Maine Agricultural Solar Stakeholder Group
September 23, 2021 Meeting Materials

Agricultural Solar Stakeholder Group Meeting
Thursday, September 23, 2021; 9:00 am - 12:00 pm

Meeting Registration Link:

https://mainestate.zoom.us/webinar/register/WN_qsFHsHkgQ3yDXieL1M5Tng

Desired Outcomes

By the end of this meeting we will have:

- Agreed on a functional matrix to distinguish approaches to siting solar projects on different types of farmland
- Discussed priority policy tools that could be applied to solar siting to protect prime farmland and soils of statewide importance
- Reviewed emerging areas of consensus and further defined deliverables
- Provided an opportunity for public input

Agenda

What	When
Welcome and Agenda Review – Jo D.	9:00 - 9:05
Tiers Concept Refinement and Discussion - Kaitlin, Eliza, Matt, Emily, Jeremy, Ellen	9:05 - 9:50
Policy Tools and Research Needs Subgroup Report-out and Discussion - Ellen, Eliza, Kaitlin, Emily, George, Patrick	9:50 - 10:35
Public Comment	10:35 - 10:45
Break	10:45 - 10:50
Scorecard Examples - applicability to Maine?	10:50 - 11:20

Taking Stock: Revisit Emerging Consensus Areas Document Finalize focus areas for process work products ID/differentiate findings and recommendations	11:20 - 11:50
Further Public Comment	11:50 - 11:55
Follow-up and Next Meeting: Thurs, Oct. 21, 9:00 am – 12:00 pm	11:55 - 12:00

Note: Agenda item times are subject to change based on the progress of the group.

Agricultural Solar Stakeholder Group Ground Rules

1. Meetings start and end on time.
2. Come prepared, having read all meeting materials in advance.
3. Be present and engaged.
4. Strive for equal air time, enabling everyone to participate fully.
5. Listen with curiosity and an openness to learning and understanding.
6. Adopt a creative problem solving orientation.
7. Commit to working toward consensus.
8. Meetings and materials are public, and comments are on the record.
9. Humor is welcome; it's OK to laugh while addressing a serious topic.

Decision-making: Decisions by the Stakeholder Group are advisory and represent recommendations to the Department of Agriculture, Conservation & Forestry and the Governor's Energy Office. The Stakeholder Group will strive to make decisions by consensus. Where not possible, recommendations supported by the majority will be advanced and other perspectives will be noted.

Meeting Schedule:

Th. 9/23	https://mainestate.zoom.us/webinar/register/WN_qsFHsHkgQ3yDXie-L1M5Tng
Th. 10/21	https://mainestate.zoom.us/webinar/register/WN_Sj7iq73NSx2NRrGNc-YPFqQ
Th. 11/18	https://mainestate.zoom.us/webinar/register/WN_MCVJo2bzRO2tj-Hvr0pqrhg
Th. 12/16	https://mainestate.zoom.us/webinar/register/WN_5I5XIFfPTZuzYx-PZGGraYA

Purpose

Develop a list of siting attributes, with as much specificity as possible. Enumerate considerations with respect to siting to inform the broader group's discussion about prioritization of development.

Parcel	**Farmland** Meets definition of farmland established in Title 36, section 1102 subsection 41 and/or affidavit from farmer.			
	Actively farmed	*Other farmland*	*Inactive farmland*	*Woodlot on farms*
Prime soils - Pursuant to Maine Instruction 430-3803	- **Encourage/incentivize dual use** - **Encourage non-dual use siting elsewhere**	- Encourage development	- **Encourage/incentivize dual use**	- Encourage co-location
Soils of Statewide Importance - Pursuant to Maine Instruction 430-3804	- **Encourage/incentivize dual use** - **Encourage non-dual use siting elsewhere**	- Encourage development	- **Encourage/incentivize dual use**	- Encourage co-location
Marginal farmland - Areas within farmland parcel not classified in the preceding categories	- Encourage development	- Encourage development	- Encourage development	- Encourage development
Non-agricultural land Encourage development on landfills, brownfields, rooftops, carports, gravel pits, mining sites, and other previously developed parcels.				

Definitions

Actively farmed: generates a gross income of at least $2,000 per year from the sale of agricultural products in one of two or three of five previous calendar years. Definition from Maine Title 36.

Co-location: involves traditional ground-mounted solar installations (designs that have not been modified to increase flexibility and compatibility for agricultural use) that host non-agricultural plantings with additional environmental benefits.

Dual-use: projects that involve the installation of solar photovoltaic panels on farmland in such a manner that primary agricultural activities (such as animal grazing and crop/vegetable production) are maintained simultaneously on the farmland.

Inactive farmland: all cropland other than harvested cropland or other pasture and grazing land that could have been used for crops without additional improvements, including cropland idle or used for cover crops or soil improvement, cropland on which all crops failed or were abandoned, and cropland in summer fallow. Definition from the USDA Agricultural Census.

Other farmland: land that does not otherwise fall into the actively farm category, consisting primarily of agricultural land used for crops, pasture, grazing, and/or wasteland that is part of a farm producer's total operation. Definition from the USDA Agricultural Census.

Woodlot on farms: woodland that is part of a farm producer's total operation.

New Jersey	Farmland Status EW2 Dual Use Solar Pilot (S3484 & A5434) – 200-300 MW Pilot (3-5 years) Grid Supply Bill (S2605 & A4554) – SREC-II competitive solicitation to incentivize > 1,500 MW by 2026			
	Unpreserved Farmland INSIDE County Agricultural Development Area (ADA's) (P.L.1964, c.48 (C.54:4-23.1 et seq.	Unpreserved Farmland OUTSIDE ADA's	Preserved Farmland Sec, 4 of P.L.2009, c.213 (C.54:4-23.3c).	Pinelands, Highlands, designated FW/C wetland
Prime soils - Pursuant to NJ NRCS	Dual Use Only with approved New Jersey public research institution of higher education. Up to 10 MW. Grid Supply Solar Allowed, impacting up to 2.5% in ADA without waiver. Hard cap of 5% of land in ADA with waiver above 2.5%.	Dual Use Allowed. Up to 10 MW Grid Supply Solar Allowed. >10 MW.	On-Farm Solar Allowed Dual Use NOT allowed Grid Supply Solar Not Allowed	Dual Use NOT allowed unless waiver Grid Supply Solar Not Allowed unless special authorization by BPU
Soils of Statewide Importance (SWI) - Pursuant to NJ NRCS	Dual Use Only with approved New Jersey public research institution of higher education. Up to 10 MW. Grid Supply Solar Allowed, impacting up to 2.5% in ADA without waiver. Hard cap of 5% of land in ADA with waiver above 2.5%.	Dual Use Allowed. Up to 10 MW Grid Supply Solar Allowed. >10 MW projects.	On-Farm Solar Allowed Dual Use NOT allowed Grid Supply Solar Not Allowed	Dual Use NOT allowed unless waiver Grid Supply Solar Not Allowed unless special authorization by BPU
Marginal farmland - Areas within farmland parcel not classified as Prime/SWI	Dual Use Allowed. Up to 10 MW Grid Supply Solar Allowed. > 10 MW	Dual Use Allowed. Up to 10 MW Grid Supply Solar Allowed. > 10 MW	On-Farm Solar Allowed Dual Use NOT allowed Grid Supply Solar Not Allowed	Dual Use NOT allowed unless waiver Grid Supply Solar Not Allowed unless special authorization by BPU

EW2: SRECII facilities in competitive solicitation process required to remunerate one percent of the renewable energy incentive payments they receive to the "Preserve New Jersey Fund Account," established pursuant to section 4 of P.L.2016, c.12 (C.13:8C-46).

Links: https://www.nj.gov/agriculture/sadc/

Grid Supply Bill:
https://www.nj.gov/agriculture/sadc/A4554NowChapterLaw169of2021Signed07.09.21.pdf

Dual Use Solar Pilot Bill:

https://www.nj.gov/agriculture/sadc/A5434NowChapterLaw170of2021Signed07.09.21.pdf

Tools for Encouraging Dual-Use / Co-location / Development in Particular Areas

Tool	How Tool Encourages Dual-Use	How Tool Encourages Co-Location	Project Size and Land Use Considerations	Implementation Mechanism	Research Needed to Assess Tool for Use in Maine
Permit By Rule (described generally by MDEP, similar to VT's 'Certificate of Public Good') **-** Projects would be granted a DEP Site Law permit in an expedited manner if the applicant demonstrates that the project meets certain standards. This eases regulatory burden for applicants, as well as the burden on regulating agencies.	Dual-use projects could be eligible for a PBR if the project met specific dual-use best practices / definitions / etc.	Certain co-location practices / projects could be eligible for a PBR and/or would receive more favorable treatment under the PBR scheme.	To generally be used for DG (less than 5 MW) projects, but could also be useful for slightly larger projects (less than 50 acres?). Utility scale projects would likely benefit from more comprehensive (i.e., full Site Law permitting) review. Projects located on or off specific areas could be eligible for a PBR, for the purpose of encouraging development on agricultural lands according to the	Agency rulemaking.	None.

