



AGROSOLAR CLEARINGHOUSE

# Smart Solar<sup>SM</sup> on Farmland and Ranchland

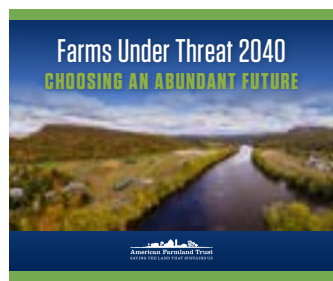
## Strengthening Farm Viability and Soil Health While Growing Renewable Energy

Over the next three decades, our nation's electric power sector will transition from a fossil-fuel dependent system to a more distributed and decarbonized energy network. Driving this change are markets, where solar and other forms of renewable energy are now cost-competitive, as well as ambitious local, state, and federal policy goals to address climate change by dramatically reducing greenhouse gas emissions. Achieving these essential goals will require substantial increases in renewable energy and primarily solar, which, according to a 2020 U.S. Department of Energy study, may rise from 4% of our nation's total energy production today to 45% by 2050. With dramatically increased funding for solar in the recently enacted

Inflation Reduction Act, this pace should accelerate quickly.

According to the same DOE study, increasing solar generation to 45% could require nearly 7.4 million acres of land by 2040 and 10.4 million acres by 2050, with approximately 90% expected to occur in rural communities.

Further studies reveal that most solar development will take place on farmland. Modeling done by American Farmland Trust (AFT), through the *Farms Under Threat: 2040* analysis,



American Farmland Trust's new report found that **83%** of new solar could be sited on farmland.

projects that **83% of new solar built by 2040 could be sited on agricultural lands, with almost half located on our most productive land for producing food and crops.** This is corroborated by a 2021 Cornell University study by Katkar et

### DOE Solar Futures Decarb+E Scenario

Land area of utility-scale solar photovoltaics (projection in 2040)



**Figure 1. Projected acres of utility-scale solar photovoltaics energy generation facilities by state in 2040.**

al. that found 82 to 85% of land suitable for solar to meet New York's ambitious climate goals is farmland. Displacing farming from productive land could put more marginal farmland in production, leading to decreased productivity, farm viability, and food security, as well as increased environmental impact.

Solar developers often select high-quality farmland, since it is more likely to be flat, dry, clear, and close to existing infrastructure. And, according to research AFT conducted in 2021, developers are often willing to pay over 10 times the amount that landowners can make renting the land to farmers, with many offering the security of long-term leases lasting on



average 25–40 years. **The growth of solar development will reshape many rural landscapes and farm economies. It also has the potential to generate public backlash and permitting moratoria that could slow the achievement of decarbonization goals.**

Scientists agree that society needs to drastically reduce emissions to slow climate change and minimize future impacts from droughts, floods, and extreme heat—including on farmers and ranchers. In addition, solar energy leases can generate new streams of income for farmland owners, helping to keep the farm viable. But solar can displace farmer-renters, and large-scale solar may threaten the future viability of local economies dependent on agricultural production.

AFT's modeling reveals that, although solar development will be widely distributed across the country, projects will be concentrated in communities with favorable siting and transmission opportunities. For example, by 2040 Texas could have over 1 million acres of solar, and many Northeastern states could have solar on as much as 6% of their undeveloped land. In addition, large-scale solar projects could take hundreds or thousands of acres of a community's farmland out of production at once. This concentrated conversion will strain the viability of the farms that remain by decreasing land availability, increasing land prices, and reducing the viability of farm support services.

**But America needs both—renewable energy and productive, resilient farms and ranches. Smart Solar can be the solution.** In 2018 AFT began its efforts to help communities accelerate solar development in ways that strengthen farm viability.

### Smart Solar Principles

Smart Solar projects meet three main goals: they accelerate renewable energy development, strengthen farm viability, and safeguard land for farming and ranching. AFT developed the following Smart Solar Principles to guide policymakers, developers, and decisionmakers:

1. Prioritize solar siting on the built environment and land not well suited for farming. Concentrate solar development on rooftops, irrigation ditches, brownfields, and marginal lands.
2. Safeguard the ability for land to be used for agriculture. Policies and practices should protect soil health and productivity, especially during construction and decommissioning.
3. Grow agrivoltaics for agricultural production and solar energy. Agrivoltaic projects allow for farming underneath

and/or between rows of solar panels throughout the life of the project.

4. Promote equity and farm viability. Require inclusive stakeholder engagement, including farmers and underserved communities, to ensure widespread benefits from solar energy development.

Smart Solar means directing solar development to where it has the least negative impact on land well-suited for farming while protecting soil health, maintaining opportunities for farming, and ensuring equitable community benefits. Smart Solar elevates agricultural considerations and aims to accelerate renewable energy development by calming community fears over solar project impacts.

