MAINE SCHOOL ENERGY PROJECTS GETTING STARTED GUIDE

SOLAR POWER

Scan the QR code to access the Getting Started Guide series and a full list of resources.

Why Install Solar?

Powering schools with solar energy ensures using a cleaner and more sustainable energy source. Utilizing solar energy provides numerous benefits.

Clean Energy

Solar panels don't generate greenhouse gas emissions while providing electricity to schools. They also harness energy from the sun, which is essentially a limitless energy source.

Resilience

Solar systems allow buildings to function independently during grid outages when the panels are generating electricity. Adding a storage mechanism enables the building to operate off-grid when sunlight is insufficient.

SOLAR FOR EMERGENCY POWER

To be able to use solar in the event of an outage, the array needs an electric device called an Automatic Transfer Switch (ATS). Schools should work with an electrician and electric provider to ensure their solar system can safely function as an emergency power source.

Low-Cost Electricity

Even though solar-powered systems require an initial investment, the energy they produce is free. District energy costs will be reduced, and the money saved can be invested back into the school.

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Maine Department of Education

GOVERNOR'S OFFICE OF Policy Innovation and the Future

Leadership

Solar panels are noticeable features on a school building, which fosters community pride and communicates that the district is committed to a clean, sustainable, energy-independent future.

Educational Opportunities

Solar panels offer valuable opportunities for students to have hands-on experiences and to gain a deeper understanding of sustainability topics. By integrating renewable energy into the curriculum, students are exposed to real-world applications of science, technology, engineering, and math (STEM) concepts. This exposure can also inspire students to pursue careers in solar development and installation.

STUDENT ENGAGEMENT

- Students can monitor and analyze the energy production and emissions saved from solar to learn about energy use.
- The National Renewable Energy Laboratory (NREL) PVWatts calculator or Google's Project Sunroof can be used to estimate solar performance.
- Field trips to solar installations allow students to learn about renewable energy.

Solar in Maine Schools

Students can be advocates for solar installations in their district. After a two-year student-led campaign, the board of **Portland Public Schools** approved a 3,500-kW off-site solar project. This project was estimated to save $50,000 annually in energy costs and provide 60% to 80% of the district's energy. The district's three high schools formed the SolaRISE Portland campaign to spread awareness and raise money for the project, collecting over $25,000.[1]

A 1-megawatt community solar farm (pictured below) was installed on the roof of the field house at **Foxcroft Academy**. This farm, which offsets over 1,200 metric tons of carbon dioxide annually, provides energy for Foxcroft Academy and the local public school district, RSU 68. Approximately 500 students, educators, community members, and government officials attended the project's celebration event.[2]

Lamoine Consolidated School installed solar on their roof via a Power Purchase Agreement (PPA). The array is expected to generate 160,000 kilowatt-hours of energy and offset around 71 metric tons of carbon dioxide each year. Over the array's 40-year lifespan, it is predicted to save the town $600,000 in energy costs. The panels provide energy for heating, cooling, and lighting the school.[3] Additionally, the energy production and carbon emissions saved are available on their tracking website. This site can be used in the classroom to engage students with data analysis and monitoring activities.

In 2017, a **Mount Desert Island High School (MDIHS)** senior initiated a conversation around solar that would lead to the 2019 installation of an array designed to cover 100% of the school's electrical needs. Funded via a PPA, the solar array is projected to produce 510,000 kilowatt-hours of electricity per year. Students appealed to decision makers with a demonstrated potential cost savings of more than $1.46M over 25 years, and the reduction of carbon dioxide emissions by approximately 252 tons per year.[4]

STATE SOLAR MAP

Generation 180 offers an Interactive map of Maine schools with solar.

As of July 2025, 40 schools have solar installations of some kind.

Solar Purchasing Options

Direct Ownership

The school/district pays for the full cost of the panels and installation, owning the system outright. This method requires a large upfront investment, which may be offset by tax credits or grants. The school is also responsible for maintenance and repairs.