			8/19/21 matrix, as well as on non-ag lands. *See 'Areas to Encourage/Discourage Development' below.*		
Public Utilities Commission Evaluation / Scoring Process (Similar to NY's 'Siting Scorecard', mentioned by Nextamp) - PUC would evaluate a proposed project's ag/nat. area impacts and consider those impacts and efforts to avoid/minimize/mitigate impacts when selecting projects in future RFPs / procurements.	Scoring could favor dual-use projects.	Scoring could favor projects that use co-location/mitigation practices.	Can be used for smaller (distributed generation) and larger (grid-scale) projects. Scoring could favor projects that avoid certain areas or are located in other areas. *See 'Areas to Encourage/Discourage Development' below.*	Legislation directing a procurement, followed by a procurement directed by the PUC.	None.
State Procurement Specific to DU / Co-location, etc. Projects - A dedicated procurement/RFP (or portion of a	Procurement could be specific to DU projects or have a DU "carve out".	Procurement could be specific to co-location projects or projects that use co-location/mitigation practices or have a	Can be used for smaller (distributed generation) and larger (grid-scale) projects. Procurement could		

procurement, etc.) for dual-use or other specific types of projects.		"carve out" for such projects.	be specific to projects located in specific areas (on landfills, brownfields, etc.) or have a "carve out" for such projects. *See 'Areas to Encourage/Discourage Development' below.*		
Interconnection (1) Detailed hosting capacity maps (perhaps including some analysis from utility perspective) could help developers become more efficient at targeted site selection. (2) Set aside capacity at substations to indicate siting preferences with reasonable criteria and procedures to enable participation. (3) Mitigation fund - develop a pooled	Prioritizes capacity to dual use. To this end, capacity set asides (2) could be categorized by intended use. Additional information (1) and upgrade assistance (3) increase the likelihood that developers would consider dual use.	Prioritizes capacity to co-location (2). Encourages developers to consider eligible sites by increasing likelihood of successful interconnection.	Capacity set asides (2) could be categorized by size - encouraging more rooftop and small ground mount in populous areas. Detailed mapping/analysis from the utility (1) could indicate where the transmission system is already under stress - meaning any additional projects in that area should proceed at their own risk - mitigating the siting of many large	Regulatory approval of interconnection tariff updates (Chapter 324). Tariff updates could be preceded by a legislative process.	Need to understand relative economics in order to assess if tool incentive is sufficient to otherwise compete. Need active involvement from the PUC to move processes forward and ensure uniform, timely utility compliance. Need to understand breadth of cost upgrades to assess if a pooled funding mechanism would effectively offset

funding mechanism to pay for substation upgrades or three phase power in preferred locations.			scale projects in one area.		developer interconnection costs.
Strengthen Local Planning Capacity (mentioned by MMA) This could be done in a number of ways, such as: (1) Create a position/otherwise add capacity @ DACF to help municipalities responsibly welcome solar to their community ("solar specific technical assistance"). This would serve to avoid moratoriums and other undue restrictions on solar development, while encouraging towns to be thoughtful about where/how to direct solar development. This is where model ordinances and BPs	Technical assistance would include assistance for creating dual-use projects.	Technical assistance would include guidance on co-location and other mitigation techniques.	Applicable for both smaller (distributed generation) and larger (grid-scale) projects. Technical assistance would include guidance on where to locate solar to maximize community benefits.	Depends on the strategy. Could include a state position and funding to support that position or funding for a grant program, as well as an entity to award that funding.	

would be "housed". (2) Grants to support planning at county or municipal level. *Applicable to small and large projects.*					
In-Lieu-Fee / Compensation Program - Require solar developers to submit a Permitting Plan (similar to NY's) in which the developer describes the steps that will be taken to avoid, minimize, remediate, and offset impacts to agriculture, forest, wetland and water resources, as well as conserved land and open spaces. Awarded solar projects could be responsible for making an agricultural mitigation payment to a designated fund	The mitigation fund payment could be structured, as it is in NY, to encourage the producer to retain or introduce agricultural activity in the solar facility area. Dual-use projects could be encouraged through the reduction or elimination of a mitigation payment with that type of project.	The mitigation fund payment could be structured to encourage co-location by reducing or eliminating the payment with that type of project.	The scale of the project could relate to the scope of the impact and therefore influence the mitigation fund payment.	Likely legislation	Amount should be tied to potential outcomes - how much $$ is needed for IX upgrades vs. permanent conservation? And what is a sufficient fee to guide outcomes? Research might be needed to answer those questions.

based on the extent to which the solar project footprint overlaps with important agricultural soils or resources. There could also be tiered fees based on the 8/19 land use matrix.					
Dual-use Pilot Program (NJ) Establish fixed-length and capacity pilot program, potential to extend and expand based-upon initial program success.	Authorizes and encourages (and will establish financial incentives) dual-use solar projects up to 10 MW each (and up to (300 MW total) and lays foundation for a permanent dual-use solar energy program. Provides opportunity to conduct necessary research on compatible crops and systems.	See left (Program has not yet defined dual-use, and does not mention co-location).	Prohibits siting on prime and SI soils, unless the project is associated with a research project (led by a public university). Adders of varying amounts will be tiered based upon project characteristics. Note: there was a utility scale bill that also passed allowing a certain percentage	Agency rulemaking. (NJ Board of Public Utilities & Depart. Of Agriculture as per Dual Use Solar Pilot Bill [S3484 & A5434])	Rutgers Extension leading research on Agrivoltaics as part of dual use standards and performance monitoring

			of projects to be sited on prime and SI soils (without research stipulation mentioned at left). - Kaitlin		
Tariff Program ("Adders and/or Subtractors") (Similar to Mass's SMART program or VT's REC and Siting Adjusters)	Provides financial incentive for developers to design on-farm arrays as dual-use. The adder may need to be large enough to compensate for the added construction costs associated with dual-use solar. Conversely, a subtractor will provide a financial disincentive for siting on farmland.	Provides financial incentive for developers to design on-farm arrays as co-location. Because co-location may not have significantly higher construction costs, the adder for co-location activities, such as pollinator habitat, may not need to be as high as those for dual-use. Conversely, a subtractor will provide a financial disincentive for siting on farmland.	If adders are significant enough, dual-use may be more profitable on farmland, vs traditional design. Encouraging dual-use on categories that provide a market-based incentive to choose dual-use. Using a subtractor for projects sited on prime, SI, and active farmland may also incentivise siting of solar on marginal or Other farmland. Projects of utility scale may be less influenced by adders, due to the significant increase in construction costs associated with	Legislative / Rulemaking (a far less likely pathway)	Research adder and subtractor values vs costs? Rate impacts Allowed designs, shading, crop requirements.

			utility scale dual-use. However, subtractors associated with siting on farmland may influence location.		
Allow Dual-Use Projects to Remain in Current Use Taxation - Treat land enrolled in the farmland current use taxation program that is housing a dual-use project as not subject to the withdrawal penalty as long as the farming operations continue to meet the farmland current use taxation requirements. There could also be a carve out for smaller solar projects that are primarily used to create energy for on-farm use. (VT) In both cases, the solar array would be treated as	This type of treatment would remove the added cost of the withdrawal penalty, thereby creating an incentive for developers to install a dual-use project if they are looking to site on land enrolled in the farmland current use taxation program.		This tool could encourage dual-use projects on land enrolled in farmland current use taxation where dual-use projects are preferential (see 8/19/21 matrix). The size of the project and the corresponding acreage would influence the size of the withdrawal penalty and therefore how much of an economic incentive the removal of the penalty is for developers.	Legislation	None

agricultural infrastructure or equipment.					
Address Stormwater Concerns for Grazing - Best management practices (BMPs) developed in consultation with DEP, Department of Ag, developers, farmers, and NRCS.	Certainty around the DEP application and approval process encourages developers to pursue dual-use designs that incorporate sheep grazing, while providing insight into the metrics used to evaluate other dual-use designs during the permitting process.	Certainty around the DEP application and approval process encourages developers to pursue co-location of sheep grazing and solar.	BMPs will be used as guidelines for smaller projects. BMPs will be used as the basis for site-specific grazing plans for larger projects.	DEP-administered with contributions from the Department of Ag and NRCS.	This has already happened!
Participation of DACF - As in VT, require that DACF receives notice about proposed projects that impact certain agricultural resources and provide the right or obligation of DACF to appear at PUC hearings depending	DACF could provide support for dual-use projects on important agricultural soils (prime or SI).	DACF could provide support for co-location projects that meet the land use categorization contained in the 8/19 matrix.	DACF support for projects during the approval process could be determined by the project's conformity with the land use distinctions contained in the 8/19/matrix. The scale of the	Likely legislation (possibly regulatory action)	None

on the size of the proposed project. (In Vermont, the Agency of Agriculture, Food and Markets receives notice for proposed ground-mounted projects 50kW or larger, and has the right to appear at PUC hearings for projects between 15-500kW and must appear if the system is greater than 500kW and located on agricultural soils.)			project could influence the involvement of DACF depending on the size distinctions made for DACF notice and its right or obligation to weigh in during project approval.		

