



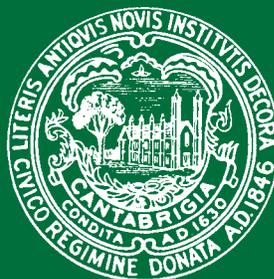
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# CAMBRIDGE

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## Climate Protection Action Committee

### 2006 ANNUAL REPORT



City of Cambridge

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## **EXECUTIVE SUMMARY**

The Climate Protection Action Committee is an advisory body appointed by the City Manager to assist the City in implementing the Climate Protection Plan. The 2006 Annual Report, which is the third to be issued, describes and evaluates the current status of Cambridge's efforts to achieve the goals of the plan.

Participation in the ICLEI Cities for Climate Protection continued to expand in 2006, as the number of U.S. local government partners grew to over 200. ICLEI membership in Massachusetts grew to 23. ICLEI continued to support its members in the Northeast from its regional office located in Boston.

The science of climate change was popularized in 2006 by former Vice-President Al Gore's documentary film *An Inconvenient Truth*. A major surge in public interest and activism on climate change ensued throughout the U.S. More specific information about potential climate change impacts in our region became available with the publication of the Union of Concerned Scientists' report *Climate Change in the U.S. Northeast*. The assessment used low and high emissions scenarios to project potential impacts. Under either scenario, the region can expect some degree of impact, although actions taken now to reduce greenhouse gas emissions could avoid the more severe effects.

Trends related to the greenhouse gas emissions inventory are tracked in the areas of energy, transportation, and waste. In 2006, there was a slight decrease in emissions associated with electricity and natural gas consumption, which account for about three quarters of Cambridge's GHG emissions. While the decrease was minor, it was the first time that a decrease was observed. It should be noted however that emissions remain well above 1990 levels, which serve as the baseline for the Climate Protection Plan. If the rate of emissions has stabilized, it would represent a turning point for the city.

Harvard University and MIT made strides in their campus sustainability efforts. The Harvard Green Campus Initiative continued to strengthen its programs. MIT launched its Energy Initiative, which includes a "walk the talk" component.

Businesses are increasing their awareness and action on climate change. The Cambridge Climate Leader program engaged 16 partners through 2006. The City began working with the Henry P. Kendall Foundation to create the Cambridge Energy Alliance, which will become a major resource for reducing energy-related emissions. The Department of Public Works (DPW) launched a composting program for restaurants and other businesses and organizations that generate organic waste.

The City has developed its first emissions inventory for municipal operations. Emissions in 2006 were 37,320 tons, which was down from 39,728 tons in 2005. Municipal operations contribute less than three percent of the community's total emissions. The City continues to make progress in finding emissions reductions. Energy efficiency projects were implemented at various buildings and facilities; a green fleet committee was established to improve fuel economy in the City's vehicles; green building design

was applied to new projects and major renovations; and recycling and waste minimization projects were carried out at City buildings. DPW working with the state Division of Energy Resources and consultants developed the web-based Energy Information System, which enables the City to track energy use in its buildings and facilities.

Interest and activity around climate change surged in 2006. However, the level of engagement and action in the private sector and among residents still needs to increase dramatically in order to meet the goals of the Climate Protection Plan. The Cambridge Energy Alliance will become a major resource to achieve higher levels of engagement and to make significant progress in reducing greenhouse gas emissions.

## **PURPOSE OF THE ANNUAL REPORT**

This is the third annual report of the Climate Protection Action Committee, an advisory body appointed by the City Manager to assist the City in implementing the Climate Protection Plan. Part of the committee's charge is to monitor activities and report annually on the status of efforts to achieve Cambridge's goal of reducing greenhouse gas emissions by 20 percent below 1990 levels by 2010. This annual report covers activities in 2006.

## **CITIES FOR CLIMATE PROTECTION**

Interest and concern about global warming among local governments and the public in general surged in 2006. As a result, membership in the Cities for Climate Protection program sponsored by ICLEI-Local Governments for Sustainability grew to over 200 in the U.S. In Massachusetts, membership rose from 23 in 2005 to 26 in 2006.

The ICLEI Northeast Regional Capacity Center hosted by the City of Boston added a second staff person and continues to support members with technical and financial support.

## **STATE AND REGIONAL ACTIVITY**

California's influence on climate issues spread to Massachusetts. The Commonwealth adopted the requirements of the "Pavley Law" which requires greenhouse gas emissions from motor vehicles to be reduced by about 30% by 2016, starting with model year 2009. The law was originally enacted in California in 2002 and was the first greenhouse gas emissions regulation applied to vehicles. California is the only state that is able to set separate air pollution regulations due to historical circumstances. Affected business interests have challenged the law in court. Massachusetts has the option to adopt either federal or California air quality standards. The Massachusetts Department of Environmental Protection has adopted the Pavley rules, which will go into effect here if the court upholds California.

Before Governor Mitt Romney left office, his administration issued the "Next-Gen Energy Plan". Under the plan, Massachusetts would meet its growing demand for electricity through efficiency, distributed generation, and renewable energy and avoid installing new fossil fuel power plants. The plan estimates the potential for about 1,400 megawatts of efficiency gains and 1,200 megawatts of clean generation.

### **Massachusetts CCP Members**

Amherst  
Arlington  
Barnstable  
Belmont  
Boston  
Brookline  
Cambridge  
Falmouth  
Gloucester  
Hull  
Lenox  
Lynn  
Medford  
Natick  
Newton  
Northampton  
Pioneer Valley  
Planning Commission  
Pittsfield  
Reading  
Salem  
Shutesbury  
Somerville  
Springfield  
Watertown  
Williamstown  
Worcester

The state's Operational Services Division issued a contract for biodiesel. Municipalities are able to purchase products and services through state contracts. The contract is based on a floating price for conventional diesel.

## **CLIMATE SCIENCE**

Climate science was popularized by the documentary film *An Inconvenient Truth* produced by former Vice President Al Gore. The film seemed to trigger a major surge in public interest and activism throughout the U.S.

