



DISTRIBUTED GENERATION IN MASSACHUSETTS

Massachusetts Department of Public Utilities

December 15, 2017



DISCLAIMER

Comments reflect my personal observations, and do not necessarily reflect the position of the Commonwealth of Massachusetts, the Department of Public Utilities (DPU), or the DPU Commissioners



OVERVIEW

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- This presentation focuses on recent developments in Distributed Generation (DG) policy
- Primary programs for DG discussed in this presentation:
 - Net metering
 - Renewable Portfolio Standards (RPS), specifically the solar carve-out
 - Grants & Rebates
 - Policies regarding DG participation in ISO-NE Markets



OVERVIEW (CONT.)

Program Name	Eligible Technologies	Eligible Nameplate Size(s)	Anticipated Capacity	End Date	Total Anticipated Funding (\$)	Limited to MA?	Agency
Net Metering General Program	Solar, Wind, Anaerobic Digestion, and Agricultural	2 MW _{AC} (private) 10 MW _{AC} (public)	1,667 MW _{AC}	None	TBD	Yes (IOUs)	DPU
<i>Small Hydro Program</i>	Hydro	2 MW _{AC}	60 MW _{AC}	None	TBD	Yes (IOUs)	DPU
RPS	Solar, Wind, Ocean, Fuel Cells, Landfill Gas, Hydro, Biomass, Hydrokinetic, and Geothermal	n/a (except for Hydro)	Variable	None	TBD	No	DOER
<i>Solar Carve-Out I and II</i>	Solar	6 MW _{DC} *	2,300 MW _{DC}	2018	TBD	Yes**	DOER
<i>Solar MA Renewable Target (SMART)</i>	Solar	5 MW _{AC} *	1,600 MW _{AC}	2022 (est.)	TBD	Yes (IOUs)	DOER



OSGF

- Every year, the electric distribution companies file on-site generating facility (OSGF) reports to the DPU
- The DPU aggregates data on installed capacity and files a report with the MA Legislature
- The data gives a snapshot of installed DG
- Limitations of data:
 - Only filed once per year (~March)
 - Only includes investor-owned utility data
- Actual (i.e. measured) *production data* is not included in the OSGF for every facility
 - There is no requirement that *production* be measured
 - Many OSGFs offset on-site load

