Renew Boston

Save Energy, Save Money

Thomas M. Menino, Mayor

NSTAR

nationalgrid

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BARR FOUNDATION

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Renew Boston Strategy Board

Meeting 8

December 3, 2013

Agenda

Goals & metrics for the City's largest buildings *(45 minutes)*

- Disclosure Ordinance (BERDO)
- Climate and energy goals: progress and targets

How we can work together to meet City's goals *(30 minutes)*

- Outreach to other buildings/users in the Top 50
  - Roles of new Utility Program Manager & City's new Outreach Manager
  - EDF Climate Corp & Peer Learning Network
  - Outreach beyond EE: CHP, steam, eco-District, resiliency
- Greenovation Pacesetters: public goals & reporting
- Outreach to Class B office building owners (not Top 50)

Next Steps *(10 minutes)*

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Goals and metrics for the City's largest buildings

Disclosure ordinance (BERDO)

Boston's Building Energy Reporting and Disclosure Ordinance was approved by the City Council on May 8, 2013; *draft regulations* were published recently.

- As the ordinance is implemented it will provide new insight into building energy use and incentivize buildings owners to make their buildings more efficient.

Building Category	Data Year	Buildings	Space (est. million s.f.)
City buildings, ≥ 35,000 sf	2012	285	16
Non-residential, ≥ 50,000 sf	2013	1,200	260
Residential ≥50,000 sf [or 50 units]	2014	350	42
Non-residential, ≥ 35,000 sf	2015	240	15
Residential ≥35,000 sf [or 35 units]	2016	200	8

Update on utility progress on whole building data service.

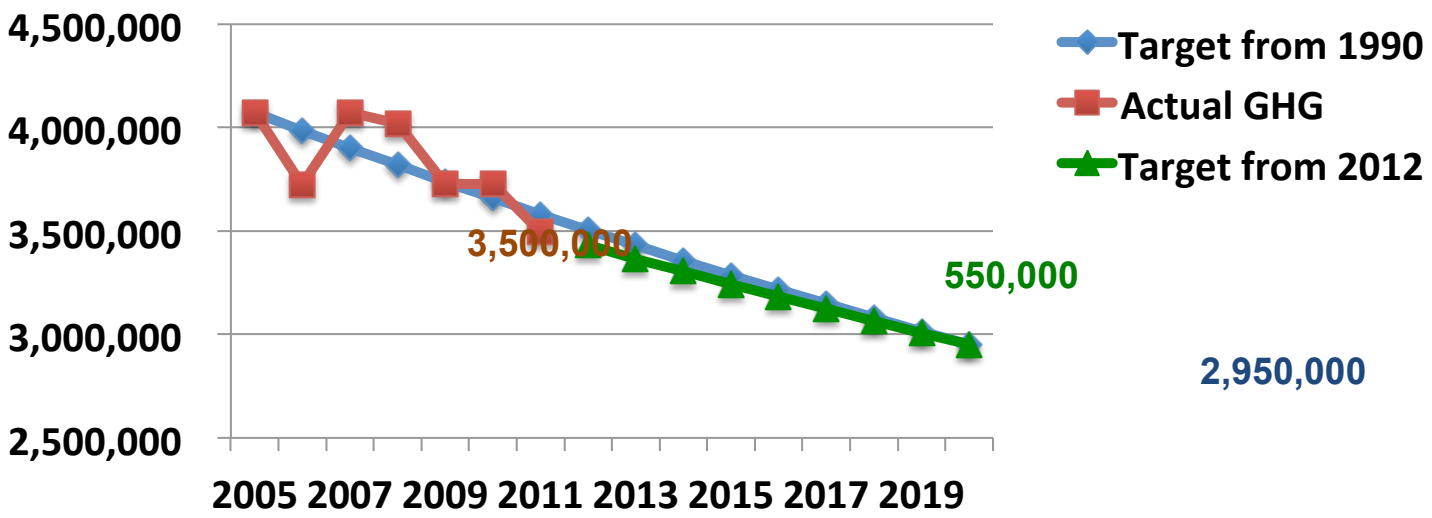
City's 2020 energy & GHG goals for C&I

C&I is roughly on track to meet 2020 GHG goals:

