

# **Massachusetts: A case study on climate change & new energy finance**



**BOSTON AREA  
SUSTAINABLE INVESTMENT CONSORTIUM**

April 25, 2016

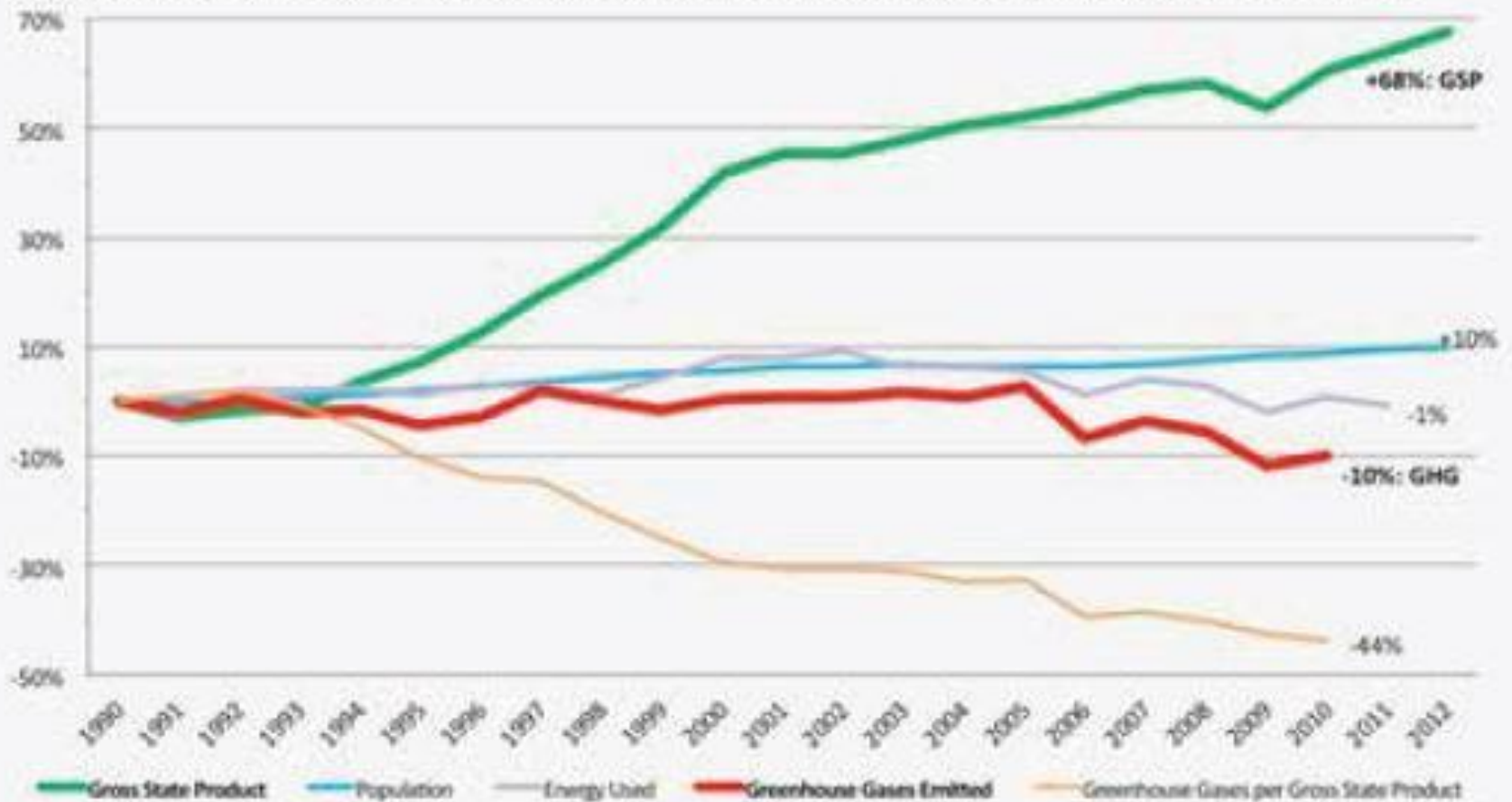
Presentation at [www.massenergy.org/BASIC](http://www.massenergy.org/BASIC)

**Non-profit mission since 1982 to make energy affordable and environmentally sustainable.**

*Helping Massachusetts and its consumers achieve GHG emission reduction requirements under the Global Warming Solutions Act (GWSA)*



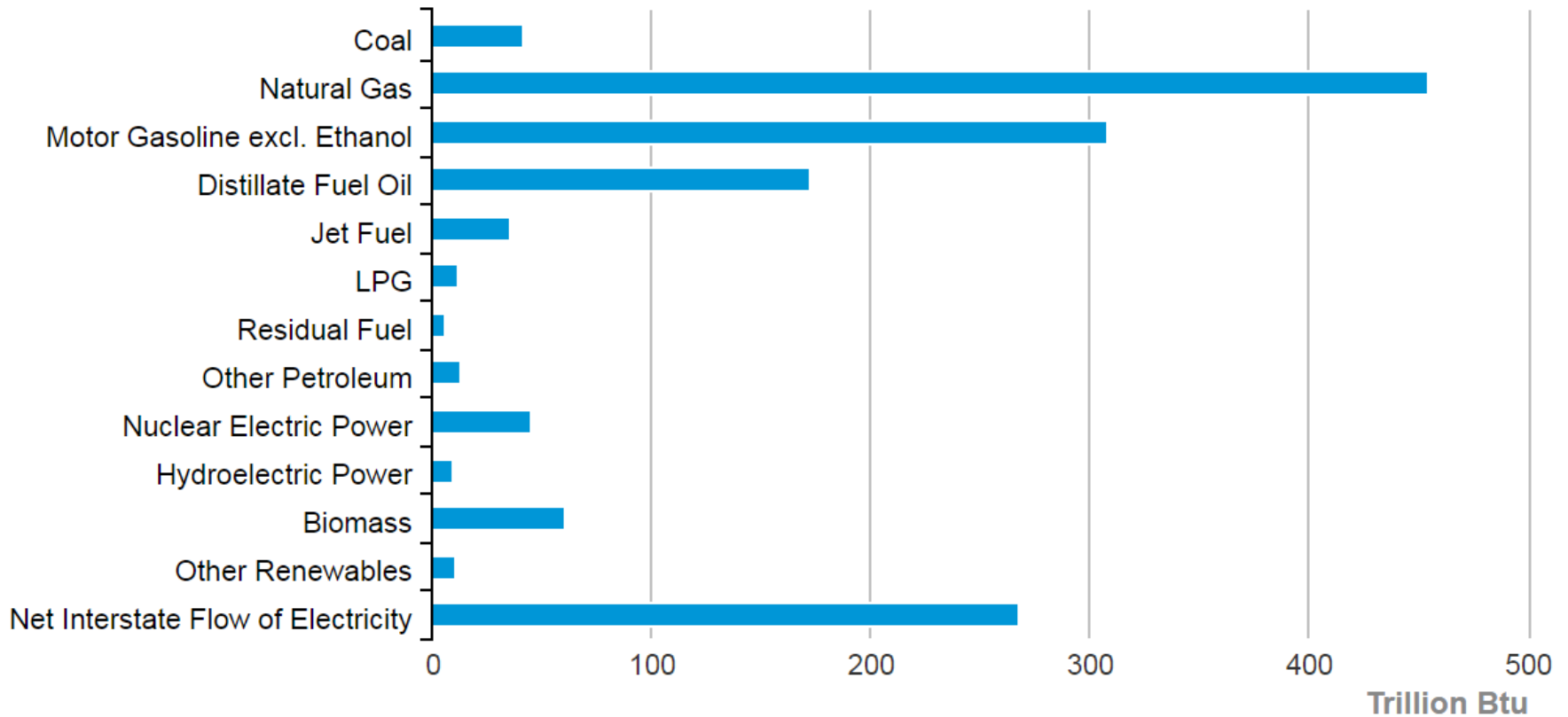
## Massachusetts' Economic Growth and Greenhouse Gas Emissions, 1990-2012



Source: MassDEP, 10/2013

Source: Massachusetts Clean Energy & Climate Scorecard 2016, Global Warming Solutions Project.