### Recommendations

Many stakeholders—from landowners to solar companies to government officials—have important roles to play to achieve a Smart Solar buildout. Legislative bodies can ensure laws and

regulations reflect Smart Solar principles. Solar companies can adopt the principles into their operations. State and federal governments can provide guidance, resources, and incentives. Actions various stakeholders can take:

- Incorporate Smart Solar Principles into land-use plans, permitting processes, and policies to guide approval of specific projects.
- Fund and participate in local/regional planning and community engagement with broad stakeholder involvement including farmers, developers, transmission groups, tribes, and environmental justice stakeholders.
- Define community preferred sites (e.g., the built environment, contaminated lands, land not well-suited to farming) and priority protection areas; prioritize siting

on preferred sites with financial incentives and permit fast-tracking and disincentivize siting on protection areas with mitigation fees.

- Develop and require minimum standards to protect soil health and productivity based on the USDA NRCS soil health principles during construction, operation, and decommissioning.
- Fund research and create pilot programs to advance agrivoltaic projects and help determine which production systems should qualify for future agrivoltaic incentives.
- Invest in research to assess socioeconomic effects of solar on farm viability, land access, equity, and energy prices.



AGRI-SOLAR CLEARINGHOUSE

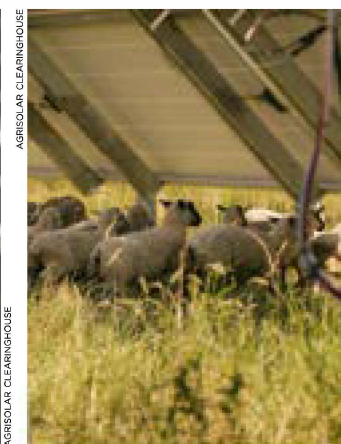
Agrivoltaics is the practice of installing solar panels on farmland so primary agricultural activities are maintained throughout the life of the project.

### RESOURCES



# AMERICAN FARMLAND

## SMART SOLAR ADVANCES FARM VIABILITY



Left: Joe Czajkowski examines his broccoli plants grown under solar panels from Hyperion Systems. Right: Sheep graze under agrivoltaic, or dual-use, solar panels.

## Smart Solar: A New Opportunity to Keep Land in Agriculture

BY GREG PLOTKIN AND EMERAN IRBY

The smell of fresh-cut grass, the sight of golden hay bales scattered in fields, and the sound of cows mooing in pastures. There's nothing like experiencing the sensory delights of America's farming and ranching communities. However, lately when you drive through rural communities across America, there's a new sight: seas of glassy solar panels.

While agriculture and solar energy are often viewed as competitors for land, a growing movement seeks to integrate renewable energy with farming and ranching—a technique called “agrivoltaics.” Agrivoltaic solar arrays can help farmers improve soil health, shade animals and workers from the harsh sun, and generate a consistent stream of income for re-investment back into the farm.

The promise of this dual land use was apparent as we pulled into Czajkowski Farm in Hadley, Massachusetts, on a recent visit. Farmer Joe Czajkowski was growing broccoli, tucked under the watchful eye of raised solar panels, for nearby students at the University of Massachusetts, Amherst. Not long ago, Joe was one of many solar skeptics in the farming community.

What changed? Today, Joe embraces solar on his land as a long-term strategy for the viability of his farm, including as an important part of his retirement plan. As he says, “Farmers don’t get pensions. This is my pension.”

An estimated 80% or more of new solar development will be sited on farmland and ranchland. That’s why American Farmland Trust is at the forefront of efforts to make sure renewable energy benefits the nation’s farmers and ranchers. Through our Smart Solar<sup>SM</sup> initiative, launched in 2021, we are working to accelerate solar energy

development and strengthen farm viability while safeguarding the land best-suited for farming and ranching.

Smart Solar guides solar development to where it has the least negative impact on farmers and ranchers. It also works to ensure that the land can be grazed or farmed in the future and promotes agrivoltaics to create opportunities for both farming and solar energy on the same land.

“It may seem counterintuitive that an organization such as American Farmland Trust—dedicated to protecting farmland and ranchland for future generations—is taking a leading role in national conversations about solar development,” says Nathan L’Etoile, director of American Farmland Trust’s Farm Viability Initiative. “However, we believe it’s essential to be deeply engaged in these discussions and actively representing the interests of the agricultural community. If not, no other national organization would be fighting for America’s farmers and ranchers in this new solar frontier.”

Here are a few ways American Farmland Trust advances Smart Solar across the country:

**AN UNCOMMON DIALOGUE ABOUT SOLAR AND AGRICULTURE:** To advance national understanding of agriculturally compatible solar development, we are deeply engaged in a listening and learning process called “Uncommon Dialogue,” convened by the Solar Energy Industries Association, The Nature Conservancy, and Stanford University. This resulted in the recent “Collaboration Agreement for Large Scale Solar Development: Climate, Conservation Community,” a strategy to guide America’s solar future. Through the partnership, American Farmland Trust champions clean energy, thriving farms, farmland protection, and rural communities.

