American Farmland Trust
SAVING THE LAND THAT SUSTAINS US

Summary:

AFT's Federal, State, and Local Policy Recommendations to Advance Smart Solar

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About American Farmland Trust

Founded in 1980, American Farmland Trust's (AFT) mission is to save the land that sustains us by protecting farmland, promoting sound farming practices, and keeping farmers on the land. AFT recognizes that fulfilling this mission depends on America's farmers and ranchers, and their ability to operate viable farm businesses. In addition to being a leader in federal agricultural policy, AFT works across the nation at the state and local level to advance policies to achieve its mission.

About this Document

This document is a short summary of local, state, and federal policies needed to advance a Smart Solar[SM] buildout. A longer version with an introduction to the issue, more explanation of each principle, examples of how these policies have already been implemented, and a stronger focus on state and local policymaking to advance smart solar is available here. While a diversity of stakeholders will need to take action to achieve a Smart Solar buildout—including developers, clean energy buyers, utilities, researchers, non-governmental organizations (NGOs), farmers, and the general public—this document is geared towards policymakers. AFT recommends that communities proactively implement policies from the menu of options presented in this document that are the most relevant to the unique economic and conservation needs, and permitting and policy conditions, of their states and municipalities. This document is organized into sections describing, and providing recommendations for, each of AFT's four Smart Solar principles. Recommendations for local governments are bolded in **gold**, actions state governments can take are in **orange**, and actions the federal government should take are in **blue**.

Contacts

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Photo of Jack's Solar Garden, Colorado

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AFT's Federal, State, and Local Policy Recommendations to Advance Smart Solar

The goals of AFT's solar policy recommendations for local, state, and federal policymakers are to maximize benefits from the solar buildout to producers, farm communities, farmland, and the climate and to minimize both displacement of farming from the land and potential negative impacts to farmland, farmer-renters, and community farm viability by accelerating Smart Solar development across the nation. Addressing community concerns around these topics, which are causing pushback to proposed solar projects on the ground across the country that is slowing array construction, will be critical to achieving climate goals. Policymakers at different levels of government have unique and critical roles to play. The federal government can invest in research and provide trusted, technical information to support community decision-making, while state and local governments are primarily responsible for the permitting and land-use decisions that will shape the future of their communities. To help shape a solar buildout that will achieve all of the above goals, AFT developed four Smart Solar principles (represented by the four headings below) and the following policy recommendations to advance each principle. Policymakers should choose and implement the recommendations from this agenda that will best help them advance a Smart Solar buildout while supporting farm viability and keeping land in farming. This document is a short summary of the policies needed to advance a Smart Solar buildout. A longer version with additional background, real-world examples, and a stronger focus on state and local policy to advance smart solar is available here.

SITING: Recommendations for Prioritizing the Built Environment and Marginal Farmland

Solar arrays are often sited on high-quality farmland because it is flat, sunny, clear, and near existing infrastructure. AFT recommends communities take the following actions to guide solar development to preferred areas and away from priority areas to avoid converting, including land well-suited for farming:

1. **Invest in Research to Identify and Increase Development of Preferred Areas.** **Federal** and **state** governments should invest, engage in, and promote research to determine costs, barriers, opportunities, and other needs to advance solar on the built environment, contaminated land, and marginal land. **Federal** and **state** governments should also dedicate funding to support Smart Solar modeling and mapping as decision support tools to help communities identify preferred sites for solar and priority areas to avoid converting.

2. **Reduce Farmland Conversion Pressure and Accelerate Development on Prefe[illegible] Areas.** **Federal**, **state**, and **local** governments should implement programs and policies that promote energy efficiency, support other forms of clean energy (e.g., wind), and accelerate solar energy development on the built environment (e.g., rooftops, irrigation ditches, parking lots, carports, transportation rights of way) and contaminated land (e.g., brownfields, landfills, abandoned mines) to reduce conversion pressure on our nation's best agricultural land. Policy options include advancing wind development, streamlining permitting and/or providing financial support for siting in preferred areas, updating building codes to ensure new construction is energy efficient/solar ready.

3. **Engage in Proactive Planning for Agriculture and Renewable Development.** **Federal**, **state**, and **local** governments should fund, convene, and participate in inclusive regional "least conflict processes" to empower communities to proactively define preferred, or least conflict, areas for siting solar as well as priority areas to avoid converting. This work would ideally be done even before solar arrays are proposed in their communities. This should be coupled with effective implementation policies (Recommendation 4) to maximize their impact.

