



# Energy Efficiency in the City of Cambridge



Department of Public Works, 5/26/10

# Outline

- Energy Use
- Reduction Plan
- Previous/current efforts/practices
- Plans

# Cambridge: A Green Community!



Reduce energy use by 20% between 2008 base year and 2013

Collaborative effort: School, CDD, DPW, Water, Electrical, Traffic Departments

# How much energy does the City use?

	Consumption	CO2 Emissions* (tons)	Expenditures	% of Total Expenditures
<b>Fiscal Year 2008</b>				
Electricity (kWh)	40,003,405	16,161	\$5,796,555	70%
Natural Gas (therms)	695,848	835	997,065	12%
Heating Oil (gallons)	432,270	1,001	777,790	9%
Vehicle Fuel (gallons)	316,915	1,158	701,693	8%
	<b>Total</b>	<b>19,155</b>	<b>\$8,273,104</b>	<b>100%</b>
<b>Fiscal Year 2009</b>				
Electricity (kWh)	41,097,364	16,603	\$5,638,408	60%
Natural Gas (therms)	792,111	951	1,139,214	12%
Heating Oil (gallons)	343,276	795	1,430,030	15%
Vehicle Fuel (gallons)	308,349	647	1,205,723	13%
	<b>Total</b>	<b>18,995</b>	<b>\$9,413,374</b>	<b>100%</b>

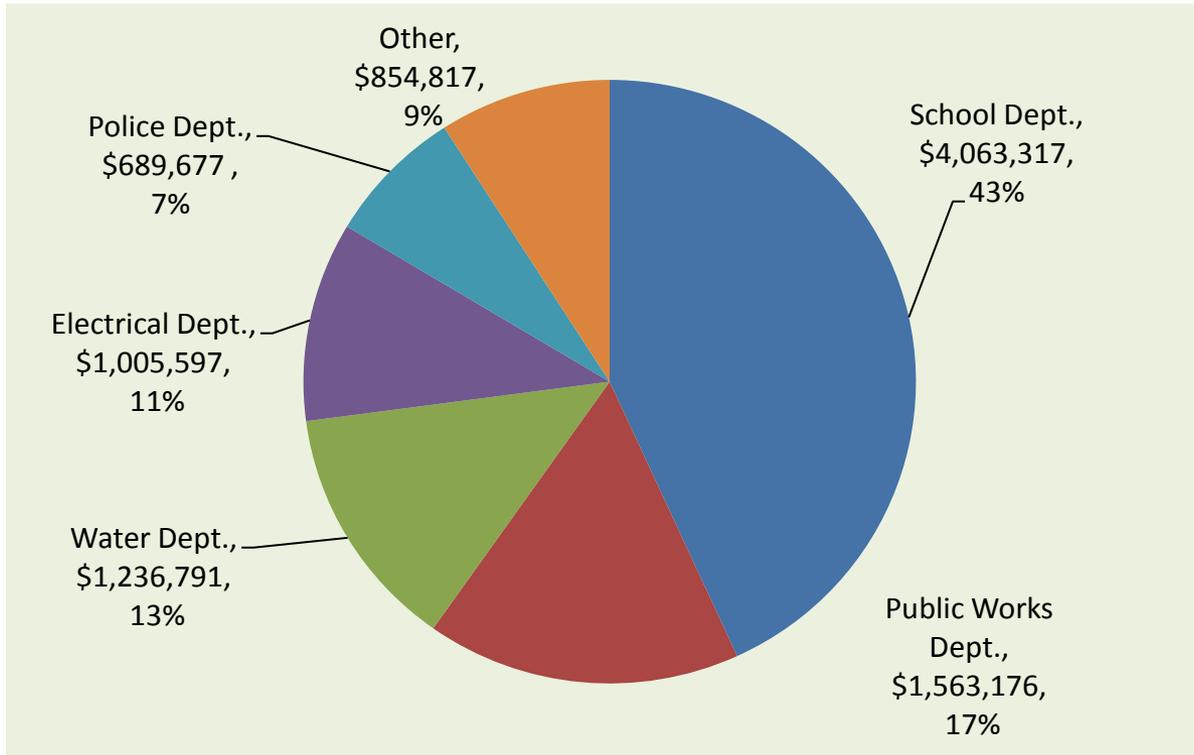
Source: Energy Information System

**\*CO2 conversion rates:**

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Heating Oil	4.63 lbs/gal	<i>(Climate Registry General Reporting Protocol v.1.1)</i>
Gasoline	4.0 lbs/gal	<i>(Climate Registry General Reporting Protocol v.1.1)</i>
Diesel	4.63 lbs/gal	<i>(Climate Registry General Reporting Protocol v.1.1)</i>
Natural Gas	2.4 lbs/therm	<i>(Climate Registry General Reporting Protocol v.1.1)</i>
Electricity	0.808 lbs/kWh	<i>(ISO NE 2006)</i>

