Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth



Massachusetts Department of Energy Resources

Agrivoltaics in the SMART Program

November 14, 2023

Introduction

- SMART is a voluntary declining incentive structure program in which the utility companies compensate solar system owners per kWh generated
- Certain system types and land uses are more highly compensated through "adders"
 - Building mounted
 - Brownfields
 - Landfills
 - Canopies
 - > Agrivoltaics





Relative Costs & Compensation Values for Systems >25 kW AC

System Type	Building Mounted	Brownfield	Landfill	Canopy	Agrivoltaic
Average Installation Cost (\$/watt)	\$2.64	\$2.26	\$2.04	\$3.82	\$2.51
Average System Size in SMART (kW AC)	170	2,112	2,155	439	1,424
Total System Count in SMART	766	8	20	83	3
Compensation Rate Adder Value (\$/kWh)	\$0.02	\$0.03	\$0.04	\$0.06	\$0.06



Program Statistics

SMART is a 3200 MW program with a goal of 80 MW of agrivoltaic capacity --> 2.5% of total

20 projects qualified in SMART with agricultural adder --> 31.9 MW, 1.8% of total approved capacity in the program

Existing project types: hay, livestock grazing, cranberries, vegetables, honey



Collaboration with Department of Agricultural Resources



Development of Guideline and Pre-Determination Application



Individual project reviews



Site visits



Stakeholder engagement



Knowledge and expertise sharing



Project Review Process & Ongoing Requirements

Step 1	Applicant submits project plans to UMass Clean Energy Extension for input and revises as needed	
Step 2	Applicant submits Pre-Determination Application to DOER and MDAR for joint review	
+		
Step 3	DOER issues a Pre-Determination letter	
+		
Step 4	Applicant submits full application to SMART program and receives a Preliminary Statement of Qualification> construction begins	
+		
Step 5	Applicant receives Final Statement of Qualification when project receives Permission to Operate> incentive term begins	
+		
Step 6	Applicant submits Annual Reports to DOER and MDAR to demonstrate the land continues to be used primarily for agriculture	



Key Regulatory Requirements



System will not interfere with continued use of land for agriculture



Designed to optimize balance between electricity generation and agricultural productivity



Raised structure that allows for continuous growth of crops underneath panels



Elements of Pre-Determination Applications

Property and soils map

Comment letter from UMass CEE

Solar array design and site plan

Shading analysis

Farm plan (crops, hay, livestock, poultry, etc)

Demonstration of compliance with regulatory requirements



Challenges & Opportunities of Agrivoltaics

Challenges

- Extended interconnection timelines
- Optimizing solar production while maintaining agriculture as primary use
- More research and data needed

Opportunities

- Additional revenue for farmers
- Diverting solar development from forests and open space
- Keeping land in agriculture and preventing development



Looking Ahead

Technical Potential of Solar Study

- Statewide parcel-by-parcel analysis of the total technical potential for solar installation and the suitability for solar (biodiversity, embedded CO2, ecosystem services, grid infrastructure, etc)
- Online mapping tool to examine suitability across variety of metrics

Commission on Agrivoltaics

- Examine research and data, solicit stakeholder input, and develop recommendations for legislative and regulatory changes
- Consider land use impacts, water quality, soil health, food production, carbon accounting

Ongoing research and data gathering

- Annual reports for SMART projects on crop and/or herd productivity, needed changes
- UMass Clean Energy Extension Dual-Use Research

