2005 Greenhouse Gas Inventory and Energy Audit

A Report on Portland's Progress Towards its Emissions Reduction Goals

CLEAN AIR COOL PLANET

Prepared for the City of Portland, ME
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ICLEI and the Cities for Climate Protection Program

In 2001, the Portland City Council passed a resolution to join the Cities for Climate Protection (CCP) program. This international program was launched by Local Governments for Sustainability (or "ICLEI") in 1993 to help local governments address rising greenhouse gas emissions. Portland is among more than 250 municipalities from around the country and over 650 governments from around the world participating in the CCP Program.

The CCP Program involves a 5-Milestone process to inventory greenhouse gas emissions, develop reduction goals and implement programs to reduce local carbon dioxide and methane emissions.

- **Milestone 1.** Conduct a baseline emissions inventory and forecast. Based on energy consumption and waste generation, the city calculates greenhouse gas emissions for a base year and for a forecast year. The inventory and forecast provide a benchmark against which the city can measure progress.

- **Milestone 2.** Adopt an emissions reduction target for the forecast year. The city establishes an emission reduction target for the city. The target both fosters political will and creates a framework to guide the planning and implementation of measures.

- **Milestone 3.** Develop a Local Action Plan. Through a multi-stakeholder process, the city develops a Local Action Plan that describes the policies and measures that the local government will take to reduce greenhouse gas emissions and achieve its emissions reduction target. Most plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct greenhouse gas reduction measures, most plans also incorporate public awareness and education efforts.

- **Milestone 4.** Implement policies and measures. The city implements the policies and measures contained in their Local Action Plan. Typical policies and measures implemented include energy efficiency improvements to municipal buildings and water treatment facilities, streetlight retrofits, public transit improvements and installation of renewable power applications.

- **Milestone 5.** Monitor and verify results. Monitoring and verifying progress on the implementation of measures to reduce or avoid greenhouse gas emissions is an ongoing process. Monitoring begins once measures are implemented and continues for the life of the measures, providing important feedback that can be use to improve the measures over time.

At the time of this report, Portland has completed Milestones 1 and 2. An initial inventory of year 2000 greenhouse gas emissions was completed in 2001 by a summer intern, Rick Pelltier, under the direction of Troy Moon, Department of Public Works.

As the first city to sign onto the Governor's Carbon Challenge, emissions reduction targets were set at 10% by 2010 for government emissions and 15% by 2015 for community emissions Portland restated this commitment in 2006 by signing onto the U.S. Mayors Climate Protection Agreement.

Clean Air – Cool Planet

Since 2005, the City has received assistance towards meeting these goals from Clean Air–Cool Planet, the Northeast's leading organization dedicated to finding and promoting solutions to climate change. Portland officials have had the opportunity to participate in two cross-border exchange programs to learn from Canadian communities' attempts to control greenhouse gas emissions. Clean Air–Cool Planet also organized a series of Global Warming Round Tables in Portland that brought together a variety of stakeholders to discuss emission reduction strategies. These events have helped to lay the groundwork for a future Action Plan.

The purpose of this 2005 inventory update is to track progress since 2000 and to provide more current information to help guide the development of an Action Plan. Data collection was conducted from October 2006 through March 2007 and was funded and supported by Clean Air – Cool Planet with technical assistance provided by ICLEI.

Next Steps: Reassess emissions reduction targets and create Action Plan

Since few emissions reduction strategies have been implemented since the original inventory in 2000, it is recommended that the results of this inventory be used to reassess the City's emissions reduction targets. The results of this inventory and previous global warming roundtables should be combined with additional research on potential actions to shape a plan that will meet these target reductions. Gathering further input from the community as well as city staff and officials will be an important part of this research.

Methodology

Both the 2005 and 2000 inventories were prepared using software provided by ICLEI and developed by Torrie Smith Associates. Information for government and community-wide energy use was gathered and entered into the software. The program then outputs energy consumption, emissions production and total cost per building or by sector. To interpret these results, it is important to understand two key terms:

Energy consumption is compared using **British Thermal Units (BTUs)**. This is a unit of measure for any kind of energy. Most energy sources were converted to BTU, as there are varying energy coefficients between energy sources (i.e. it allows you to compare the energy potential of a kilowatt of electricity with a gallon of gasoline).

Emissions production is typically tracked in **equivalent tons of CO_2 (eCO_2)**. Equivalent CO_2 is a common unit that allows emissions of greenhouse gases of different strengths to be added together. For carbon dioxide itself, emissions in tons of CO_2 and tons of eCO_2 are the same thing, whereas for nitrous oxide, a more powerful greenhouse gas, one ton of emissions is equal to 310 tons eCO_2.

Data for each inventory was collected for a particular time frame. The Community Inventory (or the inventory for the entire community of Portland, which includes all residences, commerce, industry, government operations, schools, etc.) was conducted for Calendar Year 2005. The Government Inventory (or the inventory conducted for energy consumption for strictly municipal operations) examines data for Fiscal Year 2005. The rationale for doing this was ease of data access – government data is generally organized by fiscal year. In a couple of cases, where government data represents Calendar Year 2005, a note was made in the software.

