



AFT Written Comment on American Farms, Rural Benefits, and Clean Energy
Submitted to SM.RD.CleanEnergySiting@usda.gov
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Dear Undersecretary Berke and Director Jones-Albertus,

First, American Farmland Trust (AFT) would like to thank the United States Department of Agriculture (USDA) and the Department of Energy (DOE) for hosting the clean energy listening sessions, and for inviting this written comment in response to the continued dialogue between USDA and AFT, the American Farm Bureau Federation, the American Soybean Association, the National Corn Growers Association, the National Association of State Departments of Agriculture, and the National Farmers Union on these topics.¹ We are grateful that USDA and the Department of Energy (DOE) collaborated on these listening sessions, and are taking the time to hear from a wider circle of stakeholders about the benefits and challenges clean energy present in rural communities, and what is needed to ensure that this transition, as well as the historic investments of the Inflation Reduction Act, enhance rural vitality and farm² viability.

AFT has been engaged in renewable energy policy and siting since 2018. Throughout these years of experience our staff working on these issues have increased in number, and AFT has learned and evolved a great deal in its understanding of renewable energy, the resources and support we are able to provide to farmers and landowners, and in our programming and policy work to achieve our mission of saving the land that sustains us. We are pleased to now be in a position to share what we have learned with USDA and DOE through this written comment, and through continued dialogue moving forward, in service of maximizing the benefits from this transition, providing solutions to challenges rural communities are facing, and minimizing negative outcomes to farm viability and farmland across the nation.

AFT supports decarbonization targets, agreeing with scientists that society must quickly and drastically reduce emissions to slow climate change and minimize impacts from droughts, floods, and extreme heat—which are already affecting farmers and ranchers. Decarbonization of electricity generation—responsible for a quarter of emissions in the United States—is an essential, high-priority component of this effort of which solar energy generation is expected to play a large role.

According to a 2021 [DOE study](#), in order to decarbonize U.S. electricity generation, solar energy may rise from 4% of our nation's total energy production to 45% by 2050. This buildout is expected to accelerate quickly—a recent [Solar Energy Industry Association report](#) projects that the solar industry will triple in cumulative deployment by 2028. In response to market forces, policy, and historic investments, the scale of solar projects is rapidly changing from the smaller-

¹ AFT has separately submitted the memo from this group that was first transmitted to USDA in July of 2023 on this topic as part of this solicitation for written comment.

² The term “farmland” in this document refers to all agricultural land, including farmland and ranchland. Likewise, the terms “farm” and “farmers” includes ranches and ranchers.

scale, distributed community and residential projects of the past to larger, utility-scale solar arrays occupying hundreds or thousands of acres. This transition is expected to have significant impacts on rural working lands as the least-cost option for siting such projects. According to the same DOE study mentioned above, increasing solar generation to 45% could require nearly 10.4 million acres by 2050, with 90% expected to be sited in rural communities.

Further studies reveal that, with current policies in place, most solar development will take place on farmland. **Modeling done by AFT, through its [Farms Under Threat: 2040](#) analysis, projects that 83% of new solar development will take place on agricultural land if current trends continue, with almost half on our most productive land for producing food and other crops.** Solar developers often select high-quality farmland since it is more likely to be flat, dry, clear, and close to existing infrastructure to interconnect to the grid—thus making it less costly to develop. In addition to the climate benefits these projects provide, farmer-landowners stand to benefit from the lease payments solar developers offer. Rural communities can also benefit from increased tax revenue, payments in lieu of tax agreements, and community benefit agreements negotiated with developers. And agrivoltaic projects that pair solar energy generation and agricultural production can create land access opportunities, though this is currently primarily limited to sheep grazers.

Solar arrays of all scales will be an essential part of an affordable and reliable clean energy transition. But with the increased scale and pace of projects, concerns are also being raised in rural farm communities about the impacts of proposed projects. **While the overall nationwide percentage of farmland that may be put into solar is expected to be minimal by nationwide percentage, as USDA and DOE heard in the listening sessions the impacts will be outsized in host communities with favorable siting characteristics and interconnection opportunities—with some grappling with the conversion of as much as 40% of their farmland to solar for the next 25-40 years.** This is raising concerns about impacts on land prices and availability, especially for farmer-renters who are being outcompeted by solar developers and displaced from land they used to farm. It is also raising concerns about the fate of the economic ecosystem of farm support services and businesses, and around the consequences of displacing farming from land well-suited for agriculture generally. The loss of this finite supply of land well-suited for producing food and other crops could put more marginal farmland in production, leading to decreased productivity, farm viability, and food security, as well as increased environmental impact. Finally, questions remain about the impacts to soils and the future ability to farm land that has been converted to solar if and when arrays are removed given 1) the high-disturbance periods of construction and decommissioning, 2) “use it or lose it” water rights across much of the American west, and 3) the lack of awareness and expertise from most asset owners on the practices needed to improve soil health during operation.

