BLUEWAVE

Back to Basics: Resetting the Solar Siting Conversation

What's possible for dual-use solar?

BlueWave Solar History

2010

BlueWave founded with the vision of protecting the planet by transforming access to renewable energy

2011

Launched our **solar development business** with our first small contract in MA

2013

Pioneered and built the first **community solar** projects in MA

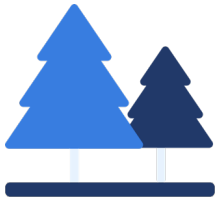
2017

Achieved B Corp certification for our commitment to the people, the partners and the places we do business

2019

Growth in community solar services, allowing us to bring access to solar to more people in more places

Conservation + Agriculture + Clean Energy = <3



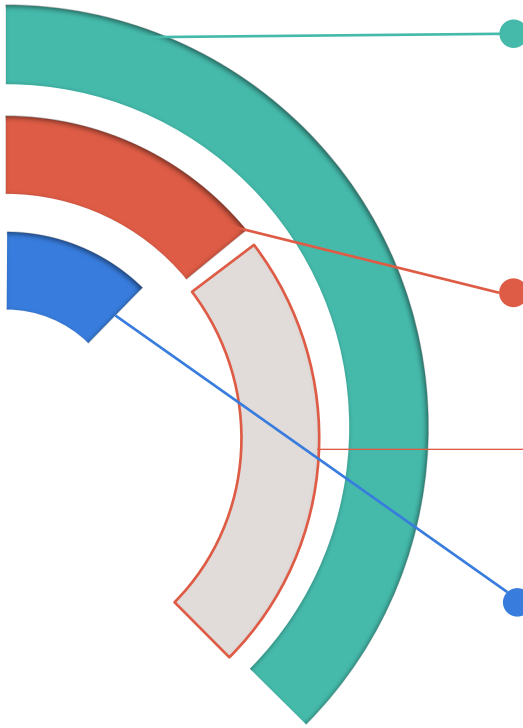
1. Engaging with the conservation community on leveraging planning tools and mitigation payments to reach conservation goals.

2. Working with farmers and farm managers to understand dual-use and how to leverage it for farm viability, food system stabilization, ecological benefits.

3. Commit to prioritizing sustainable siting and development practices. Be an engagement member of the conservation community.

ROOFTOP & CONTAMINATED LANDS ALONE CAN'T REACH GHG TARGETS

Current solar projections fall short by as much as 77%



With "Balanced Energy Mix," retaining modest amounts of other large-scale resources in New England would require **107 GW of solar (37% of total generation) by 2050.**

In this scenario, aggressive projections for Contaminated Land solar would only account for 77% of total solar needed by 2030, **and only 34% by 2050.**

Applying Acadia's annual level of rooftop solar adoption from 2020-2030 through to 2050 would **only account for 9% of total projected solar needed.**