Community Solar

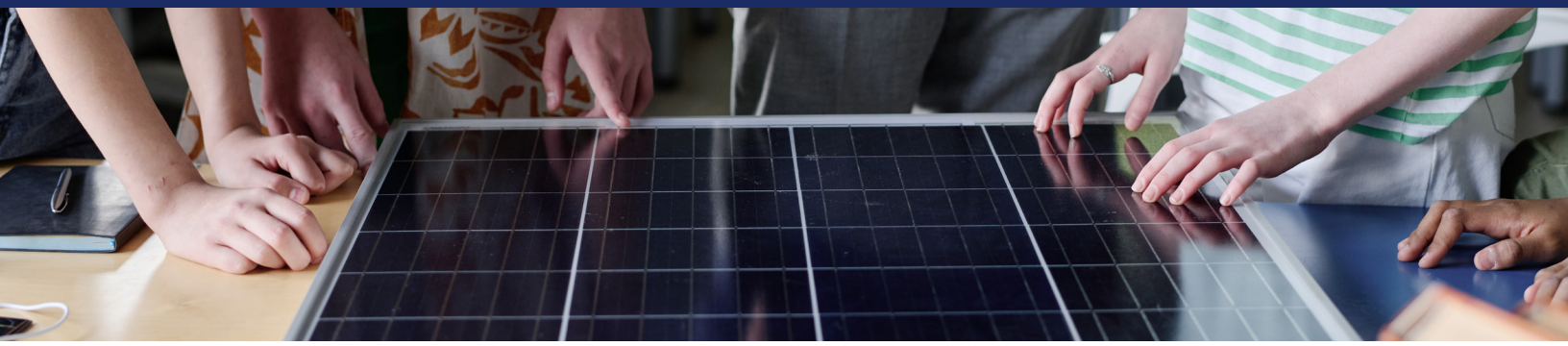
Multiple customers purchase a share of electricity from a solar array, allowing them access to green energy even if they can't install it on their own property. The customers don't pay for the panels, installation, or maintenance and are able to purchase electricity at a reduced price, which is typically fixed for a specified term.

COMMUNITY SOLAR RESOURCES

- Governor's Energy Office
- Maine Office of the Public Advocate

Power Purchase Agreement (PPA)

A third party owns, develops, and maintains a solar system on school property. The third party sells the power back to the school at a pre-determined, fixed price, usually lower than the utility price. Many schools prefer to use PPAs because they are excellent opportunities for schools to utilize on-site solar with minimal upfront cost.



Planning for Solar

Prior to installing solar power, schools should be aware of the following:

Space and Structural Integrity

Solar panels can be installed on either the roof or the ground, but there should be adequate space wherever they are placed. As a general guideline, one kilowatt of solar panels requires 100 square feet of space. Additionally, panel performance is optimized if they are unshaded and facing south. A solar vendor should be able to size the system to meet a school's needs. If the panels are roof mounted, the roof needs to be able to support the system's weight and allow easy access for maintenance. A professional should be hired to inspect the roof prior to installation.

Electrical System

If the solar system is directly connected to the building's electrical panel, the panel must be adequately sized to accommodate the additional power generated by solar. If it is too small, the school may need to upgrade the panel or add a subpanel.

Storage

Combining solar with a battery for energy storage improves the building's resilience in the event of a power outage and reduces its reliance on the grid. However, batteries have high upfront costs and limited storage capacity, so the school should consult with their vendor to decide if storage is a viable option.

Financial Resources

Net Energy Billing

Net Energy Billing is the state's solar policy that allows customers to receive electricity bill credits by sending excess energy back to the grid. These credits can be applied to current or future energy bills. There are two different Net Energy Billing programs available: kWh Credit Program and Tariff Rate Program.

Community Resilience Partnership

The Community Resilience Partnership offers grants and technical support to help Maine municipalities and tribal governments lower greenhouse gas emissions, shift to clean energy, and strengthen their resilience to climate change impacts. Schools can partner with their municipality or tribal government to enter into a PPA for a solar array, as Lamoine Consolidated School did in 2023.

Finding a Vendor

- Prior to selecting an installer, Efficiency Maine recommends obtaining quotes from at least three different Registered Vendors.
- Schools can consult EnergySage to read reviews on Maine solar companies.
- Electrical utilities may also be able to provide information on qualified installers.

RFP EXAMPLE

Lamoine Consolidated School released the Request for Proposal used for their solar PPA.

Additional Guidance

- SolaRISE Portland and students from Mount Desert Island High School offer resources for students leading solar initiatives.
- The Governor's Energy Office provides resources and information on solar in Maine.
- The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Advanced Energy Design Guide for K-12 School Buildings provides guidance on planning for renewable energy.
- Generation180's Brighter Future report provides financial and general information on solar in schools.
- The Maine Office of the Public Advocate provides information on community solar in Maine.

Sources

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