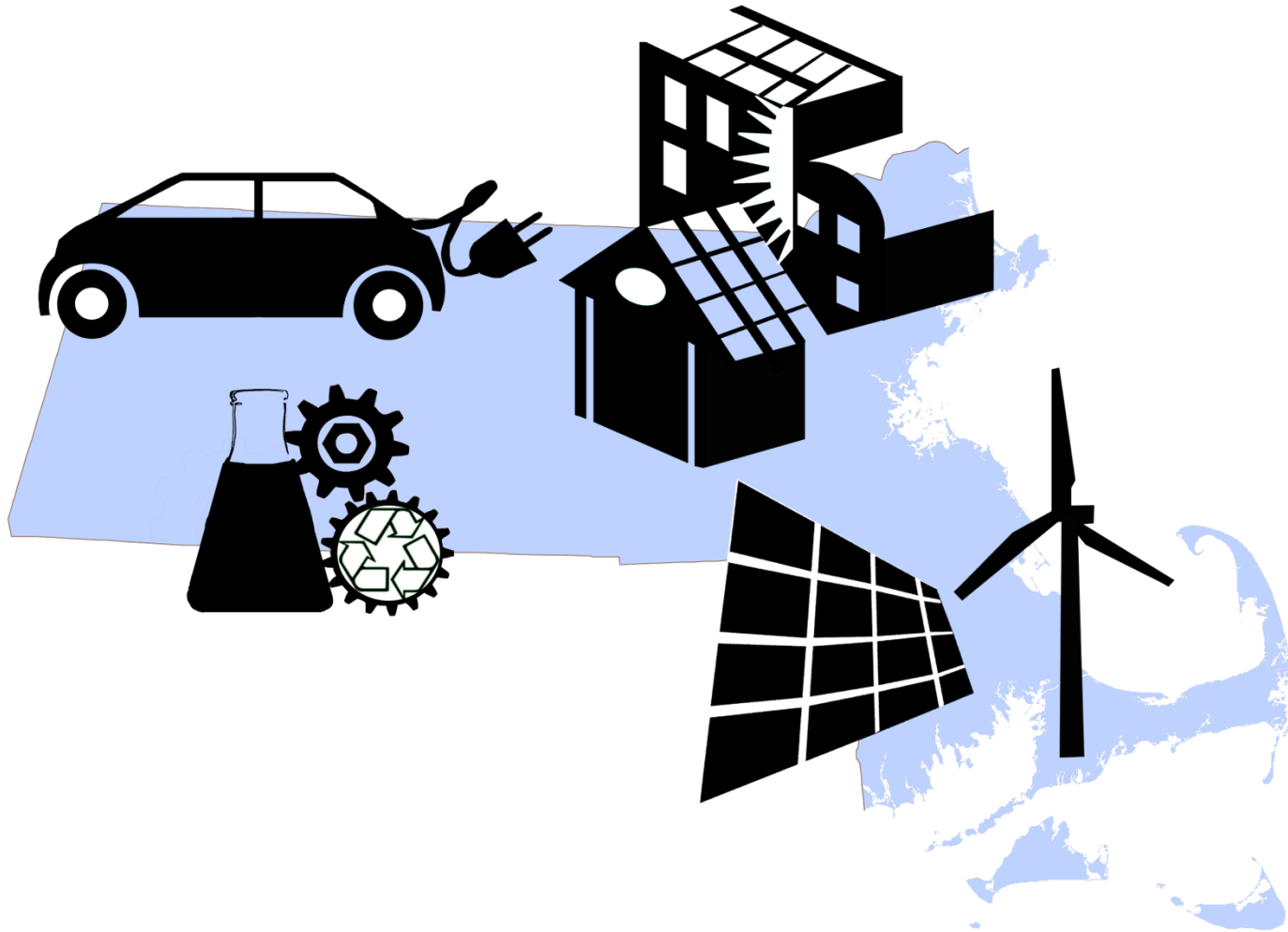


# *Massachusetts Clean Energy and Climate Plan for 2020*



*Executive Office of Energy and Environmental Affairs*



# Massachusetts Clean Energy and Climate Plan for 2020

## I. The Rationale: Launching the Clean Energy Revolution

- Energy Costs & Volatility; Energy Independence
- Economic Opportunity
- Climate change
- Air quality

## II. An Integrated Portfolio of Policies

- Buildings
- Electricity Supply
- Transportation
- Non-Energy Emissions
- Cross-cutting Policies