The Union of Concerned Scientists issued its report *Climate Change in the U.S. Northeast*. The report provided an overview of the potential impacts in our region. Two scenarios were developed to project changes. A low emissions scenario assumes a pathway of high economic growth but shifts toward less fossil-fuel use and more clean energy and resource efficient technologies under which greenhouse gas emissions peak at mid-century and decline thereafter. A high emissions scenario assumes the world stays on a course of high fossil fuel use and intensive economic growth. Under the high emissions scenario, the region would see winters warm by 8 to 12 degrees F and summers by 6 to 14 degrees F. By mid-century, Massachusetts would feel like Maryland currently in the summer; by the end of the century our climate would be similar to that of South Carolina. In Boston, days over 100 degrees F will climb from a current average of 1 to 24 by the end of the century. Even under the low emissions scenario, the regional climate will be altered but to a lesser extent. Winter temperatures are expected to increase 5 to 7.5 degrees F by the end of the century and 3 to 7 degrees F in the summer. The number of days over 90 degrees F will average 30 compared to about 10 presently. Winter snow season will diminish by 25%. A more detailed study of impacts was expected from UCS in 2007.

The Stern Report on the Economics of Climate Change issued by the British government estimated the cost of global warming and stirred debate. Arguments over financial impacts have focused mostly on the cost of taking action. The Stern Report focused on the cost of not taking action. According to the analysis, failure to take action could result in the annual loss equivalent to 5% of the world's gross domestic product and could range up to 20% if the worst climate impacts are realized. In contrast, the cost of taking action could be limited to 1% of global GDP annually. The report emphasized the importance of taking action sooner rather than later to avoid irreversible effects and costs.

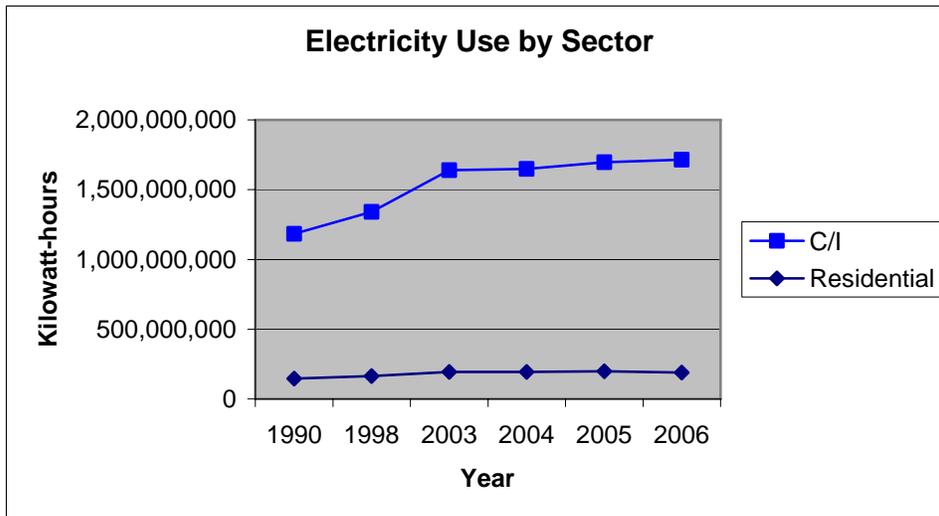
## **GREENHOUSE GAS EMISSION TRENDS**

A greenhouse gas emissions inventory has been conducted for the years 1990, 1998, and 2003. Since some sources of data used to create the inventory are not reported regularly, the full inventory is not updated annually. Instead related trends are reported to help assess progress toward Cambridge's emissions reduction goal.

## Electricity

Total electricity consumption in Cambridge continued to rise in 2006, increasing by 18,603,065 kilowatt-hours or 1.1% from the total use in 2005. The average annual increase since 2003 is about 1.5%. The increase can be attributed to growth among large commercial and institutional users, which used 27,558,019 kilowatt-hours more in 2006. This represents a 1.8% increase over the previous year. Residential electricity use decreased by 8,954,954 kilowatt-hours during the same period, representing a 4.5% decline.

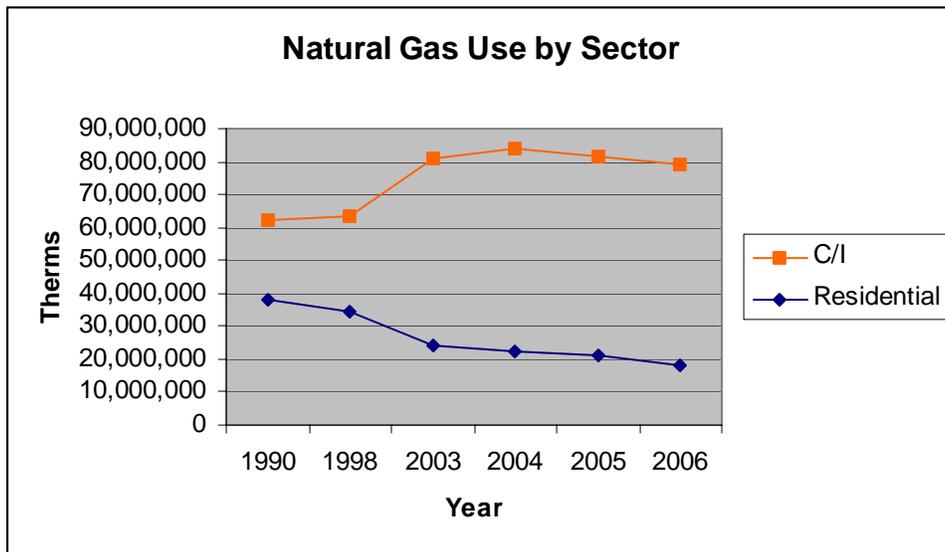
| Year | <i>kwh</i>  | <i>kwh</i>    | <i>kwh</i>    | <i>Tons</i> |
|------|-------------|---------------|---------------|-------------|
| 1990 | 146,096,000 | 1,037,539,000 | 1,183,635,000 | 414,272     |
| 1998 | 163,928,000 | 1,176,216,000 | 1,340,144,000 | 469,050     |
| 2003 | 193,869,000 | 1,445,695,000 | 1,639,564,000 | 573,847     |
| 2004 | 192,714,420 | 1,455,112,668 | 1,647,827,088 | 576,739     |
| 2005 | 198,060,572 | 1,498,050,574 | 1,696,111,146 | 593,639     |
| 2006 | 189,105,618 | 1,525,608,593 | 1,714,714,211 | 600,150     |



