MAINE DEPARTMENT OF
Energy Resources

Solar and Energy Storage Handbook for Maine Communities

A Planning Resource to Support the Responsible Development of Solar and Battery Energy Storage Projects



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This handbook represents several months of collaborative work which attempts to reflect years of productive engagement on this subject through both formal and informal conversations and forums.

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Cover image:

A crew works on panel installation at a solar project in Unity, Maine.
Image source: Maine Department of Energy Resources

The Maine Department of Energy Resources leads energy policy, planning, and development for the state. DOER provides policy leadership and technical assistance, develops energy programs, monitors energy markets, and reports on heating fuel and electricity prices, among other activities, to secure increasingly affordable, reliable, and clean energy for Maine people and businesses. To learn more, please visit maine.gov/energy.

Introduction

Solar energy generation and battery energy storage projects are a growing area of development in Maine. Solar and battery storage can be deployed together or as separate standalone projects and occur at a variety of sizes—from rooftop to utility-scale—each of which come with different considerations and benefits associated with the construction and operation of the project. Solar and storage projects can bring many benefits to the municipalities in which they are built, providing commercial tax revenue, bringing jobs and investment to the community, and offering opportunities to reuse and revitalize existing, or anchor new, commercial and industrial sites. Renewable energy projects can also provide local energy generation that can help reduce energy costs, and can bolster resilience by providing or supporting backup power during emergencies or outages.

Maine generally recognizes the principle of home rule, which means municipalities by and large have autonomy in local governance, allowing towns and cities to enact ordinances on most matters not explicitly prohibited by state or federal law. Home rule also allows municipalities to regulate development in ways that best benefit their communities, as long as they do not conflict with state or federal regulations.

As a result, there is no uniform set of local or municipal regulations for commercial solar energy and battery storage projects in Maine, creating variability in how municipalities manage these projects. Municipalities without any specific solar or battery energy storage ordinances often rely on existing processes that may include standards not specifically applicable to these project types. In some cases, existing municipal processes may cover aspects of solar energy and battery storage projects that are already subject to state and/or federal regulation, creating duplicate review. Proactive planning that incorporates effective standards and clear requirements can mitigate potential project impacts, reduce costs, balance land use priorities, and support the development of solar and storage projects that align with community priorities.

The goal of this handbook is to help municipalities understand and manage the development of these types of clean energy projects within their jurisdiction, realizing local benefits while promoting community needs and considerations. The handbook includes background information on solar and battery energy storage, reviews state and federal permitting processes, and recommends local best practices and model ordinances, in order to support communities, clarify expectations for developers, and responsibly manage solar energy generation and battery storage projects throughout Maine.

How to Use this Handbook

Every municipality in Maine has a unique geographic, economic, land use, and community context; the general information, resources, and guidance that follow are intended to meet communities where they are based on their own circumstances, so that each community can make informed local decisions and can consider specific benefits that they'd like to achieve through solar and battery storage projects. The focus of the information and recommendations in this handbook is primarily on larger solar and battery energy storage projects at the community- and utility-scales (>1 megawatt (MW)).

Part 1: Solar Energy and Battery Energy Storage Systems

Read this section if you want to learn the basics of how these systems work, the basic elements of these projects, and what developers look for in selecting sites.

Part 2: State and Federal Regulatory Context

Read this section to understand state and federal land use requirements for solar and battery energy storage projects, including applicable regulations, programs, and agencies.

Part 3: Local Policy and Considerations

Read this section to learn how your municipality can manage solar and battery storage projects through local control: zoning, site plan review, land use ordinances, and post-approval processes.

Part 4: Model Ordinances

Read this section to understand how communities can make zoning and ordinance changes to support responsible development of solar and battery energy storage. It contains model ordinances for solar energy systems and battery energy storage systems that your town can learn from, adapt, and/or adopt. The model ordinances are annotated with planning considerations to assist in community conversations and implementation.

Appendix A: Key State & Federal Land Use Laws

This appendix covers state and federal permitting and review processes in more detail.

Part 1: Solar Energy and Battery Energy Storage Systems

Solar energy and battery energy storage systems are two technologies that are contributing to Maine's goals of securing energy that is increasingly affordable, resilient, and clean. Solar and battery energy storage systems can be installed at multiple scales—from residential to commercial- or utility-scale—to generate electricity and support the grid without producing harmful emissions. When thoughtfully planned, these systems can be compatible with existing land uses in rural, commercial, and industrial zones with a low environmental and habitat impact. Commercial solar energy and battery storage projects can provide municipalities with a reliable source of long-term revenue, helping to stabilize and strengthen the commercial tax base. By diversifying local energy infrastructure, these projects not only generate consistent tax income but can also attract new investment, reduce exposure to volatile energy costs, and support a community's broader economic development goals.

Photovoltaic Solar Energy Generation Systems

Solar energy systems produce electricity by using the sun's energy. There are two primary types of solar energy systems used on a commercial scale today: photovoltaic and solar thermal systems. Solar thermal systems at commercial scale, sometimes called solar thermal power plants, are not currently being utilized in Maine. **This handbook focuses on the most common commercial solar application that municipalities will see in Maine: ground-mounted photovoltaic**

GLOSSARY

Alternating current (AC): AC is an electric current that periodically reverses direction and changes magnitude continuously with time. AC is the form in which electric power is delivered to homes and businesses, and is the form of electrical power typically used by home appliances.

Battery Energy Storage System: A type of energy storage technology that uses a group of batteries to store electricity for later use.

Direct current (DC): DC is one-directional flow of electrical charge.

Electrical Grid: An interconnected network for electricity delivery from producers to consumers. Electrical grids consist of power stations, electrical substations, power transmission lines, and power distribution to customers.

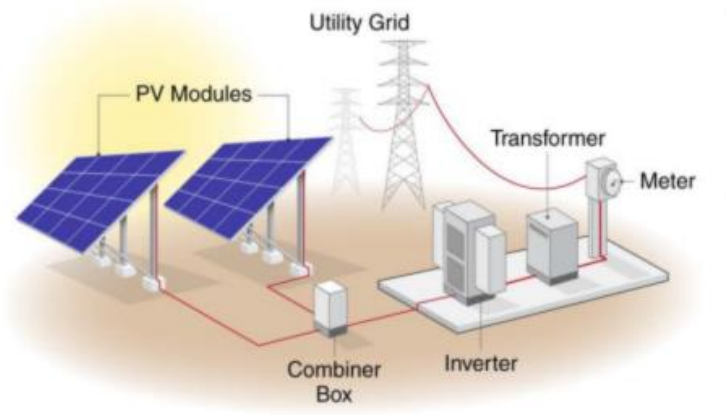
Inverter: A power inverter is an electronic device that changes direct current (DC) to alternating current (AC).

Lithium-ion Battery: A type of rechargeable battery that uses lithium in an electrochemical process to store energy. Lithium-ion batteries are designed to handle repeated charge/discharge cycles.

Photovoltaic Effect: A physical phenomenon in which electrical current is generated in a material upon exposure to light.

Photovoltaic System: A photovoltaic system, also called a PV system or solar power system, is an electric power system that supplies usable power by converting light from the sun into electricity using electronic devices known as solar cells or photovoltaic cells.

solar energy generation systems, commonly called "solar farms" and referred to here as "solar energy systems."



Example solar energy system

Image Source: *National Renewable Energy Laboratory, Research and Development Priorities to Advance Solar Photovoltaic Lifecycle Costs and Performance, October 2021.*

GLOSSARY (CONTD.)

Solar Cell: A solar cell (also known as a photovoltaic cell) is an electronic device that converts light into electricity using the photovoltaic effect.

Watt: Unit of power that measures how much power is used or produced by a system. Watts are commonly used to quantify electrical power.

Watt-hour: Measures energy used or produced over time.

Photovoltaic (PV) solar energy systems work by converting energy from the sun directly into an electrical current using solar cells. Each solar cell is typically made of silicon and protected by a layer of glass. When exposed to sunlight, energy is transferred between a positive and negative layer, which creates an electric field. This electric field allows electrons to travel along the cell in one direction, creating direct current (DC) electricity. A solar panel is made up of many individual solar cells connected together into a module or panel. The panels are mounted on a racking system and wired together into a solar array. Arrays may have a fixed orientation (fixed mount) or may move to follow the sun to maximize production (trackers). Fixed arrays are typically installed at a height of 3'-5' above the ground with a total height of around 10'. Tracker solar panels typically range between 10'-20' high, depending on the position of the panel.

PV solar systems are very scalable and are commonly used in residential, commercial, and utility applications in Maine and around the world. You might see panels installed on rooftops, parking structures, or open land. The size of a solar energy system is typically described by the system's maximum power output under ideal conditions, measured in megawatts (MW). A 1 MW solar energy system can produce enough electricity to power approximately 164 homes and requires approximately 5 acres of land, based on national averages from the Solar Energy Industries Association (SEIA). A 5 MW or larger solar energy

system is typically used to generate electricity for export to power the grid, rather than a specific business, municipality, or institution. Larger utility solar projects can generate hundreds of MW of electricity.

Solar arrays generate electricity that can be used on-site, stored in batteries, or exported to the electrical grid. The electrical grid operates on alternating current (AC) electricity, so grid-connected PV systems include an on-site inverter to convert the generated DC electricity to AC. This conversion from DC to AC power results in two expressed nameplate capacity ratings for the same solar energy system: the panels themselves have a DC nameplate capacity based on the maximum amount of power they can generate under ideal conditions, and the inverter has an AC nameplate capacity for the maximum amount of power it can convert. Since solar panels frequently do not perform at their maximum output given variability in sun intensity and cloud cover, inverters are typically slightly undersized making the DC nameplate capacity for a system oftentimes larger than the AC nameplate capacity for the same system. For example, you may see a project described as 6.3 MW DC, 5 MW AC.

Residential systems are typically either PV systems with inverters that can operate off the grid by directly powering a home and/or battery storage, or, more commonly, grid-connected systems that send power to the electrical grid to offset the grid energy used by the home. These systems can be ground-mounted or roof-mounted. Commercial solar applications include roof- or ground-mounted PV solar energy systems that work the same way as residential systems, as well as standalone ground-mounted PV solar energy systems that generate electricity for the grid. These standalone solar energy systems range in size, from smaller arrays that generate electricity to offset a portion of a town or city's energy bill, to large utility-scale projects that can supply energy to the grid to power thousands of homes.

Projects that provide or offset on-site electricity are generally referred to as "behind the meter" projects, while solar developments that are not associated with an existing load and supply electricity directly to the grid are called "front of the meter" projects. Modern solar arrays continue to decrease in cost and increase in efficiency, making solar an increasingly cost-effective investment.

Connecting and Disconnecting a Solar Energy System from the Grid

A solar project typically involves the following seven stages of development:

- Site assessment: evaluation of the suitability of a site for solar energy development
- Engineering and design: creation of specific development plans for the project

- Permitting and interconnection: regulatory requirements to build a project and connect it to the grid
- Contracting: to determine a buyer for the generated energy
- Construction: physical installation of the project components
- Operation and maintenance: conducted throughout the useful life of the project
- Decommissioning: return of the site to its previous (or improved) condition

The interconnection and decommissioning processes are discussed in additional detail below.

The process of connecting a solar installation to the power grid is called interconnection. Grid interconnection ties a solar energy system to either a distribution utility (like Central Maine Power or Versant Power), or to the transmission grid, which is owned by a utility but controlled by an independent regional transmission organization, which in New England is ISO-New England (ISO-NE). The solar project developer applies to the utility for interconnection and is responsible for paying for the interconnection study and any necessary upgrades the utility identifies. An interconnection study assesses whether the point on the grid where the project is seeking to interconnect can handle the output of the new solar project without impacting other customers or the grid infrastructure. Depending on the existing infrastructure in the area, a project may trigger required grid upgrades, like substation expansions or new transmission lines. Think of an interconnection study as a traffic study for electricity, where the distribution or transmission line is the "road" and the solar or storage project is the new development seeking to establish access to the existing road. While a traffic study might result in required upgrades to accommodate the increased number of cars on the road or subsequent changes to traffic patterns, an interconnection study might similarly require upgrades to the grid infrastructure to accommodate the additional electricity flowing through the system.

The interconnection process is conducted between the solar project developer and the utility, with the solar project developer responsible for the project's cost to interconnect. Neither the state nor municipality have direct roles in the interconnection process, except that interconnection to the distribution grid is regulated under the jurisdiction of the Maine Public Utilities Commission (PUC), to which either the utility or the solar project developer can appeal in the event of a dispute. The PUC has an appointed Interconnection Ombudsman to assist customers seeking interconnection of renewable energy projects by facilitating the efficient and fair resolution of disputes between a customer seeking interconnection and a utility. Transmission interconnection is generally under the

jurisdiction of the Federal Energy Regulatory Commission (FERC) and coordinated by ISO-NE.

Interconnection Process Resources [links]

Maine PUC Rule: Chapter 324 Small Generator Interconnection Procedures

Maine PUC: Interconnection Dispute Resolution Process

Central Maine Power: Interconnection Resources

Versant Power: Interconnection Resources

ISO-NE: Interconnection Process Guide (transmission level)

Part of the solar energy system planning process includes preparing and getting approval of a decommissioning plan. Decommissioning is the process of removing solar panels and associated infrastructure from a site. Decommissioning may occur in the future if the solar developer no longer wishes to operate a solar farm on the site or at the end of the project's useful life, typically 20+ years. The estimated operational lifespan, or "useful life", of a project is an estimate calculated based on a performance degradation rate (i.e. how much efficiency the solar energy system loses each year), which is typically around 0.5% per year based on independent studies performed by the National Laboratory of the Rockies (NLR) and the U.S. Department of Energy (DOE). Project economics can begin to shift around 80% efficiency, but individual components can be replaced to extend the useful life of a project, and as a project nears the end of its stated useful life, it can be repowered (components replaced en masse) to extend the life of the project.

A decommissioning plan will detail the infrastructure that will need to be removed from the site, how to revegetate and stabilize the site, and the restoration process to pre-development condition or preparation for transition to an alternative use. The Maine Department of Environmental Protection (DEP) is responsible for administering the state's solar decommissioning law, which requires an approved decommissioning plan for ground-mounted solar projects that occupy an area of 3 or more acres. For more information, see Part 2: State Regulation.

Solar Energy System Development in Maine

Solar energy system development began to accelerate in Maine around 2020, spurred by continued solar efficiency increases and cost decreases as well as federal tax credits and supportive state policies. As of September 2025:

- A cumulative 1,641 MW of solar energy generation capacity have been installed in Maine across approximately 8,000 acres[1], representing about 0.04% of Maine's total land area,
- Over 100,000 Maine electricity customers are accessing solar through Maine's programs across 18,811 projects, including residential, commercial, community, and utility solar, and
- EIA data indicates that in 2024, 54% of the electricity generated within the state was produced by renewable resources including 6.4% from solar.

The majority of solar capacity installed in Maine is community-scale solar, followed by utility-scale and residential. The typical size of these projects has followed changing laws. The Department of Energy Resources (DOER) Solar Dashboard defines a solar energy system between 1 and 5 MW as "community-scale" and over 5 MW as "utility-scale." In 2023, a change in the law governing Maine's community solar program (also known as Net Energy Billing) limited the size of new community-scale solar to 1 MW. Maine saw many community-scale projects permitted before 2023 just under 5 MW, while most projects permitted since this change in 2023 are 1 MW or less. In 2025, the Legislature enacted Public Law 2025, Chapter 430 (LD 1777) which prohibits any new projects, except for rooftop solar, from entering the net energy billing program across the state as of December 2025 and directs the DOER to develop a new distributed energy generation program.

With increased development in recent years, some municipalities in Maine adopted their own solar ordinances and zoning amendments, while others have relied on existing zoning and site plan review standards for this new use. As a result, a complex patchwork of local regulations governs solar development, and these types of developments are treated differently on a town-by-town basis. While some aspects of a solar development are governed by state or federal regulations (see Part 2), there has been no standard way for communities to approach solar projects on a local basis in Maine. This can create challenges and uncertainty for both municipalities and project developers.

[1] This is based on an estimate of 1 MW of solar energy installed capacity requiring 5 acres of land area and is not representative of exact project specifications in Maine.

Battery Energy Storage Systems

Battery energy storage systems (BESS) allow for energy to be stored and later released when power is needed. These systems are typically electrochemical devices that collect energy, or "charge", either from the electrical grid or directly from a renewable energy source like solar or wind. BESS can use a variety of technologies, however lithium-ion batteries (the same basic technology as consumer laptop batteries) are currently the most common. Lithium-ion batteries, from laptops to BESS, are comprised of a number of connected lithium-ion cells. The typical consumer laptop utilizes 3-6 individual cells, BESS can use many thousands of individual cells depending on the scale of the project.

Small-scale BESS can be used at the residential or commercial level. Residential BESS typically store power from solar PV or other renewables to use later – at night when solar is not being generated or during power outages – or as a substitute for connecting to the grid. Commercial BESS store energy from renewable sources or charge from the power grid during off-peak electrical demand periods, when rates are lower. They can be used to lower peak demand consumption of electricity, and to support backup power or a microgrid for operations at critical facilities like hospitals.