## III. Implementing the Global Warming Solutions Act

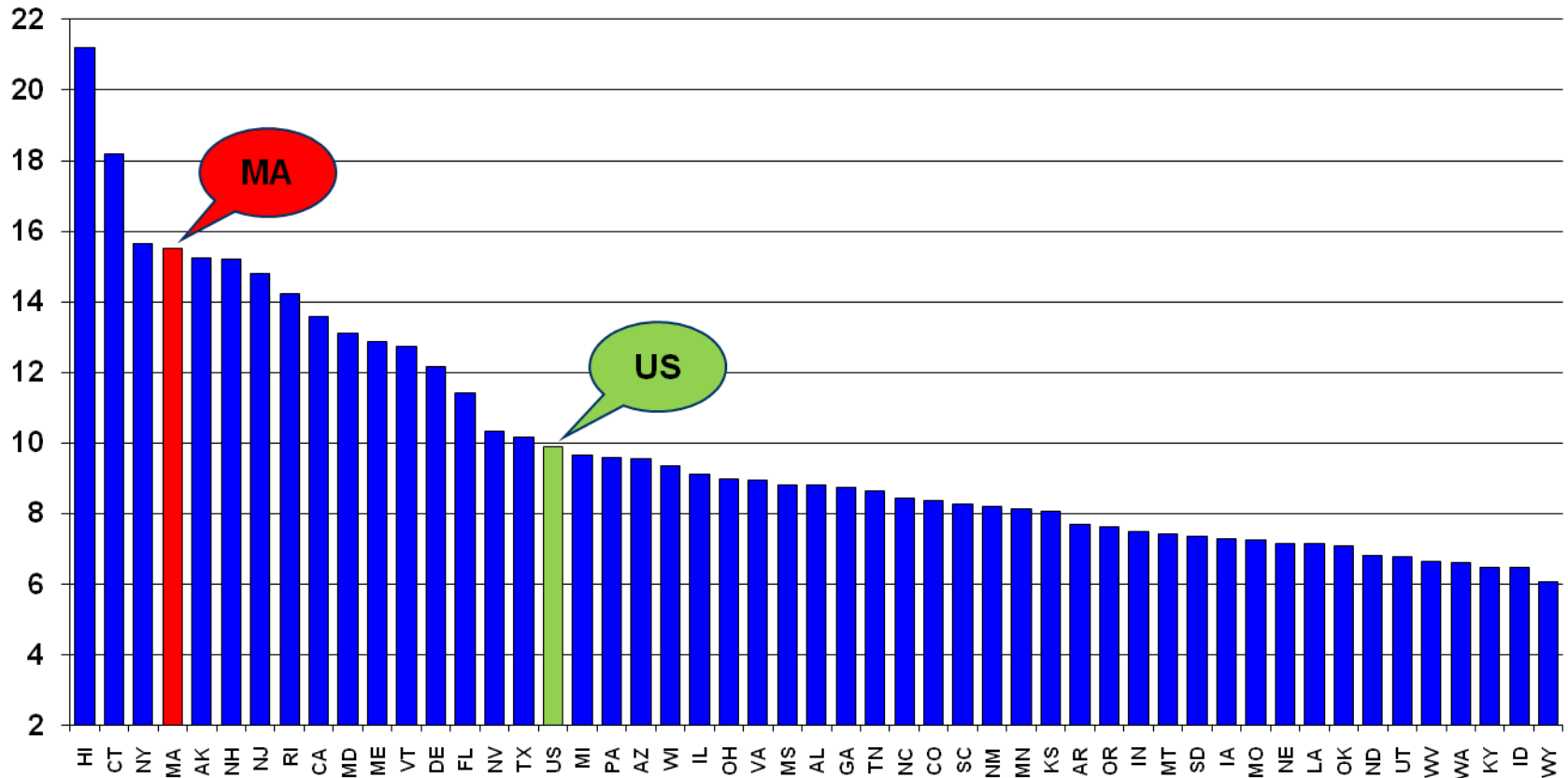
- Setting the Limit
- Putting the Plan into Action

## IV. Beyond 2020: The Road to 80% Lower Emissions in 2050



# MA has High Electricity Prices ...

2009 Average Retail Electric Price  
(Cents per kWh)



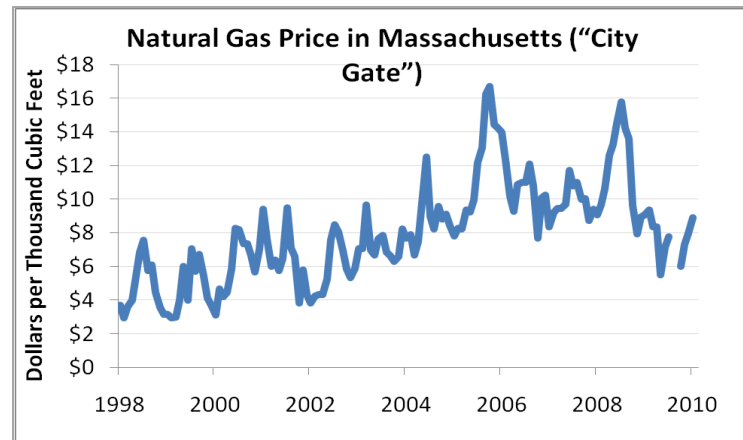
Source: EIA Form 826



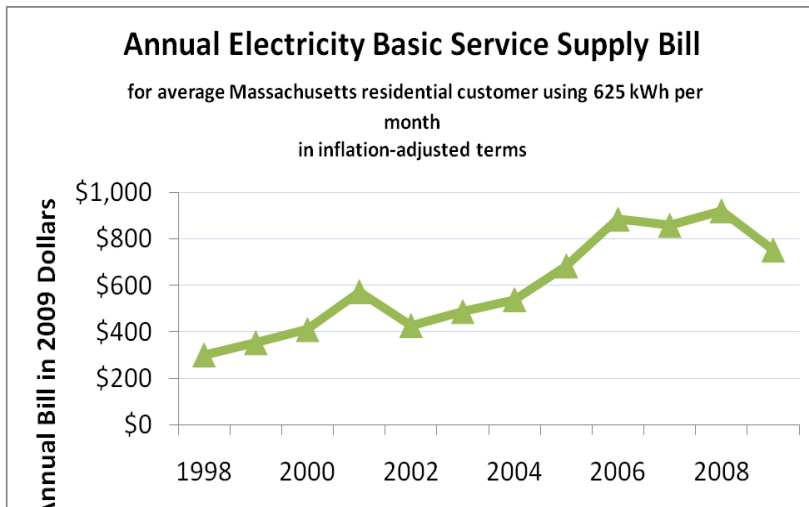
Executive Office of Energy and Environmental Affairs