## Natural Gas

Natural gas is the primary heating fuel in Cambridge. From 2005 to 2006, total usage decreased by 2,061,142 therms or 2.53%. Total natural gas use also declined in 2005 compared to 2004. Since 2004, total natural gas use has declined by 4,718,239 therms or 5.6%. The decreasing trend is particularly pronounced in the residential sector, with natural gas use declining by 3,270,469 therms or 15.4% for the sector. In the commercial and institutional sector, natural gas use increased by 1,209,327 therms or 2.0%.

| Year | Therms     | Therms     | Therms     | Tons    |
|------|------------|------------|------------|---------|
| 1990 | 38,319,279 | 23,665,743 | 61,985,022 | 381,983 |
| 1998 | 34,555,539 | 29,087,039 | 63,642,578 | 392,197 |
| 2003 | 24,455,958 | 56,351,046 | 80,807,004 | 497,973 |
| 2004 | 22,202,826 | 61,872,534 | 84,075,360 | 518,114 |
| 2005 | 21,228,325 | 60,189,938 | 81,418,263 | 501,740 |
| 2006 | 17,957,856 | 61,399,265 | 79,357,121 | 489,038 |



### Waste Disposal & Recycling

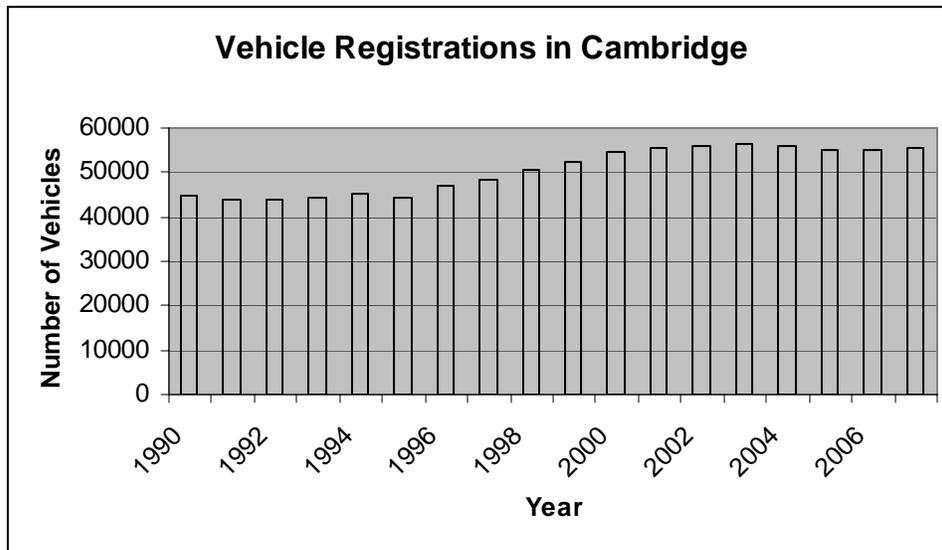
Waste management continues to be a positive sector in terms of mitigating greenhouse gas emissions. The City’s curbside recycling program diverts waste that would otherwise be sent to landfills and incinerators. The data below is limited to the quantity of waste collected by the City’s program, which serves most residences, schools, and City buildings. For the most part, waste collected by private haulers is not included due to the lack of centralized data collection. Commercial properties and some large residential complexes are served by private haulers.

|                                    |        |        |        |        |        |        |        |        |        |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Waste Collected by City (tons)     | 40,424 | 25,624 | 21,719 | 21,672 | 24,371 | 26,022 | 22,654 | 22,092 | 21,308 |
| Recycling Collected by City (tons) | 646    | 10,093 | 11,009 | 12,218 | 11,080 | 11,235 | 12,654 | 11,854 | 11,942 |
| Total Waste (tons)                 | 41,070 | 35,717 | 32,728 | 33,890 | 35,451 | 37,257 | 35,308 | 33,946 | 33,250 |
| % Recycled                         | 1.57%  | 30.10% | 33.20% | 33.10% | 33.00% | 34.40% | 33.30% | 31.60% | 31.60% |

Note: Total waste does not include trash collected by private haulers at large residential multi-family dwellings. The recycling rate reflects additional trash collected by private haulers.

## Vehicle Registrations

The total number of vehicles registered in Cambridge remains approximately level at a total of 55,617 automobiles, trucks, and other vehicles. The number peaked in 2004 at 55,943. However, vehicle registrations in Cambridge are 24.5% higher compared to 1990. The population in Cambridge grew less than 5% in the same period. The increase in vehicles registered in Cambridge is probably at least partly due to changing demographics as the community became more affluent.



Hybrid vehicles have become more visible on the streets, however it appears that they represent a small percentage of the vehicles in the city. According to data reported in the *Boston Globe*, there were 4.9 hybrid vehicles per 1000 residents registered in Cambridge through April 2007. That suggests there are about 490 hybrids registered in the city, which would be less than 1% of the total vehicles registered. It should also be noted that all hybrids are not necessarily fuel-efficient.

## Transportation Demand Management

The Vehicle Trip Reduction Ordinance, passed in 1992, and the Parking and Transportation Demand Management Ordinance, passed in 1998, establish policies and programs to encourage alternatives to single occupancy vehicle trips.