This Tesla Powerwall is one example of a residential battery energy storage system installed in a home garage.
Image Source: ReVision Energy

Utility-scale BESS are large systems connected directly to the grid that store energy, often generated by renewables, and/or charge from the grid during off-peak hours. BESS are used to stabilize and reduce strain on the grid during times of high demand, transmit energy from renewable sources during times when that energy is not being generated, and to provide backup during power outages. Integrating BESS into the electric transmission and distribution system can improve service quality and make the grid more resilient.

The capacity of BESS can be measured in megawatts (MW), the maximum amount of energy the storage system can deliver instantaneously, and megawatt hours (MWh), the amount of energy that can be stored and delivered over time. Residential and commercial BESS size varies based on needs. Utility-scale BESS projects can range in size from a few to a few hundred MW. Utility-scale BESS are typically constructed in modular, shipping container-like units and have a relatively small footprint. Smaller utility-scale BESS projects can be built on 1 acre of land or less. Larger utility-scale projects may require several acres.

BESS Capacity

Duration: The number of hours a storage device or facility can deliver continuous energy at its rated capacity. Measured in hours.

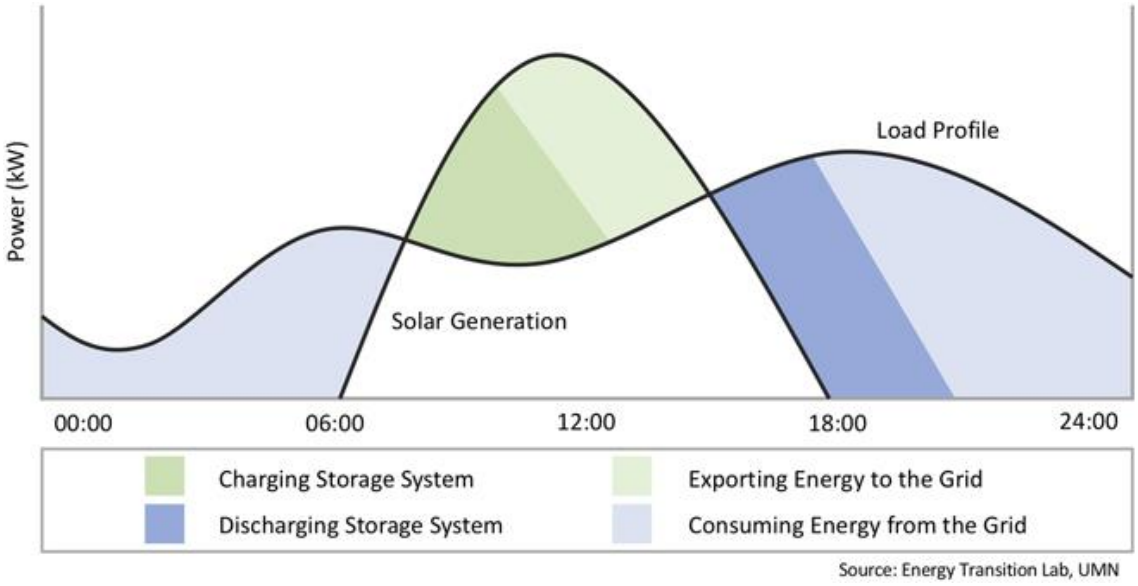
Energy capacity: The total amount of energy that can be stored in the system. Measured in watt-hours (or megawatt hours).

Rated capacity: The maximum instantaneous amount of energy the storage system can deliver. Measured in watts (or megawatts).



The Madison Energy Storage System in Madison, ME is a 4.99 MW/10 MWh lithium-ion system that is connected to the transmission grid. It has been operating since May 2019.
Image Source: Agilitas Energy

Solar and BESS complement each other. Solar produces energy during daytime hours when the sun is at its strongest; however, the amount of solar already deployed in Maine has reduced demand on the grid during those daytime hours, because of this electricity consumption is typically now at its peak during the evening hours. BESS allows solar generation to be stored when it is generated (often during the day) and then discharged later in the day (during the evening or at night when demand is high and solar is not producing as much energy). The graphic below demonstrates this benefit; the green shaded area is extra solar generation that is then "discharged" (represented by the dark blue shaded area) after sunset when the solar panels stop generating energy.



Source: Energy Transition Lab, UMN

Connecting and Disconnecting BESS from the Grid

The process for connecting a commercial BESS to the grid mirrors the interconnection process for solar projects. Grid-tied BESS projects require an interconnection study to determine the impacts to, and ensure the reliability of, the grid. Some smaller BESS projects are not interconnected and serve as a building- or campus-level backup energy system.

Additionally, as is the case with solar projects, a DEP-approved decommissioning plan and demonstration of financial assurance is required for any BESS project with a capacity of 2 MW or more. Site work and structures on these projects are typically limited, so decommissioning focuses on the disposal and recycling of the large lithium-ion batteries, and the associated cost.

BESS in Maine

BESS development has accelerated nationwide since 2018, but remains relatively new to Maine. As of May 2026, Maine had 7 operational grid-connected BESS projects ranging in capacity from 4.7 to 175 MW, with a total operational nameplate capacity of approximately 253MW. The state has a statutory goal of at least 400 MW of installed energy storage capacity by the end of 2030. Increased BESS development is key to improving grid resilience in Maine and meeting state energy goals.

As with solar energy development, proposed BESS projects are reviewed through the lens of local land use rules and ordinances. Certain aspects of BESS developments are governed by state or federal regulations (see Part 2), but there has been no standard way for communities to approach BESS projects on a local basis in Maine.

Siting Solar Farms and Battery Energy Storage Systems

What are developers looking for?

Solar developers look for relatively flat to gently sloping sites that have good south-facing solar exposure, are not shaded by nearby buildings or trees, and are adjacent or close to areas of the grid with capacity for the project to connect. Previously developed or cleared sites such as parking lots, former commercial or industrial sites, or landfills can be ideal sites for development, but can also be more complex sites to develop due to potential remediation requirements or site access issues. Sites that require extensive grading or earthwork are sometimes less appealing for solar development given the time and cost of site preparation, though projects on rolling or gently sloping land are common. Proximity to sensitive areas like wetlands increases project complexity and may add additional permitting and mitigation requirements as well as cost, but does not necessarily preclude development.



This 20-acre solar array in Gray, ME is located on land between Interstate-95 and Route 26. This is a 6.5 MW utility-scale project.

Image Source: North Star Planning

BESS developers also look for stable soils with good drainage and relatively flat land with little grading or earthwork needed. Sites close to substations, transmission lines, or existing or new renewable energy generation projects are desirable, as well as sites near major roads, with easy access for construction and maintenance. Sometimes, sites are selected for the existing high peak energy demand in the area where a battery system's operation may serve to reduce congestion on the grid.

A determining factor for both solar and BESS development is often the cost of interconnection. Developers are responsible for costs associated with interconnection, including the study and any identified upgrades to the grid. These grid upgrades, which are made in order to ensure reliable operation, can vary significantly based on available capacity, existing infrastructure, and a variety of other factors. Developers often utilize capacity maps and other tools to identify areas of the power grid that can likely support additional generation infrastructure. Both Central Maine Power and Versant Power maintain "hosting capacity maps" (see the Resources section) which provide estimated remaining load capacity by distribution circuit and at substation transformers. These maps, however, are informational and do not take the place of a formal interconnection study.

Solar energy systems and agriculture

Solar energy system development can provide an opportunity for farm owners to diversify their income stream by selling or leasing a portion of their farmland to be developed for ground-mounted solar for export to the grid or to offset some of their own onsite need. To protect prime farmland soil in Maine, the Maine Department of Agriculture, Conservation, and Forestry (DACF) encourages siting solar development on previously developed, degraded, or less productive areas of a farm, away from prime farmland soils. Recent legislation requires special permitting from DACF for siting solar projects on high-value agricultural land (HVAL). HVAL mostly encompasses prime farmland, farmland of statewide importance, and wild blueberry barrens verified by a field survey. (See Part 2 for more information about the DACF permitting process.)

In 2022, the Agricultural Solar Stakeholder Group, convened in collaboration between the Governor's Energy Office and DACF, published a report and a set of recommendations to ensure responsible siting of solar energy on agricultural lands. This Handbook, in part, attempts to address recommendation 6 from that report: "Increased support for municipal planning capacity."

Maine Soil Definitions

DACF has developed the following definitions based on federal USDA Natural Resource Conservation Service's National Soil Survey Handbook (NSSH) guidance. Soil classification is verified by a field-based survey conducted by a licensed soil scientist in accordance with the most recently updated version of the DACF guidance document.

Prime farmland: "has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses (the land could be in cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods."

Farmland of statewide importance: "are nearly prime farmland and … economically produce high yields of crops when treated and managed according to acceptable farming methods."

High-value agricultural land (HVAL): "one or more contiguous acre that meets the definition of prime farmland; farmland of statewide importance; some combination of prime farmland and farmland of statewide importance; blueberry barren; or PFAS-impacted HVAL. HVAL cannot be occupied by residential, commercial, or industrial uses that would substantially reduce agricultural potential."

An additional recommendation that arose from the Agricultural Solar Stakeholder Group was to protect productive farmland while promoting solar energy development through dual-use projects where solar energy systems coexist with agricultural uses, such as grazing land or low-growing crops. Two examples in Maine are Crescent Run Farm in Jefferson, where sheep graze under the solar arrays, supporting agricultural operations and eliminating the need for mowing the array; and Navisun LLC in Rockport, where solar was installed over 12 acres of wild blueberry fields. More resources on these types of projects are available from DACF (see Resources section).



Sheep graze under this 4 MW solar array in Skowhegan, ME.
Image Source: North Star Planning

An emerging issue in Maine is the presence of per- and polyfluoroalkyl substance (PFAS) contamination in soil, water, plants, and/or animals and animal products. PFAS are man-made chemicals that have been widely used in household and industrial products and were most commonly introduced to farmlands in Maine through the application of wastewater sludge. These chemicals are persistent in the environment, and studies suggest they may pose health risks. In cases where farmland has been tested and found to be contaminated with PFAS, it may no longer be safely used for agricultural production. The siting of solar projects on PFAS contaminated lands is one tool in the toolbox that the state is pursuing to support farmers who can no longer continue to use their properties for agricultural production.

Generally, it can be beneficial to consider siting solar on already disturbed lands, such as brownfields, PFAS contaminated lands, or other already developed sites before greenfield

development. Some municipalities have seen success developing solar systems on capped landfills, as discussed in the following section. As discussed elsewhere in this document, it is important to consider the overlap of these disturbed lands and access to three-phase power. Given the amount of new generation needed and limited existing built infrastructure, both brownfield and greenfield development will be components of future generation to most affordably meet the state's energy needs.

Solar energy systems on landfills

Capped landfills provide appealing sites for ground-mounted solar arrays because they are usually large, relatively flat, treeless, and are not suitable for other forms of development. Several towns in Maine, including Cumberland, Windham, Tremont, South Portland, Portland, and Falmouth have constructed solar energy systems on capped landfills. Installing ground-mounted solar on capped landfills allows productive reuse of degraded land, but requires additional permitting from DEP to ensure the integrity of capped landfills. Guidance from the Environmental Protection Agency (EPA) on installing solar on landfills indicates that shallow concrete footers or ballasts should be used to anchor the racking system to prevent disrupting the landfill cap. These additional measures to prevent disturbances to the landfill cap can increase overall costs of landfill construction projects.



The Town of Cumberland's solar array on top of a capped landfill. The array generates power to offset municipal energy usage.
Image Source: North Star Planning

Benefits of public engagement

Solar and battery energy storage projects can generate significant benefits for municipalities through reduced energy costs, increased tax revenue, and additional environmental benefits. However, it is important to engage residents throughout the pre-development and development process in order to ensure public awareness, build public support for the project, and to Lead by Example to enhance overall awareness of the benefits of solar PV and battery energy storage technologies. Typically, it is best practice to inform and engage residents prior to the permitting process to receive feedback on certain siting considerations. The FAQ section of this Handbook document can support municipal leaders in engaging with residents around solar and energy storage developments and addressing misconceptions around these types of developments in the state.

As a municipality considers the model ordinance language included in this Handbook, it is also recommended to hold public engagements to determine community priorities that can be reflected in the adopted ordinance language. This Handbook is designed to promote proactive conversations. This process can support the identification of areas where residents want to see solar or energy storage in order to support the highest and best use of municipal lands, including brownfields and other already disturbed lands.

Maine Solar Case Studies



Image source: Nexamp Energy

Rumford Solar, Rumford, ME

Capacity: 6.49 MW DC, 4.99 MW AC
Number of panels: ~16,000 tracker panels
Acreage: ~20 acres
Permitting requirements:

- Due to the size of this project (>20 acres), it was subject to DEP Site Law of Development.
- Rumford has a local solar-specific ordinance and does not employ zoning.

The Town of Rumford saw solar as an opportunity to localize the benefits of producing power and generate additional municipal tax revenue. The Town Manager of Rumford stated that "…to the best of our ability to discern, we believe the benefits substantially outweigh the costs," the

Village Drive Highland Green, Topsham, ME

Capacity: ~500 kW
Number of panels: 1,264 panels
Acreage: 3.66 acres
Permitting requirements:

- Due to the size of this project (<20 acres), it was not subject to DEP Site Law of Development.
- The Town of Topsham has a solar-specific ordinance under which this project was sited.

Topsham's solar-specific ordinance was called for by the community and developed in part by the Topsham Solar Advocates, a citizen initiative, which later became the Topsham Energy Committee. Topsham's Director of Planning noted that the ordinance, notably its requirements for decommissioning, sensitive habitat mitigation, and other inclusions, have played a role in assuring the community that solar developments will meet community priorities. This project is sited near a road and the Highland Green Community, but due to strategic buffering there have been very few voiced concerns. This project is one of multiple solar developments in Topsham which support municipal tax revenue, offset municipal electricity usage and bills (through a power purchase agreement), and reduce emissions.

Landfill Solar East and West, South Portland, ME

Capacity (AC): East = 990 kW, West = 2.38 MW
Number of panels: combined 9,848 panels
Projected lifetime savings: $20 million
Permitting requirements:

- South Portland has an existing ordinance that enables solar as an allowable use in every zoning designation.
- The project required a geotechnical report and feasibility study to ensure the stability of the landfill site.



Image source: City of Portland

This project, developed in two phases, allowed South Portland to repurpose a former landfill to achieve municipal cost savings. Both arrays have associated power purchase agreements (PPAs) that result in significant financial savings for the City. A PPA allows a municipality to develop a solar array at no upfront or limited upfront capital cost; under this agreement, South Portland has a contract to purchase the generated electricity from the developer and expects to buy out the system in year 7 of the contract. South Portland benefited from having relatively stable existing conditions at the landfill site which limited redevelopment costs. South Portland's Sustainability Director encourages municipalities to develop solar on their municipal land, especially where it can be seen, to Lead by Example and demonstrate to residents the benefits of solar.

Maine BESS Case Studies

Cross Town Energy Storage, Gorham, ME
Capacity: 175 MW / 350 MWh
Project size: 156 containers
Acreage: ~5 acres (~13-acre parcel)
Permitting requirements:

- This project was permitted under a standard zoning ordinance and site plan review. Specific provisions were made for emergency management and decommissioning plans.
- This project required Maine DEP and U.S. Army Corps of Engineers permits.



Image source: Plus Power

Gorham's Town Planner compared permitting this project, the largest BESS in Maine, to permitting a typical substation or cold storage facility. "There are no noticeable visual or noise impacts. The developer was diligent about meeting and answering questions … batteries [were] new to us." Gorham permitted the project under a normal site plan review process in their existing industrial zone.

Rumford Storage, Rumford, ME
Capacity: 4.99 MW / 10 MWh
Acreage: <1 acre
Permitting requirements:

- This project had no town-specific permitting requirements. As with all battery projects, it had to meet national NEC and utility standards.



Image source: Town of Rumford

Rumford permitted its battery project much like any other electrical infrastructure (i.e. a substation) and relied on existing national and utility standards to ensure the safety of the project. The battery is on formerly unused land in Rumford's Industrial Park. The Town Manager of Rumford noted the importance of having the support and involvement of emergency management personnel throughout the process. This project is a front-of-the-meter BESS that participates in the regional wholesale market.

Frequently Asked Questions and Common Misconceptions about Solar Energy Generation and Battery Storage

While there has been substantial growth in the past several years, solar energy and battery storage projects are still relatively new in Maine. There is significant support in Maine for renewable energy, but solar or battery projects are often met with questions from community members. Some common concerns may be rooted in a lack of familiarity or misconceptions about these technologies. Some of the most common concerns about solar and battery development that might arise when considering renewable energy regulations or projects in your municipality are explored below.

What are Maine's goals related to solar and battery energy storage deployment?

