

Community Services and Operations Committee
Comité des services communautaires et des opérations

Agenda 1
Ordre du jour 1

Wednesday, December 8, 1999 - 9:15 a.m.
Le mercredi 8 décembre 1999 - 9 h 15

Victoria Hall, First Level
Bytown Pavilion, City Hall

Salle Victoria, niveau 1
Pavillon Bytown, hôtel de ville

Backgrounder

November 25, 1999

ACS1999-PW-ENV-0012

1. Third Annual Progress Report towards the City's 20% Greenhouse Gas Reduction Target

Troisième rapport d'étape annuel sur l'objectif de réduction de 20 % des émissions de gaz à effet de serre de la Ville

Issue

- In 1995, the City made a commitment to reduce corporate greenhouse gas (GHG) emissions by 20% or less from 1990 levels by 2005. To achieve this commitment a Corporate Action Plan was developed in 1995.
- the City's plan has been guided by the following principles:
 - promoting employee ownership and leadership
 - developing self-financing and least cost strategies
 - integrating the 20% reduction goal with operational, financial, safety, health and economic development issues

What's New

- this is the third report to Council, intended to inform Council of progress made since 1997
- since May 1999, programs have been re-evaluated and many new initiatives are planned for 2000
- areas of achievement covered in the report include:
 - comprehensive building retrofit strategy, which has substantially reduced building operating costs
 - street lighting conversion program, which has reduced energy and maintenance costs
 - “greening” the City's fleets, which has resulted in a 13% reduction in energy use and a 21.4% reduction in CO₂ emissions over the past few years
 - employee awareness program, a renewed priority as reflected by the resounding success of 1999 Commuter Challenge
 - corporate transportation demand management (TDM), a program to promote alternative commuter transportation choices and bring about sustained behavioural change both at and away from the office

Impact

- the City has achieved a 19% reduction in CO₂ emissions from 1990 levels and has attained an 18% reduction in energy use
- economic benefits include over \$1 million avoided in corporate operating costs
- social benefits include reduced atmospheric emissions that affect our climate, local air quality and health
- leadership- with the success of its corporate GHG emissions reduction program the City is poised to bring its experience and knowledge to achieve further emission reductions within the entire community

Contact: Mary Anne Strong - 244-5300 ext. 3819
Lucian Blair - 244-5300 ext. 4444



November 25, 1999

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Department of Urban Planning and Public
Works

Ward/Quartier
City Wide

- Community Services and Operations
Committee / Comité des services
communautaires et des opérations
 - City Council / Conseil municipal
- Information

1. Third Annual Progress Report towards the City's 20% Greenhouse Gas Reduction Target

Troisième rapport d'étape annuel sur l'objectif de réduction de 20 % des émissions de gaz à effet de serre de la Ville

Information

This is the third Progress Report of the *Corporate Plan for Greenhouse Gas Reduction* which was approved by Ottawa City Council in October, 1995 (ACS1995/0807-082). The objective of the City of Ottawa Corporate Action Plan for Greenhouse Gas Emissions Reduction is to reduce corporate CO₂ emissions by 20% or less from 1990 levels by 2005.

Since 1995, the City of Ottawa has been actively engaged in the process of reducing corporate greenhouse gas (GHG) emissions, mainly through increased energy efficiency. The corporate plan has been guided by a set of strategic principles which include:

1. Promoting employee ownership and leadership;
2. Developing self-financing and least cost strategies. Fortunately, unlike many other environmental problems, there is a great potential for investments to reduce greenhouse gas emissions to pay for themselves, and yield long term cost savings;
3. Integration: To achieve the goal of a 20% reduction in GHG emissions, it is important to integrate this goal with operational, financial, safety, health and economic development issues.

Report Objectives:

This report is intended to inform Council of current progress towards meeting the City's commitment to reducing corporate greenhouse gas emissions. The objectives identified in the Second Annual Progress Report, 1997 (ACS1998/0807-012) will be discussed and progress will be assessed.

This report seeks to accomplish the following key objectives:

1. To provide an overview of initiatives to reduce corporate greenhouse gas which have been undertaken since the *Second Annual Progress Report, October, 1997*.
2. Determine the level of corporate greenhouse gas emissions in 1998.
3. Evaluate the City's progress towards meeting its 20% reduction target.
4. Examine existing programs, analyse future options and present goals for the year 2000.

Background:

As of May, 1999, 64 Canadian municipalities, including the City of Ottawa - representing almost 60% of the national population - had joined the *Partners for Climate Protection* (PCP) program. Municipalities like the City of Ottawa which are engaged in climate protection strategies have done so to demonstrate leadership, and for the multiple community benefits including: economic benefits and improvements to local air quality and health.