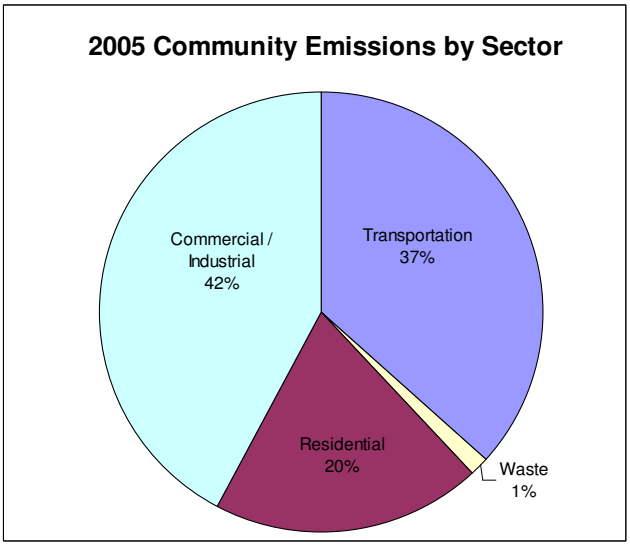
To gather the data required by the program, it was necessary to pull from many sources. For the Community Inventory, energy use was estimated by electricity and fuel providers, transportation officials, and the City's Solid Waste Manager. For Government Inventory, city and utility records were available for municipal properties, the municipal vehicle fleet, street and traffic lights, water and sewage systems, and municipal waste.

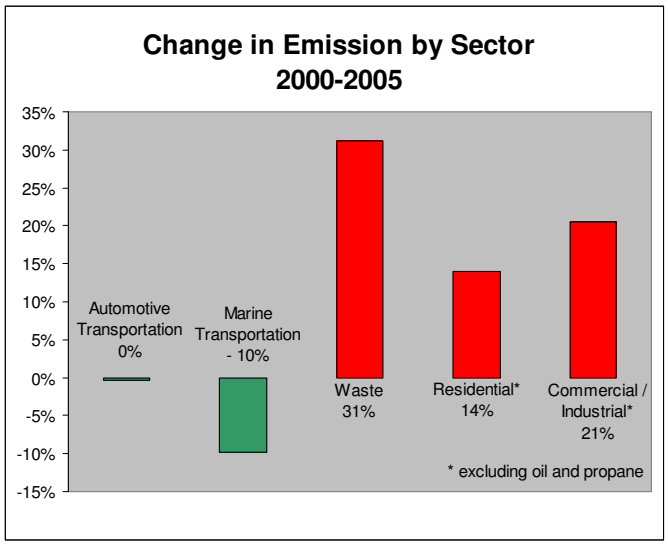
Although every attempt was made to ensure accuracy, it is important to note that this document is an estimate. There is inherent error in the derived formulas, as well as sampling error from examination of data. Often, data was double checked and/or a secondary analysis or estimate was conducted. Efforts were made to be as consistent as possible with the methodology from the 2000 inventory to ensure comparable results. Assumptions and other sources of potential inaccuracy were recorded in the "notes" section in the software.

Community Inventory

The community inventory tracked emissions due to the following: energy use in residential, commercial and industrial sectors; transportation by automotive and marine sources; and waste management.

The 2005 inventory shows that, together, the commercial and industrial sectors are the largest emitters, accounting for 42% of total greenhouse gas emissions. Transportation accounts for slightly smaller but significant 37% of emissions and the residential sector follows at 20%. Waste accounts for just 1%.

