



SMART Program for Cranberry Growers
Development Perspective
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SMART Program Primer

- Program Information: <http://masmartsolar.com/>
- Regulations finalized in August 2017 ([link](#))
- Auction took place in December-January 2017
- Capacity Blocks and Pricing released in late January ([link](#))
- Final utility SMART tariffs to be implemented late summer / early fall 2018
 - Allocations open when tariffs are official implemented
- Recent DOER Overview Presentation Has More Detail ([link](#))

Capacity Blocks by Distribution Company

Distribution Company	Amount Procured	Adjusted Block 1	Adjusted Block 2	Adjusted Block 3	Adjusted Block 4
Fitchburg Gas & Electric d/b/a Unutil	0.000	3.158	3.158	3.158	3.158
Massachusetts Electric d/b/a National Grid	43.573	28.445	72.018	72.018	72.018
Nantucket Electric d/b/a National Grid	0.000	2.417	2.417	N/A	N/A
NSTAR d/b/a Eversource Energy	2.000	71.211	73.211	73.211	73.211
WMECO d/b/a Eversource Energy	7.700	4.888	12.588	12.588	12.588
Total Capacity	53.273	110.118	163.391	160.975	160.975

Distribution Company	Adjusted Block 5	Adjusted Block 6	Adjusted Block 7	Adjusted Block 8	Total
Fitchburg Gas & Electric d/b/a Unutil	N/A	N/A	N/A	N/A	12.631
Massachusetts Electric d/b/a National Grid	72.018	72.018	72.018	72.018	576.142
Nantucket Electric d/b/a National Grid	N/A	N/A	N/A	N/A	4.833
NSTAR d/b/a Eversource Energy	73.211	73.211	73.211	73.211	585.688
WMECO d/b/a Eversource Energy	12.588	12.588	12.588	12.588	100.706
Total Capacity	157.817	157.817	157.817	157.817	1280.000

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Summary of Base Compensation Rates by Service Territory, Generation Unit Capacity, and Capacity Block

