

Evolution of Massachusetts Solar Programs and Policies: “Join the Innovation Revolution”

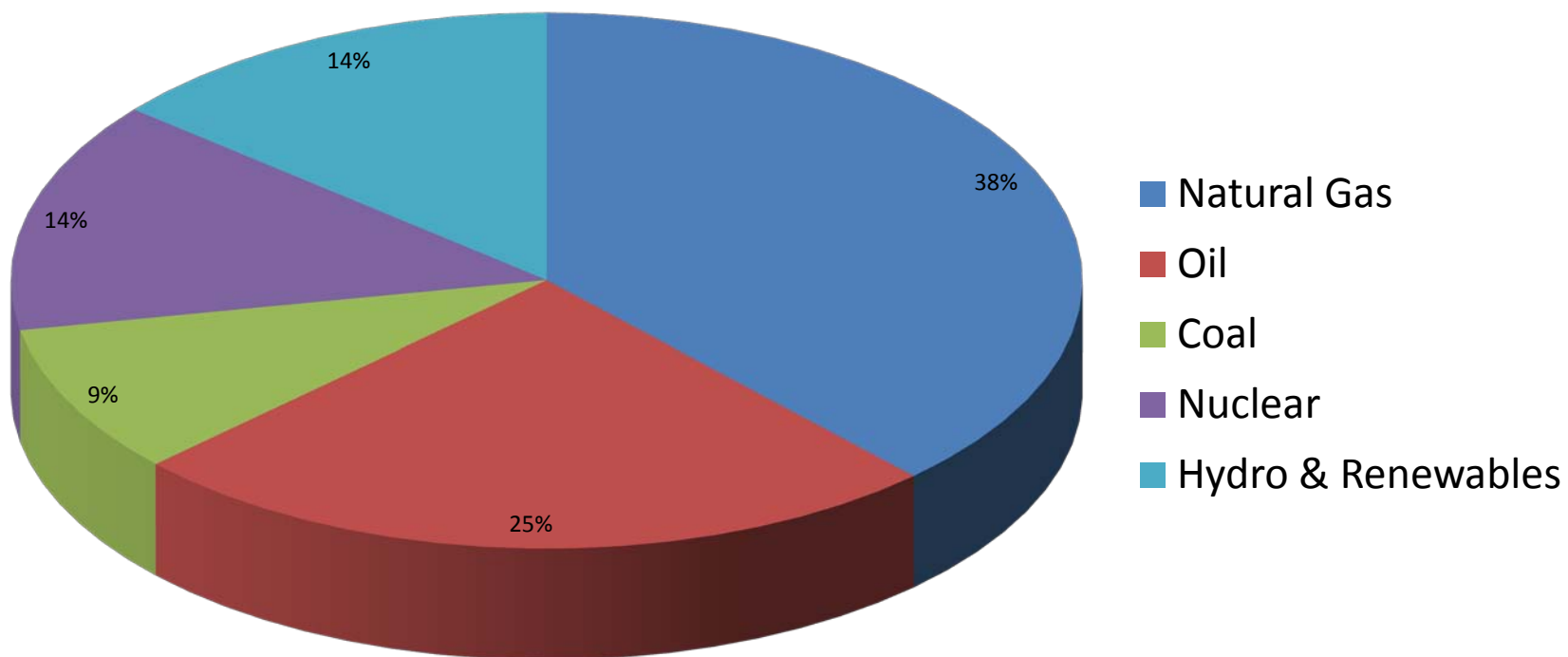
Presented by:
Andy Brydges
Program Director
Massachusetts Clean Energy Center

May 26, 2011

Agenda

- MassCEC background and context
- Policy framework
- Evolution of solar incentives
 - Different Approaches for different markets
 - Impact of early programs
 - Transition to SRECs
- New models for increased solar growth