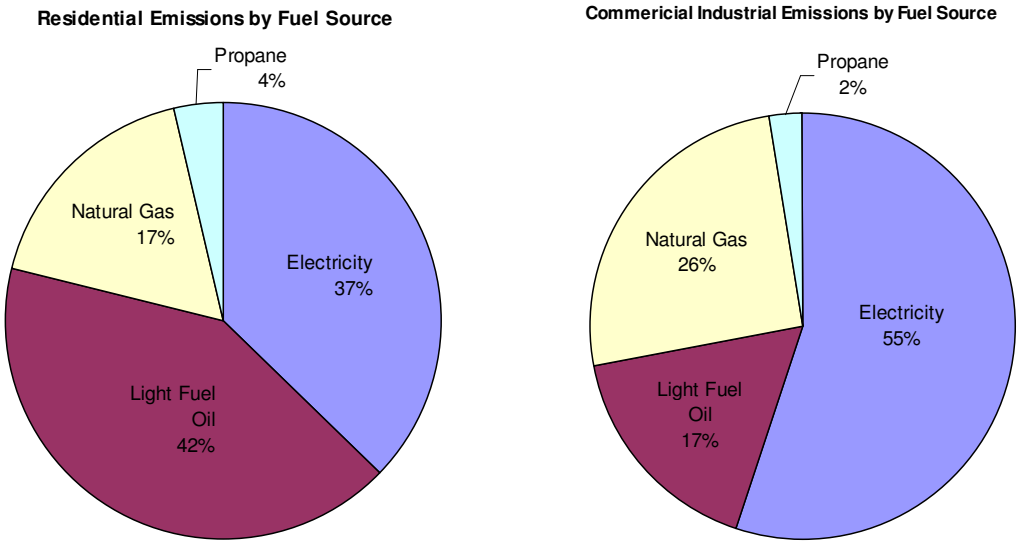




Excluding oil and propane use, since reliable comparisons cannot be made for these fuels, community greenhouse gas emissions increased by approximately 10% in Portland during the period of 2000 to 2005. The residential and commercial/industrial sectors each saw significant increases of 14% and 21 % respectively. Transportation actually saw a decline in emissions due to a relatively steady amount of automotive travel and a decline in marine transportation. Waste saw the largest increase, but accounts for the smallest portion of total emissions. Detailed analysis of both community emissions and consumption patterns are presented below along with some context behind these changes. It is interesting to note that population grew at a rate slightly under 1% for the same period, so population growth was not driving these changes.

Data on electricity, heating oil, natural gas and propane use were considered. Other sources such as kerosene, wood, solar, etc were considered insignificant for the purposes of this study. All utility data acquired for the community portion of this inventory was collected directly from respective utility companies. Non-utility data for the community portion of this study was collected, or estimated in several different pathways that are outlined below.

The following two charts show the breakdown of emissions by fuel source for the residential sector and the commercial and industrial sectors combined.



Community Electricity

Data for community electricity use was provided by Central Maine Power[1] and compared to data from 2003[2] because of apparent errors in the 2000 data.

[1] John Duvalis, CMP.
[2] It appears that 2000 community use was drastically underestimated. CMP believes that when the 2000 estimate was made, only one of the two Peninsula electricity grids was included. Unfortunately, at this time, CMP 2000

Community Electricity	TOTAL		
	2003	2005	change
Emissions (Tons eCO2)	260,602	277,480	6.5%
Energy Consumption (MMBtu)	2,297,153	2,450,041	6.7%

Community Electricity by Sector	Residential			Commercial			Industrial		
	2003	2005	change	2003	2005	change	2003	2005	change
Emissions (Tons eCO2)	61,253	66,431	8.5%	165,083	177,231	7.4%	34,266	33,818	-1.3%
Energy Consumption (MMBtu)	539,778	586,558	8.7%	1,455,298	1,564,881	7.5%	302,077	298,602	-1.2%

In total, Portland's electricity consumption increased at a rate of 6.7% from 2003 until 2005. While the greatest rate of increase (8.7%) occurred in the residential sector, the commercial sector was close behind (7.5%) and used the most electricity overall. The industrial sector actually saw a slight decline in electricity use. Emissions grew at a rate slightly smaller than consumption, most likely resulting from cleaner electricity production methods.

Although the amount of electricity consumed in 2000 is unknown, an assumed steady rate of increase over the five year period suggests a total increase of 17% for both electricity consumption and emissions since 2000.

According to the Maine Public Utilities Commission, 99% of residential customers in Maine purchased the standard electricity fuel mix offer in 2005. CMP's standard offer produces 24% fewer CO2 emissions, 22% more NOx emissions and 27% fewer SO2 emissions than the New England

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records are no longer available. Instead we must compare 2005 data to 2003 data, which is the earliest year available.

average. The commercial and industrial sectors used a more diverse mix—35% of medium sized and 90% of large customers were served by competitive providers.

Community Natural Gas

Community natural gas data was provided by NiSource, Inc[3]. Commercial and industrial data were not able to be separated, which is why these two sectors have been grouped for much of the analysis.

Community Natural Gas	**Residential**			**Commercial /Industrial**			**TOTAL**		
	2000	**2005**	**change**	**2000**	**2005**	**change**	**2000**	**2005**	**change**
Emissions (Tons eCO2)	31,225	30,933	-0.9%	97,678	98,035	0.4%	128,903	129,028	0.1%
Energy Consumption (MMBtu)	505,397	500,671	-0.9%	1,581,013	1,586,776	0.4%	2,086,410	2,087,447	0.0%

A slight decrease in natural gas consumption and emissions in the residential sector, balanced by a small increase in the commercial/industrial sectors, caused little overall change since 2000. This outcome is surprising considering the price of natural gas has varied widely over this five year period.

Community Light Fuel Oil and Propane:

Because of the non-centralized distribution system for heating oil and propane, we must estimate annual community consumption. Because of the limited accuracy of these estimates, results cannot be reliably compared to estimated 2000 emissions. Department of Energy studies on estimated gallons of fuel used per square foot or per household were combined with data from the City Assessor's database[4]. It would be useful to develop a way to improve these estimates, perhaps by collaborating with light fuel and propane oil providers in Portland.

[3] Pat Teague, NiSource
[4] Vicki Mason, City of Portland MIS

Light Fuel Oil

Using a 2001 Department of Energy study[5] and data on square footage and heating fuel from the Assessor's database, total residential living area square footage heated by oil was multiplied by 0.256 gallons of fuel per square foot of living space.