4. **Implement Incentives and Disincentives to Steer Siting Towards Preferred Areas.** **State** and **local** governments should update comprehensive plans, zoning, and other land use laws, and implement other policies below to:
    - *Incentivize* developing solar arrays proposed in preferred areas by reducing the costs, including "soft costs" (e.g., the time it takes to secure a permit), of developing these projects. Effective incentives include:
        - Streamlined permitting processes,
        - Extra points in competitive energy procurement and public funding awards,
        - Financial adders for the cost of electricity generated at these facilities.
    - *Disincentivize* development of arrays that convert land out of agricultural production (i.e., not agrivoltaic, as defined in the Agrivoltaic section below) and those proposed in priority areas communities want to avoid converting. Effective disincentives include:
        - Additional standards for identifying and addressing the agricultural impacts of solar (e.g., additional economic, social, or environmental impact studies),
        - Subtracted points in competitive energy procurement and public funding awards,
        - Compensatory mitigation fees (see box below)

AFT recommends that state or local governments consider assessing compensatory mitigation fees to mitigate impacts on farm communities from permanent development, utility-scale solar, and transmission development. Effective design and implementation of these policies should involve the following considerations:

- Determining the type of land on which proposed development would trigger a fee and assessing *meaningful* per-acre mitigation fees from developers to minimize conversion of land well-suited for farming out of production.
- Escalating per-acre mitigation fees as more land within a community (e.g., county) is converted both to deter too much land from being taken out of production, and to increase the ability for the host community to keep land in farming with viable farm operations and support services.
- Investing mitigation fees in permanent farmland protection within the community. Should the farmland protection project take place outside of the host community, fees charged should increase to incentivize protecting farmland proximate to the conversion. Fees could also be invested in programs, infrastructure, or other projects that will improve equitable access to farmland and long-term farm viability in the community, especially if protecting farmland within the host community is not possible.

5. **Collect Information.** **Federal**, **state**, and **local** governments should collect, and publicly share (at public hearings and in aggregate), data on soil type, prior land use, whether a solar array will

incorporate agricultural production, and water rights/availability (where applicable), as part of permitting and/or funding application processes to track aggregate impacts and advance Smart Solar policymaking.

6. **Minimize Permanent Conversion.** **Federal**, **state**, and **local** governments should ensure that their development review processes properly account for, and minimize, conversion of farmland out of production. AFT also recommends that **state** and **local** permitting review processes incorporate policies to minimize the permanent conversion of farmland out of production by only considering solar arrays that follow minimum standards in the Soil and Water section temporary conversion.

SOIL AND WATER: Recommendations to Safeguard the Ability to Use Land Put into Solar for Farming

Most current approaches to solar construction, operation, and decommissioning are not designed to ensure that land put into solar can again be used for farming. Given the outsized role farmland is expected to play in hosting solar, it is imperative that soil health and productivity are protected or improved, especially during the high-disturbance times of construction and decommissioning, and water rights are preserved for future use when solar is sited on farmland. AFT recommends:

1. **Develop Guidance.** **USDA-NRCS** and/or **state departments of agriculture** should develop and disseminate guidance and best practices based on NRCS soil health principles to protect soil health and productivity during construction, operation, and decommissioning, and to ensure future access to water so land may be able to be farmed after the life of the solar array. This guidance should be periodically updated as more research is completed (Recommendation 2).

2. **Invest in Research on Best Management Practices (BMPs).** **Federal** and **state** governments should concurrently invest in both near- and long-term research to determine the impacts of current solar construction, operation, and decommissioning standards and practices on soil health and productivity and water resources. This research should inform existing standards, or create evidence-based best practices where they do not already exist to achieve the following goals:
    - After panels are removed, land used for solar can go back into agricultural production,
    - Soil compaction and erosion is minimized and soil health is maintained or improved,
    - Stormwater and runoff is properly considered in array design and construction,
    - Other impacts to soil or circumstances that would ensure solar arrays do not permanently convert land out of farming (e.g., access to water) are addressed.

5. **Provide Training and Outreach.** **Federal** and **state** governments should conduct outreach to installers, developers, landowners, and local governments to share these best practices, and ideally–where able–provide trainings and/or certifications to identify installers that are equipped to follow best practices.

3. **Require Minimum Standards.** **Local** and **state** permitting authorities should:
    - Choose which best practices will serve as minimum standards that developers must follow as a condition for receiving a permit (while incentivizing other beneficial BMPs).

