needed, and the site is accessible to emergency responders in the event of an emergency.

7. Additional Performance Standards for Large-Scale Solar Energy Facilities:

   a. Greenhouse Gas Assessment: The Large-Scale Solar Energy System shall not result in a net increase of greenhouse gas emissions over a 20-year period. The Planning Board may request an independent greenhouse gas assessment including an analysis of on-site, upstream, and downstream emissions from the project.

8. Post-Approval Requirement for Medium-Scale Solar Energy Systems and Large-Scale Solar Energy Systems: Prior to the start of construction of a Medium-Scale Solar Energy System or Large-Scale Solar Energy System, the permit holder must submit to the Code Enforcement Officer a decommissioning plan and financial assurance approved by the Maine Department of Environmental Protection, in accordance with the requirements of

35-A M.R.S.A. Sections 3491-3496, as may be amended, for all costs associated with decommissioning the Solar Energy System.

9. Post-Construction Requirements for Medium-Scale Solar Energy Systems and Large-Scale Solar Energy Systems:

After completion of construction and prior to commercial operation of a permitted Medium-Scale Solar Energy System or Large-Scale Solar Energy System, the permit holder must:

a. Submit to the Code Enforcement Officer as-built drawings prepared by a Maine licensed professional land surveyor or engineer. The as-built drawings shall include the actual locations of the Solar Energy System and its components, any structures and their components, above and underground utilities, roads, swales, ditches, detention/retention facilities, areas of filling and grading, vegetated buffers, fencing, land and landscaping alterations, and any other infrastructure and facilities, all as actually constructed on the site. The as-built drawings must be accompanied by a letter signed by the surveyor or engineer certifying that the Solar Energy System had been constructed in accordance with all Planning Board approvals, including any conditions of approval and any accompanying plans and specifications.

d. Provide a written manual to the Fryeburg Fire Department and Code Enforcement Officer, which provides clear response information and instructions, including lock box details and disconnection locations necessary for a fire/emergency response at the site.

§ 280-15-12. Solar energy system. [Added 3-7-2017 by Order No. 17-31.07; amended 4-7-2020 by Order No. 19-772-01]

A. Purpose. The purpose of these provisions is to regulate a solar energy system, allow the City to be informed of the placement of a solar energy system, preserve and protect public health and safety, allow for orderly development of land, and protect property values.

B. Standards.

(1) A residential solar system (RSS) shall:

(a) Comply with the setback and height requirements of the zoning district in which the system is to be installed.

(b) Comply with the provisions of all applicable requirements of the City's building, electrical, fire, and other health safety and technical codes, including but not limited to Chapters 90: Building and Building Regulation and 128: Fire Prevention.

(c) Be installed so as not to cause any wire or wireless communication signal disturbance.

(d) Be sited to prevent glare onto abutting properties, structures, and roadways.

(e) Be removed if it has not produced power for a period of twelve (12) consecutive months.

(2) Standards. A commercial solar system (CSS) and utility solar system (USS) shall:

(a) Comply with the requirements of Article XVI: Site Plan Review.

(b) Comply with the setback and height requirements of the zoning district in which the system is to be installed; however, the Planning Board may require additional setbacks and buffers from existing abutting residential uses to minimize impacts from the project.

(c) Comply with the provisions of all applicable requirements of the City's building, electrical, fire, and other health safety and technical codes, including but not limited to Chapters 90: Building and Building Regulation and 128: Fire Prevention.

(d) Comply with the industrial performance standards specified in § 280-15-3.

(e) Ground-mounted system.

[1] Secure all ground-mounted electrical and control equipment to prevent unauthorized access. The system shall be enclosed within a minimum seven (7) foot tall fence with locking gate and Knox-Box®

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to provide emergency access. The type of fence shall be appropriate for security, screening, and/or other purposes and shall be similar to and/or compatible with the style of fences used within one-thousand (1,000) feet of the property boundary.

[2] A ground-mounted system in the Rural Residential Zone (RR) shall comply with the standards specified in § 280-15-12B(2)(l).

[3] A ground-mounted system in the Residential Development Overlay Zone shall comply with the standards specified in § 280-15-12B(2)(m). **[Added 5-3-2022 by Order No. 21-494-01]**

(f) Install all electrical wire and utility connections, except for transformers and controls, underground to the greatest practical extent. The Planning Board shall consider prohibitive costs and site limitations if asked to waive this standard.