State goals and targets to reduce emissions and make Maine's energy systems more resilient include:

- Statutory requirements for increasing the consumption of electricity in the state that comes from renewable resources, including 90% of retail sales of electricity from renewable resources and 10% from clean resources by 2040 [35-A M.R.S. §3210].
- A statutory goal that calls for the development of at least 400 megawatts of energy storage capacity installed in the state by the end of 2030 [35-A M.R.S. §3145].
- Statutory greenhouse gas emissions reductions of at least 45% below 1990 levels by 2030 and carbon neutrality by 2045 [38 M.R.S. §576-A].
- The *Maine Energy Plan* published in 2025 calls for an affordable, reliable, efficient, and clean energy system, supported by collaboration with local communities. This plan is aligned with *Maine Won't Wait*, the state's climate action plan (drafted 2020, updated 2024), particularly Strategy C, Transition to Clean Energy.

Are solar panels worse for the environment than fossil fuels?

A common misconception is that the environmental costs of manufacturing, transporting, and disposing of solar panels outweigh the benefits they provide. However, rigorous life-cycle assessments (LCAs) consistently show that most panels fully offset their production emissions within 1–3 years, while continuing to generate clean electricity for 20–50 years or more.[2] The U.S. National Laboratory of the Rockies' LCA concluded that PV solar systems have lifecycle greenhouse gas emissions of less than 50 g CO_2e per kWh, compared with

[2] Smith, Brittany L, Ashok Sekar, Heather Mirletz, Garvin Heath, and Robert Margolis. 2024. "An Updated Life Cycle Assessment of Utility-Scale Solar Photovoltaic Systems Installed in the United States." Nrel.gov. National Renewable Energy Laboratory. March 2024. https://docs.nrel.gov/docs/fy24osti/87372.pdf.

roughly 1,000 g CO_2e per kWh for coal-fired power.[3] Solar panels do require mined materials, such as aluminum, copper, silicon, and zinc, but according to the International Energy Agency (EIA), the total mass of rock extracted for all low-carbon electricity and transportation technologies is estimated to be 500–1,000 times less per unit energy than current fossil fuel extraction practices.[4] In simple terms, renewables require upfront resource investment, but avert far greater environmental costs over their lifetime.[5]

Do solar panels pose a fire risk?

Fire risk from solar panels and the associated equipment (i.e. inverters) is low. According to a study by the U.S. Department of Energy, fewer than 0.01% of systems experience fires, and when they do it is typically due to installation or equipment flaws. Modern codes from the National Fire Protection Agency (NFPA) and other entities and improved manufacturer inspection regimes and requirements have greatly reduced these safety risks.[6] Training for local fire departments are recommended during a solar energy development to ensure first responders are prepared for worst-case scenarios.

Do solar arrays make noise?

The majority of ground-mounted PV solar panels are permanently angled and do not move or generate noise. PV solar panels use low voltage power lines, so there are no crackling or hissing sounds. Tracker solar panels create intermittent motor noise that is brief in duration when they change position throughout the day. According to a 2020 review of sound from commercial photovoltaic facilities, the intermittent noise from trackers is typically between 70-90 decibels (dBA) at close distances, which is similar to the sound of a dishwasher.[7]

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[3] Dreves, Harrison. 2024. "How Extreme Weather and System Aging Affect the US Photovoltaic Fleet | NREL." Nrel.gov. National Renewable Energy Laboratory . January 24, 2024. https://www.nrel.gov/news/detail/program/2024/how-extreme-weather-and-system-aging-affect-the-us-photovoltaic-fleet.

[4] Ritchie, Hannah. "The Low-carbon Energy Transition Will Need Less Mining Than Fossil Fuels, Even When Adjusted for Waste Rock." *Sustainability by Numbers* (blog), November 6, 2023. https://www.sustainabilitybynumbers.com/p/energy-transition-materials.

[5] Bond, Kingsmill, and Sam Butler-Sloss. 2023. "Reality Check: The IEA Busts 10 Myths about the Energy Transition." RMI. Rocky Mountain Institute . September 29, 2023. https://rmi.org/reality-check-the-iea-busts-10-myths-about-the-energy-transition/.

[6] McNutt, Peter, William Sekulic, and Gary Dreifuerst. 2018. "Solar Photovoltaic DC Systems: Basics and Safety." National Renewable Energy Laboratory. U.S Department of Energy. March 2018. https://docs.nrel.gov/docs/fy18osti/68696.pdf.

[7] Kaliski, Kenneth, Isaac Old, Eddie Duncan, and RSG. "An Overview of Sound From Commercial Photovoltaic Facilities." *NOISE-CON 2020*, November 16, 2020. https://rsginc.com/wp-

Inverters and transformers in the array may emit a low hum during the daytime. Inverters and transformers typically produce sound levels between 65 and 71 dBA at very close distances (approximately 5–10 feet), a sound in the equivalent range of a normal conversation to a vacuum cleaner. This sound drops off rapidly with distance. According to the Massachusetts Department of Energy Resources, from a distance of 50-150 feet from the array, noise from the equipment nears inaudible and blends into background levels.[8] Like any other energy-generating or industrial facility, solar equipment should be designed and operated to be compliant with state and municipal noise codes and regulations that limit the sound impacts on abutting properties.

Do solar panels produce glare?

While solar panels can reflect some sunlight, modern photovoltaic systems (PV) are engineered to minimize glare using textured, anti-reflective glass, making the PV cells often less reflective than water or standard windows.[9] Most potential glare occurs only when the sun strikes panels at specific angles, or during specific times of the day, making these events short-lived and with low intensity. Federal Aviation Administration (FAA)-approved glint-and-glare studies consistently show that PV arrays rarely produce reflections that are strong enough to interfere with aviation or neighboring properties.[10] According to the American Solar Energy Society, where glare is a concern, simple mitigation strategies such as adjusting the tilt of the panels, using buffer landscaping, or siting out of specific sightlines can effectively reduce or eliminate glare concerns.[11]

Do PV solar energy systems leach chemicals into soil or groundwater?

Solar panel materials are sealed and stable with long service lifespans. During normal operation, PV solar panels pose no risk of PFAS, heavy metal, or other chemical leaching

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content/uploads/2021/04/Kaliski-et-al-2020-An-overview-of-sound-from-commercial-photovolteic-facilities.pdf.

[8] Massachusetts Department of Energy Resources, Massachusetts Department of Environmental Protection, and Massachusetts Clean Energy Center. 2024. “Ground--Mounted Solar Photovoltaic Systems .” https://www.masscec.com/sites/default/files/documents/solar-pv-guide%20%28rev%202024-10-30%29.pdf.

[9] Svetz, Matthew. 2024. “Solar Panel Glare: Is It an Issue?” Penn State Extension . April 18, 2024. https://extension.psu.edu/solar-panel-glare-is-it-an-issue.

[10] Office of Airport Planning and Programming . 2018. “Technical Guidance for Evaluating Selected Solar Technologies on Airports .” *Federal Aviation Administration* . https://www.faa.gov/sites/faa.gov/files/airports/environmental/FAA-Airport-Solar-Guide-2018.pdf.

[11] Ho, Clifford. 2013. “Relieving a Glaring Problem | American Solar Energy Society.” American Solar Energy Society . April 20, 2013. https://ases.org/relieving-a-glaring-problem/.

into soil or groundwater.[12] A controlled study by the International Energy Agency's PV Systems Program modeled worst-case scenarios, such as a broken solar panel near a well, and found that even in these situations, leaching levels of lead and cadmium were far below EPA safety thresholds.[13]

Although certain coatings in panels may contain PVF, a PFAS-based polymer, no studies have shown PFAS leaching from panels in use or post-disposal.[14] Panels contain less PFAS than common construction materials and weather-resistant fabrics.[15] According to EPA, any potential risk occurs only during disposal, and can be effectively managed through proper recycling, landfilling protocols, and adherence to EPA and state waste regulations.[16] It also makes financial sense for solar companies to ensure that solar PVs are effectively removed after their useful life—90% of a solar panel's materials can readily be recycled and dedicated solar recycling facilities already exist in Massachusetts and New Hampshire.[17]

Will a ground-mounted solar energy systems near my home lower my property value?

Large-scale solar energy systems are not known to lower nearby property values. A comprehensive analysis Power in Massachusetts and Rhode Island by American Clean examined over 71,000 home sales within a mile of 208 solar installations.[18] The study found no measurable negative impact on property values. A similar study in Virginia found that adjacent property values (for both residential and agricultural property) were not adversely affected by the construction and operation of solar facilities.[19] A further study in Rhode Island, which looked at 400,000 transactions in New England over the course of 15 years, found no associated impact on property values for solar energy systems located in rural

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[12] EPA. 2023. "Solar Panel Frequent Questions ." US EPA. October 7, 2023. https://www.epa.gov/hw/solar-panel-frequent-questions.
[13] *WWALS Watershed Coalition*, *Morven Health and Safety Assessment Report*, February 3, 2023, https://www.wwals.net/pictures/2023-02-06--brooks-county-packet/Morven_Health-and-Safety-Assessment-Report_2.3.2023.pdf.
[14] Graham Sustainability Institute, *Facts about Solar Panels and PFAS Contamination*, University of Michigan, 2023, https://graham.umich.edu/media/pubs/Facts-about-solar-panels--PFAS-contamination-47485.pdf.
[15] Ibid.
[16] EPA. 2024. "End-of-Life Solar Panels: Regulations and Management." US EPA. October 4, 2024. https://www.epa.gov/hw/end-life-solar-panels-regulations-and-management.
[17] https://www.sciencedirect.com/science/article/pii/S2211467X19301245
[18] American Clean Power . 2021. "Property Values and Utility-Scale Solar Facilities." American Clean Power .
[19] Ibid.

areas.[20] Additionally, as discussed in the model ordinance section, if communities have concerns related to visibility, there are steps—such as buffers or vegetative screening—to reduce the visual impact of solar installations.

Do solar panels emit 5G or harmful radiation?

PV solar energy systems do not emit 5G or any type of harmful radiation. Solar inverters and transformers produce minor electromagnetic fields (EMF) that fall well below safety standards, lower than everyday devices such as mobile phones, Wi-Fi routers, or microwave ovens. Studies conducted by the International Agency for Research on Cancer (IARC) found no evidence for the carcinogenicity of low-frequency electromagnetic fields in humans.[21]

Do battery energy storage systems make noise?

Battery storage systems produce modest humming from inverters, transformers, and fans for the cooling systems. According to a local planning guide from the University of Michigan, residential on-site BESS systems are typically designed to operate quietly and often produce less noise than HVAC units.[22] Commercial or utility battery storage systems typically create a humming noise between 60 dBA (equivalent to the noise level of a normal conversation or a dishwasher) and 80 dBA (equivalent to a hair dryer) near the unit, which quickly fades with distance. These sound levels are similar to those of rooftop heating, ventilation, and cooling units in residential and commercial buildings.[23] When paired with enclosures, strategic siting, and landscaping, BESS installations can easily comply with municipal noise standards and coexist quietly within residential and mixed-use areas.[24]

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[20] American Society of Farm Managers and Rural Appraisers. 2021. "Solar's Impact on Rural Property Values." ASFMRA. February 15, 2021. https://www.asfmra.org/blogs/asfmra-press/2021/02/16/solars-impact-on-land-values.

[21] Tell, Richard A, H C Hooper, G G Sias, G Mezei, P Hung, and Robert Kavet. 2015. "Electromagnetic Fields Associated with Commercial Solar Photovoltaic Electric Power Generating Facilities." *Journal of Occupational and Environmental Hygiene* 12 (11): 795–803. https://doi.org/10.1080/15459624.2015.1047021

[22] Krol, M., and Mills, S. (2024). Planning & Zoning for Battery Energy Storage Systems: A Guide for Michigan Local Governments. University of Michigan Center for EmPowering Communities. https://graham.umich.edu/project/bess-guide

[23] Brush, Ethan. 2024. "Don't Let Noise Be a Drain on BESS Developments." Energy-Storage News. May 20, 2024. https://www.energy-storage.news/dont-let-noise-be-a-drain-on-bess-developments/.

[24] Imperial County Planning & Development Services, *Le Conte Battery Energy Storage System Application*, California, 2024, https://www.icpds.com/assets/planning/draft-environmental-impact-reports/supplemental-le-conte-battery-energy-storage-system-deir/le-conte-battery-energy-storage-system-app-f.pdf.

Do battery energy storage systems leach chemicals into the environment?

The U.S. Department of Energy confirms that properly maintained systems are sealed and stable during use.[25] Any potential environmental concerns arise primarily from improper disposal.[26] Advances in recycling technology, stringent regulations, and ongoing research into sustainable energy storage solutions mitigate these risks and ensure that energy storage technologies remain environmentally friendly.[27]

Can battery energy storage systems catch fire?

Recent improvements to battery energy storage system safety requirements and modern design features greatly reduce the risk of these systems posing a significant fire risk; however, it remains best practice to coordinate closely with relevant safety professionals to ensure there are clear protocols in the unlikely event of an incident. Grid-scale lithium-ion batteries are still a relatively new technology, first deployed on the U.S. grid in 2012. As the industry matures, it is learning from facilities that have had fire incidents and implementing key advancements to reduce safety risks. Studies from the American Planning Association and the Journal of Energy Chemistry demonstrate that modern systems follow strict safety standards (National Fire Prevention Association 855 2026, UL 9540A, NEC rapid shutdown) and include design features such as thermal management, enclosures, and monitoring that can prevent faults from becoming fires.[28] These design features improve early warning systems and automatic shutdowns and reduce the risk of fires spreading from one cell to an entire BESS.

Lithium-ion batteries, whether the one used in your laptop or a large-scale grid connected BESS, are comprised of a number of connected lithium-ion cells. A typical laptop battery contains 3-6 lithium-ion cells, a large battery energy storage system can be comprised of hundreds of thousands of individual cells. Data collected by American Clean Power shows that failure rates of these individual cells are less than 1 in 10 million, and even if an

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[25] U.S. Department of Energy, *Residential Battery Storage Systems*, 2021. https://www.energy.gov/sites/default/files/2024-05/EED_2827_FIG_SafetyStrategy%20240505v2.pdf

[26] *Recycling of Lithium-Ion Batteries: A Guide for Sustainable Management*, IRENA, 2021.https://documents1.worldbank.org/curated/en/593961599738208006/pdf/Reuse-and-Recycling-Environmental-Sustainability-of-Lithium-Ion-Battery-Energy-Storage-Systems.pdf

[27] Solar Energy Industries Association (SEIA), *Solar Panel Recycling: Addressing End-of-Life Management*, 2020. https://seia.org/research-resources/end-life-management-photovoltaics/

[28] Close, James, Jonathan E. Barnard, Y. M. John Chew, and Semali Perera. 2024. "A Holistic Approach to Improving Safety for Battery Energy Storage Systems." *Journal of Energy Chemistry* 92 (May): 422–39. https://doi.org/10.1016/j.jechem.2024.01.012.

individual cell fails, BESS have bult in safety protections and monitoring software to ensure that an individual failure does not result in a large-scale incident.

Large BESS typically have smoke and gas sensors installed inside the battery containers, which can directly alert local emergency officials in the event of an issue. During the development of a BESS project, it's recommended that the operator engage the local fire department to provide training and build familiarity with the site to establish emergency preparedness plans should an incident occur.

Do battery energy storage systems require dangerous fire suppression chemicals?

Modern fire prevention technologies mitigate the fire risk of BESS without using dangerous chemicals. According to the National Fire Protection Association (NFPA), inert gas systems (like nitrogen) and water-based systems are typically favored for their safety and effectiveness.[29] The U.S. Department of Energy notes older fire suppression chemicals, such as Halon, have largely been phased out in favor of more environmentally friendly alternatives.[30] When BESS are installed, it's recommended that trainings are held for local fire departments to ensure they understand the emergency plan and fire prevention systems specific to the site.

Do battery energy storage systems emit toxic fumes?

Under standard operating conditions, modern lithium-ion batteries are sealed and do not emit toxic fumes.[31] However, in the rare event of a thermal runaway, a situation where a battery cell overheats uncontrollably, there is a release of gases that can include hydrogen fluoride (HF), carbon monoxide (CO), and hydrogen cyanide (HCN).[32] These substances are hazardous and can pose health risks if inhaled in significant quantities. The NFPA states such extreme events are exceedingly rare, and when they do occur, the gases released are typically confined to the immediate vicinity of the incident. [33] A study in the Journal of Energy Storage showed that the concentration of these gases dissipates rapidly and does not pose a significant threat to public health beyond the immediate area of the system.[34]

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29 National Fire Protection Association (NFPA). "Battery Energy Storage Systems." NFPA Journal, April 2020.
30 U.S. Department of Energy, Fire Safety for Lithium-Ion Battery Energy Storage Systems, U.S. Department of Energy, 2021.
31 Ibid.
32 Ibid.
33 National Fire Protection Association 2020.
34 Bugryniec, Peter J., Erik G. Resendiz, Solomon M. Nwophoke, Simran Khanna, Charles James, and Solomon F. Brown. 2024. "Review of Gas Emissions from Lithium-Ion Battery Thermal Runaway Failure —

Considering Toxic and Flammable Compounds.” Journal of Energy Storage 87 (111288). https://doi.org/10.1016/j.est.2024.111288.