- 2005 emissions = 4,070,000 tons eCO2 (assumed to be ~ 1990 level)
- 2020 goal = 27.5% reduction from 1990 (2005) level = 2,950,000 tons
- To be on straight line to 2020, 2011 emissions should have = 3,580,000 tons
- Actual 2011 emissions = ~ 3,500,000 tons (so, slightly ahead of pace)

How much C&I GHG remains to be abated?

- To get to 2,950,000 tons in 2020 from 3,500,000 tons = **550,000** ton reduction*



*The 550,000 ton target is based on the allocations in the 2011 CAP. The target may be adjusted in the 2013 CAP update.

Importance of growth assumptions

Assumptions about growth affect the rate of reduction needed from existing buildings to meet the goal. The more growth we expect, the greater the rate of reduction we'll need.

Growth assumption through 2020 (% of 2012 space)	Rate of GHG reduction from existing buildings needed to meet goal
2.5%	2.2%
5.0%	2.4%
7.5%	2.6%
10.0%	2.8%

The analysis that follows assumes 7.5% growth for the 8 year period 2013 - 2020.

As a point of comparison, in the 10-year period 2001 to 2010 the growth was approximately 10%.

Where will the reductions come from: 2 scenarios

Which customers should we target for these reductions? Will the reductions come primarily from the "leaders" – large customers that have already implemented efficiency projects? Or, will they come from smaller customers that have not yet implemented efficiency?

For discussion, two illustrative scenarios are presented here and on the following slides:

Scenario 1: Leaders still lead

- BERDO buildings (>50,000 s.f.) reduce GHG at faster rate to offset weaker performance by smaller buildings
- GRC BERDO buildings represent 34% of the space in 2020, but 56% of GHG reduction targets for existing space
- GRC BERDO buildings reduce GHG at 4.3% rate
- Other existing buildings reduce at 1.8% rate

Scenario 2: Level performance across sectors & building sizes

- All existing buildings reduce GHG at 2.6% rate

GHG reduction scenarios

	GRC Sector Existing BERDO Bldgs > 50k	Other Existing C&I	Total Existing C&I	New Space	Total C&I (existing + new)
Space in buildings (000s sq. ft)					
Base Year (FY 2013)	147,862	264,698	412,560		412,560
% of Base Year space	36%	64%	100%		100%
Growth assumption through 2020	147,862	264,698	412,560	30,070	442,630
% of 2020 space	33%	60%	93%	7%	100%
High-level metrics					
2011 GHG emissions	1,243,200	2,251,200	3,494,400		3,494,400
2020 GHG emission target	836,800	1,920,400	2,757,200	173,900	2,931,100
GHG reduction targets	(406,300)	(319,000)	(737,200)	173,900	(551,400)
Reduction targets (existing space only)	(406,300)	(319,000)	(737,200)		(725,300)
% of reduction targets - existing space	56%	44%			
GHG reduction 2011 – 2020	-33%	-14%	-21%		-16%
Rate of reduction 2011 – 2020	**-4.3%**	**-1.8%**	**-2.6%**		**-1.9%**

Scenario 1: leaders lead **Scenario 2: equal reductions**

Converting GHG reduction scenarios to energy scenarios

The two illustrative GHG reduction scenarios are converted to energy scenarios on the following slide. The energy scenarios show a reduction in electricity use and an increase in gas use due to CHP and switching from oil.