Similarly, commercial and industrial heating oil consumption was estimated using DOE data and information extracted from the Assessor's database. According the most recent US DOE study[6], commercial/industrial buildings burn an average of 0.50 gallons per square foot when total square footage is less the 10,000 and 0.22 gallons per square foot when total square footage is greater than 10,000. Square footage data for commercial and industrial buildings was extracted from the Assessor's database but no distinction was made between natural gas and oil as the primary heating source. Instead, another DOE study reporting that 52% of commercial/industrial square feet use oil as an energy source was referenced to estimate space heated by oil[7].

Community Oil	Residential	Commercial	Industrial	TOTAL
	2005	2005	2005	2005
Emissions (Tons eCO_2)	74,218	45,910	19,426	139,554
Energy Consumption (MMBtu)	897,820	555,377	235,554	1,688,751

The residential sector is by far the largest consumer of fuel oil, burning an estimated 6,414,955 gallons annually.

Propane

The rate of propane use in Portland was estimated by the number of permits issued for propane heaters compared with those issues for all heating units[8]. For residential units, propane use was

[5]Space-Heating Energy Consumption in U.S. Households by Northeast Census Region, 2001. Report can be found at http://www.eia.doe.gov/emeu/recs/recs2001/ce_pdf/spaceheat/ce2-9c_ne_region2001.pdf

[6] Fuel Oil Consumption and Conditional Energy Intensity by Census Region for All Buildings, 2003. Report can be found at: http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set17/2003pdf/c35a.pdf

[7] Consumption and Gross Energy Intensity by Census Division for Sum of Major Fuels for All Buildings, 2003. This report can be found at http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set14/2003pdf/c7a.pdf

[8] Gayle Guertin and Jeanie Bourke, Inspection Services, City of Portland

estimated at 10%. The DOE study[9] indicates the average amount used per year, per household in the Northeast is 327 gallons. In Portland, this would represent approximately 971,648 gallons of propane for residential use. For commercial and industrial uses, a DOE study estimates that 62,000 Btus of propane are used per square foot. In Portland, assuming a 5% rate of propane use, the estimated use of propane is 972,221 gallons in the commercial sector and 447,098 gallons in the industrial sector.

Community Propane	**Residential 2005**	**Commercial 2005**	**Industrial 2005**	**TOTAL 2005**
Emissions (Tons eCO_2)	6,562	6,566	3,019	16,147
Energy Consumption (MMBtu)	90,659	90,713	41,716	223,080

The commercial and residential sectors each used almost twice as much propane as the industrial sector.

Community Transportation

Automotive Transportation

Overall, our automotive traffic emitted a total of 323,805 tons of CO2 in the year 2005 and was responsible for about 37% of all community emissions.

[9] LPG Consumption and Expenditures in U.S. Households by End Uses and Census Regions. This report can be found at http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuel_lpg.pdf

Automotive transportation data was provided by the Maine Department of Transportation[10]. Daily Vehicle Miles Traveled was multiplied by 330 days (instead of 365) due to expected decreased traffic on weekends and holidays to get annual vehicle miles traveled. The software's "Transportation Assistant" estimates emissions from annual vehicle miles. Use of propane as a fuel was added based on estimates by the only known user, Regional Transportation Program (RTP)[11]. The Metro was not using natural gas for their buses until 2006 so CNG is 0[12]. Air and rail traffic, were not considered in the inventories because the nature of their transportation is inter-city.

Community Automotive Transportation	**2000**	**2005**	**change**
Emissions (Tons eCO_2)	325,104	323,805	-0.4%
Energy Consumption (MMBtu)	3,771,636	3,773,443	0.0%

Emissions and energy use due to automotive transportation has actually decreased slightly since 2000[13] due to a decrease in vehicle miles traveled.

Marine Transportation

An additional component of this inventory examines the consumption of fuel at the Portland Waterfront including ferry service[14], private watercraft[15], ground fishing vessels[16], cruise ships[17] and dry good/cargo vessels. Portland's waterfront transportation generated 7,620 tons of CO2 in 2005, accounting for about 2.4% of the community's transportation emissions and less than 1% of total community emissions. The largest contributor to marine transportation emissions is diesel combustion from large cruise ship visits and the Casco Bay Lines.

[10] Ed Beckwith, MDOT
[11] Charles Baker, RTP
[12] Steve Linell, GPCOG
[13] Comparison was made to corrected 2000 data as it appears that CNG and LPG transportation was overestimated in 2000. Both the original and corrected 2000 records are available in the software.
[14] Casco Bay Lines
[15] Dimillos Marina and Portland Yacht Service
[16] Hank Soule, Portland Fish Exchange
[17] Ben Snow, City of Portland.

Exact consumption data was acquired from Casco Bay Lines. Other data was estimated using the resources noted. For cruise ships and cargo vessels accurate information was available regarding number of ship visits and time spent in port. However, information on average amounts of diesel burned while idling was difficult to locate. As better information becomes available, estimates should be adjusted. It is important to note that energy consumption by large oil tankers docked at the Merrill Marine Oil Terminal are not included in this inventory, as the terminal is physically located in South Portland.

Emissions and energy use due to marine transportation was slightly decreased since 2000. This may be partly due to the reduction in the commercial fishing fleet as well as the closure of the Scotia Prince Ferry Terminal. (Note: Comparison was made to corrected 2000 data as it appears commercial fishing data was overestimated in 2000. Both the original and corrected 2000 records are available in the software).