These challenges and questions being raised in communities are slowing and halting solar projects, threatening the timely and successful achievement of U.S. climate goals. In a [recent study](#) analyzing why proposed utility-scale renewable energy projects were delayed or stopped entirely between 2008 and 2021, land concerns were the most frequent culprit, with concerns over ‘nonmonetary’ impacts (including land use changes from agricultural to industrial use) arising in 82% of cases. This dynamic is exacerbated as the scale and pace of proposed projects increase. As a result, many localities are passing moratoria to take time to study the impacts of solar, and to devise and develop policies governing permitting and siting

that will meet their communities' needs. In reaction, some states are preempting local control, sometimes to advance this buildout and sometimes to slow it down, causing further tension and conflict. **But America needs both renewable energy and productive, resilient farms and ranches. Having both will take intentional federal, state, and local action.**

The goals of AFT's solar policy work are to maximize the benefits of this transition to farmers, farmland, farm communities, and the climate and to minimize the displacement of farming and negative impacts to farmland productivity, farmer-renters, and farm communities, all while accelerating renewable energy development across the nation. While this is a challenging needle to thread, given the outsized role farmers, farmland, and rural communities are expected to play, and the historic investments now being made to advance clean energy and rural electrification AFT sees this as essential. And USDA—alongside DOE—has a critical role to play in ensuring we can find the balance to achieve all of these goals simultaneously.

AFT's Smart Solar Principles Provide a Roadmap to Solutions

AFT has developed four non-hierarchical principles that, when followed, will help lead to what AFT has termed a Smart Solar buildout that strengthens farm viability and rural vitality:

Siting: Prioritize solar siting on the built environment, contaminated land, and other land not well-suited for farming to help minimize the impacts of solar energy on our nation's best agricultural land and farm businesses.

Soil and Water: Safeguard the ability for land to be used for agricultural production when siting solar on farmland by following best practices during construction, operation, and decommissioning that promote soil health and productivity and preserve future water rights and access.

Agrivoltaics: Expand the use of agrivoltaics for agricultural production and solar energy on the same land to minimize displacement of farming from farmland and to improve farm viability.

Shared Benefits: Promote equity and farm viability in siting and permitting decisions with inclusive processes to accelerate project siting, maximize benefits, and minimize negative community impacts.

In short, 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 now and in the future, and ensuring equitable community benefits. **Smart solar elevates agricultural considerations and aims to accelerate renewable energy development by listening to and addressing, rather than minimizing, community concerns.** Furthermore, these principles recognize the importance and complexity of supporting farm viability and rural vitality, and that achieving decarbonization goals will require siting some solar on farmland—but that this must be done in ways that strengthen agriculture.

While private actors and state and local governments are primarily responsible for these decisions (see AFT's Smart Solar policy recommendations to state and local governments [here](#)), **the Federal government is uniquely positioned to provide trusted information, resources, and support and to invest in research that will provide answers to critical questions that are halting and slowing projects on the ground.** In addition, the Federal government can model good decision making in its own clean energy programs and investments.

Recommendations: How the Federal Government can Advance a Smart Solar Buildout

USDA's stated mission is to "provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on public policy, the best available science, and effective management" and its vision is to "provide economic opportunity through innovation, helping rural America to thrive." As the only arm of the Federal government with a footprint in rural America, USDA is well poised to support a Smart Solar buildout. Furthermore, given the expected scale of solar development in rural communities, the Department's mission and vision cannot be achieved without active engagement in the solar buildout, not only through its own programs and services at Rural Development, but also by providing guidance, resources, and information to farmers, state and local governments, and other federal agencies on how to balance these priorities.

