

***Greening Massachusetts
Public Housing
DHCD Sustainability Initiative***

March 2011

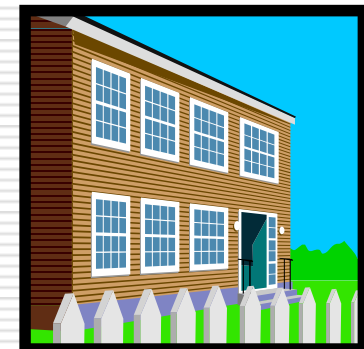
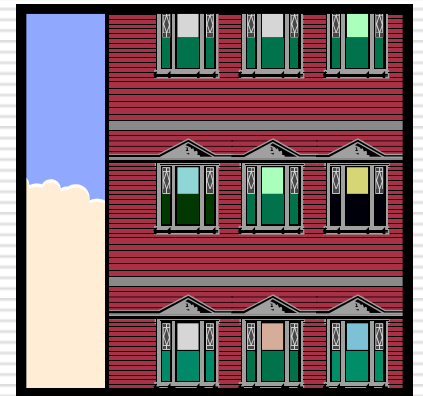
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MA Dept. of Housing & Community Development

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Topics

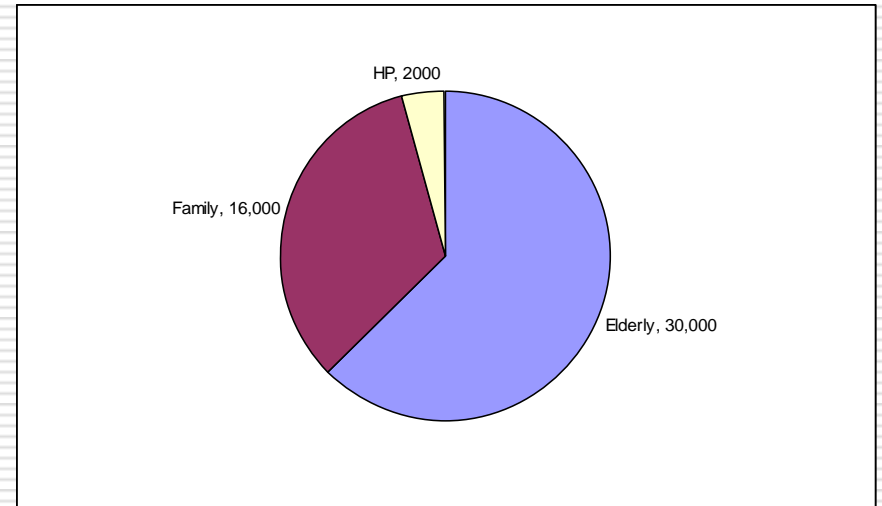
- Portfolio Overview
- Operating & Capital Spending
- Sustainability Program Goals
- What's in the Toolkit?
- Getting Metrics Right
- Results & Collaborations
- Look Ahead



MA Public Housing Portfolio

DHCD in operating oversight & capital planning role

- 48,000 state-supported public housing units
- 8000 buildings
- 242 communities



- *Housing authorities also manage 30,000 federal HUD units*
- *Housing authorities directly procure energy*

Annual Operating & Capital Budgets

Operating

- Maintenance – \$ 34 M
- Utility Costs - \$90+ M
 - \$40 M electric
 - \$22 M gas
 - \$25 M water



Capital Spending

- Bond cap
\$90 M/year
- Mixed Finance
\$25 M/year
- ARRA Funding: \$25 M

Augmented By:

- ESCO/Third Party
- Utility Energy Efficiency

DHCD goals for Sustainable Public Housing

- Reduce the “footprint”, especially energy & water use, GHG emissions (25% by 2020)
 - *Exec. Order 484; Green Communities Act*
- Implement innovative sustainable measures as model for broader community and citizen action
 - *Sustainable Development Principles*