Part 2: State & Federal Regulation

Large scale development, including grid-scale solar and battery storage projects, are subject to a range of federal and state land use requirements, as well as potential local zoning and permitting. The primary state and federal regulatory programs potentially applicable to solar and battery storage projects are summarized below.[35] A more complete description of these regulatory programs is included in Appendix A, which also includes information on the Fire Safety and National Electric codes. The key permits and applicability thresholds for state permits are depicted in Figure A. Note that additional permits such as road opening and utility location permits from the Department of Transportation and other performance standards or approvals for activities such as concrete batch plants may be required for a particular project and are beyond the scope of this overview.

State Regulation

The Maine Department of Environmental Protection (DEP) is the primary agency responsible for regulating the impacts of development on the environment in the state. Permit requirements depend on project size and impacts to regulated resources.

Site Location of Development Law

The Site Location of Development Law ("Site Law") regulates developments that may significantly impact the environment, including solar and battery storage projects that occupy an area of more than 20 acres or include more than 3 acres of buildings, roads, parking lots and similar areas that are stripped and graded and not revegetated within a year (this is generally not applicable to solar development). The Site Law is a comprehensive permitting program that includes standards related to financial and technical capacity, soils, surface and groundwater, wildlife and fisheries, sound, scenic impact, stormwater, historic resources, and erosion and sedimentation control. Solar projects regulated under the Site Law are also subject to recently enacted requirements to

[35] The Maine Land Use Planning Commission (LUPC) serves as the planning and zoning authority for the unorganized and deorganized areas of the State – areas in which there is no local municipal permitting authority. As the land use authority for the unorganized territories, LUPC retains authority for zoning and rezoning processes, determining what uses are allowed under their zoning, and issuing development permits for projects that do not trigger DEP review. For those projects located in LUPC jurisdiction that are permitted by the DEP (which included projects that trigger review under the Site Law and mining and wind power development), LUPC is also responsible for certifying compliance with LUPC standards that are not addressed as part of the DEP review. The permitting process for projects subject to LUPC jurisdiction is beyond the scope of this manual, which is intended for use by municipalities in regulating solar and BESS projects.

mitigate impacts to large undeveloped habitat blocks. The Site Law permitting process is robust, and the DEP not only seeks input from other state agencies in evaluating a project's environmental impacts but may hire third-party experts to review specific topics. There are also multiple opportunities for public and municipal input into the DEP permitting process.

Stormwater Management Law

Projects that may not trigger review under the Site Law must still comply with comprehensive standards regulating stormwater and erosion and sedimentation control. Maine's stormwater management law requires projects to manage stormwater in accordance with various treatment levels and standards. A stormwater permit is required for any project that disturbs 1 or more acres. The standards and treatment requirements vary depending on the watershed and size of impact. The Site Law review incorporates the stormwater management law requirements, and a separate stormwater permit is not required for projects that obtain a Site Law permit. Maine law also requires all projects to prevent unreasonable erosion of sediment or soil beyond the project site or into natural resources.

Maine Construction General Permit

Any construction activity that disturbs 1 or more acres must obtain coverage under the Maine Construction General Permit (MCGP), which was recently reissued to include additional measures to protect the environment from construction impacts. The MCGP includes a tiered process that requires additional protective measures for projects that impact 5 or more acres, including the requirement to use third-party inspectors and have the contractor certificated in erosion and sedimentation control.

Natural Resources Protection Act

The DEP also administers the Natural Resources Protection Act (NRPA), which regulates impacts to specific natural resources such as wetlands, waterbodies, and significant wildlife habitat. Any activity in, on or over a protected natural resource is subject to NRPA. There is a streamlined permit-by-rule process for certain minor impacts such as limited clearing within a vernal pool buffer and road and utility crossings of streams. For activities that do not qualify for coverage under a specific permit-by-rule provision an individual NRPA permit is required, which includes review of impacts on scenic and recreational resources, erosion and sedimentation control, water quality, flooding, and wildlife and fisheries habitat. Freshwater wetland impacts are subject to a tiered review process under NRPA. Tier 1 review applies to projects that will have up to 15,000 square feet of freshwater

wetland impacts; Tier 2 review applies to projects with impacts between 15,000 and 43,560 square feet (one acre) of impact; and Tier 3 review applies to alterations of more than 43,560 square feet. Each level of review requires greater analysis of impacts and potential mitigation. Importantly, the conversion of wetlands from forested to wet meadow or emergent that often occurs with solar development is a regulated impact that counts towards these jurisdictional and mitigation thresholds.

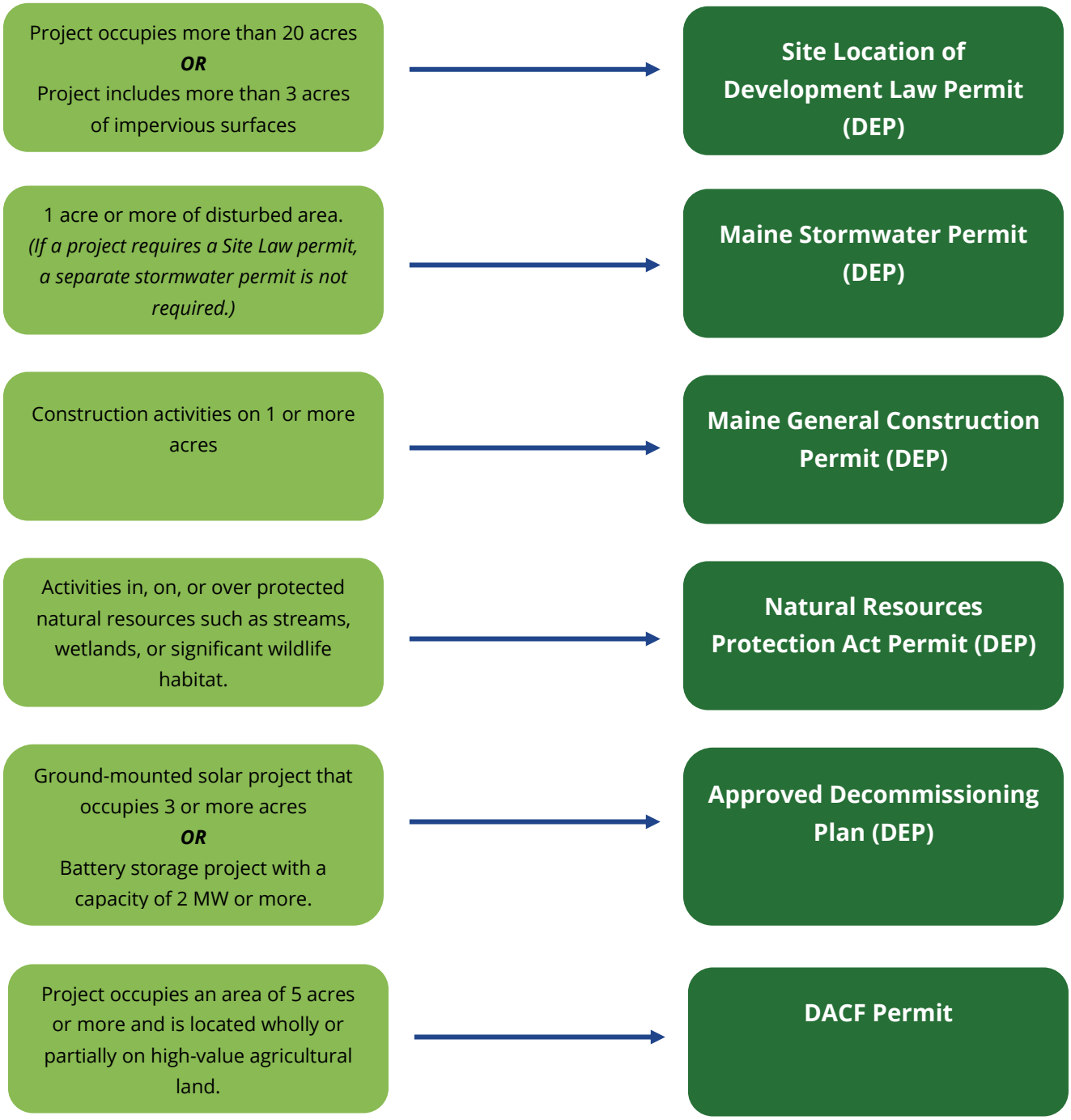
Decommissioning Requirements

State law requires solar projects that occupy an area of 3 acres or more and battery storage projects with a capacity of 2 MW or more to have an approved decommissioning plan and accompanying financial assurance set aside sufficient to decommission the project at the end of its useful life. The financial assurance must be updated after 15 years and then every 5 years thereafter. DEP administers the law in all organized municipalities and in the unorganized parts of Maine typically served by the Land Use Planning Commission if (a) the solar energy development requires a permit under the law or (b) straddles an organized/unorganized boundary.

High-Value Agricultural Land

In 2025, the Maine DACF issued final rules on permitting solar projects on high-value agricultural land. The rules apply to solar projects that occupy an area of five acres or more and at least 1 contiguous acre of high-value agricultural land. There is a streamlined permit-by-rule process for projects that occupy an area less than 20 acres; an individual permit and mitigation is required for projects that occupy an area of 20 acres or more. The mitigation requirements are tiered depending on a number of factors, including the value of the farmland impacted, its current use (i.e., is it in active production), and whether it is located in one of six counties facing high farmland conversion pressure. Mitigation discounts are available for projects that accommodate continued agricultural use. The permitting process is administered by DACF, but the DEP is responsible for implementing the mitigation requirements, including calculating and collecting compensation fees.

Permitting Triggers Under Key State Requirements



Federal Regulation

Although the Maine DEP is the primary permitting authority for developments in Maine, there are several federal programs that may be implicated by a particular project.

Section 404 Program under the Clean Water Act

The U.S. Army Corps of Engineers (USACE) regulates impacts to waters of the United States, which includes most wetlands and many streams in Maine, and is responsible for implementing the Section 404 permitting program under the Clean Water Act. A project resulting in permanent wetland loss of no more than ½ an acre may be eligible for streamlined approval under the Army Corp's of Engineer's general permit in Maine, which will soon transition to the nationwide permit system in place outside of New England. Larger wetland impacts will require an individual permit. Projects that impact streams (e.g., typically as a result of a required road crossing) or that result in fill in a wetland (for example placement of material in the wetland to accommodate road construction or other infrastructure), will require approval either through the general permit process for smaller impacts or an individual permit for more significant impacts. The USACE review process includes required consultation with (i) the U.S. Fish and Wildlife Service to evaluate potential impacts of the project on listed species or habitat pursuant to Section 7 of the Endangered Species Act, as well as (ii) the State Historic Preservation Officer or Tribal Historic Preservation Officer to evaluate the effect of the project on historic properties pursuant to Section 106 of the National Historic Preservation Act.

Hazards to Air Safety

The Federal Aviation Administration (FAA) is responsible for evaluating potential hazards to air safety and reviews impacts of structures that exceed a certain height and/or that are in the vicinity of an airport.

Oil Spill Prevention

To the extent that a project involves storage of oil or other products in excess of certain thresholds, a Spill Prevention Control and Countermeasure Plan may be required pursuant to the federal Clean Water Act. As it relates to solar and BESS projects, this regulation primarily addresses transformer oil, which is used to ensure the function and efficiency of the system's transformers.

Part 3: Local Policy and Considerations

Home Rule

Maine law and Article VIII of the Maine Constitution grant municipalities home rule authority, and, as a result, municipalities have the ability to regulate a range of activities through the adoption of charters and ordinances. Pursuant to their home rule authority, municipalities may adopt ordinances on all matters which are local and municipal in character, and are not prohibited by the state Constitution or general law.

State law does include some exceptions related to municipal authority to regulate energy sources. For example, 33 M.R.S §1423 provides that municipal ordinances, bylaws or regulations may not prohibit a person from installing or using a solar energy device on residential property owned by that person. Similarly, pursuant to Public Law 2025, Chapter 456, municipalities may not prohibit an individual or entity from using a heating or energy system for that individual's or entity's own heating or energy needs, including the heating or energy needs of a motor vehicle, or engaging the services of a person or energy distributor of that individual's or entity's choice unless the prohibition is otherwise authorized by statute. This express preemption is limited however, and would not prevent a municipality from regulating such systems.

Accessory Uses

Solar energy systems or BESS can be accessory to another primary use, such as existing residential or commercial development. Accessory solar installations may include small ground- or rooftop-mounted solar. Accessory uses are often reviewed through the building permit process by a Code Enforcement Officer. As established under 33 M.R.S. §1423, these accessory uses for residential property owners, are typically allowed or “permitted by right” in all zones. In cases where the accessory use poses a safety risk or the Code Enforcement Officer feels it may impact neighboring uses, the municipal ordinance may allow for the permit application to be elevated to the local planning board. Utility-scale solar and larger BESS are not typically accessory uses, but are more often categorized as the primary use.

Land Use Ordinances and Zoning – the “where” of local regulation

As with any type of development, if a municipality decides to regulate solar energy and battery storage projects they must also decide where in the community such uses will be allowed. Zoning ordinances are “a type of land use ordinance that divides a municipality

into districts and that prescribes and reasonably applies different regulations in each district," 30-A M.R.S. §4301(15-A). Zoning ordinances typically divide a community into different districts (e.g., residential, commercial, industrial, etc.), specify the uses that are allowed and the required permitting for such uses in each district (e.g., no permit required, code enforcement officer approval required, planning board approval required), and establish dimensional and other standards for such uses. In Maine, zoning ordinances must be consistent with the municipality's duly enacted comprehensive plan and comply with certain other statutory requirements.

For a municipality that does not have local zoning, solar uses and energy storage uses are typically allowed anywhere in that community, subject to normal review and building permit procedures, just like any other home, business, or commercial use.

For a municipality with a zoning ordinance, the community must make decisions on whether solar energy and battery storage uses are to be permitted or not permitted in each zone. When making these decisions, communities should consider the impact of these new uses on surrounding uses and community land use goals for each zone. A community's comprehensive plan is the best place to look for guidance on local land use and zoning goals; it's also important to have a community engagement process when making zoning changes to ensure decisions reflect the needs and values of the people they affect, fostering trust and support for development projects.

As noted earlier in this Handbook, both solar development and battery storage uses can be compatible with a wide range of land use contexts. Larger scale solar projects and battery energy storage projects can be found in developed commercial and industrial areas as well as very rural areas all over the state. When deciding where to allow these uses, communities should consider compatibility with other allowed land uses in the district. Vegetated buffers and/or landscaping can help a solar array fit in with the existing landscape. Communities should also consider how to prioritize the highest and best use of land parcels, and opportunities for solar to be sited on disturbed land or brownfield sites. Communities can add to or create a permitted use table to communicate where solar and battery storage projects are allowed.

Example Permitted Use Table

Use	**Village/ Downtown**	**Residential**	**Rural/ Agricultural**	**Commercial**	**Industrial**

Solar Energy System					
Battery Energy Storage System					

This example permitted use table can be adapted to a community's zoning to demonstrate where solar and battery storage uses are allowed.

Dimensional requirements such as height limits, lot coverage, and setbacks are also typical components of a zoning ordinance. These standards can differ significantly between municipalities. Height limits are typically not an issue for solar energy and battery storage projects – both are usually under the common local height limit of 35 feet. Both of these types of projects can typically meet lot coverage standards through site design for structures, gravel, and paved areas (solar panels are not considered impervious surfaces). Setbacks regulate the minimum distance a project can be built from the property line, helping to ensure a regular pattern of development and enhance privacy and visual appeal. Setbacks can be adjusted to meet specific community needs – a larger setback from the road may be appropriate in a rural zone to maintain a forested view, or in a residential zone to minimize the view from a neighboring home. A smaller setback may be appropriate in a commercial or industrial zone where there is denser development and less need to provide visual screening. The model ordinance included in Section 4 of this Handbook is a recommended starting point for these conversations.

Performance Standards – the "how" of local regulation

Larger-scale solar energy systems and BESS are typically reviewed by a municipality's planning board. Municipalities may opt to adopt site plan review ordinances, which do not need to be consistent with a local comprehensive plan but must be enacted consistent with state law and any local provisions regarding general ordinance enactment. Site plan review ordinances regulate the impact of development on public health, safety and the environment, and may include standards related to topics such as stormwater management, traffic impacts, landscaping and buffering, emergency access, protection of water quality, visual impact and sound. Municipal site plan review ordinances should be mindful to avoid duplication of state siting and permitting requirements.

The site plan review process compares a project to set performance standards. These standards establish local rules for how these facilities are developed, once the where questions have been answered.

