

# **“Renewable Energy Status and Prospects in Massachusetts”**

**Association of Energy Engineers  
New England  
January 3, 2012**

**Commissioner Mark Sylvia**

# DOER Mission

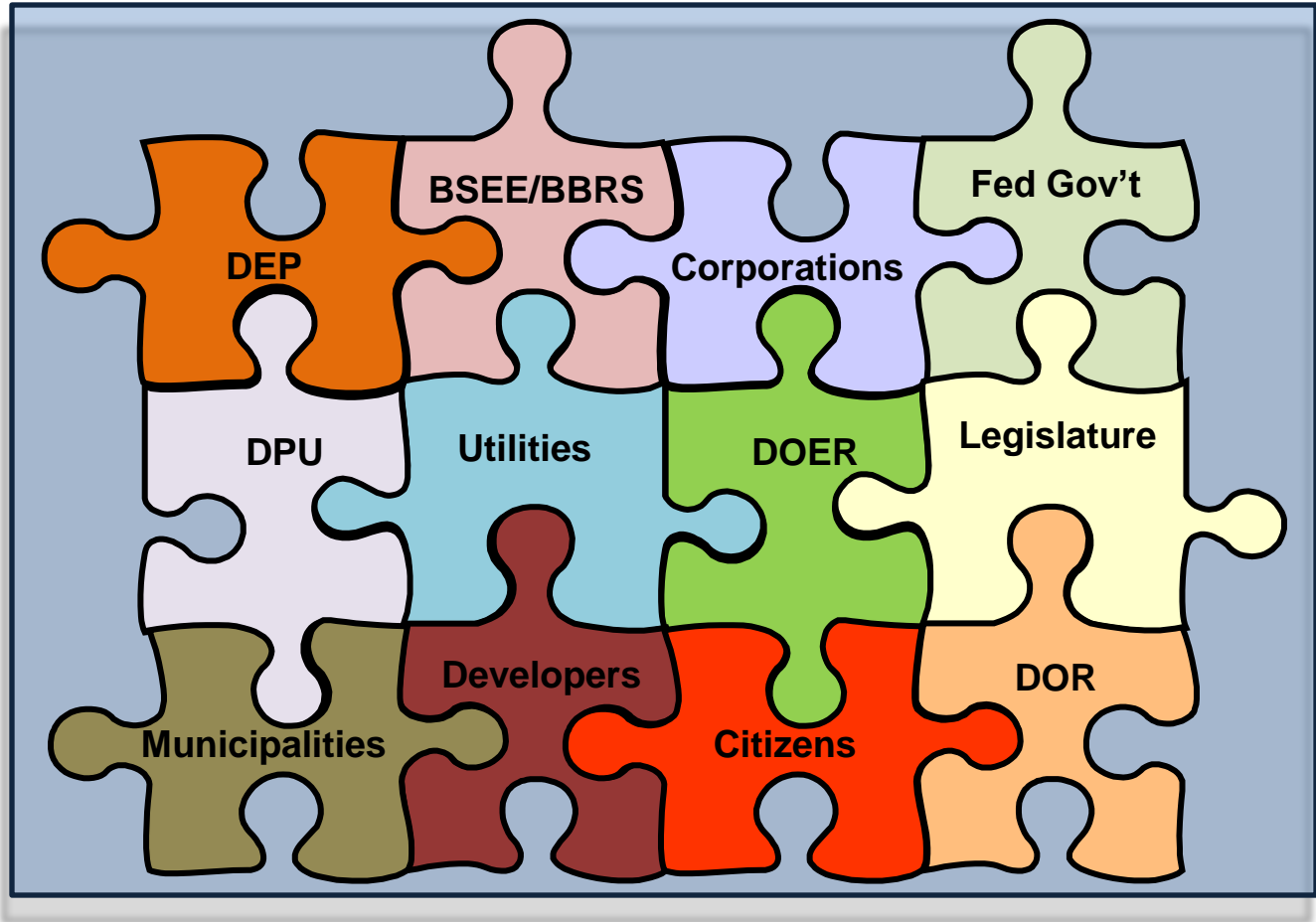
## *Creating a Cleaner Energy Future for the Commonwealth*

- Ensure deployment of all cost-effective energy efficiency
- *Maximize development of clean energy resources*
- Create and implement energy strategies to assure reliable supplies and improve the cost of clean energy relative to fossil-fuel based generation
- Support Massachusetts' clean energy companies and spur Massachusetts' clean energy employment



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# The Renewable Energy Landscape