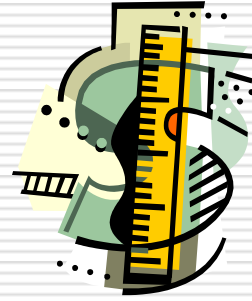


Sustainability Toolkit

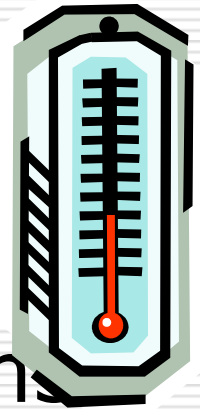


- Within Agency –
 - Capital Planning System w/ Facility Condition Index & 10 Year Cap. Plan template
 - Energy & Water Reports ~ 5 years data
 - Design Guidelines & Standards ~ 3 years, “light green”
 - Energy Performance Contracting – 10+ yrs
- Outside, Statewide – *new in 2010*
 - Green Communities expanded Utility Energy Efficiency Program
 - Multifamily Audit & WEGOWise utility benchmarking software for affordable multifamily

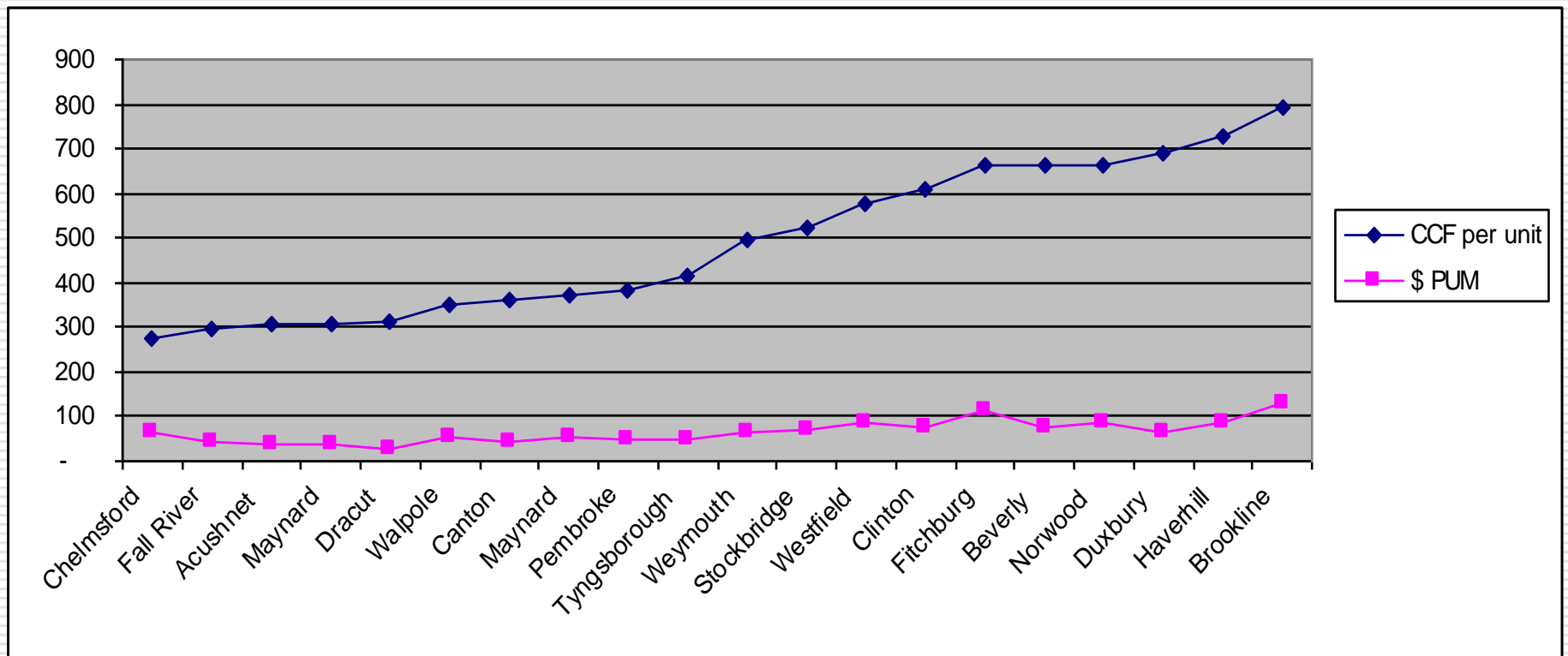
Metrics – Work in progress



- ❑ *THEN* - Energy & water consumption part of web-based fiscal reporting - *85% compliance in 2010, up from 60% in 2007, but many input errors*
- ❑ PUM - Per Unit per Month: kWh, therms, gallons, dollars
- ❑ *NOW* – with Capital Planning Inventory & web info BTU/SF/HDD



