



**ACCELERATED ENERGY PROGRAM LEADERSHIP STEERING COMMITTEE, IMPLEMENTATION PARTNERS  
&  
LEADING BY EXAMPLE  
JOINT MEETING  
NOVEMBER 14, 2014**



Secretary Shor  
Commissioner Cornelison



Governor Patrick



Secretary Valley Bartlett  
Acting Commissioner Lusardi



## Welcome

CEO Brian Devin, Mass Hospital School  
Commissioner Cornelison, DCAMM  
Acting Commissioner Lusardi, DOER

## AEP Updates

Hope Davis, DCAMM

## LBE Updates

Eric Friedman, DOER

**Celebration of Accomplishments:** *A panel of state facilities on sustainability accomplishments, challenges and lessons learned*

Facilitated by K. Bernier

## Trivia Challenge

Stephen White, DCAMM and Trey Gowdy, DOER

## Going Forward

Jenna Ide, DCAMM and Eric Friedman, DOER

**Welcome**

**DCAMM**

**Commissioner**  
**Carole Cornelison**



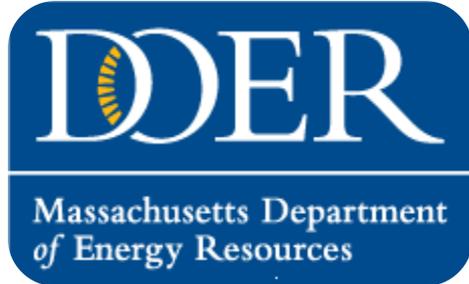
## Director Joseph Hogan, Department of Youth Services

- Worked as instrumental leader on retrofits of 14 DYS sites in AEP.
- Supported the estimated investment of \$9.3 million in the DYS sites to save \$632,000 annually.
- Coordinated between deferred maintenance, design and construction of additions, and energy projects.
- Helped manage three different types of energy project procurement methods (utility vendor, comprehensive and retro commissioning)



*The \$3.7 million retrofit at the DYS' Central Youth Service Center in Westborough includes replacement of the outdated single pane steel frame windows in the Sharp Building.*

**Thank you for your dedicated efforts!**



# **Department of Energy Resources Updates**

**Acting Commissioner,  
Meg Lusardi**

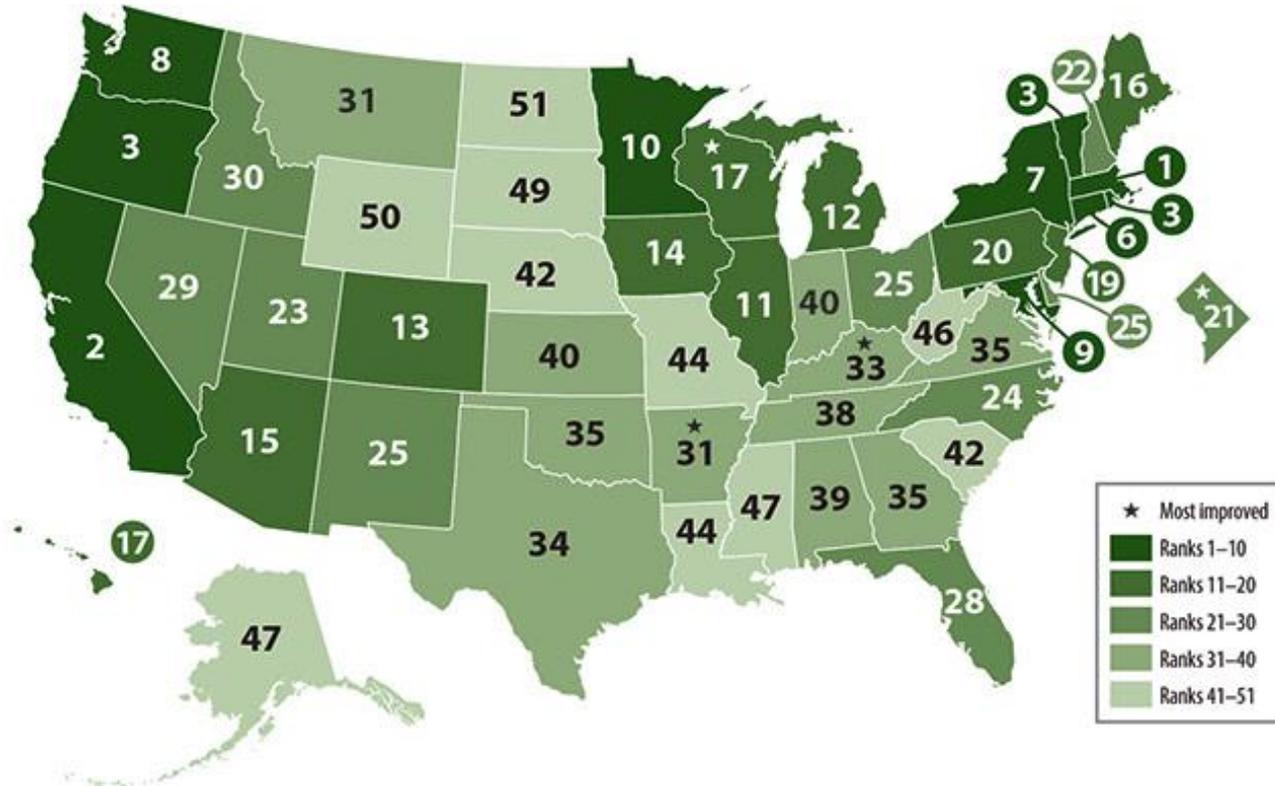
**November 14, 2014**

# Patrick Administration Key Initiatives

- Joined Regional Greenhouse Gas Initiative
- Created Leading by Example Program – EO484
- Signed Green Communities Act and Global Warming Solutions Act
- Mass Save<sup>®</sup> efficiency programs most robust in country
- Opened nation's first large wind blade test facility
- Launched Accelerated Energy Program



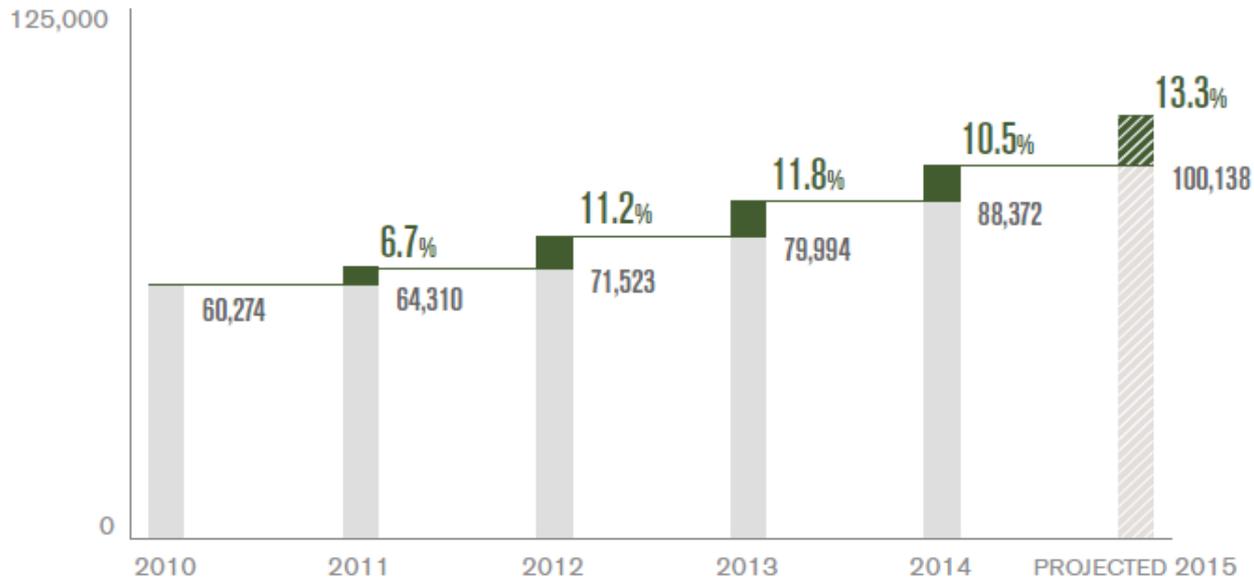
# American Council for an Energy-Efficient Economy: #1 Ranking



- Massachusetts ranked #1 in energy efficiency, four years in a row
- Tied California's record of four years at top spot

# Clean Energy Industry

Figure 1: Massachusetts Clean Energy Employment Growth 2010-2015 (Projected)



- More than 88,000 people work in the clean energy sector
- 2.4% of Massachusetts workforce
- Double-digit growth in employment growth 3 years in a row
- 5,985 clean energy businesses

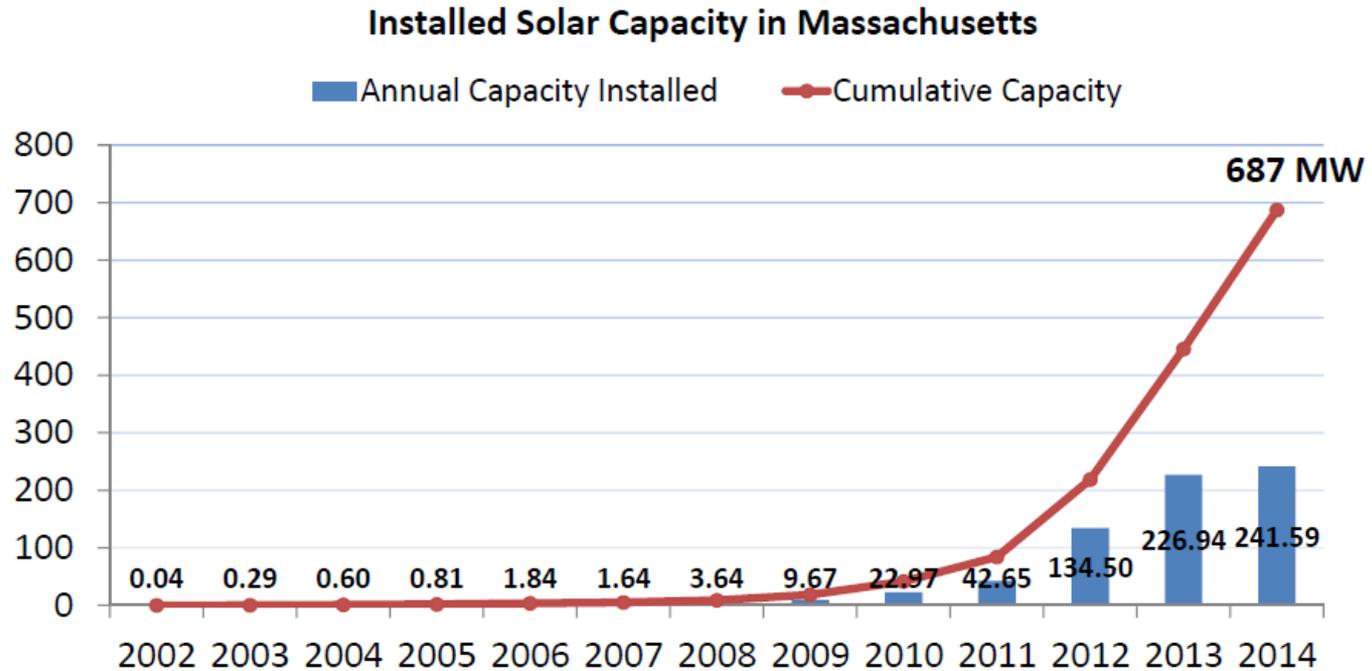
Graph:  
(MassCEC, 2014)