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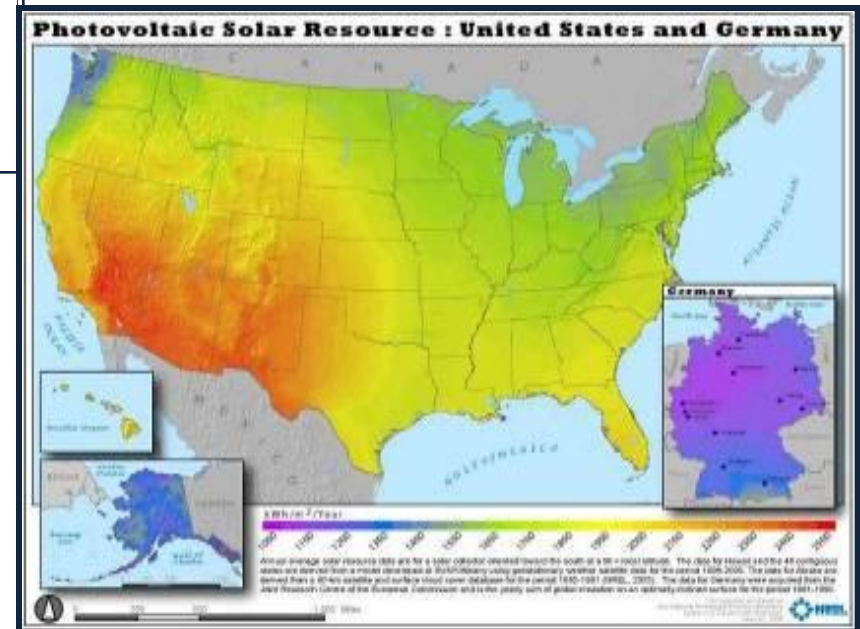
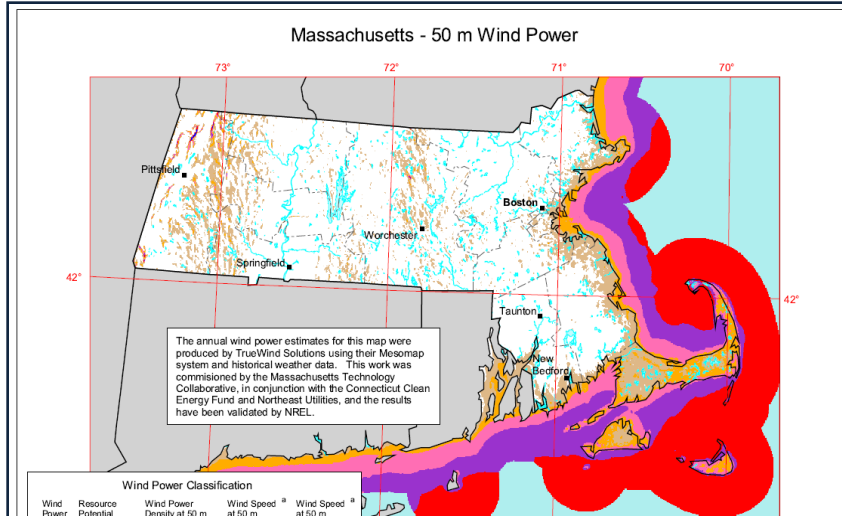
# Renewable Energy Framework

- **Patrick/Murray Administration Goals**
  - Solar: 250 MW installed by 2017 / Wind: 2000 MW installed by 2020
- **Renewable Energy Portfolio Standards (RPS/APS)**
  - Creates demand (Minimum Standard) and provides additional revenue (Renewable Energy Certificate) for qualified generation
  - Establishes an obligation of all Massachusetts Retail Electric Suppliers to provide a percent of their load with renewable energy generation
  - Strategy is to “green up” the ISO-NE grid. Generation from throughout New England and adjacent control areas are eligible
- **Green Communities Act**
  - Net Metering, Long Term Contracts and utility owned solar pv
- **Mass. Clean Energy Center (MassCEC)**
  - Provides targeted funding programs to support development of RE supply in Massachusetts.



