Massachusetts Global Warming Solutions Act (GWSA) A Buildings Overview

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- GWSA Overview
- Clean Energy and Climate Plan
- Strategies
- Inventory
2008: Legislation

- M.G.L. Ch. 21N
- An Inventory of GHG emissions in MA
- A GHG emissions registry and reporting system
- Reductions of GHG emissions by 10-25% below 1990 levels by 2020 and an 80% reduction by 2050
2009: 1990 baseline inventory

Figure 1: Massachusetts Baseline and Business as Usual (BAU) Projection of GHG emissions 1990-2020

- Historical Emissions
- Projected Emissions

Million Metric Tons of CO₂ equivalent
2010: Clean Energy & Climate Plan

- Set goal to reduce emissions by 25% below a 1990 baseline by 2020.
2011: Adaptation Report

- Proposed strategies (>200) to adapt and to mitigate impacts
- Addressed effects on: Natural Resources and Habitat; Key Infrastructure; Human Health and Welfare; Local Economy and Government; and Coastal and Ocean Zones.
2020 Clean Energy and Climate Plan

- Rationale for GHG emission reduction in MA (economic, health, security, environmental)

- 28 policies/strategies to reduce emissions from the four primary emissions sectors, & includes 3 cross-cutting strategies (e.g. MEPA).

- EEA/EOHED/MassDOT collaboration

- Implementation Advisory Committee
Projected impact of 2020 strategies

Clean Energy and Climate Portfolio Impacts vs. Business as Usual

- Business as Usual
- Buildings (-9.8%)
- Electricity Supply (-7.7%)
- Transportation (-7.6%)
- Non-Energy (-2.0%)

Million tons GHG

25% below 1990

Buildings
Energy Efficiency and Demand-Side Management

- 2020 Plan projected 9.8% GHG emissions reduction

- Based on implementing the following key strategies to meet its GHG emission reduction targets:
  - All Cost-Effective Energy Efficiency
  - Advanced Building Energy Codes
  - Building Energy Rating and Labeling
  - Developing a Mature Market for Solar Thermal Water and Space Heating
  - Expand Energy Efficiency to Oil in Commercial and Industrial buildings
  - Federal Appliance and Product Standards
  - Green Communities Designation and Grant Program
  - Leading by Example
  - Tree Retention and Planting to Reduce Heating and Cooling Loads
Buildings

Energy Efficiency: 7.3% of plan

Sector View of Energy Efficiency Investments & Benefits
(2013-2015)

Statewide electric and gas
Buildings

Energy codes: 1.6% of plan

- IECC 2012 - Public comment period until June 4
  email comments to mike.guigli@state.ma.us

- Stretch 2009 - Adopted by 130 Communities
  Requires update to match IECC 2012

- Beyond Code Options
  - Zero Net Energy
  - Passive House
  - MassSave programs
Buildings & Transportation

We have an Oil problem

2005 MA & US GHG by Fuel

- Natural Gas
- Petroleum
- Coal

MA
- 13% Natural Gas
- 63% Petroleum

US
- 20% Natural Gas
- 43% Petroleum
- 37% Coal
Electric Generation
We have a Gas dependency problem

Natural Gas has Become the Dominant Fuel for Power Generation in New England

Existing Generation
Natural gas has largely displaced oil- and coal-fired generation

- Natural gas: 52%
- Nuclear: 31%
- Renewable: 13%
- Coal: 3%
- Oil: <1%
- Pumped storage: 1%

Proposed Capacity
Natural gas is the fuel of choice for new capacity and gas-fired generators will be needed to balance variable energy resources

- Natural gas: 56%
- Wind: 38%
- Other: 6%

Energy by Fuel Type, 2012 (GWh)
ISO Generator Interconnection Queue
Supplemental Strategy Ideas:

- **Energy Efficiency: Multifamily/ Rental Housing:** Improve the energy efficiency of rental housing through various strategies.

- **Energy Efficiency: Commercial Real Estate:** Complement the utilities’ strategic planning to serve commercial real estate through numerous strategies.
Buildings
Energy Efficiency and Demand-Side Management

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Energy
Generation and Distribution

Supplemental Strategy Ideas:

- **Renewable Thermal Incentive**: Sets a hard target for a full portfolio of renewable thermal technologies. Incorporates renewable thermal into the APS.

- **Modernize the Grid**: Transform the power grid to accommodate high penetration of variable generation, storage, and electric vehicles; manage peaks and reduce line losses.
Transportation
Smart Growth and Land Use

Supplemental Strategy Ideas:

- **Clean/Electric Vehicle Incentives:** Increase use of zero emission and alternative fuel vehicles by enhancing activities and potential incentives.

- **Increase Vehicle Efficiency through Tire Inflation:** Require tire check and inflation every time a vehicle is serviced.

- **Planning Ahead for Growth:** Advance policies that support housing and economic development goals consistent with the MA Sustainable Development Principles.
Non-Energy Emissions

Supplemental Strategy Ideas:

• Reduce Emissions from the Natural Gas Distribution Network

• Reduce Fluorinated Gas Emissions from the Semiconductor Industry
MA GHG emissions

11% CO$_2$e emission drop 1990-2009 influenced by many factors: economy; natural gas prices; weather patterns; investments in energy efficiency.
Thank you! Questions?

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Data: Partial annual draft spreadsheet shortly after June each year, when virtually 99% of data available.

http://www.mass.gov/dep/air/climate/gwsa_docs.htm#inventory