State and Federal Policies and Programs to Promote Zero Net Energy Buildings

NASEO ZNEB Forum

September 18, 2013


Walgreens

Session Goals

1. Overview of state, regional, and national approaches, policies and programs to zero net energy
2. Focus on commercial buildings
3. Illustrate successes to date, challenges, plans for the future
4. Highlight issues, challenges, constraints
5. Identify varying roles of key stakeholders

Speakers

Eric Friedman, Director Leading by Example, MA Dept. of Energy Resources – In addition to directing the state greening government program since 2001, Eric was staff lead on the Governor's ZNEB task force in 2008-2009

Cathy Fogel, Senior Analyst, Energy Division, California Public Utilities Commission – Cathy has twenty years of experience developing energy and environmental policies and is currently leading analysis of utility demand side programs for the CPUC Energy Division. Areas of responsibility include ZNEBs, Smart Meter programs, market transformation, and evaluations.

Speakers

Mark Mahoney, Director, Regional Environmental and Energy Office - Western, U.S. Department of the Army –Mark oversees the tracking of state legislative and rule writing initiatives in 14 Western States and recommends courses of action to the Deputy Assistant Secretary. Mark manages the development of joint service positions on any issues impacting more than one service in the Region

Cody Taylor, Team Lead, Commercial Buildings, U.S. Department of Energy -- As the Team Lead in the in the Commercial Buildings program at the U.S. Department of Energy, Cody oversees development of a number of commercial sector efficiency tools and programs, including building rating tools, data specifications, benchmarking best practices, design guidance and measurement and verification guidance.

Getting to Zero

Policy Progress in Massachusetts toward Zero Net Energy Buildings

Eric Friedman

MA Department of Energy Resources

NASEO

September 18, 2013




Key Points

- ZNEB Task Force
- Recommendations to Implementation
- Challenges

Governor Patrick's 2008 Charge to the ZNEB Task Force:

1. Point the way toward broad marketability of zero net energy residential and commercial buildings in the private sector by 2020, and universal adoption of zero net energy buildings for new construction by 2030

2. Specify an interim standard for state-owned construction that is significantly more stringent than the current Mass LEED Plus benchmark

3. Develop specifications for the first state-owned zero net energy building by January 1, 2010.

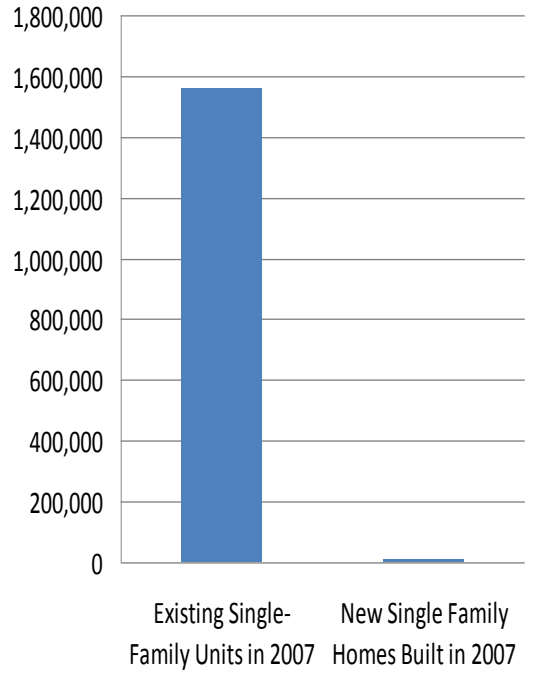
"Less energy usage isn't enough. We have to set our sights not higher, but lower – all the way to zero." – Governor Deval Patrick