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# Renewable Resources



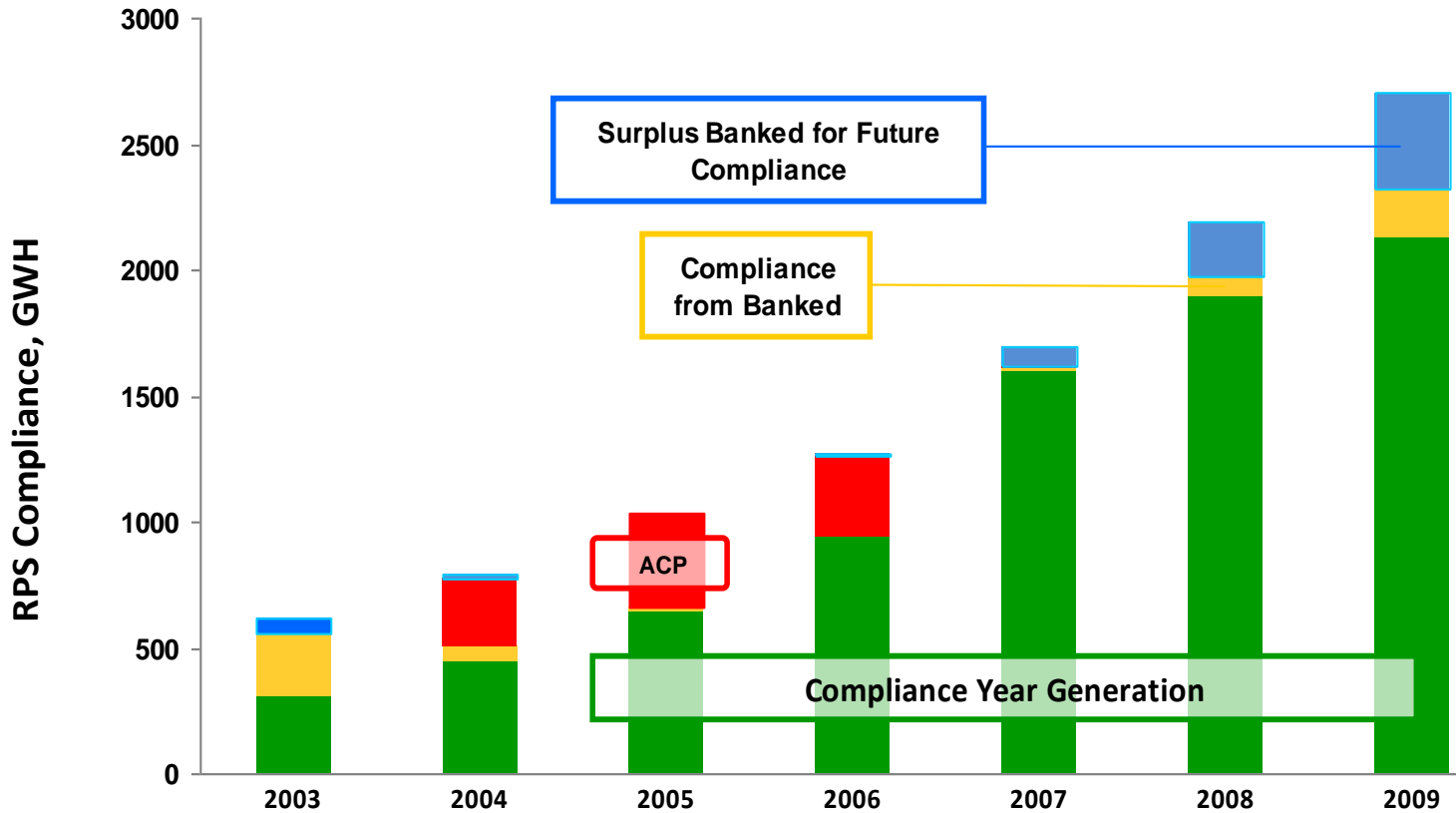
# Overview of Mass. RPS Programs

- **Renewable Energy Portfolio Standard – RPS Class I**
  - New (post-1997) renewable energy generation – original program (began 2002)
  - RPS Solar Carve Out – began in 2010 to grow solar PV sector to 400 MW
- **Renewable Energy Portfolio Standard – RPS Class II**
  - Supports MA share of existing (pre-1998) RE generation
  - Subclass supports existing Waste-to-Energy Plants in MA and dedicates at least 50% of revenues to recycling programs
- **Alternative Energy Portfolio Standard (APS)**
  - Supports non-RE technologies (flywheels, gasification, CHP)
  - CHP of key importance – provides credits for efficiency gains in electric and thermal production

# Summary of MA Renewable Energy Portfolio Standard (RPS) Programs

RPS Class	Sub Class	Technology	Minimum Standard	ACP Rate, \$/MWh
Class I		Wind, LFG, Biomass, Solar, Small Hydro, etc.	5% in 2010, increases 1%/year	\$60.93; increases with CPI
	Solar Carve-Out	Solar PV; 6 MW or less, in MA	set by formula to grow installed capacity to 400 MW	\$550; can be reduced by DOER (10 y schedule)
Class II		same as Class I	3.6%, stays constant	\$25; increases with CPI
	Waste Energy	Municipal Solid Waste Combustors, in MA	3.5%, stays constant	\$10; increases with CPI
APS		CHP, flywheels, paper-derived fuel, gasification	0.5% in 2010; increases to 5% in 2020	\$20; increases with CPI