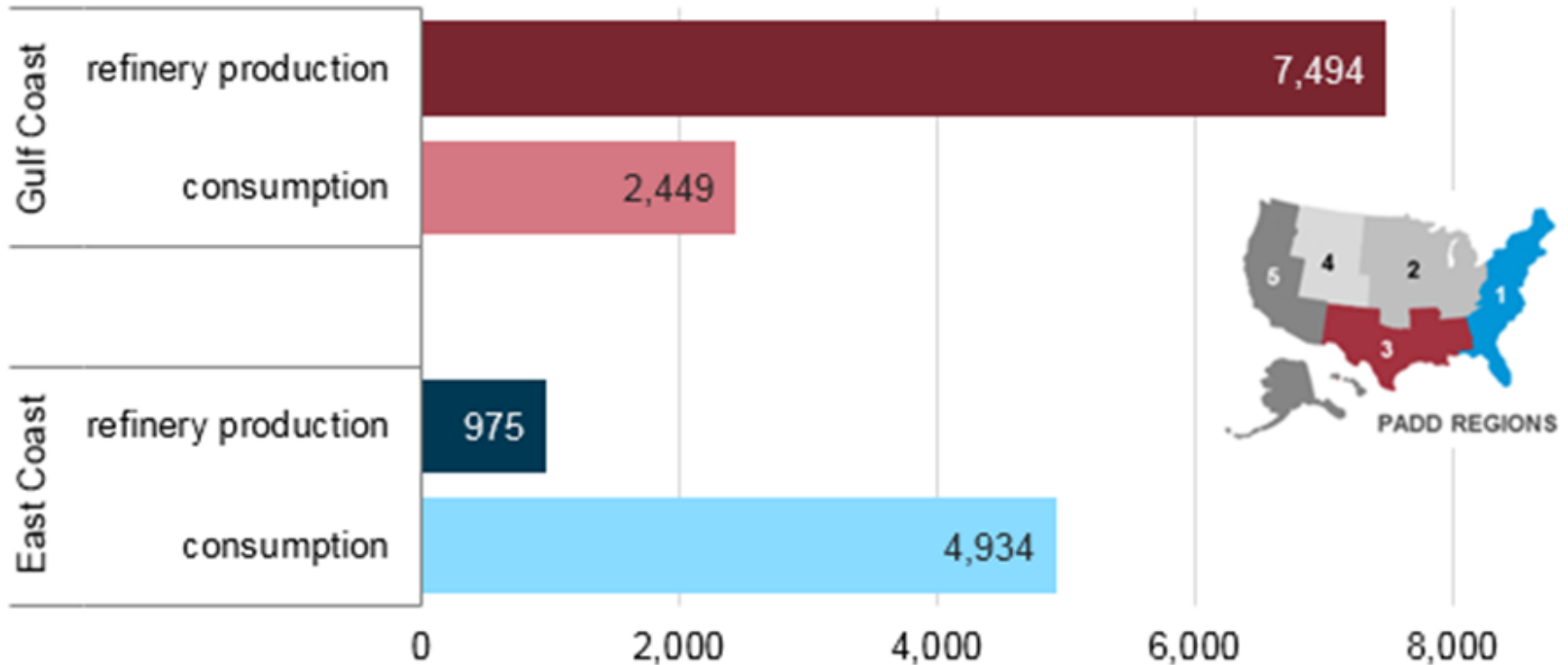
# MA Energy Consumption Estimates, 2013



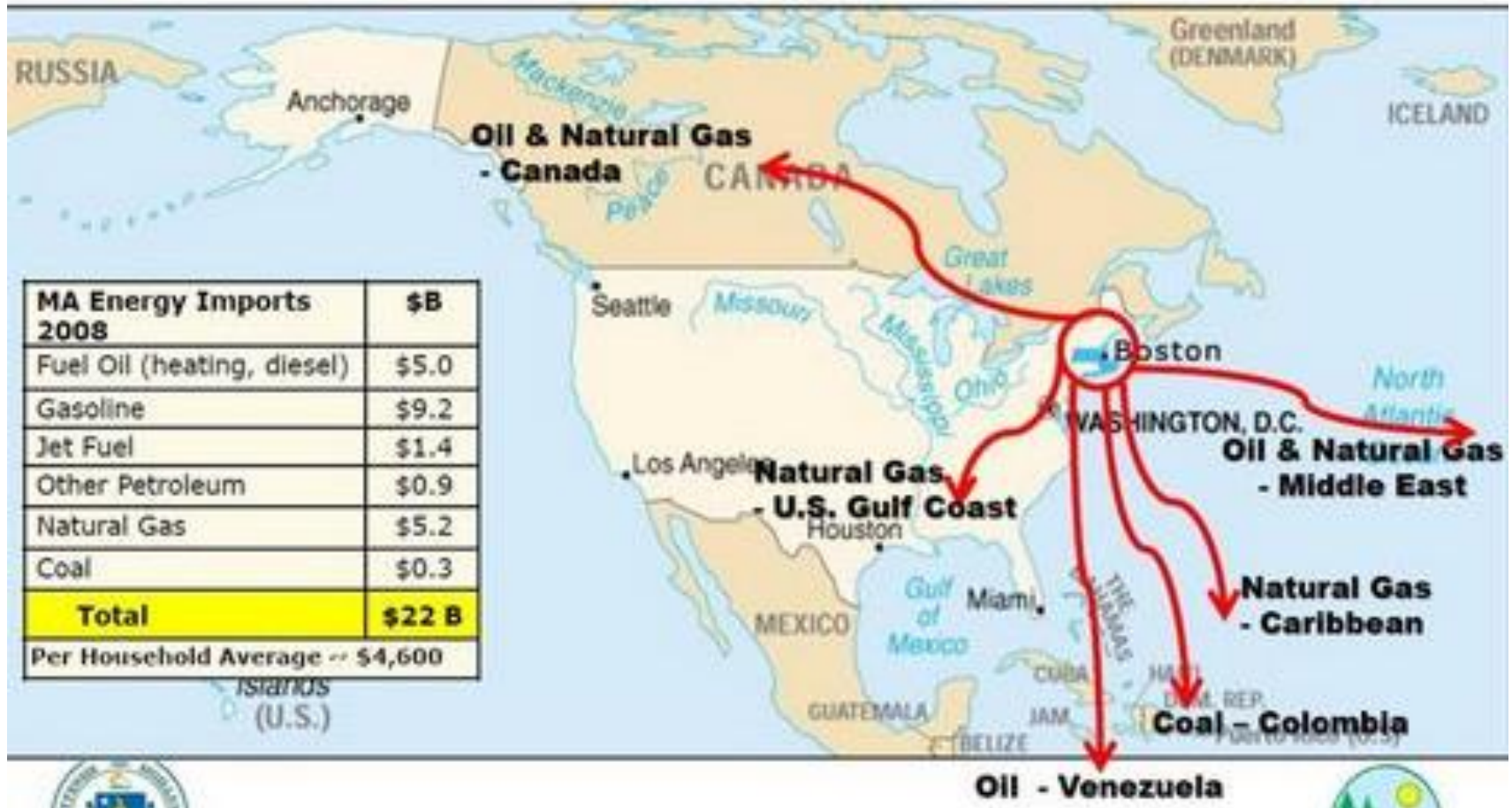
Source: Energy Information Administration, State Energy Data System

# Guzzling Gas We Don't Make

Transportation fuels refinery production and consumption in selected regions, 2014  
thousand barrels per day



# Energy Dollars Flowing out of MA



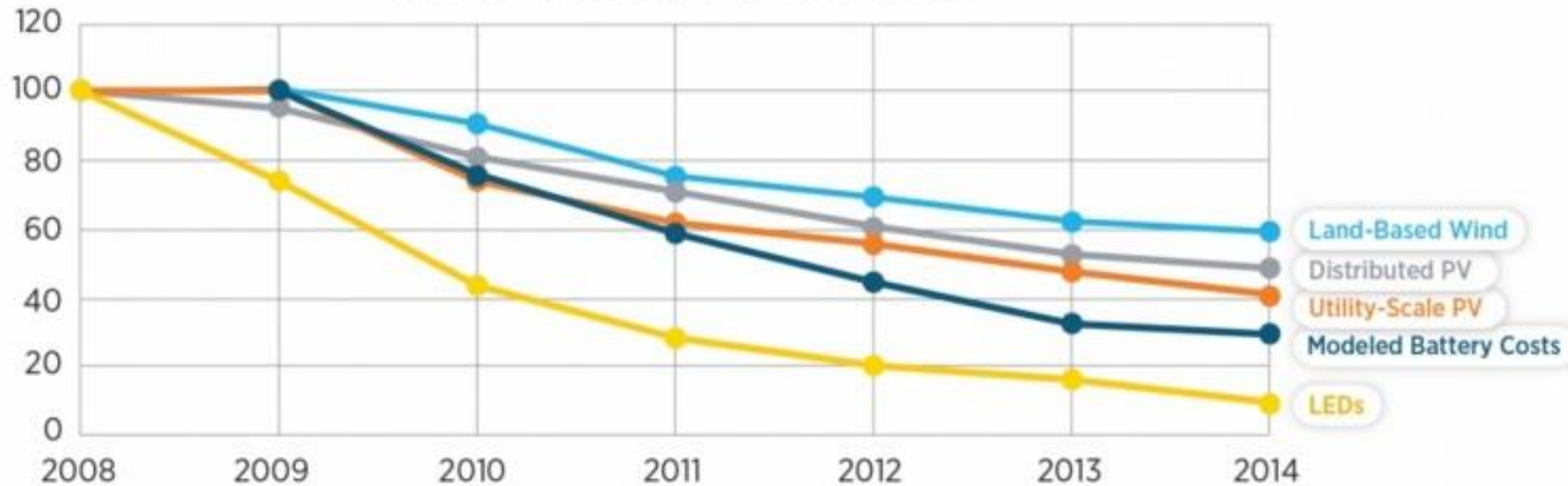
Source: Executive Office of Energy and Environmental Affairs