Massachusetts Department  
of Energy Resources

*Creating A Cleaner Energy Future For the Commonwealth*

# Solar Growth

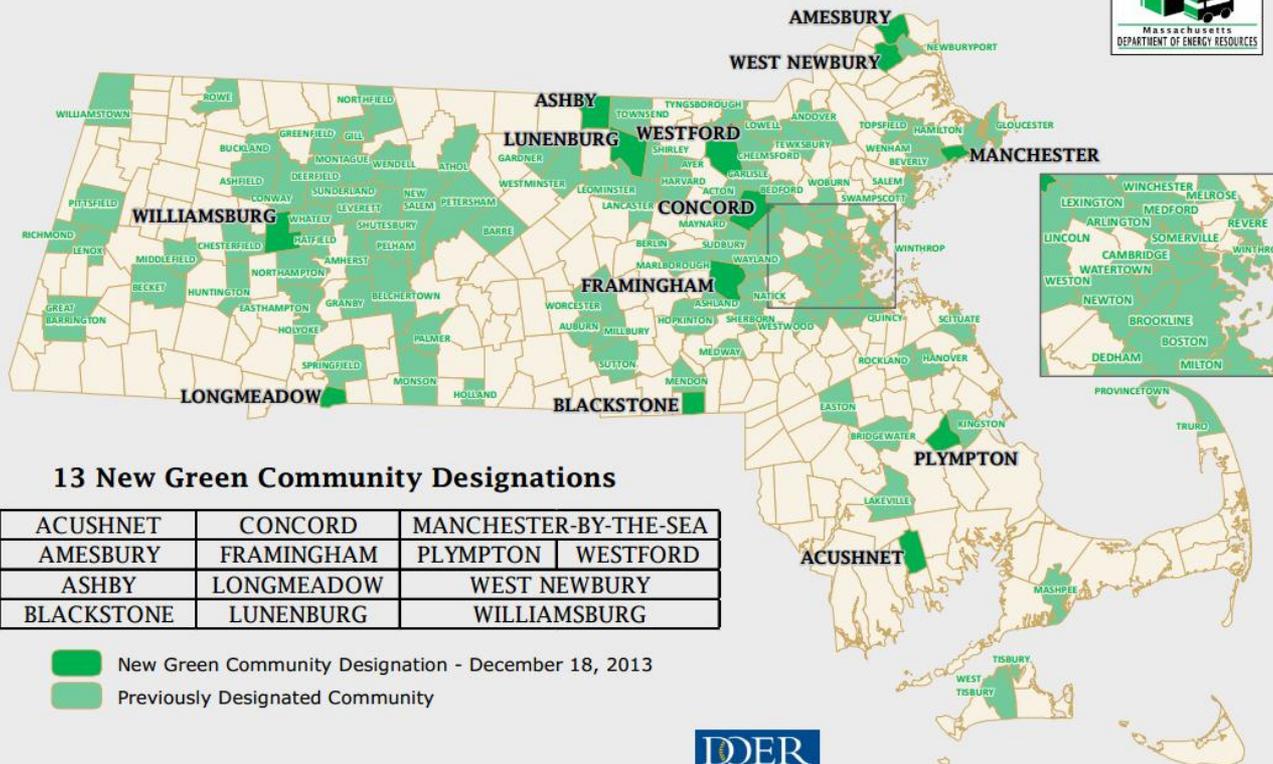


- Ranked 5<sup>th</sup> in the nation for total solar power (MA is 14<sup>th</sup> in population size and 44<sup>th</sup> in land area)
- Enough electricity to power 94,100 homes



# Green Communities

**GREEN COMMUNITY DESIGNATIONS REACH  
ONE HUNDRED TWENTY-THREE**



### 13 New Green Community Designations

ACUSHNET	CONCORD	MANCHESTER-BY-THE-SEA
AMESBURY	FRAMINGHAM	PLYMPTON   WESTFORD
ASHBY	LONGMEADOW	WEST NEWBURY
BLACKSTONE	LUNENBURG	WILLIAMSBURG

- New Green Community Designation - December 18, 2013
- Previously Designated Community

25 Miles



J. Pfister, 1-6-14



Massachusetts Department  
of Energy Resources

*Creating A Cleaner Energy Future For the Commonwealth*

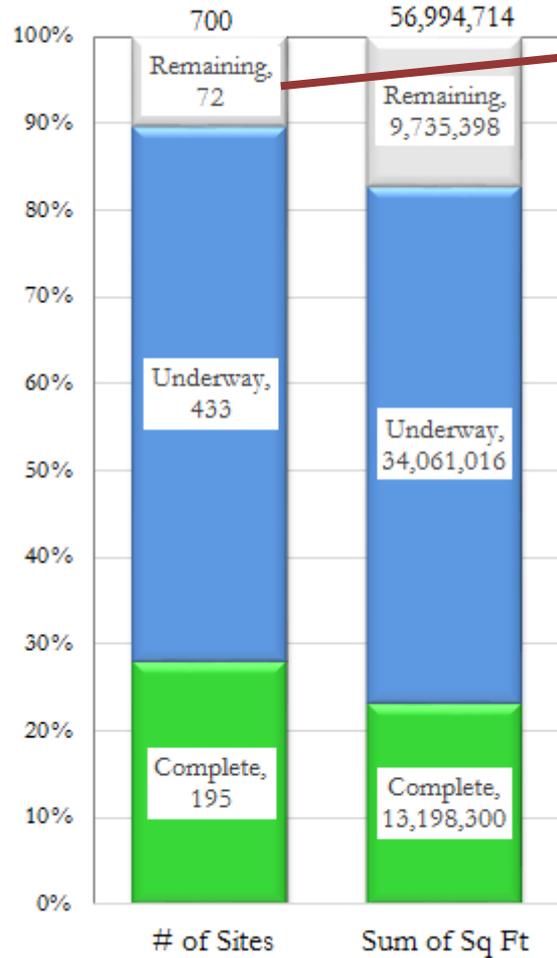
# Looking Ahead

- Three Year energy efficiency plans (2016-2018)
- Renewable thermal included in Alternative Portfolio Standard
- Managed solar growth
- Continued support to state agencies and municipalities



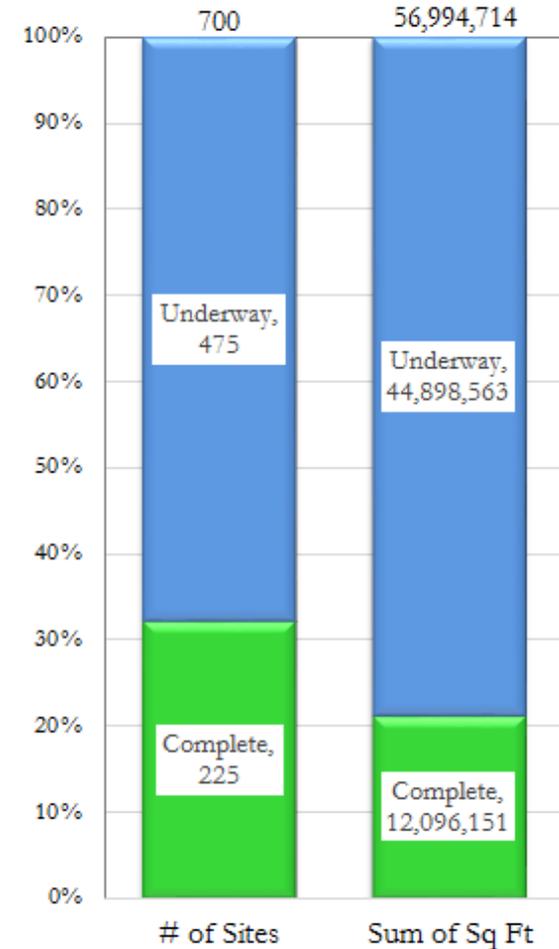
# AEP Updates

## Sep 30, 2014 (Actual)



**Oct 31, 2014  
Only 24 sites  
remaining!**

## Dec 31, 2014 (Planned)



Received \$312 million AEP funding through Environmental Bond Bills

Implemented TZNE Retrofits at Pilot Sites, including the initiation of the project at Cape Cod Community College

Launched CoFFEE Green Revolving Fund

Held Gardner Press Event

Sent 11 AEP Certification posters to Courts

Started Planning for Work after AEP (Phase II)

As of Q3 2014

**Invested \$74 million**

**Spent \$50 million**

**Saved \$6 million**

*Trial Court's Director  
of Facility  
Management John  
Bello during his  
presentation at the  
press event at the  
Gardner District  
Court.*



# AEP Accomplishments and Successes

# Planned and Structured the Work

## Identified Procurement Priorities



## Expanded Pool of Consulting Firms

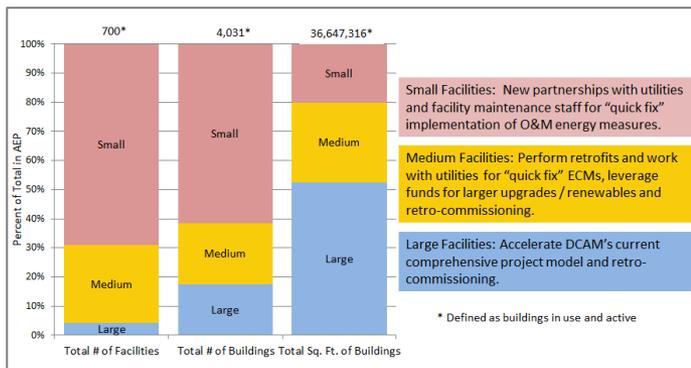
Impl Group	Electric Service Provider	Number of Sites	DELIVERY OF SERVICES								Legend	
			Audits	Water Survey	RCx Audits	30% Design Services	65% Design Services	100% Design Services	Constr. Mgmt	Constr.		
SF <sup>1</sup>	Utilities	364	Utility Prog	HD/FA/Unl					Utility Prog	Utility Prog	Utility Prog	Adequate
	Municipal	74	HD/FA	HD/FA					HD			Shortfall
WBA <sup>2</sup>	Utilities	140	HD/FA/Unl	HD/FA/Unl		HD/Unl	HD/Unl	HD/Unl				None
	Municipal	23	HD/FA	HD/FA		HD	HD	HD				Not Applicable
RCx <sup>3</sup>		14		HD/FA	HD/FA	HD	HD	HD	HD			
Comp <sup>4</sup>		48	HD	HD		HD	HD	HD	HD			
New Review <sup>4</sup>		16	HD	HD/FA								

<sup>1</sup>Total SF Sites = 438. 8 SF Sites are served by both a municipal and utility electric company. Each of these sites has been assigned to a single provider.  
<sup>2</sup>Total WBA Sites = 163. 2 WBA Sites are served by both a municipal and utility electric company. Each of these sites has been assigned to a single provider.  
<sup>3</sup>Of the 48 Comprehensive Sites, 33 are in progress.  
<sup>4</sup>Of the 16 New Review Sites, 2 are in progress and 1 is complete.