Economic Benefits:

The economic benefits of measures to reduce GHG emissions can be significant. In Toronto, the Better Buildings Partnership (BBP), launched in 1996 to improve energy efficiency in Toronto buildings, has created 3,000 new jobs and reduced annual building operating costs by \$6 million. The program has created an estimated \$60 million dollars of investment in the local economy, demonstrating that doing the right thing for the environment can also be beneficial for the economy.

Improvements to Local Air Quality and Health:

Improvements to local air quality can be achieved by measures that reduce the combustion of fossil fuels which produces CO₂ and other harmful air pollutants that contribute to urban smog. Polls show that the Canadian public is very concerned about air quality and related health issues ("Electricity Competition and Clean Air" The Ontario Clean Air Alliance. April, 1998). Air pollution is a respiratory irritant that can cause breathing problems, aggravate asthma, reduce lung function, and increase the severity of respiratory infections. It is estimated that smog causes 1800 premature deaths and 1400 cardiac and respiratory hospital admissions in Ontario each year (An estimated 60 to 70 % of the maintenance savings are attributed to the new lighting fixtures. The rest is due to changes in maintenance procedures and other factors. This figure was calculated based on the assumption that 65% of maintenance savings are attributable to the change in light fixtures). Reducing fossil fuel combustion through energy efficiency and other measures in this corporate plan will contribute to improving the air quality for City residents.

Overview of Corporate Plan Activities:

Actions recommended in the 1995 Corporate Plan are generally divided into two categories: *Program Components*, which are associated with internal practices, and *Corporate Policies*, which are associated with actions within municipal jurisdiction. To date, the corporate strategy has focussed on programs rather than policy development. Program elements that were identified as priorities for 1998 are outlined in Table 1.

It is important to note that 1998 was a year of transition for the City of Ottawa's climate change program. Both staff members responsible for the development and implementation of the City's Corporate and Community Action Plans left the corporation by August, 1998. These positions remained vacant until May, 1999 when the climate change program was re-activated. This helps explain the gaps in program development that are apparent in Table 1. Since May, 1999 programs have been re-evaluated, progress is underway, and many new initiatives are planned for 2000.

**Table 1: Objectives of the Second Annual Progress Report (1997) of
A Corporate Plan for Greenhouse Gas Emission Reductions**

Component	Work Plan, 1998	1998/99 Progress	Corporate Involvement
Corporate Programs			
Comprehensive Building Retrofit Strategy	1. Request for proposals to Energy Service Companies (ESCOs) to survey the City's building stock and create a feasible, multi-year energy efficiency strategy. 2. Investigate the need for a Corporate <u>energy use</u> reduction target (in addition to CO ₂ target).	1. a) Qualified ESCOs shortlisted. 1. b) Third party audit of City's building stock completed through <i>ICLEI Energy Services</i> . 2. Energy reduction target deferred.	Lead Role: Asset Management Branch, UPPW Additional Role: Environmental Management Branch, UPPW
Fleet Energy Reduction Strategy	Continuation of 1997 activities: 1. Encourage all operators to use ethanol blended fuels 2. Work with Superior Propane and Consumer's Gas (now Enbridge) to assess feasibility of converting to Alternative Fuels.	1. 1998, Alternative Fuels Report completed. Use of ethanol blended fuel increased. Gasoline fuel pump replaced with ethanol pump at City facilities (Swansea). 2. Fuel switching opportunities limited due to current technology, cost.	Asset Management, UPPW
Employee Involvement Programs	1. Target: Implement Computer based employee awareness program - Developed a "beta" version of computer based employee awareness.	Program suspended due to vacant staff positions in EMB.	EMB, UPPW
Employer Led Transportation Demand Management	1. Survey employees regarding commuting behaviour. 2. Negotiate with OC Transpo to obtain favourable annual transit pass rates for City employees- or allow payroll deduction. 3. Try to negotiate employee incentives such as days off to help increase participation in SMART S.M.A.R.T. (Save money and Rethink Tomorrow) program launched commuter activities.	Programs suspended due to vacant staff positions in EMB	EMB, UPPW
Monitoring, Evaluation and Coordination	1. Obtain necessary data on an on-going basis to evaluate progress Prepare annual report to council. 2. On-going monitoring of fleets, buildings and streetlights. Add waste and transportation data Add water and waste diversion to data base.	City of Ottawa wins the 1998 Voluntary Challenge Registry (VCR) Award for Municipal leadership in Climate Change 1. 1998 Annual report to council deferred due to vacant staff positions at EMB.	EMB, UPPW
Policies			
Land Development Assessment Process	1. Assess implications of GHG emissions in land use, zoning, development, permits and parking policies . 1998 GIS study: Urban Sustainability	1. Phase 1 of GIS project to develop an Urban Sustainability Planning Tool completed.	EMB, UPPW, (NRCan)
Contractor Procurement	Count the Greenhouse gas implications of contractors hired by City. Not prioritized in 1997	1998- No action	EMB