Even though state and local governments and private actors lead in proposing and permitting solar projects, the federal government – and specifically USDA – has a critical role to play in strengthening farm viability and minimizing displacement of farming from productive land as solar development accelerates across the U.S. Such actions will be an essential part of preventing conflict and providing productive paths forward in communities across the nation to achieve climate goals. In response to what we have learned and the comments raised in the listening sessions, AFT recommends the following next steps for USDA and DOE:

1. **Coordinate a USDA working group and strategic plan with external stakeholders and experts to advance federal leadership in promoting Smart Solar.** AFT recommends that USDA form an official working group to determine federal actions to advance all four Smart Solar principles. This working group should include representatives from the Farm Service Agency (FSA), National Institute of Food and Agriculture (NIFA), Agricultural Research Service (ARS), the Natural Resources Conservation Services (NRCS), Rural Development, and any other relevant agencies. This working group should meet regularly with other federal agencies (e.g., DOE) and engage with external stakeholders and experts to inform its work, including farm groups and state departments of agriculture.
2. **Provide trusted, technical guidance and information.** Questions from landowners, state and local governments, and solar developers about how to decarbonize while strengthening farm viability and protecting soils and productivity are arising with little time to arrive at solutions. As a result, the solar buildout is attempting to accelerate without widespread buy-in and a shared understanding of how to ensure that it will contribute to, and not harm, farm viability and rural vitality. All of this is creating permitting slowdowns. USDA is in a strong position to be a trusted voice in solving these issues by:
 - a. **Creating guidance and best practices to safeguard the ability to farm land put into solar in the future.** Based on its soil health principles, NRCS, in coordination with NIFA and other relevant agencies, should develop regionally relevant guidance and recommended best practices and minimum standards for construction, operation, and decommissioning³ that will protect the ability for land put into solar to be farmed in the future (e.g., maintaining or improving soil health,

³ Currently, only the State of New York has guidance and best practices for [solar](#) and [wind](#), and these have been incorporated into both local land use laws and the [state](#) permitting process and funding awards.

- retaining water access, protecting existing infrastructure like drainage tile). Rural Development, and other federal agencies investing in solar, should ensure developers will meet minimum standards when siting on farmland as a condition for receiving funding and/or as part of National Environmental Policy Act (NEPA) review. Making this guidance widely available would provide state and local governments, permitting authorities, and developers with an essential technical resource that can strengthen project awards, planning, and permitting processes; build community confidence in proposed projects; and reduce resistance and permitting delays.
- b. **Providing resources to assist with state and local decision making.** USDA should create, aggregate, and/or provide resources and opportunities to support Smart Solar projects to state and local governments. This could include maps (e.g., USDA Soil Survey Geographic Database), guidance (e.g., model laws for Smart Solar on farmland), and more funding to aid state and local governments and other Federal agencies in engaging in farmland protection planning and least-conflict processes⁴ that identify priority areas for both renewable energy development and protection.
 - c. **Supporting landowner empowerment and information.** USDA should produce, or fund and aggregate, regionally and culturally appropriate educational materials and guides for landowners that address what to look for in evaluating solar leases that meet their needs. This information should be made available at USDA county offices and online.
3. **Create and invest in a strategic research plan to advance Smart Solar.** Investing in research to answer the questions being raised in communities *today* will be essential to getting renewables built *tomorrow*. AFT recommends that USDA and DOE collaborate on creating a strategic research plan to fill current knowledge gaps on the below topics. AFT recommends then investing in research with relevant external partners and experts (e.g., state agencies, land grant universities and HBCUs, extension, farm organizations, associations representing municipalities, developers and trade associations) to examine:
 - a. **What is needed to keep land well-suited for agriculture in production during this transition.** Specifically: 1) What is delaying more robust solar siting on contaminated land, the built environment, and marginal land, and what is needed to overcome these barriers; 2) How to construct, operate, and decommission solar arrays so the land can be farmed during and/or after the life of the array to further inform future iterations of best practices in recommendation 2(a) above; 3) How to advance more diverse applications of agrivoltaics at scale; and 4) How communities can ensure shared benefits from renewable projects.

