



Tenth Annual State Markets Conference

**American Council of Engineering
Companies of Massachusetts
April 11, 2012**

Commissioner Mark Sylvia

DOER Mission

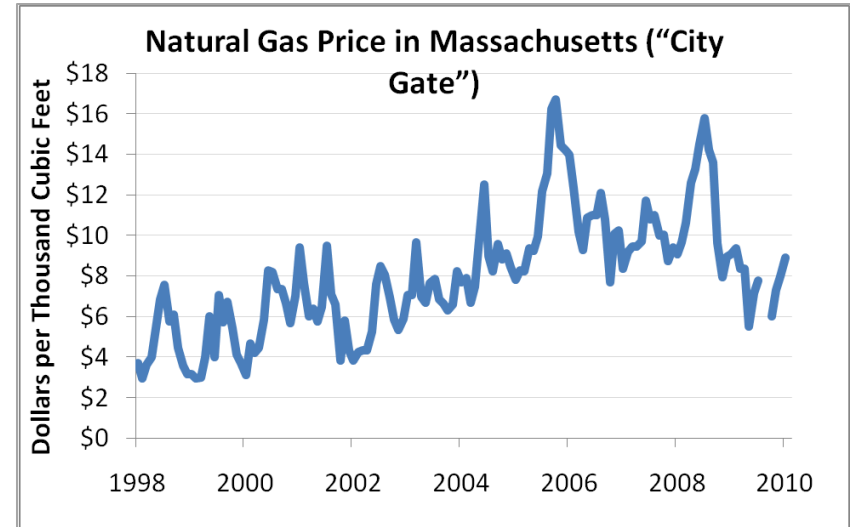
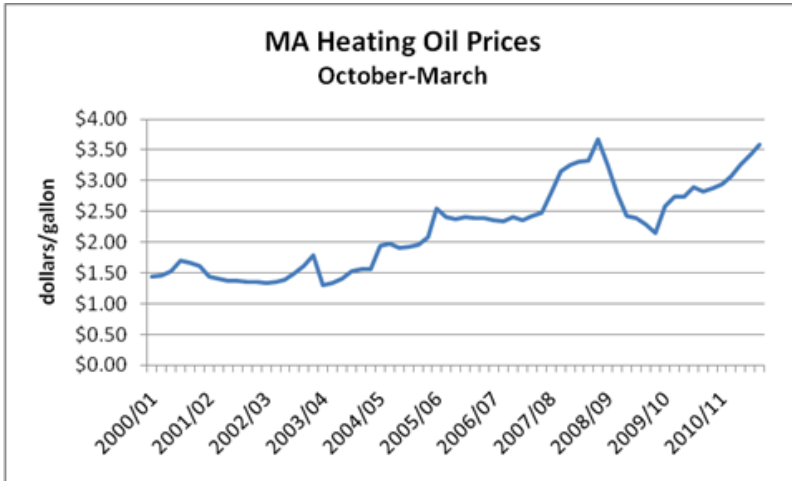
Creating a Cleaner Energy Future for the Commonwealth

- 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

Clean Energy in Massachusetts

- What are the drivers?
- What initiatives are underway?
- What will impact your businesses?

Energy Costs: Volatile and Unpredictable



\$18B Energy Dollars Flow Out of MA

We spend \$22B per year on energy; 80% leaves MA

| MA Energy Imports 2008 | \$B |
|----------------------------|---------------|
| Fuel Oil (heating, diesel) | \$5.0 |
| Gasoline | \$9.2 |
| Jet Fuel | \$1.4 |
| Other Petroleum | \$0.9 |
| Natural Gas | \$5.2 |
| Coal | \$0.3 |
| Total | \$22 B |
| Per Household Average ~ | \$4,600 |

