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ebook

# The Rise of Agrivoltaics





If there is one thing we know about our society, it's that people love a good Buy-One-Get-One. Given this concept, it should be no surprise that solar developers feel the same way. Enter the rise of agrivoltaics and the desire to maximize our land use.

With finite resources, a growing population, and ballooning energy needs, it's no wonder developers are looking to create greater productivity on parcels.

For that reason, agrivoltaics is a growing trend in the U.S. and across the world. Harvesting renewable energy with solar panels while putting soil and vegetation to good use is one of the main ways we will enter that clean, bright energy future.

So what does the rise of agrivoltaics look like? Let's explore.

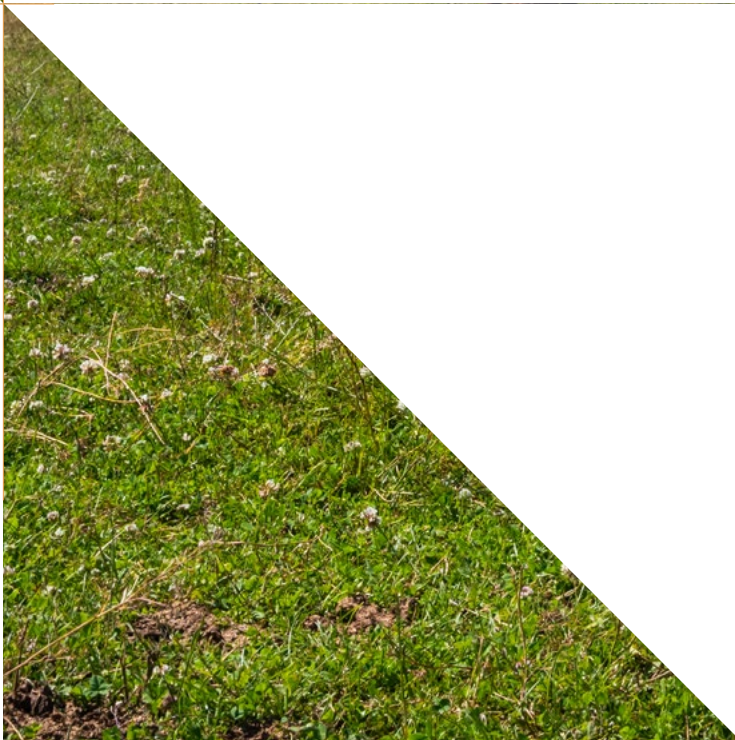




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# What Forms Can Agrivoltaics Take?

Essentially, agrivoltaics is the practice of co-locating solar and agriculture on a site. This can take a number of forms, including:



Grazing of sheep or other animals



Crops, especially low-growing vegetation that benefits from some cover and won't shade out panels



Beekeeping

## What Are the Benefits of Agrivoltaics?

The benefits of agrivoltaics fall into three basic camps: environment, developers and other stakeholders, not to mention the solar panels themselves.

### Benefits to the Environment

This is a relatively straightforward perk. Not only do solar panels prop up our renewable energy efforts, but they also condense land use, making communities more self-sufficient, prosperous, and resilient. These projects maintain habitats, minimize severe alterations to land, and reduce water usage.

### Benefits for the Solar Panels

Heat dissipation is a major consideration with solar panels. Perhaps counterintuitively, excess heat makes solar panels less productive. As plants can dramatically help with heat absorption, growing vegetation under and near solar panels helps to address this concern.



Studies show that:  
panels positioned above plants produce up to 10% more electricity



## Benefits for Developers, Communities, Farmers, and Ranchers

For developers, farmers, ranchers, and anyone else looking to turn a profit from a piece of land, agrivoltaics provides a number of advantages, including:

- Decreased mowing costs, [30% less than traditional landscape maintenance](#)
- Symbiotic relationships between plants and panels
- Potential partnerships between clean energy developers and farmers to lighten the burden for both
- Increased community sentiment due to better land use and agriculture savings, which means the project is more likely to be approved
- Reduced water loss in crops and irrigation

As we see a rise in the power [community sentiment](#) holds in the solar development process, completing projects that benefit the surrounding community is now more important than ever. The unsightly appearance many individuals believe solar sites yield is just one of many concerns surrounding communities hold in regard to solar development. Additional concerns include land infringement, noise concerns, and economic impacts. By pairing agriculture with solar development, the site has a more pleasant view to many community members and could positively impact their perception of solar entering their region.