Electric Distribution Company	Generation Unit Capacity	Base Compensation Rate Factor	Term Length	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8
Fitchburg Gas & Electric d/b/a Until ^{1 2}	Low income less than or equal to 25 kW AC	230%	10-year	\$0.35795	\$0.32645	\$0.29772	\$0.27152	Not Applicable			
	Less than or equal to 25 kW AC	200%	10-year	\$0.31126	\$0.28387	\$0.25889	\$0.23611				
	Greater than 25 kW AC to 250 kW AC	150%	20-year	\$0.23345	\$0.21290	\$0.19417	\$0.17708				
	Greater than 250 kW AC to 500 kW AC	125%	20-year	\$0.19454	\$0.17742	\$0.16181	\$0.14757				
	Greater than 500 kW AC to 1,000 kW AC	110%	20-year	\$0.17119	\$0.15613	\$0.14239	\$0.12986				
	Greater than 1,000 kW AC to 5,000 kW AC	100%	20-year	\$0.15563	\$0.14193	\$0.12944	\$0.11805				
Massachusetts Electric d/b/a National Grid ³	Low income less than or equal to 25 kW AC	230%	10-year	\$0.35795	\$0.34363	\$0.32989	\$0.31669	\$0.30402	\$0.29186	\$0.28019	\$0.26898
	Less than or equal to 25 kW AC	200%	10-year	\$0.31126	\$0.29881	\$0.28686	\$0.27538	\$0.26437	\$0.25379	\$0.24364	\$0.23390
	Greater than 25 kW AC to 250 kW AC	150%	20-year	\$0.23345	\$0.22411	\$0.21514	\$0.20654	\$0.19828	\$0.19034	\$0.18273	\$0.17542
	Greater than 250 kW AC to 500 kW AC	125%	20-year	\$0.19454	\$0.18676	\$0.17929	\$0.17211	\$0.16523	\$0.15862	\$0.15228	\$0.14618
	Greater than 500 kW AC to 1,000 kW AC	110%	20-year	\$0.17119	\$0.16435	\$0.15777	\$0.15146	\$0.14540	\$0.13959	\$0.13400	\$0.12864
	Greater than 1,000 kW AC to 5,000 kW AC	100%	20-year	\$0.15563	\$0.14940	\$0.14343	\$0.13769	\$0.13218	\$0.12690	\$0.12182	\$0.11695
Nantucket Electric d/b/a National Grid ^{4 5}	Low income less than or equal to 25 kW AC	230%	10-year	\$0.39100	\$0.32844	Not Applicable					
	Less than or equal to 25 kW AC	200%	10-year	\$0.34000	\$0.28560						
	Greater than 25 kW AC to 250 kW AC	150%	20-year	\$0.25500	\$0.21420						
	Greater than 250 kW AC to 500 kW AC	125%	20-year	\$0.21250	\$0.17850						
	Greater than 500 kW AC to 1,000 kW AC	110%	20-year	\$0.18700	\$0.15708						
	Greater than 1,000 kW AC to 5,000 kW AC	100%	20-year	\$0.17000	\$0.14280						
NSTAR d/b/a Eversource Energy ⁶	Low income less than or equal to 25 kW AC	230%	10-year	\$0.39100	\$0.37536	\$0.36035	\$0.34593	\$0.33209	\$0.31881	\$0.30606	\$0.29382
	Less than or equal to 25 kW AC	200%	10-year	\$0.34000	\$0.32640	\$0.31334	\$0.30081	\$0.28878	\$0.27723	\$0.26614	\$0.25549
	Greater than 25 kW AC to 250 kW AC	150%	20-year	\$0.25500	\$0.24480	\$0.23501	\$0.22561	\$0.21658	\$0.20792	\$0.19960	\$0.19162
	Greater than 250 kW AC to 500 kW AC	125%	20-year	\$0.21250	\$0.20400	\$0.19584	\$0.18801	\$0.18049	\$0.17327	\$0.16634	\$0.15968
	Greater than 500 kW AC to 1,000 kW AC	110%	20-year	\$0.18700	\$0.17952	\$0.17234	\$0.16545	\$0.15883	\$0.15247	\$0.14638	\$0.14052
	Greater than 1,000 kW AC to 5,000 kW AC	100%	20-year	\$0.17000	\$0.16320	\$0.15667	\$0.15041	\$0.14439	\$0.13861	\$0.13307	\$0.12775
WMECO d/b/a Eversource Energy ⁷	Low income less than or equal to 25 kW AC	230%	10-year	\$0.32862	\$0.31548	\$0.30286	\$0.29075	\$0.27912	\$0.26795	\$0.25723	\$0.24694
	Less than or equal to 25 kW AC	200%	10-year	\$0.28576	\$0.27433	\$0.26336	\$0.25282	\$0.24271	\$0.23300	\$0.22368	\$0.21473
	Greater than 25 kW AC to 250 kW AC	150%	20-year	\$0.21432	\$0.20575	\$0.19752	\$0.18962	\$0.18203	\$0.17475	\$0.16776	\$0.16105
	Greater than 250 kW AC to 500 kW AC	125%	20-year	\$0.17860	\$0.17146	\$0.16460	\$0.15801	\$0.15169	\$0.14563	\$0.13980	\$0.13421
	Greater than 500 kW AC to 1,000 kW AC	110%	20-year	\$0.15717	\$0.15088	\$0.14485	\$0.13905	\$0.13349	\$0.12815	\$0.12302	\$0.11810
	Greater than 1,000 kW AC to 5,000 kW AC	100%	20-year	\$0.14288	\$0.13716	\$0.13168	\$0.12641	\$0.12135	\$0.11650	\$0.11184	\$0.10737