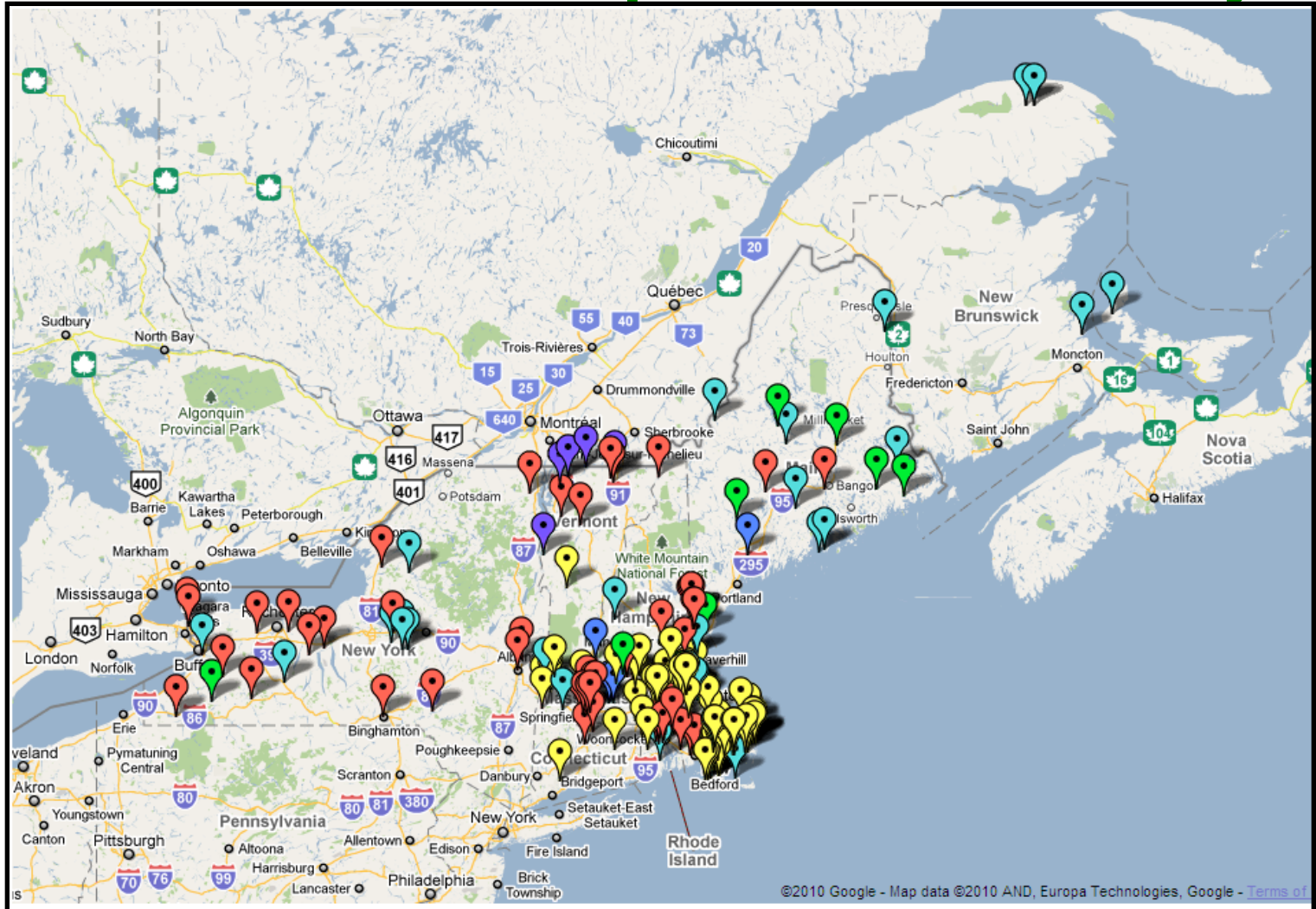
# MA Class I RPS Program Success



■ Surplus Banked	61	20	1	9	81	211	386
■ ACP Compliance	0	265	368	323	11	1	0
■ Compliance from Banked	255	61	20	2	7	81	190
■ Compliance Year Generation	304	445	645	939	1600	1896	2130



# MA RPS Class I Map of Qualified Projects



**72 MW**



**Total solar capacity installed in  
Massachusetts as of December 1, 2011**

**Goal: 250 MW by 2017**

**44 MW**



**Total wind capacity installed in  
Massachusetts as of December 1, 2011**

**Goal: 2,000 MW by 2020**

**The Patrick-Murray Administration set ambitious renewable energy goals to ensure a cleaner energy future for the Commonwealth.**

# Wind Strategies: Land-Based

- Commonwealth Wind Program (MassCEC) - provides financial support to project sponsors/developers (for feasibility studies, design/construction)
  - Federal and State Tax Credits/Incentives
- Tee-up development opportunities that can be transferred to private sector (2008-present)
  - Mass. Military Reservation
  - Leading By Example Siting at state facilities (Mt. Wachusett, Gardner)
- Develop and promote standard methodologies
- Special Projects (Mass CEC / DOER)
  - Acoustic field monitoring
  - Property values study
  - NEWEEP / New England Wind Forum / MA Wind Group



# Wind Strategies - Offshore

- Oceans Management Act 2008
  - Identified areas for wind energy development in state waters
- US Offshore Wind Collaborative
  - Supports sector development and states coordination
- Collaboration with Federal government
  - Issued RFPs for wind development in Federal waters
- Wind Technology Testing Center
  - Established largest wind blade test facility in the U.S. in Charlestown, MA

