RESPONSE

ILLUMINATING THE LAND-ENERGY NEXUS[†]

DANIELLE STOKES*

CONTENTS

INTRO	DUCTION	564
I.	AN INEXTRICABLE CONNECTION	566
II.	SUSTAINABILITY AND THE CONSERVATION RESOURCE PROGRAM	569
CONCLUSION		572

[†] An invited response to Hannah J. Wiseman, Samuel R. Wiseman & Chris Wright, *Farming Solar on the Margins*, 103 B.U. L. REV. 525 (2023).

^{*} Assistant Professor of Law, University of Richmond School of Law.

INTRODUCTION

The complexities of climate change have infiltrated every facet of life. From environmental preservation and food production to employment opportunities and policymaking, climate plays a role. These respective touchpoints have a direct connection to the Farm Bill.¹ This law serves as the crux of agricultural programs and cements the relationship between farmers and the federal government. What began as a safety net following the Great Depression has expanded into a multi-title behemoth that now regulates nutrition assistance, rural economic development initiatives, and everything in between.² In recent years, thought leaders such as the Farm Bill Law Enterprise have brought climate-centered conservation efforts to the fore.³ While it does emphasize climate risk management and adaptation, the Farm Bill fails to address the greatest climate change mitigation tactic-reducing greenhouse gas emissions. Farming Solar on the Margins⁴ provides an opportunity to meaningfully consider the critical role that marginal lands⁵ can play when assessing renewable energy generation, renewable portfolio standards,⁶ and the federal goal to achieve net zero by 2050.7

The Department of Energy reports that solar deployment must grow by an average of thirty gigawatts ("GW") between 2025 and 2030 to achieve a zero-

⁵ "Marginal lands are typically characterized by low productivity and reduced economic return or by severe constraints for agricultural cultivation." S. Kang, W. Post, D. Wang, J. Nichols, V. Bandaru & T. West, *Hierarchical Marginal Land Assessment for Land Use Planning*, 30 LAND USE POL'Y 106, 106 (2013).

¹ Agriculture Improvement Act of 2018, Pub. L. No. 115-334, 132 Stat. 4490 (codified in scattered sections of 7 U.S.C.).

 $^{^2\,}$ Jonathan Coppess, The Fault Lines of Farm Policy: A Legislative and Political History of the Farm Bill 2-29 (2018).

³ See FARM BILL L. ENTER., THE 2023 FARM BILL: FBLE RECOMMENDATIONS OVERVIEW 2 (2022), https://www.farmbilllaw.org/wp-content/uploads/2022/11/FBLE-Recommendations-Overview.pdf [https://perma.cc/LF6G-T4RV].

⁴ See generally Hannah J. Wiseman, Samuel R. Wiseman & Chris Wright, Farming Solar on the Margins, 103 B.U. L. REV. 525 (2023).

⁶ Renewable portfolio standards are state-imposed "policies designed to increase the use of renewable energy sources for electricity generation." *Renewable Energy Explained*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/renewable-sources/portfolio-standards.php [https://perma.cc/S4JP-ME7Z] (last updated Nov. 30, 2022).

⁷ Net zero describes the point at which the anthropogenic greenhouse gas emissions are counterbalanced by removing greenhouse gases from the atmosphere. President Joe Biden's plan to achieve net zero implicates federal procurement, operations, vehicle acquisitions, and energy consumption. *See FACT SHEET: President Biden Signs Executive Order Catalyzing America's Clean Energy Economy Through Federal Sustainability*, WHITE HOUSE (Dec. 8, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/ [https://perma.cc/PW6J-JC8V].

carbon grid by the target deadline.⁸ For context, one GW of solar generation requires a land mass of approximately 9,000 acres.⁹ To date, the federal government has not explained how it will meet these land-intensive energy goals. As a result, most policy discussions fail to include where and how this development will take place.¹⁰ In *Farming Solar on the Margins*, Hannah Wiseman, Samuel Wiseman, and Chris Wright offer the more than twenty million acres enrolled in the Farm Bill's Conservation Reserve Program ("CRP") as ripe for consideration. The article also helps contextualize the challenges that exist at the nexus of land use, energy, and climate change in the absence of collaborative governance structures and suggests an innovative method of colocating energy to promote agrivoltaics within the purview of conservation.¹¹