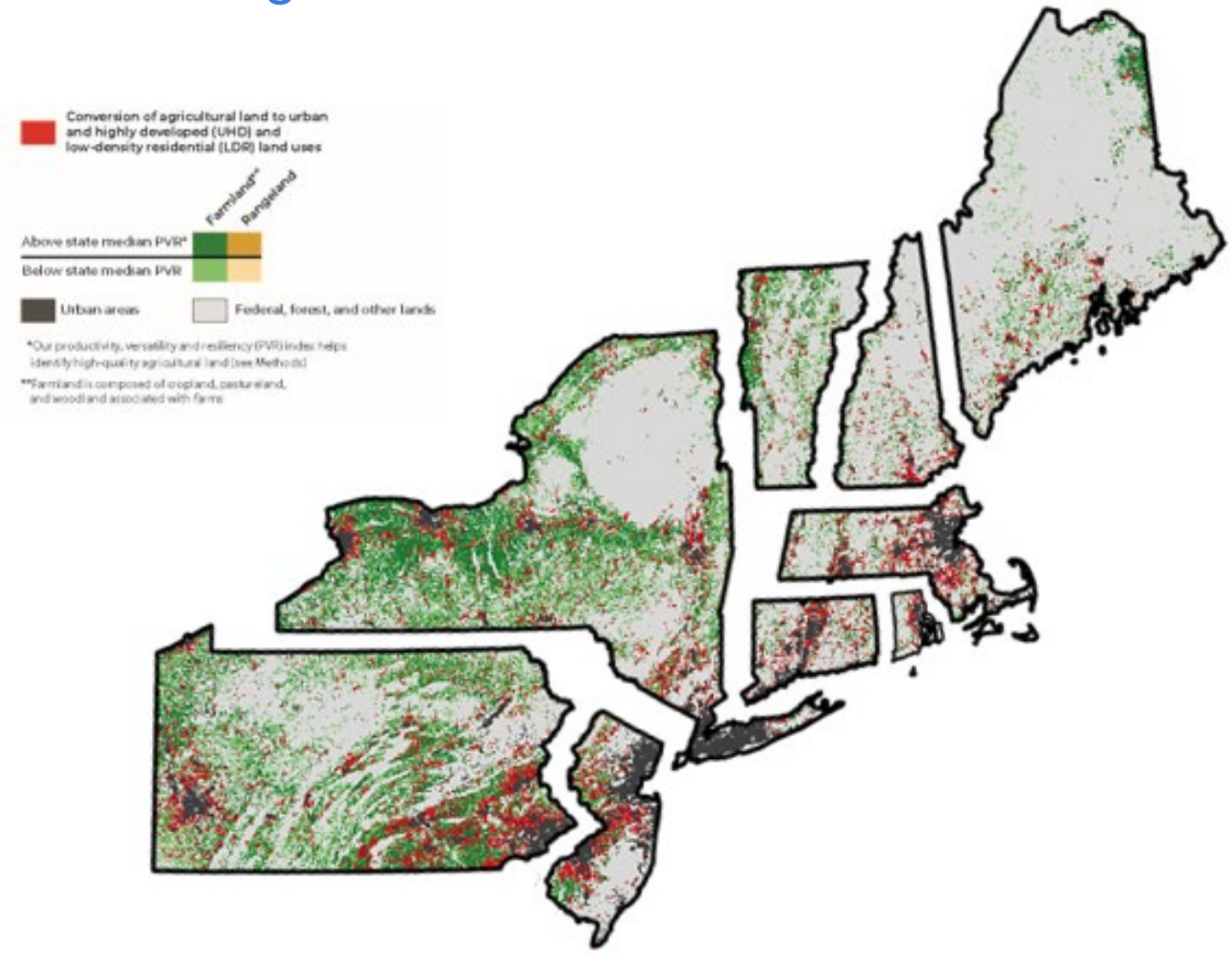
If sustainable solar does not fill this gap; what will?

Full adoption of projected Rooftop / Contaminated Land solar will still leave the region well short of its clean energy goals

Sources: 1. Acadia Center, "Meeting New England's Solar Needs on Contaminated Sites and Rooftops" (April 2020)
2. Brattle Group, "Achieving 80% GHG Reduction in New England by 2050" (September 2019) "