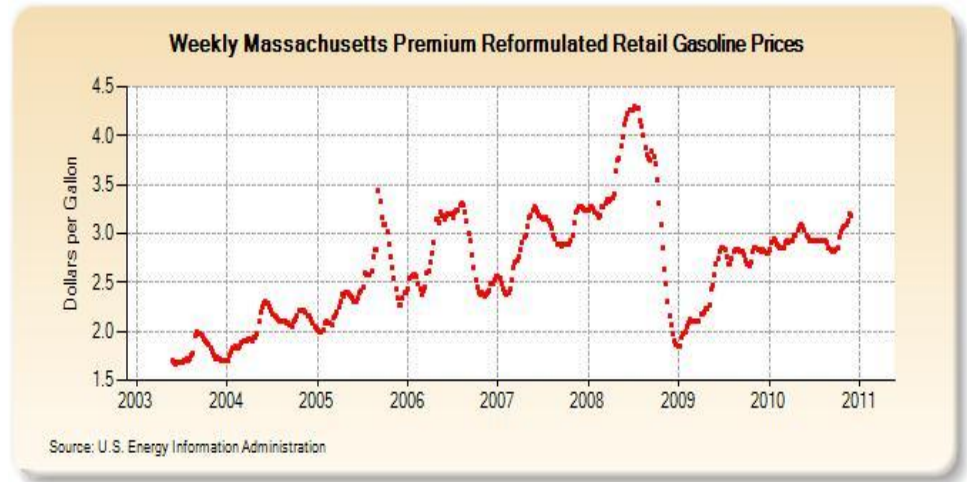
# Energy Costs & Volatility



**Figure ES-1. Increase and volatility in natural gas prices (source: DOER)**



**Figure ES-2. Increase and volatility in electricity prices (source: DOER)**



**Figure ES-3. Increase and volatility in gasoline prices (source: U.S. Energy Information Administration (EIA))**



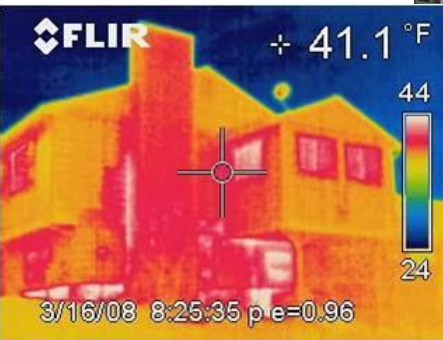
# Economic Opportunity: Projected job growth

<b>Table ES-1. Approximate Massachusetts job increases, direct and indirect, in 2020 due to Implementation of the <i>Massachusetts Clean Energy and Climate Plan</i></b>	
Federal and California vehicle efficiency and GHG standards	6,000
Federal emissions and fuel efficiency standards for medium and heavy duty vehicles	1,000
Pay As You Drive auto insurance (PAYD)	3,000
Clean car consumer incentives	2,000
Smart growth policy package	1,000
subtotal — transportation	13,000
Electric efficiency programs	10,000
Natural gas, heating oil efficiency programs	9,000
Advanced building energy codes	3,000
Federal appliance & product standards	1,000
subtotal — buildings efficiency	23,000
Renewables (solar, wind, biomass, biofuels)	6,000 - 12,000 <sup>1</sup>
Total	42,000 - 48,000



# Energy Efficiency

- Most ambitious EE program in the country;
  - 3 X California/capita;
- Doubling of employment in EE services since 2007
- \$2 Billion Investment = \$6 Billion Savings
  - Cheapest “new” source of energy;
- By 2020 – 20% electricity through EE;
- 5%-6% GHG reductions