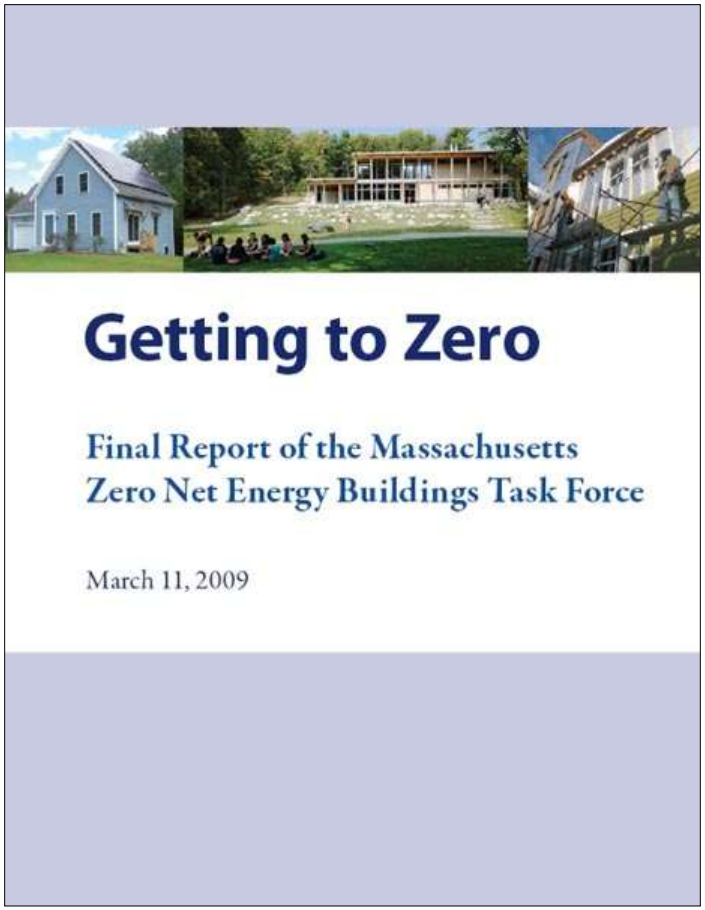
ZNEB Task Force

70 representatives from public agencies, utilities, architects, engineers, developers, and builders

working groups formed around the **public sector (state) commercial residential**

Task Force also addressed existing buildings





http://www.mass.gov/eea/docs/eea/press/publications/zneb-taskforce-report.pdf

ZNEB Task Force General Recommendations:

1. Continuous improvements in **codes and standards** – move toward performance based codes
2. Benchmarking; reporting and tracking **energy use data** for all buildings
3. **Incentives** to help address regulatory and financial barriers
4. **Workforce** development and public education initiatives
5. **Demonstration projects**

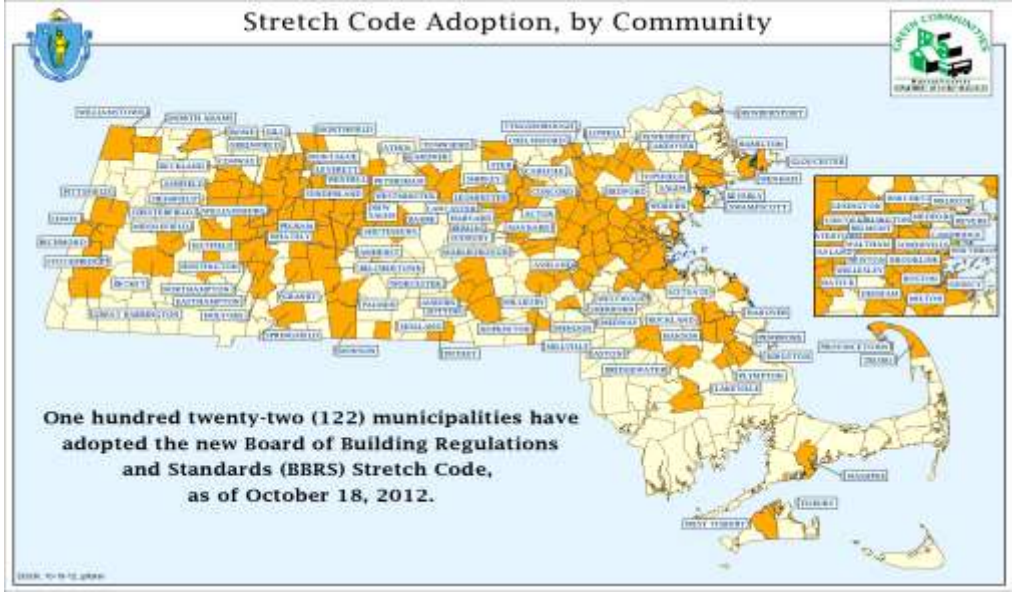
The Report has a total of 44 recommendations

From Recommendations to Policy Framework To Implementation

ZNEB Progress- Code Improvements

1. **Massachusetts Energy Code** now required to adopt new IECC code within 1 year of promulgation