**Oil & Natural Gas
- Canada**

**Natural Gas
- U.S. Gulf Coast**

**Oil & Natural Gas
- Middle East**

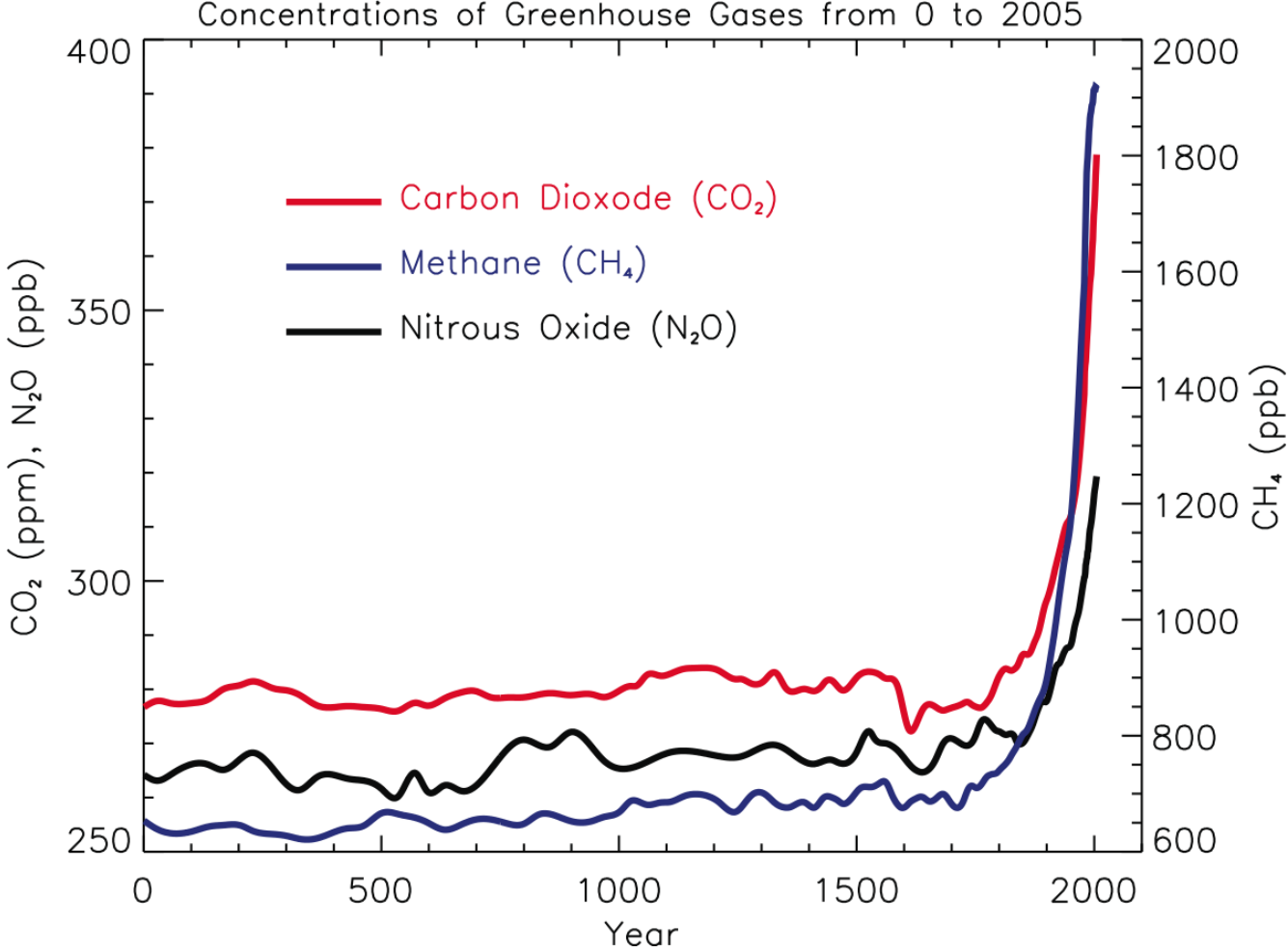
**Natural Gas
- Caribbean**

Coal - Colombia

Oil - Venezuela



Global Increase of GHG Concentrations



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Patrick/Murray Administration's Leadership Yields Groundbreaking Laws

- **Green Communities Act (GCA)**

Electric and natural gas resource needs shall first be met through all available, cost-effective energy efficiency and demand reduction resources.

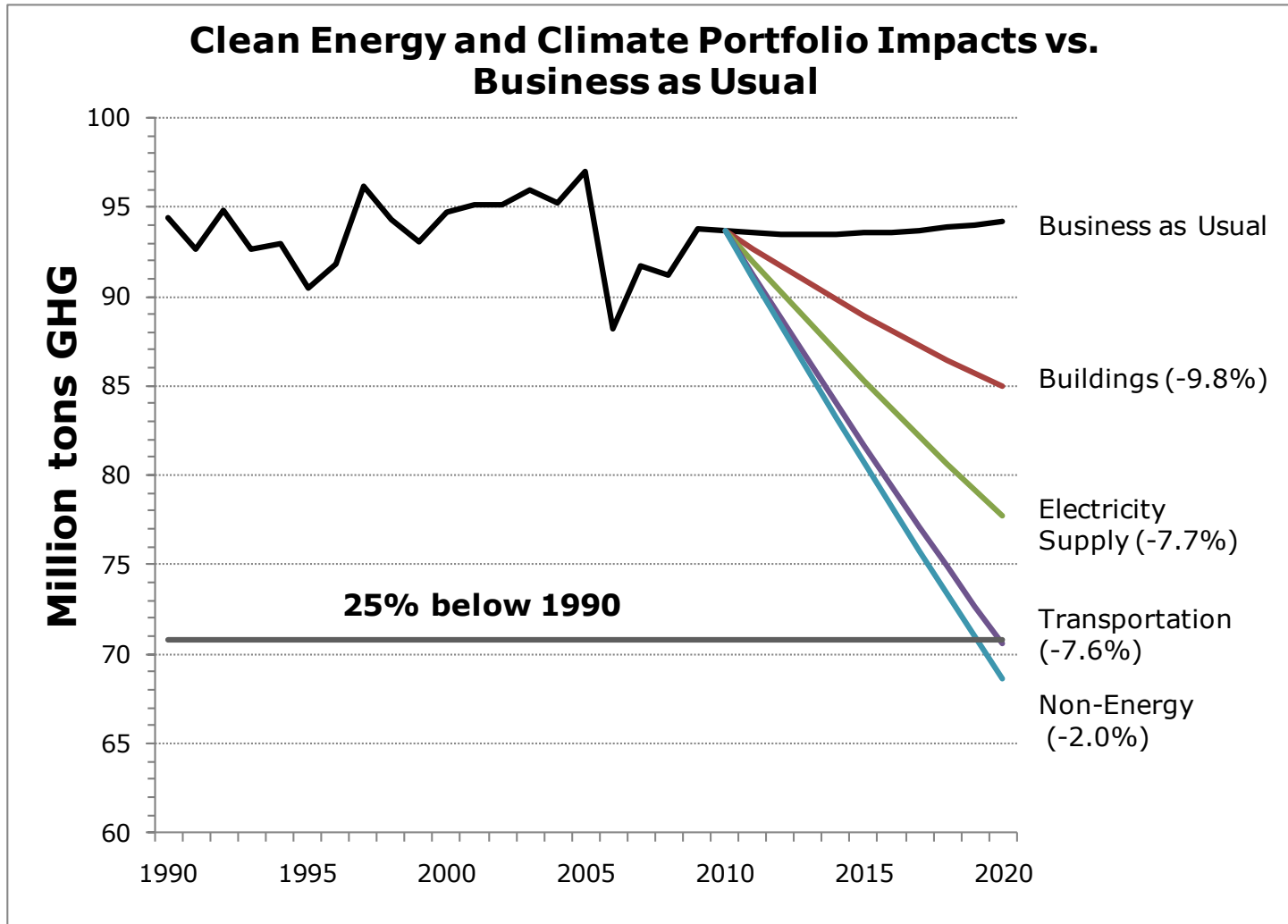
- **Global Warming Solutions Act (GWSA)**

Economy-wide greenhouse gas (GHG) emission reduction goals to achieve GHG reductions of 25% below statewide 1990 GHG emission levels by 2020, and reductions of 80% below 1990 GHG emission levels by 2050.



