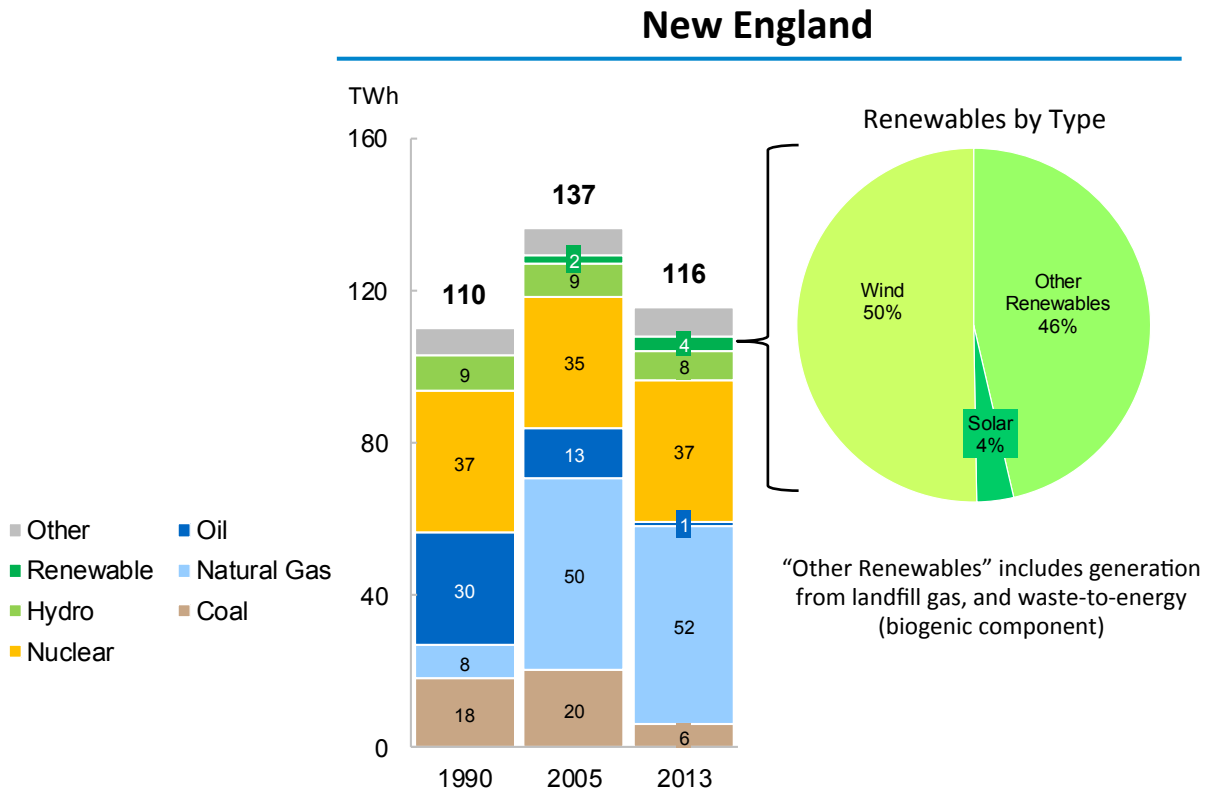
EVERSOURCE ENERGY nationalgrid

The Northeastern U.S. Energy Future

An 80% Reduction in GHG Emissions by 2050

Generation by Fuel Type

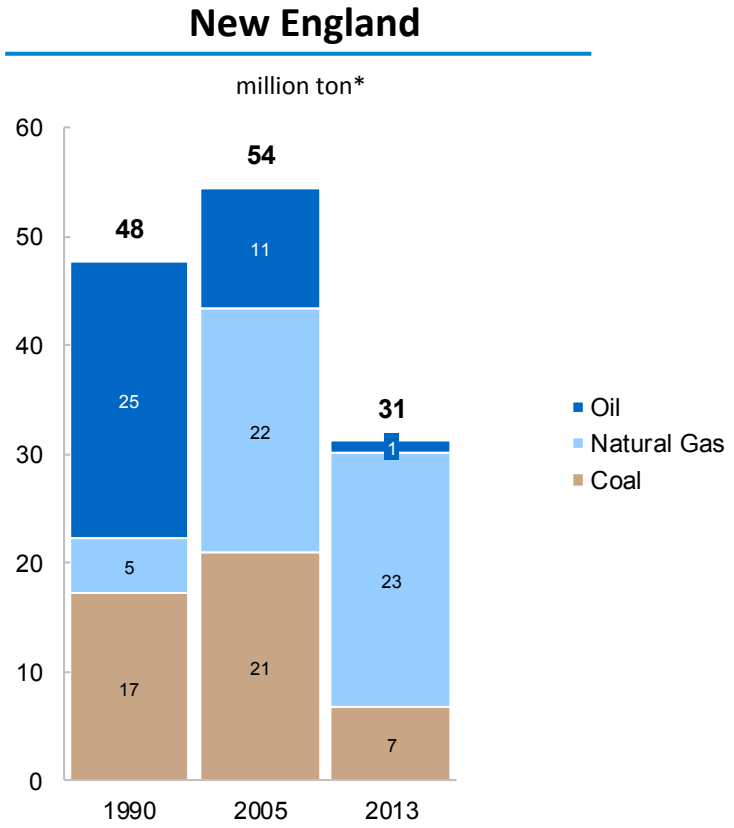
Coal-fired generation declined 80% between 1990 and 2013 in New England; gas-fired output increased 7x during the same period.