(g) Limit exterior lighting to that required for safety and operational purposes.

(h) All signs shall meet the specifications of § 280-14-13.

(i) Be appropriate to the surroundings and minimize environmental and visual impacts on adjoining properties, including:

[1] Screening ground-mounted installations from view by abutting residential properties, using vegetation, topography, and/or fencing.

[2] Using a manufactured finish appropriate to and compatible with the surroundings, with reflective characteristics that minimize negative visual impacts to the greatest practical extent.

(j) Shall plant native, non-invasive groundcover, which is low-maintenance, drought resistant, and non-fertilizer dependent, under and between rows of solar panels to prevent soil erosion. **[Added 5-3-2022 by Order No. 21-494-01[1]]**

(k) Be removed if it has not produced power for a period of twelve (12) consecutive months. In the event of a natural disaster, act of violence, or other event which results in the absence of electrical generation for twelve (12) months, by the end of the twelfth (12th) month of nonoperation the applicant shall demonstrate to the City that the project shall be substantially operational and producing electricity within twenty-four (24) months of the event. If such demonstration is not made to the City's satisfaction, the decommissioning shall be initiated eighteen (18) months after the event.

(l) A performance guarantee in compliance with Article XVII shall be

1. **Editor's Note: This order also redesignated former Subsection B(2)(j) through (l) as Subsection B(2)(k) through (m), respectively.**

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provided prior to initiating construction. The performance guarantee shall provide adequate funds to cover the total cost of decommissioning. Every five (5) years after the start of construction, updated proof of the cost of decommissioning shall be submitted to the City Engineer. If the amount of the current performance guarantee is inadequate to cover the total cost of decommissioning, the applicant shall provide a new performance guarantee to the Planning Department in an amount which is adequate to cover the total cost of decommissioning.

(m) A USS in the Rural Residential Zone (RR) shall require conditional use approval by the Planning Board in accordance with Articles XIII and XVI and the following standards:

[1] Shall not be sited on active farmland.

[2] Shall minimize impacts on active farmland including, but not limited to, fencing, use of waterways, obstructions created by placement of structures and/or overhead collection lines, division of larger fields into smaller or irregularly shaped fields, need for extensive areas of cut and fill, among other factors that create a burden or unreasonable impact on active farming activities.

[3] Shall encourage siting on unproductive land and previously disturbed land to the greatest extent possible. All topsoil disturbed during construction shall be stockpiled and returned to the site.

[4] Shall locate access roads and overhead collection lines along the edge of agricultural fields in areas next to field boundaries and hedgerows and in nonagricultural portions of the site. The width of access roads shall be no larger than that required to meet the fire code. Access roads that are proposed to be constructed through agricultural fields shall be level with the adjacent field surfaces, where possible.

[5] Shall demonstrate how the site shall be restored to its original state, including surface grade, soil, and vegetation, as part of removal of infrastructure and decommissioning.[2]

(n) A USS in the Residential Development Overlay Zone (RDO) shall require conditional use approval by the Planning Board in accordance with Articles XIII and XVI and the following standards: **[Added 11-23-2021 by Order No. 21-494-01; amended 5-3-2022 by Order No. 21-494-01]**

[1] Shall not be sited on properties where public sewer and water services can be extended and a compact pattern of residential

2. Editor's Note: Former Subsection B(2)(m)[5], which required the planting of certain kinds of plants between rows of solar panels, was repealed 5-3-2022 by Order No. 21-494-01. For current provisions, see Subsection B(2)(j) of this section. Order No. 21-494-01 also renumbered former Subsection B(2)(m)[6] as Subsection B(2)(m)[5].

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development can feasibly be developed in conformance with the purpose of the RDO Zone.

[2] Shall minimize impacts on nearby existing residential development and/or residential zones, including, but not limited to siting, fences, buffers, and/or screens.

[3] Shall locate access roads and overhead collection lines to minimize impacts on nearby existing residential development and/or residential zones.

[4] Shall demonstrate that stormwater, erosion control, and landscape plans maintain water quality and minimize export of sediment, phosphorus, and other contaminants from the site in support of the City's efforts to restore Goodall Brook by protecting the headwaters of Goodall Brook and vulnerable water bodies in its watershed.