## Established AEP Leadership Steering Committee, Working Groups and Implementation Committee



## Structured Program to Retrofit 700 Sites



# Established Program Controls

## Energy Audit Data Collection Templates

Site - Audit Template	
Audit Date: 6/29/2012	Site Contact - Name: John Fano
CAMS Site Code: WLDN2	Site Contact - Title: NE Regional Supervisor
Site: WALDEN POND STATE RESERVATION	Site Contact - #: 978-369-2354
Serial#: Energy & Environmental Affairs	Site Contact - Email:
Agency: DEPARTMENT OF CONSERVATION AND RECREATION	Auditor Prime: E&D
Site Address: Concord, MA	Auditor Sub: E&D
Site ZIP: 03301	Auditor - Name: David Ward
Prim Exec Unit: Municipal	Auditor - Title: Principal Auditor
Project Number: CO-2012 ADJ	Auditor - #: 108-450-1946
Date Source Audit:	HD Contact - Email: david.ward@dmr.state.ma.us
Date of NTP: 4/3/2012	

Commisses	
Building Codes	Building Name
Totals	14
430DM001	GALLERY SHED
430DM002	GARAGE
430DM003	NATURE CENTER SHED
430DM000	BARN

Site - Audit Results	
Audit Date: 6/29/2012	Site Contact - Name: John Fano
Site Code: WLDN2	Site Contact - Title: NE Regional Supervisor
Site: WALDEN POND STATE RESERVATION	Site Contact - #: 978-369-2354
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Prim Exec Unit: Municipal	Auditor - Title: Principal Auditor
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Date Source Audit:	HD Contact - Email: david.ward@dmr.state.ma.us
Date of NTP: 4/3/2012	

Energy Conservation Measure	Cost (\$)	Utility Incentive (\$)	Annual Savings			Simple Payback (yrs)
			Energy (MMBtu)	Water (Gallons)	Cost (\$)	
Totals	\$ 22,911	\$ -	139	372	\$ 7,345	3.1

## Building codes checklist

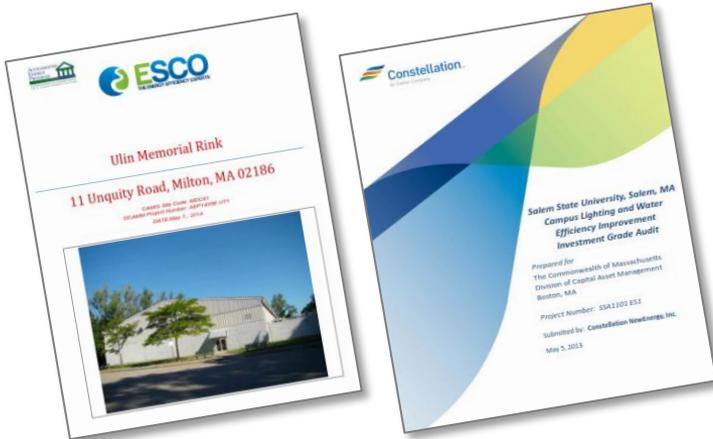
ECM No.	Potential Existing Conditions	Potential ECMs
Lighting	Incandescent, older fluorescent lights with manual controls	CFLs, new fluorescent technologies, LEDs, sensors, CFLs, new fluorescent technologies, LEDs
1.0	Bulbs, Fixtures, Ballasts, Exit Signs	Incandescent, older fluorescent lights
2.0	Controls	Older Controls, manual switches, inoperable controls
3.0	Motors	Standard efficiency motors
12.0	Windows	Single pane, old, cracked, inoperable
12.0	Doors	Hollow or cracked, poor alignment, broken, does not fully close, inoperable
12.0	Overhead door	Uninsulated, no seals, poor alignment
10.0	Air Sealing	Drafts around windows, doors, through walls, joints, corners
4.0	Energy Management System	Inoperable or no EMS
5.0	Toilets & Urinals	Standard, large volume flush toilets and urinals
5.0	Faucets	Older, standard faucets with no flow restrictors
5.0	Showers	Standard, older showerheads
5.0	Commercial Kitchen Pre-rinse Spray Valves	Standard, >2 gpm pre-rinse spray valves
4.0	Thermostats	Manual or older mechanical thermostats
4.0	Boiler Reset Control	Reset control not functioning or does not exist
17.0	Water Heater	Stand alone tank type or "everhot"
17.0	Heating Systems	Oil
17.0	Boilers	Standard efficiency forced hot water or steam
17.0	Furnaces	Standard efficiency
17.0	Unit Heaters	Standard efficiency or steam
17.0	Other	
17.0	Cooling Systems	Rooftop
17.0	Window	Standard efficiency or older unit
10.0	Pipe Insulation	Water heater
10.0	Heating distribution	Water heater

## Common Reportable Milestones and Durations for All Types of Procurements

Procurement Category	Energy Storage Bids				Water & Sewer Bids				Utility Vendor				Misc. O&M/Repair			
	Report	Open	Close	Award	Report	Open	Close	Award	Report	Open	Close	Award	Report	Open	Close	Award
Phenolic	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Water	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Sewer	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
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Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
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Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
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Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
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Water/Other	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13	10/15/12	11/15/12	12/15/12	1/15/13
Water/Other	10/15/12	11/15/12														

# Established Quality Management Plan

## Standardized Scopes of Work and Model Energy Audit Reports



## Quality Checks and Vendor Evaluations

	Total Sites	Technical Report Review		Site Evaluation		Construction Evaluation	
		QC Goal (10%)	Tech Reviews Completed	QC Goal (5%)	Site Visits Completed	QC Goal (5%)	Construction Inspections Completed
Utility Vendor	469	47	14	23	8	23	1
RCx	31	3	1	2	1	2	0
Comprehensive	99	10	0	5	0	5	0
New Review	20	2	0	1	0	1	0
Other / Evaluated	81	N/A					
<b>Total</b>	<b>700</b>						

Utility Vendor QA/QC Evaluation Status						
Vendor	Project Number	Site Code	Site Name	Technical Review	Site Inspection	Cost
Rise	AEP1301E UT1	TRC21	Fitchburg District Court	21-Feb-13	23-Apr-13	
Nxegen	AEP1302E UT1	MIL05	Braintree Armory	10-Apr-13	18-Apr-13	
Prism	AEP1303E UT1	MIL39	Northbridge Armory	19-Jun-13		
N.E.S.	AEP1304E UT1	DPW42	Chelmsford Depot	25-Jul-13		
Horizon	AEP1305E UT1	DMH33	Wrentham Housing			
AECOM	AEP1306E UT1	DPW96	MHD Medford Facility			
Source1	AEP1307E UT1	BRAD2	Bradley Palmer State Park	19-Aug-13		
Guardian	AEP1308E UT1	FWE23	Lobster Hatchery			
ECI	AEP1309E UT1	MIL56	Taunton Armory	26-Aug-13		
Groom	AEP1310E UT1	TRC27	Haverhill District Court			
Paquette	AEP1311E UT1	DMR01	LGR Region 1 Amherst	18-Jul-13		

## Construction Inspections by Quality Manager and Resident Engineer



# Reached Out to Vendors and Utility Companies

## Vendor Outreach Meetings

4 meetings with 243 participants



## 1st MOU between DCAMM and investor-owned utilities



Northeast  
Utilities

nationalgrid

THE POWER OF ACTION



Unitil

Columbia Gas  
of Massachusetts

A NISource Company



## Six LEAN Workshops

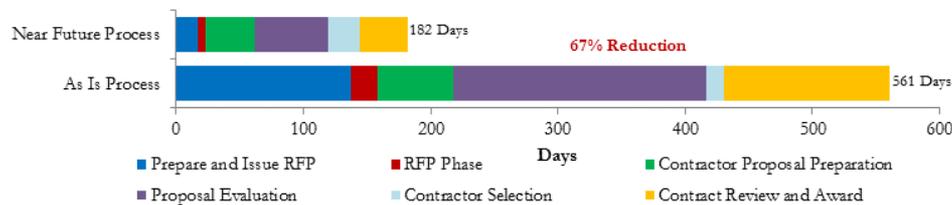
Shorten procurement duration of energy design-build and comprehensive performance contracts



LEAN Rapid Improvement Workshop (RIW)  
New data management solution & procedures



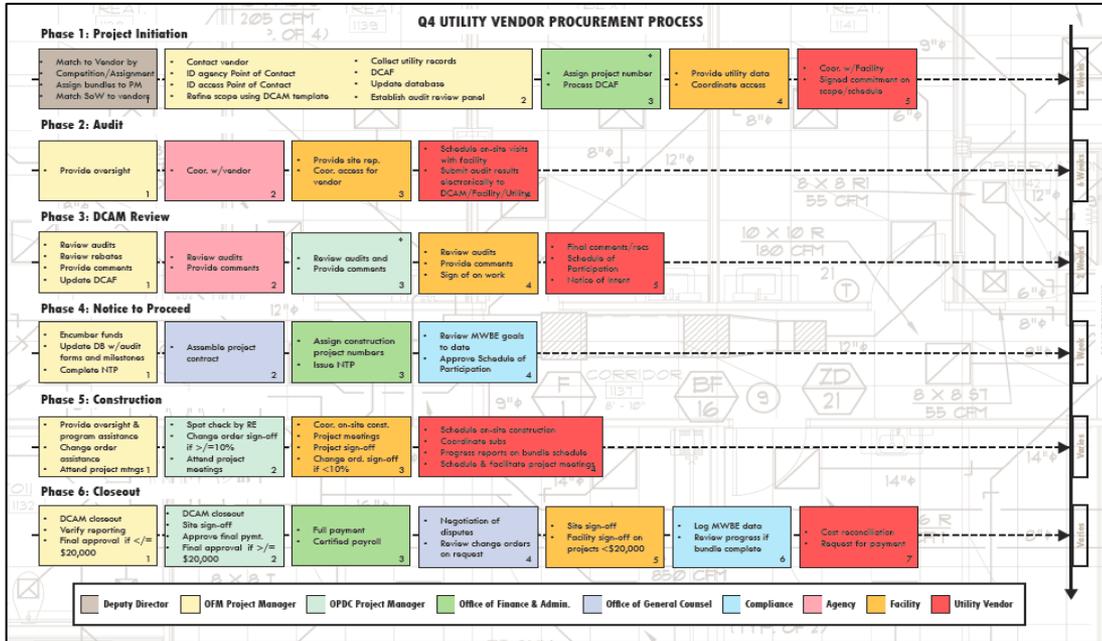
AEP Energy Design-Build Procurement Process



Three Fast Pitch  
Innovation Plans  
submitted

# Developed Program to Retrofit Small & Occasional Use Sites

Created entirely NEW procurement process (utility vendor contracting)



**NEW Utility Approved Vendors**

**13 Vendors**

**30 Contracts**

**448 Sites**

Expanded relationships with DCR & MassDOT  
To address 303 of the 448 sites

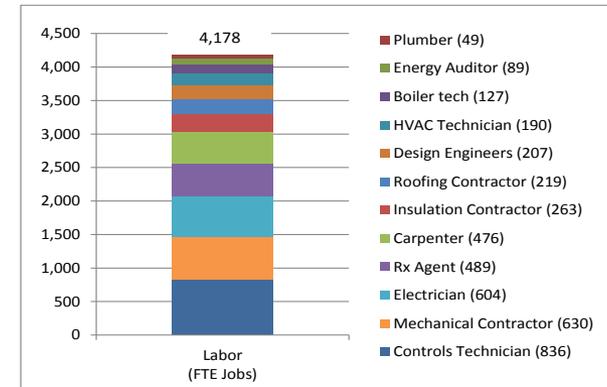


# Created (and sustained) Jobs, Access & Opportunity

## Established Workforce Advisors Held 3 meetings with stakeholders



## Estimated 4,000+ jobs through completion of implementation



## Workforce and W/MBE Participation

### Online Survey of Contractors HR practices relating to employment of women

DCAMM Study on Women in Non-Traditional Occupations

1. Does your company have any full-time or part-time employees in Massachusetts (male or female) for which the answer is "yes"?

