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Solar Siting on Agricultural Land: Should solar be a diversification tool for Maine farmers?

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Policy Brief

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Summary Solar energy systems are rapidly expanding across the United States. This expansion is also occurring on agricultural land, raising concerns regarding the loss of prime cropland and dangers to biodiversity (1, 2). However, benefits of solar siting on agricultural land include financial stability for farmers (1), reductions in greenhouse gas emissions (3), and the possibility of siting on unsuitable agricultural land (4, 5). As solar energy system installations expand, it is recommended that the state of Maine consider best management practices and policy considerations and create a policy that protects prime farmland while also providing farmers with diversification opportunities.

Introduction Solar energy systems, installations that produce energy through capturing the sun's thermal energy or photons, are rapidly spreading throughout the United States as production costs decrease and the need to mitigate climate change increases (4, 6, 2). As the solar energy sector grows, agricultural land is increasingly being used to site the solar installations (1). This trend is controversial, with voices on either side of the issue highlighting the importance of agricultural land and the economic stability of farmers (1). In acknowledgment of these concerns, and the estimation that solar capacity is expected to triple within the next five years, the state of Maine should prepare for the political, cultural, and economic struggles that may arise (1). Decision-making regarding the use of agricultural land for solar siting will demand a review of key concerns and benefits to the proposition, as well as best management practices and policy considerations.

Concerns for Using Agricultural Land for Solar Siting

Loss of crops In some instances, agricultural land is being taken out of crop production and replaced with solar energy systems (1). Reductions in prime agricultural land is a possible concern for the food security of both regional and global food systems, especially as the population continues to grow (7).

Land use change Solar energy system installations have the potential to decrease biodiversity and harm the ecological value of the land (2, 4). If solar energy is to be delivered off-site, the construction of transmission lines may also alter nearby farmland (5).

Source: http://www.agrisk.umd.edu/blog/landowners-need-to-do-background-research-before-entering-into-a-solar-energy-lease

Benefits to Using Agricultural Land for Solar Siting

Financial stability Solar siting has the potential to allow farmers to diversify their agricultural land, potentially taking on less risk and bringing in a higher income (1). Electricity costs can be offset through on-site energy use. In 2009, farmers that produced energy on-site saved an average of $2,406 on utility bills (8). The energy can also be sold off-site to generate income (1). Additionally, solar energy systems can be

affordable, long-term energy suppliers. Installation is supported through governmental programs (reducing the share of the cost to 70-80% of the project for the farmer), while maintenance is typically rare and low-cost (3).

Movement towards cleaner energy Solar energy systems are known to decrease the use of gas, diesel, and wood energy sources, ultimately reducing greenhouse gas emissions and pollution (3).

Use of unsuitable agricultural land Solar energy systems can be sited on farmland that is unable to produce crops, such as areas adjacent to or on top of barns, parking lots, distribution centers, and spent farmland (4, 5). The system may also be elevated off the ground, allowing livestock to still graze on the land below (9).

Source: http://www.discoverenergy.co.uk/agriculture

Best Management Practices for Solar Siting on Agricultural Land

Appropriate site selection The solar energy system should be sited on land unsuitable for agriculture (4), where biodiversity will be least affected (10), and, ideally, located near a transmission line (11).

Measurements considered Prior to a solar energy system installation, the land should be tested for number of hours and amount of sun exposure and temperature (11). The system should also be installed oriented towards the greatest exposure of the sun's radiation (for further instructions, please see reference 3).

Engage the community Engagement of the community allows for support of the construction (11), and subsequent use, of the system.

Policy Considerations Decisions regarding solar siting on agricultural land will require significant consideration. A starting point for some states has included drawing a distinction between what is seen as proper (solar systems used for on-site, farm-related energy) versus improper (solar systems on agricultural land, for energy to be taken off-site) agricultural solar siting (12). Other considerations include ensuring adequate land is kept in traditional crop production (2), incentivizing the protection of biodiversity (2), preventing solar leasing of farmland that may drive up farmland rent (13), removing land used for solar installations out of current use programs (9), restricting the placement of panels on prime cropland (9), performing an alternative analysis prior to siting on agricultural land (13), and limiting the size of the solar installation (13). While use of some of these considerations may impact the diversification possibilities of Maine farmers, it is hoped that a state policy will ultimately streamline the process and reduce future, negative impacts on financial returns to farmers (2).

Recommendations Given the exponential growth seen in solar energy system installations on agricultural land, the state of Maine should be prepared. An effective state policy should consider the concerns, benefits, and best management practices of using agricultural land for solar siting, as outlined in this brief. A state policy dedicated to the issue should prevent prime farmland from being taken out of crop production, be sited on land unsuitable for crop or livestock, and create precautions for damaging biodiversity. A state policy dedicated to the issue can protect prime agricultural land across the state, while also ensuring the success of farmers and the state's renewable energy sector.

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