⁴ Least conflict processes bring different stakeholders (e.g., agricultural groups, transmission groups, conservation organizations, developers, environmental justice groups, Tribes) together to inclusively and proactively determine priority areas to avoid converting, and preferred (“least-conflict”) areas for development. These processes empower communities to engage in decision making *before* projects are proposed by clarifying community priorities and values, thereby reducing conflict and project delays and accelerating solar development in the long run. Examples include the [Columbia Plateau](#) in Washington State (which was raised in the public listening session) and the [San Joaquin Valley](#) in California.

- b. **Impacts communities can expect from utility-scale solar** on farm viability, farmland loss, land purchase and rental rates, and land access for farmer-renters (especially historically underserved and limited resources producers), and recommendations for how to minimize or mitigate potential negative impacts.
 - c. **The impact of any planned, federally-funded energy infrastructure buildout** (e.g., transmission, substations, storage) on potential future conversion of farmland, with a goal of finding ways to minimize conversion of land well suited for agriculture out of farming.
4. **Model good program design and federal funding awards to enable growth of Smart Solar projects.** Smart Solar projects avoid converting land well-suited for farming out of production. With the historic investment into clean energy through the Inflation Reduction Act, the federal government will be shaping the renewable energy buildout for years to come. AFT recommends that USDA, with historic Rural Energy for America Program (REAP) and Rural Utility Service (RUS) funding, and DOE, with clean energy dollars and tax incentives, take action to implement and award federal funding in ways that will advance Smart Solar projects. This should include, as applicable for each program:
- a. Gathering information from funding applicants on soil type, prior use, plans to ensure future access to water (where applicable) and conserve and/or improve soil health, and agrivoltaic plans within the project area, and awarding higher points to projects that avoid converting land well-suited for agriculture out of production.
 - b. Through existing authorities, requiring that developers receiving federal funds for solar arrays on farmland (especially prime farmland) follow minimum standards and/or best practices to preserve soil productivity, as suggested in recommendation 2(a) above, to ensure the land can be farmed after (and ideally during) the life of the solar array. Developers must then be held accountable to following practices by hiring third-party monitors and/or experts.
 - c. Incentivizing agrivoltaic arrays that pair solar energy generation with agricultural production (see Recommendation 6, below).⁵
 - d. Supporting wider development of smaller-scale distributed solar, which is *most* beneficial for communities, localized ownership, and farm viability.
5. **Suggest that Community Benefit Agreements include components that keep land in farming and sustain the farm economy throughout the life of the solar array.** Community benefit agreements can help municipalities collect revenue to invest in essential local projects. In its [Smart Solar Policy recommendations](#) released in December of 2023, AFT recommended that state and/or local governments charge per-acre compensatory mitigation fees for prime farmland converted out of active agricultural production, and that these funds be invested into a) permanent farmland protection by purchasing agricultural conservation easements, and/or b) infrastructure, processing, and other economic development projects that will sustain and enhance the existing and anticipated local farm economy. The purposes of these investments would be to ensure farming continues as a

⁵ **Note:** Any policies or programs incentivizing agrivoltaic arrays needs to have or provide the authority and ability to the overseeing public entity to perform spot checks and claw back any benefits provided to ensure the promised farm production has come to fruition and continues throughout the full life of the project.

robust economic driver in the community throughout the life of the solar array, and to increase the odds that land put into solar will be put back into production after the project is decommissioned and the site is restored. Some states, like New York, have implemented this suggestion. Others, like Maine and Virginia, are in the process of creating these policies through inclusive stakeholder processes.⁶ USDA and DOE should ensure developers can invest in these activities through its Community Benefit Agreement requirements.

6. **Support the growth of agrivoltaic arrays.** As highlighted throughout the listening sessions, agrivoltaic arrays provide the potential of keeping land put into solar in production, but farm production is not yet being incorporated into proposed solar arrays widely across the country. Agrivoltaic arrays are also defined differently by different groups, leading to confusion and misuse of the term. To advance this potential win-win solution in a way that supports viable farm operations, AFT recommends:
 - a. **Defining agrivoltaics properly.** AFT considers agrivoltaics to be the integration of active agricultural production and solar energy generation on the same piece of land throughout the full life of the solar array, ideally in ways that co-optimize both.⁷ AFT recommends that USDA create a definition in rules and regulations, in coordination with farm and conservation groups and in consultation with DOE, for what qualifies as agrivoltaic production within USDA programs. This definition should take regional variation into account, ensure a viable farm operation continues through the full life of the solar project, and consider what minimum percentage of a solar array needs to be in production in order to qualify as agrivoltaic and receive benefits.
 - b. **Investing in research.** USDA and DOE should continue to assess and study the economic viability (for farmers and developers) and scalability of many diverse types of agrivoltaic arrays (especially crop production) in different regions of the country. Projects designed to support long-term sheep grazing are currently the least expensive, and the most common agrivoltaic application employed by U.S. developers. In the U.S., crop-based agrivoltaic projects are mostly limited to a research context, and more research must be done to fill gaps in knowledge, determine which projects are economical for farmers and developers, and identify what is needed to scale them up in different climates.
 - c. **Creating and implementing a 5-year plan to incorporate agrivoltaics throughout USDA programs.** AFT recommends USDA take action to ensure the essential programs it offered for farmers are available to those producing within solar arrays. As part of this, USDA should 1) ensure all FPAC programs are