<input type="checkbox"/> Asbestos worker	<input type="checkbox"/> Glazier
<input type="checkbox"/> Asphalt worker	<input type="checkbox"/> HVAC technician
<input type="checkbox"/> Bricklayer	<input type="checkbox"/> Insulation worker
<input type="checkbox"/> Carpenter	<input type="checkbox"/> Marble tile worker
<input type="checkbox"/> Cement finisher	<input type="checkbox"/> Mason
<input type="checkbox"/> Curbsetter/paver	<input type="checkbox"/> Millwright
<input type="checkbox"/> Driller	<input type="checkbox"/> Oiler
<input type="checkbox"/> Elevator constructor	<input type="checkbox"/> Piledriver
<input type="checkbox"/> Electrician	<input type="checkbox"/> Pipelayer
<input type="checkbox"/> Equipment operator	<input type="checkbox"/> Pitchworker
<input type="checkbox"/> Floor layer	<input type="checkbox"/> Plasterer



Metric	AEP Target	As of Q3 2014
Workforce (construction)		
- Minorities	15.2%	6.2%
- Women	6.9%	0.3%
W/MBE		
- Design	17.9%	12.7%
- Construction	10.4%	24.6%

## Massachusetts as a First Customer Cleantech Expo



## Innovative Technology Web Intake Form 37 registered companies and technologies

Mass.gov State Offices & Courts | State A-Z Topics | State Forms No Active Alerts | Skip to main content | A A | English

The Official Website of the Executive Office of Energy and Environmental Affairs

### Energy and Environmental Affairs

Search... in Energy & Environment

Agriculture | Energy & Utilities | Environmental Protection | Fisheries, Wildlife & Habitats | Recreation & Conservation | **Services & Assistance** | Agency

EEA Home > Services & Assistance > Guidance & Technical Assistance > Leading by Example > Clean Energy Innovative Technology Intake Form

#### Clean Energy Innovative Technology Intake Form

Fields Marked with a \* are required

[Click here for Technology Intake Form instructions](#)

\* Today's Date

----- Company Information -----

\* Company

Address

\* City

\* State

\* Zip

\* Primary Contact Name

\* Email

\* Phone

Website

----- Massachusetts Supplier Diversity Program (SDP) -----

Minority-owned Business Enterprise

Woman-owned Business Enterprise

Service-Disabled Veteran-Owned Business Enterprise

Small Business Enterprise

----- Technology Information -----

# Implemented Innovative Technologies

**Essex Sheriff's Department  
Demand Response and Custom  
Metal-enclosed Switchgear**



**Georges Island, DCR  
Off grid electricity with PV arrays with  
battery storage and diesel generator.**



**Concord Armory  
Burner Booster**



**Sheriff's Dpts. in Middlesex,  
Plymouth and Essex  
Automated water management  
system for laboratories**



**Berkshire House of Correction  
Instantaneous water heater in pair with  
condensing boilers**



**Bristol Community College**

**ZNE lab  
with  
ground-  
source  
and air-  
source  
heat  
pumps**



## TZNE Retrofit Charrette

74 participants across multiple disciplines



### Holyoke Com. College TZNE Owners Program Req. Charrette

#### Pilot TZNE programs:

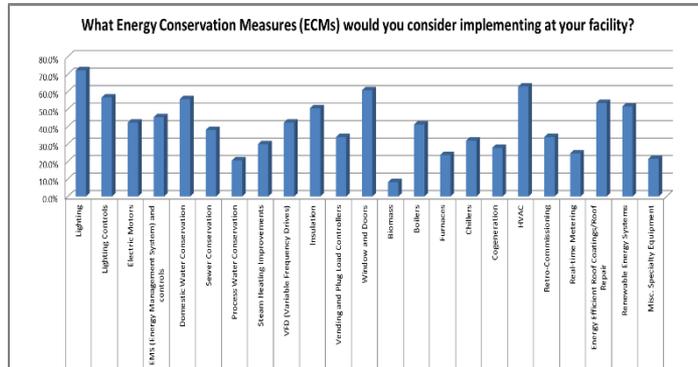
1. Cape Cod Community College
2. Holyoke Community College
3. Greenfield Community College
4. Plymouth Country Correctional
5. Essex Sheriff's Department  
(Lawrence and Middleton)
6. Georges Island
7. Lancaster Complex
8. North Central Correctional  
Institute *50% energy usage reduction*
9. Soldiers' Home Chelsea

TZNE Retrofit  
Report  
Includes Just Do  
Its ("JDIs")

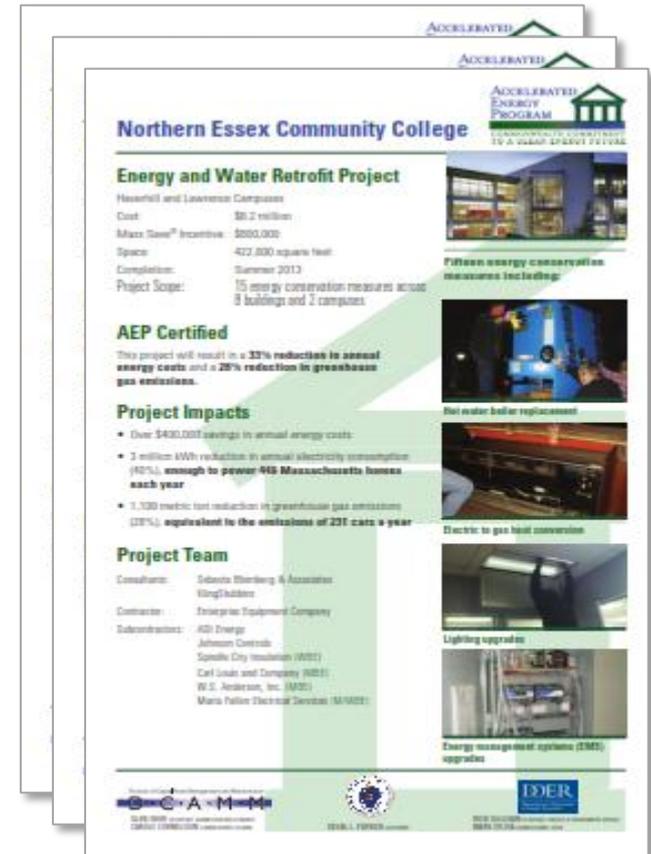


# Provided Outreach to Facility Managers

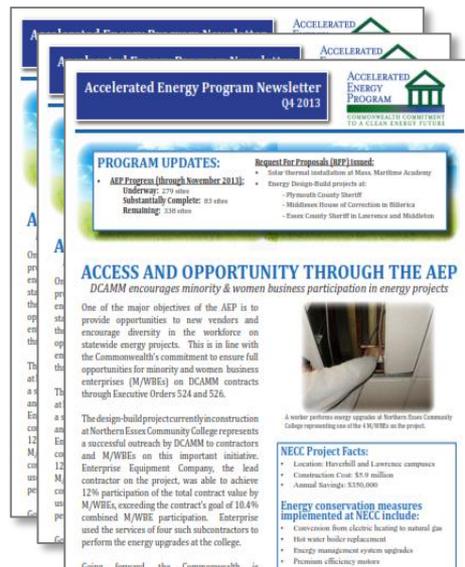
## AEP Survey of Needs to all Facility Managers



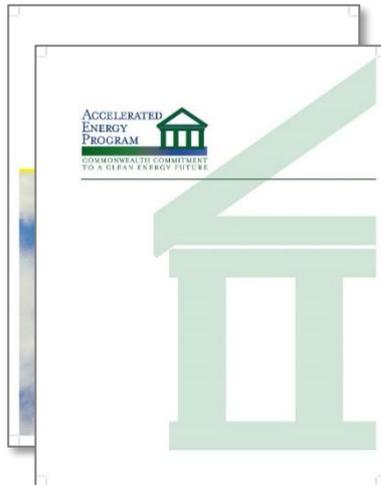
## AEP Certification Plaques & Posters



## AEP Bi-Monthly Newsletters



## AEP Welcome Kits





# Raised Awareness through Press Events

## Patrick-Murray Administration Announces Accelerated Energy Program

Innovative Program Sets Ambitious New Energy Goals to Reduce Energy Consumption at 700 State Sites; Will Save Massachusetts \$43 Million Annually; Create Up to 4,000 Jobs

## O'Neil Memorial Rink in Charlestown - 2012



## Gardner Event - Sept 2014



## NECC Event - Jan 2014



## Pittsfield Event - May 2014



## MASSBuys EXPO - May 2012



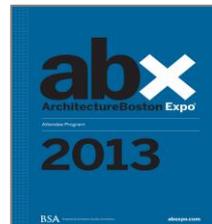
## Bradley Palmer State Park - Sept 2013



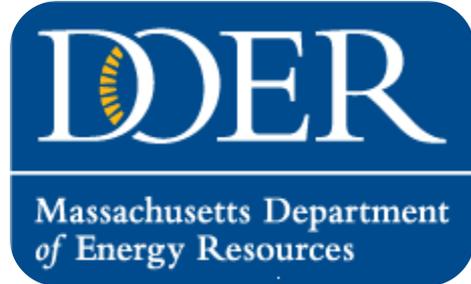
## MAFMA's semi-annual meeting - Nov 2013