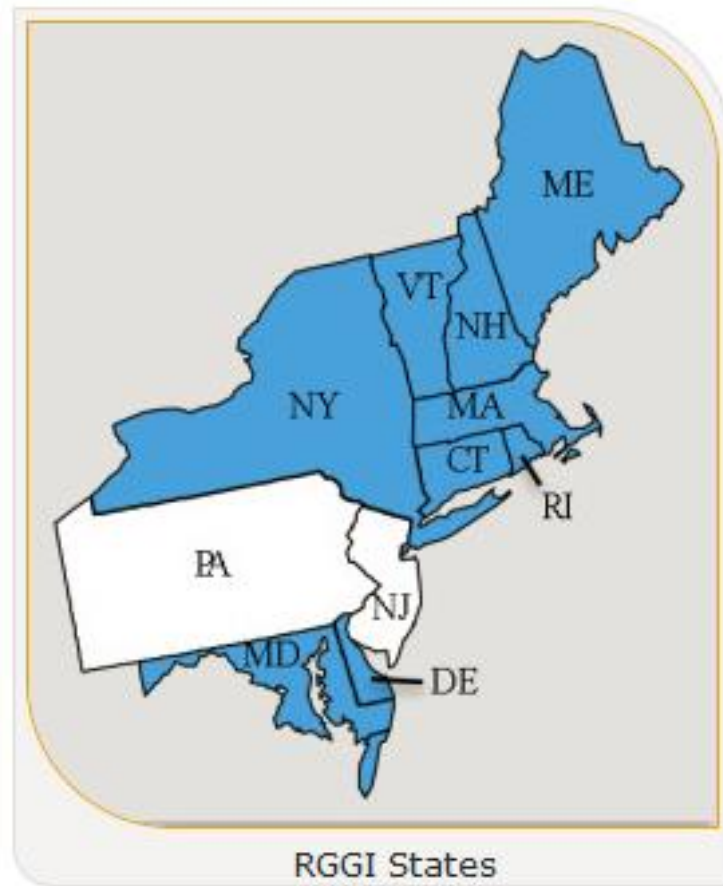
# Many Game Changers

## Falling Costs for Clean Energy Technologies

### Indexed Cost Reductions Since 2008

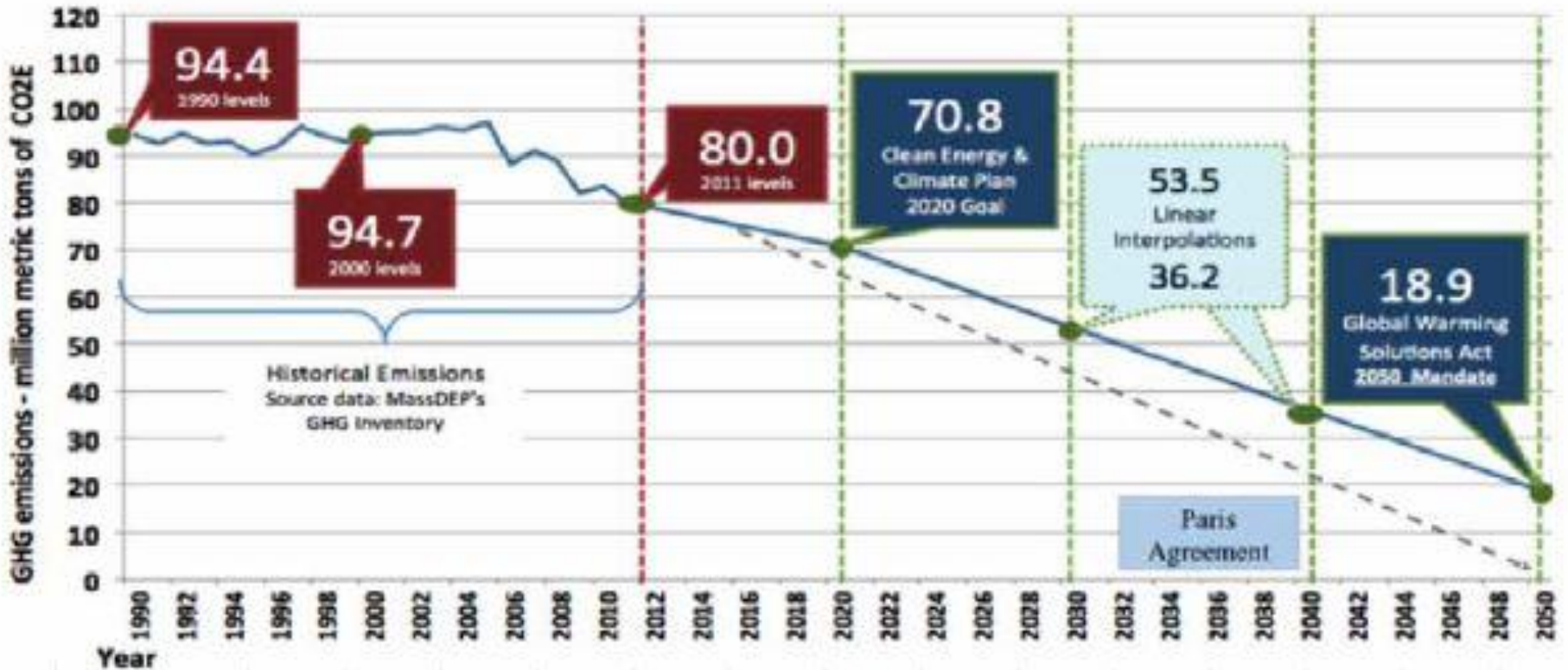


# GWSA & RGGI





## Massachusetts GHG Reduction Requirements and Interim Targets (and Paris high ambition targets) (all in MMTCO<sub>2</sub>e)

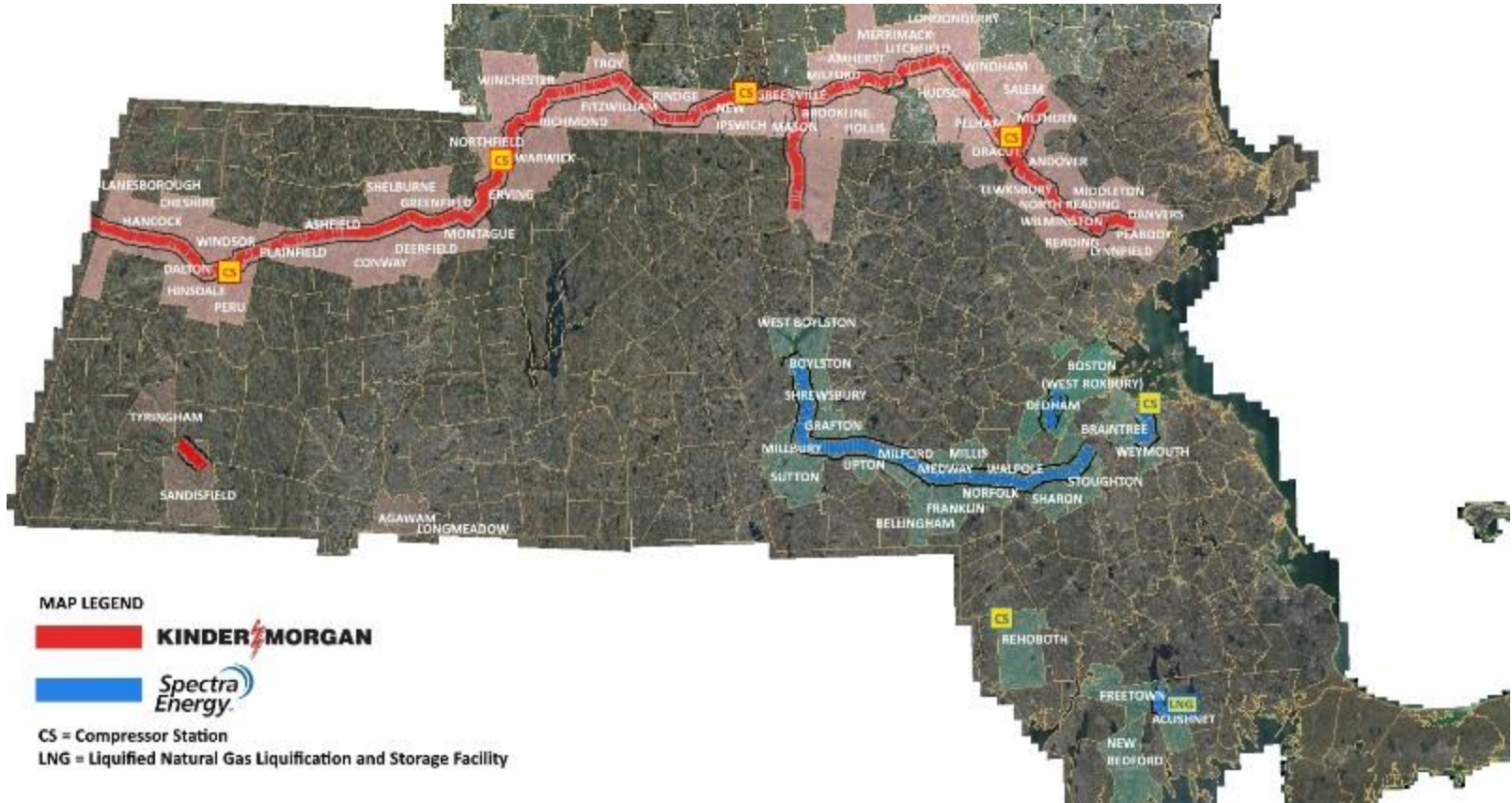


*Source: Massachusetts Clean Energy & Climate Scorecard 2016, Global Warming Solutions Project.*

# Suing the Commonwealth



# Taxing Electricity for Gas Pipelines





Massachusetts electric ratepayers are being asked to pay for new pipeline—something never before proposed.