Statewide, there is no typical... *50-60 units – Gas heat*

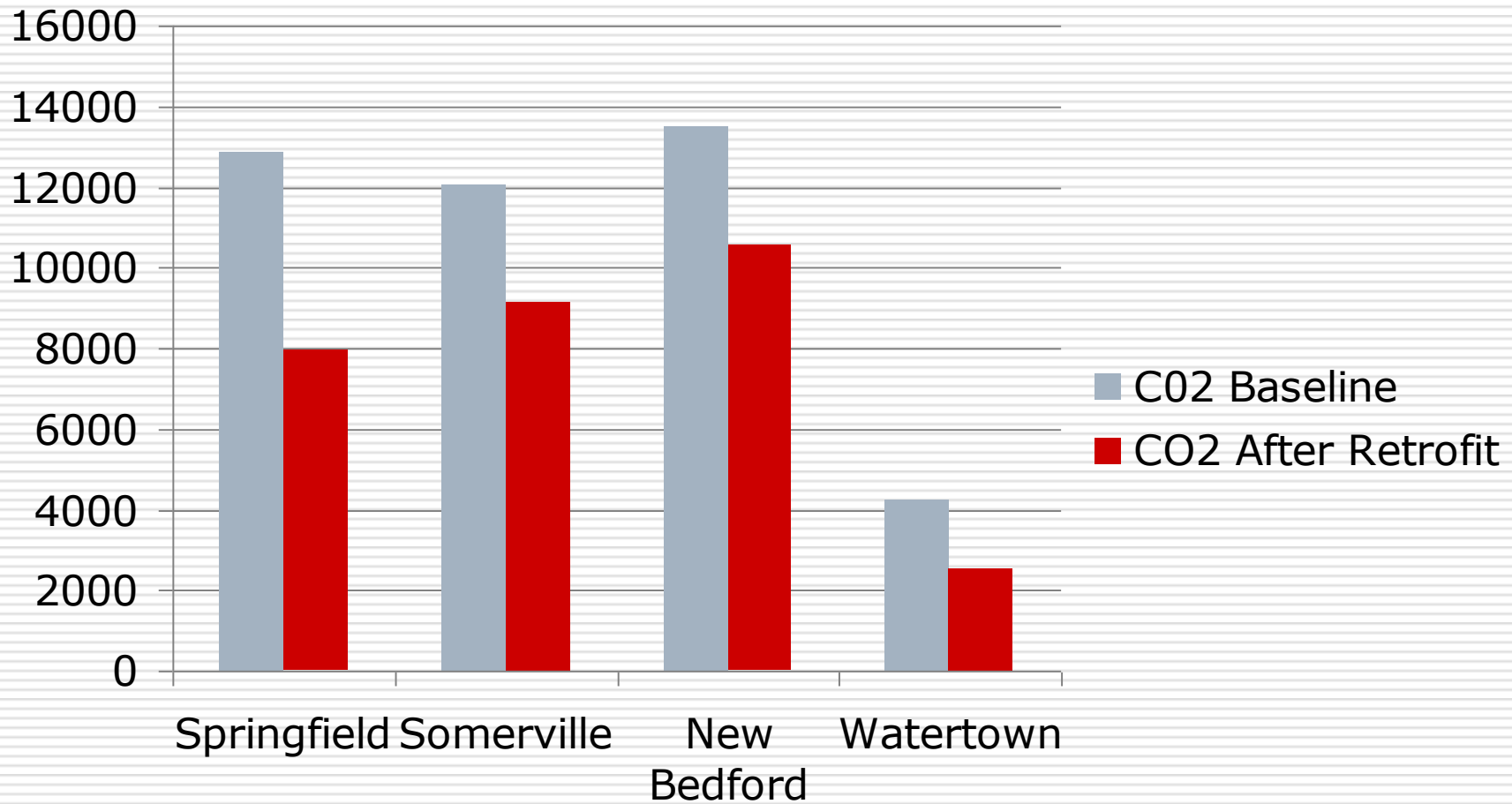


Measurable Results: Performance Contracts

- ❑ Many Large Housing Authorities worked with ESCOs on Energy Performance Contracts
- ❑ Comprehensive approach but high bar for payback and decade long burden on operating budget
- ❑ Measures included Heating System Replacement, Low Flow Toilets, Combined Heat & Power
- ❑ Boston HA - \$63 million ESCO for federal properties launched in 2010