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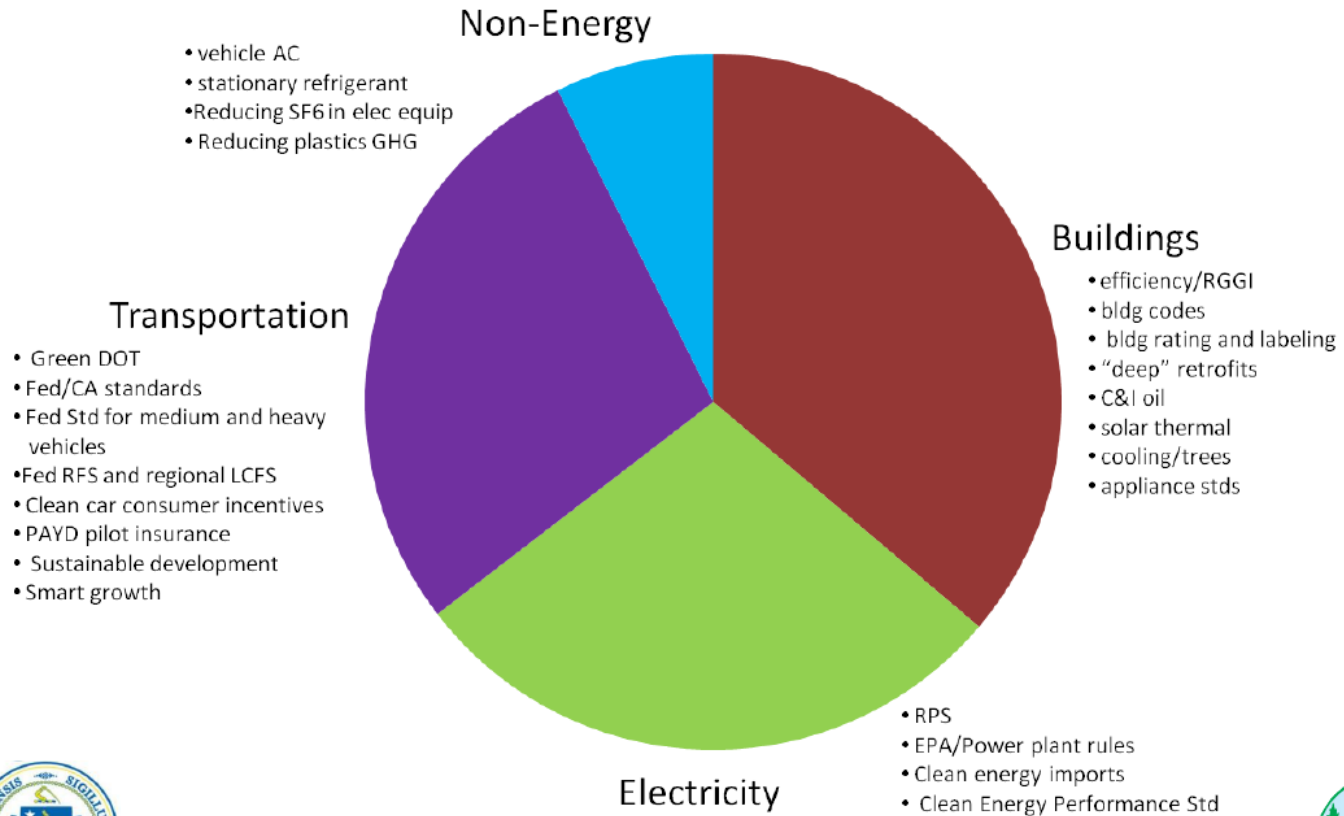
Clean Energy and Climate Plan for 2020



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Buildings Programs Provide GHG Reductions

Reduction Sources



Executive Office of Energy and Environmental Affairs



DOER

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Creating A Cleaner Energy Future For the Commonwealth

Green Communities Act of 2008

- All cost-effective energy efficiency
- Green Communities program
- Advanced building energy codes



Energy Efficiency: Our First Fuel

3-year Energy Efficiency Plans: maximizing our best energy investment option

- Making energy efficiency our “first fuel” puts the least cost, lowest impact option front and center to meet our energy needs.
- Employment in efficiency services has doubled since 2007; plans expected to add 4000 jobs
- GHG reductions of 5%-6%