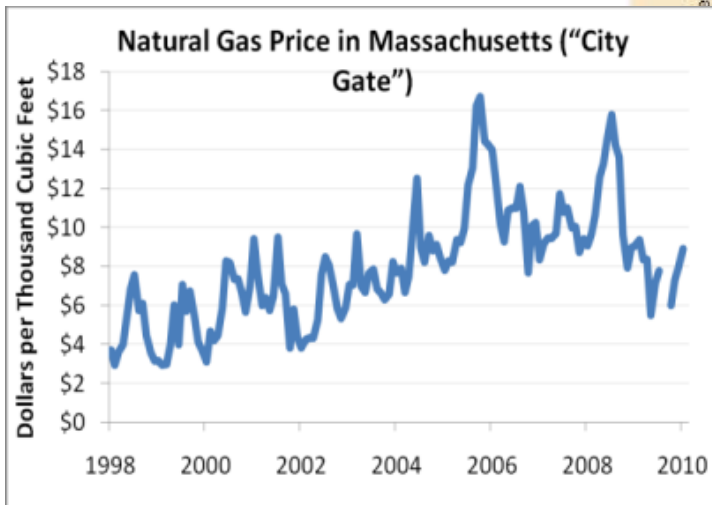
New England Generation Capacity



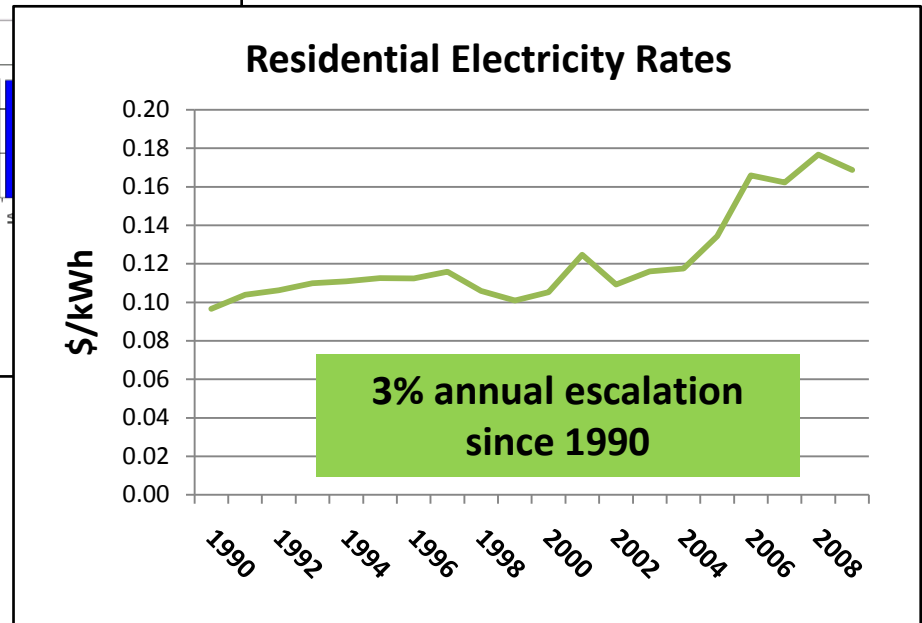
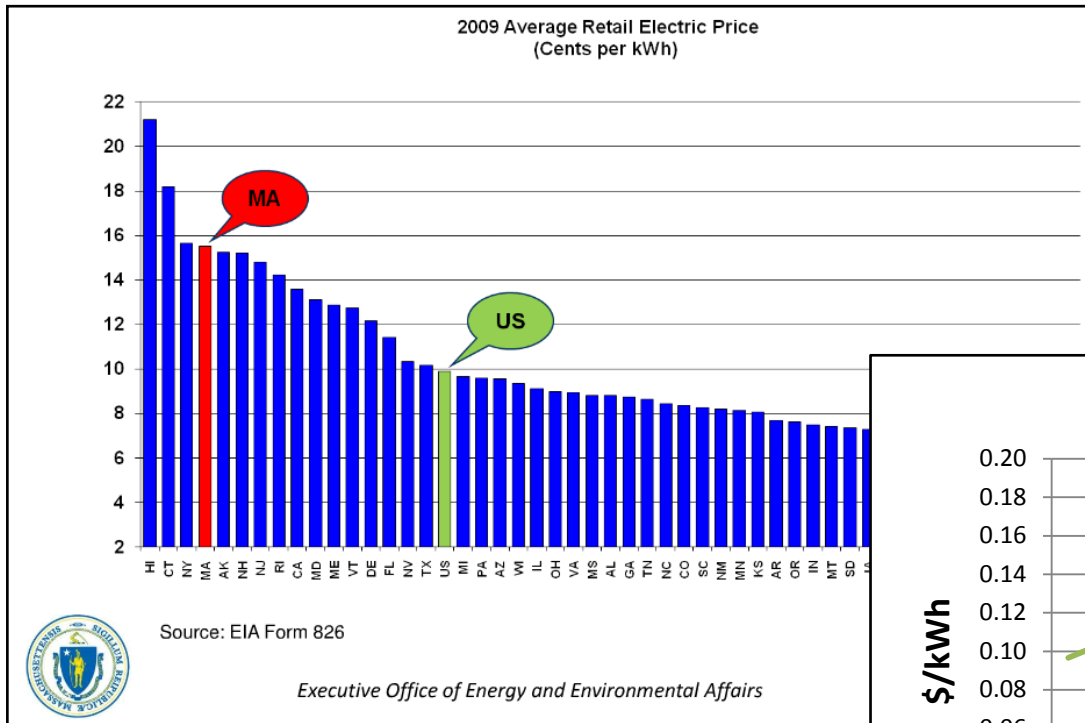
Source: ISO-NE

Energy Issues in New England

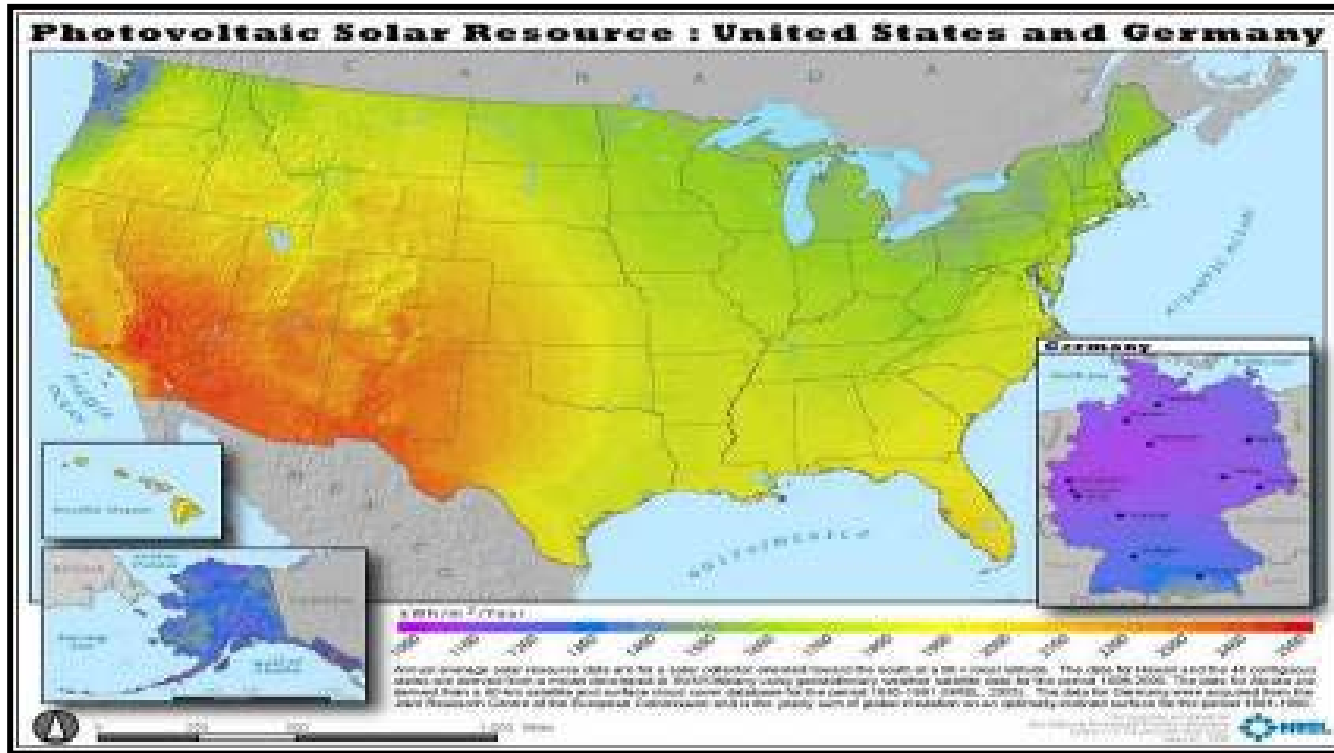
- End of pipeline for traditional resources
 - MA exported \$22b in energy value in 2008
- Price volatility