SMART Program Primer



Summary of Compensation Rate Adder Values by Type and Adder Tranche

Adder Type ¹	Generation Unit Type	Adder Tranche and Value (\$/kWh) ²							
		Adder Tranche 1 (80 MW)	Adder Tranche 2 (TBD)	Adder Tranche 3 (TBD)	Adder Tranche 4 (TBD)	Adder Tranche 5 (TBD)	Adder Tranche 6 (TBD)	Adder Tranche 7 (TBD)	Adder Tranche 8 (TBD)
Location Based	Building Mounted Solar Tariff Generation Unit	\$0.02000	\$0.01920	\$0.01843	\$0.01769	\$0.01699	\$0.01631	\$0.01566	\$0.01503
	Floating Solar Tariff Generation Unit	\$0.03000	\$0.02880	\$0.02765	\$0.02654	\$0.02548	\$0.02446	\$0.02348	\$0.02254
	Solar Tariff Generation Unit on a Brownfield	\$0.03000	\$0.02880	\$0.02765	\$0.02654	\$0.02548	\$0.02446	\$0.02348	\$0.02254
	Solar Tariff Generation Unit on an Eligible Landfill	\$0.04000	\$0.03840	\$0.03686	\$0.03539	\$0.03397	\$0.03261	\$0.03131	\$0.03006
	Canopy Solar Tariff Generation Unit	\$0.06000	\$0.05760	\$0.05530	\$0.05308	\$0.05096	\$0.04892	\$0.04697	\$0.04509
	Agricultural Solar Tariff Generation Unit	\$0.06000	\$0.05760	\$0.05530	\$0.05308	\$0.05096	\$0.04892	\$0.04697	\$0.04509
Off-taker Based	Community Shared Solar Tariff Generation Unit	\$0.05000	\$0.04800	\$0.04608	\$0.04424	\$0.04247	\$0.04077	\$0.03914	\$0.03757
	Low Income Property Solar Tariff Generation Unit	\$0.03000	\$0.02880	\$0.02765	\$0.02654	\$0.02548	\$0.02446	\$0.02348	\$0.02254
	Low Income Community Shared Solar Tariff Generation Unit	\$0.06000	\$0.05760	\$0.05530	\$0.05308	\$0.05096	\$0.04892	\$0.04697	\$0.04509
	Public Entity Solar Tariff Generation Unit	\$0.02000	\$0.01920	\$0.01843	\$0.01769	\$0.01699	\$0.01631	\$0.01566	\$0.01503
Energy Storage³	Energy Storage Adder	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Variable
Solar Tracking	Solar Tracking Adder	\$0.01000	\$0.00960	\$0.00922	\$0.00885	\$0.00849	\$0.00815	\$0.00783	\$0.00751

SMART Program Primer

- Standard STGU Project Size Limitation: 5MW AC per parcel
- All projects must adhere to Land Use and Siting Guidelines ([link](#))
- If a project is “sited on active agricultural land, Prime Agricultural Land (soil type), or land that is currently, or has in the past five years, been enrolled in the Chapter 61A tax benefit program,” the project must then must be one of the following or be subject to a greenfield subcontractor:
 - Building Mounted STGU (i.e. rooftop project)
 - Standard STGU sized to meet no greater than 200% of the annual operational load of the agricultural facility
 - Meet the requirements of an Agricultural STGU
- Greenfield Subtractors:

Greenfield Subtractors apply as follows:

Category 1 Agricultural/ Non-Agricultural:	No Greenfield Subtractor
Category 2:	\$0.0005/kWh per acre impacted
Category 3:	\$0.001/kWh per acre impacted

- Category 3 Subtractor for 40 acre project: $\$0.001/\text{kWh} * 40 \text{ acres} = \$0.04/\text{kWh}$
- The Subtractor is deducted from the base rate and the project is not eligible to receive the agricultural adder

SMART Program Primer

- Agricultural Solar Tariff Generation Unit (ASTGU)
- ASTGU Size Limitation: 2MW AC*
 - *applies for the first two capacity blocks, subject to change thereafter
- ASTGU have specific requirements and must be approved by DOER/MDAR
- ASTGU Guidelines ([link](#)) require the following:
 - Panel Height Requirements
 - Fixed-Tilt: 8ft minimum height to lowest panel point
 - Tracker: 10ft minimum height to panel in horizontal position
 - Shading Requirements
 - The “maximum sunlight reduction from the panel shading on every square foot of land directly beneath, behind and in the areas adjacent to and within the ASTGU’s design shall not be more than 50% of baseline field requirements.”
 - Sunlight reduction analysis applies during the typical growing season which is considered to be March through October, from 10am-5pm for March and October and 9am-6pm from April through September.
 - Waiver from these provisions is possible but there is a high-bar to meet