Scenario 1: Leaders still lead

- GRC BERDO buildings reduce electricity use at 4.2% rate and increase gas use at 1.8% rate (see column 1).
- Other existing buildings reduce electricity use at 2.3% rate and reduce gas use at 0.4% rate (column 2)

Scenario 2: Level performance across sectors & building sizes

- All existing buildings reduce electricity use 2.9% rate and increase gas use at 0.2% rate(column 3)

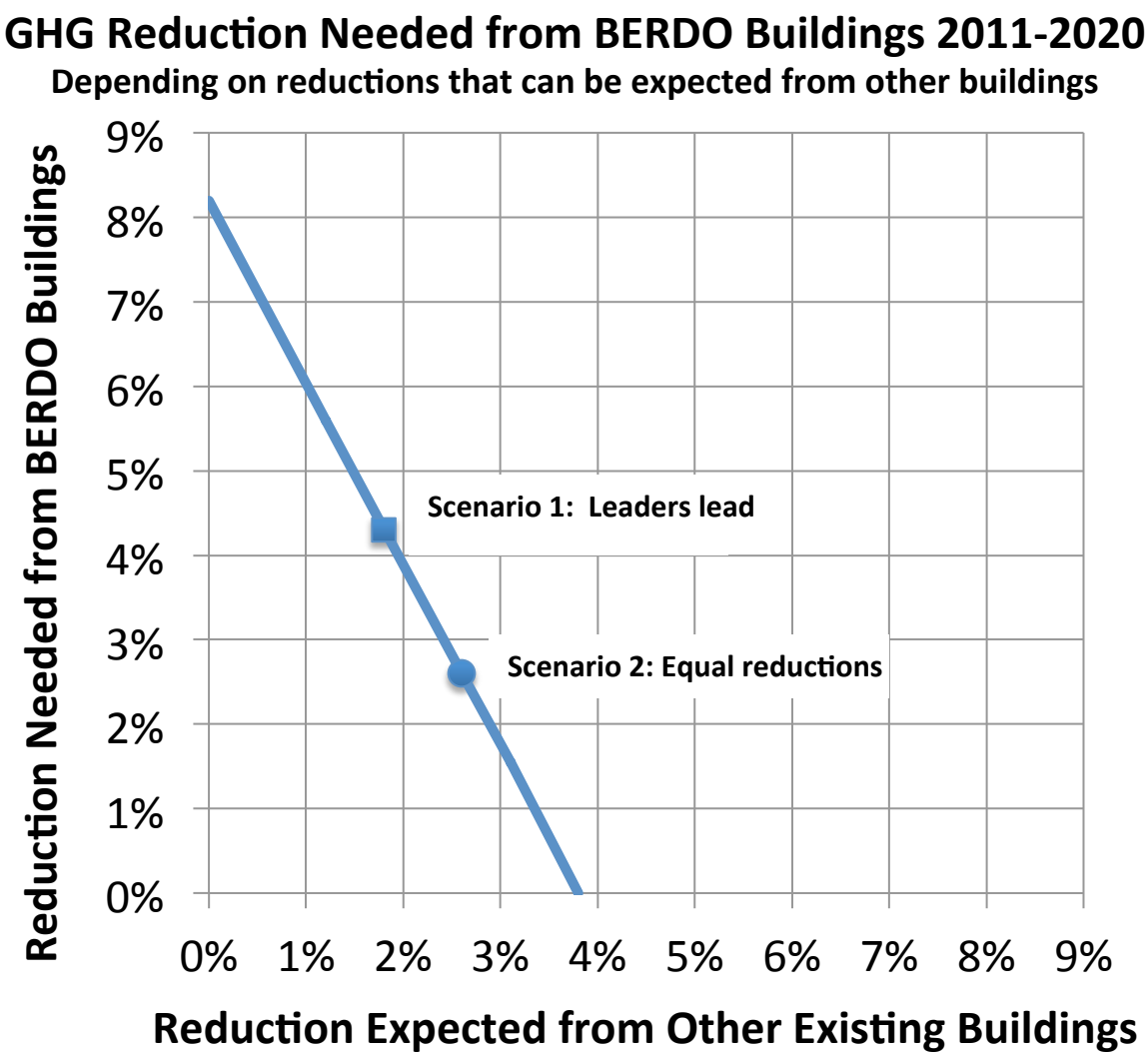
Scenarios include a target of 90 MW of new CHP, of which 40 MW is in GRC sectors.

