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Solar energy on the farm

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Introduction

Sheep graze under solar panels
Source: Maine Farmland Trust

Solar energy production accounts for less than one percent of energy produced in Maine, but nonetheless, the number of agricultural solar projects in the state is growing (ix, xi). While Maine currently lacks policies that encourage solar installations, such as tax credits and rebates, the next state administration could implement such policies, further resulting in an increase in the number of solar projects. The installation of commercial-scale solar projects is particularly attractive to farmers as it offers diversified income that protects against the unpredictable nature of farming. The Maine Legislature should consider adopting policies around the use of large-scale solar farms on agricultural lands before the installation of solar projects threatens the use of farmland for food production. The stringency of these regulations should consider the economic realities of farming in Maine while preventing the loss of farmland to solar energy production.

Solar farming and agriculture

Increasing cost of electricity from nonrenewable fuel sources and decreasing costs for solar equipment in the last five years has meant that the popularity of residential and commercial solar projects is growing in the U.S. (vi). Farms, in particular, are vulnerable to solar energy project development, as farmland is ideal for solar installation—it's typically easy to access, is already cleared, and is usually relatively flat (viii). Solar developers are leasing farmland for large-scale solar projects and paying farmers rates well above the value of the commodities grown and agricultural rental income (i).

Solar energy production has long been used to offset energy costs on farms. Historically, cost has been a deterrent, as solar energy is more expensive than fuel from nonrenewable sources due to the high price of equipment installation. But the cost of solar energy infrastructure has come down in recent years due to USDA loan and grant programs that offset costs (viii). Farmers may use a solar panel to generate power for a variety of tasks, such as "…lighting, ventilation, refrigeration, water/space heating, pumping, and fanning for aeration and crop drying" (xi). Compared to fuel from nonrenewable sources, solar energy is safer to handle, quieter, doesn't produce noxious fumes, requires less maintenance, and is free once savings offset the cost of installation (xi). Communities benefit from farmers using renewable energy sources as its use decreases greenhouse gas emissions and reduces the noise and smell associated with farm work than can affect rural quality of life and property values. Because of these benefits, legislators may want to consider adopting policies that encourage the use of small-scale solar energy systems in agricultural operations.

However, as the market for large-scale solar installation grows, conflicts between farmers and communities over the size and location of these projects can occur. In states such as

California and North Carolina, ranked first and second in the amount of solar energy produced in the U.S., solar developers lease land from farmers and install free-standing solar panels on acres of farmland (i, vii). Other farmers install solar panels and sell shares to member-owners who receive an energy credit from the energy produced on the farm (vi). Farmers benefit from this steady stream of income, offsetting potential losses due to weather, market fluctuations, and increasing labor costs. But communities are at risk of losing viable farmland if solar development is left unchecked. Municipalities may also be negatively affected if farms are benefiting from a current use tax that lowers tax rates for farmland (iii). Legislators need to decide if farmland used for commercial development like a solar farm would be remain eligible for tax breaks. The challenge for state legislatures comes in supporting farmers by making alternative means of energy production and income possible while ensuring that farmland is not lost to commercial development.

Policy implications

The use of small-scale solar energy systems on farms helps to promote the viability of agriculture by decreasing energy costs, greenhouse gas emissions, and health and safety risks. Policies such as tax credits and net metering will encourage the development of solar energy as an alternative to nonrenewable fuel sources. However, the increase of commercial solar energy installations on farmland has prompted state legislatures around the country to develop varying degrees of restrictions on the use of solar panels on farms. The strictest policies may prohibit the installation of commercial solar projects in rural areas altogether, while others may prohibit large solar panel installations on land enrolled in agricultural conservation programs (x).

But in order to allow farmers to access valuable forms of additional income, many communities decide instead to establish restrictions on the size and location of solar panels on farmland. Typically, solar companies and municipalities recommend installing solar panels on the least desirable piece of land on a property or in a community, like brownfields or areas that cannot be developed for commercial or residential use (v). In the case of farmland, farmers are advised to select locations that are difficult to farm due to soil structure or incline to use as solar sites (vii). Municipalities may choose to formalize these recommendations into zoning restrictions that prohibit solar panels on prime farmlands as established by the use of soil surveys and GIS maps (ii, iv).

Opponents of solar development on farmland are concerned about the impact of commercial development on municipalities' tax base. Many farmers benefit from a current use tax program, and some policymakers have decided the development of farmland for solar projects impacts the eligibility for these programs (iii). However, in order to encourage the use of renewable energy sources on farms, regulations can provide an exemption for solar projects where a majority percentage of energy generated is used on-site (x).

Legislators may also decide to require that farms installing large solar projects limit the number of acres committed to solar installations or that the project take up no more than a certain percentage of the property (typically less than 50%) (x). Exemptions may be granted to this regulation if the solar panels are structured in a way such that the land is still viable for an agricultural use, like livestock grazing or crop cultivation (iii). Additionally, the installation of solar panels may be subject to local regulations on the panel's height, location, and access for fire and power crews (i). With careful regulation, the Maine state legislature can support farms' interest in solar development without sacrificing the use of farmland for food production.

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