Community Marine Transportation	**2000**	**2005**	**change**
Emissions (Tons eCO_2)	8,448	7,620	-9.8%
Energy Consumption (MMBtu)	97,208	87,863	-9.6%

Community Waste

All community waste and recycling information was provided by the City of Portland[18]. This includes waste incinerated at Ecomaine facility as well as composted yard waste and leaves.

The City of Portland generated approximately 11,649 tons of Residential solid waste and 55,021 tons of Commercial/Industrial solid waste in 2005.

Most incinerated waste does not produce excess eCO_2. This is best explained by examining the fate of a piece of wood. Should that piece of wood naturally biodegrade in the woods, it will produce a certain amount of eCO_2. That same amount of eCO_2 will be released as it is incinerated. It would

[18] Troy Moon, Solid Waste Manager, City of Portland

be important to track waste as a contributor for greenhouse gas if that piece of wood was land filled. In an anaerobic environment (such as one found in a capped landfill), the wood would degrade into methane, a greenhouse gas with 22 times the potency of CO_2. However, with incineration, we must only account for greenhouse gas contribution from items (such as plastics) that would not break down naturally. Using this rationale, we can assess the incineration of solid waste from Portland created an excess contribution of about 14,794 tons of eCO_2.

In addition, 8,352 tons of plant debris were composted at the Riverside Recycling Facility. This not only reduces the waste stream, but it provides a marketable commodity for the City to landscapers and construction companies. There is also an environmental benefit associated with composting, which actually serves to have a negative emission for CO_2 – approximately 1,685 tons of CO_2 were *consumed* by compost heaps in 2005.

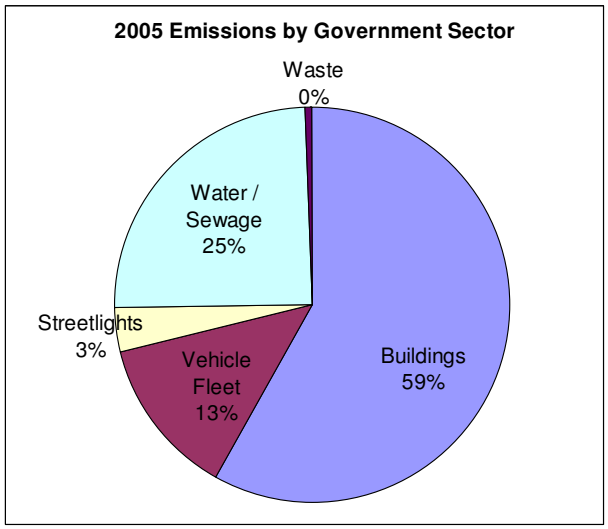
The recycling program, began in 1999, affects the waste stream (and cost) associated with incineration at Ecomaine. Although recycling cannot be held responsible for dramatically reducing greenhouse gas emissions (because emissions are low to begin with), it is an important program that continues to reduce costs and some amount of greenhouse gas emissions for the City.

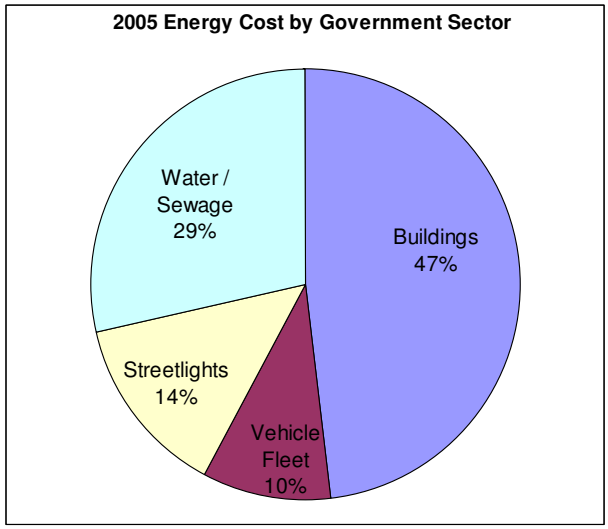
Community Waste	**2000**	**2005**	**change**
Emissions (Tons eCO_2)	10,000	13,109	31.1%

Emissions from waste have increased 31% since 2000 which reflects an increase in volume of waste incinerated. Waste from both the residential and commercial/industrial sectors have increased but commercial/industrial waste increased by 57% while residential waste increased by a more modest 14%. It is possible part of the increase in commercial waste may be due to inconsistent reporting methods by commercial drivers.

Government Inventory

Energy consumption for municipal operations was gathered by researching city utility/energy records and from the providers themselves. Electricity data was provided by Maine PowerOptions[19] since there were too many electric bills to coordinate. Since the city held an exclusive contract with Union Oil[20] for heating oil delivery, heating oil data was provided by the supplier (rather than the city). This is true for all city accounts, with the exception of heating oil on the islands and in the schools – this information was provided by the School Department[21] and Public Works[22]. Natural gas use was provided by the City Purchasing Office. Water and wastewater information was provided by Portland Water District[23] and represents consumption for only the City of Portland. Streetlight and traffic light data was also supplied by Maine PowerOptions. Municipal fleet information was provided by the Fleet Manager[24]. Lastly, the Solid Waste Manager provided municipal waste data[25].