Areas to Encourage / Discourage Standard Development (See PBR and Procurement-Related Tools Above)

Encourage

(Dual-use and co-location discussed in table)
Marginal farmland
Impervious Surfaces
Areas Zoned for Commercial/Industrial Use
Gravel Pits*
Brownfields*

Superfund Sites*
Previously Developed Lands

Discourage
Prime soils and soils of statewide importance according to the 8/19/21 matrix
Wetlands
Inland Wading Bird and Waterfowl Habitat (IWWH)
Significant Vernal Pools
Endangered & Threatened Species Habitat
Shoreland Zone
Exemplary Natural Communities
>10 Acres of Forest

*These areas are often too small for a solar project - consider requiring that only a % of the project be located in these areas.

Clean Energy States Alliance

State Pollinator-Friendly Solar Initiatives

Georgena Terry

Clean Energy States Alliance

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about this Paper

Recognizing that solar installations can coexist with pollina- tor habitats, seven states have enacted legislation to promote pollinator-friendly solar development. This white paper provides an overview of these state efforts and offers suggestions for what other states can do to promote solar while also creating or preserving healthy habitats for pollinators.

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Any errors or omissions in this paper are solely the responsibility of the author.

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Introduction

Pollinators play a critical role in the production of food and seeds. Approximately one quarter of agricultural production in the United States depends upon pollinators, predominantly bees.[1] Since 2006, bee population tracking has recorded declines of 30 percent annually.[2] Numerous species of native bees may already be extinct or at risk of extinction.[3] Loss of habitat is one reason the number of pollinators has decreased.[4]

Many states have incentives or other programs designed to promote the deployment of solar photovoltaics (PV) to meet climate or clean energy goals. But where fields are cleared for large solar PV projects to be installed, it can be at the expense of pollinators, which depend on vegetation for habitat and food. Solar and pollinators, however, need not be at odds. This paper will provide an overview of state efforts to encourage solar PV development in a manner that is beneficial to pollinators.

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1 Walston, Leroy J., Shruti K. Mishra, Heidi M. Hartmann, Igor Hlohowskyj, James McCall, and Jordan Macknick. "Examining the Potential for Agricultural Benefits from Pollinator Habitat at Solar Facilities in the United States." Environmental *Science & Technology.* 2018. 52 (13), 7566. *https://pubs.acs.org/doi/10.1021/acs. est.8b00020*.

2 Penn State College of Agricultural Sciences. "Globally, pollinators are in decline." *Center for Pollinator Research.* Accessed December 20, 2019. *https://ento.psu.edu/pollinators/resources-and-outreach/globally-pollinators-are-in-decline*.

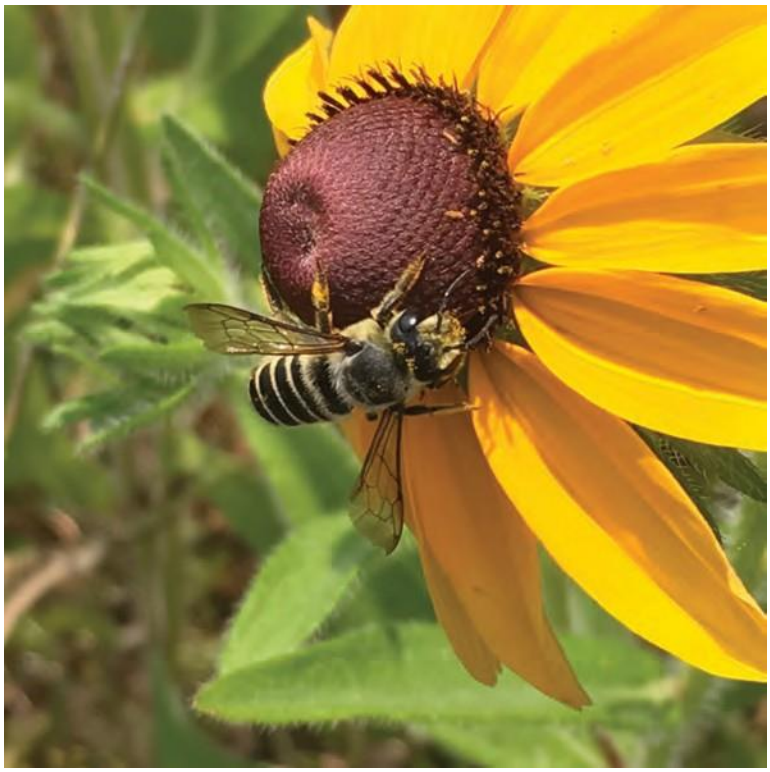
3 Xerces Society. "Red List of Bees: Native Bees in Decline." *https://xerces.org/pollinator-redlist*.

4 U.S. Fish & Wildlife Service. "Threat to Pollinators." *https://www.fws.gov/pollinators/PollinatorPages/Threats.html*.

Cover: © iStockphoto/dvulikaia

Using Solar to Grow Bees

Ground-mounted solar PV arrays can have a significant impact on pollinators, because ground-mounted systems are deployed directly into the soil, which can disturb pollinator habitat. Ground-mounted solar arrays currently occupy approximately 350,000 acres of land in the United States,[5] with significantly more growth expected in the coming years. To reduce maintenance, the area under and around these solar arrays is often stripped of vegetation that is then replaced with gravel and turf grass and treated with herbicides.[6] With a different treatment regime, if this land is instead cultivated with appropriate vegetation, pollinator habitat can be preserved or created.



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Several studies have shown that in areas where pollinator-friendly solar PV projects are deployed near agricultural lands that depend on pollinators, agricultural production may be intensified.[7] An article published by the National Renewable Energy Laboratory, titled "Beneath Solar Panels, the Seeds of Opportunity Sprout," notes that retaining the topsoil on a pollinator-friendly solar site is not as costly as removing it. The native vegetation that is planted under solar arrays is less maintenance-intensive than turf grass or gravel alternatives. When vegetation is planted under solar panels, it can absorb heat, lowering the temperature of the surrounding panels and increasing panel efficiency — resulting in more electricity production.[8]

A team of researchers at Argonne National Laboratory has examined the potential benefits of establishing pollinator habitat at utility-scale solar energy facilities to conserve pollinators and restore ecosystems. Their research has found that areas around solar panels can provide suitable habitat for bees.[9]

5 Personal Communication. Davis, Rob. "Question from Georgena." Email message to Georgena Terry. May 29, 2019.

6 Beatty, Brenda, Jordan Macknick, James McCall, and Genevieve Braus. "Native Vegetation Performance under a Solar PV Array at the National Wind Technology Center." *National Renewable Energy Laboratory*. Technical Report NREL/TP-199-66218. May 2017. *https://www.nrel.gov/docs/fy17osti/66218.pdf*.

7 Walston et al., op.cit.

8 Dreves, Harrison. "Beneath Solar Panels, the Seeds of Opportunity Sprout." *National Renewable Energy Laboratory*. Accessed December 20, 2019. *https://www.nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html*.

9 Russell, Greer. "Can Solar Save Bees?" *Argonne National Laboratory*. August 3, 2018. https://www.anl.gov/article/can-solar-energy- save-the-bees. See also, "Examining the Potential for Agricultural Benefits from Pollinator Habitat at Solar Facilities in the United States," Leroy J. Walston, et. al., *https://pubs.acs.org/doi/10.1021/acs.est.8b00020*.

State Efforts to Promote Pollinator-Friendly Solar PV

Increasingly, states are promoting pollinator-friendly solar through legislative initiatives. In the last five years, seven states have passed legislation that allows solar projects to claim that they are pollinator friendly. These state solar programs share common elements. In all cases, these states have developed guidelines that are defined for a *voluntary designation* by the solar project owner that a solar site is pollinator friendly. The program guidelines generally rely on a scorecard to assess whether a site qualifies for the pollinator-friendly designation. These scorecards have a format similar to those developed by Minnesota, the first state that took legislative action on this issue.

Community Solar and Pollinator-Friendly Solar

All of the states that have passed pollinator-friendly solar laws have also authorized community solar, a purchasing arrangement whereby multiple customers share the electricity or the economic benefits of solar power from a single solar array. Because community solar arrays serve multiple customers, they tend to be larger than most residential systems and are often ground-mounted due to their size. Community solar customers affirmatively opt in to participate as off-takers of the electricity generated. As such, a voluntary pollinator-friendly designation of a community solar array may carry more power as a marketing driver for customers in states with community solar programs than it would for solar projects that have a single off-taker and do not require buy-in from a larger consumer base.

Below is a brief description of the different pollinator-friendly solar initiatives developed by states. A summary of each state's pollinator-friendly solar program is attached as Appendix A.