## STCC - Jan 2013



*Creating A Cleaner Energy Future For the Commonwealth*



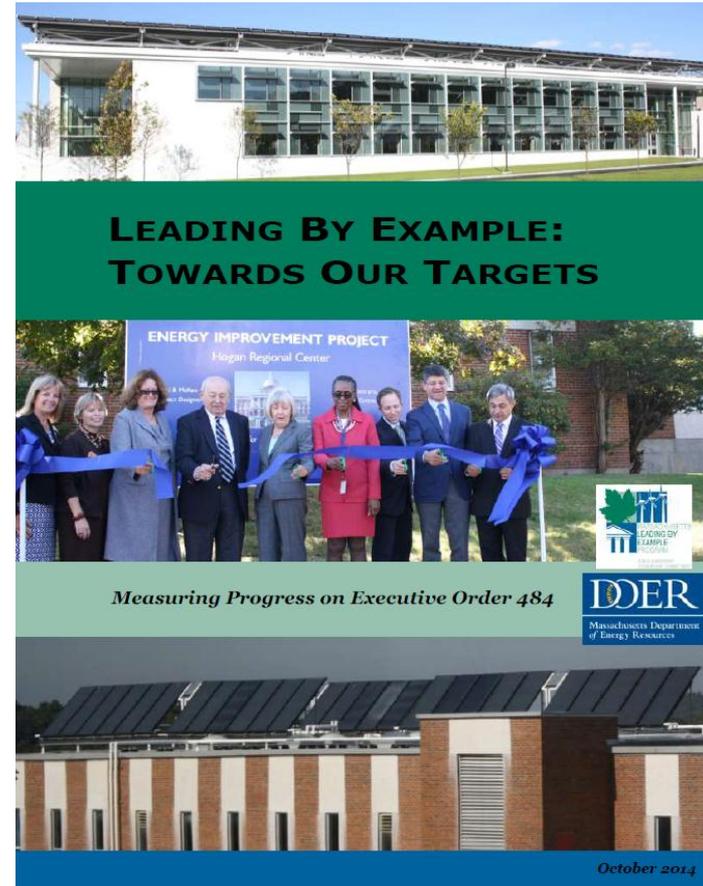
# Leading by Example Updates

**Director,  
Eric Friedman**

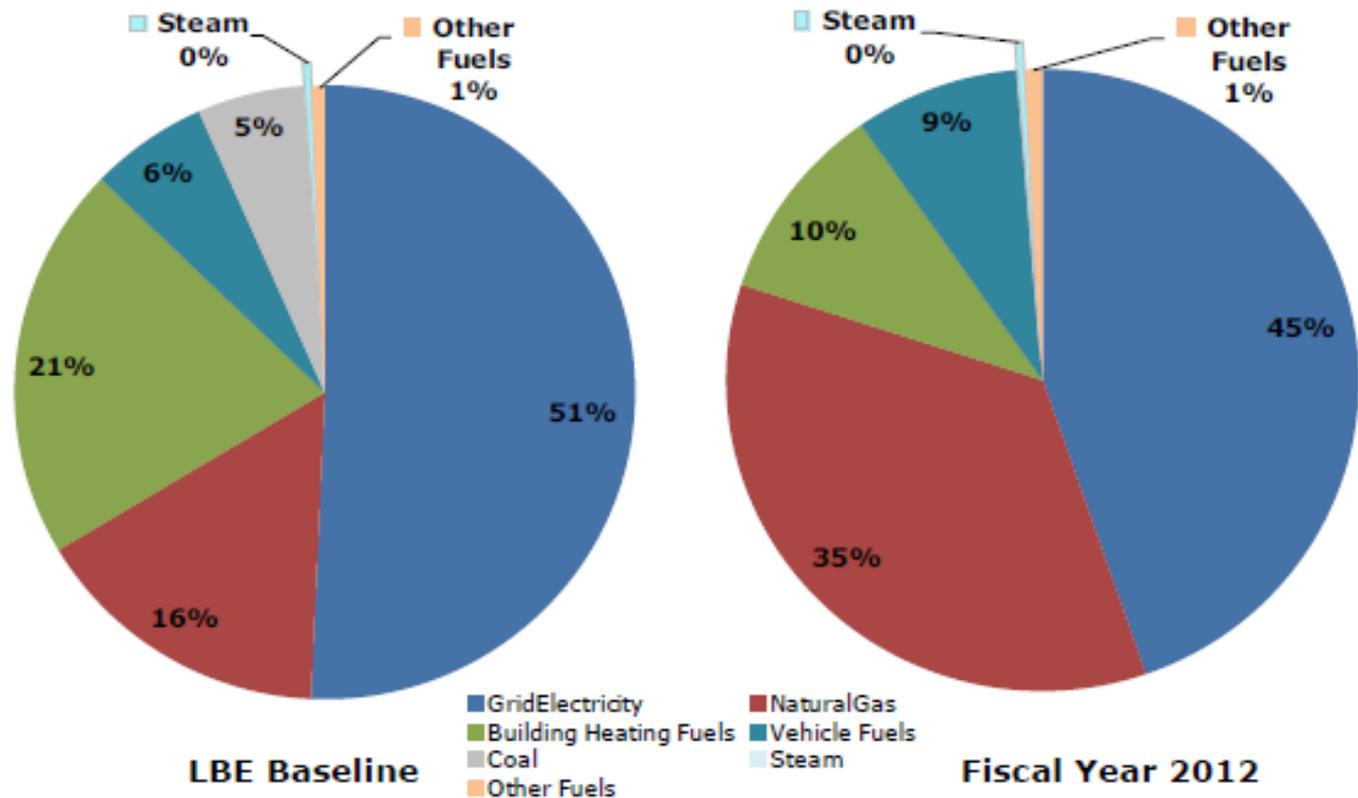
# LBE Progress Report

- First comprehensive LBE Progress Report
- Highlights progress toward E. O. 484 2012 goals
  - 25% GHG emission reduction
  - 20% improvement energy intensity
  - 15% of electricity as renewable
- 80 million of square feet of buildings and over 3,000 vehicles
- Includes hospitals, college and university campuses, prisons, visitor centers, state parks, roads and tunnels, airports, dams, waste water treatment facilities

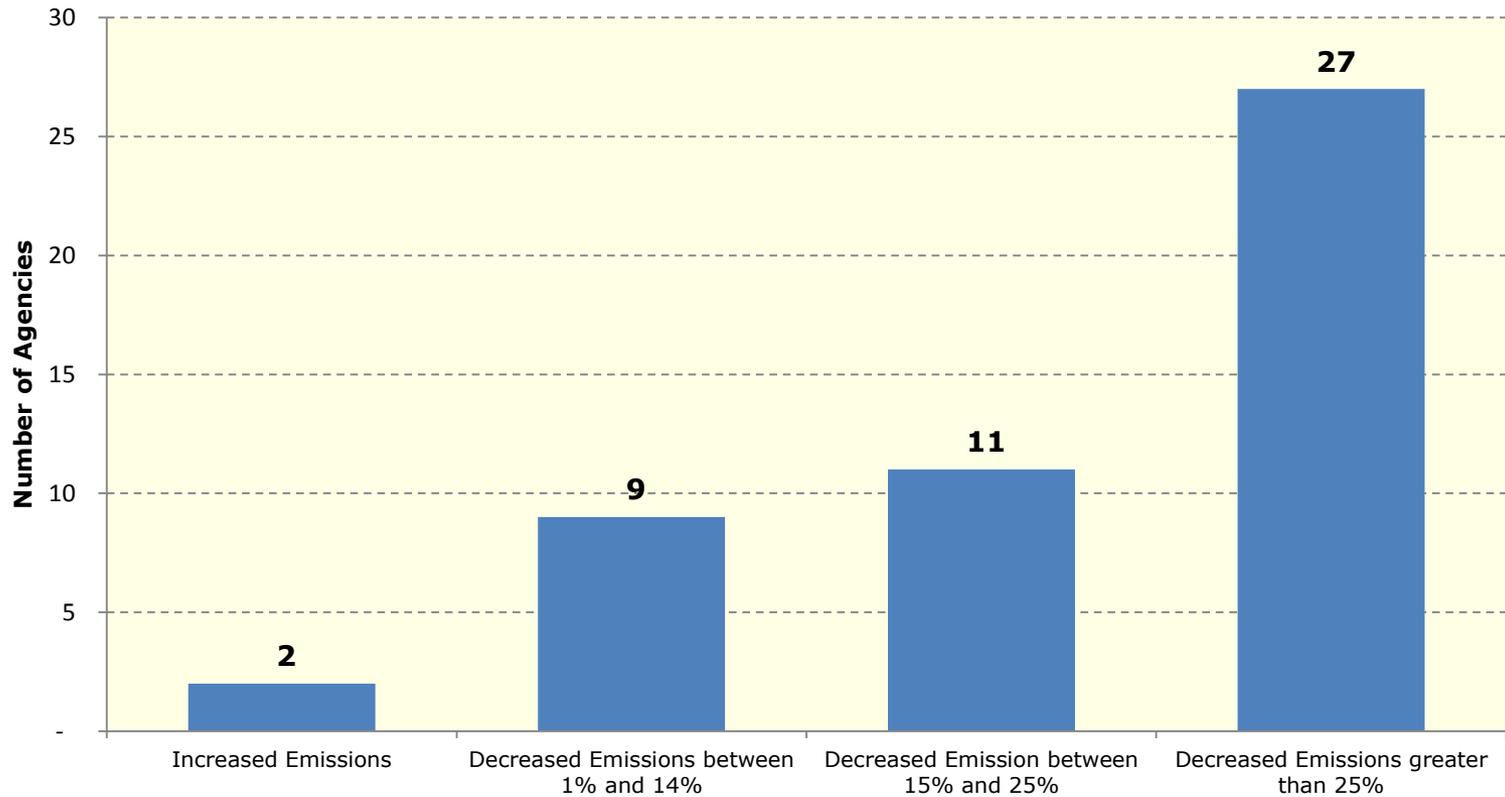
[www.mass.gov/energy/lbepprogressreport](http://www.mass.gov/energy/lbepprogressreport)



