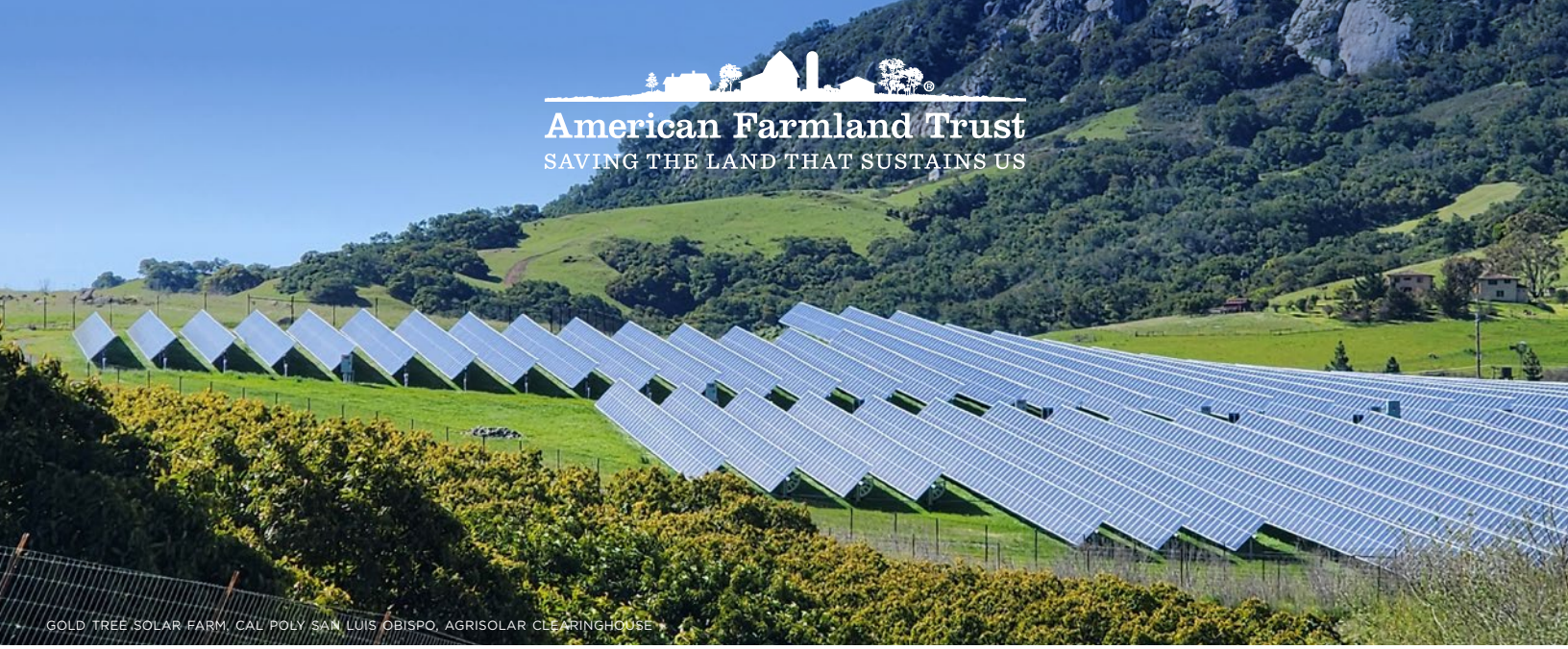
American Farmland Trust
SAVING THE LAND THAT SUSTAINS US



GOLD TREE SOLAR FARM, CAL POLY SAN LUIS OBISPO, AGRISOLAR CLEARINGHOUSE

Smart Solar℠ on Agricultural Land in the West

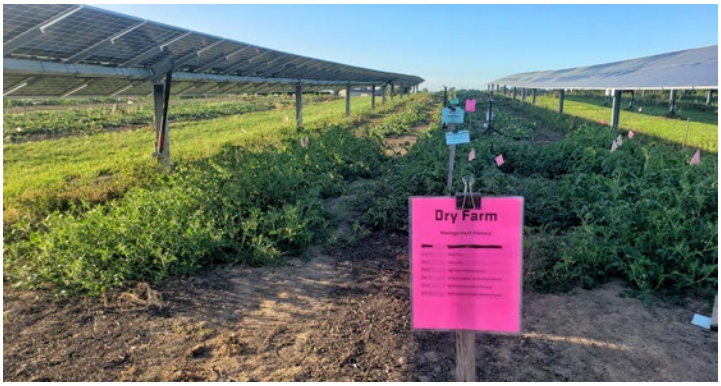
Increasing Climate Resilience and Strengthening Farm Viability While Growing Renewable Energy

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 in which 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, primarily solar, which, according to a 2020 U.S. Department of Energy (DOE) study, may rise from 4% of our nation's total energy production to 45% by 2050.