Energy scenarios

	GRC Sector Existing BERDO Bldgs > 50k	Other Existing C&I	Total Existing C&I	New Space	Total C&I (existing + new)
Electricity (MWh)					
Base Year	1,999,812	3,467,768	5,467,580		5,467,580
Year 2020	1,358,756	2,823,155	4,181,911	211,024	4,392,935
Change 2011 – 2020	(641,056)	(644,613)	(1,285,669)	211,024	(1,074,645)
% change	-32%	-19%	-24%		-20%
Annual rate	**-4.2%**	**-2.3%**	**-2.9%**		**-2.4%**
Natural Gas (000 MMBTU)					
Base Year	47,941	133,859	181,800		181,800
Year 2020	56,214	128,746	184,960	9,086	194,046
Change 2011-2020	8,272	(5,113)	3,160	9,086	12,246
% change	17%	-4%	2%		7%
Annual rate	**1.8%**	**-0.4%**	**0.2%**		**0.7%**

Scenario 1: leaders lead **Scenario 2: equal reductions**

Discussion of options



The blue line shows the blend of reductions from BERDO and other buildings that produces the total reductions required.

Any scenario at or above the line will achieve 2020 GHG goals.

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How can we work together to achieve the City's goals

Outreach to buildings/users in the top 50

City plans to follow up with Top 50 BERDO owners about opportunities

- Target BERDO buildings with potential opportunities (high energy use/s.f?)
- Encourage a "BERDO Savings Plan" for each building or owner
- Support development of workshops, professional development, etc.
- How and to what extent should City communicate to BERDO owners its coordination with PAs on outreach?

Roles of new personnel for C&I outreach

- Utility Program Manager
- City's new C/I Outreach Manager

Sector outreach strategy

- To what extent should Top 50 outreach be customized by sector
- What alignment with GRC Sector Working Groups (e.g., ABC, HCWH)?

EDF Climate Corp & Peer Learning Network

Outreach beyond EE: next slide

- Steam efficiency, fuel switching, eco-District & resiliency (incl. CHP)

Outreach to buildings/users in the Top 50 *continued…*

Outreach beyond EE: Steam efficiency, fuel switching, eco-District & resiliency (incl. CHP)

- In addition to targeting C&I sectors, Renew Boston has been targeting C&I energy users by *district*. Initial targets are:
  - Innovation District, including the Boston Marine Industrial Park (BMIP), and
  - New Market
- This work in each district will include an evaluation of opportunities for development of district energy systems, including CHP (an EE measure)
- An EcoDistrict Energy Fellow (Travis Sheehan) has been hired at the BRA
- Q1/Q2 meeting with utilities on district energy in Boston

Greenovators/Pacesetters

Should we continue & re-brand Pacesetter program?

Options include:

- Re-engage with 20 existing Pacesetters: focus on public goal-setting
  - Existing Pacesetters listed on next slide
- Ask leaders to lend their names to outreach campaign to next group
  - Target another 20 from the top 50 BERDO owners?
- Communicate performance of leading Greenovators, for example
  - In the two-year period 2012 – 2013, Renew Boston's 20 Pacesetters will implement projects that save >88 million kWh per year.

Discussion

- Relationship between Pacesetter program and Disclosure ordinance
- Roles of utility & City staff in contact with Pacesetters
  - What time requirements and allocation of contact responsibilities?
- What rewards to be a Pacesetter? For filing early with BERDO?
- Should Pacesetter status require a commitment (e.g., to setting a public goal) or should it simply be a status bestowed by the City?

Greenovators/Pacesetters

Renew Boston's first 20 Pacesetters

University

Boston Architectural College
Cambridge College
MIT
Northeastern University
UMass Boston
Harvard University

Health Care

Boston Medical Center
Steward Health Care, Carney Hospital
Dana Farber

Commercial Real Estate

Boston Properties

Assembly & Entertainment

Bethel African Methodist Episcopal Church
New England Aquarium
Museum of Fine Arts
TD Garden

Other

City of Boston
Barr Foundation
The Boston Globe
Federal Reserve Bank
Markley Group
MWRA
Gillette / P&G

Class B office space

The great bulk of Class B office space is owned by sub-top-50 owners.