Component	Work Plan, 1998	1998/99 Progress	Corporate Involvement
Assessment		1999- Deemed unfeasible, too expensive to collect data on an on-going basis. Operationally difficult to quantify contractor emissions.	

Table 1 provides an overview of objectives outlined in the previous progress report. As noted, the absence of program staff within the Environmental Management Branch led to the suspension of many programs. The next section will describe the status of program elements listed in Table 1 and present program directions for 2000 that will continue to move the City towards its GHG reduction target. These programs will demonstrate the City of Ottawa's continuing leadership role in municipal climate change action which is essential as we continue to work with private sector partners and City residents.

Spotlight on Success Feature

Spotlight on Success was a new feature in the 1997 Progress Report and will be continued in this progress report. These sections present "best practices" that have contributed to reducing corporate energy costs and reducing GHG emissions.

Examination of Programs, Future Options

1. Comprehensive Building Retrofit Strategy

a) Building Retrofit Program Description

Since 1980, the City of Ottawa has invested approximately \$3.8 million in energy efficiency improvements throughout its facilities as part of the *Energy Conservation Program*. The extent of efficiency work in City buildings has varied from year to year, depending on the availability of capital and personnel. The benefits of the City's efficiency work include:

- 17% reduction in energy use in City buildings since 1990.
- CO₂ emission reductions of 29% in City buildings since 1990;
- an average recovery period of less than five years for the cost of implementing the energy efficiency measures;
- improvements in indoor air quality through heating, ventilation and air conditioning (HVAC) upgrades;
- improvements in Ottawa's local air quality.

In November 1994, City Council endorsed the goal of further increasing the efficiency of the City's building stock by implementing a comprehensive energy efficiency retrofit strategy (ACS 1994.0807-104). At the time of the previous Progress Report (1997), the City was embarking on an exploration of the role of Energy Service Companies (ESCOs) to help facilitate this work.

Progress in 1998/99

The Asset Management Branch of the Department of Urban Planning and Public Works continued to work hard on this project in 1998/99. To fully explore the relationship between the City and ESCOs, they completed a report entitled: *Alternative Service Delivery (ASD) Business Case Analysis: Energy Retrofit* (ASC 1998-PW-ASM-0001) in 1998. This report presents a detailed analysis of:

- the comparison of the ESCO service package versus traditional contracting;
- an identification of all stakeholders in the ESCO process, and their specific roles;
- City Council policies related to the retrofit program;
- retrofit financing options - both traditional and with ESCO involvement;
- retrofit costing in comparison to base line utility consumption;
- simple and aggregate payback periods for implementing efficiency measures.

In developing the retrofit strategy, it was essential to know the extent of the energy saving opportunities still remaining in City facilities. To achieve this objective, a comprehensive audit of major City buildings was initiated in 1998. This audit was undertaken by *ICLEI Energy Services*, targeting 49 of the City's more than 200 facilities as possible candidates for retrofits. These 49 buildings represent more than 75% of the energy consumption in City facilities.

Understanding relationships with Energy Service Companies (ESCOs) and undertaking an audit of City facilities are both substantial projects. They are also essential in the development of a *Comprehensive Building Retrofit Strategy* for the City of Ottawa. Since the 1997 Progress Report, the City has dedicated its staff time and resources towards these initiatives, rather than conducting efficiency work in City buildings.

Results / Impact of this Measure:

Building operating costs have been reduced substantially due to the implementation of building energy efficiency measures at the City of Ottawa.

Year 2000 Direction of Building Retrofit Program:

- *Implementation of City building retrofits:* With the substantial investment of time and money in the development of a comprehensive building retrofit strategy, the City is poised to obtain long-term energy savings, lower operating costs, and additional CO₂ emissions reductions when this program is implemented. Energy efficiency retrofits must occur within the next few years in City buildings if the 20% commitment is to be reached. Implementing Phase II of the *ASD Energy Retrofit Project* in the year 2000 is one way to ensure that retrofits take place. Another option is to commit capital funding from within the year 2000 City budget.
- *Capitalize on the lessons learned through the development of the City's comprehensive*

building retrofit strategy in the design of a community-wide program. The hard lessons learned in understanding ESCOs and in designing a comprehensive City retrofit program has created a high level of expertise within the City. This unique and valuable knowledge should be used to assist in the upcoming design of a community-wide ICI retrofit program.

