Stimulating the Solar Market and Reducing the Soft Costs in Massachusetts

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Commissioner

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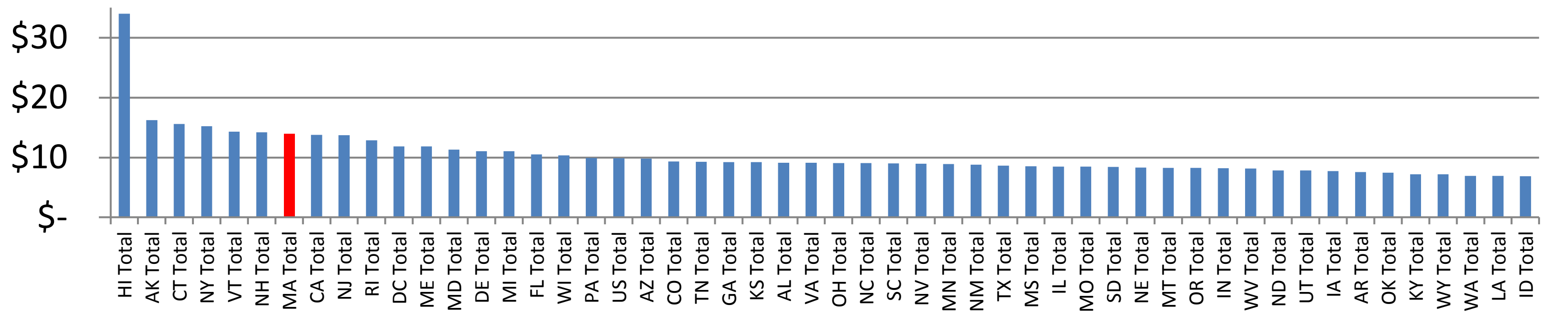
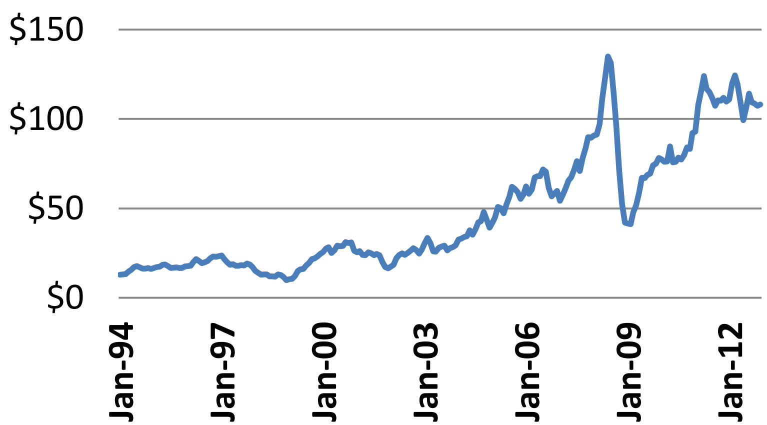
Massachusetts is at the End of the Pipeline, Making Ours an Expensive Energy State

2012 All Sectors Average Retail Price c/kWh

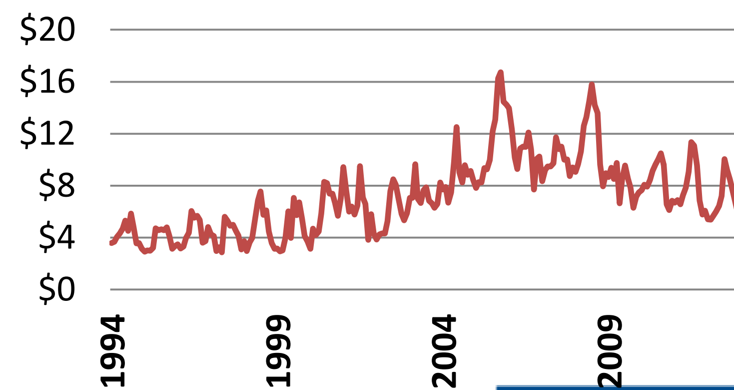


Crude Oil



MA City Gate Average

Natural Gas



PADD1 Refiner Acquisition Cost

Creating A Greener Energy Future For the Commonwealth

Massachusetts Department of Energy Resources

Massachusetts Solar Development Strategies (Pre-Solar Carve-Out)