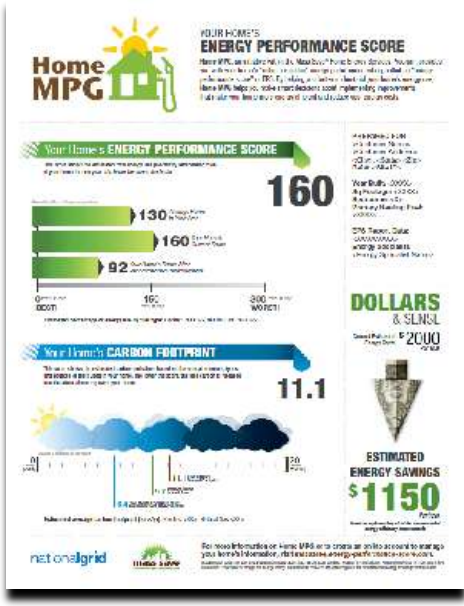
2. All school projects now incentivize compliance with **MACHPS** standard which requires stretch code or equivalent LEED energy Points



3. **Massachusetts Stretch Code**
   - Municipalities can adopt stretch energy code – 20% better than code
   - 132 cities and towns have adopted
   - Stretch code now the base code

ZNEB Progress- Energy Information & Disclosure

1. Boston & Cambridge Requiring **EnergyStar© Disclosure** for commercial buildings >50,000 SF by 2014, > 25,000 SF by 2016



2. **BAR (Building Asset Rating) Pilot**:

- Developing cost-effective, scalable method to assess "as-built" offices on EUI basis

3. **Residential labeling Pilot**

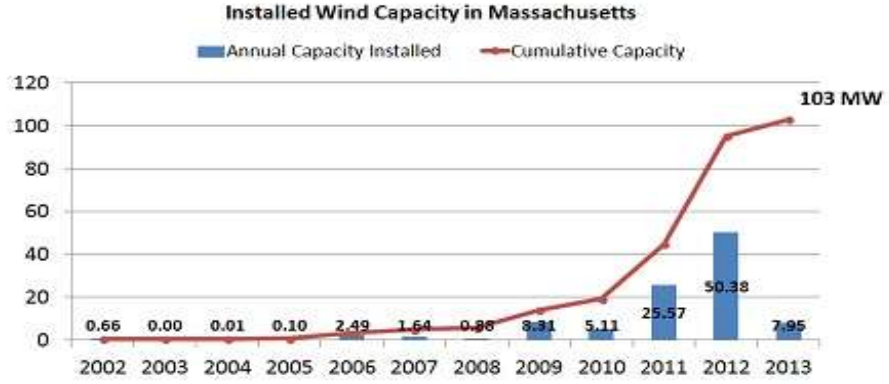
- Energy Scorecard showing comparisons for total energy use, GHG emissions, savings

4. **Real-Time Energy tracking at state bldgs**

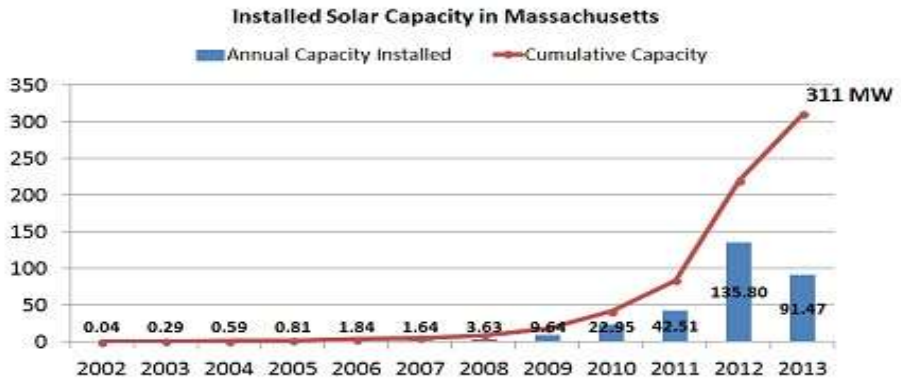
- Real-time metering at 25 million square feet of state buildings
- Actionable on-line information

ZNEB Progress- Incentives

1. **Commonwealth Solar** –incentive programs helped to surpass 250 MW goal (now at 311 MW) 4 years early
2. **Commonwealth renewable thermal incentive programs**
   - **Biomass**
   - **Heat Pumps**
   - **Solar Thermal**
3. **Combined Heat & Power APS & utility incentives**