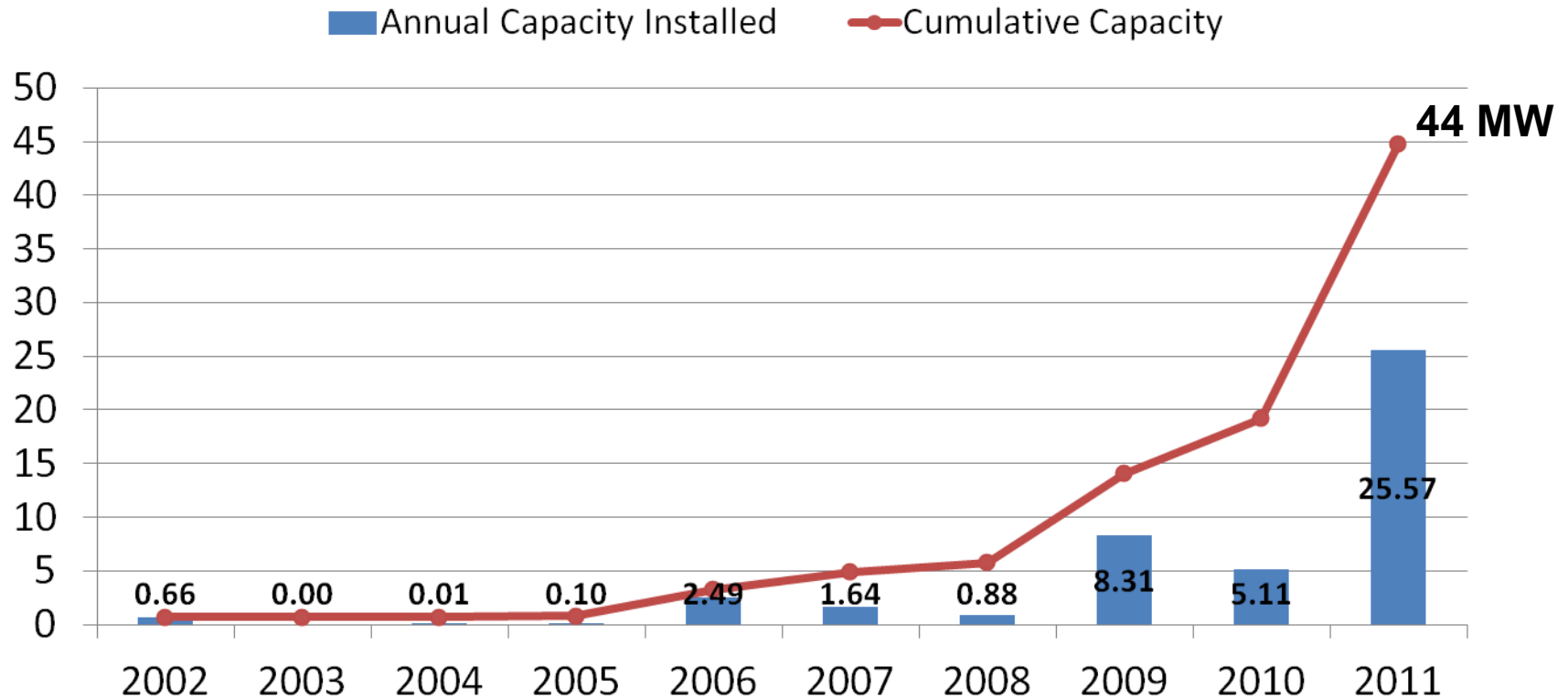
# Existing Wind Projects



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## Installed Wind Capacity in Massachusetts



**The Patrick-Murray Administration set a goal to have 2,000 MW of wind energy installed in Massachusetts by 2020. The above figures represent the cumulative amount installed as of December 1, 2011.**

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# RPS Solar Carve-Out Program and other incentives

## SREC

- Market-based incentive, part of RPS Program.
- 1 SREC (Solar Renewable Energy Certificate) represents the attributes associated with 1 MWh of generation.
- Qualification of projects continues until 400 MW is reached.
- ACP rate of \$550/SREC (10y schedule)

## MassCEC

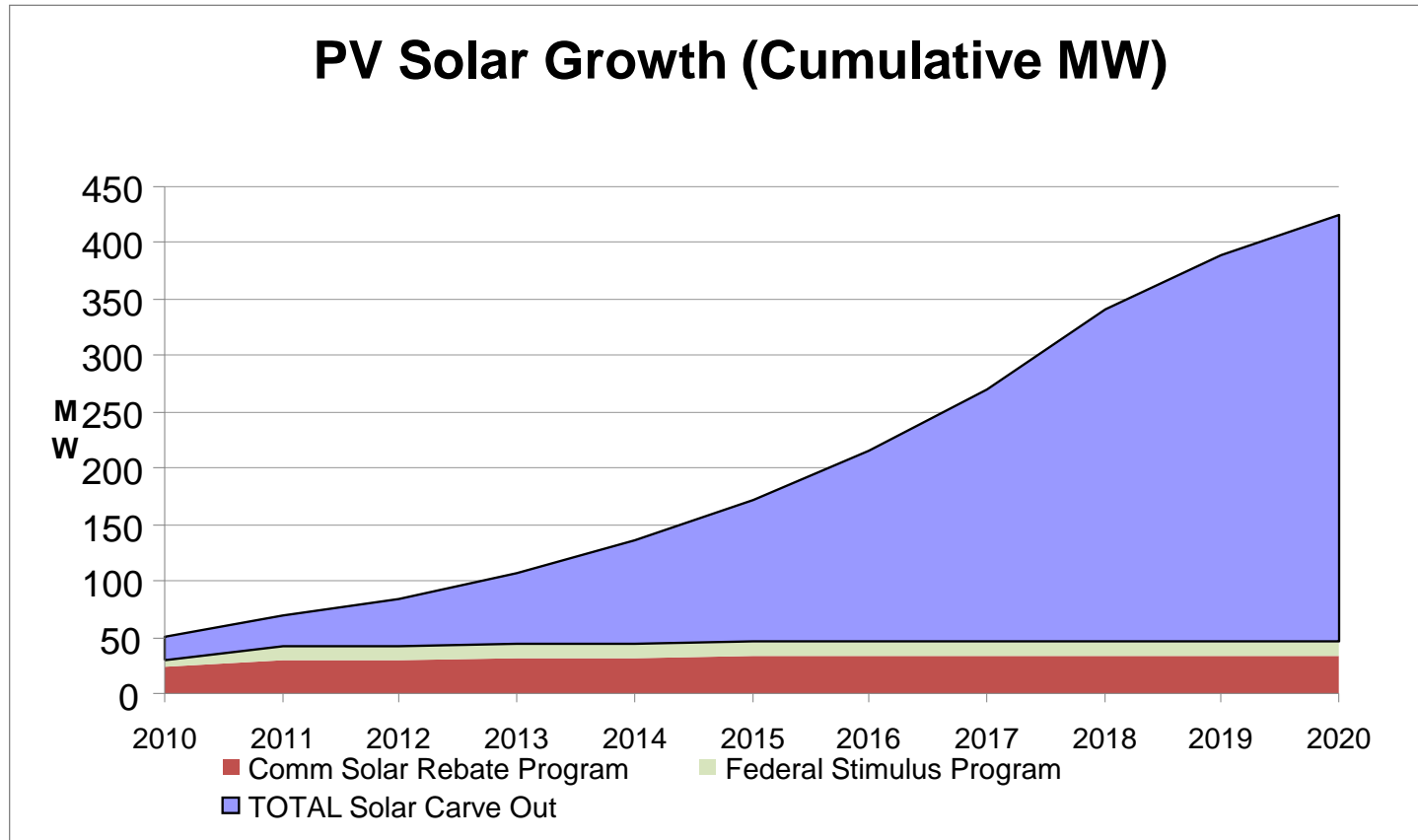
- Commonwealth Solar rebates for small <10kw solar projects to maintain a robust residential market