- Require developers to fund the hiring of qualified, independent monitors to enforce implementation of these minimum standards and agreed upon BMPs during construction and oversee and guide decommissioning and restoration for several years following the array's removal to ensure restoration has been completed.
- Require comprehensive soil health assessments during three phases of the solar array: 1) prior to construction to establish a baseline for post-decommissioning restoration; 2) periodically (e.g., every five or ten years) during operation to check on soil health and inform any management adjustments needed to maintain or improve on the baseline; and 3) for several years following decommissioning to ensure restoration is completed.[51]
- Ensure water rights associated with lands proposed for solar development are banked for future use, where applicable. Where such banks do not yet exist, governments should support the development and funding of water rights banks or trusts for this purpose.
- Ensure that no financial responsibility for removal and restoration falls on the landowner or municipality by requiring financial surety (e.g., decommissioning bonds) at the solar array's outset that will cover the full expected costs of infrastructure removal and restoration at the end of the useful life of the array.

AGRIVOLTAICS: Recommendations to Expand the Development of Solar Arrays that Integrate Farming

AFT defines agrivoltaics as the integration of agricultural production and solar energy generation on the same piece of land throughout the life of the solar array. Agrivoltaics could represent an innovative way to keep land in farming as solar deployment accelerates, but advancements in research and policy are needed to expand this practice to other production systems beyond the current most economically viable option, sheep grazing. AFT recommends the following:

1. **Invest in Research and Demonstration.** **Federal** and **state** governments should increase investment into research and demonstration projects to determine the economic viability of agrivoltaics for different crop and livestock systems (and associated conservation management) in different climates with varying scales of arrays as well as farmer interest in agrivoltaics. Research should also explore how agrivoltaic projects can improve water usage, soil health, and land access—especially for historically marginalized and limited-resource producers. In addition, research should assess what is needed to scale up agrivoltaic arrays in different communities and for various production systems (e.g., workforce development, market access, supply chain investments). **Federal** and **state** governments should encourage and/or incentivize developers to collect, aggregate, and share data (e.g., yield, soil health, economic) from current agrivoltaic arrays with state and federal agencies, researchers, NGOs, and other stakeholders to inform and advance the viability of future agrivoltaic projects.

2. **Incentivize Agrivoltaic Projects.** **State** and **local** Governments should incentivize the development of agrivoltaic solar arrays. **In order to offer effective financial incentives, government agencies and/or permitting authorities administering them need the authority**

[51] AFT estimates this to be ~$2,500 per assessment.

and ability to ensure with periodic verification that farming continues throughout the life of the array. Up-front program details should include, at a minimum:

- A definition for what qualifies for the incentive (see box below), including the percentage of the array that needs to be in continuous production if the financial benefit is not calculated per-acre,

Defining Agrivoltaics. **State** governments, led by the state agency responsible for supporting agriculture (e.g., the department of agriculture), need to set clear standards for what constitutes continuous agricultural production in a solar array that make a developer eligible to qualify for financial incentives. Farm and conservation groups should contribute to this process, in consultation with state energy offices and developers wherever possible and appropriate. **AFT suggests that the following non-exhaustive list of criteria and standards be incorporated**:

1. Over the lifetime of the solar array, the farm operation must continue to produce (outside of any planned fallow seasons) marketable and measurable *agricultural* products, not just beneficial habitat or other important ecosystem services. Land loss, light penetration, and yield thresholds should be considered in writing qualification definitions and regulations.
2. The qualification definition should take into account the type and value of agricultural products currently or recently grown on the site or in the state. Incentive amounts should be directly related to the added costs developers take on for each production system. Higher financial incentives may be needed to support the development of agrivoltaic arrays with crop production systems that align with local historic production.
3. Developers need to demonstrate that they have been actively engaging with a farmer who has a viable agrivoltaic farm business plan that, among other factors, considers soils, infrastructure, support services, water access, succession, and market access/customer segments for the farm product(s) that will be produced following installation.
4. Developers need to demonstrate they are adjusting solar array designs to meet the farmers' needs in supporting a viable farm operation for the life of the array (e.g., light availability, water wells for grazing animals, adequate water supply and infrastructure for irrigated crops, panel height and spacing changes to allow for farm machinery to pass through). Critically, array designs should be optimized to enable the producer to respond to changes in market demand over the life of the project and to meet other farm goals so as not to lock farmers into only one production system for 30+ years.
5. Developers need to demonstrate they will be working with a contractor who can implement these designs properly, including following all minimum standards recommended in the above section on Soils and Water.