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ARTICLE XVIII. SOLAR ENERGY SYSTEMS

Sec. 27-1801. Purpose.

(a) Solar energy is a renewable and non-polluting energy resource that can prevent fossil fuel emissions and reduce energy load. Energy generated from solar energy systems can be used to offset energy demand on the grid where excess solar power is generated.

(b) The use of solar energy equipment for the purpose of providing electricity and energy for heating and/or cooling is a priority and is a necessary component of the City's current and long-term sustainability agenda.

(c) The standards that follow enable the accommodation of solar energy systems and equipment in a safe manner with minimal impacts on the quiet enjoyment of property.

Sec. 27-1802. Definitions.

The following definitions pertain to terms used in this Article:

Building-Integrated Photovoltaic (BIPV) Systems. A solar energy system that consists of integrating photovoltaic modules into the building structure, such as the roof or the façade and which does not alter the relief of the roof.

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).

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.

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

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.

Pole-Mount System. 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 foundation in the ground, and wired underground to an attachment point at the building's meter. 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.

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.

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 electricity or transfer of stored heat.

Solar Energy System. See Sec. 27-201.

Solar Energy System, Active. See Sec. 27-201.

Solar Energy System, Grid-Intertie. A photovoltaic system that is connected to an electric circuit served by an electric utility.

Solar Energy System, Ground-Mounted. See Sec. 27-201.

Solar Energy System, Large-Scale. See Sec. 27-201.

Solar Energy System, Medium-Scale. See Sec. 27-201.

Solar Energy System, Roof-Mounted. See Sec. 27-201.

Solar Energy System, Small-Scale. See Sec. 27-201.

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.

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.

Solar Panel (or module). A device for the direct conversion of sunlight into useable solar energy (including electricity or heat).

Solar Thermal System (Solar Hot Water or Solar Heating Systems). A solar energy system that directly heats water or other liquid, or air, using sunlight.

Tilt. The angle of the solar panels and/or solar collector relative to horizontal. 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

Sec. 27-1803. Applicability.

(a) Notwithstanding the provisions of 1 M.R.S.A. § 302 or any other law to the contrary, the requirements of this Article shall apply to all roof-mounted,

small-, medium-, and large-scale ground-mounted solar energy systems modified or installed after January 1, 2017.

(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 Article.

(d) For purposes of this Article, the City's zoning districts are categorized as follows:

(1) ***Residential Zoning Districts***. Residential zoning districts include: RF, AA, A, G, VR, RT, A-1, S-1, G-1, G-2, G-3, and G-4.

(2) ***Mixed-Use Zoning Districts***. Mixed-use zoning districts include: LB, VC, VCW, SP, CS, PO, C, I, MSCC, VE, BC, and MCC.

(3) ***Non-Residential Commercial/Industrial Zoning Districts***. Non-residential commercial/industrial districts include: CG, CCRT, CCR, S, IL, INR, CAZ, CPCCR, INR-MSW-1.

Sec. 27-1804. Permitting.

(a) No solar energy system or device shall be installed or operated in the City except in compliance with this Article Ordinance.

(b) Solar-thermal, building-integrated, roof-mounted, and small-scale ground-mounted solar energy systems are permitted in all zoning districts subject to the dimensional standards of Sec. 27-1805. All such systems must obtain building permits.

(c) Medium- and large-scale ground-mounted solar energy systems are permitted or special exception uses in some of the City's zoning districts, as found in the regulations for the individual zoning districts, subject to the requirements of this Article.

Sec. 27-1805. Dimensional Standards.

(a) Height

(1) In residential zoning districts, building integrated and roof-mounted solar energy systems shall be included in the building height measurement, and the height of the building shall not exceed the maximum building height. In mixed-use and non-residential commercial/industrial zones, notwithstanding and other provision of this ordinance to the contrary, building integrated and roof-mounted solar energy systems shall not be included in the building height measurement.

(2) Ground-mounted solar energy systems in residential and mixed-use zoning districts shall not exceed twelve (12) feet in height when oriented at maximum tilt, except that the maximum height is twenty (20) feet for systems set back at least thirty (30) feet from any property line. Ground-mounted solar energy systems in all other zoning districts shall conform to the building height requirements of the zoning districts in which they are located.