Minnesota: Minnesota was the first state to address pollinator protection with H.F. 976, which passed in 2013. The law established a pollinator habitat program to develop "best management practices and habitat restoration guidelines for pollinator habitat enhancement" in Minnesota.[10] A scorecard for assessing pollinator sites was developed through Minnesota's program.[11] In 2016, the Minnesota legislature addressed pollinator-friendly solar sites directly. H.F. 3353 passed with near-unanimous support.[12] The scorecard for assessing pollinator sites developed under Minnesota's pollinator habitat program served as a basis for the scorecards later developed to evaluate

10 Minnesota Legislature. Minnesota Session Laws - 2013, Regular Session. CHAPTER 114--H.F.No. 976. *https://www.revisor.mn.gov/laws/2013/0/114*.

11 Minnesota Board of Water and Soil Resources. "Assessing & Prioritizing Project Sites." Accessed December 23, 2019. *https://bwsr.state.mn.us/sites/default/files/2019-02/Urban%20and%20Rural%20Assessment%20Forms_0.pdf*.

12 The billed passed unanimously in the Minnesota House. Two lawmakers voted against it in the Senate. Bipartisan support for the bill was widespread because it addressed ecological concerns shared by industry, agriculture, environmentalists, and legislators alike, and avoided more contentious issues related to pesticides.

pollinator-friendly solar sites under Minnesota's 2016 law. Minnesota's Board of Water and Soil Resources website offers a description of the program and its requirements.[13] The agency plans to include a list on its website of "Habitat Friendly Solar" projects that conform to the pollinator friendly solar program. Minnesota's Board of Water and Soil Resources notes that there are a large number of solar sites that have met the requirements.[14]

Maryland: Maryland passed pollinator-friendly solar legislation[15] in 2017. The law charges the Maryland Department of Natural Resources with researching the benefits of a pollinator-friendly vegetation management plan and creating a pollinator-friendly designation program. Owners of solar generation facilities may claim the facility is pollinator friendly if it conforms to the Maryland Department of Natural Resources' regulations.

South Carolina: The South Carolina Legislature passed the *Solar Habitat Act* in 2018.[16] The law applies to ground-mounted commercial solar energy generation sites. It directs the South Carolina Department of Natural Resources to establish a native vegetation habitat and pollinator management plan that can be used by solar operators to claim they are following voluntary site management practices.

Vermont: The State of Vermont enacted a "Pollinator Friendly Solar Generation Standard" in 2018 to give rigor to the voluntary establishment of pollinator-friendly sites and related marketing claims.[17] Vermont's law is applicable to public or private entities with a controlling interest in a ground-mounted solar system. Vermont uses a pollinator-friendly scorecard to assess whether the site meets a beneficial habitat standard.[18] The University of Vermont Extension, which played a key role in the development of the state's pollinator-friendly standard, identifies conforming pollinator-friendly solar projects on its website.[19]

New York: New York's pollinator-friendly solar law,[20] enacted in 2018, requires the New York State Department of Environmental Conservation to develop minimum guidelines for vegetation management plans used to support these claims.

13 Minnesota Board of Water and Soil Resources. "Habitat Friendly Solar Program." Accessed December 23, 20219. *https://bwsr.state.mn.us/ bwsr-habitat-friendly-solar-program*. The MBWSR maintains a webpage on Pollinator Habitat that includes a "Pollinator Toolbox" and other helpful resources at *https://bwsr.state.mn.us/practices/pollinator/index.html*.

14 Personal Communication. Shaw, Dan. "Pollinator Friendly Solar Projects in MN." Message to Georgena Terry. June 17, 2019. Email.

15 Maryland Senate. Bill 1158: Department of Natural Resources–Solar Generation Facilities –Pollinator–Friendly Designation. Chapter 372. May 4, 2017. *https://legiscan.com/MD/text/SB1158/2017*.

16 South Carolina General Assembly. "South Carolina Solar Habitat Act." 122nd Session, 2017-2018. *https://www.scstatehouse.gov/sess122_ 2017-2018/bills/4875.htm*.

17 Vermont General Assembly. "Pollinator-friendly Solar Generation Standard." 6 V.S.A. § 5102. *https://legislature.vermont.gov/statutes/section/06/217/05102*.

18 University of Vermont. "Solar Site Pollinator Habitat Scorecard." Accessed December 23, 2019. *https://www.uvm.edu/sites/default/files/Agriculture/Pollinator_Solar_Scorecard_FORM.pdf*

19 UVM Extension. "Pollinator-Friendly Solar Resources." Accessed December 23, 2019. *https://www.uvm.edu/extension/agriculture/pollinator- friendly-solar*.

20 New York State Assembly. A08083A. May 25, 2017. *https://assembly.state.ny.us/leg/?default_fld=&bn=A08083&term=2017&Summary=Y&Actions=Y&Text=Y&Committee%26nbspVotes=Y&Floor%26nbspVotes=Y*.

Illinois: In 2018, Illinois enacted the *Pollinator Friendly Solar Site Act*[21] that requires the owner or manager of a solar site to prove it adheres to standards set forth in a scorecard published by the Illinois Department of Natural Resources, in order to claim the site is pollinator friendly.

Michigan: Michigan amended its Farmland Open Space Preservation Program (PA 116) in 2019 to allow commercial solar sites on property enrolled in the Michigan Farmland Development Rights Program. Landowners agreeing to keep their land in agricultural use for at least 10 years may be eligible for tax benefits and assessment exemptions sites are required to be pollinator-friendly as defined by Michigan's guidelines.

Examples of Pollinator-Friendly Solar Projects

Utilities have begun to address pollinators in their solar development efforts. As of 2018, **Xcel Energy** in Minnesota requires disclosure of the type of vegetation to be planted on solar sites in all its solar PV solicitations.

The electric utility **Alliant Energy**'s five-megawatt solar garden in West Dubuque, Iowa features pollinator-friendly prairie planting and hosts beehives on 21 acres. This is Iowa's largest solar site.[22]

In Vermont, **Green Mountain Power**, an investor-owned utility and a certified B-Corporation,[23] has established four pollinator-friendly solar sites in the state that together generate 22 megawatts of power.[24] On a smaller scale in Vermont, a 500-kilowatt, four-acre site owned and operated by **Green Lantern Solar** hosts pollinator-friendly vegetation. The power from this site is reserved for Sugarbush Resorts. Green Lantern Solar operates about 50 solar farms and is using this site as a pilot project to assess the benefits of pollination. If the project is successful, Green Lantern may expand pollinator plantings to its other sites.[25]

Dairyland Power, a rural electric cooperative, operates 18 solar array sites in four states (Wisconsin, Minnesota, Iowa, and Illinois) with 25 megawatts of installed capacity. These sites collectively encompass 250 acres of certified pollinator habitat.[26]

Developers have played a role as well. Ohio has no legislation regarding pollinator-friendly solar, but a recent partnership between the solar developer **AEP energy** and **Denison University** resulted in the construction of a 2.3-megawatt, 10-acre ground-mounted pollinator-friendly solar array. Denison University estimates over one million beneficial plants grow on the site.[27]

21 Illinois General Assembly. Public Act 100-1022. August 21, 2018. *http://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=100-1022*.

22 Alliant Energy. "2017 Corporate Sustainability Report." August 2017. Page 6. *https://sustainability.alliantenergy.com/wp-content/uploads/2017/07/Alliant-Energy-Corp-Sustainabliity-Report_2017.pdf*.

23 Website. *Certified B Corporation.* Accessed December 23, 2019. *https://bcorporation.net*.

24 Personal Communication. Carlson, Kristin. "Panton Pollinator-Friendly Solar." Message to Georgena Terry. July 16, 2019. Email.

25 Website. *Bee the Change.* Accessed December 23, 2019. *https://www.beethechangehoney.com/blog/2017/9/19/an-update-on-our-project-in-new-haven-vermont*.

26 Dairyland Power Cooperative. "Pollinator Meadows." Accessed December 23, 2019. *https://www.dairylandpower.com/content/pollinator-meadows*.

27 Denison University. "Pollinator-friendly solar habitat first of its kind in Ohio." July 16, 2019. *https://denison.edu/news-events/featured/131013*.

Farming-Friendly Solar

The preservation of agricultural land is critical for pollinators. One of the mutually beneficial linkages between agriculture and pollinators is that nectar-foraging bees are attracted to clover, which is customarily used to fix nitrogen in the soil and can contribute to improved crop yields.

In **Massachusetts**, the Solar Massachusetts Renewable Target (SMART) program encourages solar development with incentive payments to operators of eligible solar arrays. The SMART program designates categories of compensation rate adders for solar projects, including a category for projects on farmland that allow for the continued use of the land for agriculture. In addition to the current SMART categories, the Massachusetts Department of Energy Resources recently proposed a $0.0025/kWh rate adder for pollinator-friendly solar developments that meet the University of Massachusetts' standard. The University of Massachusetts Clean Energy Extension is in the process of developing a pollinator-friendly certification program for solar facility developers and managers. The program will include best management practices, certification criteria, and recommended plant species using a rating system.