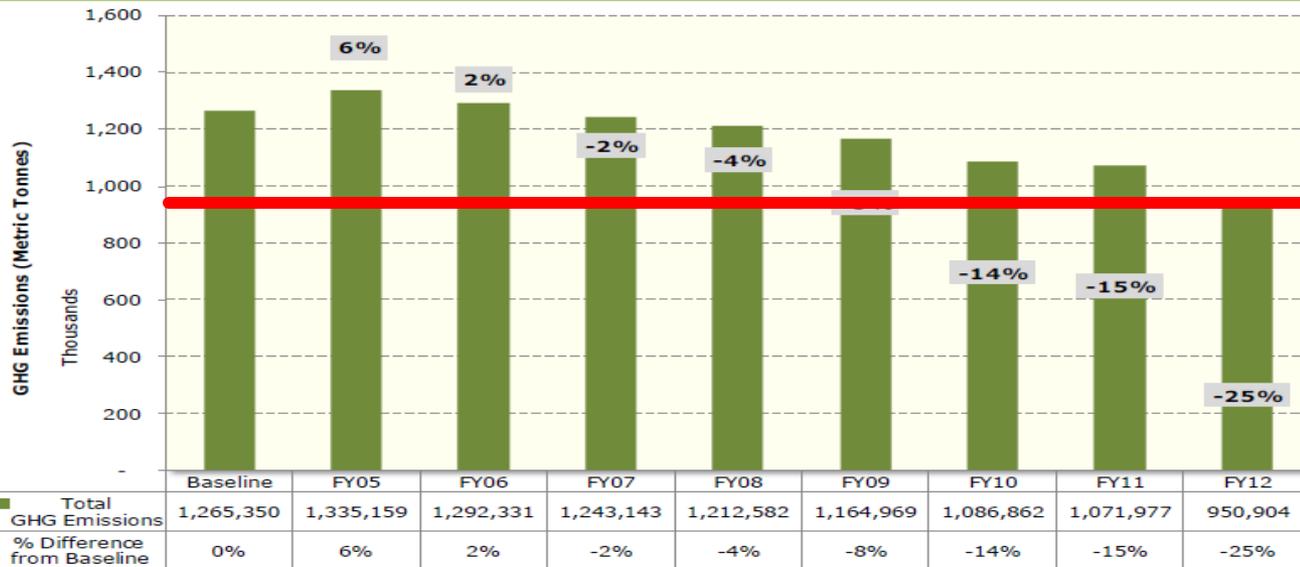
# Greenhouse Gas Emission Sources



# Agency GHG Emissions



# Greenhouse Gas Reductions

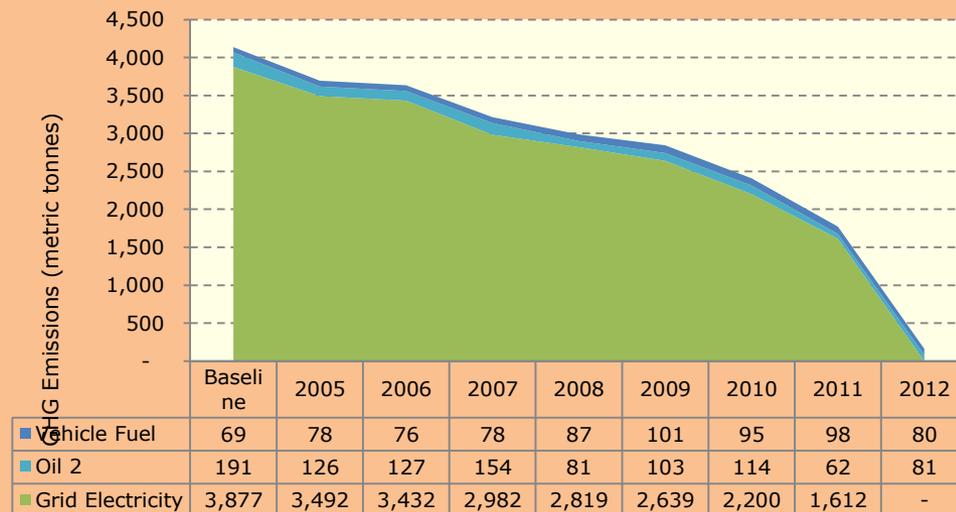


**25%  
reduction  
in GHG  
emissions  
in 2012!**

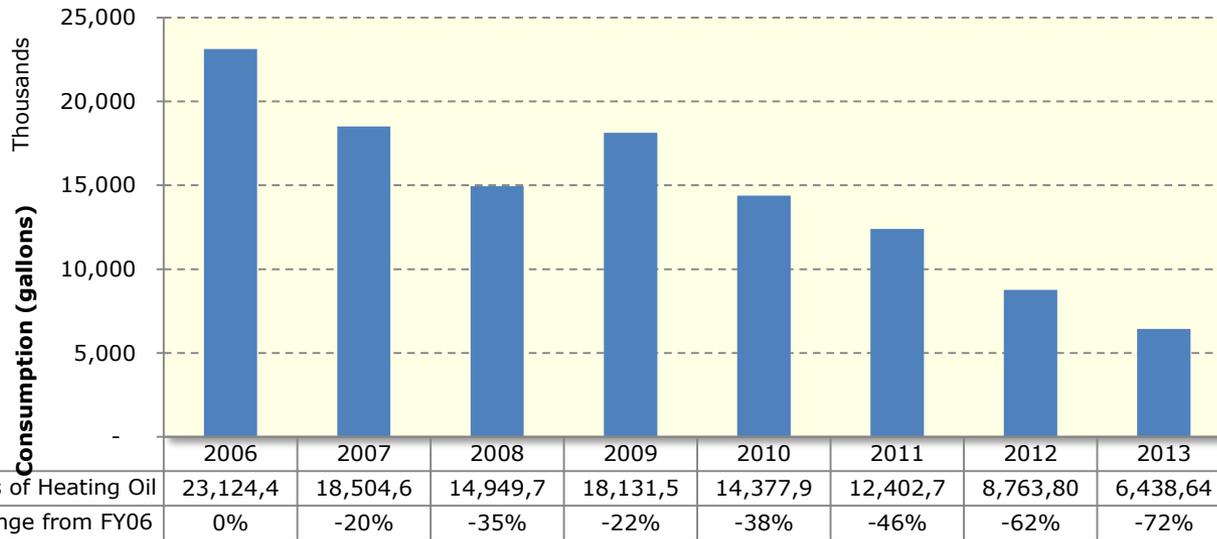
**Figure 4: Annual Change in GHG Emissions, Baseline Year to FY12**

Overall GHG emissions have decreased 25 percent from the LBE Baseline through FY12, reducing overall emissions by some 314,000 metric tons.

**Mt. Wachusett  
Community College  
Reduced GHG emissions  
from 4,000 tons in 2004  
to 0 tons in 2012**



# Moving away from heating oil

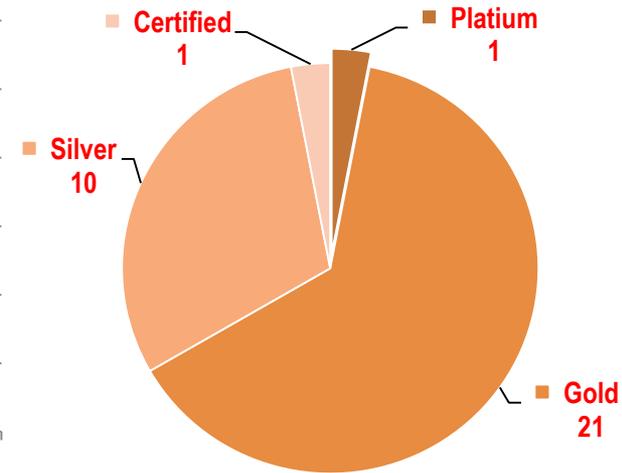
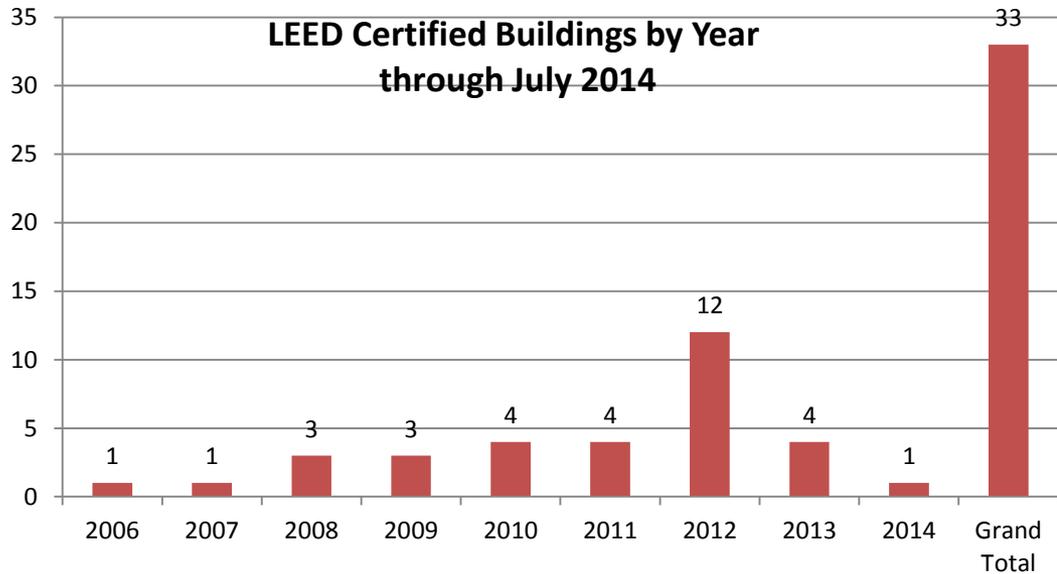


*Heating oil consumption has decreased over 72% since FY06*

**A comprehensive energy project At *DDS Hogan and Wrentham Facilities* eliminated use of 1.7 million gallons of fuel oil, reducing annual energy and maintenance costs by \$3 million**



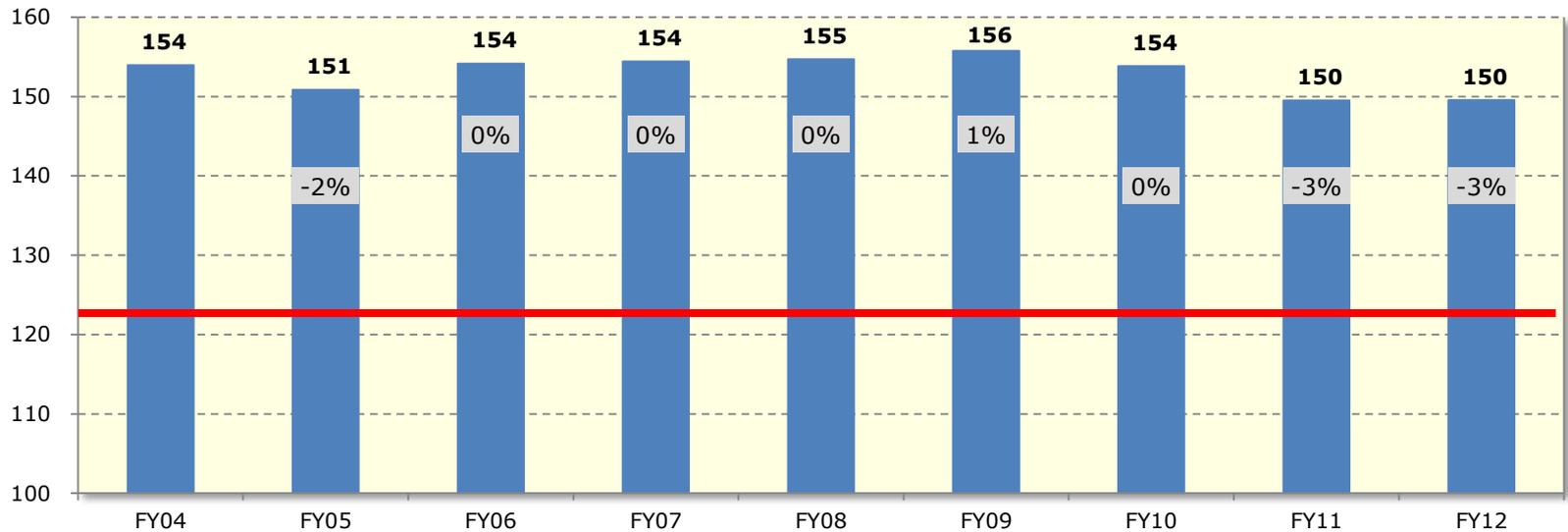
# New Construction



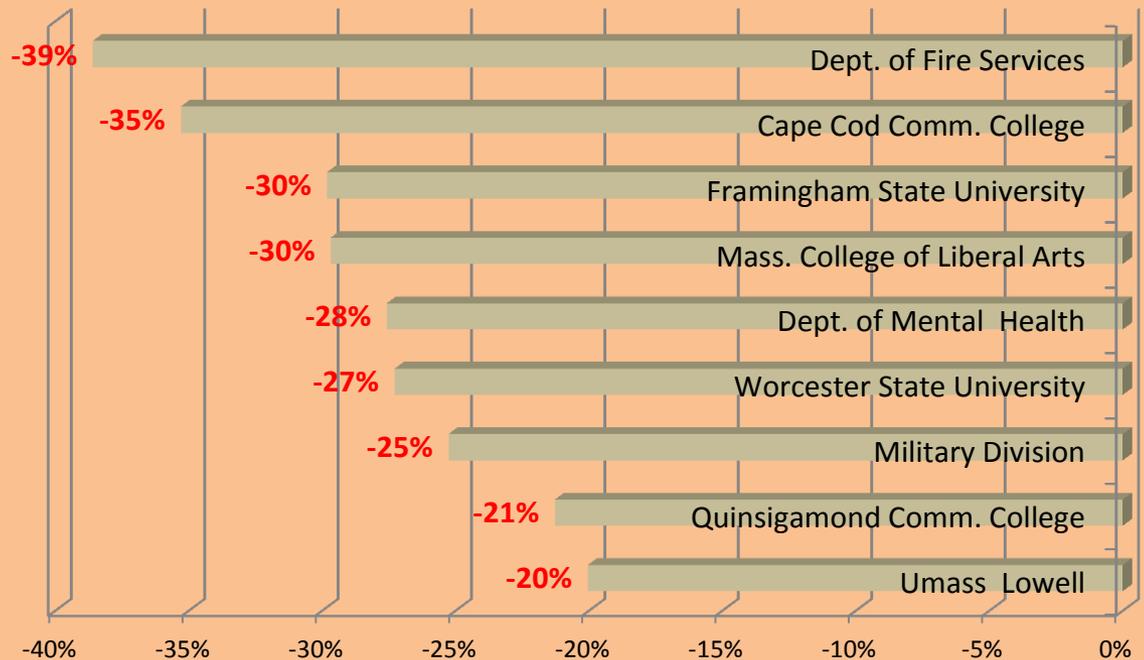
DFW headquarters is one of three buildings designed by DCAMM to meet the zero net energy building standard