DER

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Energy Efficiency Goal

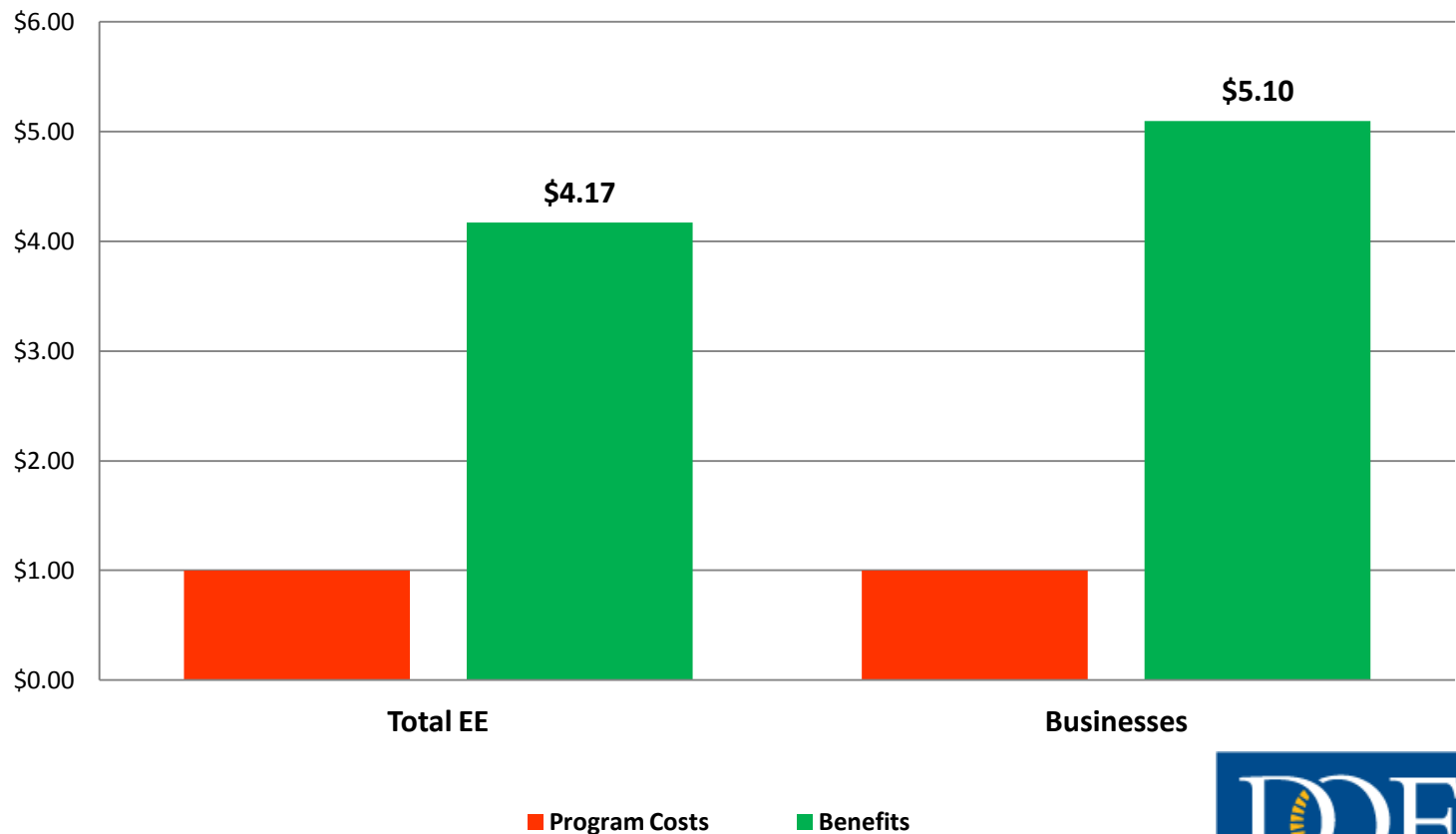
- Pursue all cost-effective energy efficiency

| THREE-YEAR PLAN GOALS | 2010 | 2011 | 2012 | Total |
|-------------------------------------|---------|---------|---------|-----------|
| Total Benefits (million \$) | 1,409 | 2,022 | 2,536 | 5,967 |
| Annual Electric Savings (GWh) | 625 | 907 | 1,104 | 2,636 |
| Annual Gas Savings (million therms) | 14 | 18 | 26 | 58 |
| Annual GHG Reductions (metric tons) | 376,000 | 538,000 | 677,000 | 1,591,000 |

- First 3- year energy efficiency plan:
 - \$2 billion investment
 - \$6 billion in benefits

Costs & Benefits of Energy Efficiency

Energy Efficiency Provides Over \$4 in Benefits for Every Dollar of Program Costs Invested, and Over \$5 Per Dollar Invested for Businesses



What's Available for Commercial Buildings?

- Statewide programs through Mass Save®
 - Integrated gas & electric programs
 - Streamlined, cost effective
 - Technical assistance
 - Incentives
 - Financing
- Technical assessments
- Technology
 - CHP program
 - Solar, wind
- Pilots to figure out more/better/faster



Who Has Benefitted?

- Small C&I Customers
 - Lighting, weatherization
- Large Commercial & Industrial Customers
 - Audits, facility retrofits, lighting upgrades, combined heat and power, variable speed drives, energy management systems
 - Memorandums of Understanding

How Does DOER Reach & Serve Stakeholders?

- Mass Save
- Green Communities
- Lead by Example
- Commercial and residential pilots
- Advance building energy codes
- Energy management systems
- Outreach and training