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

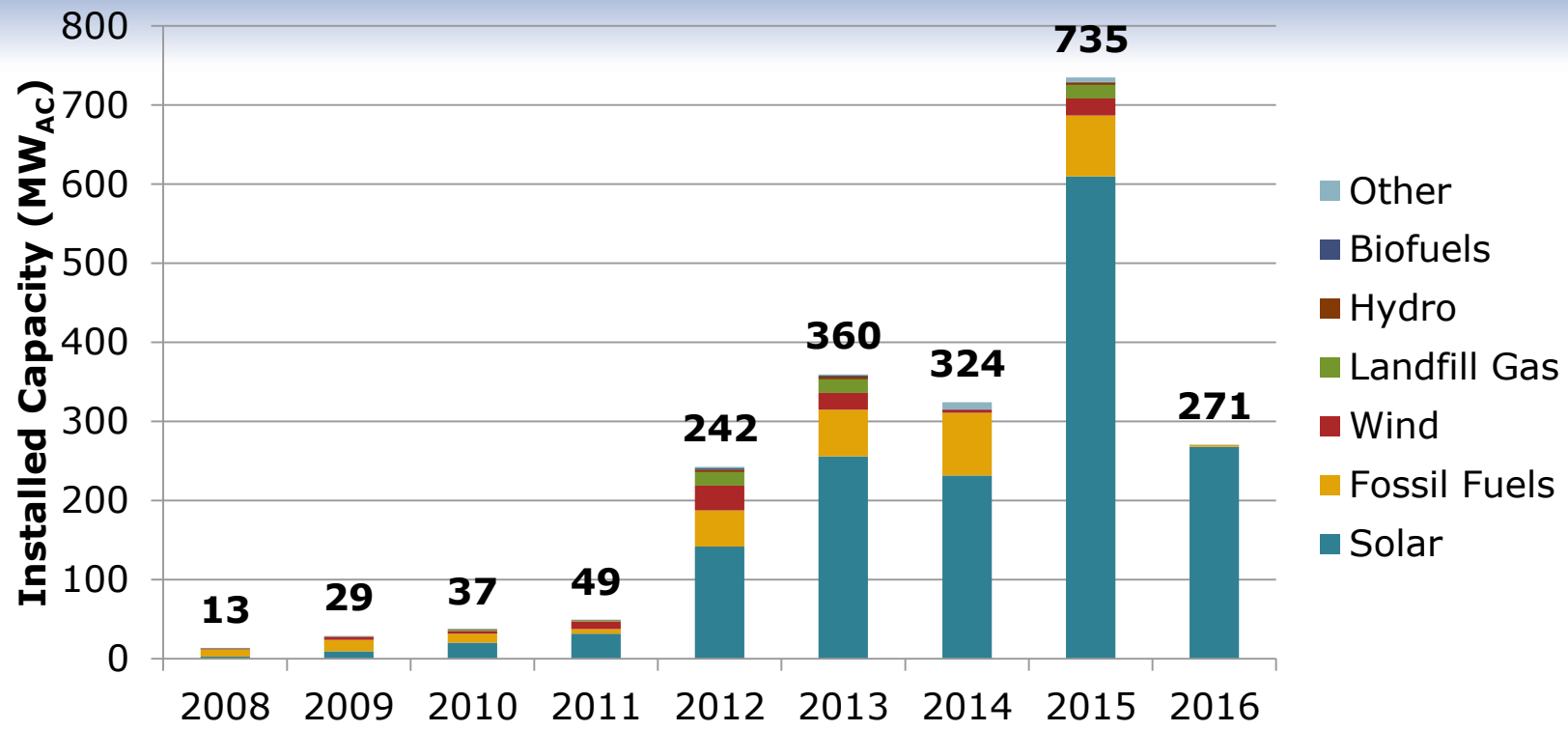


OSGF:

INSTALLED CAPACITY BY YEAR

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets





NET METERING: ELIGIBLE TECHNOLOGIES

- Eligible technologies:
 1. solar
 2. wind
 3. anaerobic digestion
 4. agricultural
 5. hydroelectric
- Other technologies are eligible for net metering as Class I facilities (up to 60 kW_{AC})

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets



NET METERING: CURRENT CAPS

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- General net metering caps for IOUs (based on the IOUs' highest historical peak load)
 - Private cap: 7%
 - Public cap: 8%
- Small hydro net metering cap is 60 MW_{AC} statewide
 - Capacity allocated to each IOU on a load share basis



NET METERING DATA

AS OF 12/1/17

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

Private: Available, Interconnected, Reserved and Pending Capacity (Values in kW)

Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)
<u>NGrid</u>	359,170	266,725	92,063	23	359	5,819
<u>NStar</u>	348,460	186,149	44,467	4,097	113,747	0
<u>WMECO</u>	59,780	30,445	29,192	0	143	7,787
<u>Unitil</u>	7,140	4,889	2,250	0	1	445
<u>NGrid-Nantucket</u>	3,500	872	75	11	2,542	0
Total	778,050	489,080	168,046	4,132	116,792	14,051

Public: Available, Interconnected, Reserved and Pending Capacity (Values in kW)

Company	Net Metering Cap	Interconnected (a)	Reserved Cap Allocations (b)	Pending Cap Allocations (c)	Capacity Available Under Cap (e)	Waiting List (d)
<u>NGrid</u>	410,480	313,405	97,015	0	59	14,741
<u>NStar</u>	398,240	177,786	14,618	3,863	201,973	0
<u>WMECO</u>	68,320	29,397	24,853	3,720	10,350	0
<u>Unitil</u>	8,160	4,295	2,160	0	1,705	0
<u>NGrid-Nantucket</u>	4,000	100	0	0	3,900	0
Total	889,200	524,983	138,646	7,583	217,987	14,741

Data available at: www.massACA.org



NET METERING: PRODUCTION DATA

- Actual (i.e. measured) *production data* is not available for every facility
 - Net metering facilities $> 60 \text{ kW}_{AC}$ are required to have (monthly) production meters

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets



NET METERING: SMALL HYDRO PROGRAM

- Allows small hydro with nameplate capacity of 2 MW_{AC} or less to net meter (previously limited to 60 kW_{AC})
 - Facilities not required to meet RPS requirements, unlike general program
- Allows 60 MW_{AC} of small hydro statewide to participate in small hydro net metering program
 - State cap is allocated across IOUs on a load share basis
- Small hydro net metering credit is 100% excess kWh at the basic service rate
- DPU promulgated final regulations establishing the small hydro net metering program in November 2017
 - IOUs are required to file updated tariffs

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets



RPS & APS:

ELIGIBLE TECHNOLOGIES

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

Class I

- Post 1997
- solar
- wind
- ocean thermal, wave, or tidal
- fuel cells w/renewable fuel
- landfill gas
- run-of-river hydro up to 30 MW_{AC}
- low-emission biomass
- marine or hydrokinetic energy
- geothermal

Class II

- same as Class I, except *pre* 1998 7.5 MW_{AC} hydro limit
- municipal solid waste *pre* 1998

APS

- CHP
- flywheel storage
- renewable thermal (pending rulemaking)
- fuel cells (pending rulemaking)
- waste-to-energy thermal (pending rulemaking)

SREC I and II

- PV that is interconnected to MA electric grid

SMART

- PV that is interconnected to MA electric grid in IOU service territories



RPS & APS DATA

- DOER has granted Statements of Qualification to the following

Category	Date of Data	Qualified (MW _{AC})	Qualified & Operational (MW _{AC})	Under Review (MW _{AC})
RPS Class I	11/01/2017	4,708.47	4,067.26	0.00
<i>SREC I & SREC II</i>	11/01/2017	2,262.5	1,868.15	27.88
RPS Class II				
<i>Non MSW</i>	11/01/2017	201.2	2.102	
<i>MSW</i>	11/01/2017	283.55	283.55	
APS (All CHP to date)	11/01/2017	341.995	341.995	
Total		7,797.72	6,563.06	27.88