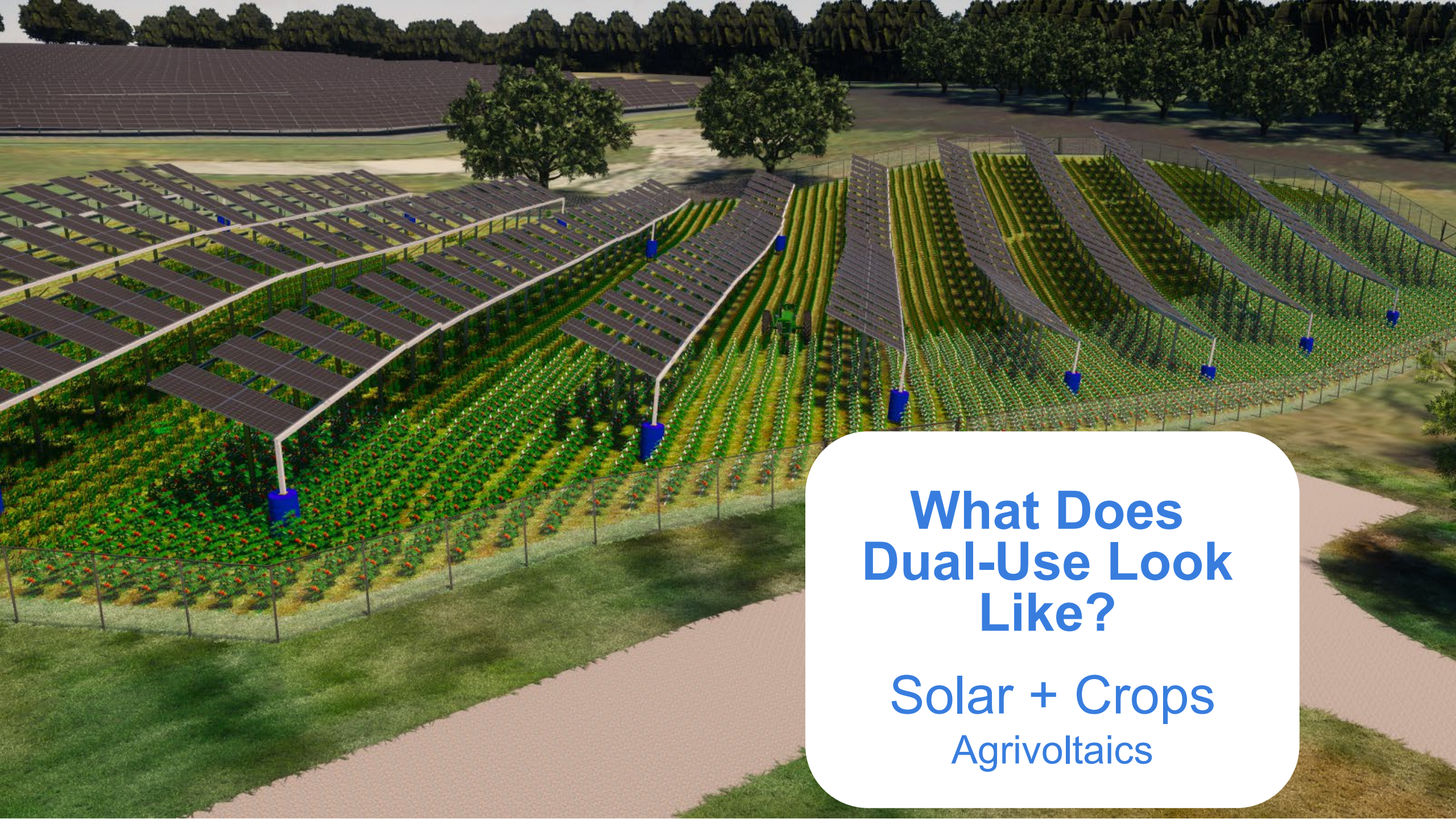
Farms Under Threat: American Farmland Trust

Evaluating Level of Threat



Farmland Conversion from 2001-2016		
State	Acres	%
New Jersey	7,100	8.7
Connecticut	23,000	6.4
Rhode Island	4,000	5.8
Massachusetts	27,000	5.2
Pennsylvania	347,000	3.8
New Hampshire	12,000	2.7
New York	254,000	2.7
Vermont	21,000	1.6
Maine	19,000	1.4

Source: Farms Under Threat: https://farmlandinfo.org/publications/farms-under-threat-the-state-of-the-states/



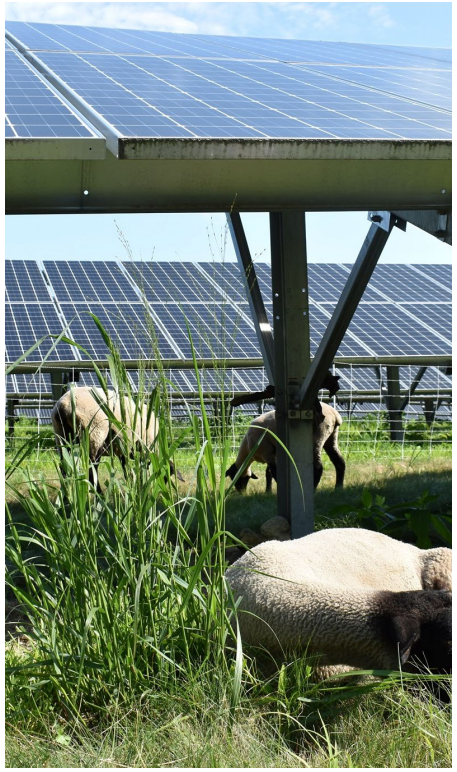
What Does Dual-Use Look Like?