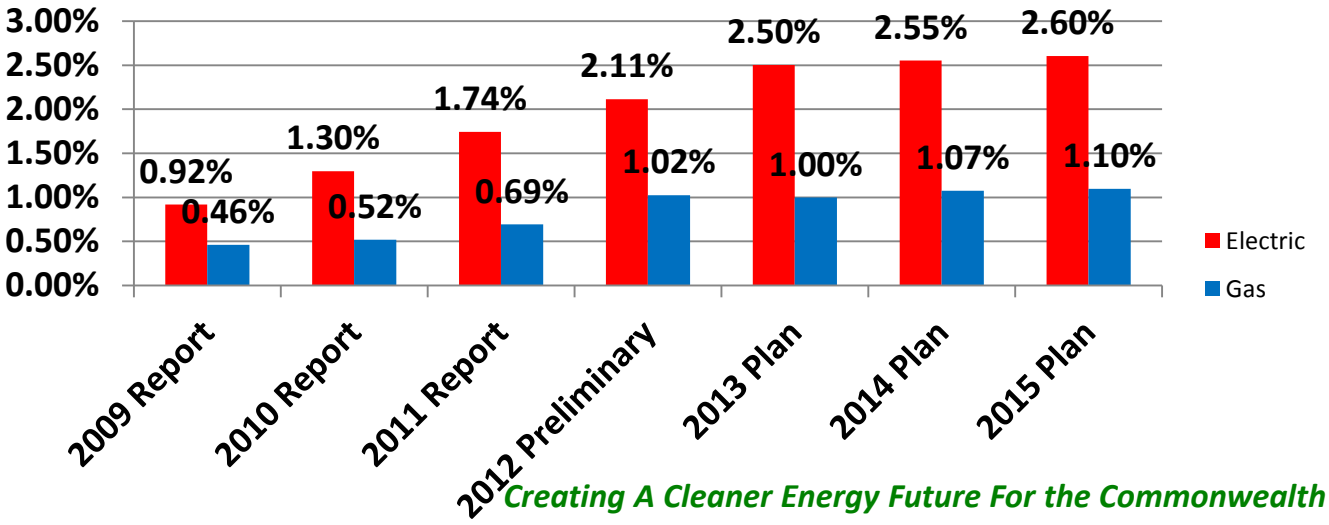
The Patrick-Murray Administration set a goal to have 2,000 MW of wind energy installed in Massachusetts by 2020. The above figures represent the cumulative amount installed as of September 1, 2013.



In May 2013, the Patrick-Murray Administration met its 2017 goal to have 250 MW of solar power installed in Massachusetts. The Administration has set a new target of 1600 MW for 2020. The above figures represent the cumulative amount installed as of September 1, 2013.

ZNEB Progress - Utility Incentives

THREE-YEAR UTILITY PLAN GOALS	2010-2012	2013-2015*	% Increase
Total Program Investment (million $s)	$1,627	$2,246	24%
Total Benefits (million $s)	$6,039	$8,980	49%
Annual Electric Savings (GWh)	2,625	3,706	41%
Annual Gas Savings (million therms)	57	72	26%
Total Costs (TRC) (million $)	$2,178	$2,774	28%
Net Benefits (TRC) (million $)	$3,861	$6,206	60%



Creating A Cleaner Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

ZNEB Progress- Residential Incentives

National Grid Residential Deep Energy Retrofit Program

- Incentives for multi/single family
- $42,000 maximum for whole building retrofits

DOER Financing

Through ARRA financing program, developing 0% DER residential loan program built into HEAT loan – 2013 release

ZNEB Progress-Demonstration Projects

1. **North Shore Community College** 58,000 SF Professional Health Building, Danvers – Completed late 2011

2. **Dept. of Fish and Wildlife**
   45,000 SF

- 294 kW solar PV
- 60 percent reduction
- high-performance env
- geothermal
- radiant ceilings
- heat recovery ventilation

3. **Olver Transit Center**
   24,000 SF
   Strategic window placement
   geothermal
   wood pellet boiler
   98 kW ground PV

