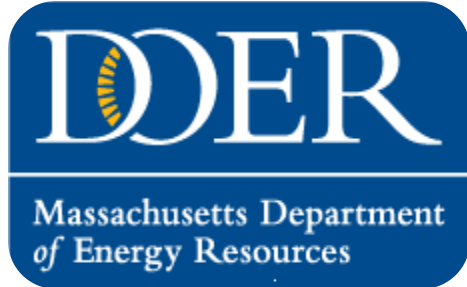


Creating A Cleaner Energy Future For the Commonwealth



COMMONWEALTH OF MASSACHUSETTS

Deval L. Patrick, Governor

Richard K. Sullivan, Jr., Secretary

Mark Sylvia, Commissioner

**NESEA Building Energy
2014**

**Seaport World Trade
Center
Boston, MA**

March 6, 2014

Residential Solar Policy in Massachusetts

Michael Judge

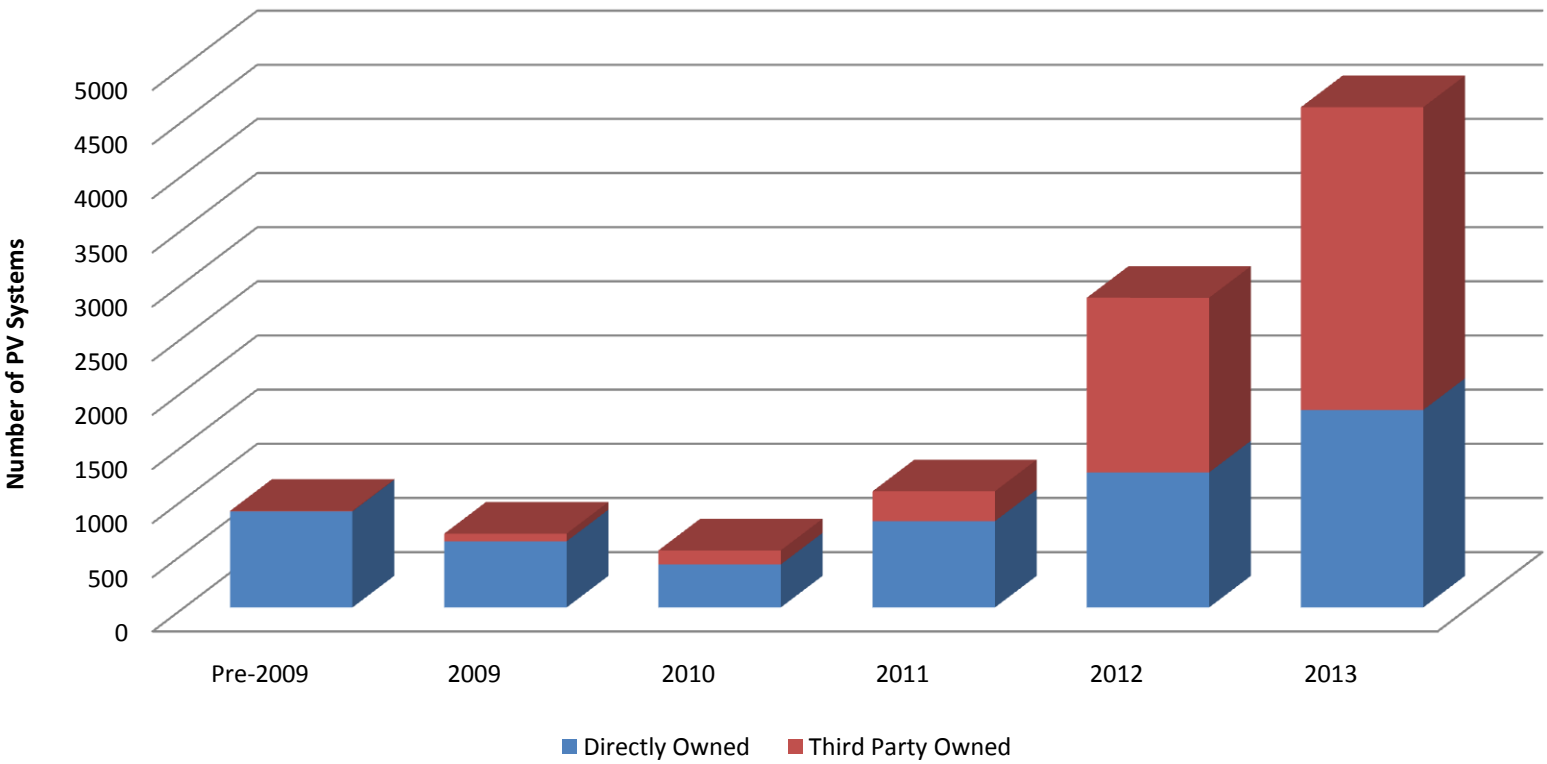
**Associate Manager, RPS Programs
Renewable and Alternative Energy Division**