There was no change in 2006 in the number of projects subject to PTDM requirements. There continued to be 37 projects affected that were preventing an estimated 49.2 million vehicle miles annually. Assuming the vehicles are primarily sedans, greenhouse gas emissions of about 25,200 tons per year are avoided.

## NSTAR Energy Efficiency

NSTAR reports that in 2006, it spent \$3,196,540 on residential, low income, and commercial and industrial energy efficiency projects in Cambridge. The projects reduced peak summer load by 2.6 megawatts and winter loads by 1.7 megawatts. An estimated total of 16,803,000 kilowatt-hours of electricity was saved. The bulk of the energy savings came from the commercial and industrial new construction program and the business solutions program. The carbon reduction benefit was about 6,200 tons CO<sub>2</sub>.

## PV Systems in Cambridge

In 2006, two residential solar photovoltaic systems were installed, adding 5.76 kilowatts of clean electric generating capacity. These additions bring the total PV capacity in Cambridge to 124.3 kilowatts. Photovoltaic systems provide a means to generate electricity onsite without emitting greenhouse gases. Usually buildings continue to be connected to the regional grid and are used to offset the total electricity supplied by NSTAR. Production data for some systems can be viewed at [www.soltrex.com](http://www.soltrex.com).

### LEED Projects in Cambridge

#### *Certified*

| <u>Project</u>                               | <u>Rating</u> |
|--|---------------|
| City Hall Annex                              | Gold          |
| Genzyme Center                               | Platinum      |
| Harvard University Information Services      | Certified     |
| Harvard University Mather Dunster Renovation | Silver        |
| Radcliffe Institute for Advanced Studies     | Certified     |
| Zero Arrow Street                            | Certified     |

#### *Registered*

| <u>Project</u>                                | <u>LEED System</u> |
|---|--------------------|
| 10 Akron Street, Harvard Real Estate Services | NC 2.2             |
| 90 Mount Auburn Street, Harvard University    | NC 2.1             |
| Arup Boston Office Renovation                 | CI 2.0             |
| Cambridge Public Library                      | NC 2.2             |
| Greenworks Building, Gravestar                | CI 2.0             |
| North Point Parcel J                          | CS 2.0             |
| Robert W. Healy Public Safety Facility        | NC 2.2             |
| War Memorial Renovation, City of Cambridge    | NC 2.2             |
| West Cambridge Youth & Community Center       | NC 2.2             |

## LEED Projects

Design and construction of green buildings continues to grow. Through 2006, six Cambridge projects have been certified by the U.S. Green Building Council under the Leadership in Energy and Environmental Design (LEED) criteria. The Harvard University Information Services building at 60 Oxford Street, was completed in 2002 and was rated at the LEED Certified level in 2006. There are also nine other projects that have registered their intention to certify. There are different LEED rating systems for

depending on the type of project. The New Construction category covers new buildings and major renovations. Commercial Interiors covers fit outs of existing space. There are also systems for core and shell projects, existing buildings, homes, and schools. Other systems are being piloted for neighborhood development and retail projects.

## **CITY INITIATIVES**

The City received recognition from the Commonwealth of Massachusetts for its overall sustainability efforts, including implementation of the Climate Protection Plan. At a State House ceremony held on October 19, 2006, a State Sustainability Award was presented to City Manager Robert Healy by Secretary of Administration and Finance Tom Trimarco.

### ***Municipal Greenhouse Gas Emissions Inventory***

With the initiation of the new Energy Information System, the City is now able to obtain comprehensive building and facility energy consumption data for use in a municipal greenhouse gas emissions inventory. Vehicle fuel consumption is also tracked and reported as well (note: Fire Department diesel fuel use is not included due to the lack of data). Emissions have been estimated for fiscal years 2005 and 2006. Emissions from employee commuting are estimated from a biannual survey. The municipal inventory does not include emissions from waste management activities due to the lack of data.

|                  | 2005               |                   |              | 2006               |                   |              |
|------------------|--------------------|-------------------|--------------|--------------------|-------------------|--------------|
|                  | <i>Million BTU</i> | <i>CO2 (tons)</i> | <i>% CO2</i> | <i>Million BTU</i> | <i>CO2 (tons)</i> | <i>% CO2</i> |
| Buildings        | 273,319            | 24,444            | 61.5         | 251,028            | 22,378            | 60.0         |
| Vehicle Fleet    | 40,120             | 3,319             | 8.4          | 37,702             | 3,227             | 8.6          |
| Employee Commute | 56,700             | 4,845             | 12.2         | 58,380             | 4,986             | 13.4         |
| Streetlights     | 23,902             | 2,706             | 6.8          | 22,275             | 2,469             | 6.6          |
| Water/Sewage     | 44,709             | 4,414             | 11.1         | 43,602             | 4,260             | 11.4         |
| <b>Total</b>     | <b>438,750</b>     | <b>39,728</b>     | <b>100.0</b> | <b>412,987</b>     | <b>37,320</b>     | <b>100.0</b> |

The inventory indicates that greenhouse gas emissions associated with municipal operations decreased by 6.1% between 2005 and 2006. The underlying energy consumption data indicates this was the result of less consumption of fuel oil in buildings and of vehicle fuels in City trucks and cars. Emissions from employee commuting increased slightly (approximately 3%). Two years of data is not sufficient to demonstrate a trend. These data suggest that the contribution of municipal operations to Cambridge's total greenhouse gas emissions is less than 3 percent. Municipal emissions will be reported annually in this report.