Performance Contracts

Energy Only – converted to lbs CO2



Work in Progress: ARRA Weatherization

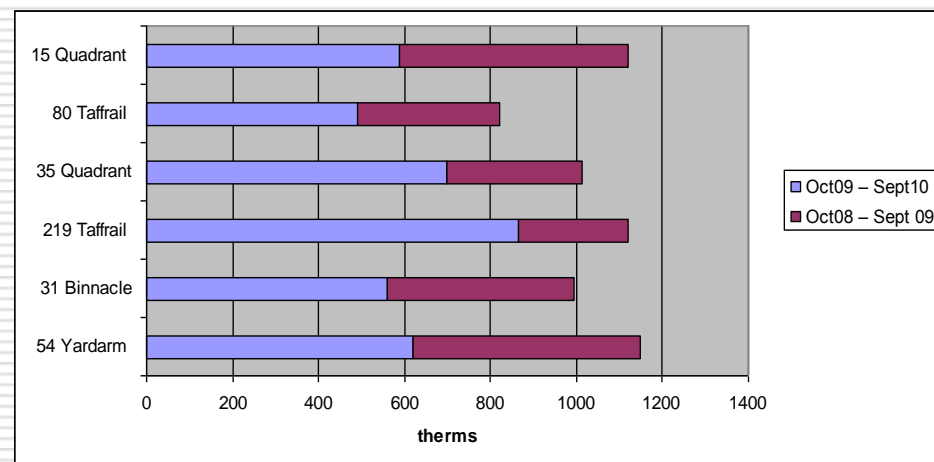
- ❑ \$25 million for multifamily pub hsg
- ❑ 97 housing authorities
- ❑ 4400 units
- ❑ High efficiency boilers & furnaces
- ❑ Leveraging: utility \$ for building shell work
- ❑ Piloting natural gas wall furnaces and air source heat pumps



Natural Gas Wall Furnaces

Quincy Snug Harbor

- ❑ 2 & 3 BR Apartments @ 695-1010 SF
- ❑ Failing oversized steam boilers
- ❑ Solution: Rinnai gas-fired wall furnaces
- ❑ Air-shares over doors
- ❑ \$8800 instead of \$20K /unit



Measuring Results: Low Income MF Energy Retrofits

- 3 year utility-funded EE plan – opportunity for new approach for MF
 - “whole building, fuel blind, meter blind”
- Public & affordable hsg collaborating with low income network & utilities
- New energy assessment ID’s all cost effective measures
- Web-based benchmarking of results

www.wegowise.com

- ❑ Created by New Ecology for affordable multifamily housing
- ❑ 2000 buildings in system to date
- ❑ Electric & gas usage downloaded
- ❑ Utility programs funding the entry of all low income MF customers

wēgowise



All Developments

[View Data](#)

[Add a Development](#)

Total utility use in Btu per square foot

[Show Raw Data](#)

[Bookmark This Report](#)