Programs Supporting Residential Solar

- Federal Tax Credits (30% PTC and ITC)
- State Tax Incentives
 - 15% Personal Tax Credit (capped at \$1,000)
 - Property Tax Exemption
 - Sales Tax Exemption
- Commonwealth Solar II Rebate Program
- Solarize Mass
- RPS Solar Carve-Out (SRECs)
- Solar loan program (forthcoming)

Third Party Ownership vs. Direct Ownership

Third Party Owned Residential PV in MA



Commonwealth Solar II Rebate

- Successor to Commonwealth Solar Rebate Program, which ran from 2007-2009
- Coincided with launch of SREC program in early 2010
- \$0.40/watt rebate on the first 5 kW of projects sized up to 15 kW
- \$0.40/watt adder is available for projects that qualify as Moderate Income or Home Value
- \$0.05/watt adder available for projects that utilized MA manufactured components
- Quarterly solicitations with approximately \$1.5 million available per quarter
- Has provided support to over 5,600 projects with a combined capacity of more than 34 MW to date

Solarize Mass

- Seeks to increase the adoption of small-scale solar electricity in participating communities through a competitive tiered pricing structure
- MassCEC and DOER select participating communities, which in turn select an installer to work with
- Installers offered tiered pricing structure that reduces installed costs for all participants as more contracts are signed
- Three rounds have been completed to date, with over 1,400 contracts signed in 33 communities
- Over 9 MW of small scale installations have been supported to date
- 15 municipalities are participating in the current round of Solarize



What is a Renewable Portfolio Standard?

- State program requiring a certain percentage of the in-state load served by Load Serving Entities (LSEs) come from renewable energy
- LSEs meet their yearly obligations by procuring Renewable Energy Certificates (RECs)
- One REC = 1 MWh
- Obligation typically expressed as percent of total electric load

Example:

Utility serves 1,000,000 MWh of load in 2013 and has an obligation to procure 8% of that through the purchase of RECs

$1,000,000 \text{ MWh} \times 0.08 = 80,000 \text{ MWh}$ (number of RECs they must procure)