Some states have addressed the compatibility of solar and agriculture without specifically establishing pollinator-friendly solar designations. In **New Jersey**, for example, agricultural land may retain a beneficial farmland assessment if a solar project sited on it generates less than two megawatts of electricity, uses no more than ten acres, at least five acres of land remains in agricultural use, and the ratio of land used for energy to land in agriculture does not exceed 1:5.

In **North Carolina**, if agricultural land is converted to a non-agricultural use, property owners must ordinarily pay a deferred taxes penalty on that land, but they may be able to avoid the penalty if the solar development on the land retains a dual agricultural use. The State of **Vermont** has a Pollinator Friendly Solar Generation Standard, but beyond that, the Vermont Agency of Agriculture has worked with the University of Vermont Extension Program to publish additional guidance on farm friendly solar.

What States Can Do to Promote Pollinator-Friendly Solar PV

For ecological conservation and agricultural productivity, states have a vested interest in pollinator protection. States are well positioned to take proactive roles on this issue as they are often viewed as authorities on energy and environmental matters and carry out programs in both arenas.

States can promote pollinator-friendly solar through legislative initiatives. As Maryland, Michigan, Minnesota, Illinois, New York, South Carolina, and Vermont have shown, state legislation could direct the development of pollinator-friendly solar designation programs. The implementation of new state programs could occur relatively swiftly by adapting existing state pollinator-friendly solar standards or those developed by academia. States could legislatively require developers to take certain measures in order to claim their site is pollinator friendly; they could also encourage municipalities or other authorities having jurisdiction to consider pollinator habitats in their solar permitting processes.

Even in states without pollinator-friendly solar laws, states agencies can take proactive roles in encouraging pollinator-friendly solar development. Where state agencies have broad mandates, they may be able to establish voluntary pollinator-friendly programs that fall within their delegated

authority. For example, the Virginia Department of Environmental Quality and the Department of Conservation & Recreation have jointly developed a "Pollinator-Smart" program.[28] The program offers guidance to solar PV developers on planning, installing, and maintaining pollinator habitat at solar sites. It includes a program manual, a vegetation monitoring guide, a database of commercially available native plant species, and "pollinator-smart" scorecards for both new and established solar facilities.[29]

Recent studies by the Yale Center for Business and the Environment address the cost-benefit analysis of pollinator-friendly solar and contemplate an ecosystem services market that could further promote pollinator-friendly solar development.[30] As the monetization of ecosystem services becomes better defined, opportunities will exist for state policies to support development of this market. Under such a market, the economic benefits of pollinator-friendly solar development compared to conventional installations of solar may be sufficient to further encourage its adoption.

Additionally, state agencies may participate as advisory board members in academia's pollinator research. For example, the **North Carolina** Department of Agriculture and the North Carolina Department of Environmental Quality are both members of the North Carolina Pollinator Conservation Alliance,[31] which has developed a technical guidance document for native plantings on solar sites. The **Pennsylvania** Department of Agriculture participates in the Stakeholder Advisory Board on Pollinator Health at Penn State's Center for Pollinator Research,[32] which has established a Solar Site Pollinator Habitat Planning Form (see Appendix A).

States can also provide educational materials on the importance of pollinators. These materials could be targeted to solar developers, farmers, or to a wider citizen audience. States could offer technical assistance to solar developers to promote the consideration of pollinators in project siting or the incorporation of pollinator-friendly measures in project design and installation.

Conclusion

In the past six years, states have increasingly taken action to encourage pollinator-friendly solar PV development. From scorecards to proposed rate adders, pollinator-friendly solar practices have evolved to demonstrate a variety of actions that states can undertake. Current research into the costs, benefits, and positive environmental outcomes will likely promote the adoption of pollinator- friendly activities by additional states and solar developers.

28 Elizabeth McGowan. "Virginia Toolkit Tells Solar Developers How to Incorporate Bee and Bird Habitat." Energy News Network. October 28, 2019. *https://energynews.us/2019/10/28/southeast/virginia-toolkit-tells-solar-developers-how-to-incorporate-bee-and-bird-habitat*.

29 Virginia Department of Conservation & Recreation. Pollinator Smart Solar Site Portal. *https://www.dcr.virginia.gov/natural-heritage/ pollinator-smart.*

30 Seigner, Katie, et al. "Capturing the Private and Public Benefits of Pollinator-Friendly Solar." *Clean Energy Finance Forum.* December 11, 2019. *https://www.cleanenergyfinanceforum.com/2019/12/11/capturing-the-private-and-public-benefits-of-pollinator-friendly-solar*.

31 Insect (blogger). "The Wildlife Value of a Messy Garden." *North Carolina Pollinator Conservation Alliance.* October 23, 2019. *http://ncpollinatoralliance.org*.

32 Penn State College of Agricultural Sciences. Overview: Center for Pollinator Research. *https://ento.psu.edu/pollinators/mission*.

COMPARISON OF SELECTED STATE POLLINATOR CHECKLISTS

	MD	VT	MN	IL	MA
Percentage of native species planted	**X**	**X**	**X**	**X**	**X**
Percentage of flowering plants, shrubs, and trees (vs grasses,sedges)	**X**	**X**	**X**	**X**	**X**
3-season bloom	**X**	**X**	**X**	**X**	**X**
Detailed habitat maintenance plan	**X**	**X**	**X**	**X**	**X**
Meets seed providers' recommended application rate	**X**	**X**	**X**	**X**	**X**
Insecticide use heavily penalized (-40 points)	**X**	**X**	**X**	**X**	**X**
Pesticide-free seed mix, local ecotypes	**X**		**X**	**X**	**X**
Pollinator nesting habitat nearby (within 1/4 mile), water, bee boxes	**X**	**X**	**X**	**X**	
Cover species diversity - varying points for 10, 20, 20+ species	**X**	**X**	**X**	**X**	
Vegetative buffer outside array with 50% native plants	**X**	**X**		**X**	**X**
Signs; research; educational events	X			X	X
Site prep BMPs: - initial weed removal, tilling and herbicides; followup maintenance	X			X	X
Milkweed cover - 1%+			X	X	
Detailed plant and habitat monitoring plan		X			X
Mowing before May 1 and after October 15 (before May 15 in MA)		X			X
NRCS Conservation Cover specs: pre-mowing of weeds; spot invasives control; overseeding native wildflowers	X				X
Coordination with neighboring chemical applicators - avoid drift			X	X	
Sufficient panel height to allow flower and grass growth (24"+)	X				
Once-a-year mowing after 3-year establishment					X

Maryland's INITIAL Solar Site Pollinator Habitat Planning and Assessment Scorecard

Circle each applicable point and then sum/minus.

1. Percent of facility to be planted, seeded or maintained with native plant species:

16-30 percent	5 points
31-50 percent	10 points
51-75 percent	20 points
76 percent or greater	30 points

2. Percent of facility to be planted, seeded or maintained with a mix of flowering plants including trees and shrubs:

16-30 percent	5 points
31-50 percent	10 points
51-75 percent	20 points
75 percent or greater	30 points

3. Flowering plant seed mix to be used includes ten or more plant species appropriate for the region or local habitat identified in the USDA-NRCS Maryland Native Grass and Wildflower Mixes for dry, mesic or wet sites (Mixes 15, 16 or 17): 5 points

4. Seed mix and/or plants used are pesticide-free, local ecotypes to the extent that it is possible to do so:

Yes	10 points
No	0 points

5. Amount of seed to be planted (lbs/acre) is determined according to seed provider's recommended application rate and/or planting density for planted species in the target area: 5 points

6. Pollinator seed mix includes species that bloom across spring, summer and fall:

Yes	15 points
No	0 points

7. The facility follows established best management practices for site preparation prior to seeding and planting (add all that apply):

Initial herbicide treatment (chemical burn) or scraping of weeds and annual grasses	5 points
Disking or tilling soil to promote weed seed germination with follow-up herbicide treatment	5 points
Follow up maintenance as needed to control weeds	5 points

8. Planned existing best management practices follow established USDA-NRCS Job Sheet Recommendation (Conservation Cover – 327, Herbaceous Plantings for Pollinator Habitat) and Implementation Requirements including (add all that apply):

Pre-establishment mowing of weeds and annual grasses as needed during initial planting period	5 points
Spot herbicide or mechanical invasive species control	5 points
Spot herbicide or mechanical woody species control	5 points
Overseeding or interseeding native wildflowers	5 points
Post-establishment mowing in dormant season only	10 points
Establishment of a detailed habitat maintenance plan	10 points

9. Additional facility practices to support pollinators include (add all that apply):

Water source	5 points
Ground nesting sites (small areas of bare ground)	5 points
Cavity nesting sites (fallen logs, shrubs, snags)	5 points
Woody stems for nesting left >2 years	5 points
Bee Boxes or Bat Boxes	5 points

10. Minimum panel height supports native flowering plants and grasses:

12-18 inches	0 points
24-30 inches	10 points
36 inches or higher	20 points

11. Vegetation buffer outside solar array (add all that apply):

At least 50% planted with native flowering plants	10 points
At least 50% planted with native plants	10 points