Many site plan review standards may not be applicable when reviewing a solar or BESS project, as these types of development do not generate traffic, produce waste, or require water or sewer connections. Others may be more relevant, including:

- Access to the site: Is there an existing driveway, or is a new driveway required? These developments generate very minimal traffic during operation, but do need a safe driveway entrance for construction.
- Natural resources: Will the project impact sensitive wildlife habitat or wetlands? The project should be designed to limit impacts on natural resources to the greatest extent possible. Any project with activities in, on, or over protected natural resources will be reviewed by the state through the NRPA permitting process (see Part 2).
- Stormwater management and erosion control: Solar panels are considered pervious surfaces since they don't impact the ground's ability to absorb stormwater, but grading, site work, foundations for BESS, and access driveways may impact stormwater flow on the site, and adequate erosion control provisions should be in place for construction. Projects with 1 acre or more of disturbed area will be reviewed by the state through the Maine Stormwater Permit or Site Location (see Part 2).
- Landscaping and buffering: Solar farms can cover large areas of land and should include sufficient landscaping and buffering provisions to limit the impact to neighboring developments and uses. A municipality should consider the

appropriate landscaping and buffering provisions to help limit any associated impacts.

- Emergency access: Fires at solar or BESS facilities are rare, but the site plan should demonstrate the fire department's equipment can access the site. It is recommended that project developers coordinate closely with local fire departments to create access and emergency response plans.

Specific performance standards for solar and BESS projects can be regulated through site plan review or by adopting new standalone ordinances (see the Model Ordinance section).

Some aspects of solar and battery storage development are subject to state permitting requirements (see Part 2). Municipalities may defer to the state and federal process for these aspects of review. The state and federal reviewing authorities typically have more staff, resources, and expertise to provide in-depth review in these areas, and municipalities and local residents can participate and submit comments to the state or federal permitting process. Copies of permits are then provided to the municipality once issued.

Building Permit Fees

Application review fees and building permit fees are charged by municipalities to cover the costs of processing applications and permits, such as the cost of staff time, public notice advertising, and mailings. Many review fees are based on the square footage of a structure and can result in exorbitant fees that can conflict with state statute[36] for solar energy projects if the square footage of the array is used. Municipalities should consider adopting a fee schedule that is specific to solar and BESS projects and aligns with the realistic costs of processing applications and permits for these types of facilities, or setting a maximum review and permit fee, to avoid inappropriate or disproportionate charges.

[36] State law requires that building permit fees "must reasonably reflect the municipality's costs associated with the license or permit procedure or enforcement." 30-A M.R.S. §3702; *see also* 30-A M.R.S. §4355 ("Any application fee charged by a municipality for any land use permit issued by the municipality may not exceed the reasonable cost of processing, review, regulation and supervision of the application by the municipality and its consultants and the administration of any requirement for a certificate of compliance with any permit conditions.")

Post-Approval Processes

There are a number of steps that occur following municipal approval of a project that may have specific applications for solar and BESS projects.

Building permits: As with any construction project, solar and BESS projects require local building permits.

Additional permits: Typically, an applicant must submit all state and federal permits to the municipality before a building permit can be issued (see Part 2 for a discussion of applicable federal and state permits). Sometimes, a driveway entrance permit may be required by the municipal road commissioner, public works department or (on state roads) the Maine Department of Transportation – these permits should also be obtained before construction begins.

Conditions of approval: A municipality can impose conditions of approval, specific requirements or stipulations attached to a project's approval, ensuring the project aligns with local regulations. Conditions of approval should be tied to a stage in the inspection process, either met before a building permit is issued, or before a final certificate of occupancy is issued (if applicable). Conditions of approval may include things like periodic landscaping maintenance, hosting a fire department training, obtaining a driveway entrance permit or other elements as determined by the municipality.

Fire department training: To ensure the local fire department is adequately prepared in the case of an emergency at a solar or BESS site, a training meeting between the fire department and the project owner is highly encouraged as a part of the routine post-approval process.

Construction inspections & escrow: The applicant should share a construction schedule with the municipality and coordinate a schedule of inspections to demonstrate best management practices are followed for erosion & sediment control, and that the project is installed in accordance with the approved plan. Inspections are typically completed by the Code Enforcement Officer or a municipality's engineer (some municipalities without engineers on staff will hire a third-party review engineer at the applicant's expense). In larger, more complex projects, the DEP typically requires the applicant to retain a third-party inspector, and copies of the third-party inspection reports can be sent to the municipality as well as the DEP. An initial construction schedule may change over the life of the project due to factors such as weather and labor or supply chain constraints. It's recommended that a developer update the municipality when any substantial changes to the expected construction schedule arise.

Plan amendments: Sometimes, a developer will need to make a modification to an approved plan. Minor changes can typically be approved by a municipal Code Enforcement Officer or planner. Larger changes that would impact site plan review standards are typically approved by the Planning Board.

Interconnection: The interconnection process between a solar or battery energy system and the electric grid is governed by the local utility, such as Central Maine Power or Versant Power, or the transmission organization, ISO-NE. Interconnection should not be part of the municipal review process. The process is regulated by the Maine Public Utilities Commission and the Federal Energy Regulatory Commission. Typically, a project obtains local approval before obtaining interconnection permission from the utility. It may take months or years for interconnection, depending on the utility capacity. In these cases, it can be reasonable for projects to request a site plan approval extension from the local planning board. Municipalities should note that oftentimes Interconnection Agreements cannot be shared publicly because they are considered critical energy infrastructure.

Resources

Utilities and interconnection

Rules promulgated by the Maine PUC governing topics such as net energy billing and small generation interconnection procedures can be found here.

Information is available from Maine's two investor-owned utilities regarding interconnection and other pertinent topics:

- Central Maine Power resources and hosting capacity map
- Versant Power resources and hosting capacity map
- ISO New England resources

In the event of a dispute between parties regarding interconnection, the Maine PUC has an appointed Interconnection Ombudsman to assist customers seeking interconnection of renewable energy projects by facilitating the efficient and fair resolution of disputes between a customer seeking interconnection and a utility.

- Maine PUC Interconnection Dispute Resolution Process

State Agencies

The Maine Department of Energy Resources provides information about renewable energy in Maine.

The Maine Department of Agriculture, Conservation, and Forestry has issued technical guidance for utility-scale solar installation and development on agricultural, forested, and natural lands. DACF's guidance and permitting for solar projects on high-value agricultural land (described in Part 2) can be found here.

The Maine Department of Inland Fisheries and Wildlife has issued solar project guidance and recommendations.

The Maine Department of Environmental Protection has issued guidance related to the siting of solar arrays on closed landfills.

The Maine Department of Environmental Protection administers certain applicable permitting requirements described in Part 2, including SLODA, Maine's Stormwater Management Law, the Maine Construction General Permit, NRPA, as well as Maine's solar decommissioning law.

The Maine Office of Community Affairs provides a wide range of support to Maine communities on topics related to Code Enforcement, planning, regional initiatives to protect against extreme weather, and more.

Part 4: Model Ordinances

How to Use These Ordinances

The model ordinances included in this Handbook are intended to assist municipalities in establishing permitting standards and performance requirements for solar energy and battery storage systems. They assume the municipality has a Code Enforcement Officer and a Planning Board (or equivalent entities), and that proposed projects will be subject to a standard site plan review process, including demonstration of right, title, and interest, as well as financial and technical capacity. The ordinance language provided can be incorporated into an existing site plan review or land use ordinance, or adopted as a separate standalone ordinance, even in communities without zoning.

Please note that the intent of the model ordinance language that follows is to provide Maine municipalities an example for review, reference, and consideration, at their sole discretion, regarding approaches to local regulation of solar and energy storage development. It is provided for informational purposes and is not intended to render any legal advice. Pertinent factual, legal, and other circumstances vary significantly among municipalities and are subject to changes. Municipalities considering use of this model ordinance or any of its provisions are advised and encouraged to consult with a qualified attorney and/or land use professional.

New ordinances, as well as amendments to existing ordinances, must go through the normal process in any community, typically a town meeting vote or a Town or City Council vote.

Throughout the model ordinances, *Planning Considerations* follow each section to provide guidance and context, so staff and volunteers at the local level might better understand technical considerations, how to determine which standards should be incorporated into local ordinances, and how to review projects according to the standards.

Maine Model Solar Energy System Ordinance

The ordinance establishes performance standards for the siting, operation, and decommissioning of solar energy systems. It does not establish where solar energy systems are permitted as a land use or how it should be incorporated into zoning districts. Because zoning structures and regulatory approaches vary among communities, municipalities may need to consider additional ordinance or zoning updates to fully integrate solar energy systems into their local land use framework (for more information, see Part 3).

Section 100: Administration

101: Authority.

This Ordinance shall be known as the "*(Town/City)* of *(Town/City name)* Solar Energy System Ordinance." It is adopted pursuant to the enabling provisions of the Maine Constitution and the provisions of Title 30-A M.R.S. Section 3001.

102: Purpose.

The purpose of this Ordinance is to allow for responsible development of Solar Energy Systems in a manner that supports renewable energy while establishing reasonable standards to protect neighboring properties, public health and safety, and the natural environment.

103: Applicability.

This Ordinance shall apply to all Solar Energy Systems and Accessory Solar Installations proposed in the (*Town/City*) of (*Town/City name*).

Section 100 Planning Considerations

This section must be included if the Solar Energy System Ordinance is to be adopted as a standalone ordinance. If these standards are to be incorporated into an existing zoning or land use ordinance, verify that these administrative provisions are included in the text of that ordinance.

Section 200: Definitions

201: Solar Energy Systems.
A ground-mounted assembly of equipment and infrastructure that captures and converts solar energy into electricity using photovoltaic technology. This includes, but is not limited to, solar panels or collectors, mounting hardware, inverters, wiring, transformers, and other associated components.

202: Accessory Solar Installation.
A solar energy system that provides a supplemental benefit to the primary use of the lot. Accessory Solar Installations may be mounted on the roof of a structure or ground-mounted. These systems are not intended for the primary purpose of generating electricity for sale to off-site users.

Section 300 Review Authority

301: The Code Enforcement Officer (CEO) or Planning Board shall be responsible for administering the provisions of this ordinance including interpreting the provisions thereof.

302: Accessory Solar Installations are subject to review by the CEO and shall meet any applicable zoning and/or dimensional requirements. At the discretion of the CEO or relevant designee, applications for Accessory Solar Installations may be forwarded to the Planning Board for review in accordance with the Solar Energy System performance standards set forth in this ordinance, particularly where site-specific conditions or potential impacts warrant additional oversight.

303: Solar Energy Systems that are the primary use of the property are subject to Site Plan Review by the Planning Board or applicable review authority and shall meet any applicable land use or zoning requirements in addition to the requirements of this ordinance.

Section 200-300 Planning Considerations

These definitions define Solar Energy Systems broadly, without regard to size or intended use, and include all mechanical and electrical components of those systems. Accessory Solar Installations are defined separately. Accessory Solar Installations *serve the primary use* (the home or business) on the lot on which they are located and are typically reviewed and approved by the CEO. The Planning Board should review Solar Energy Systems where that system *is the primary use* of the property.

The CEO may choose to bring an Accessory Solar Installation to the Planning Board for review if it has public health, safety, and welfare concerns or has enough potential community impacts to warrant a Planning Board review rather than an administrative approval. The need to elevate the review of Accessory Solar Installations is likely to be rare.

For Accessory Solar Installations reviewed by the CEO, this is the end of the applicable section of the ordinance. The remainder of the ordinance are submission requirements and performance standards solely for projects subject to Planning Board review.

Section 400: Submission Requirements for Solar Energy Systems subject to Planning Board review

401: Name and contact information of the facility owner and operator, as well as the name and contact information of the property owner.

402: An existing conditions plan to scale showing current site features, including existing vegetation, wetlands, and other regulated natural resources, topography, and any existing or adjacent structures. The plan should also identify property boundaries, roads, and any utilities, rights-of-way, existing zoning, and easements located on or adjacent to the site.

403: Scaled plans showing the location of the proposed Solar Energy System on the property, including property boundaries, limits of tree clearing and fencing, anticipated panel footprint, access roads and turnout locations, and the location of interconnection infrastructure.

404: Description of the proposed Solar Energy System, including the size of the area to be occupied by solar arrays, whether the system will consist of fixed tilt or tracker panels, and the installed generation capacity of the system.

405: For projects that are within a scenic area designated in the municipal comprehensive plan, open space plan, or other official policy document of the [Town/City] of [insert name here], the applicant must submit an assessment of the visual impact of the project on the designated scenic resource prepared by a Maine licensed landscape architect or other qualified professional. Visual impact assessments must include:

A) A visual description or viewshed map of the project covering all elements visible from public view points within the designated scenic area;

B) Identification, characterization and, extent of potential visual impacts on the designated scenic areas; and

C) Proposed mitigation measures to minimize potential visual impacts from the project on designated scenic areas.

406: Copies of all applicable state and federal agency permit applications or approvals, including but not limited to those from the Maine Department of Environmental Protection (DEP); Maine Department of Agriculture, Conservation and Forestry (DACF); U.S. Army Corps of Engineers (USACE); and any other regulatory entities with jurisdiction over the project. If the project is seeking outside agency approvals concurrently or after local review, all approvals must be submitted to the CEO prior to the issuance of a building permit.

407: A high-level construction management plan and project timeline, including identification of all known contractors, confirmation of site control during construction, the anticipated start date, major construction milestones, and the expected date the system will be operational. This is for informational purposes and modifications to this plan do not require a permit amendment.

408: A proposed Maintenance and Operations Plan describing the regular operation and upkeep of the facility. The plan shall address routine inspections and maintenance, vegetation management methods and frequency, revegetation monitoring, rehabilitation of disturbed soils, and general landscaping on site. A finalized plan should be submitted prior to operation.

409: An Emergency Management Plan that includes procedures for fire prevention, system shutdown, emergency access, and identification of any site-specific hazards or safety risks associated with the Solar Energy System.

410: A Decommissioning Plan outlining the process for removal of the Solar Energy Development and restoration of the site.

A) For solar energy systems that occupy 3 or more acres and require a DEP approved decommissioning plan, a draft plan may be submitted with the application and the final DEP approved decommissioning plan shall be submitted prior to start of construction.

B) For solar energy systems that do not require a DEP decommissioning plan under State law, the applicant shall submit a Decommissioning Plan that includes:

1) Restoration measures to stabilize the site and mitigate erosion issues;
2) Above-ground structure removal and disposal of below grade equipment;
3) Regrading;
4) Drainage structure repair;
5) Access roads;
6) Revegetation;
7) Property owner notification; and
8) Timeline for the process and an engineer's cost estimate for decommissioning the system.

Section 400 Planning Considerations

Submission requirements included in Section 400 are suggested to support the Planning Board to make findings and conclusions related to the standards below in Section 500. Section 400 establishes applicant submission information in order for the Planning Board to have enough information about the project.

Items 401-404 are standard submission requirements asking for general information related to the property, project components, and technical specifications.

Item 405 relates to a visual impact analysis. Solar energy systems may warrant a visual impact analysis when they will be constructed within an area designated as a scenic resource in the municipality's comprehensive plan, or other official planning document. If a project is proposed in a designated scenic area, this submission will require the developer to show what the impact on the landscape will be and demonstrate how visual impacts may be mitigated using buffers and setbacks in those areas as outlined in Section 500.

Item 406 relates to state and federal permitting, as discussed in Part 2 of this Handbook. This submission requirement asks for copies of the permit applications for the municipality, and for the applicant to submit final approvals to the CEO. This submission requirement allows for concurrent local and state/federal review, while ensuring that the municipality is informed of the permitting process.

Item 407 requires the applicant to share a construction schedule with the municipality. This will help coordinate a schedule of inspections with the CEO. It will also demonstrate best management practices are followed for erosion & sediment control. Projects that require DEP review will be preparing this information for state standards and can submit the same information to the municipality. This should generally be a high-level plan as all details might not be known at the time of submission. Changes to this plan do not require a resubmission or permit amendment.

Item 408 requires an operation and maintenance plan. Solar projects require limited maintenance once they are constructed. This plan shows how the area under the panels will be revegetated, and how frequently it will be mowed, as well as how often landscaping and buffers will be maintained. It also describes facility and equipment maintenance. DEP stormwater permits typically require the area under arrays to be maintained as meadows in order to be treated as pervious, which means a maximum of 2 mows per year.

Item 409 is an emergency management plan, typically reviewed by a municipality's Fire Chief to ensure the local fire department understands emergency plans and access.

Item 410 relates to the removal of the system at the end of its useful life. Solar projects of three or more acres require state-approved decommissioning plans and should submit copies of those plans to the municipality. This language allows a solar project to submit a draft plan consistent with DEP requirements during the permitting process as long as the final DEP-approved plan is submitted prior to start of construction. Municipalities can require projects that are exempt from state review to provide a local decommissioning plan. A reminder that this language only applies to solar energy systems subject to planning board review, which should generally exclude accessory installations from requiring a decommissioning plan.

Section 500: Performance Standards for Solar Energy Systems subject to Planning Board review

501: Dimensional Requirements

A) Impervious Surface

1) Solar panels and associated mounting hardware shall not be considered impervious surfaces for the purposes of calculating lot coverage or stormwater management, provided that the ground surface beneath the panels remains pervious and is maintained as a meadow, in accordance with DEP stormwater requirements.