Green Communities Division

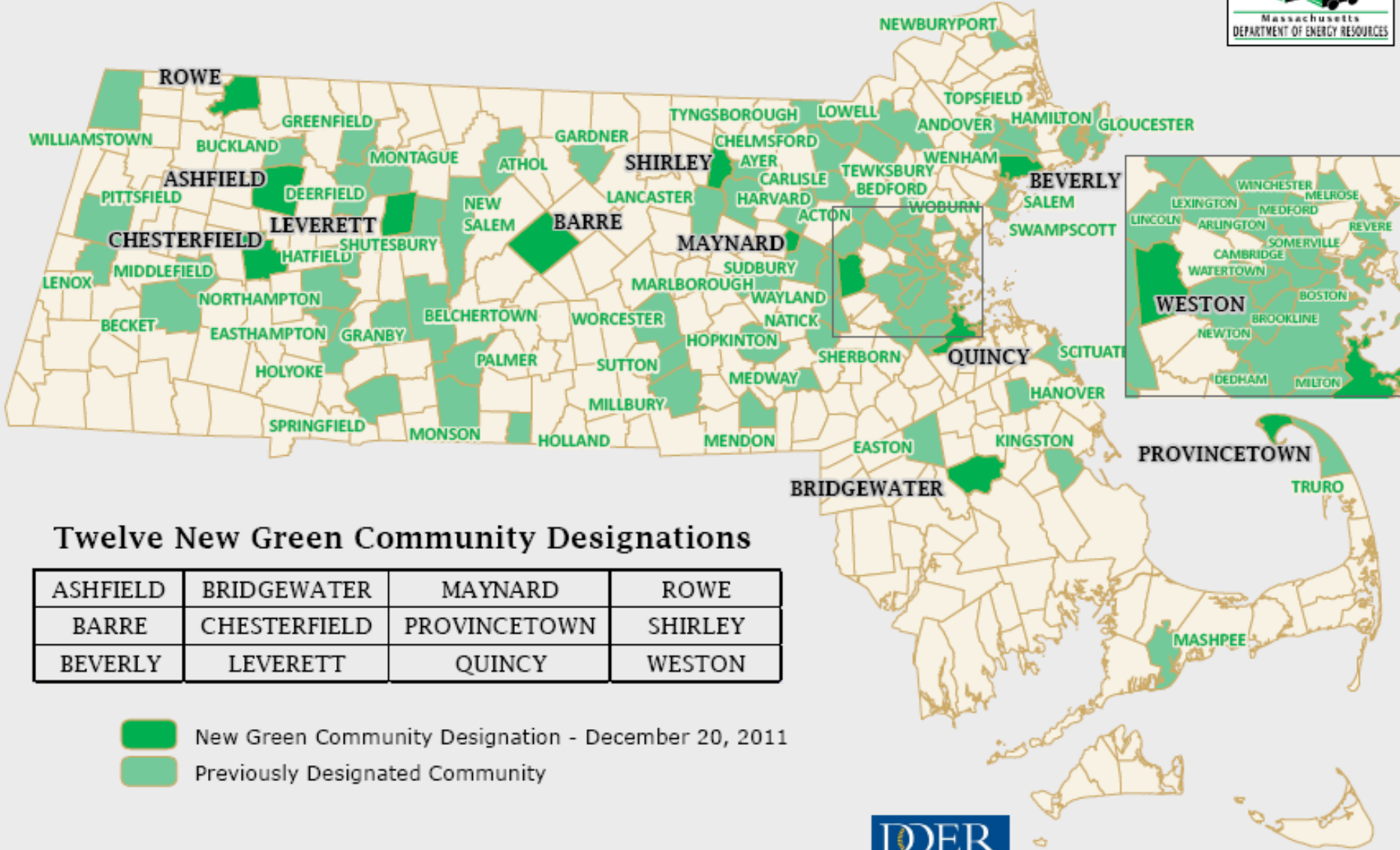
Created by Statute

- 86 cities and towns designated Green Communities
- Nearly \$18 million invested to implement energy efficiency and renewable technologies
- Total energy reductions over five years equal to the annual energy consumption of more than 13,000 Massachusetts households.
- Five challenging criteria



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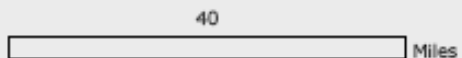
GREEN COMMUNITY DESIGNATIONS REACH EIGHTY-SIX



Twelve New Green Community Designations

| | | | |
|----------|--------------|--------------|---------|
| ASHFIELD | BRIDGEWATER | MAYNARD | ROWE |
| BARRE | CHESTERFIELD | PROVINCETOWN | SHIRLEY |
| BEVERLY | LEVERETT | QUINCY | WESTON |

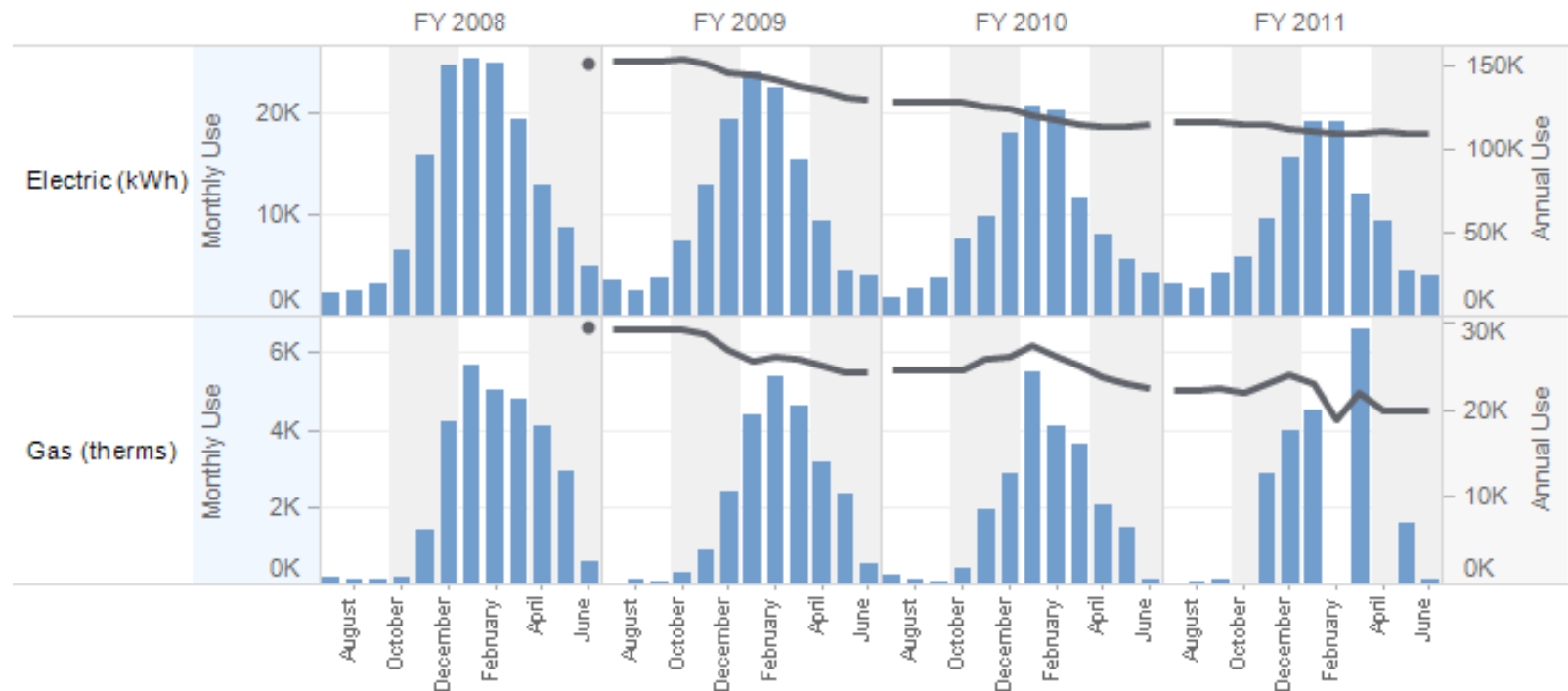
- New Green Community Designation - December 20, 2011
- Previously Designated Community