12. Education and Signage (add all that apply):

One or more "Pollinator Habitat" signs	5 points
Facility is used for pollinator research	5 points
Education Event regarding pollinator-friendly status	5 points

13. Pesticide Risk:

Routine on-site facility insecticide use	-40 points

Point Summary:

Meets Pollinator-Friendly Standards: 160
Exceeds Pollinator-Friendly Standards: 200
Maximum Points Available: 245

Developer:
Facility Location:
Facility Size:
Target Seeding Date:
Send Email or Completed Forms to:
MD Dept. of Agriculture, MD Dept. of Natural Resources, Power Plant Research Program, 580 Taylor Avenue, B-3, Annapolis, MD 21401

PPRP@maryland.gov

Comments:

Solar Site Pollinator Habitat Scorecard

For site and seed mix planning, designing, and assessment. *Pollinator planting area shall always be managed to prevent and eliminate invasive species as defined in 6 V.S.A. chapter 217 § 5101(2). Scorecards must be renewed every three years or sooner. Standards below refer either to the site plan or an established site. The site area is consistent with the 'Limits of Disturbance' per Net Meter Rule 5.103.*

Image courtesy Fresh-Energy

1. Percent site's vegetative cover is flowering species (select one)

- (●) 1-15 percent (5 points)
- ( ) 16-30 percent (10 points)
- ( ) 31-45 percent (15 points)
- ( ) 46-60 percent (20 points)

2. Flowering perennial species to be used (select all that apply)

- [ ] Includes species of Northern New England and adjacent New York provenance (5 points)
- [ ] Amount of seed to be planted (lbs/acre) is determined according to seed provider's recommended application rate and/or planting density for planted species in the target area (5 points)
- [ ] Includes only VT native or naturalized perennial species. (15 points) *Species native to the biophysical region preferred.*

3. Cover diversity within the ground cover area (# of flowering plant species that constitute >2 percent cover each; select one)

- (●) 1-9 species (5 points)
- ( ) 10-19 species (10 points)
- ( ) 20 or more species (15 points)

4. Seasons with at least 3 blooming species with >2 percent cover each (select all that apply)

- [ ] Spring (10 points)
- [ ] Early summer (5 points)
- [ ] Late summer (5 points)
- [ ] Fall (5 points)

5. Observed pollinator nesting habitat within 0.25 miles (select all that apply)

- [ ] Bare ground patches one square foot or larger, with undisturbed and well-drained soil (2 points)
- [ ] Forest edge habitat that includes flowering shrubs and young trees (2 points)
- [ ] Cavity nesting sites (e.g., dead trees, snags, fallen logs, shrubs, plants with pithy-stemmed twigs such as sumac, rose, raspberry) (2 points)

Creation of nesting habitat features (e.g. boxes, tunnels) (0.2 points per feature)

features: x 0.2 = 0.00 points

6. Pollinator management practices (select all that apply)

- [ ] Mowing occurs only after October 15, and before May 1 each year; mowing height is 5" or higher (5 points)
- [ ] Detailed establishment & management plan (10 points)
- [ ] Detailed plant & wildlife monitoring plan (10 points)

7. Pesticide risk (select if applicable)

- [ ] On-site insecticide use on plants (includes prior application to seeds/plants.) (-40 points)

8. Vegetation buffer adjacent to the solar site (select all that apply)

- [ ] At least 50% of buffer area vegetative cover planted with flowering plant species (5 points)
- [ ] At least 50% of buffer area vegetative cover planted with VT native or naturalized shrub species (5 points) *Species native to the biophysical region preferred.*
- [ ] Buffer at least 30 feet wide (10 points)

Site Owner or Designee:

Date:

Vegetation Consultant:

Seed Supplier:

Project Address: **Project Size:**

Target Seeding Date: (●) New ( ) Retrofit ( ) Revised Scorecard [ ] Attached Seed Mix Specs or Management Plans

Pollinator-Friendly Score: 10.0

Meets "Pollinator-friendly Solar" Standard: 70-84

Provides Excellent Habitat: >85

The signator certifies that the solar site adheres to this Scorecard in accordance with 6 V.S.A. chapter 217. The practices called for in this Scorecard are subordinate to any requirements of applicable State permits, agency rule or guidance. All solar projects must comply with applicable Vermont Public Utility Commission and Agency of Natural Resources permit conditions, even if those conditions conflict with practices favored by this Scorecard.

Upload completed scorecard at: **go.uvm.edu/pollinator-friendly-solar**

This form was produced by the Pollinator-Friendly Solar Initiative of Vermont: Version 9-28-2018

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Burlington, Vermont. University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status.

Habitat Friendly Solar Site Assessment Form for Project Planning

For solar companies and local governments to meet Habitat Friendly standards
5-26-2020

1) PLANNED % OF SITE DOMINATED BY NATIVE SPECIES COVER (wildflowers, grasses, sedges, shrubs, trees)

- ☐ 26-50% +5 points
- ☐ 51-75% +10 points
- ☐ 76% and above +15 points

Total points ☐

2) PERCENT OF PROPOSED SITE VEGETATION COVER TOBE DOMINATED BY WILDFLOWERS (not grasses and sedges)

- ☐ 10-20 % +5 points
- ☐ 21-30 % +10 points
- ☐ 31% and above +15 points

Total points ☐

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and wetland mixes can be combined)

- ☐ 10-19 species +5 points
- ☐ 20-25 species +10 points
- ☐ 26 or more species +15 points

Total points ☐

4) PLANNED SEASONS WITH AT LEAST 3 BLOOMING SPECIES PRESENT (check/add all that apply)

- ☐ Spring (April - May) +10 points
- ☐ Summer (June - August) +5 points
- ☐ Fall (September - October) +5 points

Total points ☐

See BWSR Pollinator Toolbox about bloom season.

5) AVAILABLE HABITAT COMPONENTS WITHIN SITE OR WITHIN .25 MILES (check/add all that apply)

- ☐ Native bunch grasses for nesting +3 points
- ☐ Native flowering shrubs +4 points
- ☐ Clean, perennial water sources +3 points
- ☐ Created nesting feature/s (bee blocks, etc.) +4points

Total points ☐

6) SITE PLANNING AND MANAGEMENT

- ☐ Detailed establishment and management plan (see notes) developed with funding/ contract to implement. +15 points

- ☐ Signage legible at forty or more feet stating pollinator friendly solar habitat (see notes for number of signs). +5 points

Total points ☐

7) SEED MIXES

- ☐ Mixes are composed of at least 40 seeds per square foot. +5 points
- ☐ All seed genetic origin within 175 of site (see notes). +8 points
- ☐ At least 1% milkweed cover to be established from seed/plants. +10 points

Total points ☐

8) INSECTICIDE RISK

- ☐ Planned on-site insecticide use or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.). -40 points
- ☐ Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas (see notes). +10 points

Total points ☐

Grand Total ☐

Gold Standard - Provides Exceptional Habitat **85+**

Meets Pollinator Standards **70**

Project Name: _____
Vegetation Consultant: _____
Project County: _____
Project Size: _____
Projected Seeding Date: _____

See notes related to the question on the back side of this form.

Notes:
Estimates of percent "cover" should be based on "absolute cover" (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on *BWSR's Habitat Friendly Solar Webpage*).

Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - *Native plant species provide benefits to a wide range of pollinators and other wildlife species. The Minnesota DNR List should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes.*

Question 2 - *There is a focus on wildflowers on this assessment form to maximize benefits to the approximately 450 species of native bees in Minnesota, honeybees and other pollinators. Wildflowers in question 2 refer to "forbs" (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.*

Question 3 - *Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total. Species must be planned to be used in a seed mix that will cover at least two acres at the site to be used for the total.*

Question 4 - *Having blooming species throughout the season helps support pollinator species. See BWSR's Pollinator Toolbox for a listing of bloom seasons for species.*

Question 5 - *The planting of native bunch forming prairie grasses, as well as native flowering shrubs is promoted as part of projects to increase nesting opportunities. If bunch grasses are included as part of plantings it is important that they are not mowed below four inches as part of yearly maintenance to ensure that they are not damaged. Habitat components must be within sites or within .25 miles of the site for thisquestion.*

Question 6 -

To meet requirements for a long-term management plan projects must provide information about:

- *Timing of yearly inspections,*
- *Evidence of funding and a contract for management for at least the first three years.*
- *A detailed native vegetation establishment plan with detailed instructions forcontractors.*
- *A detailed maintenance schedule for the first three years of the project listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other managementactions.*
- *Proposed maintenance schedule for year four and beyond.*
- *List of weed species that may become problematic at the site how they will be managed if needed.*
- *Maintenance needs for any constructed nest habitat for the project.*

Visible signage can play an important role in communicating the multiple benefits of Habitat Friendly Solar. Signs must be legible at forty or more feet in locations where the public can view the signs and state that the project is a Habitat Friendly Solar project. At least one sign is recommended every 20 acres up to a maximum of 5 signs.