- Renewable Portfolio Standard – established in 2003
- Governor Patrick's goal – 250 MW by 2017 (2007)
- Commonwealth Solar (rebates) – (2007-2009)
  - Rebate Program: $68 million, 27 MW
  - Created robust PV development sector in MA
- Commonwealth Solar II (rebates) for small (<15kW) systems has maintained residential PV market

State Law Drives Investments, Creates Economic & Environmental Opportunity

- **Green Communities Act (GCA)**
  - RPS Class I Carve Out
  - Long Term Contracts / Net Metering
  - Green Communities
  - All cost effective energy efficiency
  - Utility owned solar PV
- **Global Warming Solutions Act (GWSA)**
  - GHG reduction goals: 25% by 2020; 80% by 2050
    - 7.7% from electric supply; 1.2% from RPS
- **Act Relative to Competitively Priced Electricity**
  - Long Term Contracts
  - Increase in Net Metering Cap

Creating A Greener Energy Future For the Commonwealth

Solar Development Strategies (2008-2013)

- Offering rebates, incentives, solar renewable energy credits (SRECs)
  - RPS Solar Carve-Out Program
- Reducing soft costs, increasing participation
  - SunShot Initiative Rooftop Challenge
  - Green Communities
  - SolarizeMass®

- Streamlining processes
  - Collaboration between energy and environmental agencies: Clean Energy Results Program
- Leveraging available funding
  - Federal Stimulus/ARRA funds
  - Alternative Compliance Payment funds

SREC Program Design Features

Program design features help ensure market stability and balance, ensure balance in the market

- Adjustable Minimum Standard

  maintains SREC demand/supply in reasonable balance

- Forward ACP Rate Schedule

  provides investor certainty

- Solar Credit Clearinghouse Auction Account

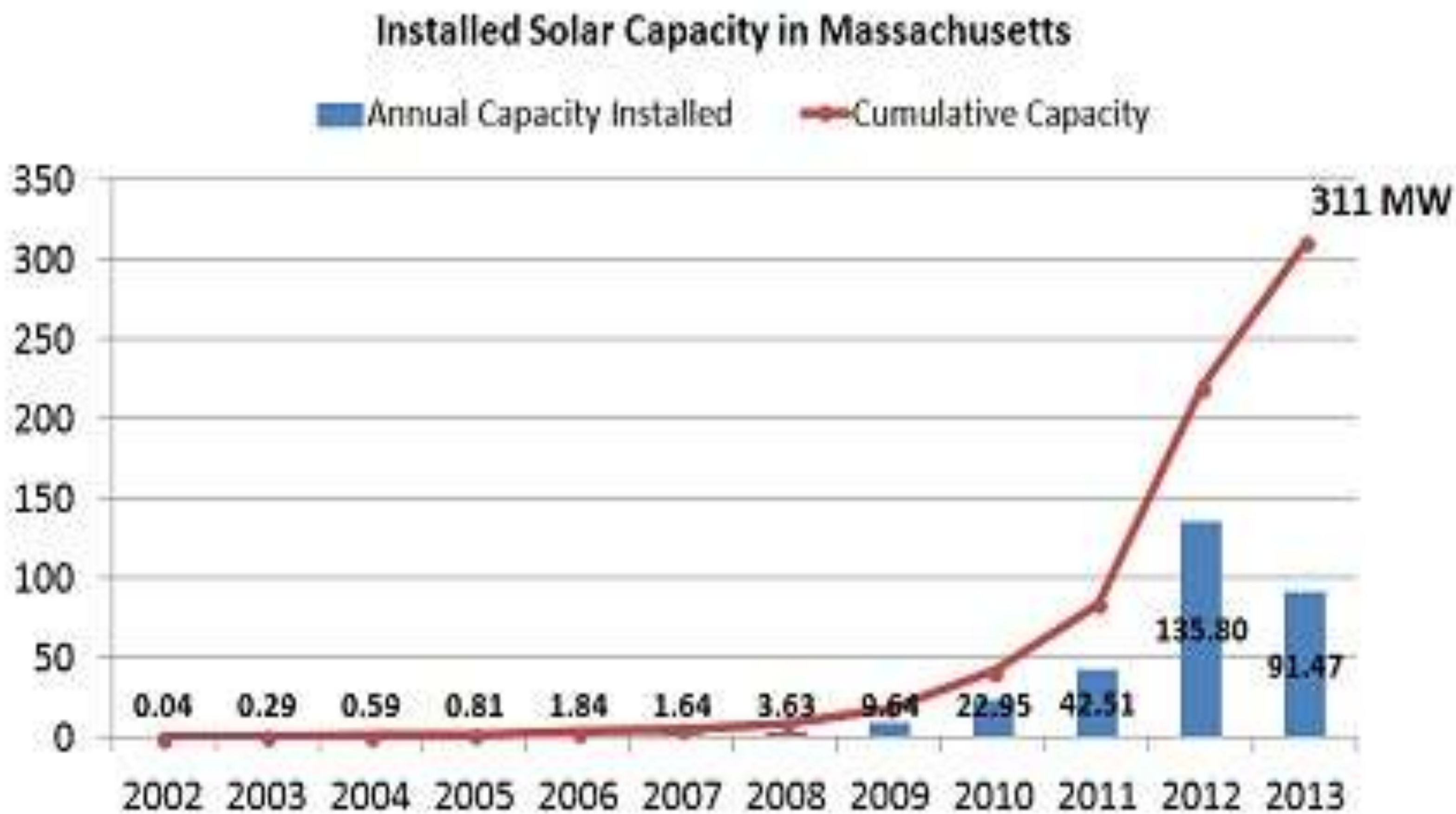
  essential price support mechanism to assure SREC floor price