Massachusetts Retail Electric Prices

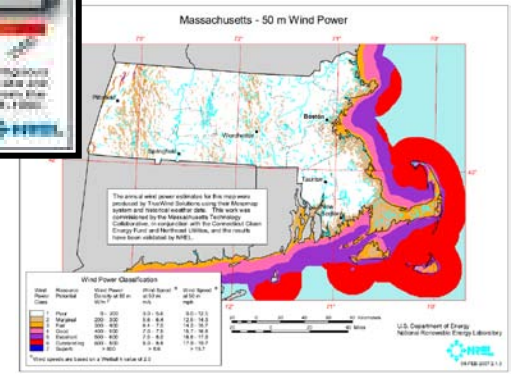


Massachusetts Renewable Energy Assets



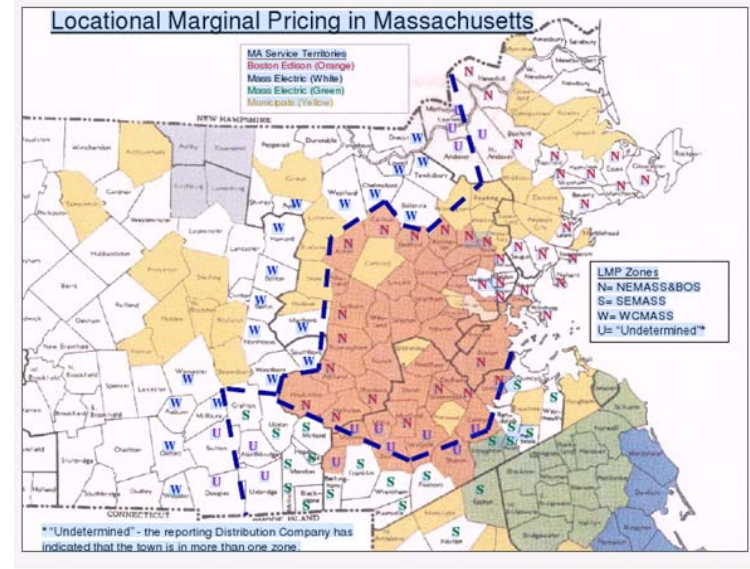
Solar

Wind

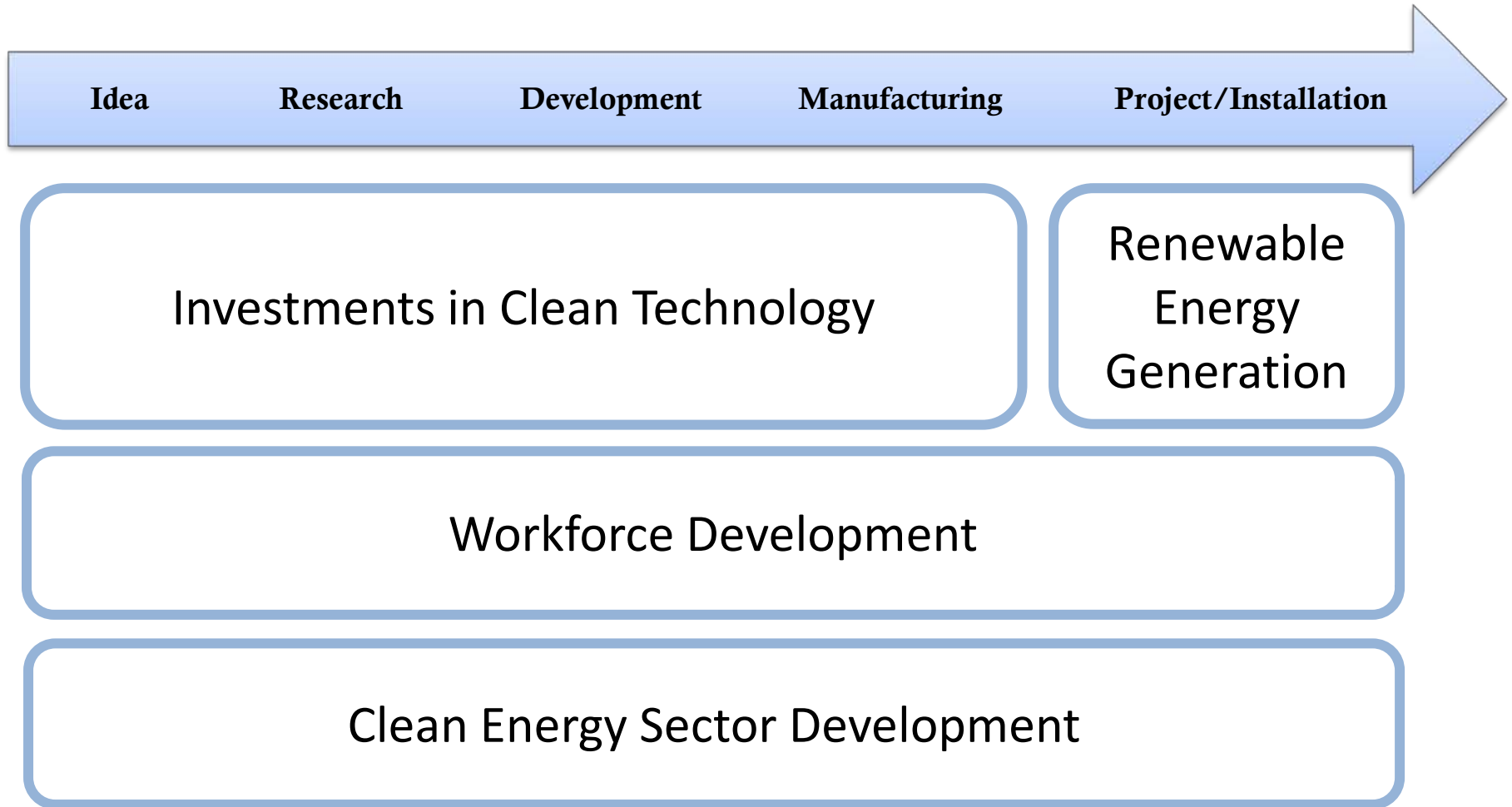


Policy Framework has Evolved

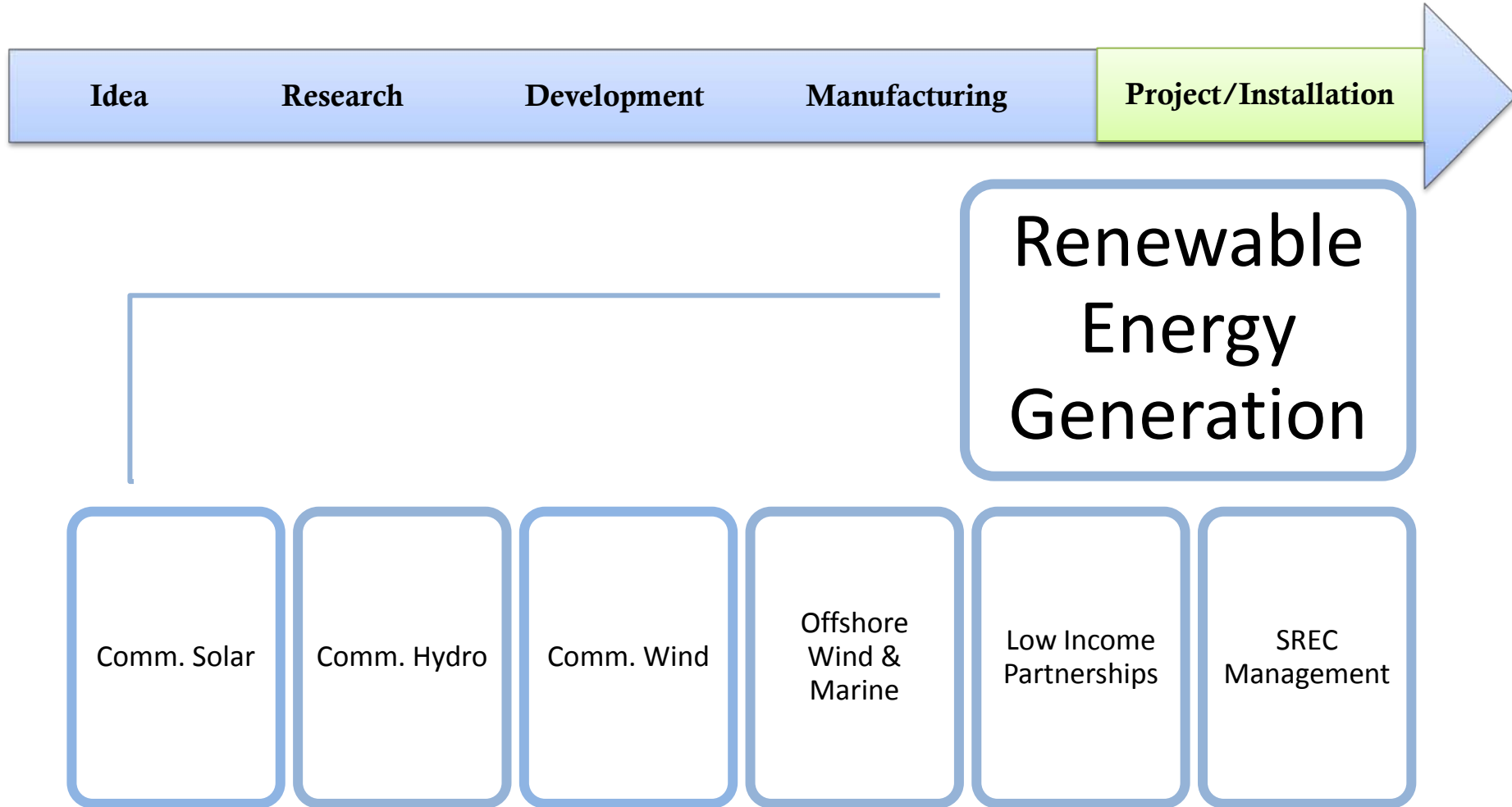
- Pre-2008
 - RPS (4% by 2009)
 - RGGI (2007)
 - Net metering (60 kW limit)
- 2008: Patrick-Murray Administration
 - Aggressive Goals
 - 250 MW Solar; 2,000 MW wind
 - 2008 Global Warming Solutions Act
 - GHG 25% below 1990 levels by 2020
 - 2008 Green Communities Act
 - Expanded net metering: 2 MW limit, value increased, virtual net metering
 - Expanded RPS: 1% growth per year (currently 6%), created Solar Carve-Out