## Federal and State Tax Credits / Incentives

## Net Metering



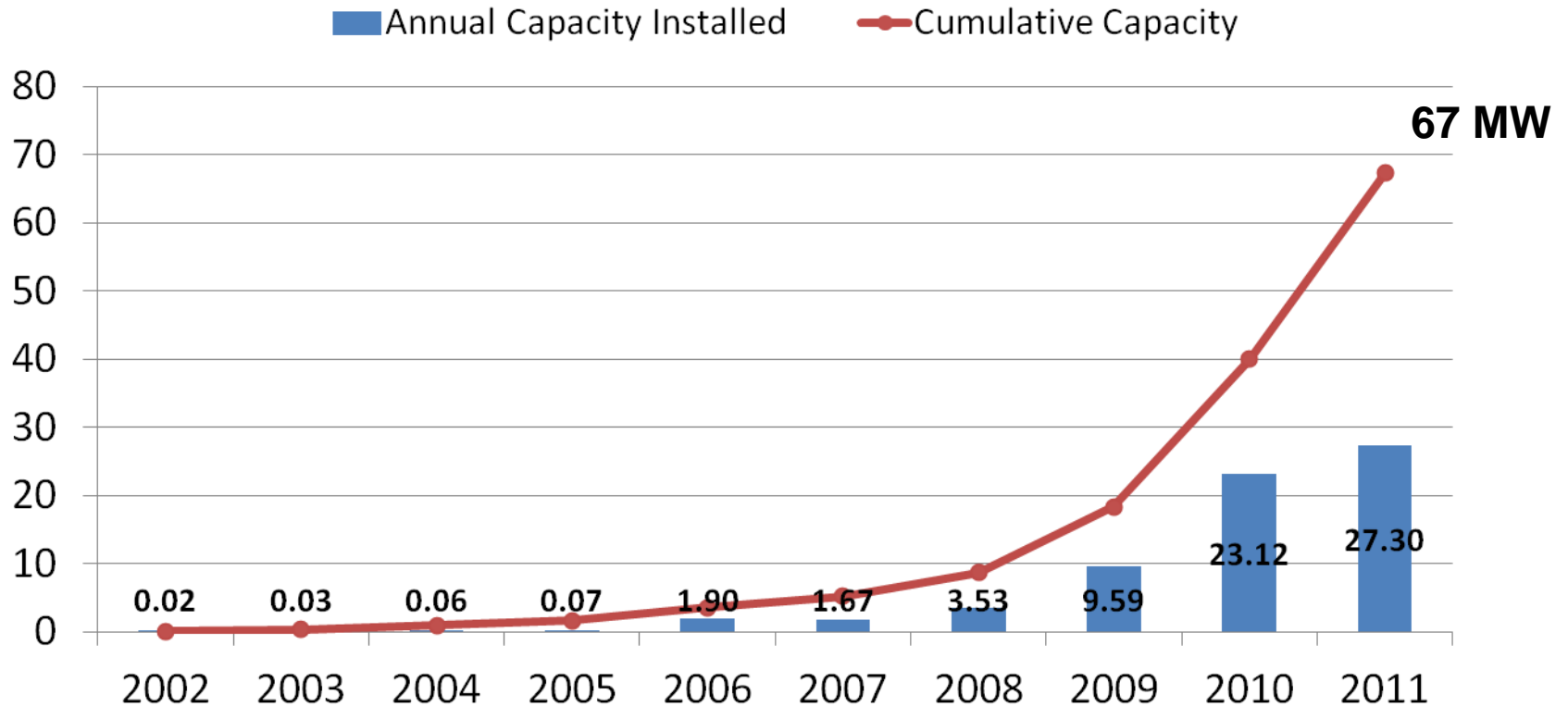
# RPS Solar Carve-Out



# Solar Carve-out's ACP Rate

- [Guideline](#) establishes a rolling 10-year Alternative Compliance Payment (ACP) Rate Schedule for the RPS Solar Carve-out.
  - Maintained at its current level through Compliance Year 2013
  - Reduced at 5% per year afterward
  - Objective: maintain robust solar development, while protecting ratepayers from unnecessary cost impacts

## Installed Solar Capacity in Massachusetts



**The Patrick-Murray Administration set a goal to have 250 MW of solar power installed in Massachusetts by 2017. The above figures represent the cumulative amount installed as of December 1, 2011.**