- *Investigate advanced efficiency design opportunities for new Corporate facilities being planned.* With the acquisition of Ottawa Hydro assets and possible Regional amalgamation within the next year or two, new municipal facilities are likely to arise. The role of advanced efficiency design such as C-2000, and the incorporation of supporting programs such as the Canadian Building Incentive Program should be explored in relation to these new buildings.

b) “Energy Use Reduction Target” Project Description

The City of Ottawa’s commitment to reduce corporate CO₂ emissions by 20% by the year 2005 (from 1990 levels) was established for several reasons. CO₂ is the most prevalent of the greenhouse gases which contribute to global climate change. It is also the easiest to measure, and is therefore used as an industry standard when tracking climate change. However, it is clear that the City’s ability to meet its stated commitment of a 20% reduction in CO₂ emissions is largely dependent on factors beyond its control.

As predicted in the 1997 Progress Report, Ontario Hydro (now Ontario Power Generation) has started to take some of its nuclear reactors off-line. To compensate, Hydro has had to increase the amount of power generated through the use of fossil fuels - fuels which produce a high volume of CO₂. This change in fuel mix may have implications with respect to the City’s CO₂ target.

For example, in 1996 an 8% reduction in the City’s overall energy use translated into a 29% reduction in CO₂ emissions. While the City’s electrical use remained relatively stable between 1996 and 1998, CO₂ emissions from electricity increased from 7,954 tonnes in 1996, to 12,967 tonnes in 1998, an increase of over 38%. This change was due to the higher percentage of fossil fuels used to generate the City’s electricity. Clearly, measures taken by the City to reduce energy consumption do not necessarily translate to a corresponding reduction in CO₂ emissions.

While the City can affect energy efficiency in its facilities and fleets, it has little to no control over the fuel mix used for electrical power generation. If CO₂ emissions are the only baseline by which to judge the City’s success, then, depending on Hydro’s emerging fuel mix, extremely “deep” efficiency programs and retrofits may be required which simply do not make financial sense for the City.

To address this issue, the previous Progress Report suggested an energy use reduction target be explored. Unlike the fluctuating CO₂ emissions brought on by the changing fuel mix for

electrical power generation, energy consumption is something over which the City has direct control. A target could be set according to the projected CO₂ emissions of a known provincial fuel mix (say, 1990 or 1999). This would allow the energy use target to serve as a reasonable point of program “cut-off”: the goal would be to meet the energy use reduction target, with the fuel mix of a given year, regardless of future fuel mixes and the related fluctuation in CO₂ levels.

An energy reduction target has the additional benefit of providing employees with a more tangible and understandable goal. Climate change, greenhouse gas reduction and carbon dioxide emissions are not terms readily understood by those not involved with the issue. This lack of understanding could act as a barrier to program uptake. Energy efficiency is a familiar concept to most people and thus, may be easier to promote than greenhouse gas emission reductions.

Progress in 1998/99

The barrier to progress on this issue in 1998 was the absence of Climate Change staff, as mentioned earlier in the Progress Report.

Impact of this Measure

To be determined.

Year 2000 Direction of Energy Efficiency Target

- *Investigate a Corporate energy use reduction target (in addition to a CO₂ emissions target).* There are multiple reasons to make an energy use reduction target a priority issue in 2000.

First is the precedent being set through the *Partners for Climate Protection* (PCP) program, formerly known as “the 20% Club”, through which the City made its commitment to a 20% reduction in CO₂ emissions. Recently, the focus of the PCP has been on reducing the emission of *all* greenhouse gases rather than focusing exclusively on CO₂. This may have different implications when related to the provincial electricity generation fuel mix, and the evolution in PCP focus should be explored as it relates to a City of Ottawa energy use reduction target.

The second reason to make an energy use reduction target a priority item is the de-regulation of the utility industries. As utility monopolies, Enbridge Consumers Gas and Ottawa Hydro are subject to regulatory control of fuel source, transmission, distribution, sales and service. On October 1st, 1999 the Canadian gas industry will “unbundle” in response to Bill 35, the *Energy Competition Act*. Only gas transmission through the pipeline will remain with the regulated company. Competitive companies will assume the functions of fuel purchasing, pricing, and the sale of gas to consumers. Ontario’s 275 local electric utilities and Ontario

Hydro are scheduled to “unbundle” in another year.