Solar + Crops

Agrivoltaics

Dual-Use Examples

Agrivoltaic



Grazing

Pollinator Friendly

Conservation

Elements of Strong Dual-Use Policy

- **Develop clear agricultural siting guidelines and program framework** with input from the farming, research, and solar industry stakeholders.
- **Establish a working group** to address program adjustments and set standards that fit the state's unique agricultural needs.
- **Allow flexibility of dual-use construction** standards that support differing agricultural activities to continue as the primary site activity under or around arrays.
- **Utilize Shading Analysis tool or for project design verification**, developed by BlueWave and verified by the Fraunhoefer Institute for Sustainable Energy for the MA Dual-Use program. Similarly, states are looking at the PAR required per crop.
- **Use a third-party certification** or programs currently in place to verify farm plans and that the land remains in active agricultural use.
- **Financial incentive** to steer solar developers towards dual-use to preserve/increase agricultural production and meet clean energy goals at the same time. This could be keeping their farm tax assessment, an adder, etc. depending on the intensity of dual-use desired by the state.

Example Baseline Guidelines from New York

NYS Agricultural Solar Siting Guidelines

Environmental Monitoring

Hire or designate an EM to oversee the construction, restoration and follow-up monitoring in agricultural areas.

Construction Requirements

- Before any topsoil is stripped representative soil samples should be obtained.
- Topsoil should be stockpiled and kept separate from other excavation materials.
- Post-Construction restoration requirements.

Monitoring and Remediation

- Topsoil and trench settling
- Drainage
- Excessive Rock
- Soil Compaction
- Agricultural Fencing and Gates

Decommissioning and Restoration

- All materials removed
- Soil tested to ensure restoration or improvement of soil quality

NEW YORK STATE OF OPPORTUNITY. Agriculture and Markets

Source: NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS guidelines for solar energy projects - construction mitigation for agricultural lands. 10/18/2019.

Top 7 States for Dual-Use Policy Engagement

Which Northeast states have the policy special sauce to be the next sustainable solar market?

Image: AFT: Farms Under Threat

Criteria for Opportunity

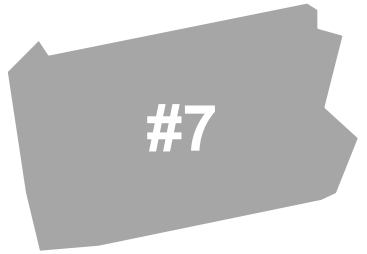
Creating a standard to evaluate level of farmland threat

Evaluation Categories

Criteria	Best Practices	Total Potential Score
Structural Support	• Is there an active community solar program? • Are there incentives for dual-use development? • Are there clear solar siting standards in place? • Are there current use taxation programs?	**5**
Organizational Support	• What NGOs, organizations or agencies are open to dual-use? • How engaged is the State's Department of Ag? • Involvement of local institutional experts?	**5**
Farmland Protection Potential	• Regional Farms Under Threat Ranking	**5**
Farmland % Preserved with Dual-Use	• Potential % of total farmland to preserved using state food system and farmland preservation numbers available.	

Pennsylvania

SCORE: 46%



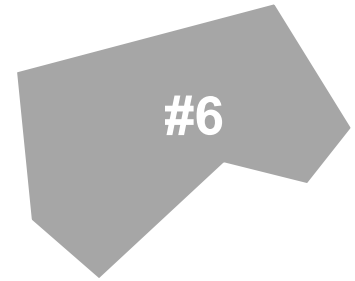
Criteria	State Details	Score
Structural Support	Interest amongst environmental groups is high for community solar and possibly Dual-Use. **No leg. again!**	1
Organizational Support	• Farm Bureau is very interested in Dual-Use and collaborating with community solar developers. • Environmental NGOs are engaged but efforts are fragmented	3
Farmland Protection Potential	5th highest farmland conversation rate	3
Overall	**Despite low score, economic circumstances are especially dire for farmers, which moves the state up the list in terms of urgency to act.**	**7/15**
Farmland % Preserved with Dual-Use	No current comparable data, could be developed through a state-wide food systems plan	

Action Items

1. ~~Advocate for the passage of HB 531 Community Solar Bill that is in the House Consumer Affairs committee currently.~~
2. ~~Advocate for Dual-Use support at the PUC after the legislation is passed.~~
3. Advocate for solar legislation next session!