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# Solar PV Initiatives

- Energy Efficiency and Conservation Block Grants
  - DOER directed ARRA funding for systems on public buildings, (e.g., schools, town halls)
  - 1,977 KW of installed, interconnected solar
  - 177 KW remains to be interconnected by spring 2012.
- DOER/DEP Solar PV on Landfills Initiative
- Mass CEC / DOER Solarize MA Initiative
- Leading by Example Solar PV at State Facilities
  - On track to achieve 5 MW of Solar PV and over 10 MW of wind power by the end of this year

# Mass Save Energy Efficiency Program for CHP Incentive Structure

- Green Communities Act of 2008 recognizes CHP projects as an Energy Efficiency Measure eligible for Incentive Funding by Utilities.
- Rebate Incentive Structure
  - Small systems (<150 kW): \$750/kW
  - Larger systems (≥150 kW): up to \$750/kW
- Only high efficiency CHP units likely to demonstrate threshold BCR > 1. Characterized by:
  - Significant run hours, High thermal use, Low installed costs
- Rebate limited to no more than 50% of installed cost.

# Alternative Energy Portfolio Standard

- Established under Green Communities Act 2008. Provides for RPS-type program for alternative (non-renewable) technologies.
- Program compliance obligation began in 2009.
- Eligible technologies include flywheels, CHP, gasification with carbon capture/sequestration, paper derived fuels.
- Key technology of interest is CHP. Provides credit for electric generation and useful thermal load.
- Qualified units produce Alternative Energy Credits (AECs).
- Alternative Compliance Payment (ACP) Rate is \$20/MWh (2010) and increases with CPI. Provides AEC ceiling price.

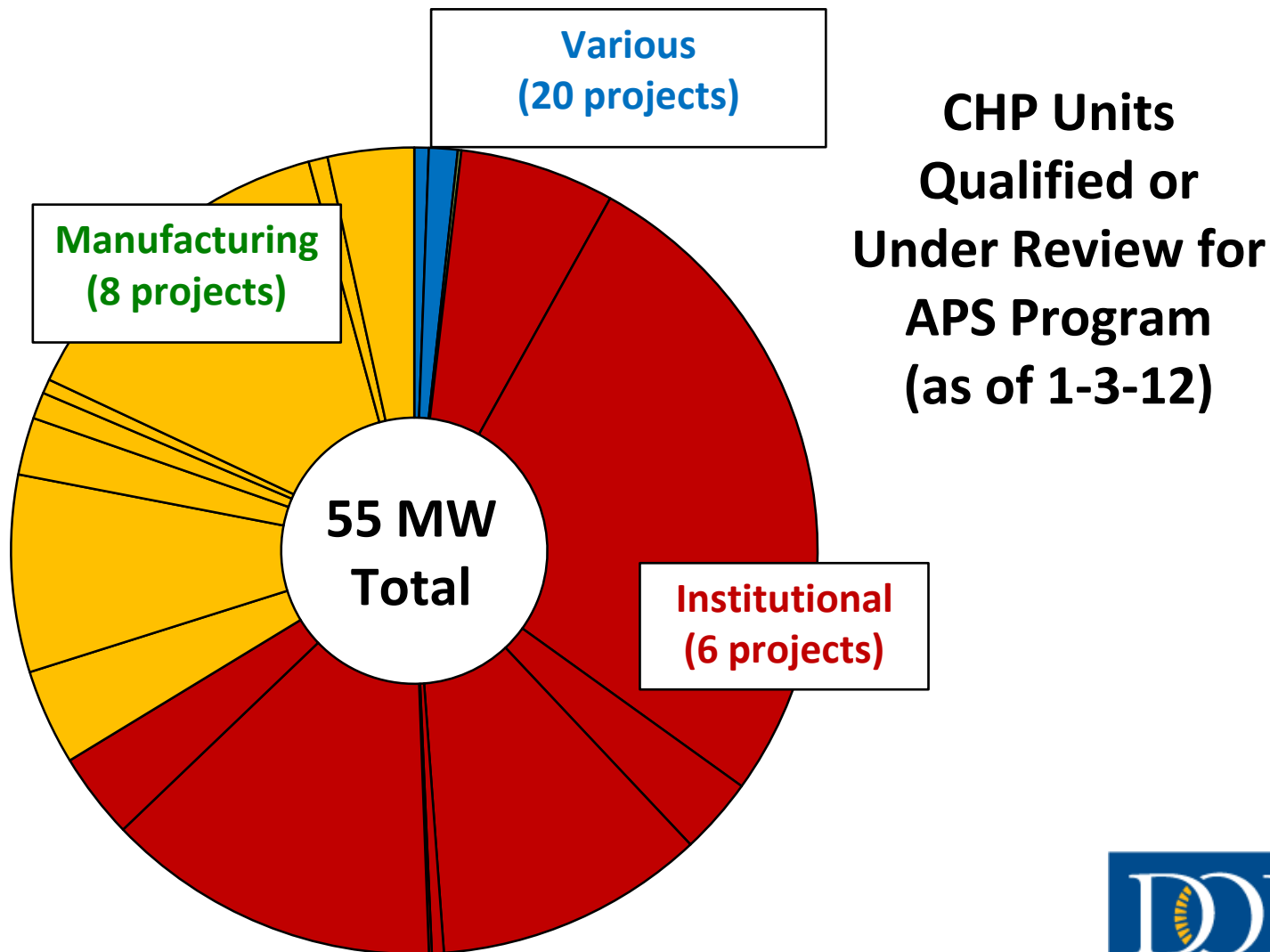
# MA Alternative Portfolio Standard – Minimum Standard and Cumulative CHP Demand

Year	APS Minimum Standard	Est. MW of Installed CHP
2009	1.00%	
2010	1.50%	64
2011	2.00%	92
2012	2.50%	121
2013	3.00%	148
2014	3.50%	177
2015	3.75%	205
2016	4.00%	215
2017	4.25%	226
2018	4.50%	237
2019	4.75%	249
2020	5.00%	261

Approximately 27 MW of new CHP installations required each year through 2014, and half this amount in years following.