A fundamental principle of property law underlies this proposal: utilizing land most efficiently while minimizing waste.¹² This utilitarian notion is particularly compelling when considering climate change mitigation and adaptation. *Farming Solar on the Margins* recognizes that competing interests at the land-energy nexus may require balancing tests to achieve some level of Pareto efficiency.¹³ The authors also acknowledge that the CRP will not solve every energy or climate problem, but it does offer a policy framework within which various stakeholders and perspectives can be incorporated into the climate policy agenda.¹⁴

The authors contribute in two key ways: (1) by highlighting the inextricable connections between land, energy, and climate governance while inquiring how to maximize policymaking at the land-energy nexus; and (2) by utilizing the Farm Bill to exemplify the ways that these connections can be governed

⁸ See OFF. oF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, SOLAR FUTURES STUDY, at vi (2021), https://www.energy.gov/sites/default/files/2021-09/Solar%20 Futures%20Study.pdf [https://perma.cc/W5QN-MZPY].

⁹ DJ Gribbin, *Environmental Permitting Might Block Biden's Clean Energy Targets*, BROOKINGS (May 13, 2021), https://www.brookings.edu/blog/the-avenue/2021/05/13/enviro nmental-permitting-might-block-bidens-clean-energy-targets/ [https://perma.cc/7AK9-U58E].

¹⁰ See generally, e.g., OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, *supra* note 8.

¹¹ Agrivoltaics is the combination of agriculture and solar photovoltaic technology on the same land. *See* Wiseman et al., *supra* note 4, at 550-51. Congress has also proposed a study for dual-use renewable energy systems that would investigate the compatibility of different species of livestock and crops alongside renewable energy. What land will be included in the study and whether the provision will be adopted in the 2023 reauthorization remains unknown. *See* Agriculture Resilience Act, S. 1337, 117th Cong. (2021).

¹² See Terry W. Frazier, *The Green Alternative to Classical Liberal Property Theory*, 20 VT. L. REV. 299, 312 (1995) (defining utilitarian theory as arranging property laws to "maximize the aggregate of utility [so] that all members of society" benefit); Nadav Shoked, *The Duty To Maintain*, 64 DUKE L.J. 437, 449-50 (2014) (describing modern property theories in conjunction with owners' rights).

¹³ Wiseman et al., *supra* note 4, at 544-45.

¹⁴ Id. at 557-61.

holistically. This Response's aim is to reinforce the call for solar on the margins and to slightly expand upon potential implementation measures. Part I of this Response discusses some of the challenges embedded in policymaking at the nexus. Part II examines how the Farm Bill can be reconceptualized to assess conservation and sustainability through a modern, climate-conscious lens. Ultimately, *Farming Solar on the Margins* has opened the door for viable policy considerations as Congress prepares to reauthorize the Farm Bill.

I. AN INEXTRICABLE CONNECTION

The clean energy transition is riddled with regulatory mismatches. One keen observation is that "farmers have land and subsidies but need a steadier source of income. Renewable energy developers, in turn, need land and more subsidies."¹⁵ This observation also identifies the various policy levers that must be manipulated to effectively regulate the siting, permitting, and funding of renewable energy. *Farming Solar on the Margins* centralizes the Farm Bill as a key piece of legislation that can incentivize the energy transition from a federal perspective, but this alone may not adequately address the state and local regulatory structures that are also integral to the transition process.