# FY09 Total Energy Costs \*



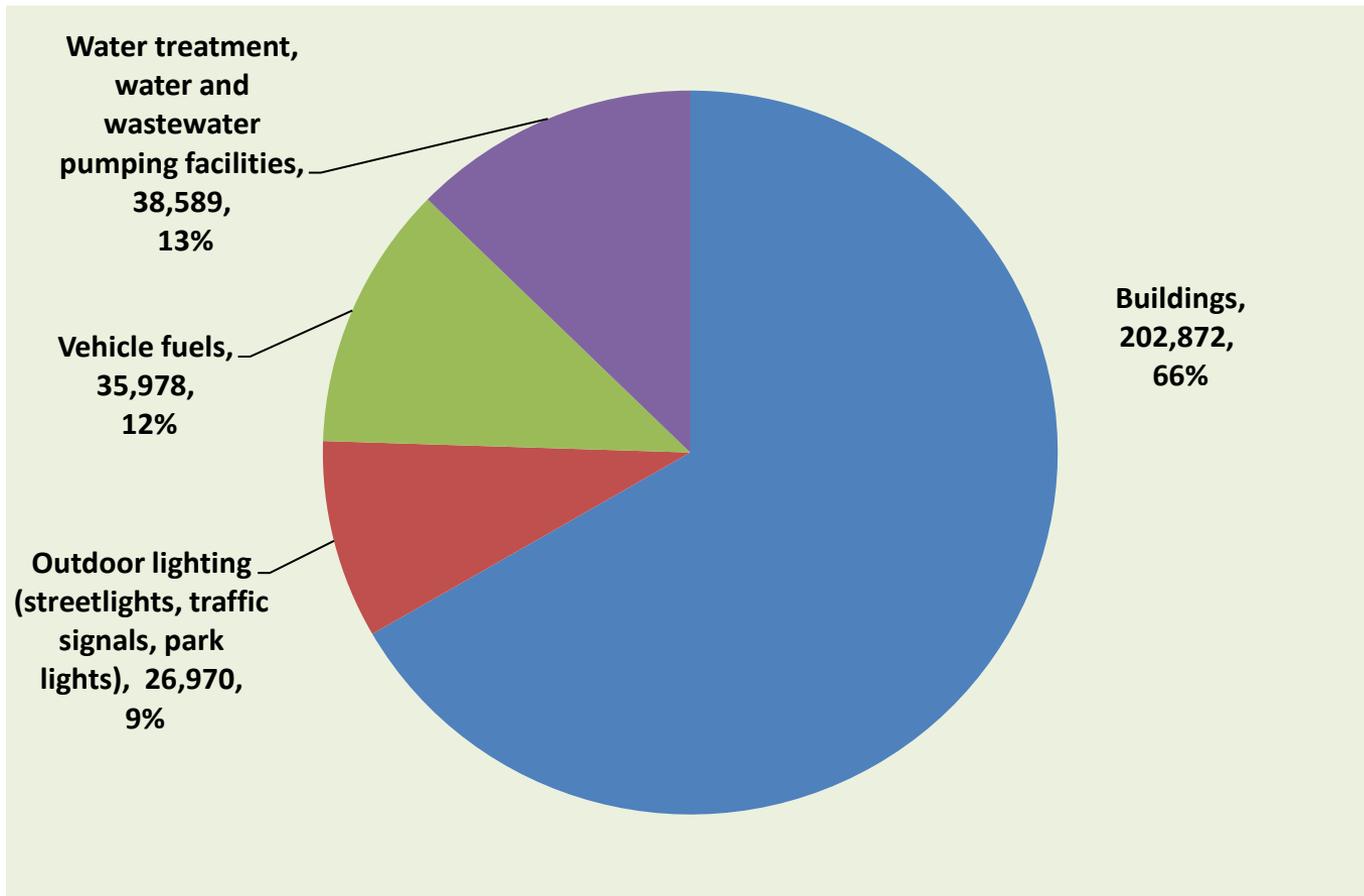
**Other =**  
 Fire, ECC (4%), Traffic (2%), Libraries (2%), DHSP & others (1%)

Department	Total Energy Costs*
School Dept.	\$4,063,317
Public Works Dept. (DPW facility, office buildings, youth centers, Cemetery, park lights, sewer pump stations)	1,563,176
Water Dept.	1,236,791
Electrical Dept. (Street lights, office)	1,005,597
Police Dept.	689,677
Other (Fire, ECC, Traffic (parking garages, traffic signals, maintenance office), Libraries, DHSP (golf course))	854,817
<b>TOTAL</b>	<b>\$9,413,374</b>

\* Includes gas, electricity, oil, and vehicle fuel.