Name


















Full-Year Sum

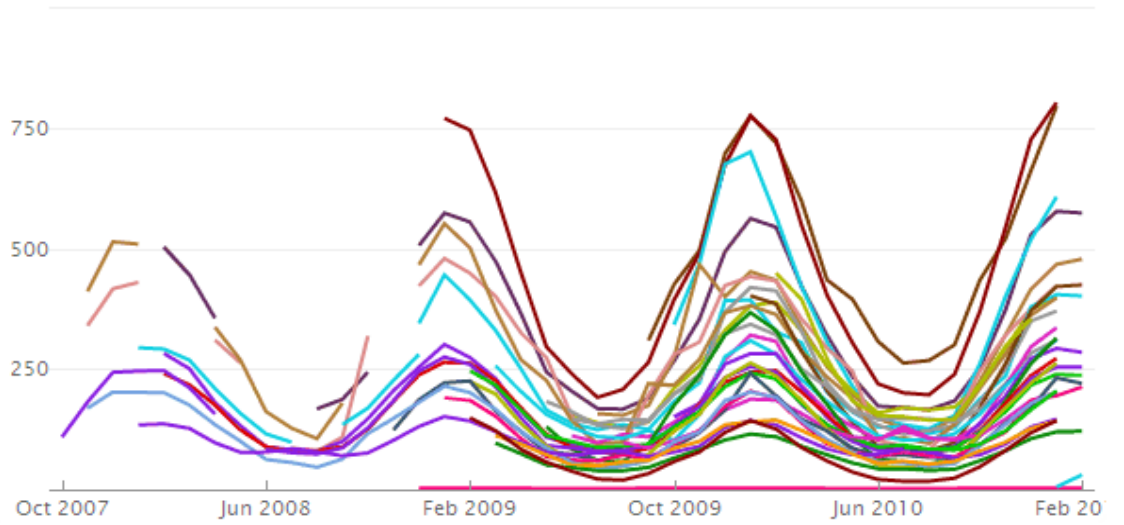
Detailed Data per Month

click for detailed data

click a square to show or hide an item on the graph

Click & drag to zoom

• Mayflower	172,693	
• Calumet Court	159,916	
• Sol-E-Mar	120,262	
• George Booth Apar...	116,762	
• Bingham Way	97,971	
• Tewksbury St	94,768	
• Green Meadows	93,855	
• Woodland Meadows	84,201	
• Captain Eldredge ...	84,078	
• Oxford Terrace	83,937	
• Fountain Drive	79,573	
• Hill St	75,931	
• Forest St	67,869	
• Munroe Terrace	67,301	
• Greeley Village	60,423	
• Greenwood St Apar...	59,372	
• Adams Court	56,017	



Portfolio Summary

Showing: **All Energy** Water Electricity Gas Oil



This graph shows the performance of all of your buildings, relative to one another.

- ◊ Buildings in the top right quadrant need the most attention — they are the most inefficient and expensive ones in your portfolio.
- ◊ Use the buttons at the top to switch between different utilities.

Legend

Click label to toggle graph items

- Burke Mountain
- ◆ Hopeville
- Mystic Bay
- ▲ Spruce Village

Curtis

Custom Reports » Curtis

[View Report](#) [Edit Report](#) [Delete Report](#)

Natural gas use in Btu per square foot

[Show Raw Data](#) [Add Benchmark](#) [Bookmark This Report](#)