The result is that consumers will be able to purchase their energy from a wide range of competing distributors who will, in turn, be supplying power from the electric generating stations or gas producers of their choice. For example: the City now purchases electricity from Ottawa Hydro, which gets roughly 85% of its power from Ontario Hydro’s generating stations. In a deregulated market, the City can purchase its electricity from whichever broker it chooses. This broker may be selling electricity produced from generating stations in places such as Ohio, Quebec or Mexico.

In October 1999, the natural gas utilities will “unbundle”, with a portion of the industry remaining a regulated monopoly, and the creation of spinoff companies which will compete with other energy brokers.

With the potential for tremendous fluctuation in possible fuel types and their CO₂ content, it becomes even more pressing to set a fixed energy reduction target as a limiting factor by which to measure the City’s progress. If this scenario occurs, it will be important to *Integrate the City’s environmental priorities with fuel purchase decisions* to ensure that air quality issues and climate change are considered during the procurement process.

2. **Street lighting Conversion Program Description:**

In 1990, the City of Ottawa commenced a retrofit program to reduce the energy used by its street lighting system. Old, inefficient incandescent and mercury vapour lighting was replaced with high pressure sodium units. The retrofit program took four years to complete and cost approximately \$4 million. Benefits were immediately apparent, and the installed electrical load dropped by more than 30%.

Progress in 1998/99

Since 1990, the number of street lights in the City of Ottawa has greatly increased, from approximately 18,000 in 1990 to 23,907 in 1999- a 25% increase in lighting fixtures. Despite this increase, costs have remained relatively stable and energy use is still below 1990 levels. If retrofits had not taken place, the increased lighting load would have used approximately 30 percent more electricity than the current system, and created almost 2000 additional tonnes of CO₂ each year.

Reducing energy costs is not the only advantage of new street lighting units. High pressure sodium fixtures have a rated lifetime that is 24 times greater than the incandescent bulbs they replaced. Significant maintenance savings have accrued over the years as a result. For example, maintenance costs for 1998 were \$1,084,124, 27% less than peak maintenance costs of \$1,497,409. These substantial savings were achieved in spite of the fact that there were almost 6,000 more fixtures in 1998.

Impacts of this Measure

Estimated Avoided Costs since 1990:
 Maintenance: \$ 268,635 per year.
 Energy: \$ 360,000 per year.
 Estimated CO₂ Savings per year: 2000 Tonnes

Year 2000 Direction of Street lighting Measure

Street lighting is considered a mature market where high retrofit penetration levels have already occurred. The National Climate Change process' Municipalities Table evaluated the opportunities for further savings and has concluded that additional gains in this sector are not available at this time. Over the longer term, as new technologies are introduced, opportunities in this sector will be re-examined. However, cost and energy savings of existing measures will continue to accrue.

3. Greening the City's Fleets

Fleet Emissions Reduction Program Description

Vehicles account for 27% of Canada's total greenhouses gas emissions, second only to GHG emissions from residential, institutional and industrial buildings. Motorized vehicles, particularly if they are used in applications that have large amounts of idling, stopping and starting, can also create a wide variety of unhealthy local air pollutants in addition to CO₂.

Since 1990, many efforts have been made to reduce the City of Ottawa's fleet emissions. Reductions in vehicle -kilometres travelled, vehicle downsizing, the use of more efficient vehicles and driver education have all been considered as elements of the City's fleet emissions reduction strategy. City policies such as the use of sub compact vehicles and the use of "PCOs" Parking Control Officers on bicycles have all been noticed by other municipalities striving to reduce their own corporate emissions and fleet energy use.

Progress in 1998/99

The City's fleets have achieved significant energy and CO₂ reductions over the past few years. Energy used by City fleet is 13% below 1990 levels and CO₂ emissions are 21.4% lower. The City continues to test vehicles for compatibility and feasibility of conversion to alternative fuels such as propane and natural gas. Ethanol blended fuel, though not considered an alternative fuel, is also used due to its reputation as a cleaner, less CO₂ intensive fuel source compared to gasoline. In 1996, the then Department of Engineering and Works proposed the following targets with respect to alternative fuels and ethanol blended gasoline:

1. Make ethanol blended gasoline available to City fleets. The use of ethanol fuel was recommended due to reputed environmental benefits, and because its use requires no vehicle modification.
2. Of those cars, vans and light trucks that are cost-effective and operationally feasible to convert, the department will strive to achieve the following target for use of alternatively fuelled vehicles:

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- 50% commencing 1997
- 60% commencing 1998
- 75% commencing 1999 and every year thereafter.