Source: Energy Information System

# Energy Use by Category\*



	MMBTU
Buildings	202,872
Outdoor lighting (streetlights, traffic signals, park lights)	26,970
Vehicle fuels	35,978
Water treatment, water and wastewater pumping facilities	38,589

\* In MMBTU (millions of British Thermal Units), which measure energy across fuel types.  
Source: EIS

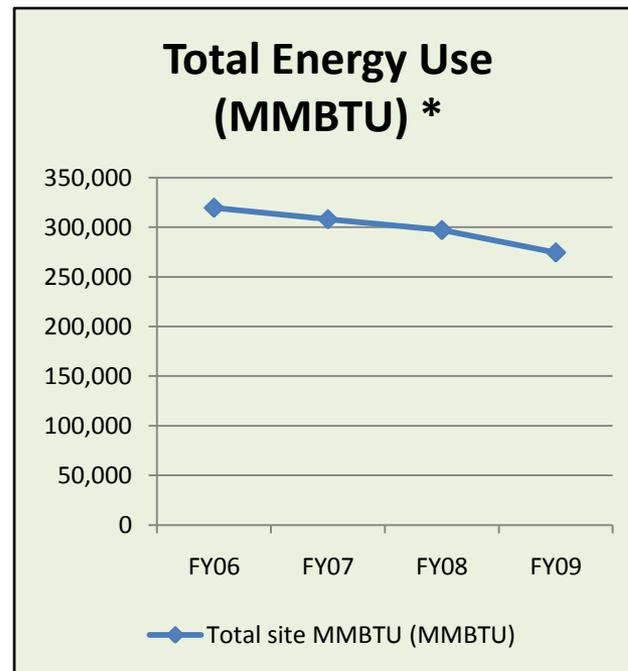
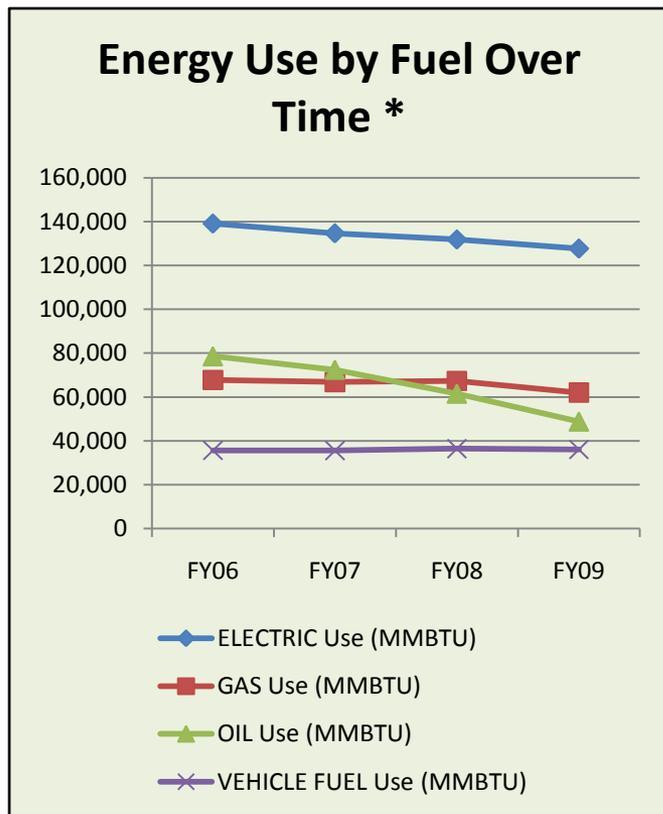
# **City of Cambridge Energy Reduction Plan**



**Submitted by Robert W. Healy, City Manager  
City of Cambridge, MA**

**May 14, 2010**

# Green Communities Designation Application\*



\* Per Green Communities criteria, buildings that came online after FY08 base year and buildings that were replaced are excluded from reduction calculations. Therefore, above charts do not include FY06-FY09 usage for Main Library, War Memorial Recreation Facility, Healy Public Safety Building and West Cambridge Youth Center (all designed to LEED standards) and former Police Headquarters at 5 Western Ave.

Program requires monitoring of new buildings to ensure they perform as designed.

# Energy Reductions FY2008–10 ↓ 15%

## How?

- LEED buildings under construction in FY08, FY09
- Energy Efficiency Projects and Programs

# Energy Efficiency Programs

- **Building Improvements since 2005**

Lighting - 600,000 kWh @ parking garages, Water Treatment Plant, others

HVAC - high efficiency AC, boilers, energy mgmt systems, vending misers

Oil to gas conversions – Peabody, Kennedy Longfellow, Cambridgeport, Longfellow

- **Standard contract language**

- HVAC upgrades & repair/maint contract, Healy Bldg janitorial

- **Energy Star purchasing policy**

- Peak Demand Reduction
- 370 LED Walk Signals in FY09
- GreenSense Energy Awareness



# **20% Energy Reduction Plan**

## **Water Treatment Plant Energy Audit**

### **Energy Efficiency and Conservation Block Grant, NStar rebates and other funding sources**

- High efficiency gas boilers @ Longfellow School, DPW Frazier Administration, Moore Youth Center
- Lighting Upgrades, Occupancy Sensors & HVAC improvements @ four schools, five municipal buildings including City Hall

Energy management systems and monitoring

Retro-commissioning

PC Power Management: Collaborate with IT  
Department

Green Fleet Purchasing Policy

# Additional Actions

- Creation of Energy Fund
- School Sustainability Coordinator
- Sustainability Standards
- GreenSense in Schools
- Demand Response
- LED Pilot
- Solar compactors – trash route reduction