Name ▾

Full-Year Sum ▾

Detailed Data per Month

click for detailed data

click a square to show or hide an item on the graph

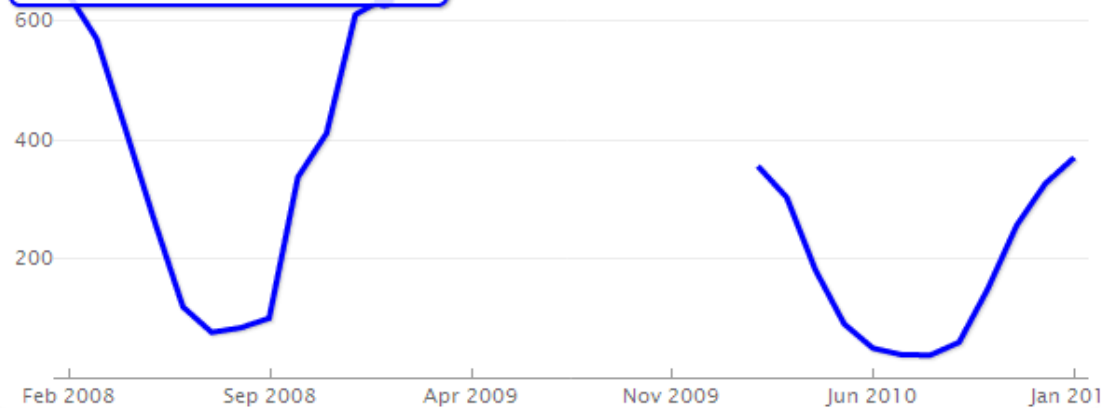
Click & drag to zoom

Curtis Apartments

66,768





Jan 2009 daily usage
634.9 Btu per square foot (daily)
Curtis Apartments




Curtis


Custom Reports » Curtis


 View Report


 Edit Report

 Delete Report

Natural gas use in Btu per square foot

 Show Raw Data

 Add Benchmark

 Bookmark This Report

Name ▾

Full-Year Sum ▾

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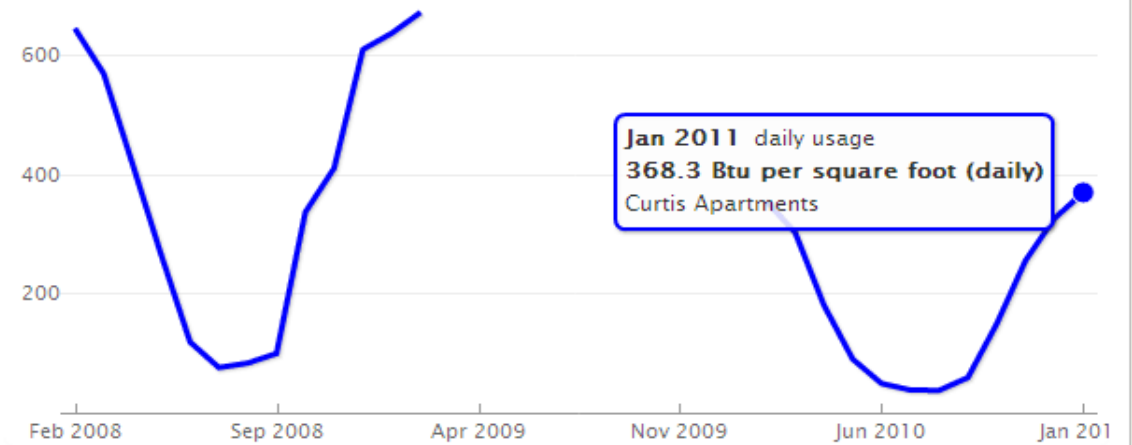
click a square to show or hide an item on the graph

Click & drag to zoom

Curtis Apartments



66,768



Jan 2011 daily usage
368.3 Btu per square foot (daily)
Curtis Apartments


Curtis


Custom Reports » Curtis

[View Report](#) [Edit Report](#) [Delete Report](#)

Electricity use in kWh (not normalized)

[Show Raw Data](#) [Add Benchmark](#) [Bookmark This Report](#)

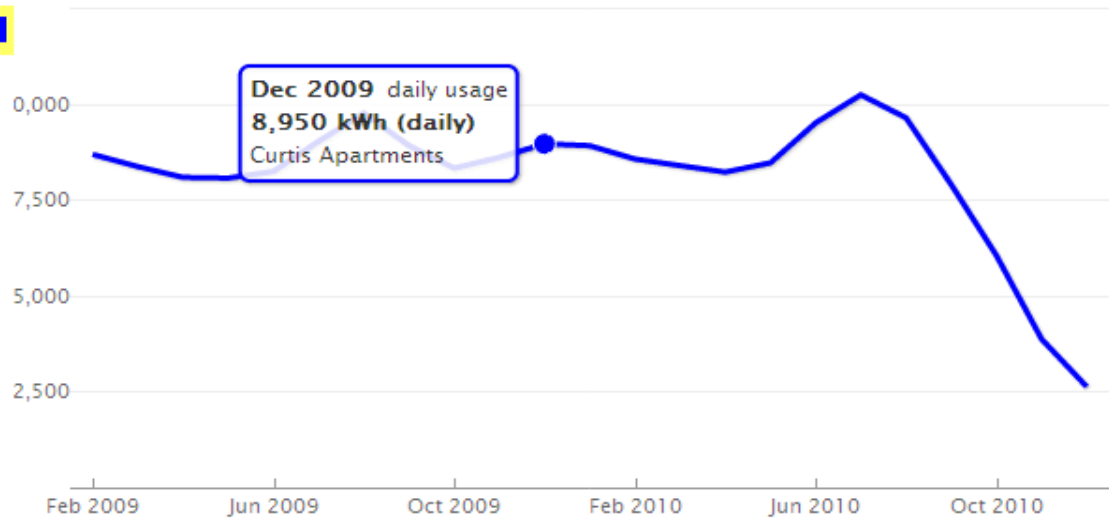
Name 
click for detailed data

Full-Year Sum 

Detailed Data per Month
click a square to show or hide an item on the graph

Click & drag to zoom

Curtis Apartments  2,805,976 



Curtis

Custom Reports » Curtis

[View Report](#) [Edit Report](#) [Delete Report](#)