### Smart Solar<sup>SM</sup> Principles

#### PRINCIPLE 1

Prioritize solar siting on buildings and land not well suited for farming.



#### PRINCIPLE 2



Safeguard the ability for land to be used for agriculture.

#### PRINCIPLE 3

Grow agrivoltaics for agricultural production and solar energy.



#### PRINCIPLE 4



Promote equity and farm viability.

**ADVANCING POLICY SOLUTIONS FOR SMART SOLAR:** “The question is not if solar will be developed, but how,” says Samantha Levy, American Farmland Trust’s Conservation and Climate Policy Manager. “Local, and sometimes state, governments are responsible for permitting solar projects in the U.S. Their policies shape what is proposed and ultimately developed.” To guide these policies, American Farmland Trust’s four Smart Solar

**Smart Solar**, continued on page 4



## Ways to Give

We rely on the generosity of our members, who care about protecting the nation's farms for future generations. Here are a few ways you can help.



**1 DONATE ONLINE.** It is easier than ever to support our work. Visit [farmland.org/donate](http://farmland.org/donate) to make a gift using your credit card or bank account. It's quick and secure!

**2 GIVE A GIFT MEMBERSHIP** by visiting [farmland.org/gift](http://farmland.org/gift). A membership is great for anyone who loves the land. You can also make a tribute gift in honor or memory of friends or family who care about protecting our precious farmland at [farmland.org/tribute-gift](http://farmland.org/tribute-gift).

**3 CONTRIBUTE A GIFT OF STOCK.** Transfer stock to AFT to avoid capital gains tax while taking a charitable deduction for the full fair-market value. Call (800) 431-1499 or visit [farmland.org/stock-gifts](http://farmland.org/stock-gifts).

**4 JOIN THE FARMLAND FOREVER SOCIETY** by remembering AFT in your will and estate plans. Your contribution will help save America's farmland and ranchland for generations to come. Call (800) 431-1499 or visit [aftgiving.org](http://aftgiving.org) for more information.

**5 BECOME A SMART SOLAR CORPORATE PARTNER.** Invest in Smart Solar principles and increase your company's visibility through a Corporate Sponsorship that supports AFT's work on farm viability, farmer engagement, and soil health. Visit [farmland.org/corporatepartners](http://farmland.org/corporatepartners).

**6 PARTICIPATE IN WORKPLACE GIVING.** If you work for the federal government or are a member of the military, you can donate during your workplace charity campaign. Others may give through EarthShare, a nationwide giving network, or by asking your employer if they have a matching gift program. Visit [farmland.org/workplace-giving](http://farmland.org/workplace-giving) to learn more.

**7 PROTECT YOUR LAND.** Own a farm? AFT's Farm Legacy program can work with you to ensure your land remains in farming and supports future generations of farmers. Learn more at [aftgiving.org](http://aftgiving.org).

### Smart Solar, continued from page 1

principles encourage policymakers to address community concerns and maximize benefits to farmers while advancing solar. To learn more about the principles, visit [farmland.org/smart-solar-policy-recommendations](http://farmland.org/smart-solar-policy-recommendations).

**FARMERS POWERING COMMUNITIES:** Beginning this year, American Farmland Trust is working with leaders in solar through our Farmers Powering Communities (FPC) partnership to produce 500 MW of community solar capacity over the next five years. Although this is an ambitious goal, our team is embracing the challenge to demonstrate that Smart Solar can be achieved at scale. By bringing together those working to feed the planet with those working to power America, FPC helps to ensure that solar development maximizes benefits to farmers as well as to low- and moderate-income energy customers.


**BUILDING AN INDUSTRY LEADING TEAM:** Over the last two years, American Farmland Trust has significantly increased our presence in key states across the country with current




staff or projects focused on solar in Colorado, California, Texas, Virginia, Oregon, New Jersey, Oregon, Washington, New York, Massachusetts, and Illinois. When we begin to think about solar development as an opportunity to strengthen rural communities and build farm

viability, it can help take some of the fear away. The future is as bright as we can build it. We hope you'll join us.

**Want to learn more about Smart Solar? Visit [farmland.org/solar](http://farmland.org/solar)**



**American Farmland Trust**



**AMERICAN FARMLAND**

1150 Connecticut Avenue, NW  
Suite 600  
Washington, DC 20036  
(800) 431-1499 • [farmland.org](http://farmland.org)

---

EDITOR: Kirsten Ferguson  
DESIGN: Cutting Edge Design, Inc.