Green Communities – Can Now Measure Energy Use by Building

Building Dashboard

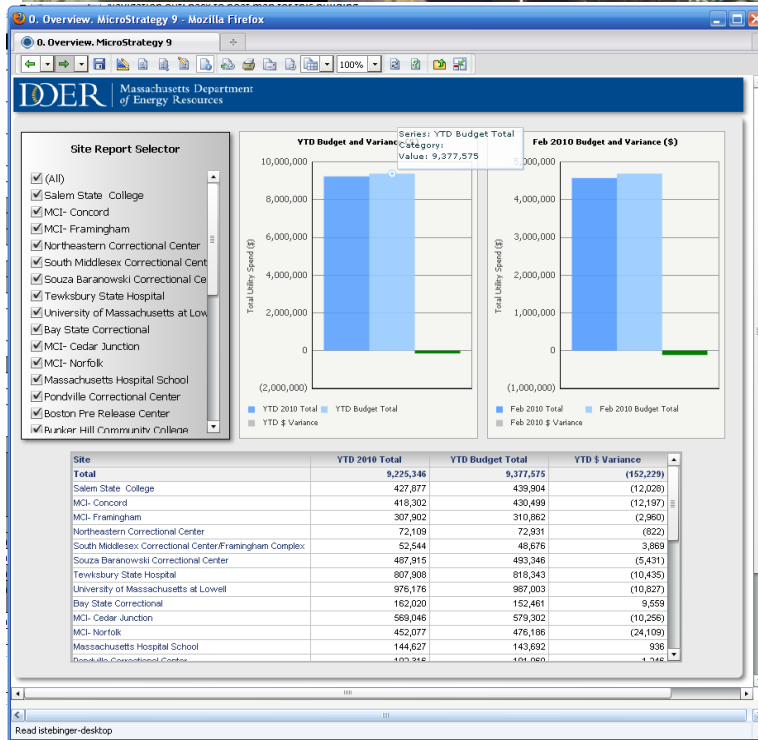
Usage Trends ■ Monthly Use ■ Annual Use (12 Month Rolling Sum)



Leading by Example: Real-time Energy Management in State Buildings



1. Installation of over 110 near real-time (5 minute) building-level meters for electricity, natural gas, oil, steam, condensate, propane, hot and chilled water



2. Access to web-enabled software application that tracks, trends, benchmarks, and reports on energy consumption data to drive energy efficiency



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Energy Future For the Commonwealth

Accelerated Energy Plan

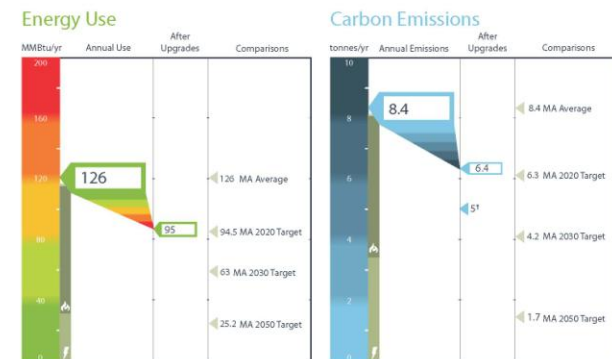
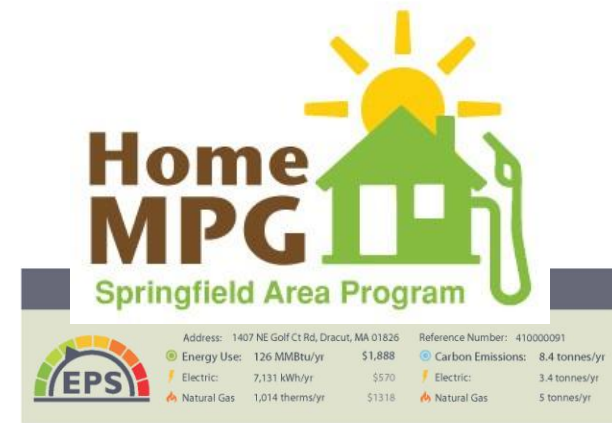
- Governor's Leading by Example initiative
 - Set aggressive energy and greenhouse gas reduction target for all state agencies
 - Requires minimum amounts of clean renewable power
- Division of Capital Asset Management
 - An accelerated energy plan will greatly expand the retrofiting of state facilities across agencies
 - Coming soon

Building Labeling Pilot

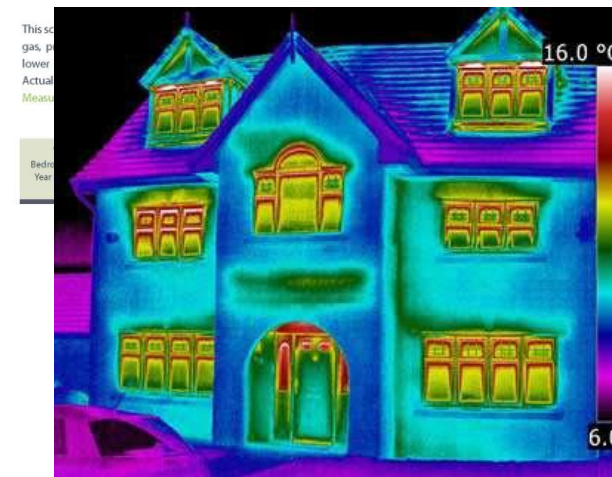
Mass Save pilot in Springfield area

- Residential energy audit with 'Home MPG' score
- Customized website for home
- Local bank financing streamlined
- Option to view thermal image where available & desired