Estimate based upon APS being met only by CHP

# CHP Project Contributions to APS Program



# Other Resources and Activities: CHP

- Northeast Clean Heat and Power Initiative
  - Membership advocacy organization
- U.S. DOE, Northeast Clean Energy Application Center
  - UMass, Amherst and Pace University
  - Provides technical information and early stage project evaluations
- International District Energy Association

# Electric Vehicles

- Installing 142 electric vehicle charging stations throughout 25 cities and towns
- Locating Level 2 charging stations about 60 miles apart throughout the Commonwealth, reducing range anxiety for drivers throughout the State.

# Distributed Generation/Interconnection

- Green Communities Act directs state to have clean energy generation serve 20% of customer load by 2020
  - Meeting through on-site electricity or distributed generation (like solar PV, wind, and combined heat and power)
  - Administration is focused on interconnection process being as streamlined, uniform, and transparent as possible
  - DOER filed Mass. DG Interconnection Report
    - Establish clear timelines
    - Ombudsman
  - DPU investigation
  - Joint comments
  - More: <http://sites.google.com/site/massdgc>



# Exciting Time in Massachusetts

- ACEEE: #1 State for Energy Efficiency
- MassCEC Jobs Report
- Eighty-six Green Communities
- 104 Stretch Code Communities
- Building labeling pilots
- Nearly \$70 million in clean energy ARRA funding directed and leveraged by DOER
- 72 MW of solar PV installed
- 44 MW of wind generation installed
- 142 EV charging stations

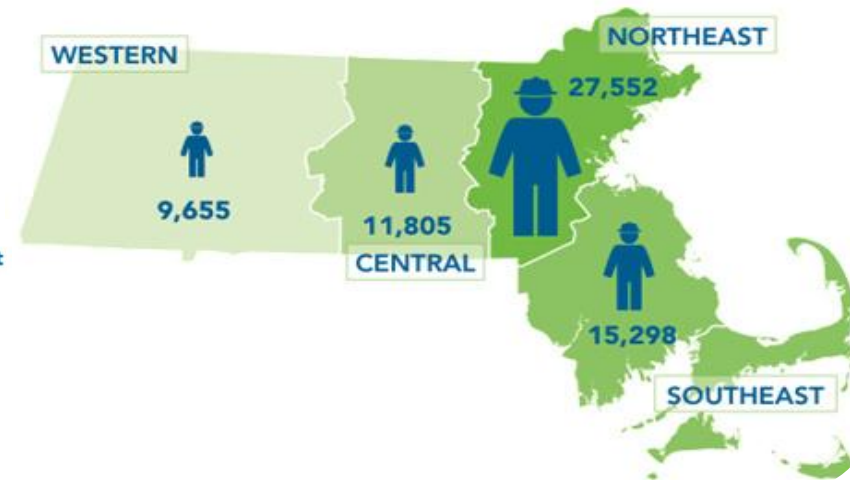


# Clean Energy Industry Provides Jobs

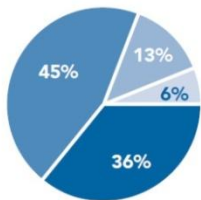
## 2011 Massachusetts Clean Energy Industry Study Key Findings

- 4,909 clean energy firms
- 64,310 clean energy workers
- 1.5 percent of total workers in the Commonwealth
- 6.7 percent growth rate from July 2010 to July 2011

## Industry Report: Massachusetts' Clean Energy Sector is Large, Diverse, and Growing

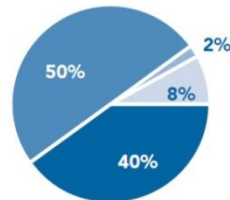


MA Clean Energy Employment Growth from July 2010 to July 2011



- Positive growth over past 12 months
- Same number of clean energy employees
- Fewer clean energy employees
- Don't Know/No Answer

Projected Clean Energy Employment Growth, July 2011 to July 2012



- More
- Same number of clean energy employees
- Less
- Refused



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# Looking Ahead

- GWSA Clean Energy & Climate Plan
  - 25% reduction in GHG by 2020
- Increased collaboration between state agencies
  - Clean Energy Results Program
- Expanding activity in additional technologies
  - Anaerobic digestion, hydropower
  - Smart grid
  - Offshore wind
  - Renewable thermal energy
    - Solar heating, heat pumps, biomass
- Continued collaboration with region

# Helpful Links / Email

- RPS / APS and Renewable Policies (DOER)
  - [www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/](http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/)
  - Email: [doer.rps@state.ma.us](mailto:doer.rps@state.ma.us)
  - Dwayne Breger, Director of RE/AE
    - [Dwayne.breger@state.ma.us](mailto:Dwayne.breger@state.ma.us)
- Commonwealth Solar / Wind (MassCEC)
  - [www.masscec.com](http://www.masscec.com)