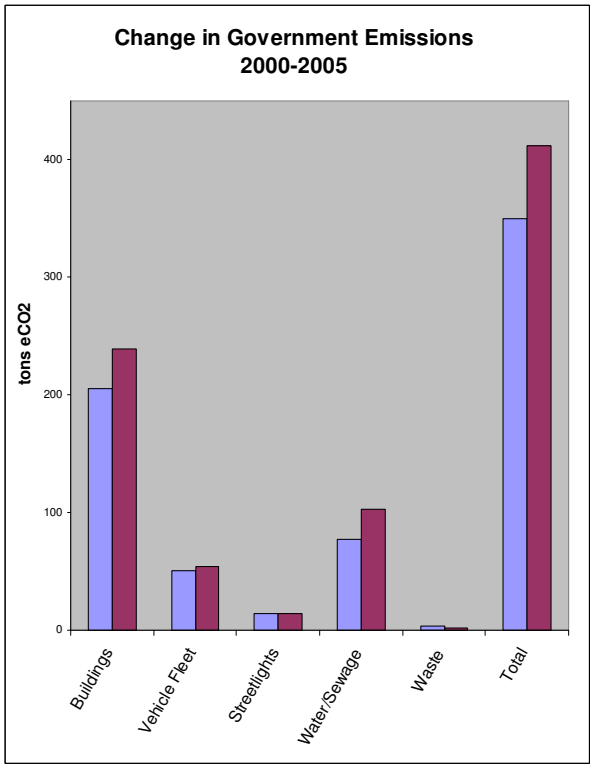


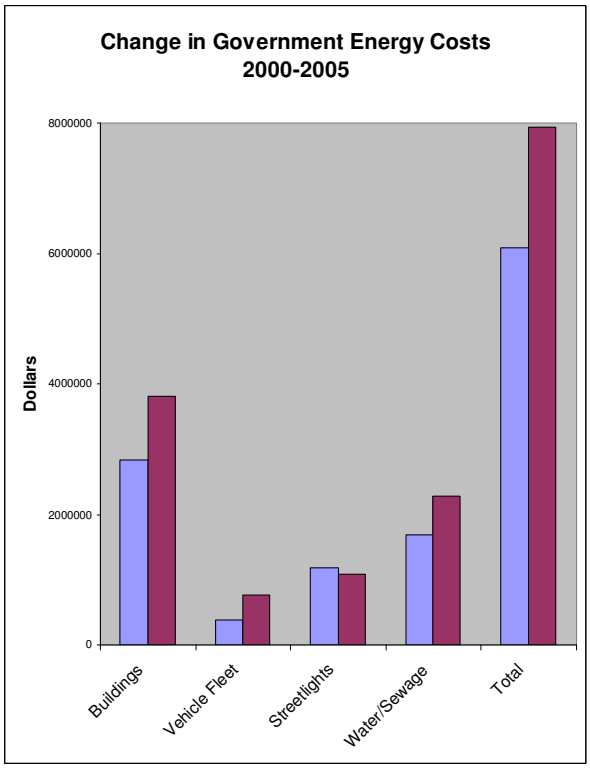
The majority of government emissions result from energy consumption in the City's buildings and facilities. Water and sewage systems and the vehicle fleet are also large contributors at 25% and 13%

[19] Mary Lou Gallup, Maine PowerOptions
[20] Bob Horne, Union Oil Company
[21] Doug Sherwood, Portland School Department
[22] Betsy Beety, Public Works
[23] Dick Clark, Portland Water District
[24] Kevin Austin, Fleet Manager
[25] Troy Moon, Solid Waste Manager, Public Works.

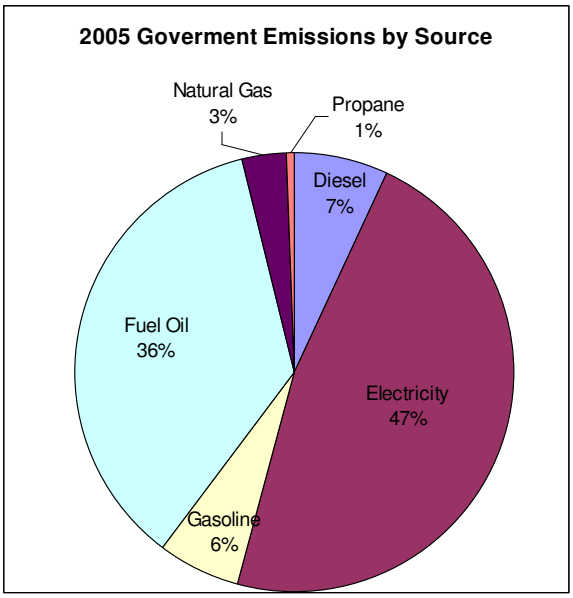
respectively. Streetlights and traffic signals account for a smaller portion and emissions from waste incineration are negligible.