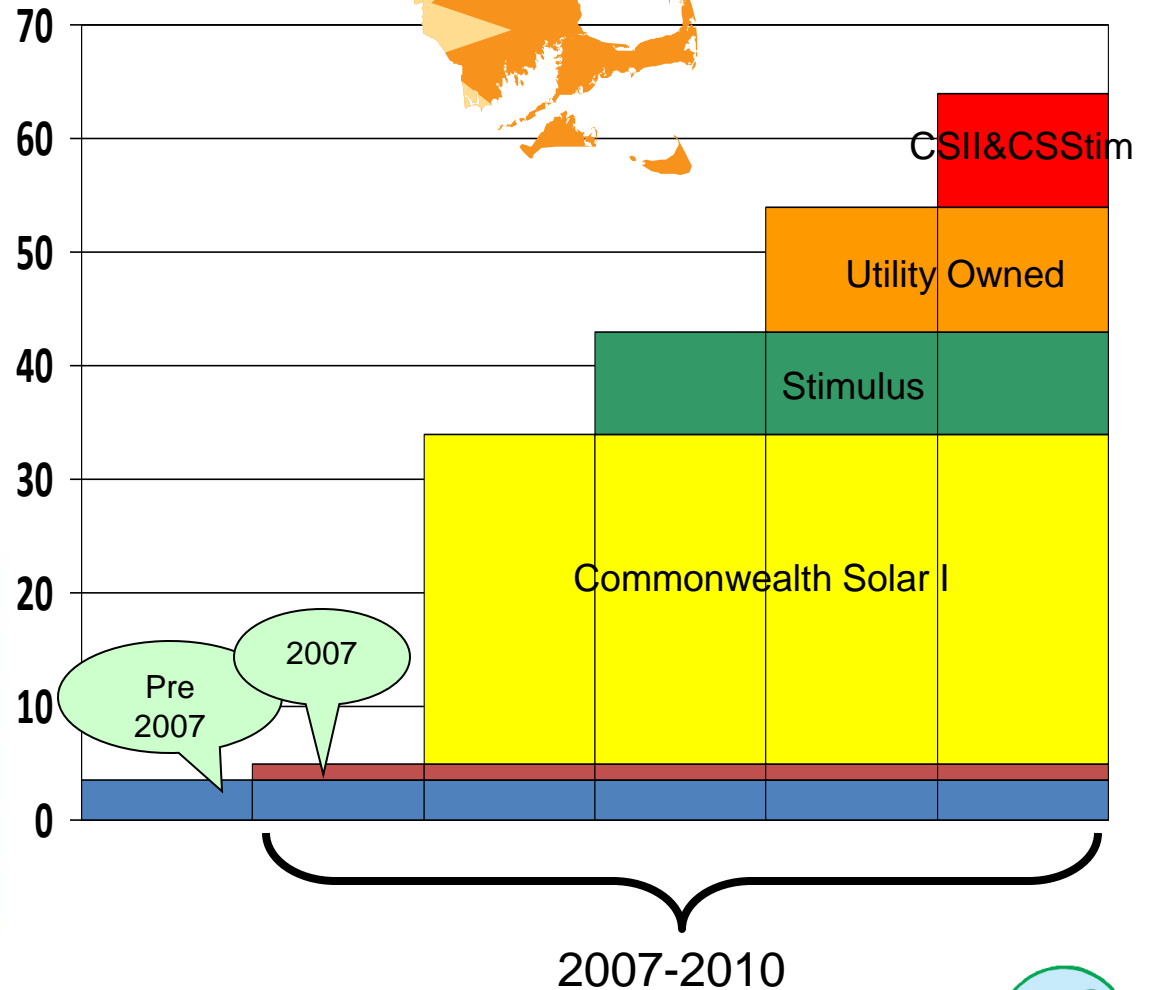
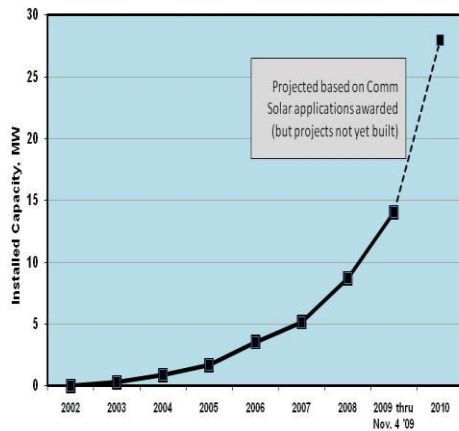
# Solar

- 20-fold increase in solar PV – from 3.5 MW to more than 60 MW by end of 2010;
- 4-fold increase in number of firms involved in solar energy installation (50 >> 200);
- Doubling of employment in solar manufacturing and installation between 2007 to 2009.



# Commonwealth Solar

- 250 MW Goal
- 20 X Solar Growth
- Over 2,900 projects
- Solar employers have grown from 50 before Comm Solar to over 200 in 2009



# Solar



Market Sector	Current U.S. Market Price Range (c/kWh)	Cost (c/kWh) Benchmark 2005	Cost (c/kWh) Target 2010	Cost (c/kWh) Target 2015
Residential	5.8-16.7	23-32	13-18	8-10
Commercial	5.4-15.0	16-22	9-12	6-8
Utility	4.0-7.6	13-22	10-15	5-7



# Wind

- 10-fold increase in wind – from 3.1 MW to more than 30 MW by end of 2010;
- Building the wind cluster:
  - Wind Blade Test Facility;
  - Cape Wind
  - Vestas R&D
  - Siemens Offshore
  - MasTank/EEW
  - New Bedford Port;
  - FloDesign
  - American Superconductor
  - First Wind



New Bedford Marine Commerce Terminal





Bay State gets fed windfall;  
Grant will give Mass. energy  
research edge

## The Boston Globe

Cape Wind lures business to Mass.;  
Patrick says at least 100  
manufacturing jobs to follow

## 'The city that lights the world'



Gov. Deval Patrick formally announces Wednesday in New Bedford that the city will host the country's first port designed specifically to support offshore wind projects. "We are first," Patrick said. "We are first. ... We are leading a whole movement."

### Governor leads raucous celebration of New Bedford's Cape Wind coup

By CHARIS ANDERSON  
canderson@times.com

**NEW BEDFORD** — To whistles and raucous applause, Gov. Deval Patrick on Wednesday formally announced the plan to construct in New Bedford the country's first port facility designed specifically to support the assembly and installation of offshore wind projects.

#### MORE INSIDE

Mood upbeat  
at economic  
development  
meeting. BB

Cape Wind, a project that is another first for the U.S., will use the facility during its construction and manufacturing phases, directly creating as many as 1,000 jobs in Southeastern Massachusetts and positioning New Bedford to attract many more as the offshore wind industry continues to grow, officials said.