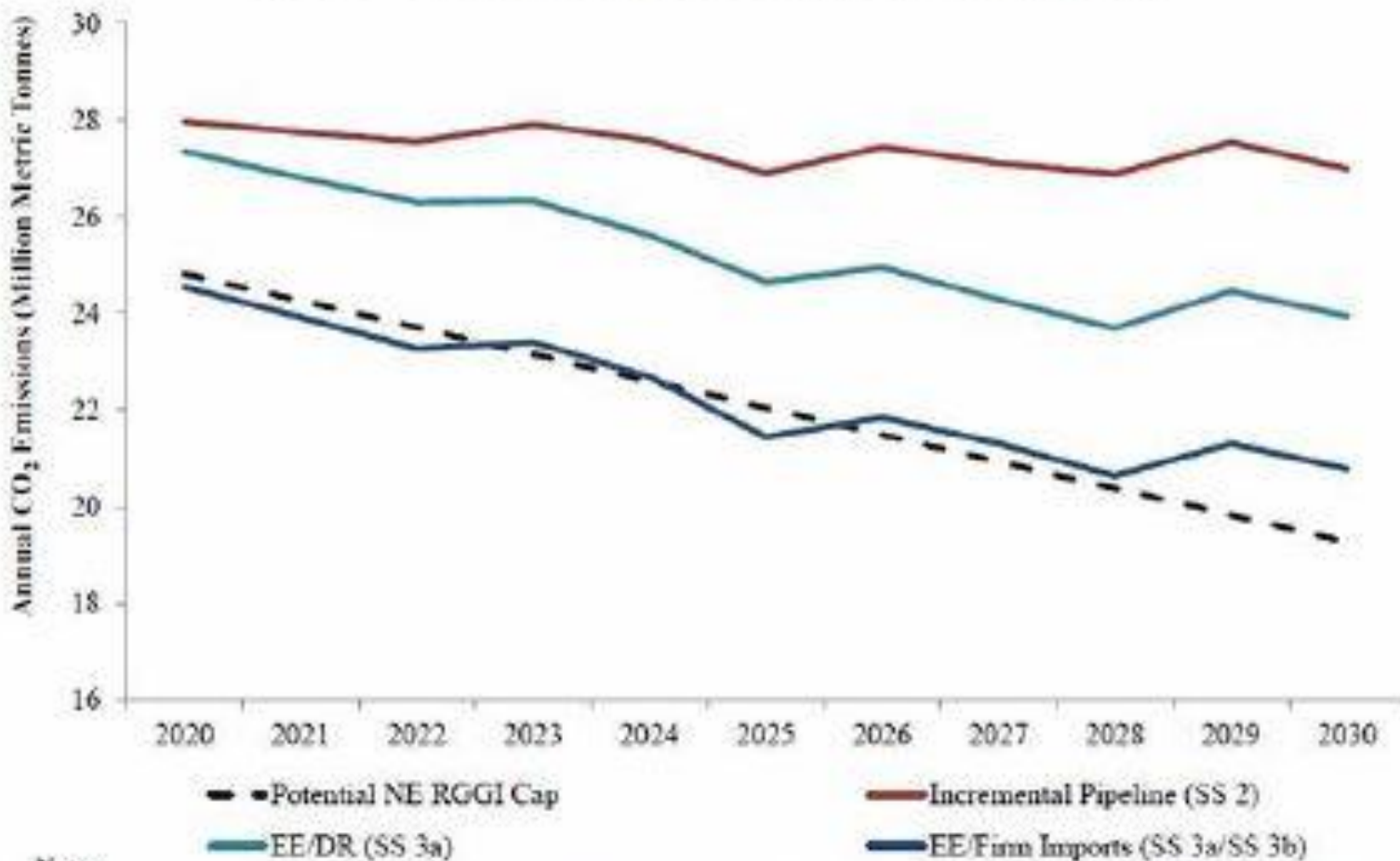
**THE STUDY ASKS:**

**ARE NEW GAS PIPELINES NEEDED TO  
KEEP THE LIGHTS ON IN NEW ENGLAND?**

**THE ANSWER:**

No. Under business-as-usual circumstances, the region **can maintain electric reliability through 2030**, even without additional new natural gas pipelines. Even under a “stressed system” scenario, there are cheaper, less carbon intensive ways to ensure electric reliability, like energy efficiency and demand response, that are less risky for ratepayers.

Figure 8: Annual CO<sub>2</sub> Emissions and Potential ISO-NE Climate Goals

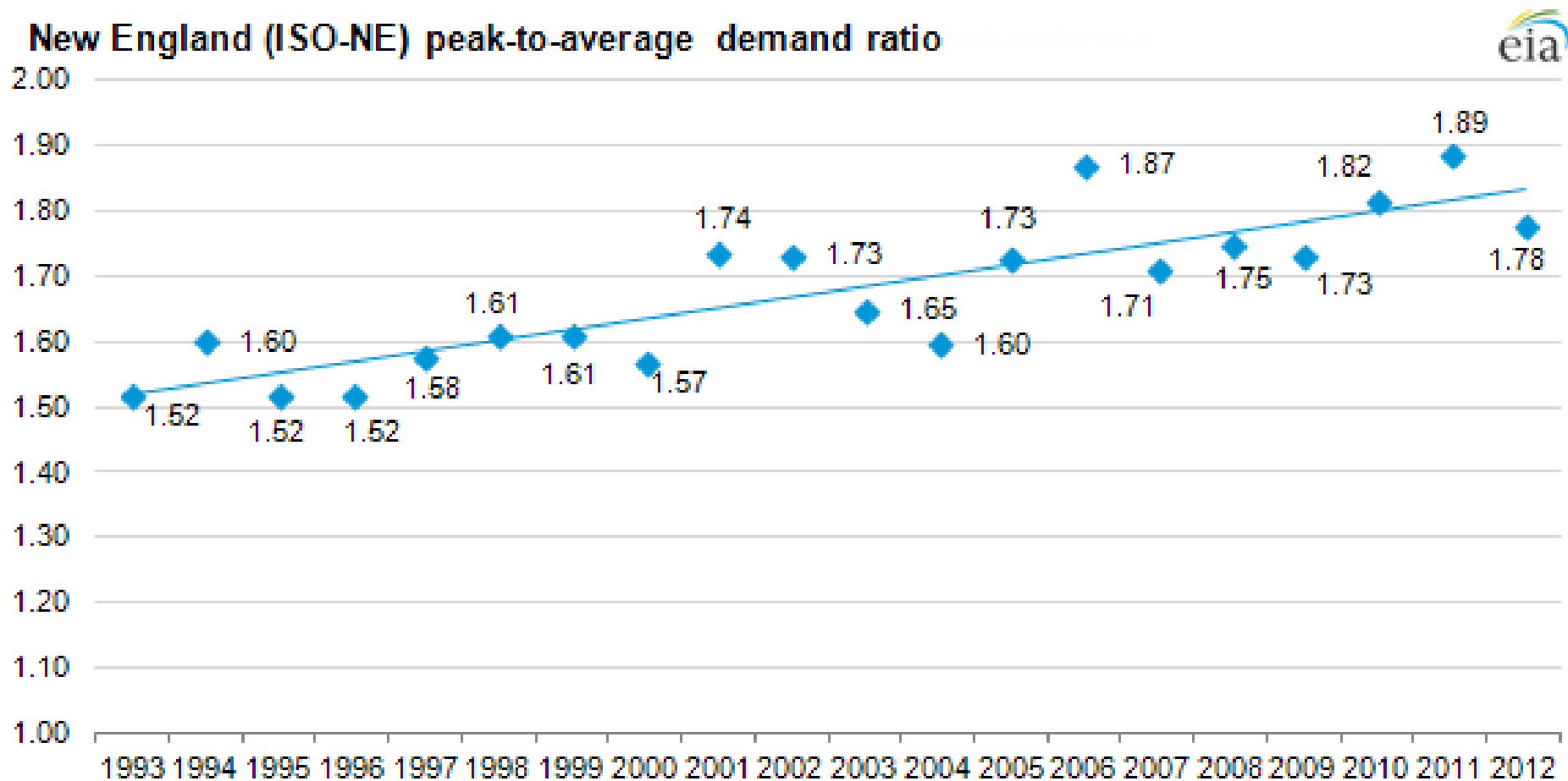


Note:

[1] Pipeline emissions include an estimate for in-region GHG emissions from fugitive methane leaks. Emissions for Dual Fuel (SS 1a) and Firm LNG (SS 1b) are excluded for clarity; both solution sets report annual emissions that are within 0.15 million metric tons of the Incremental Pipeline (SS 2) solution set.

Source: Massachusetts Clean Energy & Climate Scorecard 2016, Global Warming Solutions Project.