B) Height

1) Height shall be measured from the ground to the highest point of the array at maximum tilt.

C) Setbacks

1) Setbacks shall be measured from the array to the nearest property line.
2) All ground-mounted solar arrays shall comply with the minimum setback requirements of the applicable zoning district, unless more restrictive standards are specified elsewhere.

[501 Alternate Language for communities without dimensional standards]

A) [Impervious Surface performance standard is not necessary in communities that do not otherwise regulate impervious surface or lot coverage.]

B) Height

1) Height shall be measured from the ground to the highest point of the array at maximum tilt.
2) Maximum height of solar arrays = 35 feet.

C) Setbacks

1) Setbacks shall be measured from the array to the nearest property line.
2) All components of the Solar Energy System shall adhere to minimum setback requirements consistent with similar types of development.

502: Fencing

A) When required by the National Electrical Code (NEC) or the utility, solar energy systems shall be enclosed by a fence that secures the full extent of the developed area, including all panels, mounting hardware, electrical equipment, and associated infrastructure.

B) Fencing shall comply with applicable electrical and fire safety codes, be maintained in good condition for the life of the project, and include locked access gates and visible emergency contact information.

C) As practicable, the fence should be designed with wildlife permeable fencing or be elevated to provide clearance along the entire perimeter by small wildlife.

503: Vegetated buffers

A) Vegetated buffers are suggested to minimize impacts on designated scenic resources and, if determined by the Planning Board taking into account the project size and compatibility of abutting land uses, to minimize impacts on abutting land uses. Existing woody and shrubby vegetation may be retained to meet this requirement; however, new plantings may be required where existing vegetation is insufficient to minimize impacts on scenic resources. New plantings shall consist of at least two rows of plantings and include only native species of trees and shrubs.

1) Where vegetated buffers are not feasible or would not provide effective year-round screening, the Planning Board may require non-vegetative buffering measures, such as decorative fencing, berms, or other context-appropriate visual barriers, to minimize the system's visual impact.

B) Vegetated buffers shall be maintained for the life of the Solar Energy System in accordance with the approved Maintenance and Operations Plan.

504: Decommissioning

A) The following applies only to Solar Energy Systems that do not require DEP decommissioning plans. For purposes of this ordinance, DEP-approved decommissioning plans satisfy the following requirements.

1) A decommissioning guarantee in the form of an appropriate financial assurance may be required for projects that do not require a decommissioning or removal guarantee from the DEP. Such guarantee shall be adequate to cover the cost of removal and disposal of all Solar Energy System elements, to stabilize the site, and to mitigate soil erosion issues post removal. An updated guarantee must be submitted to the town 15 years after first approval, and every 5 years thereafter.

2) For any solar energy system that has reached the end of its life or, absent written notice of extenuating circumstances, has ceased generating electricity for more than twelve (12) consecutive months, the owner or operator shall remove the installation no more than eighteen (18) months after the date of the discontinued operations. The owner shall notify the municipality's CEO of the proposed date of the discontinued operations and plans for removal.

3) Once the owner and/or operator has properly removed all components of the solar array and structures, the owner and/or operator shall notify the municipality in writing and request an inspection from the municipality's CEO. If the removal is satisfactory, then the CEO shall notify the owner

and/or operator in writing to release the abandonment performance guarantee.

4) Failure to decommission and remove the system in accordance with this section shall constitute a violation of this ordinance. The municipality may draw on the performance guarantee and pursue any legal or administrative remedies necessary to ensure proper removal and site restoration.

Section 500 Planning Considerations

Item 501 wording is relevant in communities with zoning standards in place for dimensional requirements and requires conformance with those standards.

In communities without zoning, structure height and setback requirements are suggested in the alternative language provided.

- Most fixed tilt arrays are no more than 15 feet in height, and most tracker arrays, which are taller, can meet typical building height limits of 35 feet in the majority of zones.
- Setbacks are the required distance from the solar array to the property line. In general, setbacks should be consistent with the overall pattern of development in the area. A suggested setback is 20 feet, which would allow for a vegetated buffer or plantings to be maintained or installed between the fenced area and the property line. Based on the negligible traffic and noise impacts of Solar Energy Systems, 20 feet will be adequate in most cases. In some communities, rural areas or other areas with unique considerations may have larger setbacks.

Item 502 relates to fencing for security purposes. Safety fences are typically required by NEC. A description of the fence will help the community understand what the project will look like. Many projects built in Maine utilize an agricultural style fence, which includes wooden poles and a wire mesh of 6-inch x 6-inch squares. This style of fencing is less industrial looking than a typical chain link style fence and is more appropriate in rural areas.

Item 503 describes buffers. Buffers are located within the setback area and provide a visual screening of the Solar Energy System. Each municipality may have different requirements for buffering and screening in different zoning districts, or between different types of land uses. Communities can decide if solar projects should be screened from all property lines, or only where projects abut different uses (i.e., a solar energy system abuts a residential development). Communities may decide that in some cases buffers and screening are not necessary and amend this language as needed.

Buffers are typically vegetated, consisting of trees, hedgerows, and shrubs. If a municipality does not have existing buffering standards, best practice is to require buffers that consist of native plants and include year-round screening, like evergreens. Buffers and screening around the border of the property help the project blend into the landscape. Buffers can also support habitat, help dampen sound from equipment, and can be a part of erosion control or stormwater management. This standard also gives the Board some discretion to consider other vegetated buffer configurations to fit in with existing conditions.

Item 504 reviews a local decommissioning plan for projects that do not require a DEP approved decommissioning plan to ensure that the project is properly managed at the end of its useful life. This item also includes procedures for the CEO to make determinations on when the system is no longer functioning and should be removed.

Maine Model Battery Energy Storage Ordinance

The ordinance establishes performance standards for the safe siting, operation, and decommissioning of standalone and grid-connected battery storage systems. It does not establish where BESS is permitted as a land use or how it should be incorporated into zoning districts. Because zoning structures and regulatory approaches vary among communities, municipalities may need to consider additional ordinance or zoning map updates to fully integrate BESS into their local land use framework (for more information, see Part 3).

Section 100: Administration

101: Authority.
This Ordinance shall be known as the "*(Town/City)* of *(Town/City name)* Battery Energy Storage System Ordinance." It is adopted pursuant to the enabling provisions of the Maine Constitution and the provisions of Title 30-A M.R.S. Section 3001.

102: Purpose.
The purpose of this Ordinance is to allow for responsible development of Battery Energy Storage Systems (BESS) in a manner that supports renewable energy while establishing reasonable standards to protect neighboring properties, public health and safety, and the natural environment.

103: Applicability.
This Ordinance shall apply to all BESS proposed in the (*Town/City*) of (*Town/City name*).

Section 100 Planning Considerations

This section must be included if the BESS Ordinance is to be adopted as a standalone ordinance. If these standards are to be incorporated into an existing zoning or land use ordinance, verify that these administrative provisions are included in the text of that ordinance.

Section 200: Definitions

201: Battery Energy Storage System (BESS).
"Battery energy storage system," as defined by State law, means a commercially available technology that uses chemical processes for absorbing energy and storing it for a period of time for use at a later time." This includes but is not limited to lithium-ion batteries. A BESS includes all components necessary for operation, such as inverters, battery management systems, fire prevention, and electrical interconnection hardware. The system may be connected to on-site generation or the electric grid.

202: Accessory Battery Energy Storage System.
A Battery Energy Storage System (BESS) that is incidental to the principal use of the lot and is intended primarily to store energy for on-site consumption.

Section 300: Review Authority

301: The Code Enforcement Officer (CEO) or Planning Board shall be responsible for administering the provisions of this ordinance including interpreting the provisions thereof.

302: Accessory Battery Energy Storage Systems are subject to review by the CEO and shall meet all applicable zoning and/or dimensional requirements. At the discretion of the CEO or relevant designee, applications for Accessory Battery Energy Storage Systems may be forwarded to the Planning Board for review in accordance with the BESS performance standards set forth in this ordinance, particularly where site-specific conditions or potential impacts warrant additional oversight.

303: BESS that are the primary use of the property are subject to Site Plan Review by the Planning Board or applicable review authority and shall meet any applicable land use or zoning requirements in addition to the requirements of this ordinance.

Section 200-300 Planning Considerations

These definitions define Battery Energy Storage Systems without regard to size, and includes all mechanical and electrical components of those systems. Accessory Battery Storage Systems are also defined. Accessory BESS *serve the primary use* (the home or business) on the lot on which they are located and are typically reviewed and approved by the CEO. The Planning Board should review and approve BESS where that system *is the primary use* of the property.

The CEO may choose to bring an Accessory BESS to the Planning Board for review if it has public health, safety, and welfare concerns or has enough potential community impacts to warrant a Planning Board review rather than an administrative approval. The need to elevate the review of Accessory Battery Storage Installations is likely to be rare.

For Accessory BESS reviewed by the CEO, this is the end of the applicable section of the ordinance. The remainder of the ordinance are submission requirements and performance standards solely for projects subject to Planning Board review.

Section 400: Additional Submission Requirements for Battery Energy Storage Systems subject to Planning Board review

401: Name and contact information of the facility owner and operator, as well as the name and contact information of the property owner.

402: An existing condition plan showing current site features, including existing vegetation, wetlands, and other regulated natural resources, topography, and any existing or adjacent structures. The plan should also identify property boundaries, roads, and any utilities, rights-of-way, existing zoning, and easements located on or adjacent to the site.

403: Scaled plans showing the location of the proposed BESS on the property, including property boundaries, physical dimensions of the system, access roads and turnout locations, limits of tree clearing, all fencing and screening, exterior lighting, and the location of all proposed electrical infrastructure.

404: Technical specifications for the proposed BESS, including but not limited to the system specifications, estimated power capacity, height, dimensions, and general appearance.

405: Copies of all applicable state and federal agency applications or approvals, including but not limited to those from the Maine Department of Environmental Protection (DEP), U.S. Army Corps of Engineers (USACE), and any other regulatory entities with jurisdiction over the project. If the project is seeking outside agency approvals concurrently or after local review, all approvals must be submitted to the CEO prior to the issuance of building permits.

406: A high-level construction management plan and project timeline, including identification of all known contractors, confirmation of site control during construction, the anticipated start date, major construction milestones, and the expected date the system will be operational. This is for informational purposes and modifications to this plan do not require a permit amendment.

407: An Emergency Response Plan that includes procedures for fire prevention, system shutdown, and hazard mitigation. The plan must include documentation of compliance with the applicable National Fire Protection Association and state safety standards. The plan must be reviewed by the municipal Fire Chief or designated public safety official. The plan shall include:

A) Site access and layout map identifying key safety infrastructure including but not limited to shutoff switches, fire prevention systems, and access points.

B) Emergency contact information for the facility operator or designated site manager.

C) Description of the training or coordination to be provided to local emergency personnel.

D) Safety data sheets for all hazardous materials or products containing hazardous materials.

408: A proposed Maintenance and Operations Plan describing the regular operation and upkeep of the facility. The plan shall address routine inspections and maintenance, vegetation management methods and frequency, revegetation monitoring, rehabilitation of disturbed soils, and general landscaping on site. A finalized plan should be submitted prior to operation.

409: A Decommissioning Plan outlining the process for removal of the BESS and restoration of the site.

A) For BESS with a capacity of 2 or more megawatts and requiring a DEP approved decommissioning plan, a draft decommissioning plan may be submitted with the application and the final DEP approved decommissioning plan shall be submitted prior to start of construction.

B) For BESS that do not require a DEP decommissioning plan under State law, the applicant will submit a Decommissioning Plan that includes:

1) Restoration measures to stabilize the site and mitigate erosion issues;
2) Above-ground structure removal and disposal of below grade equipment;
3) Regrading;
4) Drainage structure repair;
5) Access roads;
6) Revegetation;
7) Property owner notification; and
8) Timeline for the process and an engineer's cost estimate for decommissioning the BESS.

Section 400 Planning Considerations

Submission requirements included in Section 400 are suggested to support the Planning Board to make findings and conclusions related to the standards below in Section 500. Section 400 establishes applicant submission information in order for the Planning Board to have enough information about the project.

Items 401-404 are standard submission requirements asking for general information related to the property, project components, and technical specifications.

Item 405 relates to state and federal permitting, as discussed in Part 2 of this Handbook. This submission requirement asks for copies of the permit applications for the municipality, and for the applicant to submit final approvals to the CEO. This submission requirement allows for concurrent local and state/federal review, while ensuring that the municipality is informed of the permitting process.

Item 406 requires the applicant to share a construction schedule with the municipality. This will help coordinate a schedule of inspections with the CEO. Projects that require DEP review will be preparing this information for state standards, and can submit the same information to the municipality.

Item 407: this plan is typically reviewed by a municipality's Fire Chief to ensure the local fire department understands emergency plans, access, and how the fire prevention system works.

Item 408: BESS require limited maintenance once constructed. This plan describes facility, landscaping, and equipment maintenance. This should generally be a high-level plan as all details might not be known at the time of submission. Changes to this plan do not require a resubmission or permit amendment.

Item 409 relates to the removal of the system at the end of its useful life. Battery storage projects of 2 MW or more require state-approved decommissioning plans. This language allows a BESS project to submit a draft plan consistent with DEP requirements during the permitting process as long as the final DEP-approved plan is submitted prior to start of construction. Municipalities can require projects that are exempt from state review to provide a local decommissioning plan. A reminder that this language only applies to BESS subject to planning board review, which should generally exclude accessory installations from requiring a decommissioning plan.

Section 500: Performance Standards for Battery Energy Storage Systems subject to Planning Board review

501: Vegetation Clearing and Site Disturbance

A) Site clearing for BESS installations shall be limited to the area necessary for system installation, access, and fire safety requirements.

B) Vegetation management within the BESS area shall prioritize low-maintenance, native plant species.

502: Fencing

A) All BESS shall be enclosed by a fence that secures the full extent of the developed area, including all associated systems and infrastructure.

B) Fencing shall comply with applicable electrical and fire safety codes, be maintained in good condition for the life of the project, and include locked access gates and visible emergency contact information.

503: Vegetated Buffers

A) Vegetated buffers are suggested to minimize impacts on designated scenic resources and, if determined by the Planning Board taking into account the project size and compatibility of abutting land uses, to minimize impacts on adjoining land uses. Existing woody and shrubby vegetation may be retained to meet this requirement; however, new plantings may be required where existing vegetation is deemed insufficient for effective visual screening. New plantings shall consist of at least two rows of plantings and include only native species of trees and shrubs.

B) Vegetated buffers shall be maintained for the life of the BESS in accordance with the approved Maintenance and Operations Plan. This includes regular inspection and any necessary actions to preserve the effectiveness of the buffer for visual screening.

504: Noise

A) Noise from the BESS and associated equipment shall not exceed the maximum permissible sound levels established in the municipality's noise ordinance or zoning standards at the property line.

505: Decommissioning

The following applies only to BESS that do not require DEP decommissioning plans. For purposes of this ordinance, DEP-approved decommissioning plans satisfy the following requirements.

1) A decommissioning guarantee in the form of an appropriate financial assurance may be required for projects that do not require a decommissioning or removal guarantee from the DEP. Such guarantee will be adequate to cover the cost of removal and disposal of all BESS elements, to stabilize the site, and to mitigate soil erosion issues post-removal. An

updated guarantee must be submitted to the town 15 years after first approval, and every 5 years thereafter.

2) A Battery Energy Storage System (BESS) that has reached the end of its useful life or, absent written notice of extenuating circumstances, has ceased operations for more than twelve (12) consecutive months, the owner or operator shall remove the installation no more than eighteen (18) months after the date of the discontinued operations. The owner shall notify the municipality's CEO of the proposed date of the discontinued operations and plans for removal.
3) Once the owner and/or operator has properly removed all components of the BESS, the owner and/or operator shall notify the municipality in writing and request an inspection from the municipality's CEO. If the removal is satisfactory, then the CEO shall notify the owner and/or operator in writing to release the abandonment performance guarantee.
4) Failure to decommission and remove the system in accordance with this section shall constitute a violation of this ordinance. The municipality may draw on the performance guarantee and pursue any legal or administrative remedies necessary to ensure proper removal and site restoration.

Section 500 Planning Considerations

Item 501 describes site clearing, with the intent to preserve as much of the existing landscape as possible, and to encourage low-maintenance landscaping.

Item 502 relates to fencing for security – rather than screening- purposes. Fencing is required by the electrical code for these facilities. Depending on the project site location and surrounding context, Planning Boards should consider either an agricultural style fence, which includes wooden poles and a wire mesh of 6-inch x 6-inch squares, or a typical chain link style fence.

Item 503 describes vegetated buffers and how they will be maintained. Buffers provide a visual screening of the BESS. Each municipality may have different requirements for buffering and screening in different zoning districts, or between different types of land uses. Communities can decide if BESS should be screened from all property lines, or only where projects abut different uses (i.e., a BESS abuts a residential development.) Communities may decide that in some cases buffers and screening are not necessary and amend this language as needed.