⁶ New York requires mitigation fees for solar projects on 30 acres or more of prime farmland that was actively farmed. The Commonwealth of Virginia is exploring a mitigation fee structure for solar projects proposed on over 10% prime soils, and Maine is exploring creating a mitigation structure. Washington state is proposing a mitigation policy for farmland lost as a result of government action.

⁷ Dual-use (sometimes also referred to as co-location), generally involves traditional ground-mounted solar installations that provide other social benefits or host non-agricultural plantings with additional environmental benefits (e.g., flash grazing of sheep as part of planned vegetation management, planting pollinator habitat). While such projects are beneficial, they should not be considered agrivoltaic solar. Agrivoltaics specifically describes the production of a farm product, undertaken in an integrated way with a solar array throughout the life of the array. For AFT, all agrivoltaics are dual-use, but not all dual-use is agrivoltaic.

accessible to agrivoltaic farmers, 2) ensure conservation practice standards most relevant for agrivoltaic producers are technically tailored for this specific application, and 3) clarify through a national bulletin that those providing conservation technical assistance with federal dollars (e.g., NRCS agents, Technical Service Providers, conservation districts) are able to assist grazers, crop producers, and other farmers and ranchers developing and working on agrivoltaic projects. USDA should also support organizations who are matchmaking farmers interested in agrivoltaics with solar asset owners who want to make their land available.

7. **Uniformly apply the Farmland Protection Policy Act (FPPA) to utility-scale solar development.** Administered by NRCS, the FPPA requires federal agencies to consider the impact of their programs on farmland conversion, and to rate and track the potential impact of any project supported by federal funds that the agency determines will result in the permanent conversion of agricultural land to a nonagricultural use. It also seeks to ensure that federal programs are administered to be compatible with state, local, and private policies to protect farmland. While, in theory, solar development may not be permanent, many factors would need to be in place for a viable farm to begin on that land 35 years or more into the future. Therefore, alongside continued investment in permanent farm and ranch land protection through programs like the Agricultural Conservation Easement Program (ACEP), AFT recommends that NRCS consider non-agrivoltaic solar development permanent conversion as it concerns the FPPA. To accomplish this, USDA should:
 - a. Release guidance to state NRCS offices that defines non-agrivoltaic utility-scale ground-mounted solar arrays as permanent conversion of agricultural land subject to the FPPA.
 - b. Track *actual* conversion of agricultural land as a result of solar projects subject to the FPPA, as opposed to its present practice of tracking only *proposed* conversion.
 - c. Require that solar projects subject to the FPPA minimize their development footprint on the country's most productive, versatile, and resilient agricultural land to the maximum extent practicable.

These changes to the FPPA would not preclude solar development on agricultural land. Rather, they would result in a better understanding of the actual impact of federally-funded activities on agricultural land conversion, including conversion to solar development. They would also help minimize the conversion of the country's most productive and irreplaceable agricultural land from all federally-funded activities, including solar development, where feasible to do so.

8. **Support low- and moderate-income ratepayers.** To ensure these policies are not regressive, the federal government should increase investment into 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. For example, the Low Income Home Energy Assistance Program (LIHEAP), offers block grants to states that flow to local agencies to support lowering energy bills and improving energy efficiency.

Thank you for inviting this comment. AFT looks forward to continuing to work with USDA and DOE to advance Smart Solar projects across the nation. Please do not hesitate either to be in touch with questions, or if AFT can provide assistance in achieving these shared goals.