Home score and thermal image raise awareness and guide smart energy efficiency investments



*With energy from renewable sources



Building Labeling Pilot

2 year Commercial Office pilot

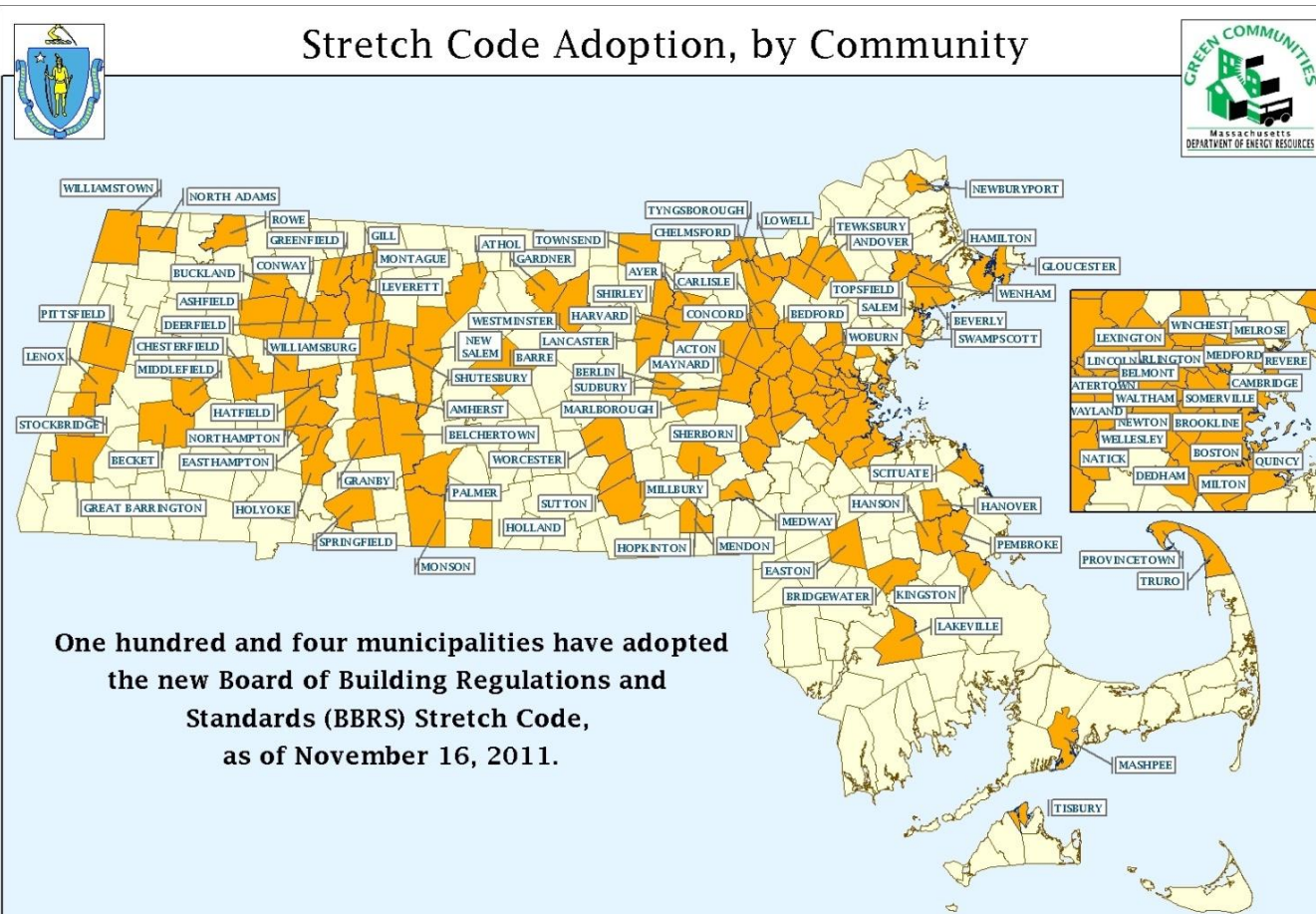
- US DOE & Barr Foundation Grants
- Boston, Cambridge, Marlborough
- Rating the building, not the tenants
- Collaboration with US DOE & CA

Labeling pilot to find low-cost path to improved energy data for real estate and energy efficiency investors

| Bldg Asset Rating | | | |
|---|----------------|----------------------|----------------|
| 100 Cambridge Street, Boston, MA 20114 | | | |
| C | O | | M |
| US B.A.R. RATING: | | | |
| Square Feet: | 90,000 | B₂ | |
| Fuel (Site): | Natural Gas | | |
| Fuel (Source): | Coal | | |
| Carbon: | 10,000 tons/yr | | |
| EUI: | | | Finance Rating |
| HVAC: | | Hypothetical | A1 |
| Lighting: | | Example | A3 |
| Plug Load: | | | B3 |
| Heating System Effic. 87% 90% C1 | | | |
| Building Envelope: | | | |
| Thermal Insulation: | R-35 | R-27 | B3 |
| Air Leakage: | .23 | .29 | B2 |
| Glazing: | | | |
| SHGC | 32 | 25 | A3 |
| U-Value | .28 | .35 | A3 |
| Renewables: | | | |
| 250 kW Solar Array | | | A2 |
| 1 MW CHP | | | A1 |

Building Energy Codes

- Intrinsic market driver for energy efficiency
- Allows best practices to update – saving ratepayers
- Energy code (IECC and Stretch) updated every 3 years
- 105 Stretch Code Communities



Building Energy Codes - Timeline

- New IECC 2012 published in July 2011
- Public hearing for IECC 2012 and stretch code planned for May 2012
- Proposed effective date to update energy codes is July 2013
- Commercial stretch code aligned with USGBC 'LEED' modeling
- Changes for 2012 include allowance for CHP and district heating

CLEAN ENERGY RESULTS

Advancing renewable energy & energy efficiency in the Commonwealth

- **Encourage clean energy projects**
 - Remove technical and regulatory barriers
 - Complex environmental permitting
 - Limited information for communities on environmental requirements and best practices
 - Difficulty in finding appropriate sites for new projects
 - Streamline siting and permitting processes
 - Tap MassDEP's scientific expertise
- **Clean Energy Results Program offers:**
 - Assistance to project proponents
 - Services for communities
 - Streamlined regulatory pathways
 - Improved public health and environmental data



Creating A Cleaner Energy Future For the Commonwealth

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.