MassCEC Areas of Focus



Renewable Energy Generation Division



Program Overview

Commonwealth Solar

Commonwealth
Solar I

Commonwealth
Solar II

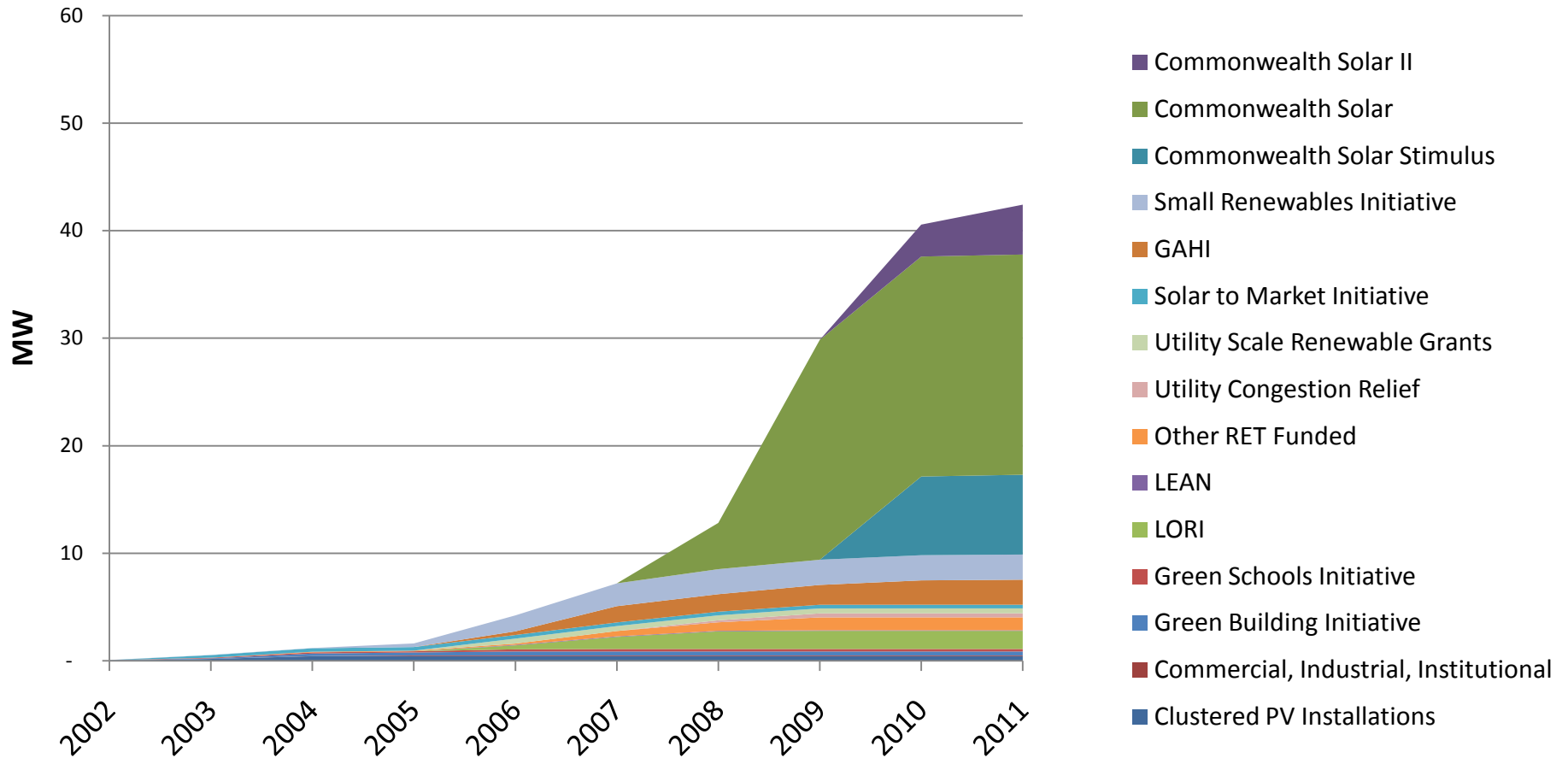
Commonwealth
Solar Stimulus

Commonwealth
Solar Hot Water

Variety of Incentive Approaches

- **Solar as demonstration projects**
 - LEAN, GAHI, Utility Congestion Relief Pilot
- **Partnerships**
 - Solar to Market Initiative, Clustered PV Initiative, Solarize
- **Solar as “carrot” for energy efficiency/sustainability**
 - Green Schools Initiative, Green Buildings Initiative
- **Competitive Rebates**
 - CI3, Large On-Site Renewables Initiative
- **Rebates for Mid-Large scale systems**
 - Utility Scale Renewables, Commonwealth Solar, Comm. Solar Stimulus
- **Rebates for Small-scale Systems**
 - Small Renewables Initiative, Comm. Solar, Comm. Solar II