Question 7 - *All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Please refer to pages 7-8 of BWSR's Native Vegetation Establishment and Enhancement Guidlines for more information about appropriate seed sources. To obtain points for including milkweed in projects at least 1% must be in seed mixes based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover 1% of the ground surface with milkweed.*

Question 8 - *It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.*

Updated Draft Consensus Areas

September 16, 2021

From initial stakeholder group materials:

- Prime farmland and soils of statewide importance are critical natural resources and are key to Maine's current and future agricultural productivity, biodiversity, and food security.
- Solar energy development is key to reducing greenhouse gas emissions and creates economic benefits in communities throughout the state.
- Maine is in a unique position to grow its food economy locally, regionally, and nationally; however, that will require preserving working lands for future generations.
- Dual-use farmland can be an important tool for diversifying income to farms. Opportunities for aligning solar and agricultural uses may exist with increased education and engagement.

From stakeholder group's discussions to date. **Additions since the previous meeting are bolded, and are presented as additions to previous consensus areas for further discussion**:

- There is a lack of data to support a clear picture of the problem the group has been tasked with addressing. Further research and ongoing monitoring may be needed.
    - The group may recommend that greater spatial data be produced (including statewide land use data, comprehensive parcel data, and aerial photography), and that resources be identified to fund this work. **The group should give additional consideration to specific methods of collection and necessary authorization to advance this recommendation.**
- There is substantial interest in exploring opportunities for positive interactions between agriculture and solar, including dual-use and co-location. The group has committed to defining these terms, with a sub-group forming to propose a draft to the full group. Specific consensus areas related to this topic include:
    - Dual-use may play a role in minimizing impacts of solar development to agriculture.
    - Grazing as a vegetation management strategy can often provide additional agricultural value without substantial added development costs. Regulatory requirements should at minimum seek to enable these practices as an alternative to traditional vegetation management.
    - Permit-by-rule or other regulatory adjustments could encourage solar development that supports or enhances ongoing agricultural uses.
    - Clarifying how dual-use and/or co-located solar development impacts the tax status of farmland enrolled in Maine's farmland current use taxation program.
        - The group may consider recommending that qualified land remain eligible to enroll or remain enrolled in the farmland current use program notwithstanding installation of solar generation equipment configured for dual-use.
    - Certain dual-use applications may incur additional solar development costs, potentially raising ratepayer or energy cost concerns.
    - Applying the Massachusetts model of requiring all solar development impacting agricultural land to be dual-use is too restrictive for Maine's needs.
    - The group is interested in considering how to further advance the adoption of dual-use practices, such as through a pilot program.
- The group supports sound decommissioning requirements that protect the potential for future reversion from solar production to agricultural use. Standards established by PL 2021 Ch. 151 (LD 802) provide an example, although members' perspectives on these are mixed.

- The group is interested in exploring mechanisms to encourage solar siting on non-agricultural lands.
- **The group further acknowledges that mechanisms may vary based on considerations including the scale or size of projects.**
- **The group has been invited to provide feedback on technical guidance published by the Department of Agriculture, Conservation and Forestry, and suggests certain revisions and consideration of regular updates to this guidance (**https://www.maine.gov/dacf/ard/resources/docs/dacf-solar-guidance-182021.pdf)

From: Jo D.Saffeir <jsaffeir@gmail.com>
Sent: Thursday, September 9, 2021 10:18 AM
To: Rossi, Candace J (NYSERDA) <Candace.Rossi@nyserda.ny.gov>
Subject: Allocation information regarding NY Ag & Markets Mitigation Fund

Hello Candace:
I am following up on a voicemail I left you yesterday. I am a Maine-based natural resource consultant, and am facilitating a Governor's stakeholder group in Maine focused on the impact of solar siting on the state's prime farmland and soils of statewide importance.

I understand that your state has established an agricultural and markets mitigation fund as a fee-based approach to mitigating siting impacts. I am interested in learning whether New York has established criteria that guides the allocation of these funds, and what types of projects have been supported thus far with this funding. Is there any information that you might provide?

Thanks very much, Jo D. Saffeir

Jo D. Saffeir Consulting
67 Leighton Road
Pownal, Maine 04069
207.400.4810 c
jsaffeir@gmail.com
Pronouns: she|her|hers why pronouns matter
==========
From: "Rossi, Candace J (NYSERDA)" <Candace.Rossi@nyserda.ny.gov>
Subject: RE: Allocation information regarding NY Ag & Markets Mitigation Fund
Date: September 9, 2021 at 2:06:38 PM EDT
To: 'Jo D.Saffeir' jsaffeir@gmail.com

Jo, thank you for reaching out. We have not yet established the criteria that guides the allocation of these funds. Payments to the fund are not provided until the effected projects reach commercial operation. But, in part to help inform this process, NYSERDA has developed an Agricultural Technical Working Group (A-TWG). It is anticipated that the A-TWG will host discussions, potentially developing criteria and guidance regarding how the Mitigation Fund will be administered. However, final decisions will be made by NYSERDA with concurrence from the New York State Department of Agriculture and Markets.
Thank you,

Candace Rossi, CEM
Senior Project Manager, NY-Sun
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Municipal Solar Concerns

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Incentivize appropriate development

• Incentivize development in marginal and contaminated or unusable spaces first. (PFAS/PFOA contaminated soils)
• Incentivize more structurally challenging built environment focused projects.
• Fully fund the municipal reimbursement portion of the "current use" program to ease pain on local property tax for statewide concerns.
• Strengthen local planning capacity with solar specific technical assistance.
• Provide PUC, DEP and ACF with enforcement powers, and adequate staffing resources to oversee projects reducing the burden on codes enforcement.
• Shield landowners and community from planned obsolesce of technology.
• Close loopholes that may allow land in one program to roll to another with no penalties for the purpose of solar farms.
• Develop a robust oversight and support program and link assessment with desired outcomes

Disincentivize farmland development

• Require projects to be collocated activities – existing farm production and generation.
• Roll back on equipment exemptions for siting in farmland enrolled in "current use". (No double dipping on community)
• Use soil and land assessments to site larger more efficient projects in appropriate places.
• Require local governing body to accept the change in use not just vet the development plan.(California, Connecticut, Florida, Nevada, Tennessee, and Oregon)
• Remove the exemption for tax penalties from moving from TG to CU if solar is placed on the land.
• Create a list of trusted development partners for any collocation project by establishing a robust licensing or certification program like shoreland zone certified contractors.
• Revisit the Farmland current use program with an eye towards greater accountability/penalties for productivity under solar installations

Hi All,

I really appreciate George's updates on the mil and population rate for Rumford. I think this really helps illustrate what I hope will be a key take away. I reworked that chart below.

The amounts are calculated using the lower new valuation number for the future tax bills (.0225) rather than 2020 mil rate (.0305) but retained the last Tree Growth State assessed land value based on the 2020 state valuation and the current $20k-$40k average taxable value for those undeveloped lands at the "highest and best use". The estimated average per residence burden is using the census bureau and Maine Housing reported average Maine household size (2.3) multiplied by the per resident share.

The amount of land in Tree Growth remains the same (25,907 acres) and the model assumes the state will continue to value the land in mixed wood at the same value. Unfortunately, that wouldn't be the case as Tree Growth calculations are based on the county-wide valuation and the portion of the lost value's impact on school funding for the community. Thus, a reduction in value of land in any community would result in lower county valuation and Tree Growth "Penalties" (or state partial value reimbursement) will decline proportionally. These lost value and tax shift numbers are very optimistic as a result.

(.0225 mils and 5,780 for resident population, per acre assessment value based on $20k-$40k in current schedule)

Full Per Acre Value	Full Value Ttl	TG Reduced Value	Lost Value	Per Resident Burden	Estimated Avg Residence Burden
$ 450	$ 11,658,150	$ 262,308	$ 46,351.38	$ 8.02	$ 18.44
$ 900	$ 23,316,300	$ 524,617	$ 308,659.75	$ 53.40	$ 122.82

When George and I were chatting, I provided him some information on revised numbers using a mil rate of .0215 because I heard him incorrectly. I am including that chart too. All the other numbers are the same though.

(.0215 mils and 5,780 for resident population, per acre assessment value based on $20k-$40k in current schedule)

Full Per Acre Value	Full Value Ttl	TG Reduced Value	Lost Value	Per Resident Burden	Estimated Avg Residence Burden
$ 430	$ 11,140,010	$ 250,650	$ 34,693.22	$ 6.00	$ 13.81
$ 860	$ 22,280,020	$ 501,300	$ 285,343.45	$ 49.37	$ 113.54

Key points:

- Even when a program is reimbursed by the state, there is a burden shift to only the adjacent taxpayers for a state-wide goal or benefit.