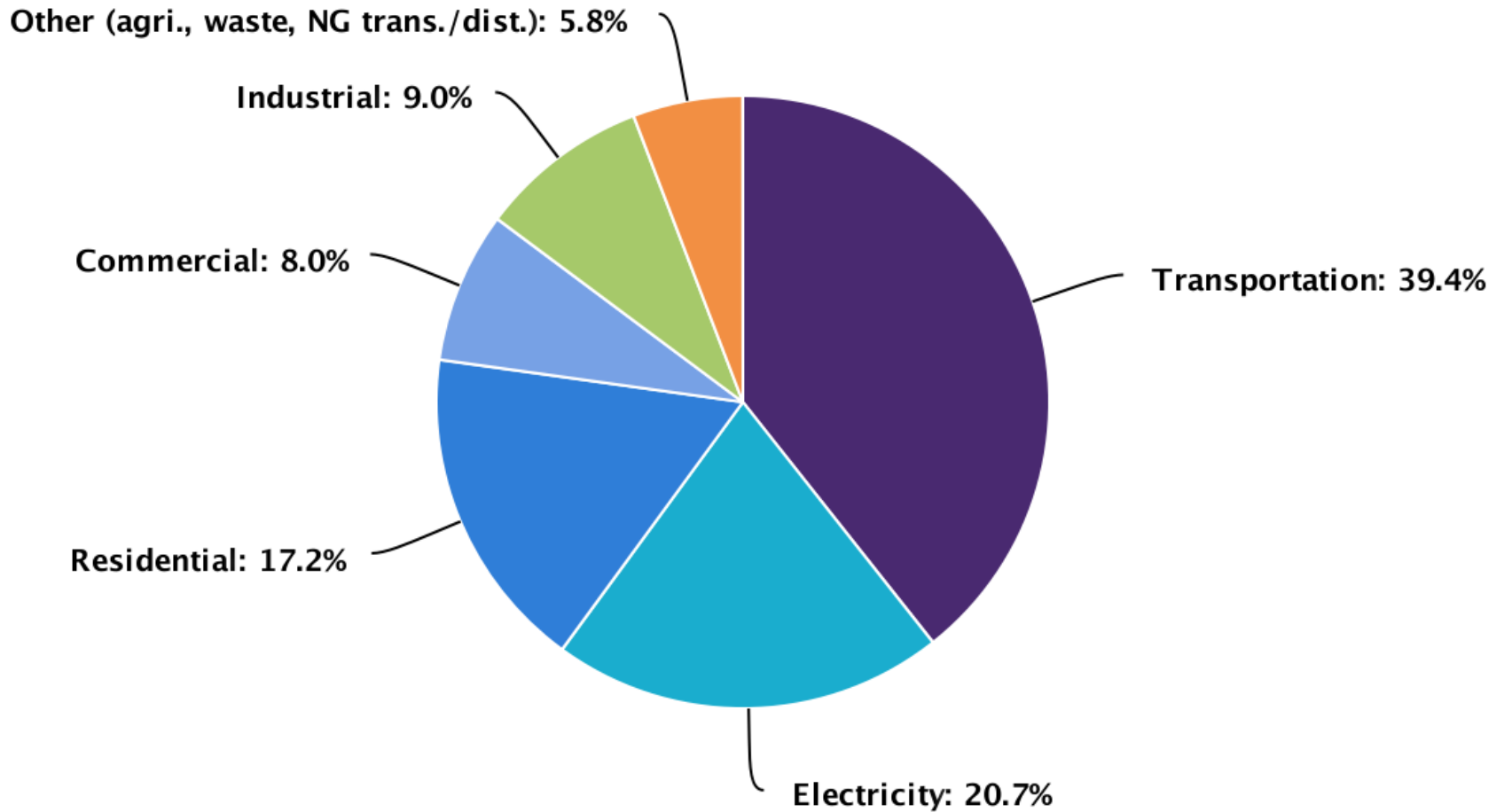
# Peak demand is big issue





# 2011 MA GHG Emissions by Sector

80 MMTCO<sub>2</sub>e, electricity as its own sector

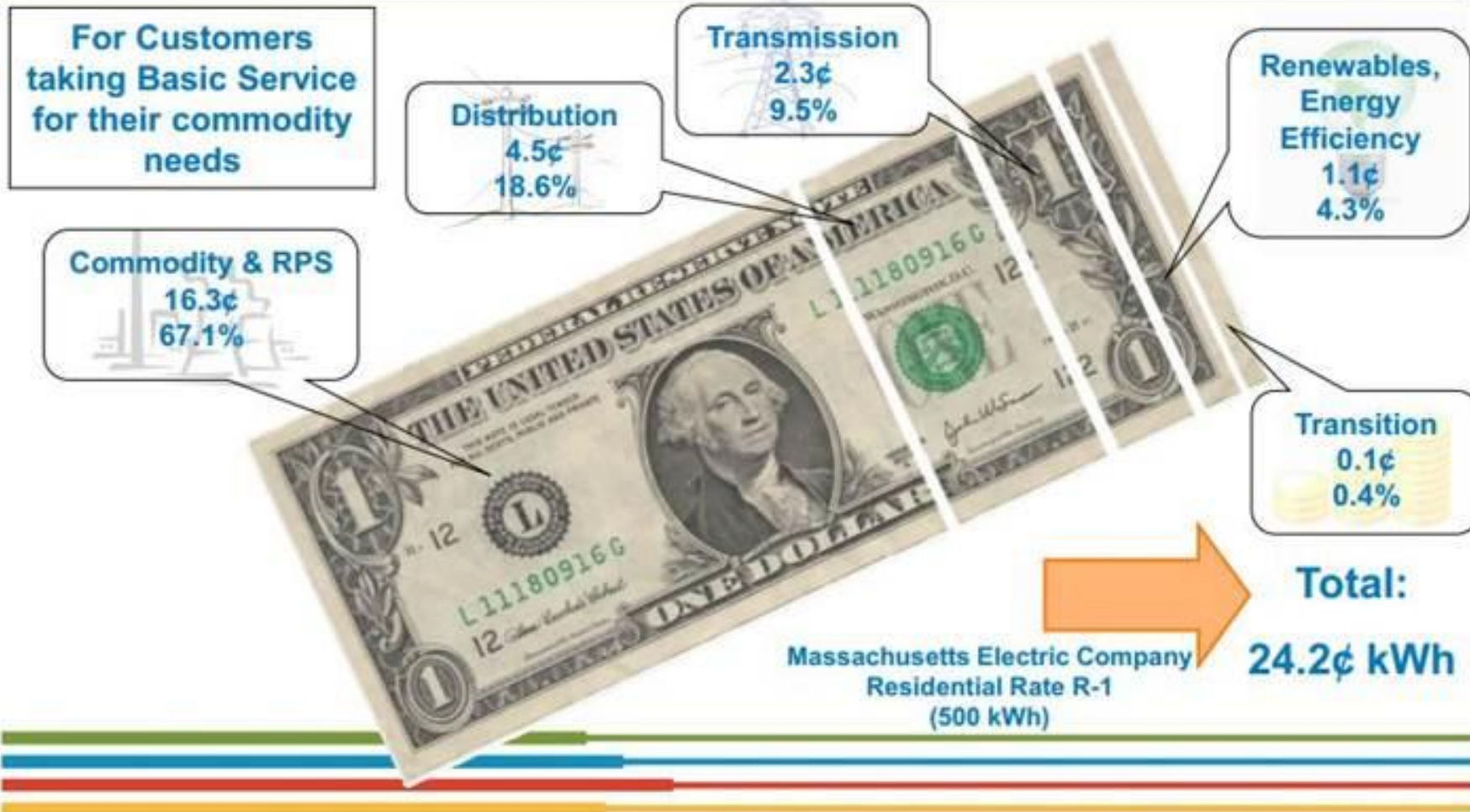


# Typical MA Residential Electric Customer

(Basic Service rates beginning November 1, 2014)

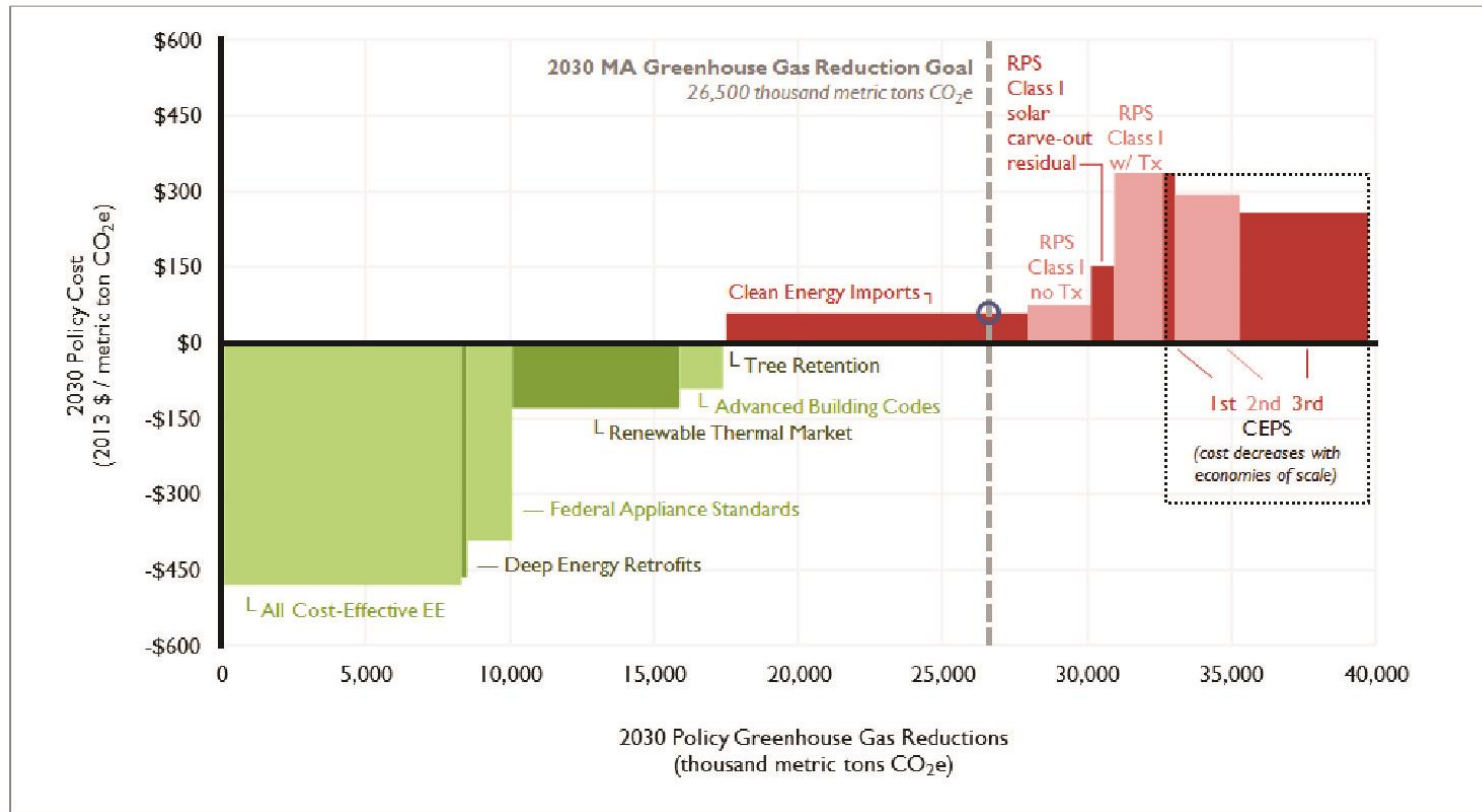
**nationalgrid**

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# Nothing Out Performs Energy Efficiency