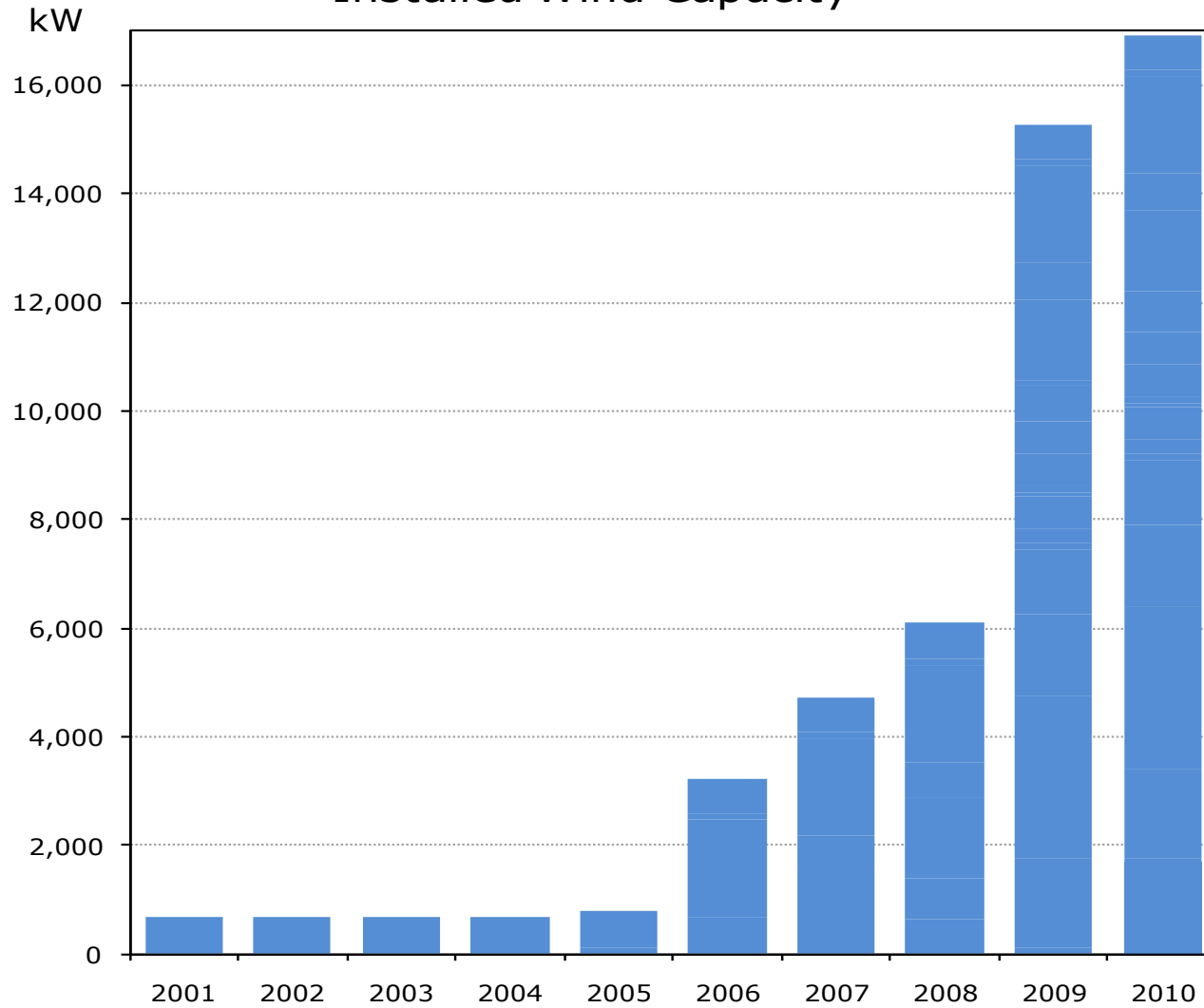


Artist's rendering of the New Bedford Marine Commerce Terminal.

SouthCoastTODAY.com

# Wind

## Installed Wind Capacity



*Executive Office of Energy and Environmental Affairs*



*“By a range of different measures, Massachusetts stands out as a clean-energy leader among states in the U.S....with strong results to date in leading-edge policies, industry expansion, job creation, and increased investment and deployment.”*