Alternatively fuelled vehicles

At the end of 1998, there were 26 alternatively fuelled vehicles at the City representing 4.5% of the total fleet of 578 vehicles. It has been more difficult to implement the target of switching to alternatively fuelled vehicles than anticipated due to several factors including: the limitations of current technology, high costs and the absence of leasing options. The Asset Management Branch is currently negotiating with Toyota Canada to test their new hybrid vehicle, the Toyota Prius.

Spotlight on Success: Increase in Ethanol Blended Fuel Use

The City has achieved its goal of providing ethanol blended fuel to City Fleets. There is now an ethanol blended fuel pump located at Swansea which replaced the gasoline pump at this site. From March 1996, to December, 1998 ethanol blended gasoline accounted for approximately 10.8% of fleet fuel consumption and is estimated to have reduced the City's potential CO₂ emissions by 87 tonnes.

Year 2000 Direction for Fleet Emission Reduction Program

Asset Management continues to pursue the goal of increased use of alternative fuels where cost effective and operationally feasible. The department will continue to tender for appropriate vehicles, soliciting both gasoline and alternative fuel bids and the economic feasibility of each option will be assessed at that time. At this time, the City does not pay a premium for alternatively fuelled vehicles, this can act as a major barrier to their use. The Environmental Management Branch, through their knowledge of the federal climate change process will assist Asset Management in identifying potential external support for the purchase or lease of alternatively fuelled vehicles.

Environmental Management Branch staff will also work with Asset Management to investigate new programs that are available to reduce the fuel and energy consumption of City of Ottawa fleets. Research will explore both technological and behavioural opportunities for reducing the City's fleet's gas consumption further. Based on this research, recommendations will be offered for improved climate protection and cost reduction strategies, and external program support will be identified.

4. **Employee Awareness Programs**

Program Description

Employee awareness and participation in greenhouse gas emission reduction activities are key elements of any corporate climate change strategy. Informing employees of the links between specific individual behaviours that contribute to climate change and local environmental concerns can help build support for programs required to change habits. Demonstrated leadership in establishing effective employee programs can garner credibility within the community as outreach programs are developed to reduce the community's energy use and greenhouse gas emissions. Lessons learned during internal outreach campaigns can be evaluated to enhance community outreach efforts.

Progress in 1998/1999

As evident in Table 1, employee awareness programs suffered due to unfilled EMB positions in 1998. However, in May 1999 with the addition of a new climate change team, employee education became a renewed priority. In fact, 1999's corporate Commuter Challenge was a resounding success and results are the focus of the next *Spotlight on Success*.

Spotlight on Success: Commuter Challenge, May 31- June 4, 1999

Throughout this year's National Environment Week, the City of Ottawa participated in the Commuter Challenge, a week long event where commuters across the region were asked to adopt "greener" modes of transport, such as walking, riding their bikes or taking the bus. All City employees who chose to be a "green commuter" any day throughout the week of May 31 - June 4, 1999 had their name entered in draws for over 20 donated prizes including a cell phone and gift certificates for local restaurants. The City demonstrated their corporate support by providing two prizes of one day off to lucky participants. By the end of the week, 183 City employees had registered with the Challenge, keeping an estimated 4,969 kg of polluting emissions such as CO₂ from entering the atmosphere.

City staff were actively involved in ensuring the success of the entire community's Commuter Challenge. Mayor Jim Watson issued a direct challenge to the City of Calgary, last year's winners, to see which city would have the greatest number of participants. By the end of the week, Ottawa had defeated Calgary 6,247 participants to 4,966, to become the 1999 Canadian Commuter Challenge Champions.

Year 2000 Direction for Employee Awareness Program

Programs like the Commuter Challenge are important components of outreach strategies designed to support climate change and other corporate goals. Planning is underway to implement elements of the Commuter Challenge year round through a corporate Transportation Demand Management (TDM) program. A survey was circulated amongst City of Ottawa participants to get feedback on the 1999 Commuter Challenge. Of the 46% of participants who responded to the survey, 97% said they would welcome other corporate environmental programs in the future to aid in our 20% CO₂ reduction target. Comments

and suggestions received about the design and implementation of future programs include:

- “I think the City needs to lead by example on this issue. That is, implementing the policies of the Official Plan and related programmes on a daily basis.”
- “Good initiative by the City to promote environmental awareness to City employees. I've enjoyed participating in this project and continue using my bike to come to work.”