Figure 6. Massachusetts marginal abatement cost curve for GWSA compliance, 2030



○ The marginal policy for 2030 is Clean Energy Imports at \$59 per metric ton CO<sub>2</sub>e, in 2013 dollars.

Source: Exhibit EAS-16

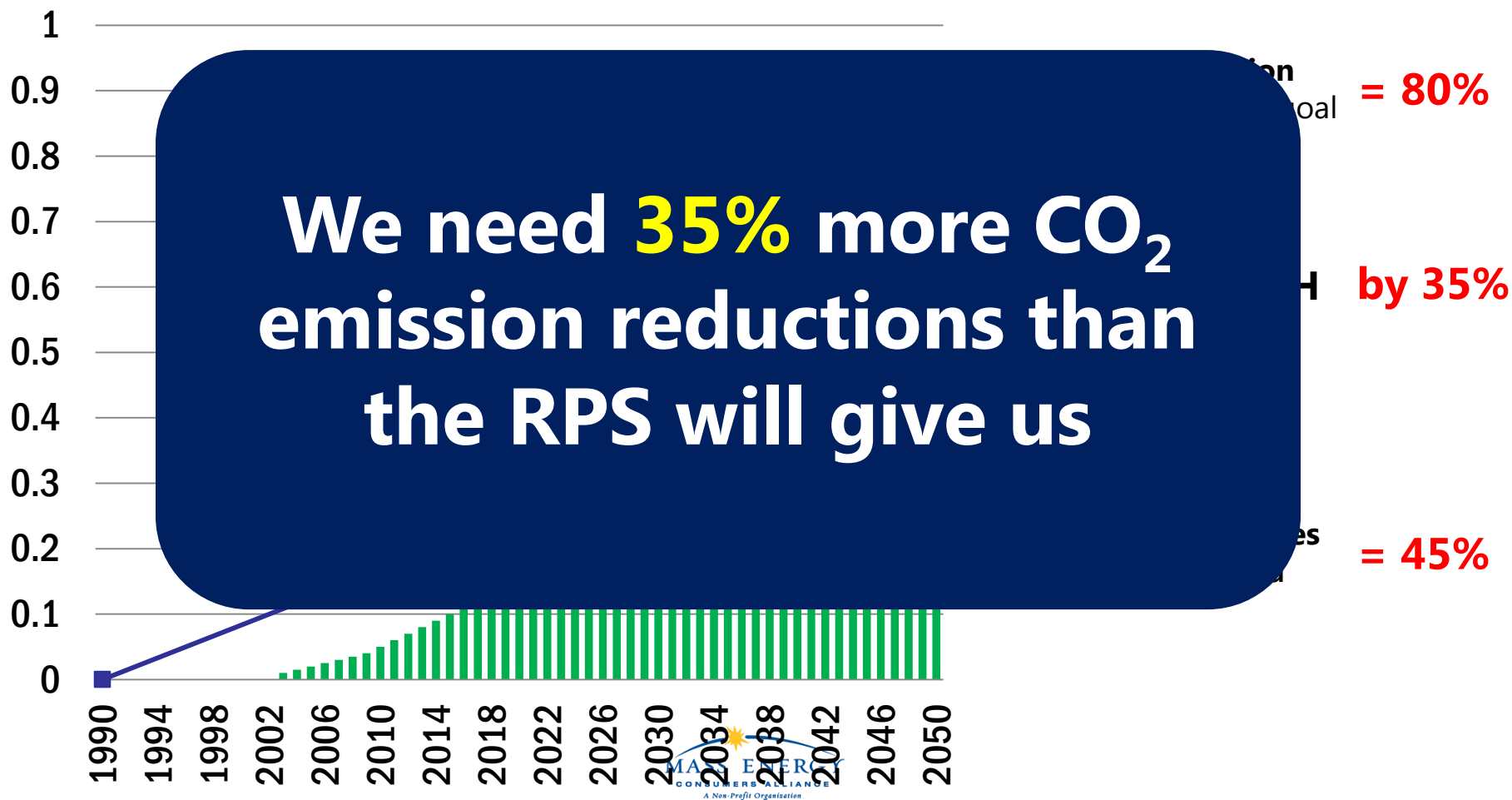
# Lighting Efficiency

**LED BULBS USE 85% LESS ENERGY AND LAST UP TO 20 YEARS LONGER THAN INCANDESCENT BULBS**

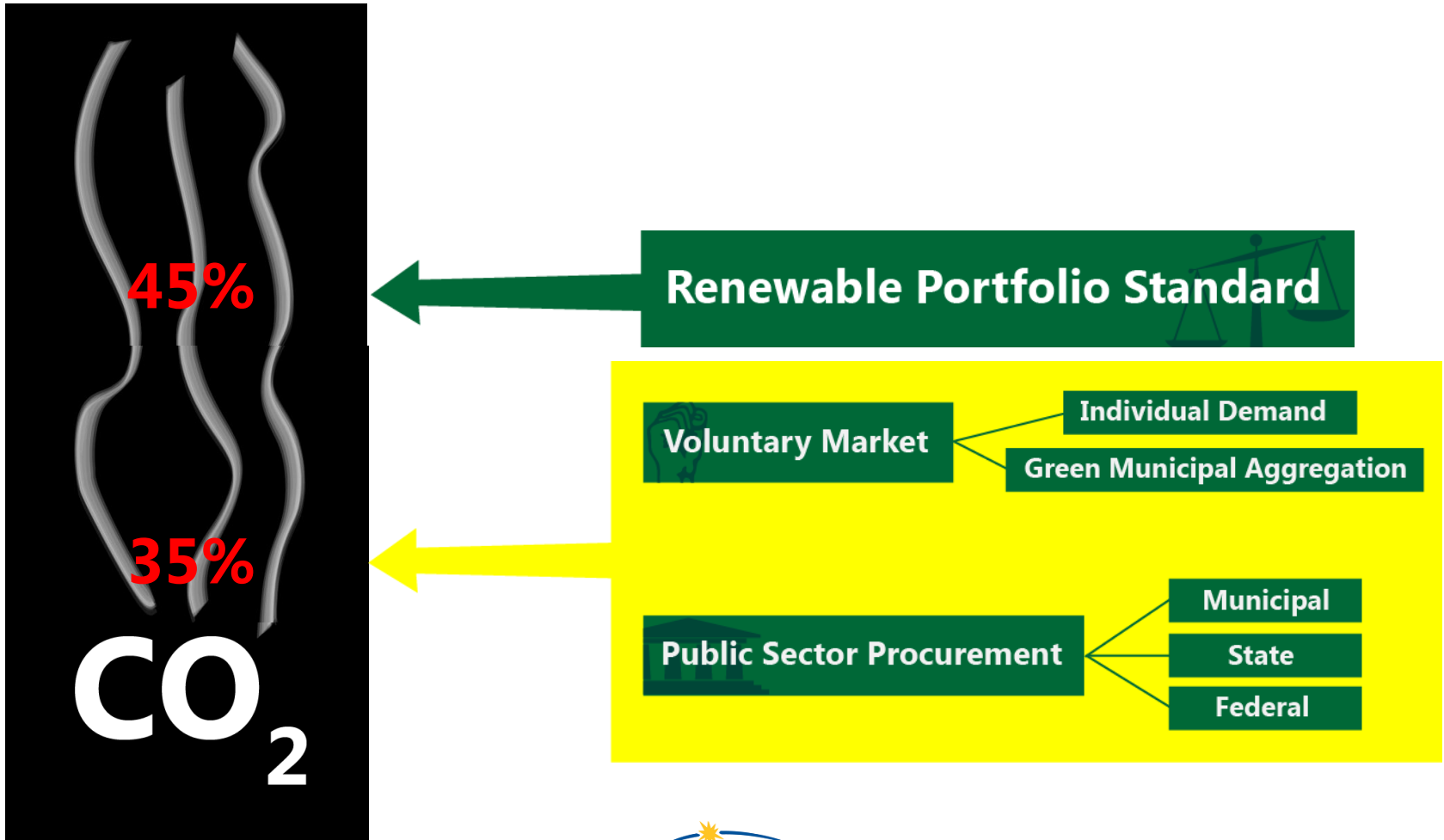


# MA: Where does the RPS get us?

GWSA CO<sub>2</sub> Emission Reduction Goals vs. Renewable Portfolio Standard