Electricity use in kWh (not normalized)

[Show Raw Data](#) [Add Benchmark](#) [Bookmark This Report](#)

Name ↕

Full-Year Sum ▾

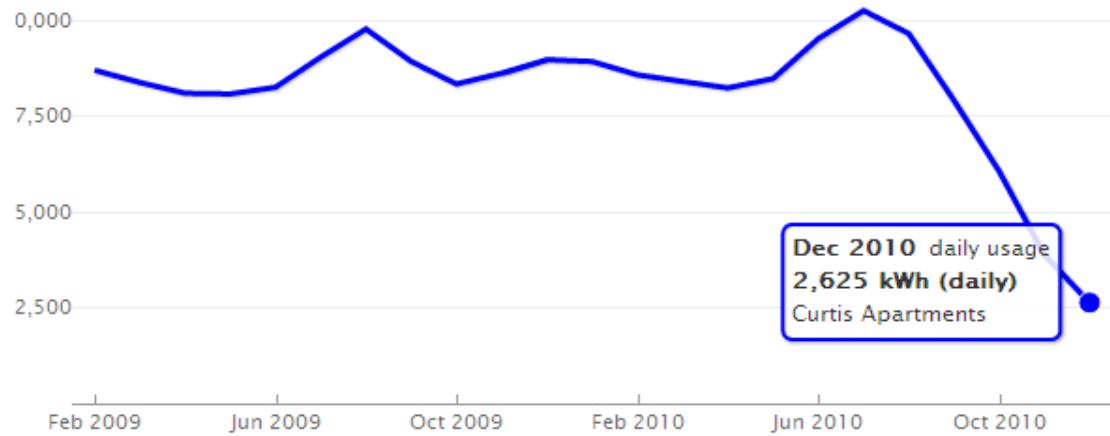
Detailed Data per Month

click for detailed data

click a square to show or hide an item on the graph

Click & drag to zoom

Curtis Apartments  2,805,976



50-52 Trowbridge

All Developments » CCHI » 50-52 Trowbridge

[View Data](#)

[Utility Accounts](#)

[Building Upgrades](#)

[Share](#)

[Edit Building](#)

[Delete Building](#)

Effect of Boiler and Distribution Upgrade (September 17, 2009)

[← Back to the list of all building upgrades](#)

Natural gas use in Therms (not normalized)

[Show Raw Data](#)

[Bookmark This Report](#)

Name

Full-Year Sum

Detailed Data per Month

click for detailed data

click a square to show or hide an item on the graph

Click & drag to zoom

Sep 08 - Aug 09

22,074

Sep 09 - Aug 10

14,690

Description of Upgrade

Before: Atmospheric boiler- former steam system

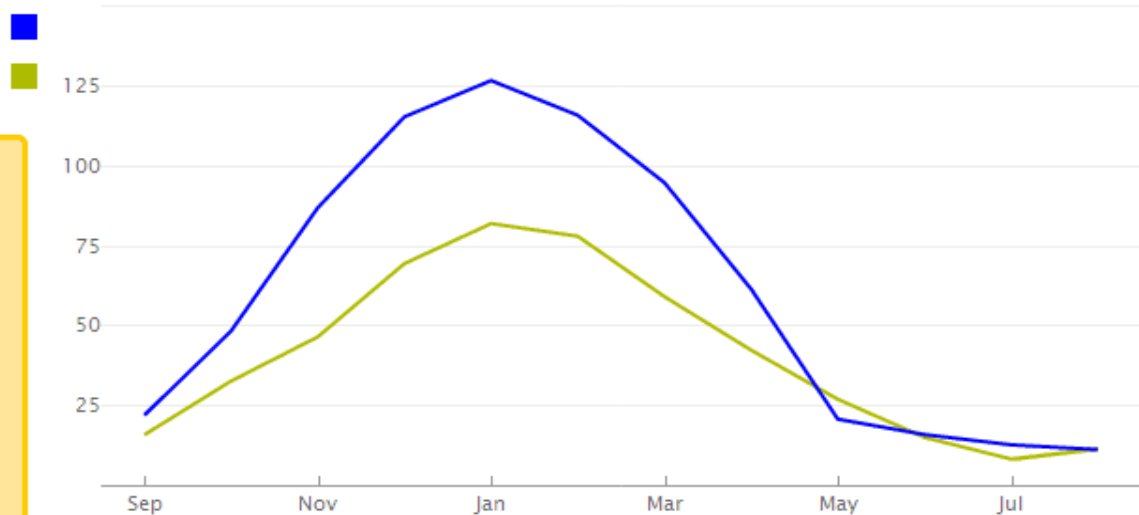
After: Condensing Boiler- fan coils and baseboard

