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A Contested Domain: Implications for solar farming on agricultural land

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Policy Brief

A CONTESTED DOMAIN: IMPLICATIONS FOR SOLAR FARMING ON AGRICULUTRAL LAND

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Background:

Among policy issues, an area of contestation revolves around the use of agricultural land for solar farming. Solar energy offers a clean, renewable alternative to fossil fuels. Initiatives at both the state and federal levels have sought to develop clean energy sources. The 2014 US Farm Bill currently allocates $800 million, in part, for such endeavors (Borchers, Xiarchos, & Beckman, 2014). Tangentially, states have made efforts to reduce their carbon footprint. Maine's 38 MRSA §576 sets a medium-term bench mark, seeking to reduce greenhouse gas emissions to 10% below 1990 levels by 2020 (Maine Department of Environmental Protection, n.d). Concurrently, the state remains a party to the collaborative Regional Gas Initiative, a multi-state agreement to cut power plant emissions by 30% or more from 2020-2030 (Turkel, 2017). Lastly, Maine's (2015) Comprehensive Energy Plan proposed incentives for residential and small commercial users of solar and wind power. Policy makers, however, are questioning the implications of diverting agricultural land to solar development. In short, what are the benefits to farmers, consumers, and the environment? What are the costs? Should Maine adopt a policy encouraging solar development on farm lands?

Benefits

Advocates for solar farming include a myriad of policy analysts, farmers, business owners, and developers. For farmers, leasing land for solar development is accompanied by a host of benefits. Farmers operate at considerably small profit margins. Market volatility coupled with environmental factors, e.g., floods, droughts, pests, engender a sense of precarity in the agriculture sector. The additional income received from such ventures provides a reliable supplement for farmers (Janke, 2010). Furthermore, solar energy may reduce production costs, in addition to serving as a viable way to market to the sustainably-minded demographic (Cline, 2008). Lastly, some operations, for example, sheep farmers in the UK, have taken advantage of economies of scope by using the same piece of land for two different activities. These farmers have enjoyed the added income gained from farming solar with minimal disruption (Mathiesen, 2014).

Another benefit surrounds land use. Many places are off limits to solar development. Wet lands, mountainous regions, and reserves are among restricted areas. In addition, these developments cannot be within proximity to transmission lines and other forms of infrastructure. Recent studies have found that solar development in the U.S. will require an area equivalent to that of Connecticut (Hernandez, Hoffacker, Murphy-Mariscal, Wu & Allen, 2015). Given the paucity of land, advocates, suggest that farms serve a favorable site for solar as the land is already cultivated.

The environmental benefits attributed to solar energy remain a central factor for development. States seeking to curb greenhouse gas emissions, find renewable resources such as solar or wind power as a feasible alternative to fossil fuels. Proponents suggest solar as a win-win scenario, providing a needed power source while stemming emissions.

Finally, solar farming can lead to job growth. According to the U.S. Department of Energy's (2017) report, solar firms employed 374,000 workers marking a 25% increase from 2015 to 2016. Work aided by solar development includes manufacturing, construction, and installation activities (Popovich, 2017).

Challenges

Developing solar infrastructure on agricultural land is not without challenges. Maine, as with all other states, levies preferential tax treatment on farm lands (Kuethe & Sherrick, 2014). The state's Use Value Assessment pairs tax rates to earnings derived from farm production, representing a mode of tax relief for farmers.[1] The loss of agricultural land to commercial endeavors, may provide an added tax burden for farmers.

Food insecurity remains another focal point for concern. Farmers often profit more from renting land for solar development than for food production (Ryan, 2016). As farmers divert land from food to power, critics express caution over the effect the trend will have on the nation's food supply.

Homeowners often express trepidation over the effect of solar development on property values. Few empirical studies have been devoted to this relationship, but the NIMBY mentality may have an adverse effect.

Lastly, community members elicit concern over externalities such as glare, noise pollution, and electromagnetic fields associated with solar installations (Day, 2016). Whether real or imagined, such concerns may yield palpable effects as homeowners choose to relocate from areas dedicated to solar use. This pattern may merit loss of tax receipts and increased vacancy rates serving a drain on local coffers.

Discussion/ Policy Implications

The development of solar energy on agricultural land is accompanied by an array of benefits as well as challenges. In addition to fostering job creation, solar development provides additional income to farmers, increased tax revenues, and a clean, renewable source of energy. Yet, cultivating land for solar development may adversely affect the food supply, property values, and impose a tax burden on farmers. These issues are nested under the broader context of changing financial incentives and a mosaic of state regulations. This makes measurement challenging but not impossible. Given this, decisions for a state-led policy should be informed by empirical evidence, case studies, and hard data. Maine can look to other states, such as California, to provide a template, gaining insights into the benefits and drawbacks (Hernandez et al., 2015). Questions of food security may be corrected through a state policy ensuring that farms using solar produce at a specific percentage of previous capacity. Incentives, whether they be tax-based or not, should carefully measure the effects and respond accordingly. Lastly, other alternatives such as wind, may prove more suitable. In sum, each side of the debate must be scrutinized, leveraging empirical evidence. Questions to consider are: how much should the state incentivize development? What regulations can prevent losses in food production? And, do unforeseen consequences result?

[1] See Maine's *Farmland Tax Law* http://www.maine.gov/revenue/forms/property/pubs/bull20text.htm

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