Solar energy development implicates partisanship, economic incentives, and traditional notions of rural identity.¹⁶ It also calls into question the feasibility of current governance structures to facilitate a wide-scale clean energy transition. Specifically, the interconnections between land use, energy regulation, and environmental law raise issues related to spatiality and the scale of governance within renewable energy planning and siting.¹⁷ I have previously argued that current governance structures should be expanded to incorporate renewable energy federalism defined by collaborative policymaking and coordination.¹⁸ The geography-centric nature of renewables and their transmission requirements give the federal government a unique perspective on where to locate utility-scale facilities and the appropriate siting guidelines.¹⁹ This, however, does not take away from the role that states and local governments must also play to ensure autonomy and experimentalism within the regulatory process.

Farming Solar on the Margins's proposal to utilize marginal farmland is one way to put renewable energy federalism into practice. As with any transition, there may be impediments to implementation. The main challenges can be categorized as structural, political, and place-based. I will discuss each of these challenges in turn.

¹⁵ *Id.* at 530 (footnote omitted).

¹⁶ See id. at 531-33.

¹⁷ See Hari M. Osofsky & Hannah J. Wiseman, *Dynamic Energy Federalism*, 72 MD. L. REV. 773, 777-78 (2013) (discussing need for multilevel governance approach to meet clean energy needs).

¹⁸ See Danielle Stokes, *Renewable Energy Federalism*, 106 MINN. L. REV. 1757, 1777-84 (2022).

¹⁹ *Id.* at 1764-69.

Structurally, the existing regulatory patchworks must be disentangled and reconstructed to form a homogeneous policy fabric.²⁰ By integrating renewable energy development into conservation efforts, *Farming Solar on the Margins* weaves together critical facets of environmentalism. Scholars have described regulatory patches within the land use context as primarily involving local governance operating in the shadows of private controls in conjunction with overlays of federal and state regulations.²¹ In recent years, there has been a resounding cry to move beyond a local government-centered view of land use, particularly given the onset of climate disasters.²² The global impact of land use and energy consumption cannot be overstated. These issues are not purely local and should not be governed as such. Instead, regulation across governance scales—national, state, and local—would be most effective.

The overlapping interests and connected outcomes related to solar siting support the call for a coordinated and collaborative governance structure. Take the agricultural sector as an example. It produces eleven percent of American greenhouse gas emissions.²³ These emissions are mobile and cannot be concentrated, so their effects are felt worldwide. There are currently no national (or international) policies that directly regulate greenhouse gases.²⁴ Integrating an energy component within the CRP identifies land availability for solar siting and advances interests across scales. A federal process to maximize land usage to reach net-zero goals exists, which can also benefit states' renewable portfolio standards. Locally, the projects can increase tax revenues and the disposable income of program participants.²⁵ In the absence of collaboration across scales,

²⁰ See generally STEPHEN BREYER, REGULATION AND ITS REFORM (1982).

²¹ Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENV'T L.J. 241, 255 (2011) (citing Craig Anthony Arnold, *The Structure of the Land Use Regulatory System in the United States*, 22 J. LAND USE & ENV'T L. 441, 446-47 (2007)).

 $^{^{22}}$ Id. at 291-92 (describing scholars' predictions as to possibilities of structural land use reform).

²³ Sources of Greenhouse Gas Emissions, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions [https://perma.cc /V9NY-RC9M] (last updated Aug. 5, 2022).

²⁴ While no enforcement mechanisms are in place, key regulatory stakeholders such as the Intergovernmental Panel on Climate Change acknowledge that sustainable land management is a major factor in reducing the negative impacts of climate change. Most notably, the international goal of limiting temperature rise to 1.5 degrees Celsius challenges policymakers and scholars to identify ways to achieve this goal. *See* ALMUT ARNETH ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS 24 (2019), https://www.ipcc.ch/site/assets/uploads/sites/4/2022/11/SRCCL_SPM.pdf [https://perma.cc /JGP9-ZP9A].