# 45% + 35% = 80% Emission Reductions





# Mass Energy Green Power Programs

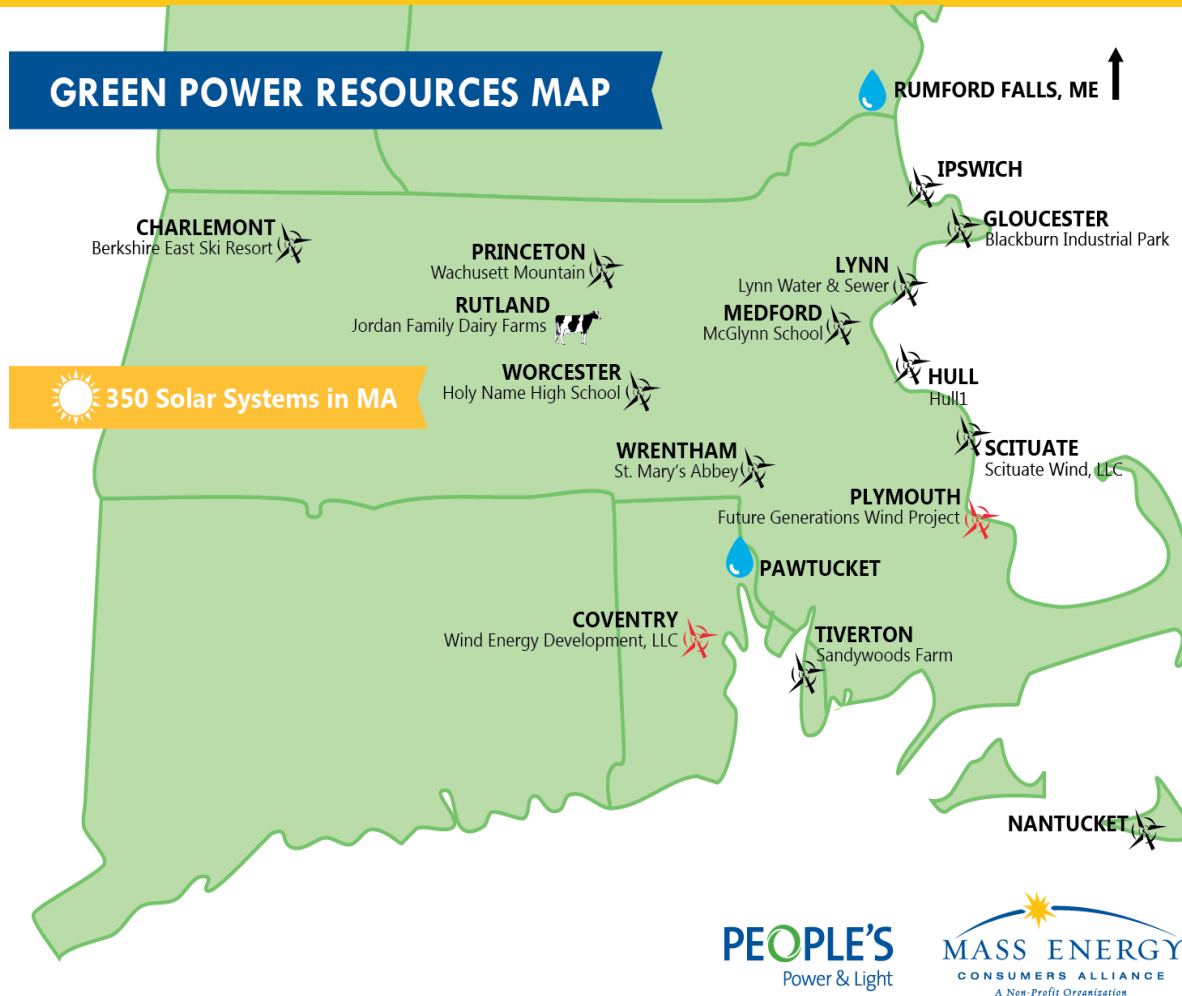
☀ **New England  
GreenStart**

☀ **New England  
Wind**

☀ **Work Green /  
Live Green**



# Our Local Sources

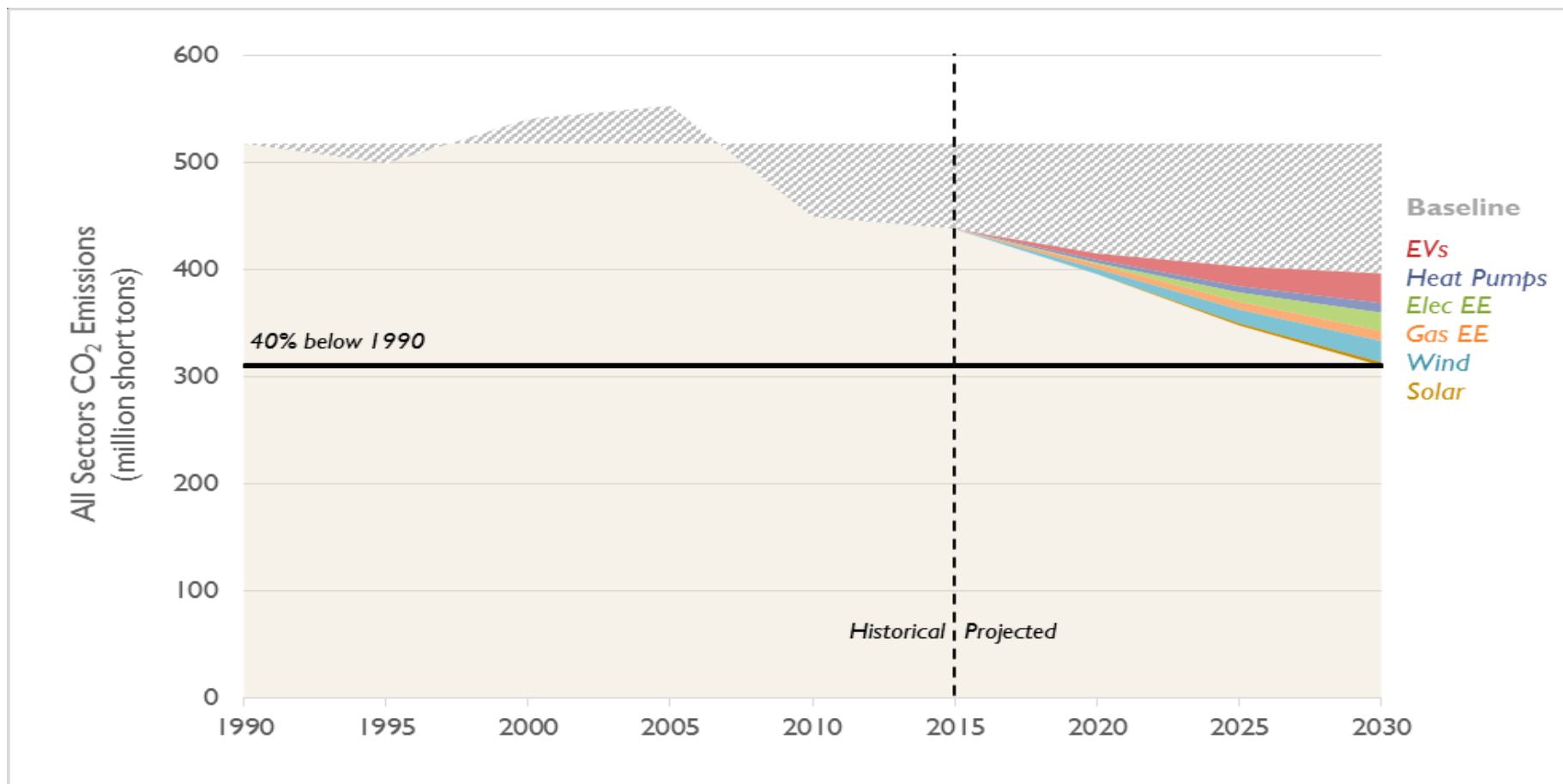


# Green Municipal Aggregation

- ✦ Electric supply for residents will have:
  - ✦ 11% Class I RECS required by the RPS in 2016, 12% in 2017...
  - ✦ An additional 5% Class I RECs each year from **Mass Energy**
- ✦ 5 years ahead of state