Typical Development Process

- In order to obtain a Statement of Qualification (SOQ) and reserve a position in the SMART program, the project must have:
 - Site Control
 - An executed Interconnection Service Agreement (ISA) with the Utility
 - All necessary land use permits
- **Site Control**
 - Developer must demonstrate a legally binding agreement that allows for the construction of the facility (i.e. lease or purchase the property)
- **Interconnection Service Agreement Timing and Cost**
 - ~9-15+ months from filing of interconnection application
 - More complex system modifications required = more study time
 - \$20,000-\$50,000+ in application and study fees
 - More complex studies = more \$\$
- **Permitting Timing and Cost**
 - ~3-9+ months from filing of permit applications
 - Time required depends on complexity of site (e.g. wetland or cultural resource areas, endangered species, etc.), town bylaws and permit application requirements, town review process, and state/federal review process (if necessary)
 - \$50,000-\$100,000+ in application, engineering and study fees depending on complexity of the site and applicable requirements

Typical Development Process

- **Interconnection Construction Timeline (performed by Utility)**
 - ~6-12+ months from signing of ISA to actual system modification work being completed
 - Timing depends heavily upon the complexity of system modifications
 - Higher levels of solar penetration on a given feeder generally lead to more complex studies and system modification requirements
- **Project Construction Timeline – Commencement to Commissioning**
 - 1MW project ~ 3 Months
 - 5MW project ~ 6 months
 - Project construction work typically done concurrently with interconnection construction work to optimize schedule
- **Overall Project Timeline – Signing of Site Control to Completion of Project**
 - Interconnection process is typically the schedule driver (unless there are substantial permitting issues)
 - Straightforward project connecting to a line with available capacity and minimal permitting requirements / hurdles
 - 15 months
 - Project with complex interconnection study requirements and long interconnection construction schedule
 - 27 months

Cranberry Specific Issues



- **Permitting**
 - Solar on Upland Bogs
 - Upland bogs are generally considered non-resource areas for purposes of Wetlands Protection Act by most Towns and the DEP
 - Little permitting resistance expected from Conservation Commissions assuming that a project is in compliance with other requirements
 - Solar on Wetland bogs
 - Very limited precedence in the state (one 1MW project)
 - ASGTU requirements will result in significantly different project designs that allow a maximum shading of 50% on *every square foot* of land under and around solar panels
 - ASGTU units provide “unique benefits” by maintaining the viability of agriculture in the state and producing clean energy
 - Operating cranberry bogs, even if technically defined as Bordering Vegetated Wetlands (BVW), are not naturally functioning wetland systems (e.g. sand, irrigation, pesticides/herbicides, etc.)
 - ASGTU preserve the agricultural use of the land, and therefore do not alter the function of the bogs
 - What is the true impact of an ASTGU to the wetland system and what is the appropriate permitting/regulatory path forward?

Cranberry Specific Issues

- **Operational**
 - Limited research on productiveness of cranberry bogs with reduced sunlight
 - Potential upside in reducing scald
 - DOER/MDAR require annual reporting, but an ASTGU does not need to meet certain production amounts (so long as the project continues to comply with ASTGU design requirements)
 - Will the design work for ongoing crop management and harvest?
 - Who is responsible for crop management after project completion?

Questions for Developers

- **Ensuring the best chances for success**
 - Has the developer reviewed all applicable bylaws, permitting requirements and applicable regulations?
 - If so, why does the developer believe the project will work on your land?
 - Has the developer filed for an interconnection “pre-application” for the site?
 - If so, how will the developer manage the timeline and cost of the potential system modifications?
 - What is the overall expected project timeline based on the above?
 - How will the developer fund the interconnection and permitting processes?
 - Request to see balance sheet
 - How will the developer finance the construction of the project?
 - Request financial / banking references
 - What is the developer’s construction experience?
 - What is the developer’s operational experience?
 - What is the decommissioning plan for the project?
 - Possibly require a financial security for decommissioning