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.

Exciting Time in Massachusetts

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

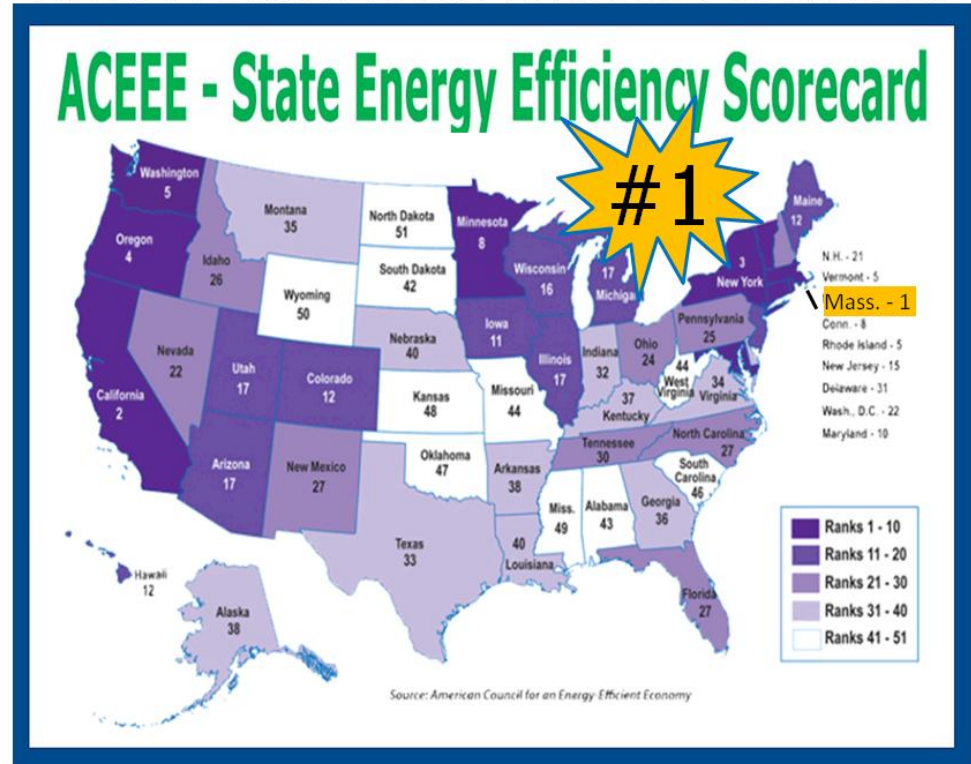


#1 State in Energy Efficiency

ACEEE credits policy implementation

"Massachusetts earned its number one ranking this year by excelling in every aspect of energy efficiency."

THE 2011 STATE ENERGY EFFICIENCY SCORECARD



"Central to Massachusetts' success is the continued implementation of the 2008 Green Communities Act, which laid the foundation for greater investment in energy efficiency programs."



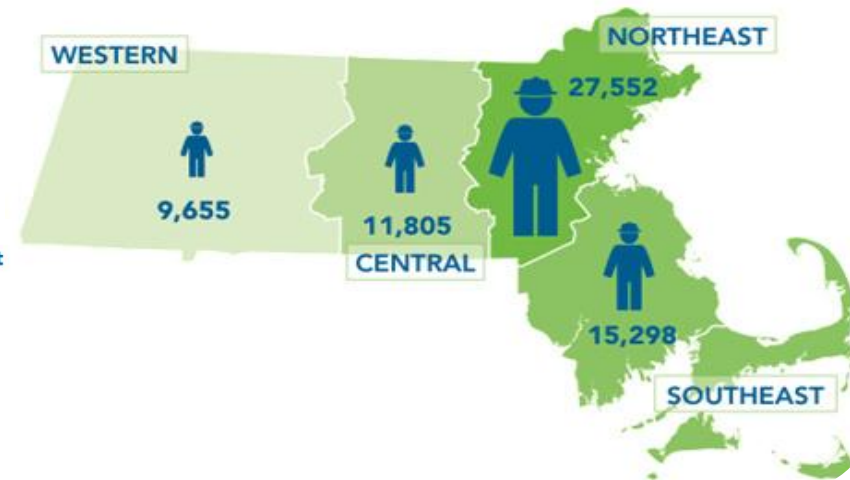
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Clean Energy Industry Provides Jobs

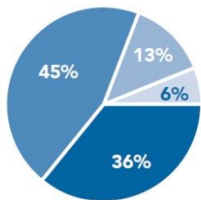
2011 Massachusetts Clean Energy Industry Study Key Findings

- 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

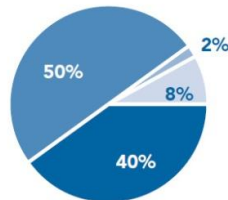


MA Clean Energy Employment Growth from July 2010 to July 2011



- 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

- Clean Energy & Climate Plan Implementation
 - 25% reduction in GHG by 2020
- Planning for the next three year EE plans
- Building labeling pilots
- Increased collaboration between state agencies
 - Clean Energy Results Program
- Expanding activity in additional technologies
- Continued collaboration with region
 - RGGI
 - ISO-NE