### ***Energy Sector***

In fiscal year 2006, costs for building energy consumption (electricity, natural gas, fuel oil) was \$6,723,132. In fiscal year 2007, the City spent \$7,302,368 on building energy

consumption, an 8.6% increase. These figures include the schools. The consumption numbers have not been adjusted to account for differences in heating and cooling degree days.

| <i>FISCAL YEAR</i> | <i>ELECTRIC kWh</i> | <i>ELECTRIC Total Cost (\$)</i> | <i>GAS Therms</i> | <i>GAS Total Cost (\$)</i> | <i>OIL Gallons</i> | <i>OIL Total Cost (\$)</i> |
|--------------------|---------------------|---------------------------------|-------------------|----------------------------|--------------------|----------------------------|
| 2005               | 40,224,951          | \$4,619,024.02                  | 701,334           | \$813,883.72               | 629,342            | \$678,211.63               |
| 2006               | 41,260,770          | \$4,576,066.89                  | 752,933           | \$1,192,720.13             | 561,057            | \$954,344.72               |
| 2007               | 39,911,282          | \$5,213,792.86                  | 715,991           | \$1,038,785.91             | 516,982            | \$1,049,789.62             |

*Energy Information System* – The Public Works Department led the development of a new Web-based energy information system to track electricity, natural gas, fuel oil, and transportation fuel consumption and costs for all City agencies. The system was developed by Peregrine Energy Group under the sponsorship of the state Division of Energy Resources. Data on electricity and natural gas use is automatically downloaded from NSTAR. The system provides the capability to track energy use on a monthly basis in all City facilities and to account for gasoline and diesel consumption by municipal vehicles. Cambridge is the first municipality in Massachusetts to develop this capability.

*Energy Efficiency Projects* – A number of energy efficiency upgrades have been implemented or planned at municipal facilities. While not a comprehensive list, the following have been documented to date:

| <i>Description of Upgrade</i>               | <i>Electricity Saved KWh/year</i> | <i>Natural Gas Saved Therms/Year</i> | <i>CO2 Reduction tons/year</i> | <i>Estimated Annual Savings</i> |
|---|-----------------------------------|--------------------------------------|--------------------------------|---------------------------------|
| Danehy Park Building Lights                 | 1,567                             | N/A                                  | 1.1                            | \$213                           |
| Vending Miser Pilots                        | 4,881                             | N/A                                  | 3.5                            | \$664                           |
| Traffic Meter & Maint. Office Lights        | 5,391                             | N/A                                  | 3.9                            | \$733                           |
| Parking Lot #2 (Harvard Sq.) Lights         | 9,784                             | N/A                                  | 7.0                            | \$1,331                         |
| Lombardi Building Air Conditioning          | 17,004                            | N/A                                  | 12.2                           | \$2,313                         |
| Area 4 Youth Center Lights                  | 18,218                            | N/A                                  | 13.0                           | \$2,478                         |
| Green Street Garage Lights                  | 53,310                            | N/A                                  | 38.1                           | \$4,250                         |
| Central Square Library Lights               | 54,785                            | N/A                                  | 39.2                           | \$7,451                         |
| Russell Field Fieldhouse green building     | 86,909                            | N/A                                  | 62.1                           | \$11,820                        |
| City Hall Boiler Replacement                | N/A                               | 8,301                                | 49.0                           | \$14,112                        |
| Senior Center HVAC Improvements             | 55,413                            | 8,400                                | 89.2                           | \$21,816                        |
| Sullivan Water Purification Facility Lights | 262,800                           | N/A                                  | 187.9                          | \$35,741                        |
| First Street Garage Lights                  | 263,964                           | N/A                                  | 188.7                          | \$35,899                        |
| LED Traffic Signals                         | 750,342                           | N/A                                  | 536.5                          | \$142,565                       |
| <b>Totals</b>                               | <b>1,584,368</b>                  | <b>16,701</b>                        | <b>2,462,718</b>               | <b>\$284,384</b>                |

The conversion of the traffic signal system to LED technology was about half-done in 2006 and was on schedule for completion in 2007. Combined, the projects have saved

1,584,368 kilowatt-hours of electricity per year and 16,701 therms of natural gas per year. Annual CO2 emissions have been reduced by 1231.4 tons or 2.46 million pounds and saved \$284,384 in annual energy costs. City agencies continue to assess facilities for energy savings.

*Renewable Energy* – In 2005, the City Council set a goal that 20% of municipal electricity come from renewable sources by 2010. Under its electricity supply contract with TransCanada, the City receives 1% of its power above the state Renewable Portfolio Standard from renewable sources. In 2006, the RPS stood at 2.5%, therefore 3.5% of the City’s electricity was renewable.

In 2006, the Center for a New American Dream selected Cambridge to participate in its Responsible Purchasing Network and receive technical assistance from Think Energy, a Maryland-based clean energy consultant. Think Energy began assessing the City’s options for purchasing renewable energy certificates and participating in a renewable energy generation project outside the city. The City also contracted separately with Think Energy to evaluate selected City facilities for potential renewable energy installations. Recommendations were due in 2007.

The Public Works Department installed four Big Belly solar-powered trash compactors. Two are located in Winthrop Park, one in Harvard Square near Out of Town News, and one in Sennott Park. In addition to being powered by solar photovoltaic cells, these compactors help reduce vehicle trips to collect trash resulting in less fuel consumption and GHG emissions.

### ***Transportation***

In fiscal year 2005, the City purchased 247,028 gallons of gasoline, 15,749 gallons of diesel, and 59,472 gallons of B20 biodiesel (20% biofuel and 80% conventional diesel). This resulted in an estimated total of 3,216 tons of CO2 emissions. In fiscal year 2006, the City purchased 235,995 gallons of gasoline and 65,784 gallons of diesel, resulting in a total of 3,136 tons of CO2 emissions. The City suspended the use of biodiesel in FY2006 due to the significant price premium compared to conventional diesel. Despite the switch back to conventional diesel, which involves a higher CO2 emissions rate per gallon, a 2.5 percent decrease in CO2 emissions resulted due to the decrease in gasoline consumption. The City Manager initiated a Green Fleet process in 2006 which caused some vehicles to be replaced with more fuel efficient models. The data does not include Fire Department diesel consumption due to the lack of data.