²⁵ For example, a solar lease payment can range from \$300 to \$2,000 per acre annually, depending on the facilities located on one's property. *See Solar Farm Land Lease Rates* | *YSG Solar*, YSG SOLAR (Oct. 6, 2020), https://www.ysgsolar.com/blog/solar-farm-land-lease-rates-ysg-solar [https://perma.cc/KUL6-H8CX]. The federal government also has proposals to lease public lands to developers at reduced rates ranging from eight dollars to fifty dollars per acre depending on the state. *See Expanding Renewable Energy*, U.S. DEP'T OF THE

there may be tension among stakeholders under the *Farming Solar on the Margins* proposal if regulatory objectives are not clearly defined. These tensions can also manifest via partisanship.

At the outset, the authors in *Farming Solar on the Margins* identify political polarization as a hindrance to aggressive climate policies.²⁶ Integrating solar energy siting incentives into the CRP could pose challenges across both sides of the political aisle. The potential challenges are multifaceted. "Not in My Back Yard" or NIMBYism complaints resulting from land use changes are the most common.²⁷ However, policymakers must also consider the juxtaposition of solar energy siting on land originally slated for conservation. It is unclear where blue states will land when environmental, development, and land disturbance interests must be weighed in the decision-making process.²⁸ To circumvent partisan divides and broaden the points of discussion, scholars have recommended framing policy recommendations in less contentious terms.²⁹ Rather than explicitly discussing shifts from land conservation to solar development, a more palatable approach may be to focus on economic development or disaster resilience.³⁰ Where energy projects have demonstrable economic benefits, politicians of any affiliation and the public at large are more willing to get on the bandwagon.³¹

Garnering policy support is critical to shaping perspectives around community impact. Many place-based ideals influence both policy and development preferences in rural communities. Within the climate change context, there are also place-based costs and benefits to the clean energy transition that are rather explicit when viewed along the rural-urban divide.³² Utility-scale renewable projects are often expected to be located in rural areas, but bearing the costs of development does not necessarily guarantee access to all benefits.

Due to the nature of energy, power can be generated in one location and transmitted elsewhere. Rural communities, then, may reap the financial benefit attached to a project—rather than the clean energy benefit that the project derives. For some, these trade-offs are significant given the duality of residing

INTERIOR: BUREAU OF LAND MGMT., https://www.blm.gov/programs/energy-and-minerals/renewable-energy [https://perma.cc/W7ZG-U9F4] (last visited Feb. 10, 2023).

²⁶ Wiseman et al., *supra* note 4, at 528-29.

²⁷ See Stokes, supra note 18, at 1762.

²⁸ See Brian Kennedy, Alec Tyson & Cary Funk, *Americans Divided Over Direction of Biden's Climate Change Policies*, PEW RSCH. CTR. (July 14, 2022), https://www.pewresearch.org/science/2022/07/14/americans-divided-over-direction-of-bidens-climate-change-policies/ [https://perma.cc/82BP-EMF5].

²⁹ See Hari M. Osofsky & Jacqueline Peel, *Energy Partisanship*, 65 EMORY L.J. 695, 719-20 (2016).

³⁰ See id. at 702.

³¹ See id. at 734.

³² See Danielle Stokes, Bridging a Rural-Urban Divide, ENV'T F., Sept.-Oct. 2022, at 25, 25.

in a rural area with vast land masses. On the one hand, these areas are hubs for food production, habitat preservation, and aesthetic beauty. On the other hand, the energy transition forces communities to contend with the built environment predominating the physical environment. Scholars have pointed to the cultural cognition theory which suggests that "an individual's attitude to risk is shaped by the social structures in which the individual is embedded and the 'cultural bias' that [they favored]."³³ If a pristine environment and agricultural way of life are fundamental cultural values, a shift from conservation to development will need to address these concerns. Similar to the tactic of engaging with policymakers around palatable topics, the same likely holds true in this instance. Emphasizing the environmental and economic benefits acknowledges the priorities of most rural community members. This approach capitalizes on mutual understanding rather than a politically charged topic such as climate change.