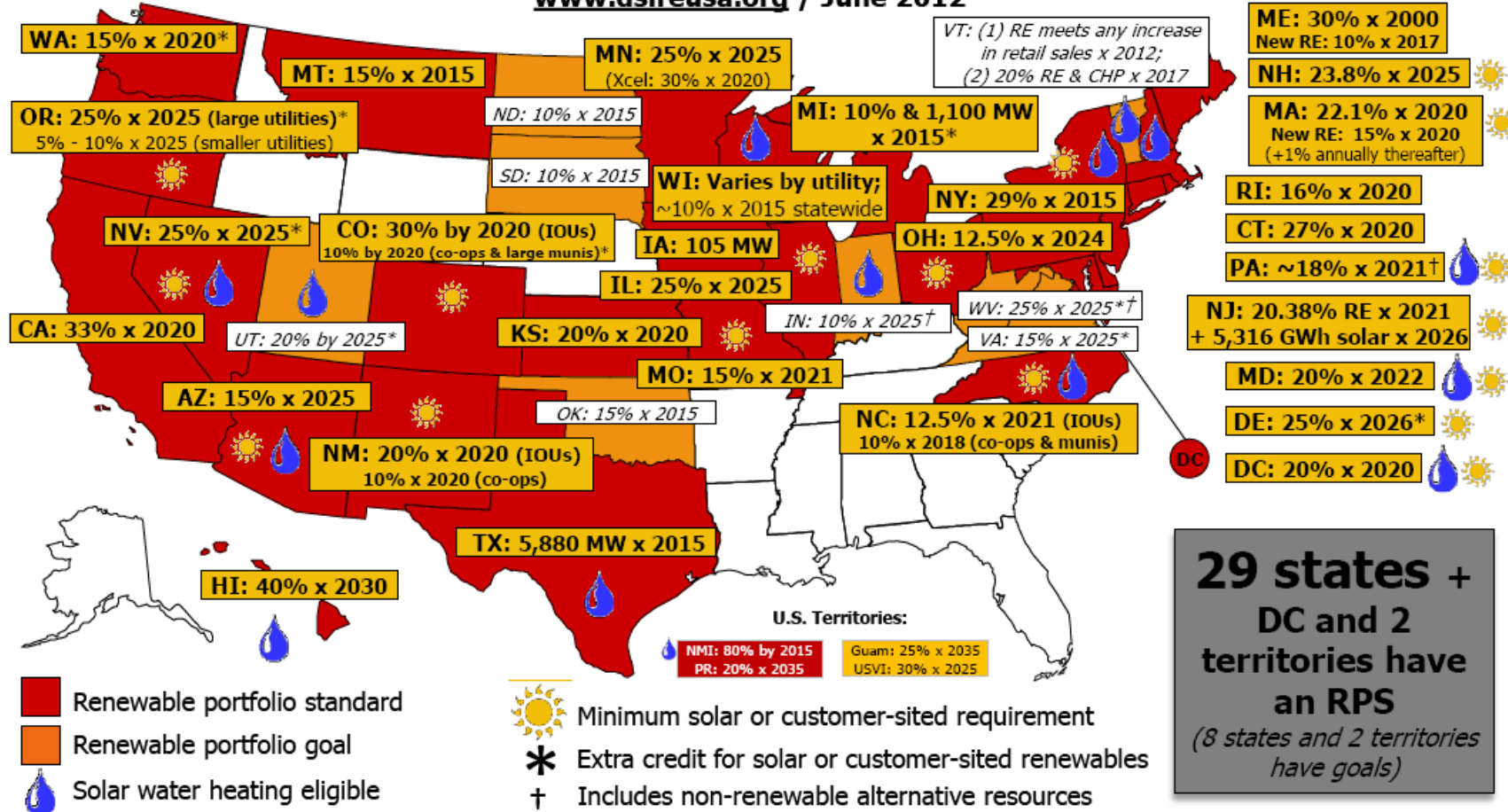
REC Pricing

- Market driven
- State usually sets two variables:
 - Minimum Standard
 - Alternative Compliance Payment (ACP) Rate
- Minimum Standard refers to yearly percentage obligations placed upon compliance entities
- ACP rate is the price LSEs must pay for every MWh they are short of meeting their obligation

RPS Programs Nationally

RPS Policies

www.dsireusa.org / June 2012



29 states + DC and 2 territories have an RPS
(8 states and 2 territories have goals)

MA RPS Class I Program

- Established in 1997, first year of compliance in 2003
- Eligible technologies include solar PV, solar thermal electric, wind, ocean thermal, wave or tidal energy, fuel cells, landfill methane gas, small hydro, low-emission biomass, marine or hydrokinetic energy, and geothermal electric
- Generation Units from New England and adjacent control areas (i.e. New York, Quebec, and New Brunswick) may qualify
- Minimum Standard of 9% in 2014
- Set to increase by 1% each year going forward

MA RPS/APS Programs

- In 2008, 3 new classes were added to the RPS
 - Class II Renewable Energy for facilities in operation prior to 1998 (mostly small hydro, LFG, and wind)
 - Class II Waste-to-Energy for waste-to-energy facilities located in MA
 - Alternative Portfolio Standard (primarily CHP projects)
- In 2010, a Solar Carve-Out was added to Class I
- Obligation is part of the Class I total, but has different market parameters and qualification process

Summary of MA Portfolio Standard Programs

RPS Class	Sub Class	Technology	Minimum Standard	2014 ACP Rate, \$/MWh
Class I		Wind, LFG, Biomass, Solar PV, Small Hydro, AD, etc.	9% in 2014, increases 1%/year	\$66.16; increases with CPI
	Solar Carve-Out	Solar PV; 6 MW or less, in MA	set by formula to grow installed capacity to program cap	\$523; reduced annually according to 10-year schedule
Class II	Renewable	same as Class I	3.6%, stays constant	\$27.16; increases with CPI
	Waste Energy	Waste to Energy Plants, in MA	3.5%, stays constant	\$10.86; increases with CPI
APS		CHP in MA, flywheels, storage, etc.	3.5% in 2014; increases to 5% in 2020	\$21.72; increases with CPI

Solar Carve-Out I (2010-date)

Program designed to ensure market stability and balance

- Adjustable Minimum Standard
 - maintains SREC demand/supply in reasonable balance
- Forward ACP Rate Schedule
 - provides investor certainty
- Solar Credit Clearinghouse Auction Account
 - essential price support mechanism to assure SREC floor price
- Opt-In Term
 - provides right to use Auction, adjusted to throttle installation growth rate
- Program Cap
 - Enables sufficient market growth opportunity (exceeds Governor's goal of 250 MW by 2017)