Cost: \$0.00

Annual Savings

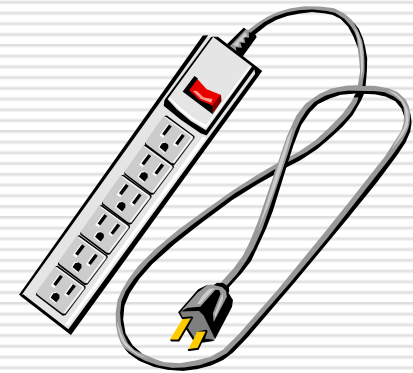
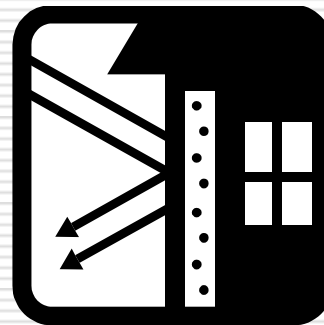
Expected: unknown

Actual: 33% (7,384 Therms)



Results: Innovative Technology *Moving from **Brown** to **Green***

- ❑ Focus on Mass. Companies
- ❑ Alternatives to Electric Heat
- ❑ Third Party Ownership
- ❑ Small-Med. HA



Solar Roofs

Roof repairs & replacements now include solar retrofit evaluation.



Ameresco Solar installing PV on Canton roof this spring



Ann Whalen elderly housing in Amherst has Solectria system which can be tracked online

Winthrop HA: Hot Air Solar Panel Installation

Before - 1980's
passive solar
trombe walls



After -
21st century solar



SunMate Hot air solar panels
manufactured in Methuen

**PLYMOUTH HOUSING AUTHORITY
OLMSTEAD/STANDISH COURT 200.1**



**Freewatt
Co-gen Unit**

Families are staying much warmer than their Pilgrim forebears – at a reasonable price that includes on-site electricity and heat!

Page 1 of 1

MCHP status page Page 1 of 1

Model number	000099	Date & Time	05/04/2009 09:41:26
Serial number	000096-100022	System on for	1372h 27m 34s
FW revision	WA_S-1.03	kWh (today)	0.0 kWh (\$0.00 saved)
Network/time status	link down, NIST time set	kWh (lifetime)	2372.0 kWh (\$410.36 saved)
IP address	10.0.0.212		
Cogen state	STOPPED	Thermostat set to	68 °F
Output power	0 W	Indoor temp	70 °F
Engine RPM	0 rpm	Outdoor temp	58 °F
System mode	normal		
System status	System OK		

Update once

MCHP status page Page 1 of 1

Model number	000099	Date & Time	05/04/2009 09:41:55
Serial number	000096-100023	System on for	1417h 29m 23s
FW revision	WA_S-1.03	kWh (today)	1.9 kWh (\$0.33 saved)
Network/time status	link and NIST Ok	kWh (lifetime)	2848.6 kWh (\$492.81 saved)
IP address	10.0.0.214		
Cogen state	STOPPED	Thermostat set to	66 °F
Output power	0 W	Indoor temp	66 °F
Engine RPM	0 rpm	Outdoor temp	56 °F
System mode	normal		
System status	System OK		

Update once

Aerogel Innovative Insulation at Framingham/Musterfield



- R- Value = 10.3 per inch
- Used in Comprehensive Mod project under siding and in rehab of basement
- Available on sheet rock

Project site visit to view product installation. Aerogel company president meets with Sec. Bialecki

Biomass heat in Somerset

Wood pellet stove in community room saved energy,
increased comfort and social interaction



Prospects

- Finish water conservation – best payback
- Align Capital Plans with utility program offerings
- Electric heat strategy
- More Third Party solar
- Near Zero Net Energy demos



Thank you!

- Questions, comments welcome

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