# Energy Use Intensity

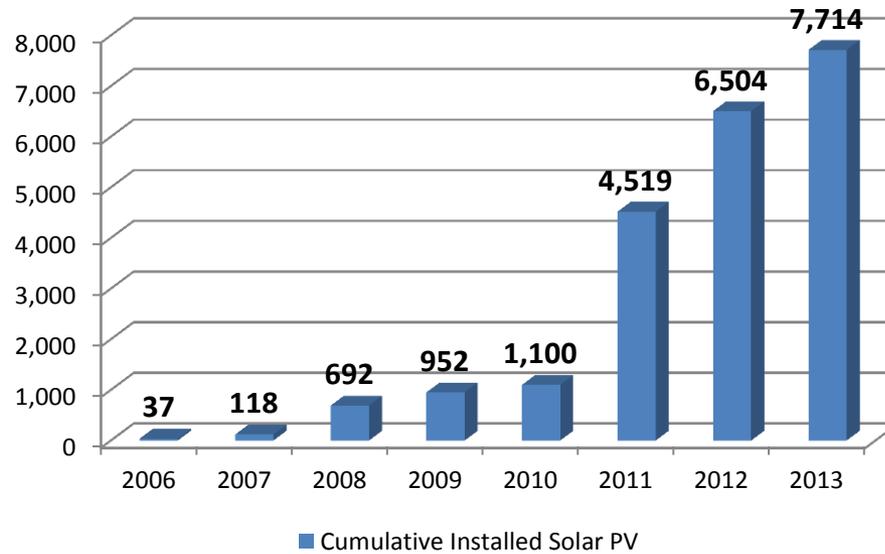


**Nine agencies/  
campuses reduced  
EUI by 20% or more**



Installed solar PV at state facilities increased from 100kW in 2007 to over 7.5 MW in 2013

### Installed Solar PV at State Facilities

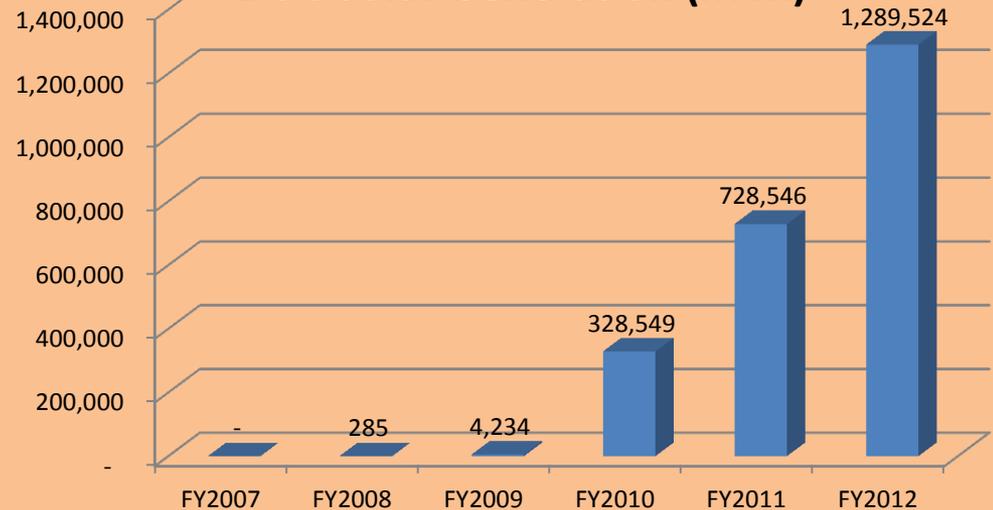


Solar Growth

DOC has installed 1 MW of solar PV,

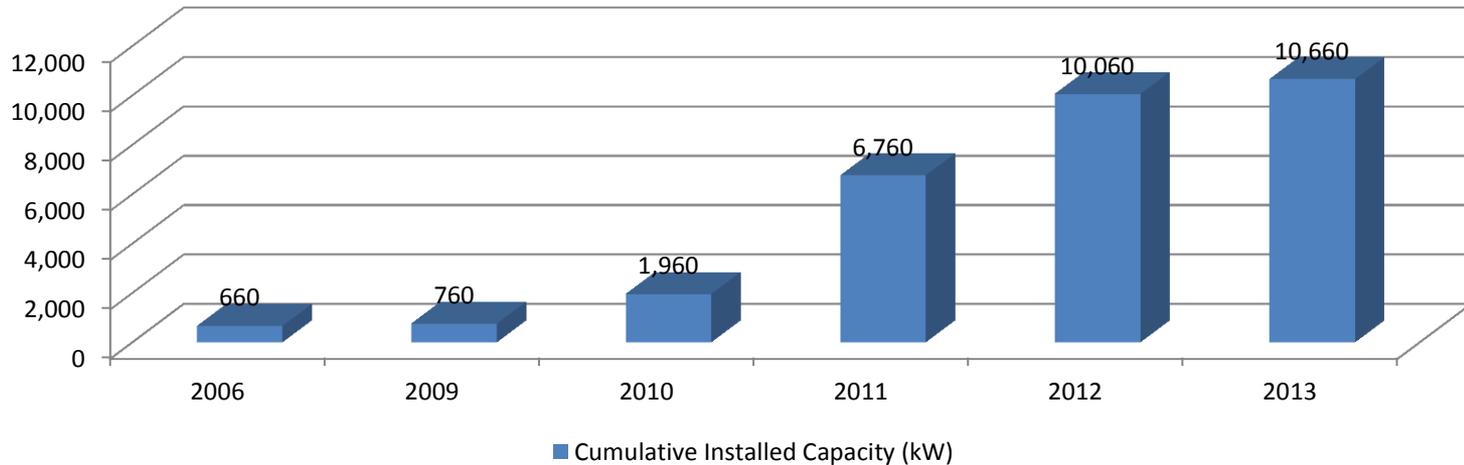


### DOC Solar Generation (kWh)



# Wind Generation

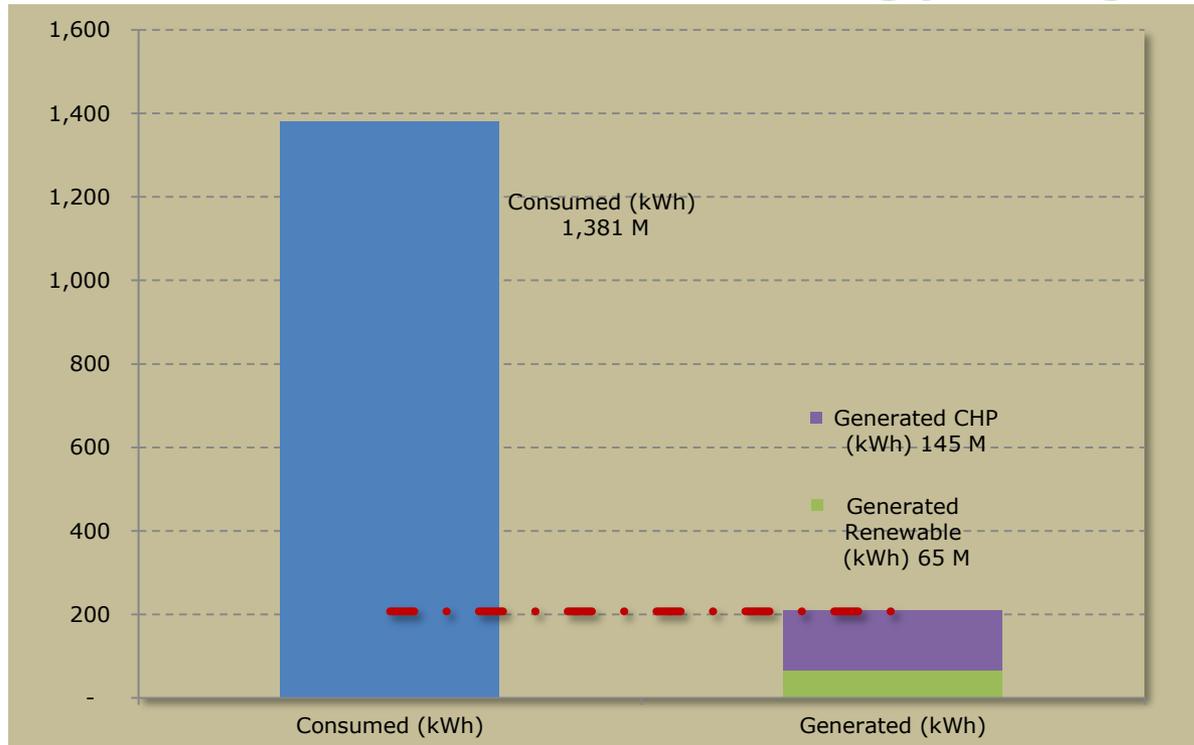
## Cumulative Installed Wind at State Facilities



**Two 600kW wind turbines installed at Deer Island contribute to the 25% on-site renewable generation at MWRA's Deer Island**



# On-site Energy Progress



**15.21% of state government electricity consumption is generated on-site from clean and renewable sources**

**UMass Medical 17.5 MW natural gas CHP power plant generates 65% of campus electricity demand**





**THANKS!**



**DER**

Massachusetts Department  
of Energy Resources

wealth

## Celebration of Accomplishments:

*A panel of state facilities on sustainability accomplishments, challenges and lessons learned*