A lot of solar is in development in MA

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets



RPS & APS: PRODUCTION DATA

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- Production data is available for every facility
 - Interval meters, however, are not required
- Monthly PV production is tracked by MassCEC's Production Tracking System (PTS), which serves as the independent verifier for SREC data
- Class I and Class II behind-the-meter production is tracked by qualified Independent Verifiers, and reported to NEPOOL GIS for REC minting
- SMART PV systems will be tracked by the IOUs
- Spreadsheets summarizing all qualified units are available on [DOER's website](#) and are updated monthly



RPS & APS: OTHER FUNDING SOURCES

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- RPS and APS qualified facilities are (often) eligible for other programs, such as:
 - Net metering
 - Grants/rebates
 - State tax incentives
 - Energy efficiency programs (e.g., some CHP and heat pumps)
- SREC-qualified facilities, however, are generally prohibited from receiving additional state rebates/grants
- APS renewable thermal facilities will also be prohibited from receiving more than 80% of their total installation costs from other state rebate/grant programs



RPS & APS: SREC II EXTENSION

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- DOER launched SREC-II program in April 2014 to continue growth of solar market to meet Commonwealth's goal of 1,600 MW_{DC} by 2020
- Currently more than 1,860 MW_{DC} installed under SREC I and II programs SREC II program cap reached in February 2016 in terms of applications received
 - Over 460 MW installed in 2016 with a similar amount expected in 2017
- DOER extended SREC program at reduced incentive levels while developing the successor SMART Program
- Extension expected to yield as much as 700 MW_{DC} of additional projects beyond original 1,600 MW_{DC}
- Extension will remain in effect until SMART Program goes into effect



SOLAR MASSACHUSETTS RENEWABLE TARGET (SMART) PROGRAM

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- In April 2016, legislation was enacted that directed DOER to:
 - lower the cost of solar incentive programs to ratepayers, and
 - develop a statewide solar incentive program to encourage the continued development of solar energy in MA
- Program designed by DOER establishes a tariff-based incentive program that will support an additional 1,600 MW_{AC} of new solar
- IOUs filed a model tariff with DPU for review in September 2017 (DPU 17-140)
- IOUs released RFP to select approximately 100 MW of projects in their respective service territories
 - Results of the RFP will be announced in January 2018 and will establish compensation rates under SMART



APS RULEMAKING

- Legislation enacted in 2014 and 2016 required DOER to add the following technologies to the APS:
 - Renewable thermal (i.e., heat pumps, solar thermal, woody biomass, biogas, biofuel, etc.)
 - Fuel cells
 - Waste-to-Energy thermal
- Allows useful thermal energy and electricity generated by facilities to receive Alternative Energy Certificates (AECs)
- Significant potential to reduce fossil fuel consumption in the heating sector and increase DG electric generation from fuel cells in MA
 - New natural gas fuel cell facilities already under construction
- Final regulation scheduled to be promulgated on December 29, 2017

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets



ENERGY STORAGE, RESILIENCE, AND ELECTRIC VEHICLES

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- DOER has significant efforts underway to advance the deployment of energy storage in MA:
 - Establishing a 2020 energy storage target of 200 MWh
 - Allocating ~\$25 million to energy storage demonstration projects to date
 - Including a compensation rate adder for solar projects that are co-located with energy storage under the SMART program
- DOER has allocated \$40 million to clean energy resilience grants for municipalities and hospitals, which include CHP, microgrids, and energy storage paired with renewables
- Through its MOR-EV program, DOER has provided nearly \$12 million in rebates to over 5,880 electric vehicle owners, in support of the Commonwealth's goal of having 300,000 electric vehicles by 2025



GRANTS & REBATES: MASSCEC

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- The MA Clean Energy Center implements a variety of programs that support DG deployment, including, but not limited to, the following:
 - Commonwealth Hydro
 - Commonwealth Organics-to-Energy
 - Commonwealth Wind
 - Mass Solar Connect
 - Solarize Mass
 - Mass Solar Loan
- Incentives vary by program
 - Most grants & rebates, while important, are not the primary driver for development



POLICIES GOVERNING DG PARTICIPATION IN ISO-NE MARKETS

Outline

- Overview
- OSGF
- Net Metering
- RPS & APS
- Grants & Rebates
- Policies re: DG Participation in ISO-NE Markets

- MA electric distribution companies are required to register DG connected to their networks as Settlement Only Generators (D.P.U. 09-03-A)
 - Money earned by the IOUs in the energy market will help to shield IOUs' non-DG customers from impact of loss of revenue from net-metered customers



www.mass.gov/dpu

Thank you

Brian Ritzinger

Electric Power Division
MA Department of Public Utilities
One South Station
Boston, MA

Brian.Ritzinger@state.ma.us

Information on MA net metering:
www.mass.gov/dpu/netmetering