Utilizing marginal lands for solar development is a novel suggestion that reflects the regulatory gaps that exist in the absence of a collaborative governance structure. The interconnections between land use, energy law, and climate policies not only call for holistic policymaking, but also governance structures that consider public and private interests, community voice, and economics. Regulation that incentivizes action or inaction in one sphere automatically affects what is possible in another. Further, failure to invite all interested stakeholders to the regulatory table often results in inequitable outcomes. Part II discusses how environmentalism, economics, and equity converge as attributes of sustainability and should also be used to inform our understanding of conservation.

II. SUSTAINABILITY AND THE CONSERVATION RESOURCE PROGRAM

In explaining how to operationalize land-energy law to address climate change, *Farming Solar on the Margins* thoughtfully considers the costs and benefits of solar energy development on marginal farmland. The authors also acknowledge the statutory interpretation hurdles that may exist if solar energy development is read into the CRP in its current form.

At its inception, the Farm Bill sought to preserve, maintain, and rebuild farmland resources in the national public interest.³⁴ The national public interests at that time were centered around agricultural commodities and exporting key crops.³⁵ Conservation generally, and soil conservation, in particular, has always been a foundational component of the legislation, but the interests that it sought to preserve have now expanded.³⁶ With the Supreme Court's latest foray into the

³³ Osofsky & Peel, *supra* note 29, at 713-14 (acknowledging debate surrounding theory and suggesting it can impact perceptions about climate change and its governance).

³⁴ See Agricultural Adjustment Act of 1938, Pub. L. No. 75-430, 52 Stat. 31 (codified as amended in scattered sections of 7 U.S.C.).

³⁵ See 7 U.S.C. § 1282.

³⁶ See COPPESS, supra note 2, at 2-29.

major question doctrine, it is unclear how it would rule on an expansive interpretation of "vague" statutory language.³⁷

Setting aside whether the CRP language must be revised, I submit that the cost of climate change is so great that it is necessary to expand the limits of conservation and reimagine its conceptualization. New questions must be considered: What should be conserved? Is there greater value in protecting one environmental resource—land—as compared to another—air? How should environmental protection trade-offs be assessed? In following the *Farming Solar* on the Margins recommendations, there may be less land conservation but greater environmental conservation that curtails the catastrophic effects predicted if mitigation and adaptation goals are not realized.

Through the Farm Bill, we can explore how conservation could be understood within the context of the "Three E's" of sustainability: *environment, economy, and equity*.³⁸ With each of these concepts factored into the policy-making calculus, conservation efforts can be balanced methodically. Values will inevitably be assigned to each concept, which may lead to questions regarding the assessment process. Assessing conservation through a sustainability lens is in no way a foolproof method, but it does provide a systematic framework for addressing complex issues, such as agrivoltaics.

First, when considering the environment, the Farm Bill and CRP minimally consider climate change.³⁹ However, as the authors of *Farming Solar on the Margins* suggest, the Farm Bill could be more effective if the land-energy nexus is viewed as an opportunity for climate policy.⁴⁰ Growing data suggests agrivoltaics boasts benefits such as soil nutrient recharge, water use reduction, and extended growing seasons.⁴¹ Soil contamination induced by defective equipment is a minor risk that has also been noticed.⁴² Most research to date indicates that the benefits outweigh the potential burdens to developed land. For instance, a National Renewable Energy Laboratory study assessed twenty-five sites across the country with varied metrics.⁴³ Their research identified five C's

³⁷ See West Virginia v. EPA, 142 S. Ct. 2587, 2595 (2022) (holding EPA had no authority to create emission caps by "generation shifting" electricity production to lower-emission methods).

³⁸ The American Planning Association refers to the triple bottom line of sustainability, which includes the "Three P's": people (equity), profit (economy), and planet (environment). *See* WAYNE M. FEIDEN WITH ELISABETH HAMIN, ASSESSING SUSTAINABILITY: A GUIDE FOR LOCAL GOVERNMENTS 3-4 (2011), https://www.cityofpa.us/DocumentCenter/View/7378 /PAS-Report-565 [https://perma.cc/6NH8-GE33].