- Opt-In Term

  provides right to use Auction for a set period of time

- Program Cap of 400 MW

  Enables sufficient market growth opportunity (exceeds Governor's goal of 250 MW by 2017)



In May 2013, the Patrick-Murray Administration met its 2017 goal to have 250 MW of solar power installed in Massachusetts. The Administration has set a new target of 1600 MW for 2020. The above figures represent the cumulative amount installed as of September 1, 2013.

Creating a Cleaner Energy Future for the Commonwealth

DOER
Massachusetts Department of Energy Resources

SolarizeMass®

- Partnership between MassCEC and DOER
- Encourages the adoption of small-scale PV projects by:
  - Deploying a coordinated education marketing and outreach effort
  - Offering a group purchasing model
  - Providing increased savings as more people in a community go solar
- 2011 pilot program results in four selected communities:
  - 164 contracted projects representing over 800 kW of capacity
  - Projects installed at significantly less $/watt cost than statewide average during the same period
- 2012 program results in 17 selected communities:
  - 748 contracted projects representing over 4.8 MW of capacity
- 2013 programs: 10 communities participating in Round 1; 10 more communities will participate in Round 2

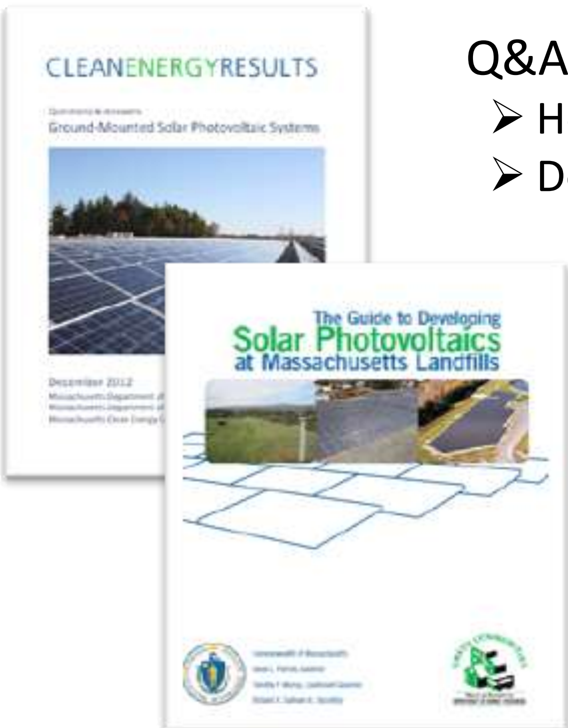
SOLARIZE MASS

Rooftop Solar Challenge

- DOE grant to lower "soft costs" ($566,354)
- Local partners: 5 municipalities, public entities, local solar industry association
- Products:
  - prescriptive structural review process to reduce the review time required for common types of residential systems below 10kW
  - updates to the state's interconnection website to make the content more user friendly
  - model solar PV bylaw with regulatory guidance for both rooftop and ground-mounted PV systems of all sizes.
  - guidance documents on Community Shared Solar
  - workshops with financial institutions to provide education and support local solar lending
  - review of model permitting processes and permit applications for systems under 300 kilowatts (kW) and 10 kW

Clean Energy Results Program

Collaboration between Energy & Environmental Agencies



Q&A on Ground Mounted Systems

- Health topics
- Decommissioning

PV Guide for Projects on Landfills

- Available Incentives
- Permitting
- Development models

PV on Capped Landfills: post closure use permits for 39 sites.

- 11 of these are operational
- 1 more is awaiting interconnection
- 8 more are under construction