Analysis Notes:
1. Figures account for in-state generation only; imports are not included
2. "Other" includes small generation contributions from miscellaneous fuel sources not classifiable into the main categories listed. These include non-biogenic municipal solid waste, tire-derived fuel, manufactured and waste gases, etc.
3. Charts are representative of generation from facilities with nameplate capacity of 1 megawatt or greater delivering electric power to the grid

Electric Sector Emissions

CO2 emissions from oil-fired generation declined 96% between 1990 and 2013 in New England; total CO2 emissions have declined 35%.

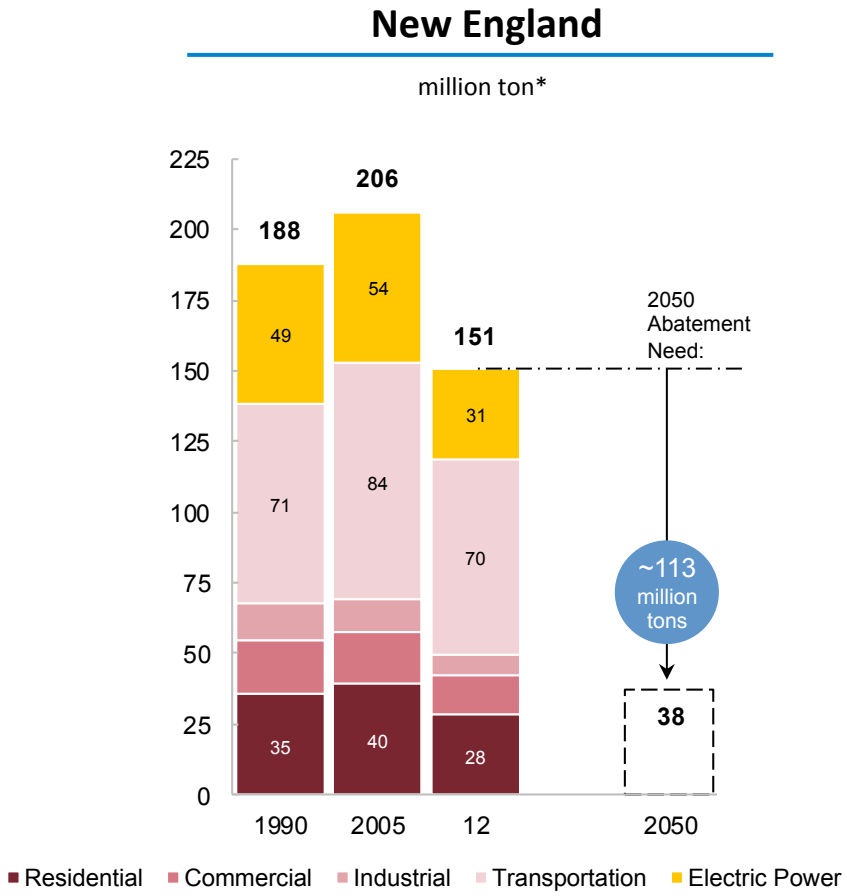


*All emissions are reported in "short ton" throughout this analysis regardless of whether they are labeled "ton" or "short ton."

Analysis Notes: Energy efficiency efforts that result in lower electricity usage are effectively captured in the emissions of the "Electric Power" sector.