Connecticut

SCORE: 53%



Criteria	State Details	Score
Structural Support	• Community solar program is small and RFP process will be completed on July 15 • Carbon Free by 2040 goal	1
Organizational Support	• Opportunity for DEEP to engage land use and solar community for next phase on solar	2
Farmland Protection Potential	• 2nd highest farmland conversion rate • 2nd most expensive farmland in the US	5
Overall	**Farmlands face a high level of threat, but CT faces a lack of structural and organizational support.**	**8/15**
Farmland % Preserved with Dual-Use	*25% of new farmland goal could be met via dual-use, including 22% of new acreage goal for livestock and 34% of new acreage goal for ground crops.*	

Action Items

1. RFP process is nearly completed for the solar programs, but connecting with the Farm Bureau and NGOs is important to move the solar conversation in CT.

New York

SCORE: 60%

Criteria	State Details	Score
Structural Support	• Community solar program getting going – largest clean energy goals in the region. • Nothing specific in NY-SUN operating plan, but there is a leftover bucket for incentives • Possible taxation programs to leverage	3
Organizational support	• AFT very engaged in solar opportunities • The NY PSC specifically called out dual-use in their latest NY-SUN order. • NYSERDA engaged	3
Farmland Protection Potential	6th highest farmland conversation rate	3
Overall	**Early stages, with potential to ramp up**	**9/15**
Farmland % Preserved with Dual-Use	No current comparable data, could be developed through a state-wide food systems plan	

Action Items:

1. Ask NYSERDA to consider dual-use for the NY-SUN program.
2. Work together with NGOs and developers to create a robust and effective program.
3. Encourage progress toward a state-wide food systems plan building on existing “NYS Farm to School” program

Rhode Island

SCORE: 67%

#4

Criteria	State Details	Score
Structural Support	Community solar program is small, but has aggressive renewable goals - 100% by 2030	2
Organizational support	Land use community engaged in solar siting conversation, opportunity to present an alternative	3
Farmland Protection Potential	• 3rd highest farmland conversion rate • Most expensive farmland in the nation	5
Overall	**Moderate support structures are in place but farmlands will need more aggressive support due to level of threat.**	**10/15**
Farmland % Preserved with Dual-Use	*45% of new farmland goal could be met via dual-use, including 40% of new acreage goal for livestock and 63% of new acreage goal for ground crops.*	

Action Items

1. OER is trying to gauge what efforts can be made to expand the Community Remote Net Metering program. Data is being gathered.
2. Land use community may be open to the dual-use alternative.

Maine

SCORE: 73.3%

Criteria	State Details	Score
Structural Support	• Net Energy Billing program on-going and very popular, • NEB program can be amended to incentivize preferred siting such as dual-use • Current Use Taxation Legislation (Tabled)	3
Organizational Support	• AFT, MFT, Maine Audubon, Farm Bureau, NRCM engaged in collaborative conversations • Dual-use named in the legislation, unknown whether the PUC will incentivize until after Block one of the program • DEP, DACF, GEO all engaged	5
Farmland Protection Potential	9th highest farmland conversation rate	2
Overall	**Excellent organizational support in place, but a relatively lower threat to farmland.**	**10/15**
Farmland % Preserved with Dual-Use	*Opportunity to create 2% of new farmland goal via dual-use; large-proportion of farmland vs. low energy load results in low percentage of total new farmland called for in NEFV.*	

Action Items

Opportunity in the Spring 2021 for legislation or the NEB program review to influence program.

1. Ask PUC and the Governor to consider a dual-use incentive or preferred siting status in the DG procurement (community solar) program.
2. Encourage PUC and the Governor to incentivize dual-use in the Net Energy Billing Program.
3. Encourage the solar siting working group in Maine to steer towards dual-use.