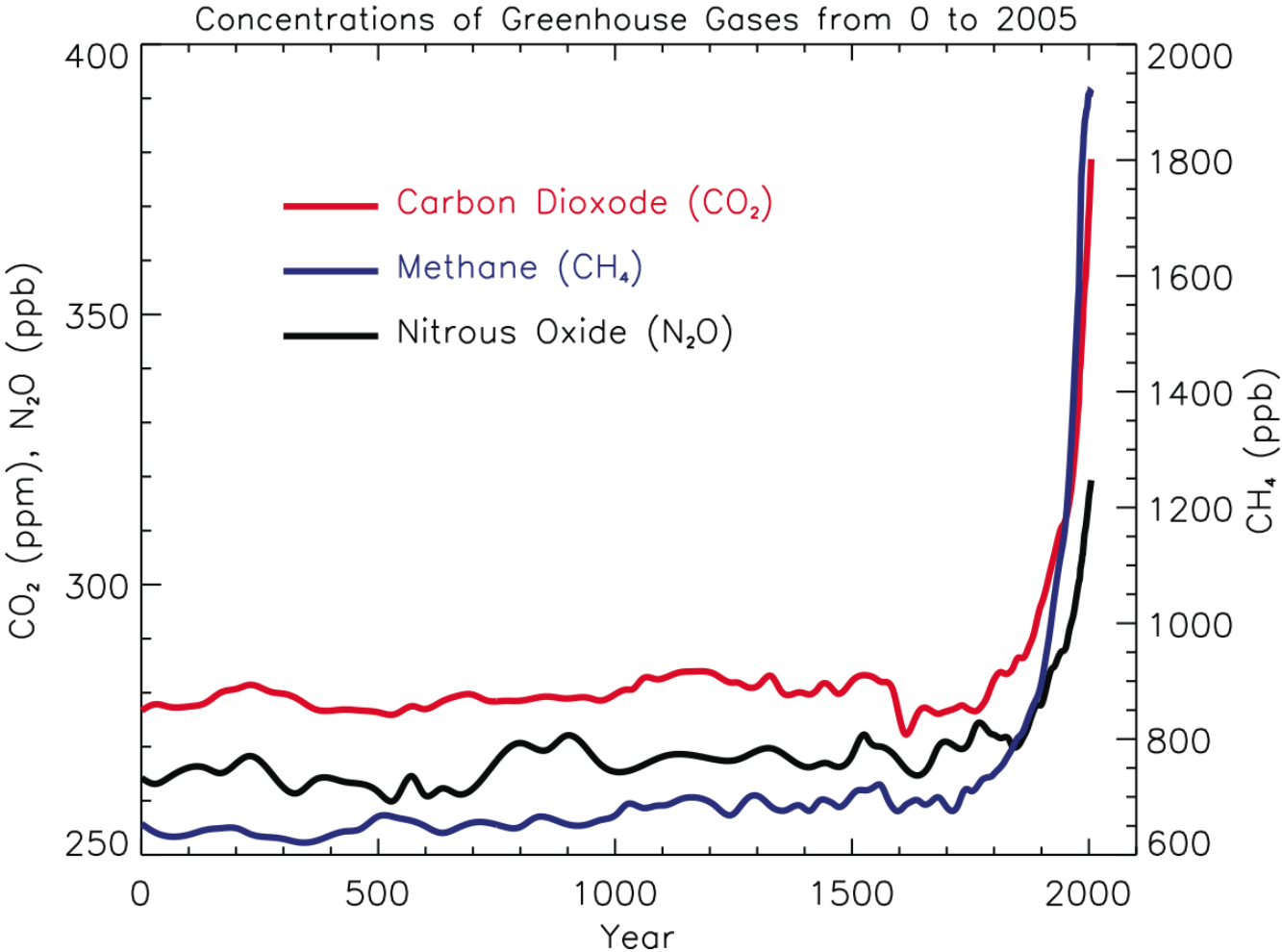
A Future of Innovation and Growth:  
Advancing  
Massachusetts' Clean-Energy Leadership,  
Clean Edge, Inc., April 22, 2010.



*Executive Office of Energy and Environmental Affairs*



# Global Increase of GHG Concentrations



# An Integrated Portfolio of Policies



*Executive Office of Energy and Environmental Affairs*



# Buildings (9.8%)

All cost-effective energy efficiency/RGGI (7.1%)

Advanced building energy codes (1.6%)

Building energy rating and labeling

“Deep” energy efficiency improvements for buildings (0.2%)

Expanding energy efficiency programs to C/I heating oil (0.1%)

Developing a mature market for solar thermal water/space heating (0.1%)

Tree retention and planting to reduce heating and cooling loads (0.1%)

Federal appliance and product standards (0.6%)



# Electricity (7.7%)

Renewable Portfolio Standard (1.2%)

More stringent EPA power plant rules (1.2%)

Clean energy imports (5.4%)

Clean energy performance standard (CPS)



# Transportation (7.6%)

Federal and California vehicle efficiency and GHG standards (2.6%)

Federal emissions and fuel efficiency standards for medium and heavy duty vehicles (0.3%)

Federal renewable fuel standard and regional low carbon fuel standard (1.6%)

Clean car consumer incentives (0.5%)

Pay As You Drive (PAYD) auto insurance (pilot program, possible expansion later) (1.1%)

Sustainable Development Principles (0.1%)

GreenDOT (1.2%)

Smart growth policy package (0.4%)



# Non-Energy Emissions (2.0%)

Reducing GHG emissions from motor vehicle air conditioning (0.3%)

Stationary equipment refrigerant management (1.3%)

Reducing SF6 emissions from gas-insulated switchgear (0.2%)

Reducing GHG emissions from plastics (0.3%)