SREC Market Update

- Current program oversubscribed in May/June 2013
- Emergency Regulation was filed on June 28th and extended eligibility to projects that had met certain project development milestones
- Currently about 675 MW qualified under SREC I
- Qualified projects over 100 kW were able to receive an extension through June 30th if they could demonstrate 50% of construction costs have been incurred by December 31st
- Projects <100 kW can qualify if interconnected prior to start date of SREC II
- No new projects will qualify under SREC I as of effective date of SREC II

SREC-II Policy Objectives

- Provide economic support and market conditions to maintain and expand PV installations in MA
- Control ratepayer costs
- Maintain robust, progressive growth across installation sectors and manage growth to reach 1600 MW by 2020
- Maintain competitive market of diverse PV developers, without undue burdens of entry
- Address financing barriers limiting residential and non-profit direct ownership, without compromising third-party ownership model
- Minimize regulatory complexity and maintain flexibilities to respond to changing conditions

Key Differences Between SREC I & SREC II

- Larger program capacity cap (1,600 MW – Final SREC I Cap).
- No more Opt-In Terms. Qualified projects generate SREC IIs for 40 quarters (10 years) from quarter in which they qualify.
- Both ACP Rate and Auction Price decline over time.
- SREC Factors differentiate market sectors and provide different incentive levels to different types of projects.
- Managed Growth sector helps control market growth. Qualification under this sector will be limited by Annual Capacity Blocks made available on a two year forward schedule by DOER.
- Compliance Obligation and Minimum Standard set in regulation for 2014 and 2015. Annual calculations thereafter based on actual and projected supply, constrained by Yearly Installed Capacity Targets, which help determine Annual Capacity Blocks for Managed Growth sector.

Market Sectors and SREC Factors

Market Sector		SREC Factor
A	Generation Units with a capacity ≤ 25 kW, Solar Canopies, Emergency Power Generation Units, Community Shared Solar Generation Units, low or moderate income housing units.	1.0
B	Building Mounted Generation Units, ground mounted Generation Units with a capacity > 25 kW with 67% or more of the electric output on an annual basis used by an on-site load.	0.9
C	Generation Units on Landfills or Brownfields, or Generation Units with a capacity of ≥ 650 kW with less than 67% of the electrical output on an annual basis used by an on-site load.	0.8
Managed Growth	Unit that does not meet the criteria of Market Sector A, B, or C.	0.7

Auction and ACP Rate Schedules

Year	\$/MWh		
	Auction Price Bid	Auction Price <u>After</u> 5% Fee	ACP Rate
2014	300	285	375
2015	300	285	375
2016	300	285	350
2017	285	271	350
2018	271	257	350
2019	257	244	333
2020	244	232	316
2021	232	221	300
2022	221	210	285
2023	210	199	271
2024	199	189	257
2025	Values announced by DOER each year to maintain 10-year forward schedule.		
2026			
2027			
2028			
2029			
2030			

SREC-II Anticipated Rulemaking Process

- RPS Class I regulation revisions were filed in early January.
- DOER held a public hearing on January 24th and accepted comments through January 29th.
- DOER has sent an updated version of the draft regulation to the Joint Committee on TUE for their review.
- DOER projects changes to the regulation to be promulgated in early Spring 2014.