Massachusetts

SCORE: 80%

Criteria	State Details	Score
Structural Support	• Legacy community solar program, large clean energy and net zero goals and needs (GHG, LMI participation) • Taxation program could be addressed	5
Organizational support	• MDAR, DOER, EEA, and Gov engaged • AFT and others very engaged	3
Farmland Protection Potential	4th highest land conversion rate	4
Overall	**Excellent structural support combined with strong organizations has great potential to make an impact.**	**12/15**
Farmland % Preserved with Dual-Use	*36% of new farmland goal could be met via dual-use, including 31% of new acreage goal for livestock and 50% of new acreage goal for ground crops.*	

Action Items

1. Ask MDAR for a long \-term working group to help make the program more streamlined and robust.
2. Join us in our call for 3rd party certification of crop plans and agricultural activity certification.

New Jersey

SCORE: 87%

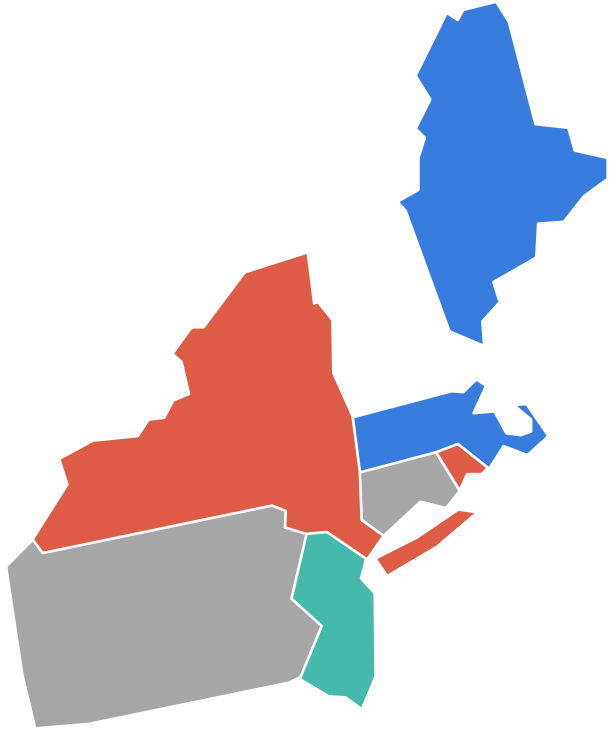
Criteria	State Details	Score
Structural Support	• Large clean energy goals and needs, specifically for community solar	4
Organizational support	• Stakeholders interested in pursuing dual-use solar • BPU – straw proposal likely out soon. Push for dual-use as preferred siting, incentive for dual-use • Legislation to allow for dual-use on farmland without size restriction.	4
Farmland Protection Potential	• #1 highest conversion of farmland rate • Projected to be the first state to reach "build out"	5
Overall	**Powerful structural and organizational support in place to combat aggressive conversion rates.**	**13/15**
Farmland % Preserved with Dual-Use	*No current comparable data, could be developed through a state-wide food systems plan*	

Action Items

1. Ask the BPU to allow for farmland siting with dual-use in the successor program and provide for an incentive for a robust dual-use program.
2. Engage with the legislature to pass legislation allowing for dual-use.
3. Keep building relationships with the Farm Bureau and NGOs.

Summary of Ranked Top 7 Opportunities

Rank	State	Level of Threat	Level of Opportunity	Rating
1	New Jersey	High	High	87%
2	Massachusetts	Medium	High	80%
3	Maine	High	Medium	73%
4	Rhode Island	High	Medium	67%
5	New York	Medium	Medium	60%
6	Connecticut	High	Low	53%
7	Pennsylvania	Medium	Low	46%



Possible new programs: Vermont, New Hampshire, Maryland, Virginia

Thank you!

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Components of an Effective Dual-Use Adder

Risk & Complexity by Asset Class

- Higher uncertainty
- Higher risk
- Higher complexity
- More moving parts
- Investor revenue returns expectations

Varied Design Needs by Structure

- Additional steel
- Higher labor cost

Support for Farm Operations/ Farmers

- Inputs & Equipment
- Capital Improvements
- Farm Manager / Technical Assistance
- Farm Subsidy Payment

Requirements based on Solar Operations

- Higher O&M
- Higher insurance premiums
- Unknowns

Financial Impact of Project Size

- Less density vs. standard solar
- Less lease revenue vs. standard solar
- Less profit vs. standard solar
- Fixed costs remain same (interconnection)