The energy cost breakdown contains some noticeable differences. While the cost of energy in City buildings and facilities represents a smaller percentage, it still accounts for the largest portion of the City's energy cost. The biggest difference was in streetlights and traffic signals, which account for a much larger percentage of energy cost than emissions because of the low emissions/cost ration of electricity compared with other energy sources. The cost of waste removal and incineration is not represented.





The percentage breakdown of emissions by sector is similar the 2000 inventory but, overall, emissions have increased. Although, emissions due to streetlights and waste incineration have actually decreased, increases in the buildings and facilities, vehicle fleet, and water and sewage systems caused an overall rise of 18% since 2000. Energy costs have soared even faster and were 30% higher in 2005 than in 2000.



If we compare emissions by source rather than sector, we find than electricity use accounts for the most emissions, followed by fuel oil. Gasoline and diesel each account for 6-7%, while natural gas and propane are the smallest contributors.

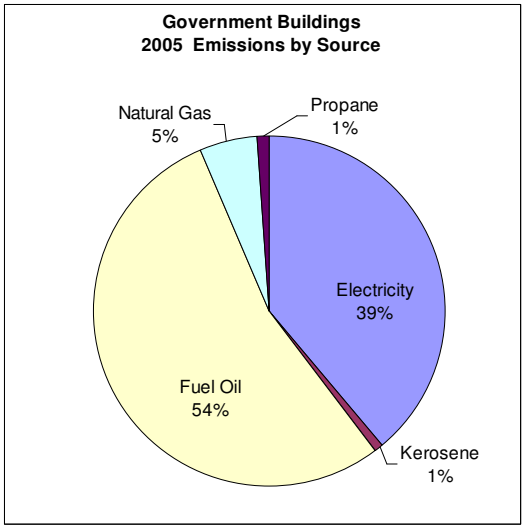
Each of these sectors and sources is explored further in the following sections.

Government Buildings and Facilities

Information was collected from the following city buildings and facilities:

- Barron Center
- Bell Street Project
- City Hall
- Health and Human Services
- Fire Department
- Parks and Recreation
- Police Department
- Public Assembly Facilities
- Other Public Buildings
- Public Schools
- Public Works buildings
- Portland International Jetport
- Transportation and Waterfront

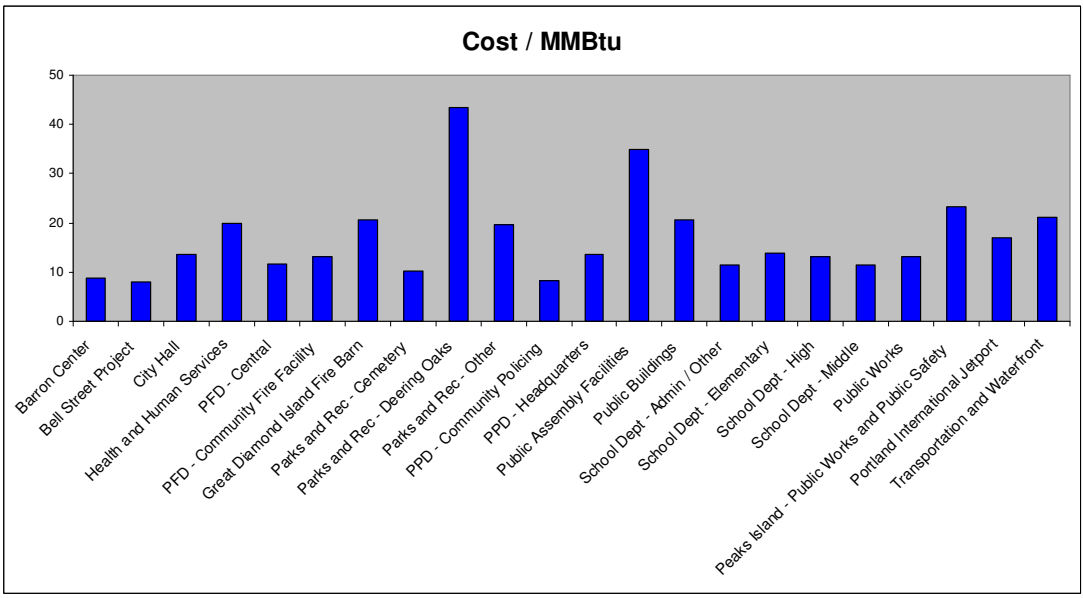
Buildings and facilities account for 59% of government CO_2 emissions and most of the city's energy use and cost. And each of these categories increased significantly between 2000 and 2005. Emissions and energy use each increased by 17% while cost increased by a larger factor of 34%.