What is the priority of reaching this group? How should they be targeted?

What is the role of outside entities in the outreach?

	Office Class A	Office Class B	Office Other
Total square footage (000s)			
Buildings owned by Top 50	35,630	4,093	1,654
Buildings owned by others	5,465	**14,270**	7,867
Total	41,095	18,363	9,521
Average building square footage (000s)			
Buildings owned by Top 50	1,018	171	138
Buildings owned by others	304	**137**	75
Total	775	143	81
Number of buildings			
Buildings owned by Top 50	35	24	12
Buildings owned by others	18	**104**	105
Total	53	128	117

Note: This table includes buildings ≥ 35,000 s.f.

Next steps

C&I Working Group: City, NSTAR, National Grid

- Deep dive engagement on selecting the right solution sets
- Report on results from 2013
- Market plan for 2014
- Review of base year energy usage by sector for BERDO reporters

Appendix

Sectors - space data & energy estimates to review

Baseline 2012 energy use by sector from PAs (need 2012 from NSTAR)

How sync energy & space data for same groups of BERDO reporters?

		GRC Sector BERDO Reporters (>50,000 SF)				
		1	2	3	4	5
	Base Year Energy & Space (sources don't match)	**Health Care**	**Higher Ed**	**CRE**	**City (BERDO data)**	**Total of GRC Sector BERDO Buildings >50k**
1	**Space in Buildings (gross sq. ft.)**	25,597,020	34,484,254	75,854,340	11,926,000	147,861,614
2	% of 2020 space	6%	8%	18%	3%	36%
	Base Year Energy Use Estimates					
3	Electricity (MWh):	591,740	634,814	702,227	71,031	1,999,812
9	Electric use, kWh/gross square foot	23	18	9	6	14
	Energy sources in MMBTU:					
4	Electricity (site MMBTU)	2,019,016	2,165,985	2,395,999	242,358	6,823,358
5	Natural Gas	960,351	1,508,066	1,733,557	592,173	4,794,147
6	Oil	269,997	363,739	800,110	125,795	1,559,641
7	Steam	995,947	99,595	398,379	49,807	1,543,728
8	Total energy use (MMBTU)	4,245,311	4,137,385	5,328,044	1,010,133	14,720,874
9	Energy use, KBTU/gross square foot	166	120	70	85	100
10	**2011 GHG emissions (metric tons eCO2)**	374,100	350,900	446,100	72,100	1,243,200

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Office Space Owned by Top 50 (>=35,000 s.f.)

	Office Class A	Office Class B	Office Other	121-A
The Blackstone Group	5,416,232			
Beacon Capital Partners	5,050,007	210,005		
Boston Properties, Inc.	4,939,185	238,627		
Tishman Speyer	4,025,018			
TIAA-CREF	2,383,452			
The Chiofaro Company	1,971,208			
Manulife Financial	1,146,985	514,213		
Bank of America	1,645,931			
The Flatley Company		613,125	1,004,585	
UBS Realty Advisors LLC	1,502,842			
Fortis Property Group, LLC	1,419,949			
Liberty Mutual Group, Inc.	709,050	596,931		
Transwestern	988,474	310,370		
Synergy Investments		815,386	411,296	
Simon Property Group, Inc.	1,207,117			
Brookfield Office Properties	1,191,535			
Federal Reserve Bank of Boston	1,051,295			
Brickman Properties	161,979	541,317	126,507	
World Trade Center	819,416			
Millennium Partners		252,528		
Samuels & Associates			65,646	1,380,017
Benderson Development Co.			45,981	972,402
St James Company				1,183,414
Top 50 Owners	35,630,000	4,093,000	1,654,000	3,536,000