The City Manager created a Green Fleet Committee to develop policies and procedures to increase fuel economy and reduce pollution emissions from the municipal vehicle fleet. The Committee began work on developing a fleet inventory and initiated a new vehicle acquisition process. It is now City policy that prior to approval of a vehicle purchase, an agency must identify three vehicle options and rate them in terms of fuel economy and emissions. The EPA fuel economy ratings and emissions scores are used for this

purpose. The agency’s functional requirements, cost, and safety are considered along with fuel economy and emissions in making final choices.

| <i>Fiscal Year</i> | <i>Fuel</i>   | <i>Gallons Used</i> | <i>CO2 tons</i> |
|--------------------|---------------|---------------------|-----------------|
| 2005               | Gasoline      | 247,028             | 2,558           |
|                    | Diesel        | 15,749              | 165             |
|                    | B20           | 59,472              | 493             |
|                    | TOTAL CO2     |                     | 3,216           |
| 2006               | Gasoline      | 235,995             | 2,444           |
|                    | Diesel (ULSD) | 65,784              | 692             |
|                    | TOTAL CO2     |                     | 3,136           |

The City continues to provide incentives and services to municipal employees to reduce single-occupancy auto commuting. The program includes transit pass subsidies, shuttle bus service, ride-share matching, bicycle facilities, and guaranteed ride home service.

The City’s infrastructure projects designed to improve conditions for pedestrians and cyclists continue, with major roadway reconstruction at Porter Square , traffic calming projects throughout the city, new on-road bicycle facilities, bus shelters and benches, and other amenities. The citizen bicycle and pedestrian committees continue to advise on infrastructure and policies and assist in promotional activities.

City staff are engaged in advocacy and planning for the MBTA’s proposed Green Line extension from Lechmere through Somerville and onto Medford. Also, City staff is working on planning for the Urban Ring, which would provide transit service from the airport, through Chelsea and Everett, Somerville, East Cambridge, Cambridgeport, and the Longwood Medical Area, to Dorchester, allowing riders to switch from one transit line to another without having to go into downtown Boston.

***Land Use***

*Green Buildings* – The City has a policy that all new municipal construction and major renovations follow the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) standards. City Hall Annex was the City’s first green building project and achieved a LEED Gold rating. Other projects that were in design or construction that will achieve LEED ratings include the Russell Field Fieldhouse, Main Library Expansion, new Police headquarters, West Cambridge Youth Center, War Memorial swimming facility, and the Cambridge Rindge and Latin School renovation.

The Sustainable Building Industry Council presented Consigli Construction first place in its Exemplary Sustainable Building Awards for City Hall Annex. The Annex was also featured in a 3-part global warming series by New England Cable News that aired in September. The series also featured Cambridge’s Sprengnether family on their efforts to make their triple-decker residence more energy efficient and use clean energy.

## ***Waste Reduction***

The Public Works Department worked with the schools to conduct the “Recyclecraze” (formerly called Recyclemania) competition to encourage recycling in Cambridge schools. The competition involved 13 schools with the challenge of recycling as much paper as possible over a four month period from January to April. The Kennedy-Longfellow School took first place by recycling over 90 pounds of paper per student. The Peabody School came in a close second, recycling over 80 pounds per student. The winners were presented with trophies made from recycled materials. Overall, Cambridge schools increased their paper recycling by 25% over the previous year.

## **COMMUNITY INITIATIVES**

### ***Energy***

*Cambridge Energy Alliance* – A collaboration with the Henry P. Kendall Foundation was started in 2006 which has led to the creation of the Cambridge Energy Alliance. The initiative is envisioned as a \$100 million effort to take place over 5 to 7 years to implement massive energy efficiency and installation of clean distributed energy systems throughout Cambridge. Planning was underway for the launch of the initiative in 2007.

*Energy Fairs* – The City has been sponsoring two annual energy fairs for residents. At Danehy Park Family Day, held in the fall, an energy tent is set up with information tables and exhibits presented by NSTAR, Conservation Services Group, Massachusetts Energy Consumers Alliance, Green Decade Cambridge, the Community Development Department, and others. In February 2006, the City presented the first Home & Energy Fair at Cambridge Rindge and Latin School, which featured information and workshops on energy efficiency, home improvements, renewable energy installations, tree planting, and other topics.

*MIP&L* – Six places of worship and religious institutions continue to participate in Massachusetts Interfaith Power and Light. This non-profit organization helps members of all faiths to be better environmental stewards with an emphasis on energy use. Members have access to various energy services.

*Scout/CFL projects* – Boy Scout Troop 56/Venturing Crew 56, which is based at Grace Methodist Church in Central Square, took part in an NSTAR-sponsored program that offers compact fluorescent lights (CFL) for fundraising campaigns. The scouts sell CFLs in the same way that they sold candy in order to raise funds to support camping, canoeing, and bike trips that are part of the Scouts mission of building leadership and outdoor survival skills. And the CFLs help make Cambridge more energy efficient and reduce greenhouse gas emissions. NSTAR provides educational materials and arranges the supply of CFLs.

*Cambridge Climate Leader* – This program is the City’s effort to engage businesses, organizations, and institutions in supporting the goals of the Climate Protection Plan.

Through 2006, the program has drawn 16 partners. The partners sign an agreement voluntarily pledging to support the goals of the plan and to undertake actions to reduce emissions. The City supports the partners with energy, transportation, and waste reduction technical assistance and public recognition.

| <b>Cambridge Climate Leaders</b> (through December 2006) |                                 |
|--|---------------------------------|
| Genzyme Center   | The Inn at Harvard              |
| Pfizer   | Whole Foods Market Fresh Pond   |
| Whole Foods Prospect Street                              | Whole Foods Market River Street |
| Camp Dresser McKee                                       | TIAX LLC                        |
| Abt Associates   | Metabolix                       |
| Shire Human Genetic Therapies                            | Cambridge Brewing Company       |
| Cambridge Innovation Center                              | Ole Mexican Grill               |
| Trinity Property Management                              | HMFH Architects                 |

*Green Buildings* – The Trolley Square mixed-use development on Massachusetts Avenue in North Cambridge was dedicated on November 20. The development features 40 affordable rental and homeownership units plus some retail and community space. Homeowner’s Rehab, Inc. (HRI) is the developer and Jane Jones is the project manager. With support from the Enterprise Foundation, Cambridge Affordable Housing Trust, MassHousing, Energy Star Homes, and the MTC, significant energy and environmental design features were incorporated into the project including a highly energy efficient building envelope (HERS rating over 90 on a scale of 1 to 100); Energy Star appliances and lighting; a gearless traction elevator that is 50% more energy efficient than a conventional elevator; dual flush toilets; and recycling of 90% of construction debris. HRI also recently received funding from the MTC and MassHousing to install a 45 kilowatt solar photovoltaic system that will be installed. This will be the single largest PV system in Cambridge.