Solar Loan Program

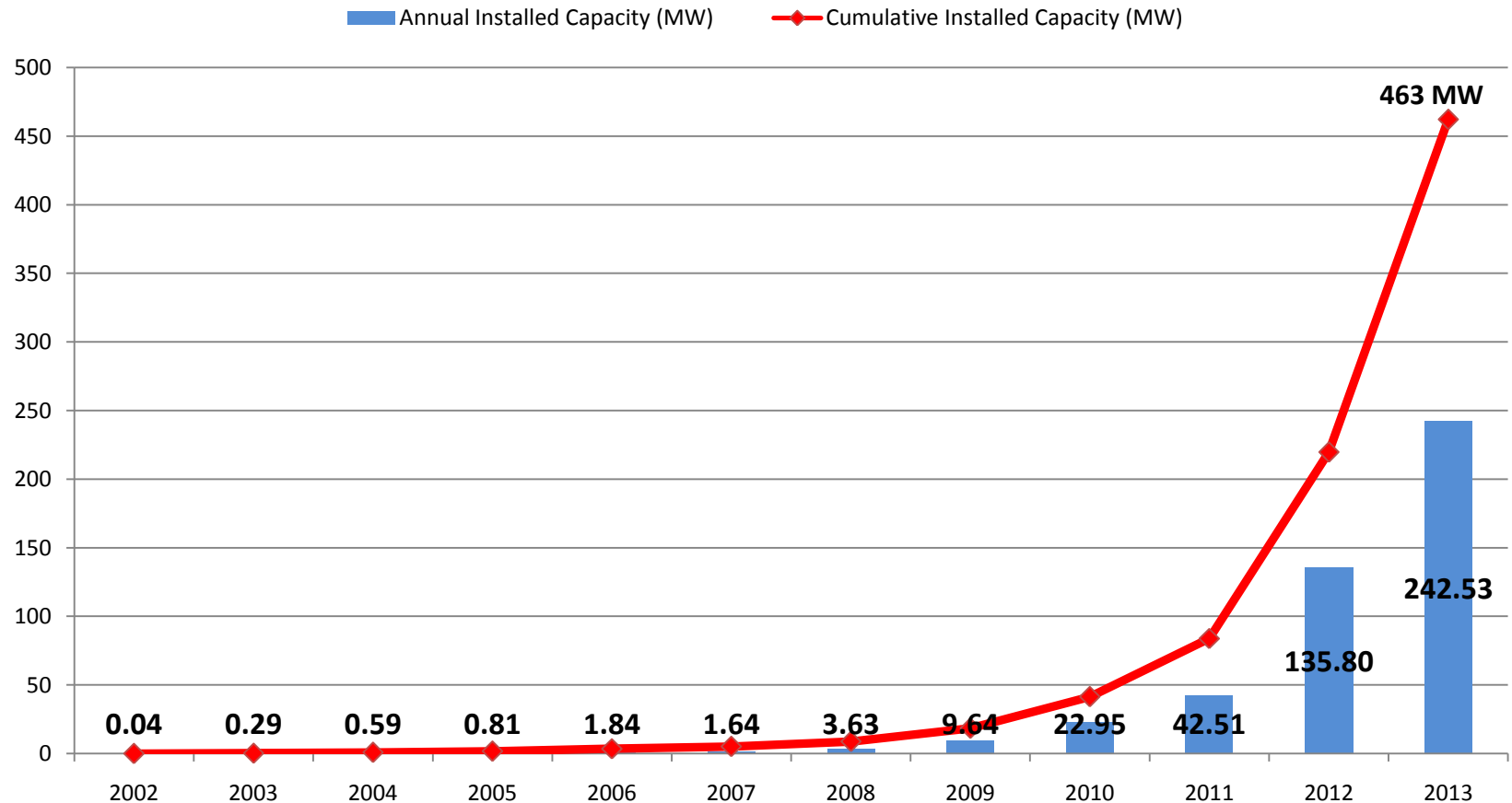
- DOER estimates that a robust residential direct ownership market would need to be supported by \$20-50 million in loans at the start of SREC II, and \$300-600 million cumulatively through 2020. This represents a significant opportunity for the financing/banking industry.
- DOER has announced the development of a financing support program using ACP funds. Final development of the program will be done in coordination with stakeholder input, including direct discussions with the banking industry.
- DOER anticipates using approximately \$30 million of ACP funds for this purpose. Leveraging funds will be important, along with strategies to enable banking sector to sustain lending as ACP support is diminished.
- MassCEC will maintain CommSolar II rebate program through the development of the financing program.

MA Ranks High Among States Supporting Solar

- Governor's goal of installing 250 MW by 2017 met four years early; new goal of 1600 MW by 2020.
- 348 of 351 MA cities and towns have a solar installation. Over 130 municipalities are hosting solar projects on town facilities.
- Solarize Mass program has supported 9 MW of residential solar in 33 towns (another 15 towns are underway).
- More solar was installed in 2013 than in all prior years combined
- Massachusetts is well ranked nationally (SEIA 2012 and 2013)
 - 6th in solar capacity installed in 2012
 - 6th in cumulative installed capacity
 - 3rd in commercial installations; 6th in residential installations
 - 2nd lowest weighted average commercial installation costs
 - 4th in total solar jobs; 6th in per capita solar jobs
- Over 1800 firms in MA work primarily in the renewable energy sector, employing over 21,000 workers. Nearly 60% of renewable energy workers support the solar sector (*2013 MassCEC Jobs Report*).

Remarkable Solar Growth in Massachusetts

Installed Solar Capacity in Massachusetts (as of January 1, 2014)



Thank You

DOER RPS Website: www.mass.gov/energy/rps

RPS Contact: DOER.RPS@state.ma.us

DOER Solar Website: www.mass.gov/energy/solar

SREC Contact: DOER.SREC@state.ma.us