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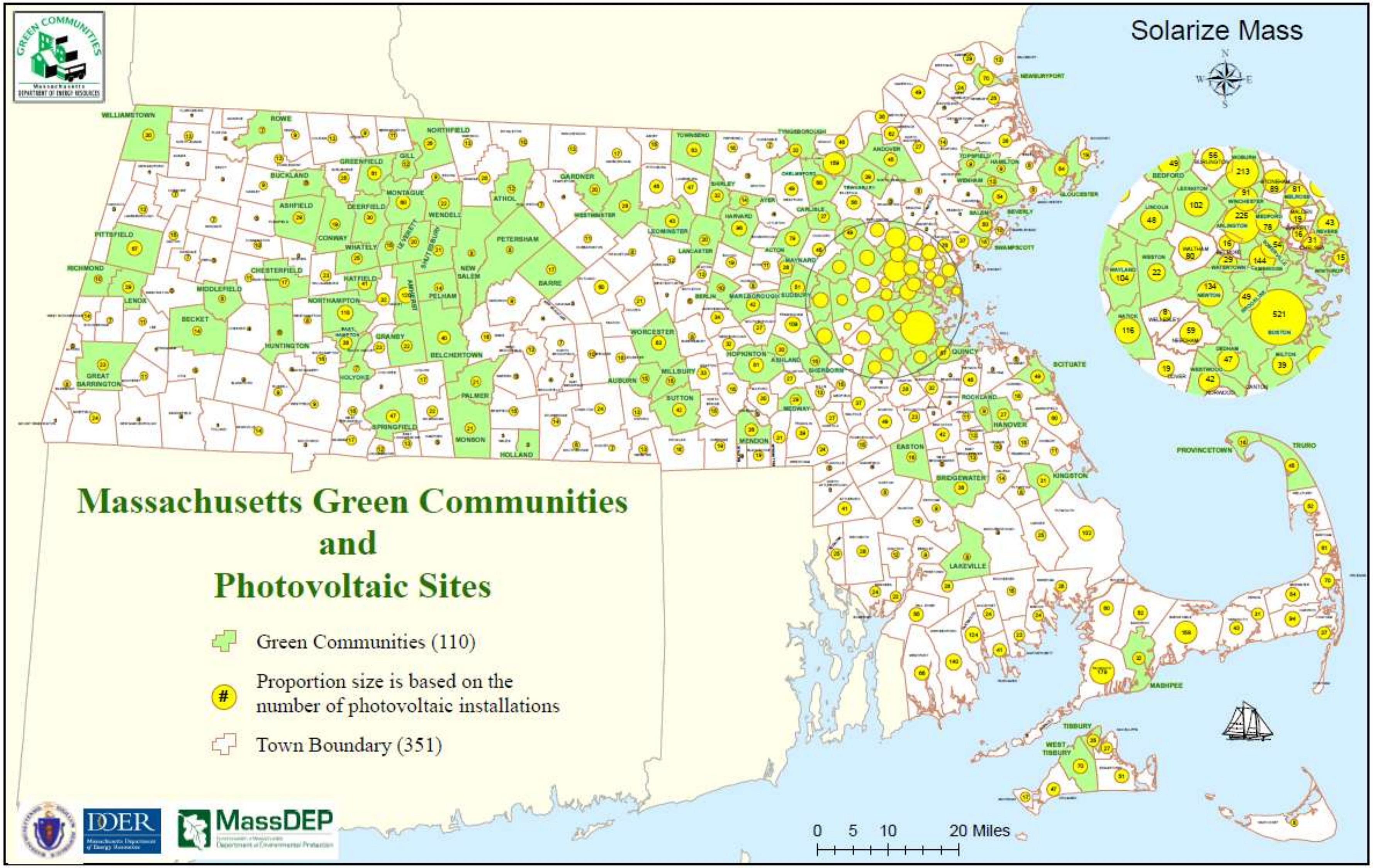
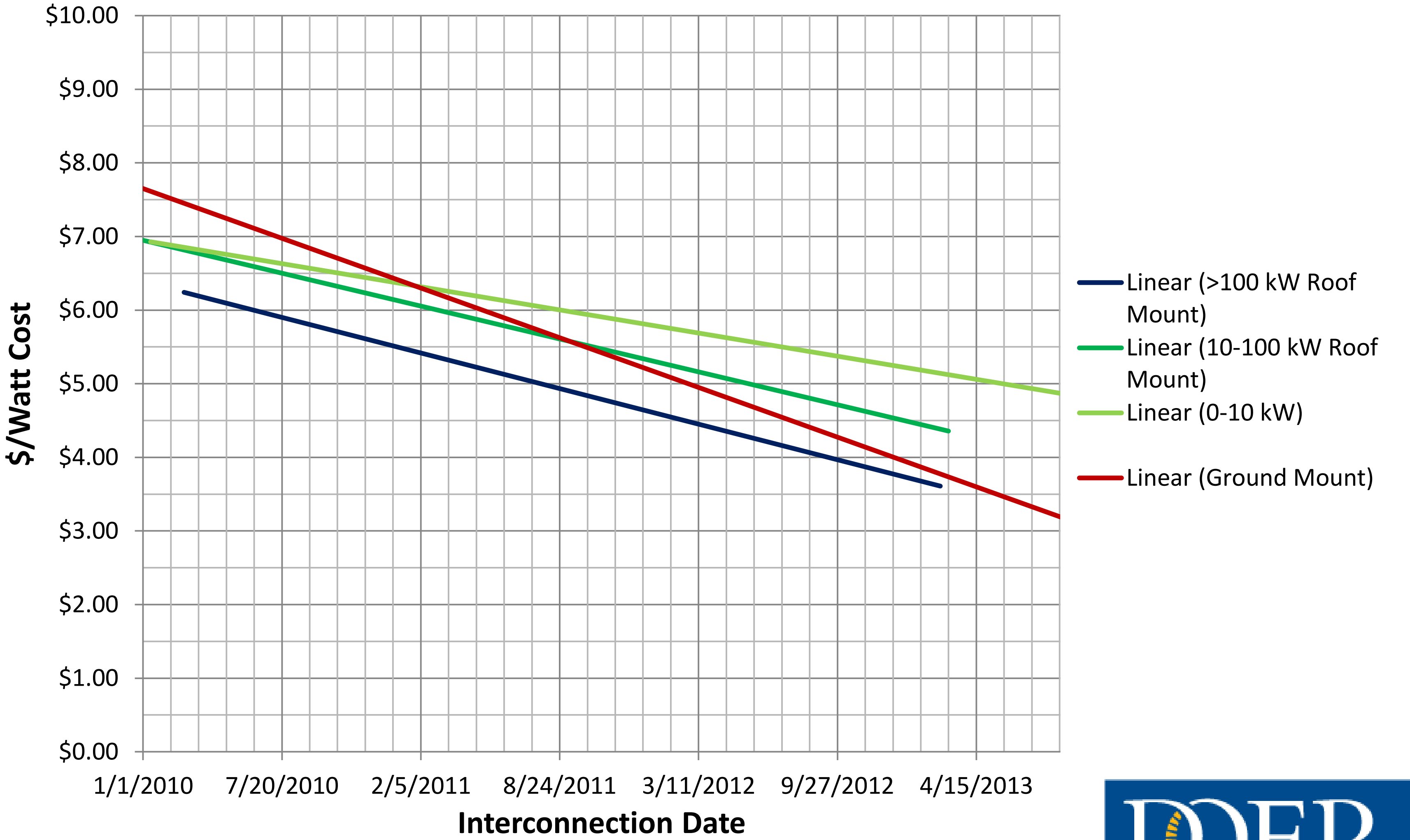