- The Open Space and Farmland programs are not reimbursed to the community.
- Solar projects along the midcoast are buying undeveloped land at market rate and paying property tax under the “highest and best use” valuation.
- Both the tax benefit and the tax penalty are constitutionally protected and would require a referendum vote to change.
- More technical support to advance sound projects is needed for most communities to make geographically appropriate decisions.
- Municipal official need clear and consistent and responsive contact information for damage and repairs that interface with the public way including new transmission lines.
- It would be helpful to have policies that would help weed through the vast numbers of solar developers to have clear best practices and protections for both landowners, habitat and communities.

Microsoft Word - Bulletin 20 (Farmland).doc (maine.gov)

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Agricultural Solar Stakeholder Group Meeting
Tuesday, August 24, 2021; 9:00 am - 12:00 pm
Held virtually

Meeting Recording: https://www.youtube.com/watch?v=3Vq9bNdLxwo

Stakeholder Member Attendance: Nick Armentrout (Spring Creek Farm), Emily Cole (American Farmland Trust), Fortunat Mueller (ReVision Energy), Ellen Griswold (Maine Farmland Trust), Eliza Donoghue (Maine Audubon), Kaitlin Hollinger (BlueWave Solar), Patrick Wynne (City of Hallowell), Celina Cunningham (Governor's Energy Office), Nancy McBrady (Department of Agriculture, Conservation and Forestry), Jeremy Payne (Maine Renewable Energy Association), and Julie Ann Smith (Maine Farm Bureau).

On August 24, 2021 the Maine Department of Agriculture, Conservation and Forestry (DACF) and the Governor's Energy Office (GEO) virtually hosted the fifth meeting of the Agricultural Solar Stakeholder Group. At this meeting the following was discussed:

- Nexamp's perspective on solar siting considerations
- Municipal perspective on potential impacts of solar siting
- Tier concept for influencing solar siting
- Review of emerging areas of consensus and further defined deliverables

Nexamp's perspective on solar siting considerations
Palmer Moore, VP Business Development at Nexamp gave an overview of Nexamp's experience developing solar in states across the country and how policy has influenced its work. Nexamp is a solar development company based in Massachusetts with over 300MW installed across 10 states from Maine to California.

While utilities nationwide are using new tools, equipment, and safety protocols to better manage interconnections, tracking interconnection is difficult as the roster of proposed projects lined up for interconnection is constantly changing. With so many projects in flux, interconnection costs that may include significant upgrades can swing from $5,000 to $5 million making development costs unpredictable. Local ordinances or moratoria can add to additional uncertainty. Given the interest in solar development, land leases are becoming more competitive, further increasing project costs.

Nexamp has been exposed to a variety of policies focused on balancing the impact of solar development on agricultural land. In New York, the Department of Agriculture and Markets created a notice of intent process which incorporates a mitigation fee. The fee is determined by a calculation that incorporates a value to agricultural soil. These polices put the onus on the developers to verify the quality of the soil through site evaluation. According to Palmer, when such a policy is implemented, this approach is welcomed by developers as spatial soil data is lacking. More information about this mitigation fee can be found here:

- NYSERDA Smart Solar Siting Scorecard: https://media2-production.mightynetworks.com/asset/27414533/RESRFP21-1_Smart_Solar_Siting_Scorecard__1_.pdf?_gl=1*11tedb2*_ga*NDM3OTUyMTc0L

- https://media2-production.mightynetworks.com/asset/27414533/RESRFP21-1_Smart_Solar_Siting_Scorecard__1_.pdf?_gl=1*11tedb2*_ga*NDM3OTUyMTc0LjE2MTE1OTgxMjA.*_ga_T49FMYQ9FZ*MTYyOTgxMTU3MC4yMDguMS4xNjI5ODEyNzUyLjA
- NYSERDA Mitigation Payment Requirements: https://www.nyserda.ny.gov/-/media/Files/Programs/NYSun/agricultural-mitigation-payment-requirements-guidelines.pdf

Several other states have implemented the use of pollinator scorecards. In many cases these are voluntary, while in others a minimum score is required to develop a project. Alternatively, an analysis as to why the location for the development was chosen by the farmer and developer may be presented to the permitting authority. Here are some other examples of current scorecards:

- Illinois: https://www2.illinois.gov/dnr/conservation/PollinatorScoreCard/Pages/default.aspx
- Maryland: https://dnr.maryland.gov/pprp/Pages/pollinator.aspx
- Massachusetts: https://ag.umass.edu/clean-energy/services/pollinator-friendly-solar-pv-for-massachusetts
- Minnesota: https://bwsr.state.mn.us/minnesota-habitat-friendly-solar-program
- Vermont: https://www.uvm.edu/extension/agriculture/pollinator-friendly-solar
- Fresh Energy has a few more: https://fresh-energy.org/beeslovesolar/pollinator-friendly-solar-scorecards

As a general practice, Nexamp installs pollinator habitat as a best practice, implementing the National Wildlife Federation certification for habitat and ecological diversity. It also installs livestock fencing instead of chain link fences to create less industrial looking sites and to allow wildlife to pass through sites.

Municipal perspective on potential impacts of solar siting

Rebecca Graham, Legislative Advocate with Maine Municipal Association covering multiple policy areas including agriculture, conservation, and forestry, gave a presentation covering interests and concerns of solar development for municipalities. In Maine, most of the services municipalities provide are paid through property tax revenue. The current use tax programs utilized for agricultural production offers no state reimbursement to municipalities for the loss of tax revenues for sheltering this land use. Allowing agricultural land that has been altered by solar development to remain in these programs is of concern for municipal revenue streams. It is MMA's perspective that farmland developed for solar should be removed from current use tax program,

Recent changes to energy laws have rapidly increased solar development in Maine. These changes have ushered in over 200 out of state agents and sponsors with no prior history of developing projects in Maine. As a result, municipalities have had to vet a new industry and have often responded by creating ordinances and assurances for decommissioning projects. Such work has fallen to volunteer boards that often lack the appropriate expertise and has caused concern for comprehensive land use planning. Further, many projects being proposed are just under the 20-acre threshold which eliminates the requirement of Site Law review by the State, although other oversight including stormwater permitting and Natural Resource Protection Act

To support municipalities' desire for more solar, MMA suggests these measures:

- Incentivize development in marginal and contaminated or unusable spaces first (such as PFAS-contaminated soils).
- Incentivize more structurally challenging, built environment focused projects (e.g., Brownfields, gravel pits).
- Fully fund the municipal reimbursement portion of the "current use" program.
- Strengthen local planning capacity with solar-specific technical assistance.
- Provide PUC, DEP and DACF with enforcement powers, and adequate staffing resources to oversee projects, reducing the burden on code enforcement.
- Close loopholes that may allow land in one current use program to roll to another with no penalties for the purpose of solar farms.
- Create a list of trusted development partners for any co-location project by establishing a robust licensing or certification program like shoreland zone-certified contractors.
- Revisit the farmland current use program with an eye towards greater accountability/penalties for productivity.

A discussion of the future obsolesence of projects brought up the value of project locations near grid infrastruture as being a driver to keep a site in future power production. Further, the lack of solar panel recycling facilities in Maine was noted, although some companies utilize recycling facilities in neighboring states.

Tier concept for influencing solar siting

Ethan Winter, Northeast Solar Specialist for American Farmland Trust, gave an overview of a matrix policy tool a subgroup has been drafting to identify development preferences for siting attributes. Farmland soil types and current uses of farmland were examined. The current version of the matrix proposes that solar development be encouraged on marginal farmland regardless of land use status (active or inactive). On land with prime soils or soils of statewide importance being actively farmed, dual-use development would be encouraged and could include incentives that encourage non-dual use elsewhere. On inactive farmland on prime and important soils, dual-use development would also be encouraged and incentivized. On other farmland as identified in the USDA census, regardless of soil type, solar development would be encouraged.

The group discussed the impact that policies falling within this guide could have on future agricultural development. Questions arose as to whether dual-use could bring inactive farmland back into production and it was mentioned that dual-use incentives have done little to create more dual-use projects under Massachusetts' SMART program.

The matrix also identified woodlots on farms as a land use type in need of development for siting preferences. It was acknowledged that there is room for further extrapolation on the varying types of dual-use/co-location development and soil conditions encountered by solar development (i.e. blueberry barrens on soils of local importance). In addition, it was noted that the definition of farmland under Title 36, section 1102 which has an income and minimum acreage requirement, or reliance on an affidavit from the farmer regarding soil type, could be too broad for incorporation into a future policy. It was also noted that non-farmland sites such as brownfields were not covered in this work as they will be a subject of a future distributed generation stakeholder group.

Review of emerging areas of consensus and further defined deliverables

Upon review of the current consensus areas, it was mentioned that the topic of decommissioning could include a recommendation to modify LD 802 An Act To Ensure Decommissioning of Solar Energy Developments to allow for further flexibility and reduce project costs. Further discussion led to the consideration of supporting a dual-use pilot program, noting support for dual-use in the current use tax program, and supporting the creation of resources for municipalities. Additional discussion on mitigation fees and BMPs is also warranted. In addition, the group agreed to establish a subgroup to identify potential policy tools and research needs.