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

Compared to other renewable energy sources, solar is especially land intensive. According to the same DOE study, increasing solar generation to 45% of the nation's energy production 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.

American Farmland Trust's (AFT) 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. Further studies reveal that, without intervention, most solar development will occur on farmland. Modeling done by AFT through its *Farms Under Threat: 2040* report projects that 83% of new solar energy installations built by 2040 could be sited on agricultural lands, with almost half located on our most productive land. For example, by 2040, Texas could convert 345,000 acres of agricultural land to solar, and California could convert 311,000 acres.



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Solar developers often select high-quality agricultural land since it is more likely to be flat, clear, and close to existing infrastructure. According to research AFT conducted in 2021, developers frequently are willing to pay multiple times the amount that landowners can make through farming the land or renting it to other farmers, with the security of long-term leases lasting on average 25–40 years. By generating new streams of income for landowners, solar leases may help keep farms and ranches viable. At the same time, solar can displace producers, and large-scale solar projects can take thousands of acres of a community's farmland out of production at once. This concentrated conversion could strain the viability of the remaining operations by decreasing land availability, increasing land prices, and reducing the viability of farm support services. It also has the potential to generate public backlash and permit moratoria that could slow the achievement of decarbonization goals.

At the same time, much of the West is experiencing aridification, as ongoing drought, coupled with unsustainable water use, results in the depletion of ground- and surface water resources. Important agricultural regions like California's San Joaquin Valley are looking at a future where a minimum of 500,000 acres of agricultural land will inevitably be retired over the next two decades as part of efforts to achieve groundwater sustainability. Strategic deployment of smart solar may provide a way to repurpose fallowed land while replacing lost income and creating new jobs, as well as enhancing irrigation efficiencies for crops grown under the shade of raised agrivoltaic panels.

Scientists agree that society needs to drastically reduce emissions to slow climate change and minimize the future impacts from droughts, floods, and extreme heat—including on farmers and ranchers. But America needs both renewable energy and productive, resilient farms and ranches. AFT's Smart Solar℠ approach offers a way forward.

Smart Solar Principles

Smart Solar projects meet three main goals: 1) accelerate renewable energy development, 2) strengthen farm viability, and 3) safeguard land for farming and ranching. AFT developed the following Smart Solar Principles to guide policymakers, developers, and decision-makers:

1. **Siting: Prioritize solar siting in the built environment, contaminated land, and other land not well suited for farming.** Concentrate solar development on rooftops, irrigation ditches, brownfields, and marginal lands, including those without sufficient water resources.
2. **Soil and Water: 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. **Agrivoltaics: Grow agrivoltaics for agricultural production and solar energy on the same land.** Agrivoltaic projects allow for farming underneath and/or between rows of solar panels throughout the life of the project. Early research shows soils in agrivoltaic systems retain moisture longer, and crops grown under and between solar panels are less reliant on supplemental irrigation.
4. **Shared Benefits: Promote equity and farm viability.** Require inclusive stakeholder engagement, including farmers and underserved communities, to ensure widespread benefits from solar energy development.

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

Smart Solar means solar development where it has the least negative impact on land well-suited for agriculture while protecting soil health, maintaining opportunities for farming and ranching, and ensuring equitable community benefits.

AFT's key strategies to advance Smart Solar include building stakeholder consensus; promoting Smart Solar siting and practices; conducting social, economic, environmental, and agronomic research and education; advancing policy at the federal, state, and local levels; and community-based workforce development. To date, this work in the western United States has included:

- Publication and distribution of "Solar Leasing: A Guide for Agricultural Landowners in the Pacific Northwest."
- Participation in the Columbia Plateau Least Conflict Solar Siting process in Washington State.
- Partnership with Pitzer College on a USDA Foundation for Food and Agriculture Research funded project to research agrivoltaics and regenerative farming systems.
- Study exploring benefits and obstacles to agrivoltaics through surveys and roundtables with Colorado producers to inform research, policy, and resources.
- Education for producers, service providers, developers, and policymakers.

Near-term opportunities to further advance Smart Solar across the West include:

- Solar leasing guides and webinars for other western states, as well as translation into Spanish.
- Training and guides for technical service providers to assist landowners and producers in evaluating options.
- Agrivoltaic research and demonstration for increasing water use efficiency and understanding impacts on soil health.
- Outreach, education, and training in agrivoltaics for Spanish-speaking farmers and farmworkers.
- Curriculum development and community-based workforce development in the field of agrivoltaics.
- Online solar toolkit for Texas farmers and ranchers, including solar leasing, community-scale, and on-farm solar resources.
- State-level coalition building to promote Smart Solar policies.

RESOURCES

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Check out **farmland.org/solar** or contact:

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