(b) Setbacks for Ground-Mounted Solar Energy Systems

Notwithstanding any other provision in this Ordinance to the contrary, the setbacks for ground-mounted solar energy systems shall be as follows:

Minimum front yard: In residential zoning districts, one hundred (100) feet. In mixed use and non-residential zoning districts, whatever the front yard setback is for that zoning district, but in no event less than thirty (30) feet.

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

Minimum side yard: Thirty (30) feet.

(c) Lot Coverage

Only the paved or otherwise impervious areas of sites on which ground-mounted solar energy systems are installed shall be counted in the lot coverage calculation.

(Ord. No. 14 16/17, 3/6/17 [Fiscal Note: Less than $1,000])

Sec. 27-1806. Standards for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems.

(a) Roof-mounted and building-mounted solar energy systems and equipment shall be permitted only if they are determined by the Code Enforcement Officer, with input from the City Engineer and the Fire Chief, not to present any unreasonable safety risks, including, but not limited to, the following:

(1) Weight load;
(2) Wind resistance;
(3) Ingress or egress in the event of fire or other emergency; and
(4) 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 National Fire Protection Association (NFPA) 1, Fire Prevention Code.

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

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

(e) Any connection to the public utility grid must be inspected and approved by the appropriate public utility.

(f) Notwithstanding any other provision of this Article to the contrary, any solar energy system installation on non-residential or multi-family properties completed prior to January 1, 2017 shall be required to comply with the photovoltaic system "marking" requirements contained in the latest edition of NFPA 1, Fire Prevention Code, on or before April 1, 2018. The Code Enforcement Officer shall endeavor to notify all affected property owners of this requirement on or before April 1, 2017, but failure of an affected property owner to receive such notice shall not relieve the property owner from compliance with this subsection.

(g) If a solar collector ceases to perform its originally intended function for more than 12 consecutive months, the property owner shall remove the collector, mount and associated equipment by no later than 90 days after the end of the twelve-month period.

(h) Each solar energy installation shall be maintained as necessary to ensure that it is operating safely and as designed over its useful lifetime.

Sec. 27-1807. Additional Standards for Medium- and Large-Scale Ground-Mounted Solar Energy Systems.

In addition to the standards in Sec. 27-1806, medium- and large-scale ground-mounted solar energy systems shall comply with the following:

(a) Utility Connections – Reasonable efforts, as determined by the Planning Board, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

(b) Safety – The solar system owner 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 visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.

(d) Glare - 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, to the extent practical.

(e) Additional Standards for Large-Scale Solar Energy Systems

(1) Operations & 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.

(2) Signage – Signs on large-scale ground-mounted solar energy systems shall comply with the regulations in Sec. 27-1561 *et. seq.* of this Chapter. A sign meeting those regulations shall be required to identify the owner and provide a 24-hour emergency contact phone number.

(3) 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.

(4) Installation Conditions – The large-scale ground-mounted solar energy system owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the Fire Chief. The owner or operator shall be responsible for the cost of maintaining the solar energy system and any access road(s), unless accepted as a public way.

(5) Removal – Any large-scale ground-mounted solar energy system which has reached the end of its useful life or has been abandoned consistent with this ordinance shall be removed. The owner or operator shall physically remove the installation no more than 150 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:

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

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

(c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Code Enforcement Officer may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

(6) Abandonment, Guarantee.

(a) 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

without having first obtained the written consent of the Code Enforcement Officer.

(b) At the time of approval, the applicant for a new large-scale ground-mounted solar energy system shall submit to the City an evergreen performance guarantee, to be approved by Corporation Counsel, in the amount of 150% of the estimated demolition cost of the system, such cost to be determined by the City Engineer or other duly designated person. The owner may apply to the Planning Board for release of the guarantee at such time that it or its assigns remove the system and associated abandoned structures, and such completed removal is found to be satisfactory by the City Engineer.

(c) If the owner or operator of the solar energy system fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the City retains the right to use the performance guarantee and all other available means to cause an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system to be removed.

(Ord. No. 12-16/17, 2/6/17 [Fiscal Note: Less than $1,000])

Secs. 27-1808 – 27-1900. Reserved.