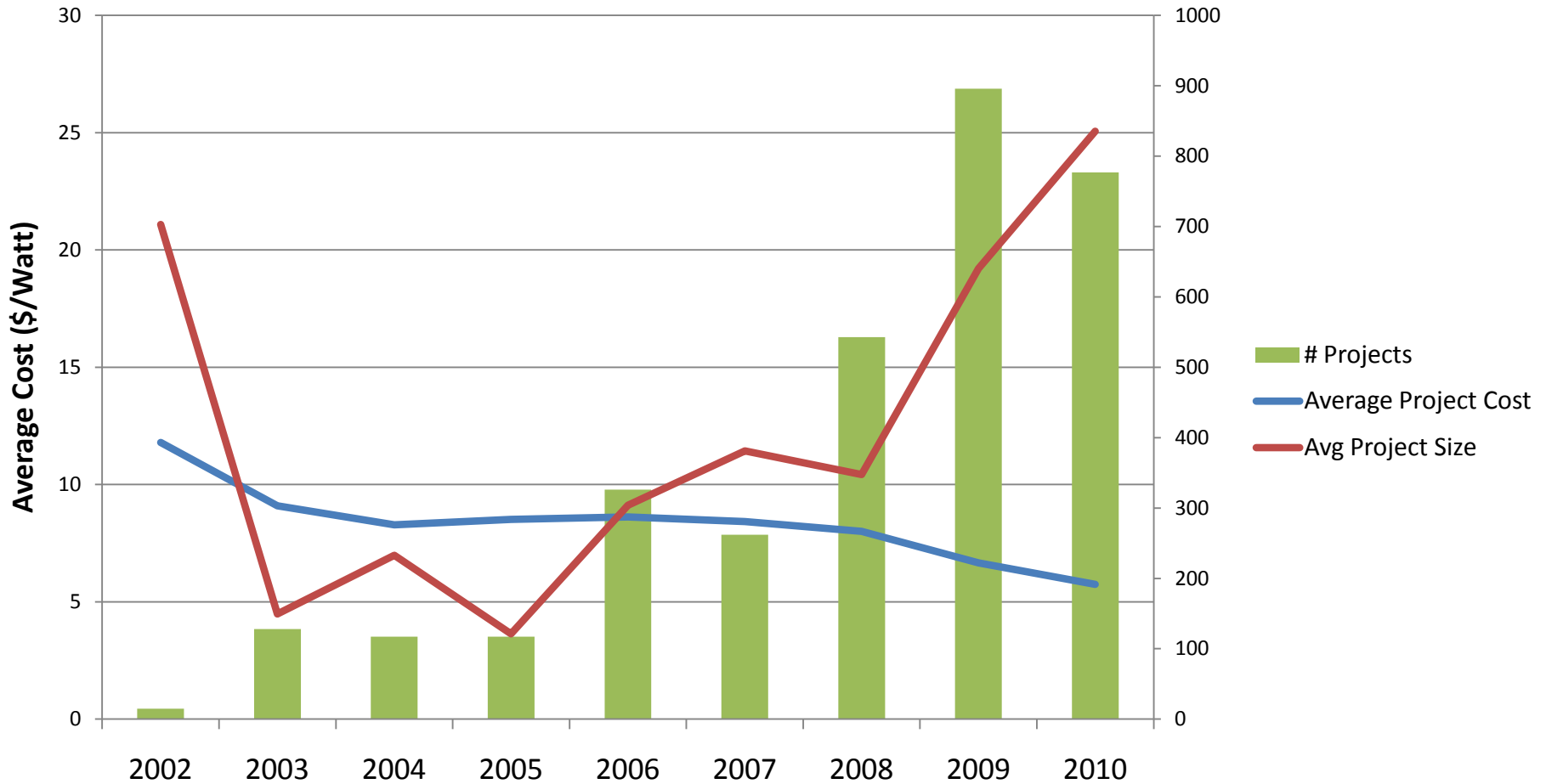
Growth of Solar PV



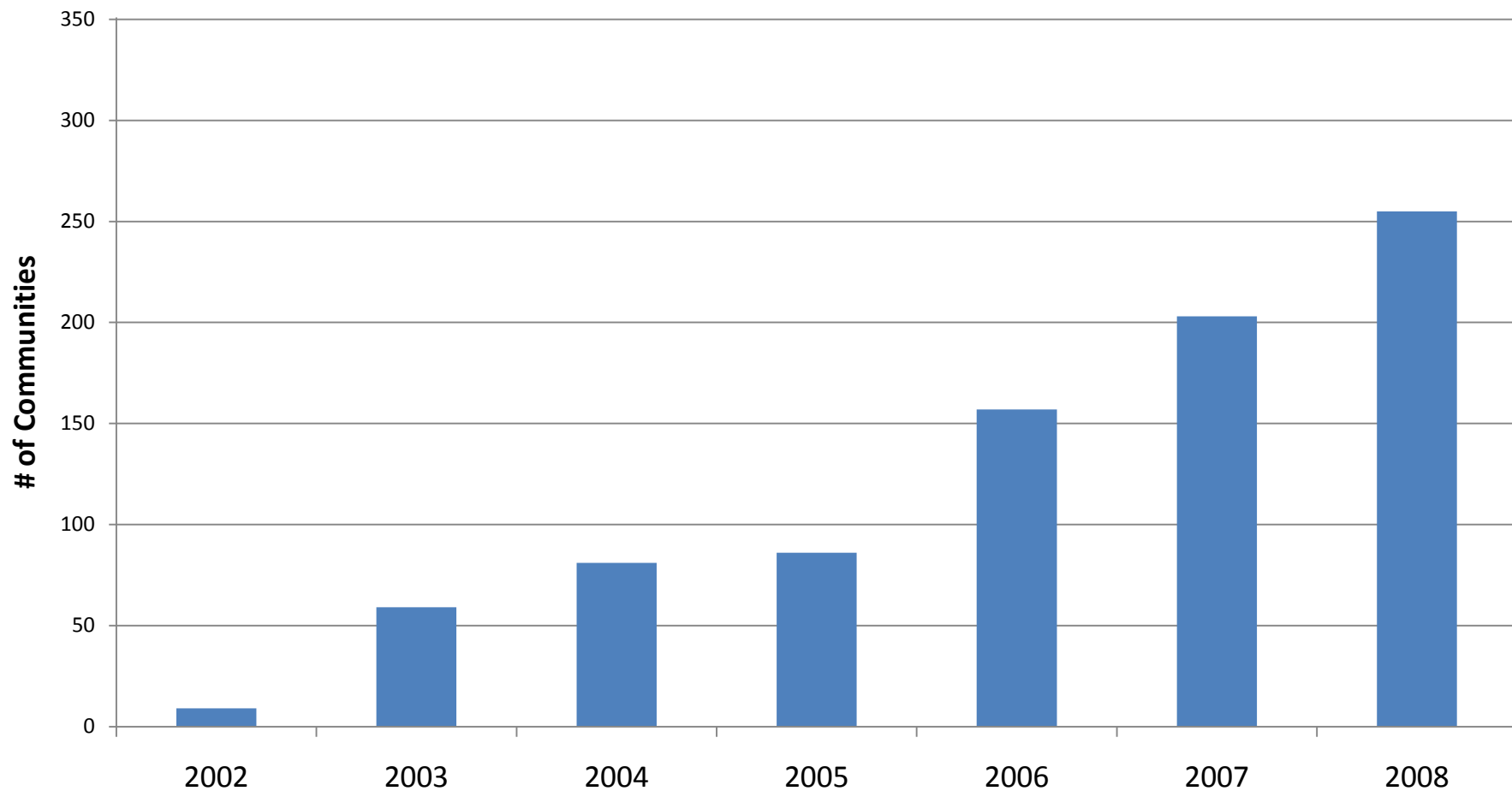
Impact of Early Incentive Programs

- Active installation companies grew from 30 to 200+
- Average system size increased
- Decreases in costs
- Wide geographic penetration
- Rise in 3rd party ownership