Energy Future For the Commonwealth

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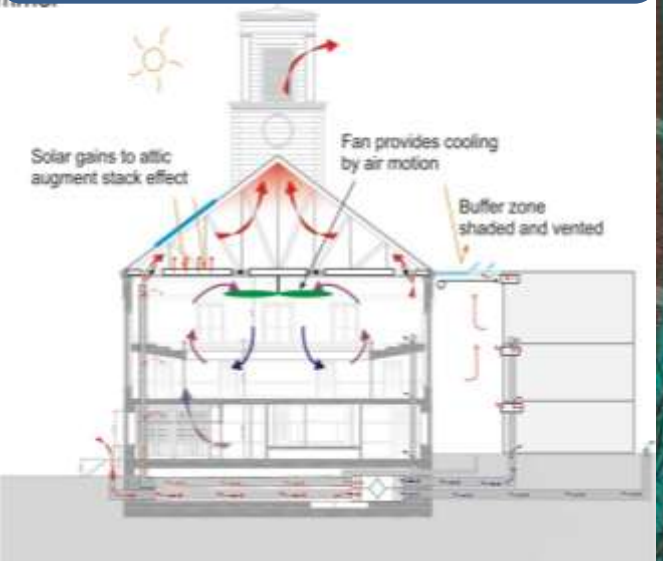
ZNEB Progress- ARRA Deep Energy Retrofits

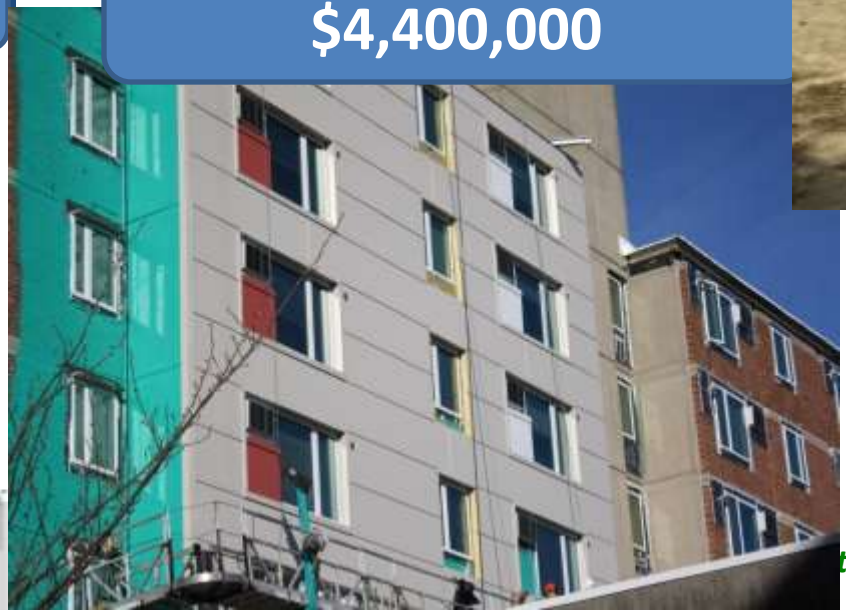
CENTER FOR ECOTECHNOLOGY
$1.2 million

ARCHITECTURAL HERITAGE FOUNDATION
$650,000
3 Historical Deep Energy Retrofits

UNITED TEEN EQUALITY CENTER
$1,900,000



CASTLE SQUARE TENANT'S ORG
$4,400,000



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ZNEB Progress- Training & W.D.

- DOER Building code and best practices training for code officials
- MassGreen training centers for residential weatherization
- Solar thermal , wind, PV, biodiesel installation training programs
- Equipment funding to schools
- www.cleanenergyeducation.org & clean energy internship program
- ZNEB advisory council
- DCAMM Accelerated Energy Program

Clean Energy Sector

- ❑ From July 2011 to July 2012, industry grew 11.2%
- ❑ 71,523 people employed at 4,995 clean energy firms
- ❑ 1.7% of total Massachusetts workforce

Creating A Cleaner Energy Future For the Commonwealth

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ZNEB Challenges

- Definition not always clear
- Building performance does NOT equal modeled performance
  - Problem with modeling?
  - Problem with design/construction?
- Need for effective commissioning for new technology
- Training of building operators lacking
- Installation and effective us of BMS systems key
- Plug - load creep in design and actual use
- Existing vs. New Buildings
  - Strategies not always the same
- Site constraints at some locations make ZNEB hard
- Building size and use can be impediments