**John Bello, Trial Courts**

**Joe Hogan, Dept. of Youth Services**

**Howie Larosee, Mass College of Art and Design**

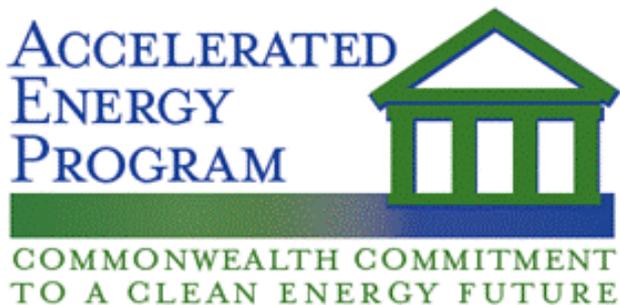
**Colonel Tim Mullen, National Guard**

**Raul Silva, Dept. of Conservation & Recreation**

**Maureen Socha, Springfield Tech. Community College**

# Accelerated Energy Program and Leading By Example Program

## Trivia Challenge



# What's Next?

# DCAMM E-Team 5 year Planning through 2020

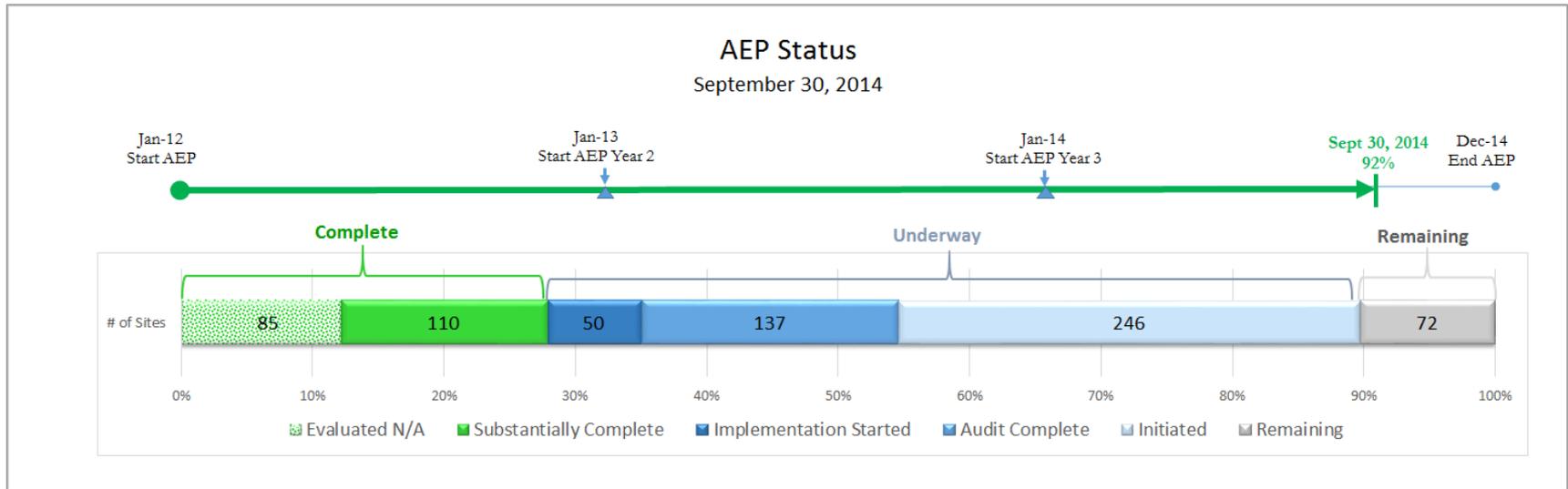
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Resiliency

Towards Zero  
Net Energy

Continuous  
Facility  
Improvement

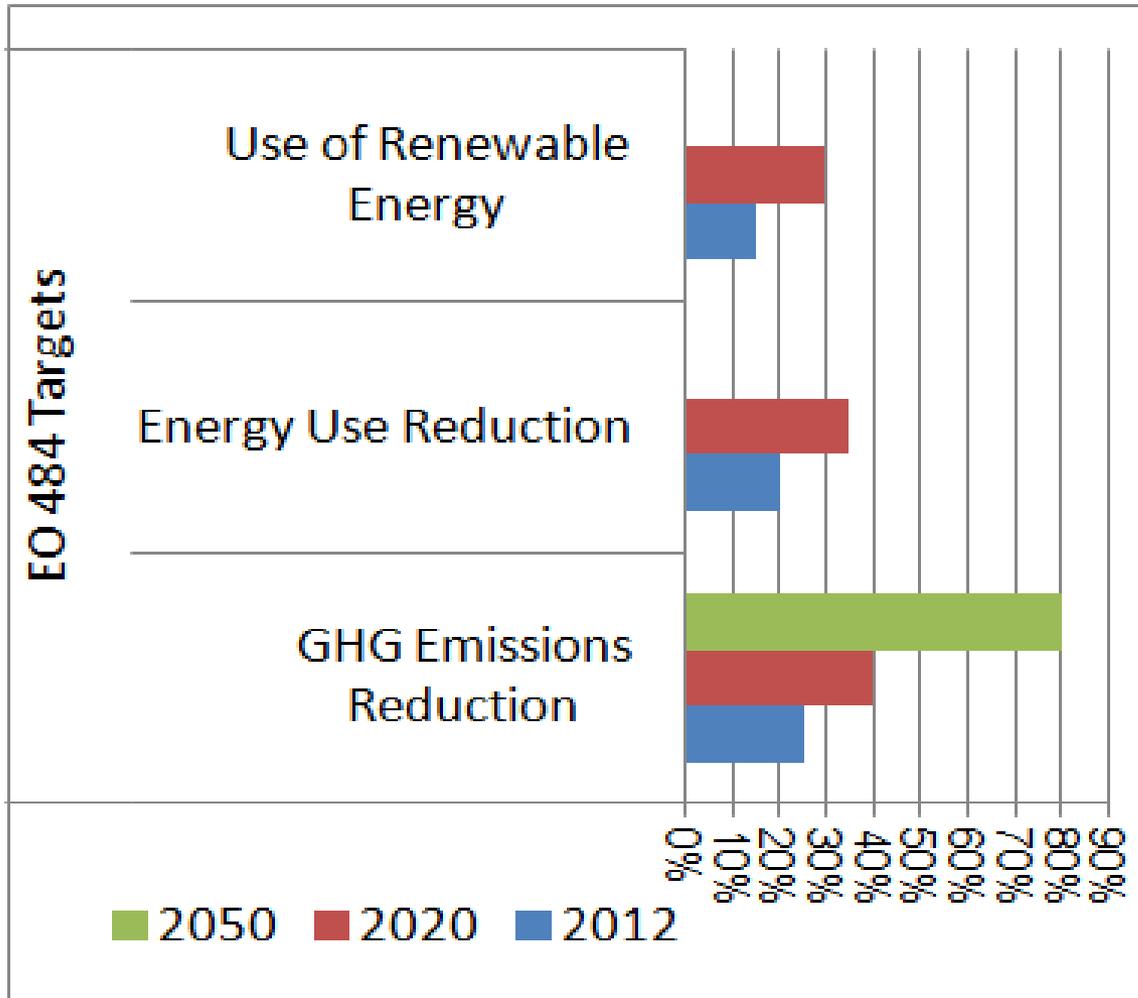
# Complete initiated energy projects



## Manage retrofit projects through delivery process:

- Initiate
- Complete draft and final audit
- Start implementation and construction
- Substantially complete

# LBE Long-Term Targets



- 30% renewable by 2020
- 35% energy reduction by 2020
- 40% GHG emission reduction by 2020
- 80% GHG emission reduction by 2050

Resiliency

Towards Zero Net  
Energy

Continuous Facility  
Improvement

- Provide ongoing FM training and support
- Sustain performance through facility energy usage reports and analytics
- Conduct continuous commissioning
- Maintain systems

# Education and Outreach

## Progress:

- Guidance documents
- Media events/Ribbon cutting
- Blog posts
- LBE Awards

## Moving Forward:

- Topical webinars
- Sustainability Challenge
- Education for all staff
- Increased communication with agency leaders



Resiliency

Towards Zero Net  
Energy

Continuous Facility  
Improvement

- **Recruit the right team**
- **Integrate and stage project development**
- **Implement additional innovative ECMs**
- **Integrate with deferred maint. & construction**
- **Address plug loads and behavior modification**
- **Install renewable energy (PPAs, NMAs, DR)**

- Provide ongoing FM training and support
- Sustain performance through facility energy usage reports and analytics
- Conduct continuous commissioning
- Maintain systems

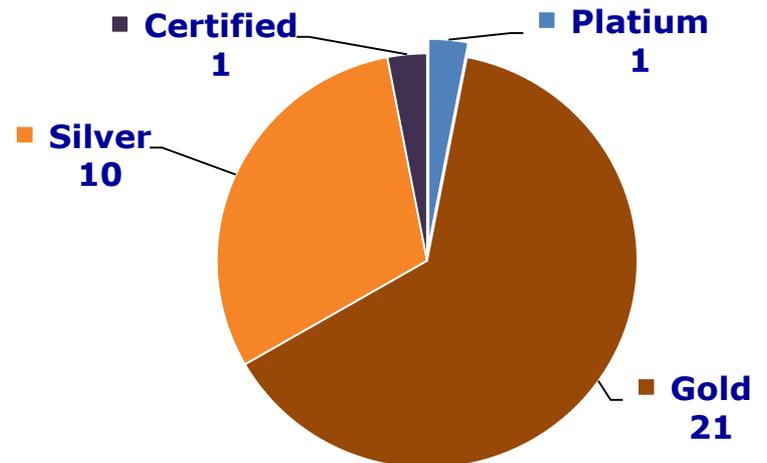
# New Construction

## Progress:

- ZNEB buildings constructed (NSCC, DFW)
- More ZNEBs in design
- 33 LEED certified buildings

## Moving Forward

- New minimum standard
- Broader adoption of ZNEBs
- Best practices for high performance
- Improved energy tracking



## Resiliency

- **Manage climate change risk**
- **Address vulnerabilities in facilities**
- **Prepare facilities and occupants for responding**
- **Incorporate sustainability with risk management**

## Towards Zero Net Energy

- Recruit the right team
- Integrate and stage project development
- Implement additional innovative ECMs
- Integrate with deferred maint. & construction
- Address plug loads and behavior modification
- Install renewable energy (PPAs, NMAs, DR)

## Continuous Facility Improvement

- Provide ongoing FM training and support
- Sustain performance through facility energy usage reports and analytics
- Conduct continuous commissioning
- Maintain systems

# Innovative Technologies & Strategies

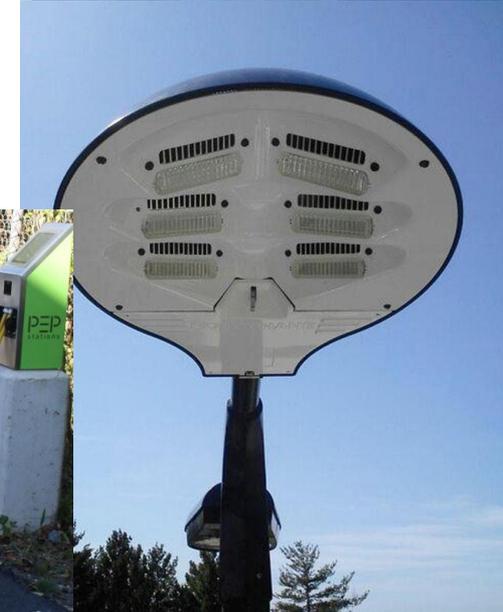
## Progress:

- ARRA funded EEMS
- Piloted new technologies
- CEIP self- financing



## Moving Forward:

- Massachusetts as First Customer
- Phase 2 - building energy intelligence
- Renewable thermal installations
- Solar canopies
- Revolving loan fund
- LED lighting
- Alternative Fuel Vehicles



# Going Forward...

Education  
&  
Outreach

Resiliency

New Construction

Towards  
Zero Net Energy

Innovative Tech &  
Strategies

Continuous Facility  
Improvement