

Emerging technology allows solar panels and agriculture to coexist, but legal hurdles remain

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Solar panels and grazing sheep can coexist in the same field. Credit: Wikimedia Commons, [CC BY-SA 4.0](#)

Renewable energy technologies such as wind turbines and solar panels

are gaining traction, but are sometimes met with local resistance because they take up valuable space that could otherwise be used for agricultural production.

Agrivoltaics provides a way of creating dual land usage, combining solar panels with crops or grazing animals in the same field. But this emerging technology faces regulatory headwind because the land will no longer be classified as agricultural.

A new study from the College of Agricultural, Consumer and Environmental Sciences (ACES) at the University of Illinois presents an overview of zoning and taxation regulations that affect agrivoltaics across the United States, identifying challenges and possible solutions.

"There are many benefits to co-locating solar panels and agriculture on the same plot of land. There is an increased need for [renewable energy](#), while agricultural land continues to decrease. When you're able to find a technology where you can put these uses together, you may reduce the overall potential that either technology could have on its own, but you still get a better total outcome. It can also be a very good financial diversification for the farmer," says Tyler Swanson, one of the study's authors.

The study focuses on regulations concerning solar panels and grazing because it is a more established practice. It can be difficult to find crops that thrive under solar panels, but for grazing animals, particularly [sheep](#), the combination works out well. The sheep graze around the solar panels, providing needed vegetation maintenance.

"The sheep don't really care about hanging wires or poles; as far as I know there's never been an issue where the sheep have caused structural damage to the solar panels. They mostly just go around, eat the grass, sleep and lay under the panels during the day when it's hot outside. They

save the solar developer money, because there is no longer a need to hire a mowing company to trim the vegetation," Swanson says.

Swanson and co-author Jessica Guarino, a postdoctoral research associate in ACE, identified zoning and taxation regulations across the United States. They found agrivoltaics installation typically causes the area to be declassified as agricultural land, resulting in added regulatory burdens, [higher taxes](#), and sometimes fiscal penalties for violating zoning ordinances. To further complicate matters, state and local policies may differ.

"Even if states are promoting policies supportive of the nexus of agriculture and renewable energy, there will often be local pushback," Guarino says. "Especially in [rural areas](#), there can be a lot of opposition to bringing in new technology on [agricultural land](#), which is highly valued. For the farmers working that land, it's usually a generational thing, so they are emotionally invested as well. That kind of social tension evolves into legal challenges for agrivoltaics."

The researchers hope their work will encourage a shift to policies that incentivize agrivoltaics production and provide tax incentives rather than tax penalties for dual land usage.

Swanson and Guarino also identify another legal issue affecting agrivoltaics implementation: the contractual agreements between farmers and solar panel developers.

Typically, a solar developer contracts with a farmer to bring sheep to the solar panel facility. In some cases, the [solar panels](#) are installed on existing farmland, and the farmer provides the vegetation management through grazing. Either way, both parties must ensure their property is protected.

"You have a solar developer who has a multimillion-dollar energy generation facility, and they want to make sure the sheep aren't going to cause any damage to it. But you also have a farmer who has thousands of dollars or more in sheep, and they want to protect those as well," Swanson explains.

"Generally, insurance costs will be high, as you need to hedge against damage to the solar farm, as well as potential harm to the sheep. There's also the added cost of driving back and forth from the solar farms for the farmer, depending on how far away it is."

Swanson and Guarino include a couple of sample contracts in their paper, including one from the [American Solar Grazing Association](#), a trade group that assists sheep farmers in negotiating with a solar development company.

The paper is published in the *Chicago-Kent Journal of Environmental and Energy Law*.

More information: Paper: [Emerging agrivoltaic regulatory systems: A review of solar grazing](#)

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