# Cross-cutting Policies

MEPA GHG policy and protocol

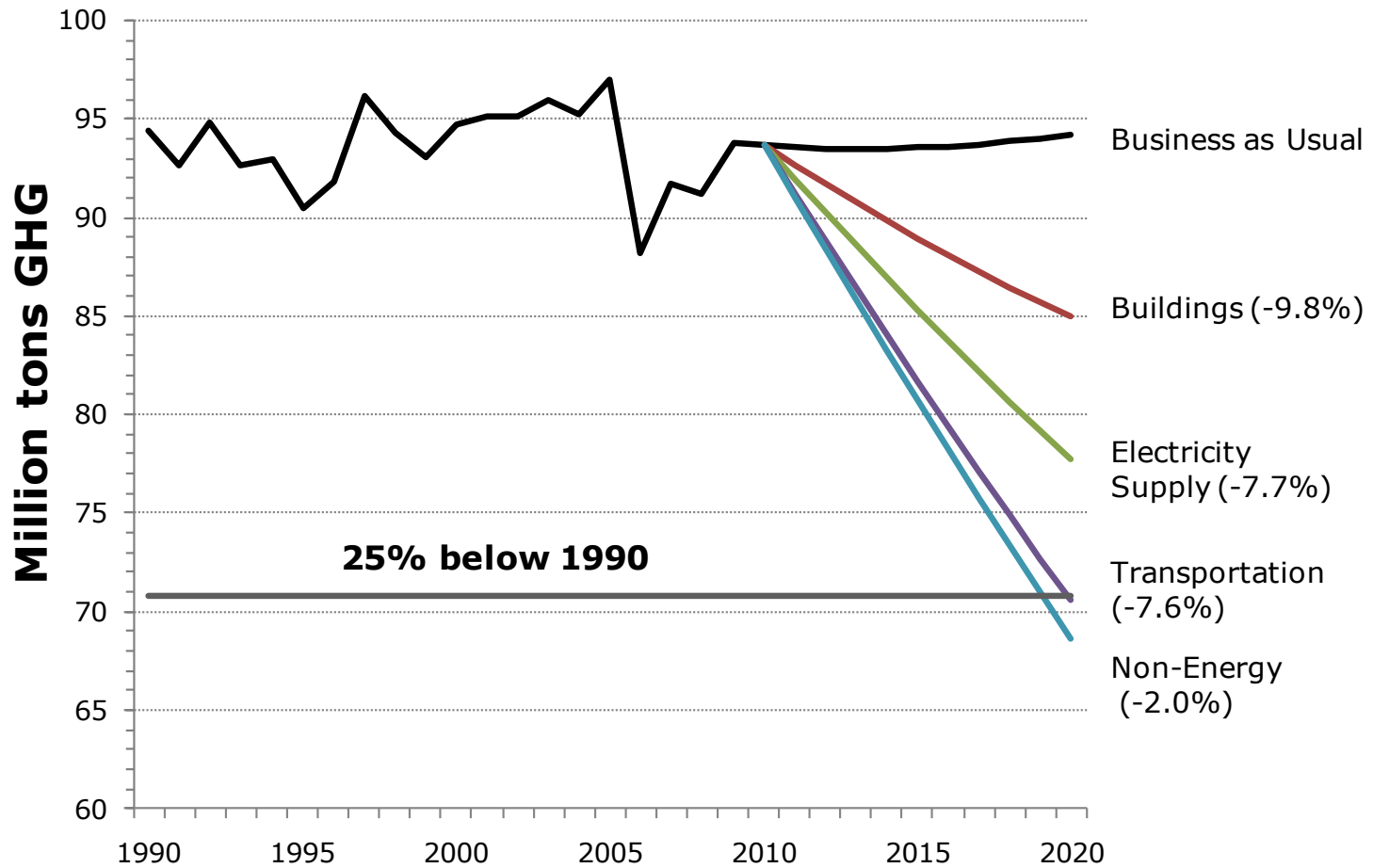
Leading by Example

Green Communities Division

Consideration of GHG emissions in State permitting, licensing  
and administrative approvals