The additional economic benefits to the farming and ranching industries within the area can also curb many of the concerns that solar will price consumers out of energy in their area. Land infringement is also mitigated as existing farmland partnering with solar developments means we could see fewer parcels being purchased and cleared for solar development.

a farm in 2023 saved

**\$115,000**



[in mowing costs in just seven months](#)

# What Is the Rate of Growth for Agrivoltaics?

“According to the U.S. Department of Energy’s Solar Futures Study, solar energy could supply as much as 40% of U.S. electricity by 2035,” [says the U.S. Department of Energy](#). Happily, agrivoltaics is already taking off to leverage that potential.

The market hit 3.89 billion in value in 2021 and is projected to grow to 10.97 billion by 2030, [according to some estimates](#). That’s a compound annual growth rate of 12.3%. [By other estimates](#), the rate is around 11.7%, averaging out to a healthy 12% in the next decade.

The Department of Energy chimes in to add that “there are over 2.8 GW of agrivoltaics sites in the U.S., the majority of which involve sheep grazing and/or pollinator habitat and “At least five commercial solar-crop sites are operating in Colorado, Massachusetts, and Maine.”

Such growth does, of course, bring potential concerns with it.

## What Environmental Issues Should Developers Consider?

What concerns must developers keep in mind when considering an agrivoltaic installation? Some of the most salient currently include:

- Overgrazing** While grazing can decrease mowing costs at solar sites, overgrazing is detrimental to soil.
- Wildfires** Fires in California, the Pacific Northwest, the Northeast, and other places in the U.S. and North America cause concern for agrivoltaics investments (although preliminary numbers seem to indicate that smoke blockage has limited effects on photovoltaic productivity).
- Soil compaction and reduction in soil quality** Solar panels may compact soil and reduce quality, but different installation methods and mitigation may improve the situation.
- Crop cultivation** Not all crops will take to the agrivoltaics environment immediately. Experimentation will be called for.

Despite these concerns, there is reason to believe that agrivoltaics will find a more welcome reception across America than photovoltaic-only installations.








## Does Agrivoltaics Increase Community Sentiment?

One of the elements of pushback on solar is that it monopolizes land that could be used agriculturally. Agrivoltaics neatly handles this, also increasing community sentiment by offering:

-  Financial benefits for farms: While the [number of farm bankruptcies is down](#), the numbers are still alarming. Agrivoltaics can help provide a profit motive for solar and bring farms back from the brink.
-  Crops for local communities: Feeding the local populace is another incentive for agrivoltaics development.
-  Prettier-looking installations: Aesthetics matters, and many simply don't like the cold, mechanical look of solar installations. Add some sheep and veggies, and the effect is much more pastoral.

Even if communities are open to considering agrivoltaic installations, developers still need smart strategies for making projects financially feasible.

# What Tax Incentives Exist?

The Federal Investment Tax Credit is a major boon for agrivoltaics enthusiasts, offering a **30% credit** on tax liability — e.g. however much one would pay in taxes, they can **reduce that by roughly a quarter** of the cost of the solar energy system.

This is a true credit, **reducing your tax liability dollar for dollar**, rather than a rebate, which is highly appealing to many strapped farmers and investors working within thin margins.

At the state level, there exist other opportunities. These include loans, grants, rebates, tariff adders, and state-level tax credits.

The only question that remains is, how can developers find suitable land? That's where Transect comes in.

## How to Find Suitable Land for Agrivoltaics

Developers looking to build a robust and insightful understanding of agrivoltaics potential need the right tools to help them do it. From exploring slopes and soils to floodplains and fire risk, successful development professionals will benefit from automated site and risk assessments.

Transect allows solar developers to see site-specific data regarding soil composition and compaction, water and wetlands information, land owner, tax credits, protected environmental features and required permits in seconds. The tool's AI-powered Solar Pulse tool, currently in beta testing as of 2024, allows developers to identify and measure county-level community perception of solar development and see how it could impact a development project.

Agrivoltaics foreshadows the bright future ahead paved by the work of innovation.



Want to learn more about how Transect can help you find and select the perfect site for your next Agrivoltaics project? **Schedule a demo today!**