During the fall, the Museum of Science created a cell phone-based self-guided green building tour of City Hall Annex. The cell phone format enabled users to guide themselves to stations located around the Annex to learn about the green features with narrative from people involved with the project. An improved version of the tour is planned for 2007.

*Irving House Energy Star* – Irving House, a 44-room inn at 24 Irving Street, was awarded an Energy Star label for energy efficiency by the federal Energy Star program. Using Energy Star’s Portfolio Manager benchmarking tool to compare itself to other hospitality facilities, Irving House scored 100 in terms of its relative energy performance. The Inn participates in Boston Green Tourism, which seeks to green the hospitality industry, restaurants, and convention services and attract visitors that seek environmentally-friendly accommodations and visitor services. Members include the Fairmont Copley Plaza and the Lenox Hotel in Boston.

## **Transportation**

The Charles River Transportation Management Association provides the EZRide Shuttle on a route that connects North Station in Boston via Kendall Square to Central Square. In 2006, it carried 204,451 passengers.

The Parking and Transportation Demand Management Ordinance requires certain employers to provide incentives and services to support non-single occupancy auto commuting. The results are reported in the Greenhouse Gas Emissions Trends section of this report.

## **Waste Reduction**

The Public Works Department's Recycling Division received a grant from the state Department of Environmental Protection to develop a business composting program. Working with Save that Stuff, the City's business recycling contractor, a new service was created to collect organic waste such as food and florist trimmings from restaurants, hotels, office cafeterias and other establishments. The waste is sent to composting facilities to be converted into soil amendments.

The Recycling Division launched a number of efforts to increase recycling. A campaign called "If It Rips, Recycle It" was promoted by DPW to educate residents about which paper and cardboard materials can be recycled. Public area recycling bins were placed in Porter, Central, and Harvard Squares to facilitate container recycling. Scrap metal collection was added at the DPW recycling drop-off center. In fiscal year 2007, 15 tons of scrap metal was recycled.

## **COMPREHENSIVE PROGRAMS**

### ***Harvard University***

The Harvard Green Campus Initiative is continuing its mission to make the university more sustainable through a comprehensive, campus-wide program. Harvard has funded a \$12 million Green Campus Loan Fund that provides interest-free to low-interest financing for high performance building design, operations, and maintenance as well as building occupant behavior projects. HGCI also acts as an in-house sustainable design consultant for the university's projects. Harvard has the largest number of green buildings designed according to the LEED standards in Cambridge. Their website at <http://www.greencampus.harvard.edu/theresource> provides information about Harvard's green building projects. HGCI also continues to implement social behavior programs including its Residential Green Living program in student housing that addresses energy and waste reduction practices.

In 2006, Harvard completed and posted annual greenhouse gas emissions inventories that range back to 1992. Harvard follows the inventory protocol created by the World Resources Institute. The inventories can be found on the HGCI website at

<http://www.greencampus.harvard.edu>. The inventory provides a means for Harvard to assess its performance in reducing its contribution to climate change.

In the fall of 2006, 88.3% of undergraduates in the Faculty of Arts and Sciences (FAS) asked the administration to commit to reducing FAS greenhouse gas emissions by 11% below 1990 levels by 2020. HGCI is working with FAS to develop a business plan to assess the possibility of committing to this goal. FAS accounts for 37 percent of Harvard's total emissions.

### ***MIT***

Campus sustainability activities at MIT have continued to sharply focus on addressing the challenges posed by climate change and energy use. Climate change and energy have emerged on campus as a common ground for engaging the campus's diverse community of faculty, staff, students, city leaders, and residents alike. The level of awareness and interest on campus to address these issues – both in the classroom and in campus operations – has skyrocketed with new partnerships and collaborations forming.

The establishment of the MIT Energy Initiative (MITEI) in 2006 reflects this new priority, commitment, and collaborative framework at MIT to address the current energy and environment challenges. MITEI is aligning MIT's research, education, campus energy management assets to “to help transform the global energy system to meet the needs of the future and to help build a bridge to that future by improving today's energy systems”. This includes multi-disciplinary research and education programs to address the global energy challenge, while also extending MIT's impacts by adopting best campus energy practices to reduce its own energy footprint. To advance the campus energy component, MITEI has established the Campus Energy Task Force that is developing and beginning implementation of programs focused on energy conservation, efficiency, sustainable design, and the application of advanced energy technologies. In addition, opportunities are being developed to engage students and faculty in researching campus energy issues to help find solutions that can be applied on campus. More information is available at <http://mit.edu/mitei/index.html>.

In April, the student-led initiative Biodiesel@MIT won the national GE/MTV Ecomagination Challenge, which awarded them \$25,000 to build and operate a solar-powered, waste vegetable oil-to-biodiesel processor on campus to fuel campus vehicles. Planning is currently underway. Numerous other student-led initiatives are focused on finding ways to promote sustainable energy practices on campus.

MIT's green building program continues to grow. MIT has recently registered 3 new building construction projects with the U.S. Green Building Council's LEED program, including a new graduate residence, business school headquarters, and a cancer research facility. It is anticipated that the Sloan School of Management building will achieve a LEED Gold rating.

Aggressive Transportation Demand Management Programs – including MIT subsidized public bus, subway and commuter rail passes, free rideshare and van pool services, discounted car sharing and eco-taxi memberships, free campus bus shuttles, and ample bike racks – continue to reduce the passenger miles driven by the MIT community, and resulted in MIT being distinguished as a “Best Work Place for Commuters” by the EPA again in 2006.