In response to the survey results, work is underway to bring other corporate environmental programs to the City of Ottawa. Programs will focus on climate change mitigation strategies such as energy efficiency and waste reduction. Plans for the year 2000 are outlined next.

Goals for 2000

1. Year-long employee program

Employer based social marketing of CO₂ reduction measures is an inexpensive and highly effective method of promoting behavioural changes in employees. It is anticipated that changes in employee behaviour can be sustained at work and at home, reducing CO₂ emissions and saving money for both the employee and corporation. To achieve this goal, the City's Climate Change Team will be implementing a year-long workplace climate protection campaign to reach employees. Throughout the calendar year, employees will be given the chance to participate in the three theme weeks described below.

- Waste Reduction Week: November 1-5, 1999 is Ontario's Waste Reduction Week. Activities planned at the City include a clothing drive, waste free day, art exhibit featuring recycled materials. The focus will be to link waste reduction with climate change and to foster long-term employee waste reduction and increased diversion rates.
- Energy Efficiency Event (Winter): This event will feature activities and information on how to reduce energy consumption and achieve CO₂ and cost savings. Natural Resources Canada's "Energuide for Houses" will be a feature element. Activities will include displays, home energy tips and prize draws.
- Commuter Challenge: In June, 2000 the Commuter Challenge will return to the City with a week of TDM activities, daily transportation facts and prize draws.

These three climate protection theme weeks will be the key components to the year long corporate program at the City which is designed to promote employee environmental action and CO₂ emission reductions. There will also be on-going information to remind employees to check their habits throughout the year, and keep them informed of the City's climate change actions and results.

2. New Employee Package

Currently at the City, no welcome package is offered to new employees to explain such services as recycling, bus and bike routes to work and corporate environmental goals. The Environmental Management Branch will compile this information and package it for the

benefit of new employees. Waste reduction, energy efficiency and transportation issues will be outlined in an easy to read package which will be distributed to all employees initially, and then to each new employee as they are hired. Information will include:

- Energy Efficiency: Employees will be encouraged to turn off lights and computers at night, use the screen savers on their computers, and walk up stairs rather than use the elevator.
- TDM: Employees will be offered information on bus and bike routes and corporate policies such as taxis use for external meetings and tele-commuting.
- Waste Reduction: Employees will be given a listing of all recyclables for their office blue box, composting information and other helpful hints.

It is anticipated that this package will help inform and involve City employees in the City's environmental protection goals and programs, and demonstrate the City of Ottawa's commitment to the reduction of GHG emissions associated with climate change.

3. Green Rep Program

The three climate protection theme weeks will need City employee volunteers to aid in the information distribution and set up. Currently at the RMOC, a network of volunteers is used to enhance employee environmental outreach activities. "Green Rep" volunteers are recruited and trained in environmental issues and are used as contact points for each floor or department. An investigation will be made between the Region's organized network of volunteers and the City's general open call for help for each climate change campaign to determine which approach yields the greatest participation numbers from its employees. Based on two campaigns (Energy Efficiency Week and Commuter Challenge) held concurrently at the RMOC and at City Hall, recommendations will be made to determine the best method for enhancing participation in corporate environmental programs at the City.

5. Corporate Transportation Demand Management (TDM)

Program Description

Transportation Demand Management (TDM) is a program consisting of a group of measures to reduce the rate of growth of traffic and air pollution. Employer led TDM programs can be an effective means to promote behavioural changes at work and at home. TDM measures are created to promote activities such as active transportation (walking, cycling), car-pooling and public transit by employees.

With TDM measures in place and promoted by the employer, both the employer and the community stand to benefit. The employer may spend less money on parking infrastructure as there would be fewer cars to accommodate. Also, the workforce may be healthier and less stressed without having to experience rush-hour traffic every morning. Finally with less traffic on the streets at peak hours, TDM measures can reduce congestion, as there would be less single occupancy vehicles (SOV) on the road. Fewer SOVs on the road at peak times could reduce the need for infrastructure repairs and expansions, save tax dollars, reduce GHG emissions and improve local air quality.

Progress in 1998/99

The success of the 1999 Commuter Challenge demonstrates that it is possible to improve commuter habits in the short-term. It is now necessary to move forward and establish a long-term TDM program for the Corporation of the City of Ottawa.