Changes in System Demographics

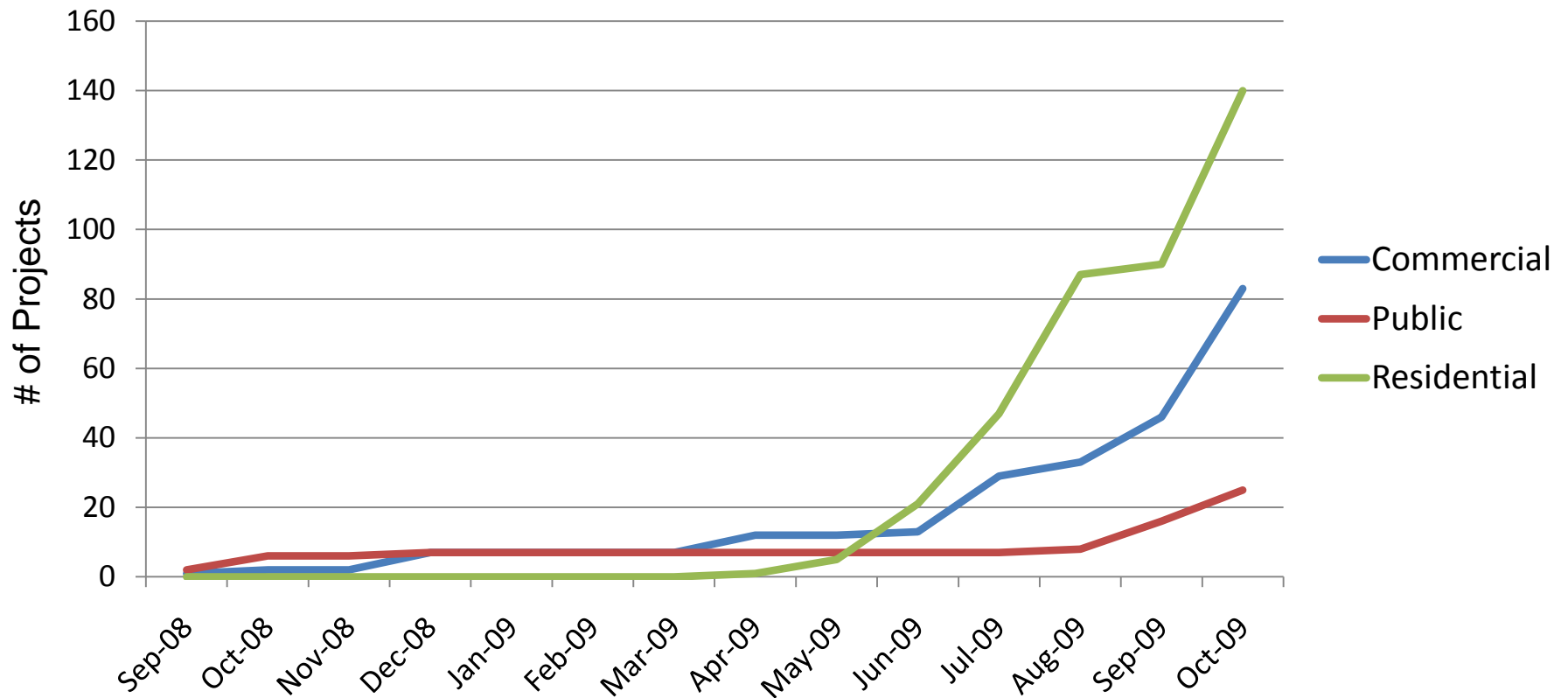


Cumulative Number of Communities Served



Growth in 3rd Party Ownership

Commonwealth Solar 3rd Party Ownership Projects



Solar Renewable Energy Certificates (SRECs)

Electricity Pathway

- Electrons from all generation sources are physically the same
- Cannot be tracked independently on the grid
- Difficult to know what source produced your electricity
- SRECs address this challenge

Electricity and RECs can be, and often are, sold separately



SRECs Pathway

- SRECs represent the right to claim the attributes of the renewable generation source
- 1 SREC = 1,000 kWh
- Certified and verified SRECs ensure that only one buyer can claim each SREC
- Utilities are required to purchase SRECs every year

SRECs As a Revenue Stream

■ Value

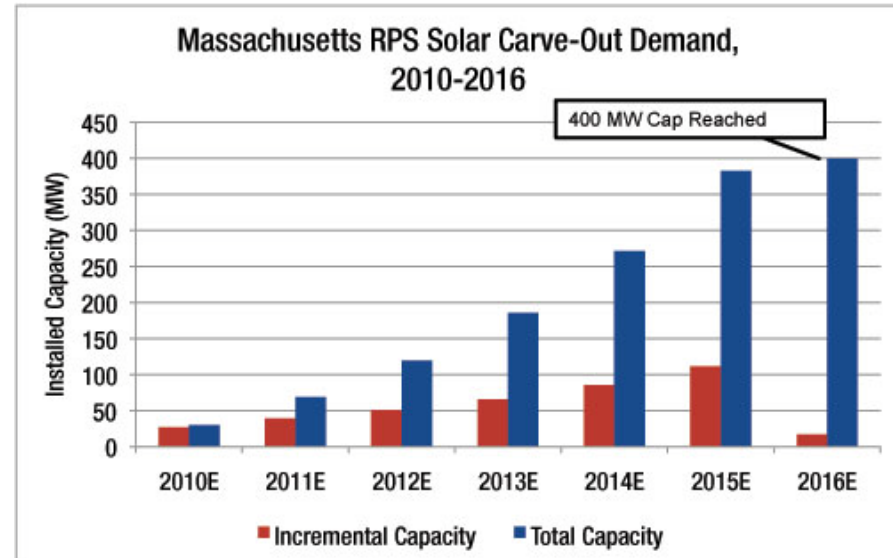
- Clearinghouse price of \$285/SREC... (NPV ~\$1.60/Watt)
- Ceiling price of \$550/SREC... (NPV ~\$3.10/Watt)