MIT continued to expand its recycling program. In 2006, MIT recycled over 40% of the total amount of trash generated on campus and was awarded a GoGreen award from the City of Cambridge for its strong recycling program. Recycling of debris for two recent building demolitions topped 96 percent of total waste. MIT’s compost program has been reinvigorated and currently pre-consumer food waste from major dining facilities is composted. The purchasing of recycled products continues to be a priority for the institute, and is reflected in an institute environmentally preferable purchasing policy.

MIT introduced the Campus Sustainability Undergraduate Research Opportunities Program (CS UROPs) where students can research, recommend and implement change in technical, financial, and policy systems to make MIT more sustainable. The CS UROP Program funds undergraduate students to examine MIT’s campus infrastructure with the goal of reducing MIT’s environmental footprint. Each CS UROP works with both a faculty advisor and a technical advisor from MIT Facilities, the Environmental Programs Office, or Laboratory for Energy and the Environment.

## **EDUCATION & CIVIC ENGAGEMENT**

*Climate Protection Case Studies* - The Climate Protection Action Committee prepared five case studies of local actions that reduce GHG emissions. The case studies covered Pfizer’s energy efficiency improvements, Cambridge Health Alliance energy efficiency projects, the Sprengnether residential energy upgrade, MIT’s co-generation plant, and the PlanetTran hybrid livery service.

*GoGreen Awards* – At its annual event to recognize Cambridge businesses, institutions, and organizations for their sustainable environmental practices, the City recognized Biogen IDEC and Pfizer in the energy category, PlanetTran and the Cambridge Health Alliance in the transportation category, and MIT and Iggy’s Bread of the World in the waste reduction category.

*Community Organizations* - Green Decade Cambridge (GD/C), a community organization, affiliated with the Massachusetts Climate Action Network, has been working to promote the goals of the Climate Protection Plan. GD/C participates in community events to educate the public about climate change and actions and also advocates for policies and programs before the City Council. Interest in taking action at the neighborhood level has also begun to develop. A new organization called Greenport has formed in the Cambridgeport neighborhood to promote sustainability and reducing carbon footprints on a neighbor to neighbor basis.

## **EVALUATION OF PROGRESS**

In 2006, there was a slight decrease in emissions associated with electricity and natural gas use in Cambridge. These emissions account for about three quarters of total emissions in the city. While this decrease was minor, it was the first decrease observed since the annual reports began in 2004. Weather and economic factors could have accounted for the decrease. But it appears that Cambridge is in a period of stable emissions.

Relative to the City's goal to reduce emissions by 20% below 1990 levels, Cambridge remains far above 1990 emission levels. Achieving stable emission rates would mark a turning point, but much remains to be accomplished to attain the goal.

Electricity and natural gas use in the residential sector has continued to decline. Residential electricity use decreased 4.5% from 2005 to 2006 and natural gas use declined 15.4%. This is a bright spot in the city's emissions profile.

The waste sector continues to be a source of significant emission reductions. Recycling rates continue to increase modestly while total waste production remains relatively stable. Recent efforts to increase recycling and to introduce organics composting promise to further reduce waste and emissions from this sector.

The breadth of activities to mitigate greenhouse gas emissions appears to be expanding in the community. More businesses and residents are demonstrating concern about global warming and are making efforts to reduce emissions.

The institutions continue to build their campus sustainability programs. The Harvard Green Campus Initiative has shifted the university toward making efforts to make sustainability part of campus decision-making as evidenced by their many programs. At MIT, the Energy Initiative launched by President Hockfield includes a "walk the talk" element and organizational changes are being made to move the agenda forward.

Among businesses, participation in the Cambridge Climate Leader program has grown. We are seeing more businesses that track performance in terms of greenhouse gas emissions. Cambridge is also the home of many businesses that provide environmental products and services, particularly in the area of energy. The business sector is ripe for increased action on sustainability and climate protection.

Green Decade Cambridge has increased its membership and has become an effective advocate for local climate protection. It gives voice to the concerns of citizens and a way for that concern to be transformed into action.

The Cambridge Energy Alliance will provide a substantial mechanism to address greenhouse gas emissions that has not been available before. This initiative will be a major focal point over the next several years.

These local trends are occurring in a changing context at the state and national levels. Areas that Cambridge has no direct control over but which are key to managing our emissions will be affected by state and national policy. Increased vehicle fuel economy, greenhouse gas emission regulations for vehicles, green power options for electricity consumers, and increased availability of biofuels appear to be areas where new policies will enhance the city's ability to achieve its goals.

There is progress. But the scale and pace of action still needs to expand dramatically if Cambridge is to achieve its climate protection goals.

## **PLANS AND OPPORTUNITIES**

*Cambridge Energy Alliance* – This initiative launched with the Kendall Foundation will be the primary effort in the city over the coming years to reduce greenhouse gas emissions. The model for the Alliance holds the potential for significant reductions although it appears despite the scale of the effort that further actions will be necessary to achieve the plan's goals. In order for the Alliance to succeed, it will require the participation of all sectors in promoting and taking advantage of the energy efficiency and clean distributed energy services that will be offered.

*Renewable Energy* - The City Council's goal for renewable energy use at municipal facilities will require implementation measures over the next few years. The City will need to be innovative in its approach to financing the installation of these systems.

*Energy Fair* – The Home and Energy Fair has been a successful event in terms of providing information and resources to residents interested in energy efficiency and renewable energy. The City needs to continue to develop and enhance this event and attract larger numbers of attendees.

*Green Buildings* – Green building has become common place for municipal and institutional projects. However, private development is still lagging in adopting this approach. The City needs to find new ways to encourage private developers to use LEED and other resources to make their projects more energy efficient and environmentally-friendly.

*Organics Composting* – The Public Works Department business composting program has been popular. This service needs to be further promoted to engage more participation.