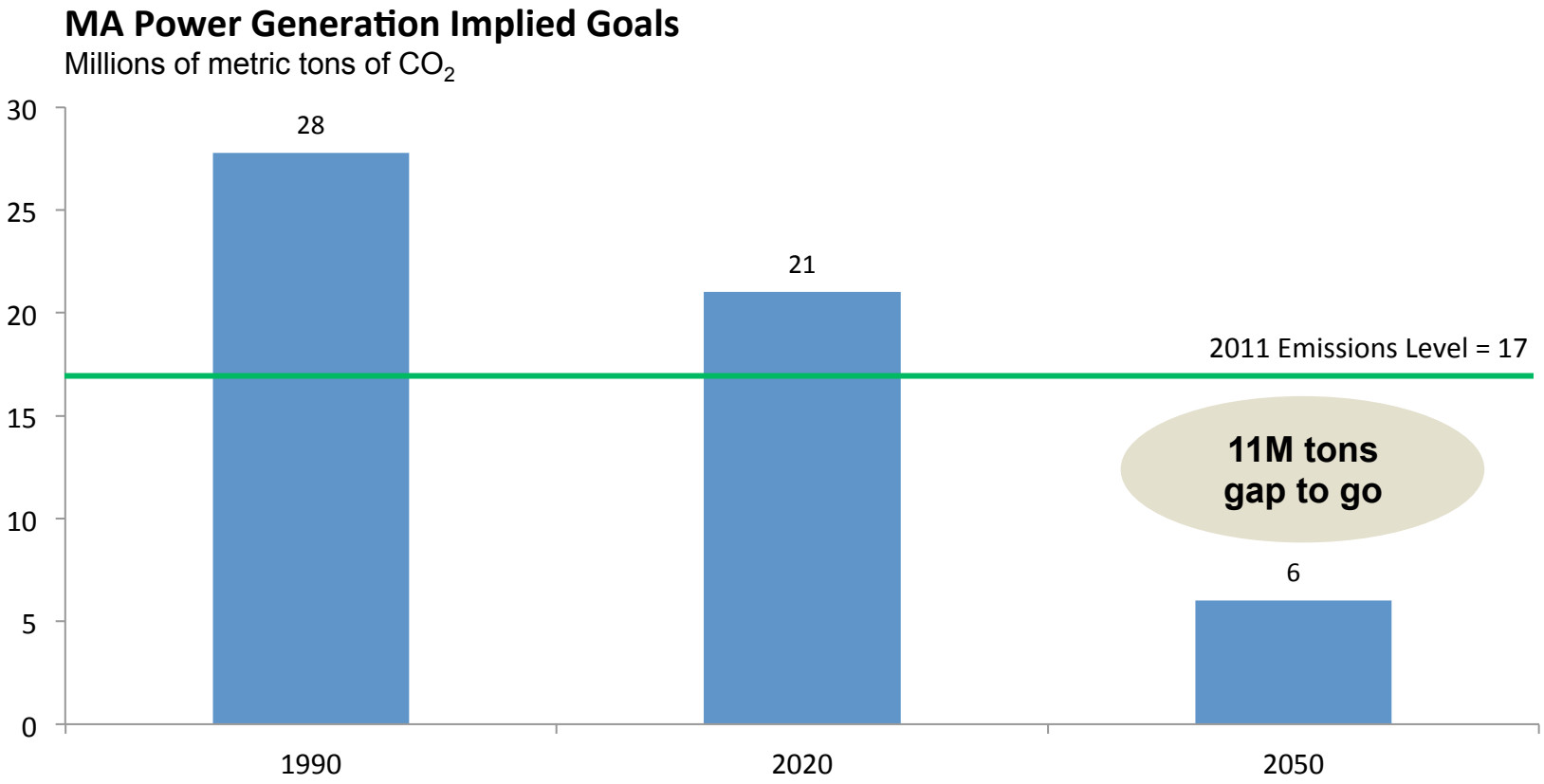
Overall Carbon Emissions

While electric sector is changing economy-wide CO2 emissions, by contrast, declined only about 20% between 1990 and 2012.



MA Carbon Emission Targets

MA has already achieved its 2020 power generation carbon emissions goal and only has 11M tons to go.



Source: MA DEP.

Reaching 2050 Target – Power Generation

Two levers are available to meet the 11M carbon reduction gap for the power generation sector.

Grid Modernization

Reduce Generation Demand

- Next Level of Energy Efficiency
  - Building energy codes, labeling, performance standards
  - Deeper energy retrofits
  - Behavioral/information-driven programs
  - Building operation & maintenance
  - New energy efficiency technologies
- Demand-Focused Programs
  - Demand Response
  - Time-Varying Rates
- Customer-Sited DG and Energy Storage

Increase Use of Clean Energy Resources

- Portfolio Approach to Clean Energy
  - Wind
  - Solar
  - Hydro
  - Other
- Broad Deployment of Energy Storage to Firm-Up Renewables
- Maximize Combined Heat & Power Opportunities

Grid Modernization as the Backbone

Ultimately, a modernized grid will be the backbone to enable the future 2050 carbon goal.

Grid Modernization Desired Outcomes

- Reduce the Impact of Outages
- Optimize Demand
- Integrate Distributed Energy Resources
- Workforce and Asset Management

Grid Modernization Highlights

Eversource and National Grid have proposed innovative grid modernization plans that will transform the grid.

- Innovative Time Varying Rates
- Advanced metering infrastructure
- Volt/Var Optimization
- Advanced Grid Resiliency and Reliability
- DER Technology Integration Tools and Systems