Item 504 relates to noise levels. This wording presumes that there are noise standards in existing ordinance language. As discussed in the Handbook, noise concerns are not a significant concern for BESS. BESS have sound levels similar to those of rooftop heating, ventilation, and cooling units in residential and commercial buildings and should comply with standard noise level requirements.

Item 505 reviews a local decommissioning plan for projects that do not require a DEP approved decommissioning plan to ensure that the project is properly managed at the end of its useful life. This Item also includes procedures for the CEO to make determinations on when the system is no longer functioning and should be removed.

Questions?

If you have any questions about this Handbook, please email questions to doer@maine.gov. The DOER team looks forward to partnering with communities across Maine to help them meet their energy goals.

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Appendix A: Key State and Federal Land Use Laws

State Programs

The following is an overview of the key state programs that regulate land use impacts associated with solar and battery storage projects.

Site Location of Development Law

Maine's Site Location of Development Law (Site Law) is the primary mechanism by which the state, through the Department of Environmental Protection (DEP), regulates developments that could have a significant impact on the environment including solar and battery storage projects that exceed certain size thresholds. 38 M.R.S. §§ 481-489-E. The Site Law is a comprehensive permitting program that evaluates a broad range of land use impacts. Communities may choose to regulate the same types of impacts or, alternatively, defer in whole or in part to the DEP's regulation of such impacts.

Applicability

A solar or battery storage project requires review and approval under the Site Law if it (i) constitutes a "structure," which includes any building, parking lot, road, paved area, wharf, or area to be stripped or graded and not revegetated within a year that occupies a ground area in excess of 3 acres; or (ii) occupies an area of more than 20 acres. The DEP has provided guidance on the types of impacts associated with solar development that must be taken into account in determining whether the 20-acre threshold has been met, including:

- All area covered by the panels and arrays.
- All area inside the fence.
- All area outside the fence that is required for maintenance (including mowing).
- All access roads and impervious areas.
- The area of the collector line to the point where it connects to a distribution system.
- Shade management areas outside the fence.
- All areas required for buffers, whether for noise, visual, or stormwater treatment purpose.

Solar projects do not typically involve new impervious areas of more than three acres and therefore do not constitute a "structure" but often, depending on size, occupy an area of

more than 20 acres and therefore trigger the Site Law.[37] Battery storage projects may trigger Site Law review either because they occupy an area more than 20 acres or because they involve more than 3 acres of new impervious area.

Review Standards

For projects that require review and approval under the Site Law, the DEP will evaluate the following.

Financial Capacity and Technical Ability (38 M.R.S. § 484(1))

A developer must provide evidence of financial capacity to design, construct, operate, and maintain the specific project and meet all Site Law obligations. For permitting purposes it is sufficient to provide general information on the ability of the project to obtain financing for all aspects of the development. Prior to the start of construction, however, the applicant must provide documentation of financing or sufficient funds to construct the project for DEP review and approval. In addition to financial capacity, the developer must provide evidence of technical ability to design, construct, operate, and maintain the development in accordance with state laws and regulations.

For more information see: 06-096 C.M.R. ch. 373 § 2 (financial capacity); 06-096 C.M.R. ch. 373 § 3 (technical ability).

No Adverse Environmental Impacts (38 M.R.S. § 484(3))

A developer must provide comprehensive information demonstrating that the project will have no adverse environmental effects on existing uses, scenic character, air and water quality, and other natural resources. To assess potential adverse impacts, a developer must provide information on the following:

Noise

A project must demonstrate compliance with DEP's noise standards, which establish sound limits based on existing uses. The DEP limit is more conservative in existing quiet areas, which is typical of rural areas in Maine. The DEP will apply the local limit if the municipality has a duly enacted quantifiable noise standard that is (1) not more than 5 dBA higher than the DEP limit, and (2) applies to the noises generated by the development. The DEP does

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37 A very rough rule of thumb is that a solar project requires five acres per megawatt of installed capacity. The land area is typically greater for trackers than fixed tilt design. Additionally, the site layout, including grade and resources that may be present and need to be avoided significantly influence the area required for development.

not regulate construction noise between the hours of 7 a.m. and 7 p.m. or daylight hours, whichever is longer.

For more information, including daytime and nighttime noise limits, see: 06-096 C.M.R. ch. 375 § 10 (control of noise).

Visual Quality and Scenic Character

An applicant must demonstrate that the project fits harmoniously with existing land uses and describe efforts to minimize visual impacts caused by the development. Although part of the Natural Resources Protection Act, the DEP uses Chapter 315 Rules on Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses as guidance in evaluating scenic impacts under the Site Law.

For more information see: 06-096 C.M.R. ch. 375 § 14 (scenic character); 06-096 C.M.R. ch. 315 (mitigating scenic impacts).

Wildlife and Fisheries

The developer is required to contact the Department of Inland Fisheries and Wildlife (MDIFW) to determine any potential impacts of the development on wildlife habitat and fisheries. In 2020, MDIFW issued a solar guidance document that identifies types of sensitive wildlife and fisheries resources and measures to eliminate or reduce impacts to such resources, including the use of buffers and wildlife friendly fencing. Impacts to specific types of wildlife habitat are also regulated under the Natural Resources Protection Act, discussed below.

For more information see: 06-096 C.M.R. ch. 375 § 15 (wildlife and fisheries); *Maine Department of Inland Fisheries and Wildlife Solar Energy Project General Resource Guidance and Recommendations*, March 2020.

Of particular relevance to solar, wind and transmission projects, in 2025 the DEP finalized rules that require mitigation for impacts of renewable energy projects to large undeveloped habitat blocks, important wildlife corridors, and other habitat types identified by MDIFW. The new rule identifies when mitigation is required and establishes how much mitigation is required, either through improvement or protection of similar habitat or payment to an in-lieu fee program. The rule is limited to renewable energy projects, which are defined to include solar, wind, and high-impact transmission lines.

For more information see: 06-096 C.M.R. ch. 375 § 15-A (compensation for adverse effects of renewable energy development on wildlife and fisheries habitat).

Historic Sites

The developer must submit information demonstrating that the proposed development will not adversely impact any official historic or archeological sites. If necessary, the DEP may require the developer to submit a historic and archeological survey.

For more information see: 06-096 C.M.R. ch. 375 § 11 (preservation of historic sites).

Unusual Natural Areas

The developer is required to submit evidence that the development will not adversely affect any unusual natural area, such as those with unique geological, botanical, zoological, ecological, hydrological, or other scientific, educational, scenic or recreational significance. If necessary, the DEP may require the developer to conduct and submit a survey showing the status of any nearby unusual natural areas.

For more information see: 06-096 C.M.R. ch. 375 § 12 (preservation of unusual natural areas).

Buffers

The application requires the developer to provide a narrative and drawing of buffers that will be used to minimize any visual impacts, impacts from surface runoff and sedimentation, and impacts to wildlife from the development. The submission must include relevant dimensions, planting specifications, and contact information of individuals who will maintain the buffers. These buffers are evaluated by the DEP on a case-by-case basis to ensure that they adequately protect water bodies, the movement of wildlife between important habitats, and shield adjacent uses from unsightly developments and lighting.

For more information see: 06-096 C.M.R. ch. 375 § 9 (buffer strips).

Soil Suitability (38 M.R.S. § 484(4))

To ensure the proposed development is constructed on soils suitable for the undertaking, the developer is required to hire a certified soil scientist to conduct a soils investigation and complete a soil survey report. Soil surveys vary based on intensity level, which is dictated by the type of development at issue. Notably, “energy facilities,” which include substations, switchyards, compressor stations, maintenance buildings associated with transmission lines, power plants or wind-energy generation facilities, or comparable developments require completion of a Class B (high intensity) soil survey. If a solar development or battery storage project does not fall within the scope of an “energy facility,” it is likely that the project would need to complete a Class D (medium intensity) soil survey, which is the standard soil investigation conducted for most projects that are not otherwise identified as “high intensity” under Site Law.

For more information see: 06-096 C.M.R. ch. 376 (soil types).

Stormwater Management and Erosion and Sedimentation Control (38 M.R.S. § 484(4-A) and (7))

The project must meet DEP's comprehensive stormwater management and erosion and sedimentation control requirements, including a demonstration that the activity will not unreasonably increase flooding.

First, developments must produce a comprehensive stormwater management plan as part of the application process. Included within this submission is a narrative description that addresses pre-develop and post-development site conditions with respect to stormwater runoff, flooding, and water quality. The narrative portion of the stormwater management plan must also identify, among other things, site topography, prior flooding, proposed alterations to drainage and land cover, and an overall assessment of development impacts on nearby surface waters, adjacent properties, and downstream structures. Developers must also provide detailed information on drainage plans, a pre-and post-development runoff analysis, and a peak stormwater quantity management plan that addresses retention, infiltration and runoff of stormwater for 24-hour storms at 2-year, 10-year, and 25-year frequencies.

The developer must also demonstrate that site development will not cause unreasonable erosion or sedimentation beyond the site or into protected natural resources. To ensure no adverse impacts, the developer must include in its Site Law application a narrative description of measures that will be taken to control erosion and sedimentation during construction and following completion of the development. The plan must include calculations for the appropriate size and spacing of control measures and detail a construction, installation, inspection, and maintenance plan for structures such as detention basins, infiltration structures, underdrains, buffers, ditches, and culverts. Increasingly, the DEP requires the developer to hire a third-party inspector to oversee construction activities with a particular focus on erosion and sedimentation controls and stormwater management.

For more information see: 06-096 C.M.R. ch. 375 § 4 (no unreasonable effect on runoff/infiltration relationships); 06-096 C.M.R. ch. 375 § 5 (erosion and sedimentation control); 06-096 CMR 375.6 (no adverse effect on surface water quality); 06-096 CMR 500 (stormwater management); and 06-096 C.M.R. ch. 502(urban impaired streams).

As discussed below, similar stormwater management and erosion and sedimentation control requirements apply to smaller projects as well.

Protection of Groundwater (38 M.R.S. § 484(5))

In its application, the developer must provide comprehensive information that the development will not have an unreasonable adverse effect on groundwater. This includes a narrative of the location, quantity, and source of groundwater and measures the developer intends to implement to avoid degrading groundwater. If a development plans to use or store a material that could result in impacts to groundwater, the project must provide a groundwater protection plan identifying the methods, processes, and plans the developer intends to implement to avoid such impacts. This typically requires preparation of a construction Spill Prevention, Control, and Countermeasure (SPCC) plan.

For more information see: 06-096 C.M.R. ch. 375 § 7 (groundwater quality) and 06-096 C.M.R. ch. 373 § 8 (groundwater quantity).

Protection of Infrastructure (38 M.R.S. § 484(6))

An applicant must also demonstrate that a development has provided sufficient infrastructure and utilities for the project, including water supply, wastewater disposal, and solid waste disposal, and that development won't have an unreasonable or adverse effect on the utilities serving the municipality or area where construction is proposed to occur.

For more information see: 06-096 C.M.R. ch. 375 § 16 (waste disposal); 06-096 C.M.R. 375 § 18 (water supply).

Blasting (38 M.R.S. § 484(9))

If blasting is required, the project must provide a site plan showing locations of proposed blasting, as well as the location of all structures and wells within 2,000 feet of the proposed blasting location. The developer must also provide a report authored by a qualified individual assessing potential adverse impacts of blasting activities on natural resources, structures and wells, and possible effects of noise, vibration, and surface and groundwater. The report is required to include a blasting plan showing how potentially adverse impacts of the blasting will be controlled, a schedule for proposed blasting, and any signage, warnings, and site access limitations that will be imposed to minimize potentially adverse impacts.

For more information see: 38 MRS 490-Z(14); 06-096 C.M.R. ch. 375 § 10(C)(4).

Air Emissions and Odors

In its application, the project must provide an air emissions analysis identifying all point and non-point sources of air emissions from the development. This may include point sources such as stacks or non-point sources like roads and vehicle traffic. For any point

sources, the project must provide a summary of the types and amounts of emissions from that source, including the particulate matter.

Although unlikely to be an issue for solar developments or battery storage projects, developers are nonetheless obligated to address whether the proposed project will create any significant odors and, if so, how they will be controlled and addressed.

For more information see: 06-096 C.M.R. ch. 375 § 1 (air quality) and 06-096 C.M.R. ch. 375 § 17 (control of odors).

More information regarding Site Law requirements can be found on DEP's website and in the Site Law application.

Special Provisions for Solar Energy Developments (38 M.R.S. § 484(11))

During the First Special Session of the 132nd Legislature, the Legislature amended the Site Law to prohibit construction of a solar energy development within 100 feet of a river, stream or brook. The prohibition does not apply to vegetation removal for shade management or road or utility crossings within 100 feet of a river, stream or brook. Notably, this Site Law prohibition is limited to solar energy developments and does not apply to other forms of development.

Application Process

The Site Law application process is robust. There are public notice requirements, required public informational meetings, and ample opportunity for the public and municipalities to provide comment throughout the DEP's review of the application. There is also an opportunity to request that the DEP hold a public hearing on an application. The DEP will hold a public hearing in those instances where it determines there is "credible conflicting information regarding a licensing criterion and it is likely that a public hearing will assist the Department in understanding the evidence." 06-096 C.M.R. ch. 2 § 7(C).

As part of its review, the DEP will solicit input from other state agencies such as the Maine Department of Inland Fisheries and Wildlife, Maine Natural Areas Program, and the Maine Historic Preservation Commission. DEP has internal staff expertise on stormwater management, solid waste, geology, and groundwater review. Depending on the extent of impacts and public interest, the DEP may hire third-party reviewers in areas such as sound and visual impact.

The processing timeline for a Site Law application for a solar project is 195 days (with a goal of 120 days) and for a battery storage project is 150 days (also with a goal of 120 days).

Interested parties may request a draft of a decision and are afforded an opportunity to provide comments on the draft decision prior to its issuance.

Natural Resources Protection Act

The Natural Resources Protection Act (NRPA) is the primary mechanism by which the state regulates impacts to certain protected natural resources. 38 M.R.S. §§ 480-A to 480-KK. As with Site Law, NRPA is administered by the DEP. If a solar development or battery storage project involves grading, filling, displacement of soil or other types of construction activities in, on, or over specified protected natural resources, the developer will be required to obtain a NRPA permit in addition to Site Law approval. Although the applicant must submit separate applications, the DEP order is a consolidated one that covers both Site Law and NRPA.

Regulated Natural Resources

NRPA regulated resources include the following:

- Coastal wetlands
- Coastal sand dune systems
- Great ponds
- Rivers, streams, or brooks
- Significant wildlife habitat (including significant vernal pool habitat; high and moderate value waterfowl and wading bird habitat; shoreland nesting, feeding and staging areas; habitat for endangered or threatened species; and mapped moderate and high value deer wintering areas)
- Fragile mountain areas
- Freshwater wetlands
- Community public water systems

Exempt Activities

The Maine Legislature has identified several activities that fall outside the scope of NRPA. Relevant to solar developments and battery storage projects, the following activities do not require a NRPA permit:

- Certain maintenance and repair of structures;
- Certain activities that alter less than 4,300 square feet of freshwater wetlands subject to other regulations or conditions; and,
- Cutting or clearing subject to mandatory shoreland zoning laws.

A comprehensive list of NRPA exemptions can be found here: Title 38, § 480-Q: Activities for which a permit is not required.

Permitting Pathways

For projects that require a NRPA permit, there are two permitting pathways depending on the activity: (1) permit-by-rule (PBR); and (2) individual permits.

Permit-By-Rule

The DEP has determined that certain activities in or near protected natural resources will not significantly affect the natural resource if carried out in accordance with certain standards. These qualifying activities are eligible for a PBR rather than an individual permit. If eligible for a PBR, the developer must provide the DEP with advanced notice of the activity and comply with the standards governing that activity. The following relevant activities are eligible for a NRPA PBR:

- Activities adjacent to certain protected natural resources, including, but not limited to coastal wetlands, great ponds, rivers, streams brooks, significant wildlife habitat contained in a freshwater wetland, and certain marsh vegetation areas;
- Replacement of certain existing permanent structures (excluding certain maintenance and repair activities, which are exempt from NRPA);
- Crossings (utility lines, pipes, and cables);
- Stream crossings (bridges, culverts, and fords);
- Certain activities in, on or over a significant or potentially vernal pool habitat as long as a set percentage of the critical terrestrial habitat (the 250-foot buffer around the vernal pool depression) remains forested; and,
- Certain clearing activities located in, on, or over high or moderate value inland waterfowl and wading bird habitat, including clearing for shade management.

A full list of PBR activities, and their requirements can be found here: 06-096 C.M.R. ch. 305.

Individual Permits

If an activity is subject to NRPA and is not eligible for a PBR, the project must apply for an individual NRPA permit. In assessing a NRPA permit, the DEP will evaluate the following:

- Whether the activity unreasonably interferes with existing scenic, aesthetic, recreational or navigational uses;
- Whether the activity will cause unreasonable soil erosion or sedimentation;
- Whether the activity would harm fisheries and other habitats;
- Whether the activity would interfere with the natural flow of any surface or subsurface waters;

- Whether the activity would negatively impact state water quality laws, including lowering the classification of any nearby waters;
- Whether the activity would unreasonably cause or increase flooding in the project area or adjacent properties; and
- If the activity crosses an outstanding river segment, whether the applicant has demonstrated no reasonable alternative.