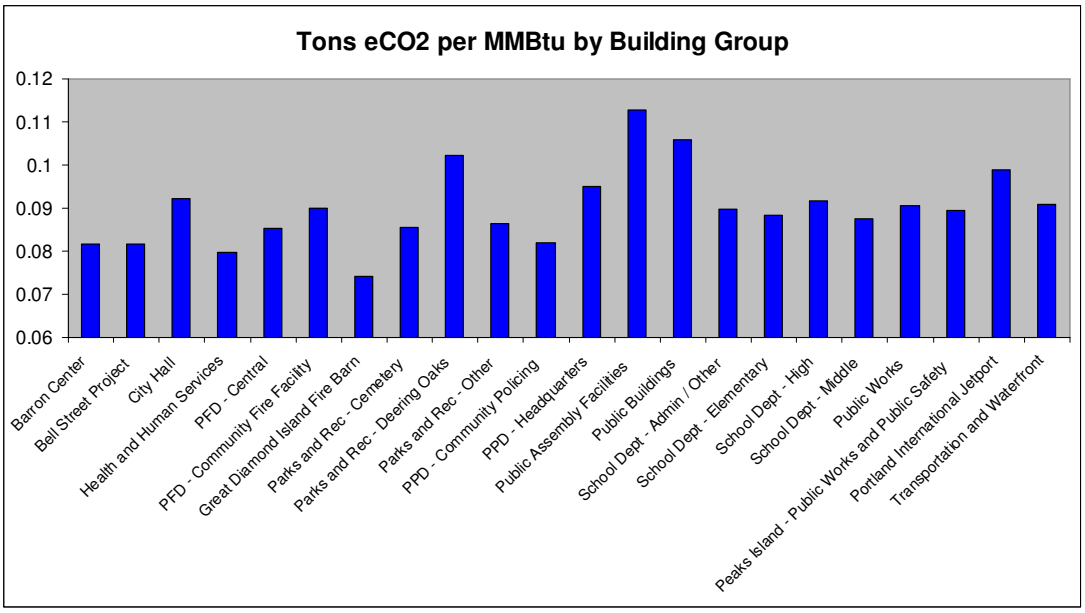
Overall, fuel oil use accounts for the majority of emissions in City buildings and facilities. Electricity was also a major contributor, accounting for 39%. Natural gas, propane, and kerosene were less significant.

Each building group has a varying mix of energy needs. Some facilities use heating oil for space heating, while others use natural gas or electricity. This creates some complication in analyzing and comparing energy consumption and greenhouse gas emissions between facilities.

If facilities are examined on a Per Million BTU scheme, some interesting trends can be elicited.



Facilities with a relatively high Cost per Million BTU may be using energy in an inefficient manner. The level of detail of this analysis cannot be brought to the level of individual buildings or floors, but one may assume that these facilities spend too much for their energy costs (relative to other municipal facilities). For example, the pricing scheme may be inappropriate, or the facility may be using an inappropriately selected energy source for its proper use.



One can also extract information regarding the amounts of greenhouse gases emitted for each unit of energy that is used (regardless of energy source). Higher values (such as those found at the Public Assembly Facilities and Public Buildings) suggest that the major sources of energy selected by the facility can be considered "dirty" fuels, rather than using cleaner fuels.

Ideally, one would expect nearly identical numbers for Cost per BTU. It is fiscally prudent to lower, as much as possible, all Cost Per BTU levels. It is also crucially important, in the City's campaign to protect the environment and quality of life in Portland, to lower the CO_2 per BTU level as well.

It is very important to take into account the specific energy needs for each facility in question. There is no magic formula for the mix of heating oil to electricity to natural gas to propane, etc.

Maintenance garages have different energy requirements than administrative offices. Closer scrutiny is necessary to identify further energy inefficiency for the City's buildings and facilities.

Government Vehicle Fleet

The City operates, maintains, and procures all of the municipal vehicles in the City. This includes school buses, staff vehicles, fire trucks, garbage haulers, heavy equipment, street sweepers, etc. It is important to note that Portland Water District vehicles were included in this inventory, even though they are not fueled or maintained by municipal operations. The rationale for this is that water and wastewater service is an inherent and obligatory municipal service even if not directly controlled by the City.

The City's fleet produced 5,381 tons of eCO_2 through combustion of unleaded or diesel fuels in 2005 with a total cost of $764,275. This represents 13% of all government emissions with approximately 53% of eCO_2 generated from the fleet was produced by gasoline-powered equipment. This represents a 7% increase in emissions and 96% increase in cost between 2000 and 2005.

Government Streetlights and Traffic Signals

City-operated streetlights and traffic signals account for approximately 1,432 tons of CO_2 emission in 2005. The City's lights consume 12,633 million BTU of electricity. Streetlights are generally of the mercury-vapor type, and account for approximately 3% of all municipal operations emissions of CO_2. In order to have operated these lights, the City paid approximately $1,080,645. This represents a slight decrease in emissions, energy and cost since the original inventory in 2000.

Government Water and Sewage

Controlled by the Portland Water District, the water and sewage services draw significant resources from the City of Portland. With an annual estimated cost of $2,278,537 in 2005, energy consumption for transport and processing produced 10,243 tons of eCO_2—25% of government emissions. By far, the majority of water and sewage costs and emissions result from electricity use. 2005 emissions were 33% greater than in 2000 and costs increased by 35%.

Municipal operations incinerated an estimated 1,600 tons of municipal waste for and composted 835 tons of leaves and yard waste. Together, this accounts for 187 tons of eCO_2, just 0.4% of total government emissions and 43% less than in 2000.