- When and how spot checks will occur to ensure farming activities continue (e.g., annual location checks early in the life of the array, followed by more periodic verification),
- Conditions under which financial penalties will be applied or incentives clawed back if farming discontinues as well as who will be liable to pay for related noncompliance,
- How to prioritize arrays that increase the viability of, or provide new or enhanced farming opportunities for, operations owned by historically marginalized farmers, and
- A plan to periodically report publicly on project awards, efforts, and activities to increase public data and knowledge of agrivoltaic arrays. The **state agency** should also develop partnerships with research entities to collect, analyze, and share data collected from arrays they support to help increase understanding of agrivoltaic viability and scalability.

3. **Support Agrivoltaic Farmers.** **USDA** and **state programs** that support farm viability, training, conservation practice adoption, farmer-to-farmer networking, risk management, and more should be adapted to provide services and support to producers farming within solar arrays.

SHARED BENEFITS: Recommendations to Promote Farm Viability and Equity

Farming is a tough business with numerous risks and narrow margins. Solar arrays on farmland can reduce costs and provide steady, diversified revenue to landowners when integrated into a farming business. But as solar arrays increase in size, impacts are amplified. Farms are often described as "anchor businesses" because of the network of other businesses and services they support. Large, non-agrivoltaic, utility-scale arrays on hundreds or thousands of acres, of the kind that are increasingly being proposed in farm communities, will be an important part of an affordable energy transition, but they can strain the viability of farms that remain by decreasing land availability, increasing land prices, and reducing business for farm support services. Also, any off-farm implications to energy policy decisions that could raise rates for low-income households must be addressed. AFT recommends the following actions:

1. **Invest in Research:** **Federal** and **state** governments should invest in research to determine the potential impacts of solar development on farm economies, land access and tenure, Indigenous foods and land rights, food supply chains, and communities that have historically borne disproportionate health and economic burdens from energy generation.

2. **Incentivize Community and Distributed Solar.** AFT recommends that **state** governments implement net-metering policies, and that **federal** and **state** governments fully fund programs that will advance residential and behind the meter solar and storage development, including for farm businesses. Programs supporting community solar (40 acres or less) should also be created, and such programs should advance Smart Solar by: incentivizing both agrivoltaic arrays (as defined above) and siting on contaminated lands and the built environment; requiring developers to follow minimum standards to protect soil health and future access to water; achieving well-distributed projects with county-by-county incentives; and designing programs to ensure they benefit small- and mid-sized farms and historically marginalized farmers.

3. **Ensure an Adequate Amount of Working Farmland is Protected from any Development.** **Local** or **state** governments should implement policies that keep enough land in production to ensure that farming will remain viable in the community and spread the hosting opportunities and benefits across the state—for example, by developing statewide and/or county level farmland conversion caps or escalating mitigation fees as more farmland is developed (see Appendix B). **Local** and **state** permitting authorities should also require economic and other impact studies that may result from constructing arrays that would take an appreciable percentage of a community's farmland out of production.

4. **Engage in Inclusive and Proactive Community Planning:** **Federal**, **state**, and **local** governments should fund and participate in local/regional planning and community engagement with broad stakeholder involvement (See Siting Section Recommendation 3 and 4). **Local** and **State** governments and permitting authorities should incentivize up-front community engagement when developers seek permits. Federal- and state-recognized Tribes should be consulted on a

government-to-government basis where solar arrays have the potential to impact traditional tribal lands, Indigenous food sovereignty, and other rights.

5. **Support Landowner Empowerment and Decision-Making**: **Federal**, **state**, and **local** governments should support development and promulgation of information, including in languages other than English, that empowers farmers and landowners to navigate the negotiation process with developers and best represent their interests and needs.

6. **Reduce Energy Burden and Energy Poverty:** To ensure the policies described throughout this document are not regressive, **federal**, **state**, and **local** governments should develop, implement, and support policies and programs that lower energy bills and increase energy efficiency for low- and moderate-income ratepayers, and communities that have historically borne disproportionate health and economic burdens from energy generation.

Conclusion

Policymakers at all levels of government have a critical role to play in achieving a Smart Solar buildout. Given that farmland is a preferred site for solar arrays, especially utility-scale solar, this newer land use presents both opportunities and challenges for people and businesses in rural areas. Navigating these concerns over the next few years to maximize benefits and minimize impact will be essential to achieving renewable energy goals. AFT recommends that the Federal government and Congress work together to advance the federal recommendations throughout this document in the near term. Meanwhile, state and local policymakers should choose, develop, tailor, and implement policies from the menu of recommendations included throughout this document that are the most relevant to achieving a Smart Solar buildout within their local contexts. With such proactive action, communities will be best poised to strengthen agriculture while advancing a form of energy essential to slowing climate change across the world.