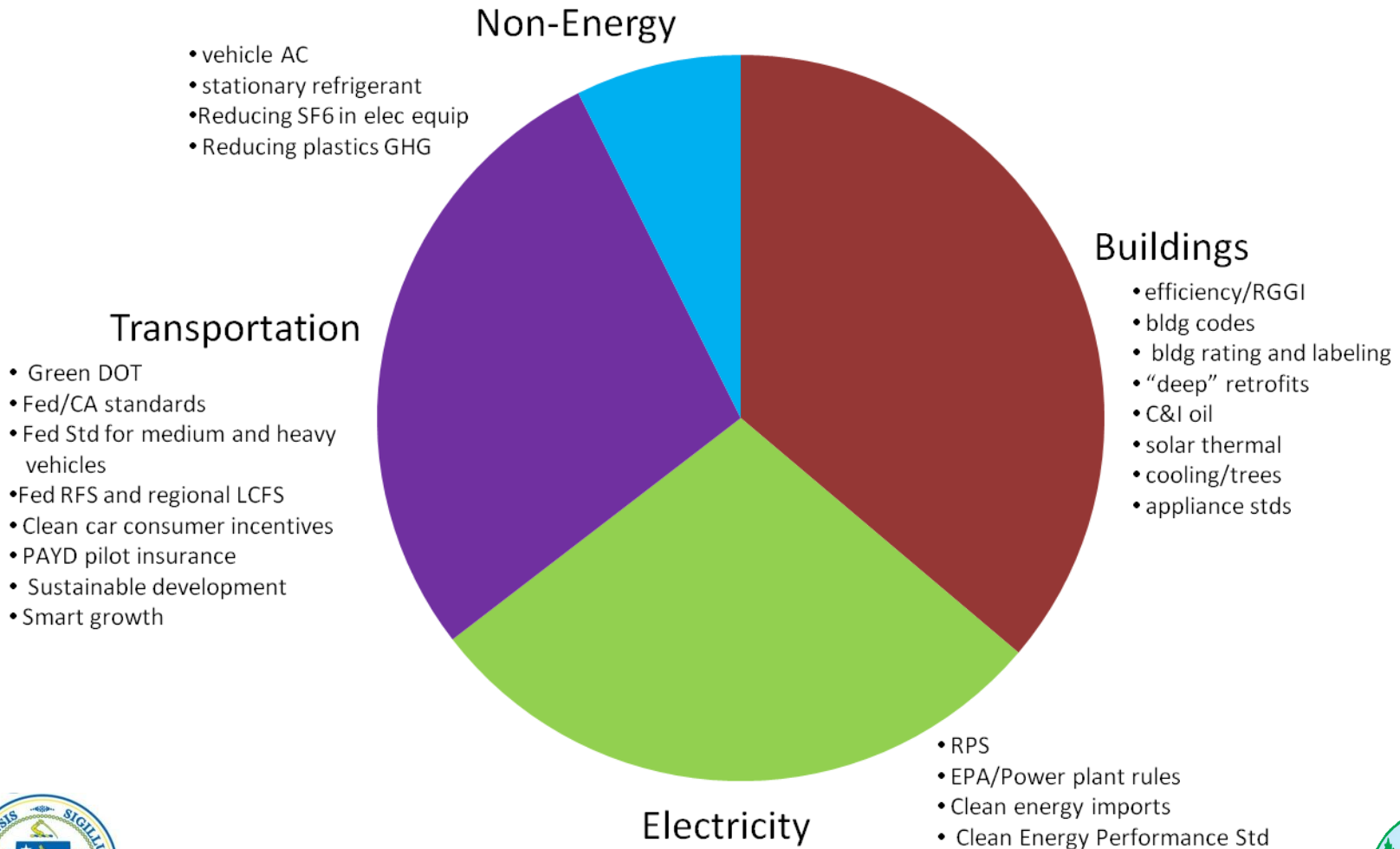


# Clean Energy and Climate Portfolio Impacts vs. Business as Usual

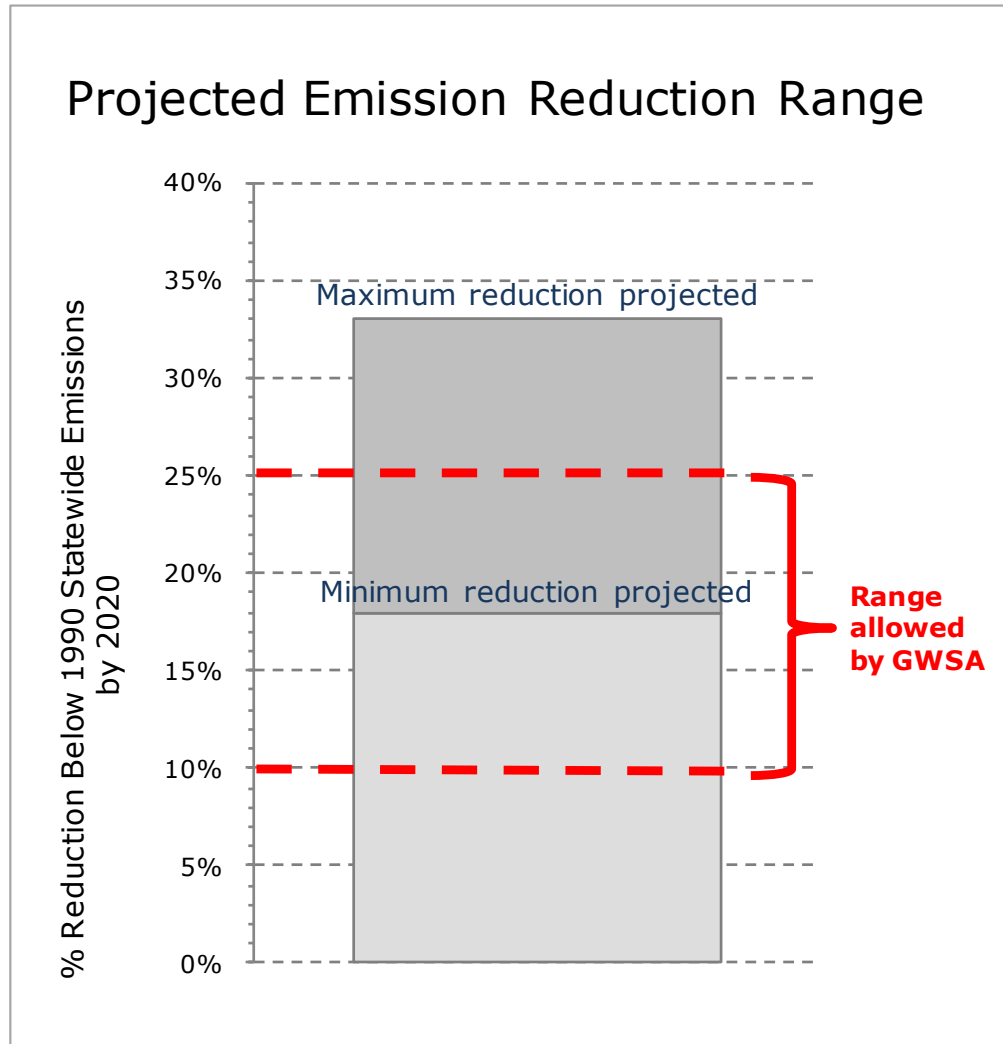


# Clean Energy Results

## Reduction Sources



# Setting the Limit



# Putting the Plan into Action

Launch Clean Energy and Climate Advisory Committee

In 2011, state agencies responsible for each new measure will complete program development and consultative processes with stakeholders

Next four years – annual status reports to the Clean Energy and Climate Advisory Committee

Increased public, NGO, community, City/Town engagement

5-year reviews



END



*Executive Office of Energy and Environmental Affairs*