■ Reporting

- Report production data to Production Tracking System (PTS) at MassCEC, which serves as the Independent Verifier

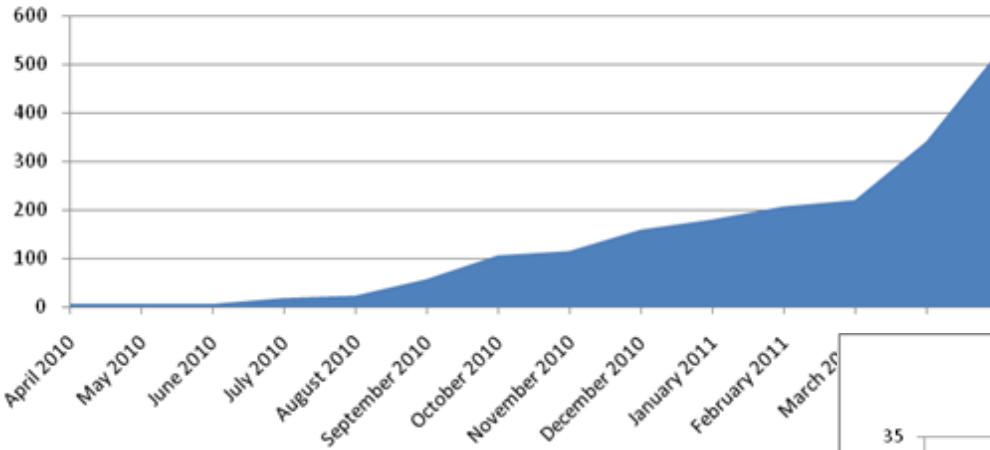
■ Selling

- SRECs typically aggregated
- Buyers include IOUs and competitive load serving entities, brokers, and other parties
- Trading is done on NEPOOL-GIS platform



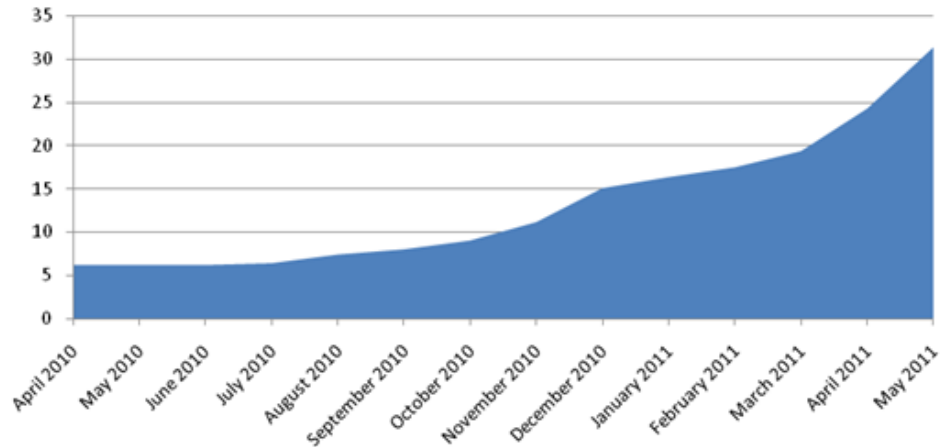
SREC Progress

Number of Units Qualified



Size	#	MW
< 10 kW	477	2
10 - 100 kW	83	3
100 - 500 kW	50	9
> 500 kW	18	24

Capacity of Units Qualified (MW DC)

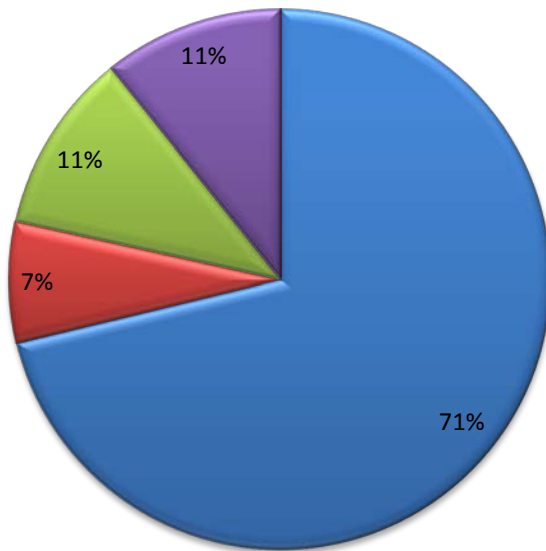


- 20 Active Aggregators
 - 13 Aggregations w/ Residential systems
 - 8 Aggregators open to any Residential project

Solar Installed in MA (through May 1, 2011)

PV Installed Base

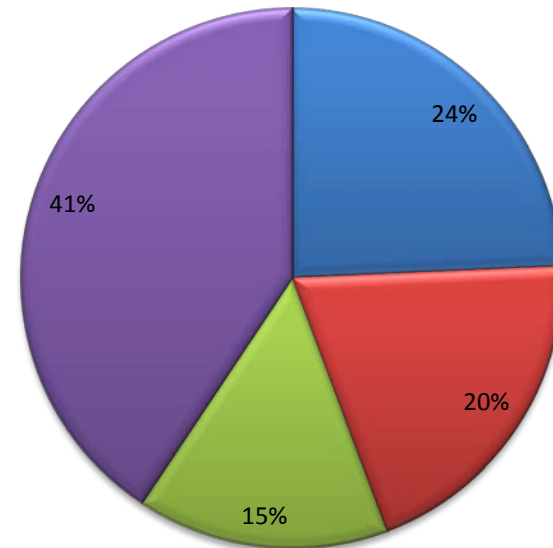
■ MassCEC ■ Non-MassCEC ■ Utilities ■ SREC Only



49 MW

PV Pipeline

■ MassCEC ■ Non-MassCEC ■ Utilities ■ SREC Only



37 MW

Thank You!

Andy Brydges

Program Director

ABrydges@MassCEC.com

Learn more at

www.MassCEC.com

Follow us on Twitter:

www.Twitter.com/MassCEC