³⁹ See, e.g., 7 U.S.C. § 8107a; 16 U.S.C. § 1675.

⁴⁰ Wiseman et al., *supra* note 4, at 535-36.

⁴¹ See Solar Energy Techs. Off., *Farmer's Guide to Going Solar*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/solar/farmers-guide-going-solar [https://perma.cc/JUU5-5RT3] (last visited Feb. 10, 2023).

⁴² Id.

⁴³ This includes crop production, pollinator habitats, ecosystem services, and livestock production. *See* JORDAN MACKNICK ET AL., THE 5 CS OF AGRIVOLTAIC SUCCESS FACTORS IN

of agriovoltaic project success: Climate, Configurations, Crop Selection and Cultivation, Compatibility, and Collaboration.⁴⁴ Ultimately, the recommendations provided guidance on how to successfully deploy agrivoltaic projects.

In addition to the environmental characteristics of a particular site, broader geographic advantages should also be considered when weighing the environmental attribute of sustainability. Most agricultural lands have connections to the electric grid and are in proximity to transmission lines and access roads.⁴⁵ For these reasons, they are prime locations for solar development and should be prioritized as such.

Sustainability also contemplates economics. As *Farming Solar on the Margins* suggests, there are many financial incentives to participating in the CRP. Farmers enrolled in the program receive annual rental and other incentive payments.⁴⁶ There are several options under the agrivoltaics proposal that could benefit all stakeholders. For instance, farmers could receive both a subsidy from the government and lease payments from developers.⁴⁷ Conversely, the financial strategy could provide an opportunity for collaboration between each of the interested stakeholders—government, farmers, real estate developers, and utilities. The parties could identify a cost-sharing plan that results in a net increase in payments for farmers, but fewer costs for the other interested parties. In turn, local economies would benefit from the increased tax revenue, additional jobs created during project construction, and may even be able to offset their greenhouse gas emissions.

Lastly, but most importantly, principles of equity are integral to sustainability despite often being overlooked. Within the context of agrivoltaics, this metric factors in issues related to cultural preservation, access to the proposed economic incentives, and job training to meet new workforce needs. Procedures that are developed to facilitate solar developments should incorporate multi-scalar and cross-sector interests.⁴⁸ These considerations exemplify how assessments of the land-energy nexus can be interwoven with sustainability principles. *Farming Solar on the Margins* examines many of these facets. I would simply offer that land-energy policies can be framed within the context of the "Three E's." In

THE UNITED STATES: LESSONS FROM THE INSPIRE RESEARCH STUDY, at vi (2022), https://www.nrel.gov/docs/fy22osti/83566.pdf [https://perma.cc/RZD6-23RL].

⁴⁴ Id.

⁴⁵ *Id.* at 1.

⁴⁶ Conservation Reserve Program, U.S. DEP'T OF AGRIC.: FARM SERV. AGENCY, https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/ [https://perma.cc/NN7Z-Y5AM] (last visited Feb. 10, 2023).

⁴⁷ The authors in *Farming Solar on the Margins* argue that "double dipping" should be permitted to induce farmers to utilize environmentally friendly practices. *See* Wiseman et al., *supra* note 4, at 558.

⁴⁸ These include policymakers at the national and subnational levels, community members, developers, as well as government and industry more broadly.

doing so, the standard conceptualization of conservation can take on a new form and expand to meet today's challenges.

CONCLUSION

As Congress prepares to take up the reauthorization of the Farm Bill in 2023, it should be cognizant of the role it plays in creating policies at the land-energy nexus. As *Farming Solar on the Margins* suggests, "finding political common ground is the only real hope for climate progress."⁴⁹ By recommending the use of marginal lands for solar energy generation, Hannah Wiseman, Samuel Wiseman, and Chris Wright offer a practical solution grounded in an underappreciated area of policy that is critical to the future of development. Given the current political climate, one can only hope that policymakers will consider thoughtful proposals such as farming solar on the margins.

⁴⁹ Wiseman et al., *supra* note 4, at 561.