Creating A Greener Energy Future For the Commonwealth

Average $/Watt Installed Costs (2010-2013)



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Maintain Solar Growth, Robust Market

- Governor Patrick's 250 MW goal for 2017 reached
- SREC cap of 400 MW nearly reached; applications oversubscribe the program
- Emergency Regulations and guidance for SREC I
  - ➢ Extensive stakeholder process
- Post 400 MW Policy Development (SREC II) underway
  - ➢ Maintain and expand PV installations
  - ➢ Maintain robust growth across installation sectors
  - ➢ Control ratepayer costs

SREC II Policy Objectives

- Provide economic support and market conditions to maintain and expand PV installations in MA
  - ➢ Maintain steady growth of market towards when the technology reaches cost parity with RPS Class I
  - ➢ Meet the Governor's goal of 1600 MW installed by 2020
- Control ratepayer costs
- Maintain robust growth across installation sectors
- Manage market growth to meet 2020 goal and until the market is better prepared for Class I RECs
- Maintain competitive market of diverse PV developers, without undue burdens of entry
- Address financing barriers limiting direct ownership, without compromising third-party ownership model
- Minimize regulatory complexity and maintain flexibilities to respond to changing conditions

Forward Minting

- Forward Minting is available as opt-in offer to mint 10 years of estimated SRECs production upon Commercial Operation Date. DOER may establish discount of 10 year production.
- Available to residential projects that are owned directly by the property or building owner. Availability extended to Community Shared Solar projects meeting "residential criteria".
- Restriction of Forward Minting to direct ownership sector will boost relatively low market penetration of direct ownership, which provides greater benefits to homeowners and to the local economy, as demonstrated by policy consultants. DOER seeks comment on whether Forward Minting should be made available to 3rd-Party Ownership.
- Performance estimation based on PV Watts analysis. Metering must be reported by and independently verified. Projects which fall 80% below estimated generation are reported to DOER and face penalties.
- Forward Minted SRECs have 3-year shelf life. Allows owner to hold or sell, subject to market conditions.
- DOER will report quarterly on amount of unsettled Forward Minted SRECs available in the market.

Massachusetts Solar Highlights

- Governor's goals
  - Original: 250 MW by 2017, met four years early
  - New: 1600 MW by 2020
- 346 of 351 MA cities & towns have 1+ solar installation
- 7th nationally in cumulative installed capacity (SEIA 2012)
- 3rd in commercial installations and 6th in residential installations (SEIA 2012)
- 2nd lowest weighted average commercial installation costs
- 4th in total solar jobs and 8th in per capita solar jobs (2012)
- Solar generation as a percentage of the RPS increased by more than 700% from 2010 to 2011 and is expected to increase by an additional 300% in 2012

Sources: SEIA/GTM Research 2012 US Solar Market Insight Report, The Solar Foundation's National 2012 Jobs Census, and 2011 Annual RPS/APS Compliance Report

Thank you!

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