For additional information see: 38 M.R.S. § 480-D; 06-096 C.M.R. ch. 315 (scenic and aesthetic uses); 06-096 C.M.R. ch. 335 (significant wildlife habitat); 06-096 C.M.R. ch. 342 (significant groundwater wells).

Permitting for Freshwater Wetlands

In addition to the individual permitting standards, the DEP has created a three-tiered NRPA permitting system for projects that are in or near freshwater wetlands. The application requirements increase with each tier, as do the processing timelines.

- Tier 1 review applies to projects that will have up to 15,000 square feet of impact to freshwater wetlands (certain higher value wetlands are not eligible for Tier 1 review).
- Tier 2 review applies to projects that will alter between 15,000 and up to 43,560 square feet (i.e., 1 acre) of freshwater wetland.
- Tier 3 review applies to projects that alter 43,560 square feet (i.e., 1 acre) or more of freshwater wetland.

For all wetland alteration permits the applicant must demonstrate that they have avoided and minimized impacts to the greatest extent practicable. Additionally, if the alteration causes a loss or degradation of the functions and values of the wetland, compensation is usually required. The applicant may make an in-lieu fee payment to compensate for impacts to wetlands or conserve existing wetlands (or improve degraded wetlands) to offset project impacts.

For additional information on freshwater wetland impacts see NRPA Application Packet and 06-096 C.M.R. ch. 310 (wetland and waterbody impacts).

Of particular note for solar projects is a change in DEP practice regarding wetland compensation requirements. The DEP requires compensation for the filling of wetlands above a certain threshold. Historically, wetland conversion impacts, such as clearing of vegetation that converts a forested wetland to a scrub/shrub wetland, did not require compensation. These impacts were relatively common along transmission rights-of-way to ensure that vegetation did not interfere with electrical lines. Because this type of clearing

activity did not adversely impact the functions and values of the wetland, DEP did not require compensation.

With the significant increase in solar development in the state, there was also an increase in wetland conversion impacts. These conversion impacts occur when forested wetlands are converted to scrub/shrub for shade management as well as conversion of forested or scrub/shrub wetlands to wet meadow in areas where panels are installed. The DEP concluded that these impacts were degrading the functions and values of the wetland complexes and therefore issued guidance on compensation requirements for conversion impacts.

Although compensation amounts are based on a site-specific functional assessment, in general, conversion impacts in excess of 15,000 square feet now require compensation at 50% of the amount that is required for filling a wetland. Conversion impacts associated with traditional linear portions of a project, such as electrical lines, may be subject to a reduced compensation requirement.

For additional information see DEP In-Lieu Fee Fact Sheet and DEP Wetland Conversion Guidance.

Finally, wetlands of special significance (WOSS), which include freshwater wetlands that contain significant wildlife habitat (such as IWWH or vernal pools) or are within 25-feet of a stream, are subject to additional restrictions and limitations. Neither battery storage nor solar panels are currently allowed in a WOSS. Utility lines and roads are allowed, upon a showing that there is no practicable alternative. *See generally* 06-096 C.M.R. ch. 310 §§ 4 and 5.A.

Stormwater and Erosion and Sedimentation Control Requirements

Maine law requires that persons who conduct construction activities that involve displacing or exposing soil or other earthen material take appropriate steps to prevent unreasonable erosion of soil or sediment beyond the project site or into protection natural resources. 38 M.R.S. § 420-C. Maine law also requires that any person who constructs a project that includes 1 acre or more of disturbed area obtain a stormwater management permit prior to start of construction. 38 M.R.S. § 420-D.

As part of its stormwater management law the DEP has implemented detailed stormwater management requirements that include basic standards (that apply to all projects), general standards (that detail various treatment levels), phosphorus standards (that apply in certain lake watersheds), urban impaired standards (that apply in impaired areas), and flooding standard (that applies when certain thresholds are exceeded).

For projects that require a Site Law permit, the stormwater and erosion and sedimentation control requirements are addressed as part of the Site Law permit and no separate stormwater permit is required. Projects that are not subject to Site Law, however, must obtain a stormwater permit if they disturb 1 or more acres.

There is a PBR option for projects with minimal impacts (less than 5 acres of developed area, and less than 20,000 square feet of impervious area in more sensitive watersheds, or less than 1 acre of impervious area in other watersheds). The PBR requires compliance with erosion and sedimentation control and housekeeping requirements. Projects that do not qualify for the PBR must obtain an individual stormwater permit and demonstrate compliance with all applicable standards.

The stormwater management law standards and permitting requirements can be found here: 06-096 C.M.R. chs. 500, 501 and 502.

Maine Construction General Permit

The Maine Construction General Permit (MCGP), also administered by the DEP, authorizes the direct discharge of stormwater associated with construction activities that includes 1 acre or more of disturbed area (area that has been stripped, graded, grubbed, filled, or excavated). This is a federal program under the Clean Water Act that has been delegated to the state of Maine. It therefore applies in addition to state permits addressing stormwater discharges.

Prior to engaging in construction activities, projects must submit a notice of intent to comply with the permit, along with a site map, Inland Fisheries & Wildlife approval, if appropriate, and a stormwater pollution prevention plan (SWPPP). The SWPPP in turn must include an erosion and sedimentation control plan, inspection and maintenance plan for control measures, and housekeeping measures to address dust, debris, and other materials. If the project is a "Large Construction Activity" (5 or more acres), it must comply with additional requirements including a hiring a contractor certified by the DEP in erosion control practices, having a resident inspector also certified in erosion control practices, storing certain amounts of mulch on site, and complying with certain record keeping requirements.

Many of the MCGP requirements overlap with the Site Law and state stormwater requirements. Importantly, however, the MCGP requirements apply to all projects that disturb 1 acre or more. Thus, even if a project does not trigger the Site Law, compliance with the MCGP will ensure that construction impacts, particularly related to erosion and sedimentation and stormwater, are adequately controlled.

For more information see: 2025 MCGP; 2025 MCGP Appendices

Solar Agricultural Rule

The Maine Department of Agriculture, Conservation and Forestry issued final rules on Permitting Solar Energy Developments on High Value-Agricultural Land, with an effective date of April 20, 2025 (the "Solar Agricultural Rule"). The Solar Agricultural Rule establishes permitting and compensation requirements for solar energy developments located on high-value agricultural land. The rule defines high-value agricultural land (HVAL), establishes tiers of value with variable compensation amounts depending on the value and extent of impacts to such land, defines dual-use agricultural and solar production and establishes credits for and monitoring and reporting requirements for obtaining credits for such dual use, and creates a permitting process for projects located on HVAL.

Applicability

The Solar Agricultural Rule applies to solar energy developments that occupy an area of five acres or more and are wholly or partially on HVAL. HVAL is land that has physical attributes that indicate high suitability for agriculture, including 1 or more contiguous acres of land that constitute field-surveyed prime farmland or farmland of statewide importance and blueberry barrens. It excludes forest land, certain contaminated lands, and areas with built infrastructure such as roads and other alterations that make the land unfit for agricultural purposes.

A permit is required for projects that start construction after the effective date of the rule, except that projects which had site control prior to September 1, 2024, are exempt from the rule. Site control includes ownership, leasehold or easement interests, options to acquire a license, leasehold, or easement interest, as well as filed applications.

Permitting Process

For projects under 20 acres, there is a streamlined permit by rule process. For projects 20 acres and above, an individual permit is required. The permit application requires a demonstration that impacts to HVAL have been avoided or minimized to the extent practicable and, for projects requiring an individual permit, compensation for impacts to HVAL. Even if a project fails to demonstrate that it has avoided and minimized impacts to HVAL to the maximum extent practicable, it may pay an increased fee (110% of the otherwise calculated amount) in lieu of issuance of a permit denial.

The compensation ratios differ from a low of 0.5 to 1.0 per acre of impact to 2.0 to 1.0 per acre of impact, depending on the value of the HVAL (prime farmland, farmland of statewide

importance, and blueberry barrens), whether the land meets the definition of “active farmland”, varying discounts for dual use that accommodates continued agricultural use, and assessment of the impact of the project on “farm viability”.

A higher compensation ratio of 8.0 to 1.0 per acre of impact applies to projects that are in one of top six counties facing high conversion pressure but only if the land is either prime farmland or farmland of statewide significance, is in active farmland, the project is not engaged in certain dual use activities, and the land occupies more than 20% of the farm operation land. There is also an option to pay a higher mitigation ratio and avoid the requirement to conduct a field-based survey and other application requirements.

The permitting process is administered by the Department of Agriculture, Conservation and Forestry but the DEP is responsible for implementing the mitigation requirements, including calculating and collecting compensation fees.

More information, including referenced guidance material, is available on the Maine DACF Solar Siting Resource Hub.

Fire Safety Code

The State of Maine has adopted the 2018 edition of the Uniform Fire Code created by the National Fire Protection Association (NFPA). Chapter 52 of the Uniform Fire Code governs energy storage systems and requires certain fire safety features for battery storage facilities depending on the type and location of the batteries.

Some of the safety features addressed by the Uniform Fire Code include, but are not limited to, venting; spill control; temperature-control; proper signage; and automatic smoke detection. The Code also sets forth certain location and building requirements to ensure adequate fire department access and separation of battery storage locations from other areas of the building. The Code further specifies maximum allowable quantities of batteries and the appropriate distance between battery arrays and requires a hazard mitigation analysis if a battery storage project uses battery technology that is not specifically identified in the Code.

NFPA 855 2026 is a recent and more comprehensive standard for installation of stationary energy storage systems and reflects minimum requirements for mitigating hazards associated with battery energy storage systems. While not formally adopted by the state, NFPA 855 serves as a useful tool for how best to design, and manage risks associated with, battery storage systems.

For more information see: 16-219 C.M.R. ch. 3 § 1; NPFA #1, Uniform Fire Code, Chapter 52; NFPA 855 2026.

National Electric Code

The State of Maine adopted the 2020 edition of the National Electric Code, National Fire Protection Association Standard #70, which governs the safe installation, removal, and use of electricity. In addition to providing general electrical safety standards, Article 706 of the Code provides standards for certain energy storage systems with a capacity greater than 1 kilowatt hour. Specifically, this section mandates certain installation, maintenance, and circuit requirements for these types of energy storage systems.

For more information see: 02-318 C.M.R. ch. 120 § 1; NFPA #70, National Electric Code.

Solar and Battery Storage Decommissioning Standards

Maine implemented decommissioning requirements for ground-mounted solar projects that occupy 3 or more acres and battery storage projects with a capacity of 2 or more megawatts. 35-A M.R.S. §§ 3491-3499. The decommissioning plan must address the physical removal of all components of the project to a depth of at least 24 inches or to the depth of bedrock along with the regrading and revegetation of all disturbed areas. If the property was classified as farmland any time within the proceeding 5 years, removal to 48 inches or to the depth of bedrock is required, and the decommissioning plan must also address restoration methods that will support the resumption of farming or agricultural activities at the property. Finally, the developer must include in its decommissioning plan evidence of financial capacity to fully fund the decommissioning. This can be in the form of a performance or surety bond or letter of credit, and it must be updated after 15 years and then every 5 years thereafter.

The DEP typically required decommissioning of solar projects that triggered the Site Law. This decommissioning law ensures that even smaller solar and battery storage projects that do not trigger Site Law are subject to these same decommissioning requirements.

Federal Programs

In addition to state law, there are several federal laws and regulations that may apply to solar developments and/or battery storage projects depending on the specifics of the project.

United States Army Corps of Engineers (USACE) Section 404 Permitting

The New England District of USACE issues permits under Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material into "Waters of the United States." Waters of the United States includes wetlands and streams that meet certain definitions, although the specifics of which wetlands constitute waters of the United States has been the subject of litigation for many years and remains somewhat unsettled.

The foundations for solar projects (pilings) and electrical line poles are not fill and do not typically require a Section 404 permit as long as they can be installed without creating additional impacts to the wetland (e.g., by direct embed or other appropriate methods). Likewise, the cutting of above-ground vegetation does not by itself trigger the requirement to obtain a Section 404 permit as long as there is no stumping, grading or other construction impacts that cause material to be redeposited in the wetland. *E.g.*, 33 C.F.R. § 323.2 (definitions of discharge of dredged material and discharge of fill material) and § 323.3(c)(2) (pilings). The use of timber mats to minimize construction impacts is considered fill and is therefore a regulated impact.

Currently, there are two types of USACE permits in Maine: (1) general permit; and (2) an individual permit. New England is in the process of transitioning from use of the so-called general permit to the nationwide permit program. The new Maine regional general permit, issued November 2025, aligns with the proposed new nationwide permits that will take effect in March 2026. Although there are differences in the extent of coverage, jurisdictional thresholds, and eligibility criteria, the nationwide permit program functions similarly to the general permit program in that smaller impacts associated with identified activities that meet the eligibility criteria are authorized pursuant to a more streamlined process and without having to obtain an individual permit.

The USACE review process includes required consultation with (i) the U.S Fish and Wildlife Service to evaluate potential impacts of the project on listed species or habitat pursuant to Section 7 of the Endangered Species Act, as well as (ii) the State Historic Preservation Officer or Tribal Historic Preservation Officer to evaluate the effect of the project on historic properties pursuant to Section 106 of the National Historic Preservation Act.

For more information on the current Maine Regional General Permit see: 2025-2030 Maine Regional General Permit

Federal Aviation Administration (FAA)

In 2013, the FAA issued an interim policy to address glint and glare impacts from solar panels on aviation safety. The initial policy addressed glint and glare effects from solar

projects both on airport property and in the vicinity of a pilot's final airport approach. A revised policy was issued in 2021 that narrowed the scope of the policy to solar projects at federally-obligated (federally funded) towered airports. 86 Fed. Reg. 25801 (May 11, 2021).

Initially, FAA believed that solar panels could introduce novel glint and glare effects to pilots but subsequently concluded that in most cases the effect was similar to what pilots experience from water bodies, buildings with glass facades, and similar features. Accordingly, the final policy is focused on ocular impacts on air traffic control personnel, and the policy does not apply to airports that (1) do not have an air traffic control tower, (2) are not federally-obligated, or (3) solar projects not located on airport property. Although the policy does not apply to these three categories of projects, the policy nonetheless encourages projects located near airport property to consider ocular impacts from the solar array and coordinate with local airports as appropriate.

For additional information on the FAA's policy see: Federal Aviation Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports.

Potential adverse impacts associated with solar projects not located near or on airports is minimal. Nonetheless, it is good practice to coordinate with the FAA, particularly for larger projects. Projects may utilize FAA's Notice Criteria Tool, which is an on-line tool to determine whether there is a requirement to file notice with the FAA. The project inputs information on the longitude, latitude, horizontal datum, site elevation and proposed structure height to determine whether further action with the FAA is required to evaluate potential hazards to air safety. For more information on the Notice Criteria Tool see: https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm

If notice is required the project submits the required information to the FAA, which in turn conducts an aeronautical study. One of three responses is typically issued: determination of no hazard (construction does not exceed obstruction standards and no lighting is required); determination of no hazard with conditions (mitigating measures such as marking and lighting are required); or determination of hazard (the structure/construction presents a hazard to air navigation).

Spill Prevention Control and Countermeasures Plan (SPCC)

A solar development or battery storage facility may also be required to comply with the Spill Prevention Control and Countermeasure Plan (SPCC) requirements pursuant to the federal Clean Water Act. The SPCC obligation applies to facilities that meet the following criteria:

- The facility stores, transfers, uses or consumes oil or oil products (this includes diesel fuel, gasoline, hydraulic oil, etc.);
- In the aggregate, the facility stores more than 1,320 gallons of oil or oil products in above-ground containers (only includes containers with 55+ gallon storage capacity) or, in the aggregate, more than 42,000 gallons in completely buried storage tanks; and
- The facility could have a "reasonable expectation of an oil discharge" to navigable waters in quantities that would be harmful. This is determined by considering the proximity of the facility to nearby waters and or features that could transport oil or oil products to nearby waters.

If a facility meets these criteria, it is required to create a Tier I or Tier II SPCC, depending on the volume of oil or oil products stored. At a high-level, an SPCC must contain the following:

- Provide a facility diagram that identifies the location and contents of each storage container containing oil or oil product, discharge prevention measures for routine handling of products; discharge and drainage controls and secondary containment; countermeasures for discovery, response, and cleanup; and methods of disposing of recovered materials;
- Procedures for reporting discharges;
- Identify any equipment with reasonable potential for failure;
- Provide containment and/or equipment to prevent a discharge or failure;
- Conduct any tests according to facility procedures;
- Train oil-handing personnel on discharge protocols and contents of SPCC; and
- Describe efforts to secure and control access to oil handling, processing, and storage areas.

For more information see: Spill Prevention, Control, and Countermeasure (SPCC) for the Upstream (Oil Exploration and Production) Sector | US EPA; 40 CFR Part 112