# Emission reductions required to meet 40 percent target by 2030 in RGGI states

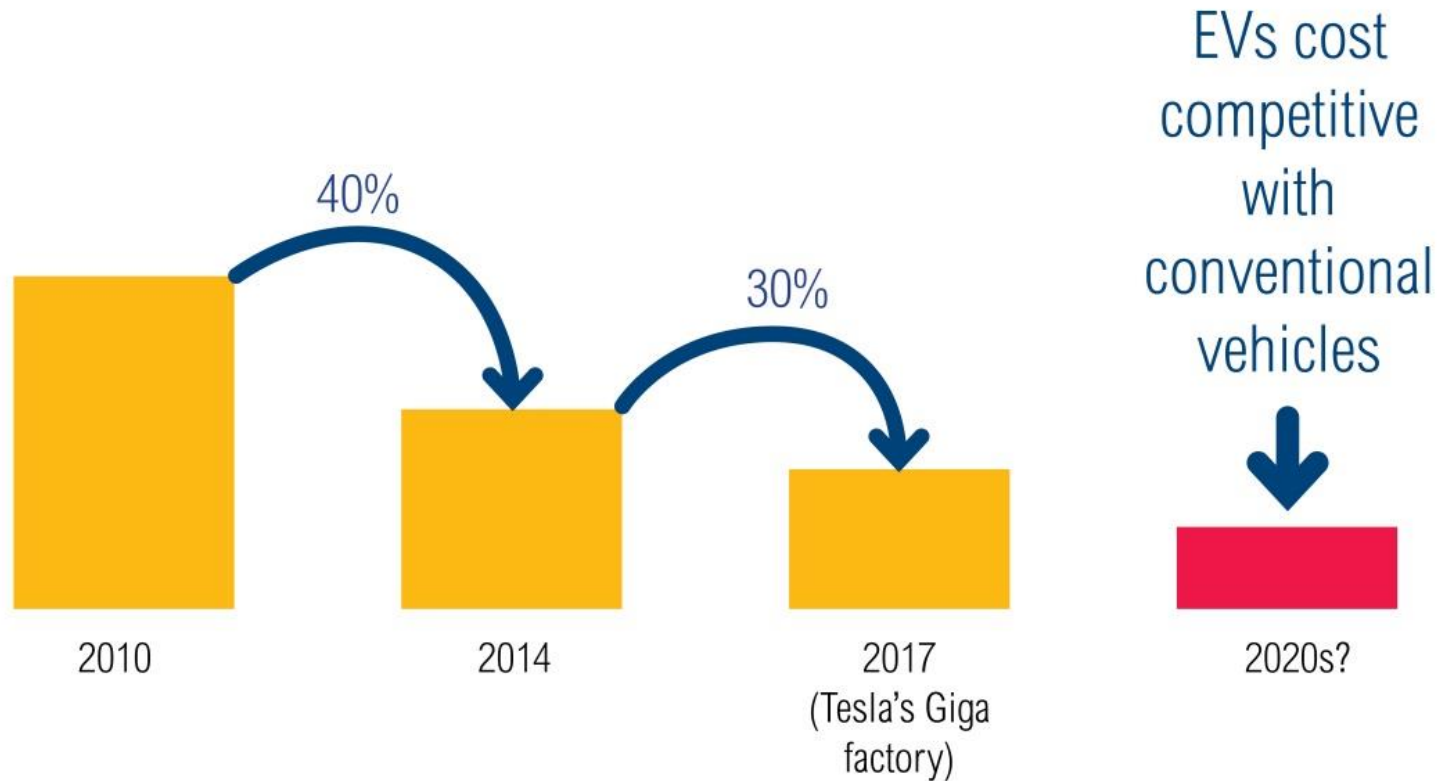


THE ALL-NEW  
ALL-ELECTRIC 2017 CHEVROLET  
**BOLT EV**  
AVAILABLE LATE 2016



2017

# ELECTRIC VEHICLE BATTERY PRICES ARE FALLING

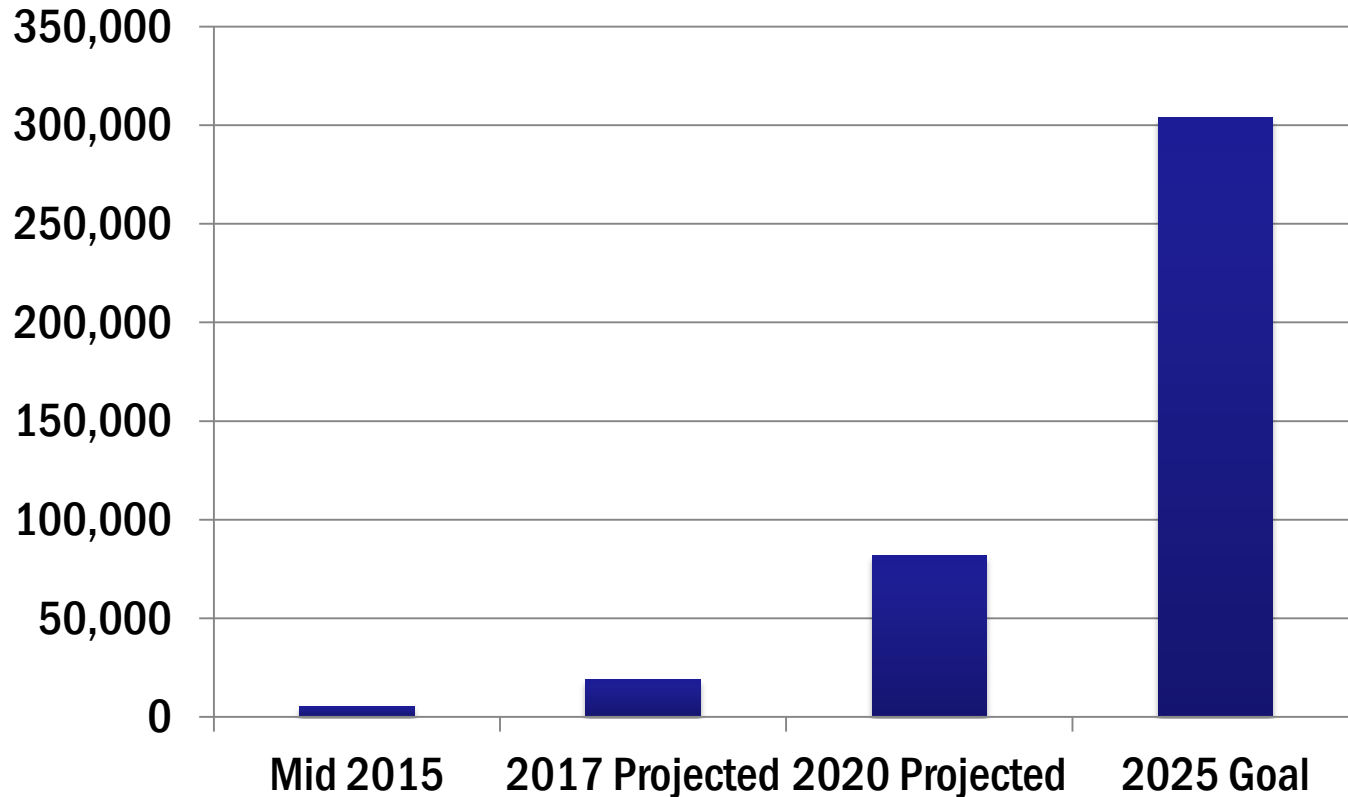


[www.wri.org/seeingisbelieving](http://www.wri.org/seeingisbelieving)

 WORLD RESOURCES INSTITUTE



# Massachusetts Current Reported EV Totals and Cumulative Goal



Sources: Registration numbers reported to authors upon request; ZEV Program Implementation Task Force. Multi-State ZEV Action Plan. NESCAUM, 2014. Web.

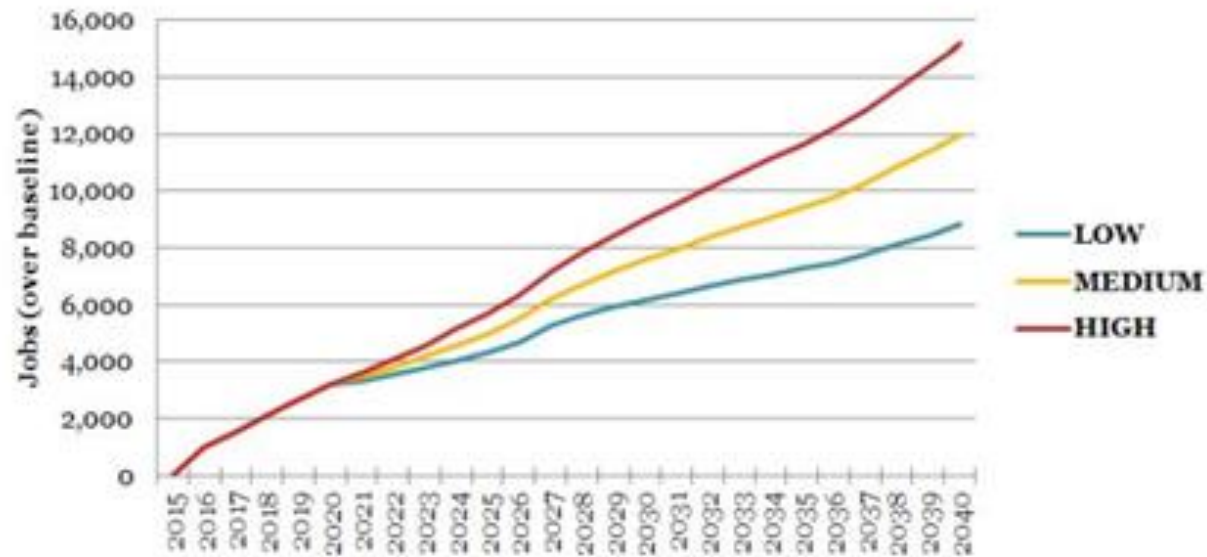
# MBTA!



# Job Creation by Carbon Tax

**Figure ES-3: Total Employment Change versus Baseline**

With three scenarios for the rate of increase in the carbon tax after year five, as shown in the previous graph: the low scenario reaches \$50/ton in 2040, the medium scenario \$75/ton, and the high scenario \$100/ton. All three scenarios provide equal rebates per household and give rebates to businesses and other institutions in proportion to their number of employees.



# Thank you!

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**Anaerobic digester, Rutland, MA**