Year 2000 Direction: Development of Corporate TDM Program

The City of Ottawa will lead by example in 2000 as it creates a TDM program for its employees. The corporation has many components of a TDM program already in place such as lockers and showers, expensive hourly parking and bike racks for 20% of full time employees. Research will determine the best possible components of a corporate TDM program to bring to the City. Programs like ride-share software, van-pooling and pay-roll deduction transit passes will all be considered as potential program elements. Other local corporations, such as Nortel, have been successful in offering their employees a TDM package that is feasible, cost-effective and reduces fossil fuel emissions and their experience will be solicited to enhance the City's program.

With amalgamation of existing TDM measures and the addition of new ones, the City of Ottawa will develop a comprehensive TDM program for its employees that will reduce CO₂ emissions, improve local air quality and ultimately lead to a sustained behavioural change both at and away from the office.

6. Monitoring and Reporting

Program Description:

Monitoring is a key component of the corporate strategy. The verification and tracking of energy savings can allow for the continual adjustment of priorities to ensure that the 20% reduction target will be achieved. It can also be used to quantify emissions and cost savings of specific programs to illustrate their success. The Environmental Management Branch (EMB) has been delegated the task of co-ordinating Action Plan activities and information dissemination. Climate change staff in the Environmental Management Branch are delegated the task of monitoring and analysing data to assess progress and re-examine priorities for achieving the City's CO₂ reduction goals. An annual progress report is to be delivered to council, the Partners for Climate Protection Program and to the Voluntary Challenge Registry (VCR).

Progress in 1998/99

Monitoring objectives identified in the 1997 progress report were to begin tracking corporate waste, water consumption, and employee commuter habits. These additions have yet to be incorporated into the corporate plan for several reasons. For example, analysis done for the comprehensive retrofit strategy noted that there was little opportunity for cost-effective reductions in water consumption. Since it was concluded that no water efficiency programs were feasible at this time, water usage will not be monitored. Waste is still not included in the inventory because the City does not collect information on corporate waste to landfill.

Spotlight on Success: VCR Leadership Award 1998

On February 11, 1999 Councillor Elisabeth Arnold accepted the Voluntary Challenge and Registry's (VCR) 1998 Leadership Award for Municipalities on behalf of the City of Ottawa, for the City's role in the reduction of local GHG emissions. The Award was presented in recognition of the City's Corporate Climate Change Program and for "the extraordinary leadership towards the voluntary reduction in greenhouse gas emissions". The VCR is a national program to encourage corporations to take voluntary action to reduce emissions.

The City of Ottawa, as a municipal government, was recognized for its instrumental role in meeting Canada's climate change objectives. Much like federal, provincial and territorial governments, GHG emissions generated by municipal governments are derived, in large part, from buildings and fleet vehicles. To date, VCR Inc. has enlisted 53 municipalities, 41 of which have registered action plans. In 1998, only the City of Ottawa had assumed a leadership role and followed up with a progress report by submitting its Corporate Plan for Green House Gas Emission Reductions to the VCR Inc.

Year 2000 Direction for Corporate Monitoring:

The EMB will work with waste management staff to determine whether it is feasible to collect waste and recycling information. As new programs are developed, efforts will be made to quantify results so that progress can be measured over time. For example, prior to implementing a corporate TDM program, a survey will be sent to staff to determine existing commuting habits and results will be included in the monitoring inventory.

It can become extremely time-consuming for climate change staff to seek information on an on-going basis from all departments engaged in energy reduction activities. In 2000, the EMB will work with all departments involved in implementing the Corporate Action Plan to improve annual reporting and information sharing. Monitoring staff will be able to quantify the emissions savings associated with specific programs as information is provided. Enhanced information sharing can result in more detailed analysis of the greenhouse gas emission reductions of specific measures planned or implemented.

7. Long-term Programs and Policies

1. Community Energy Management

Program Description:

The level of energy use and greenhouse gas emissions in a community are not only a function of technology and human behaviour, they are also determined by the structure of urban form. Urban land use patterns and infrastructure are major factors influencing greenhouse gas emissions levels within a community. Canadian urban land use patterns are associated with a high level of urban sprawl and automobile dependence. Reduced air quality, increased energy use and the consumption of large amounts of land for roads and parking are a few consequences of these trends.

Progress in 1998/99:

Community energy management considers the impact of plans and policies on energy demand

and can help minimize future energy requirements and associated emissions. The EMB is working with Natural Resources Canada (NRCan), the Region and a contractor to develop better modeling techniques that will allow communities to advance new land use and transportation management policies aimed at reducing energy consumption and greenhouse gas emissions. This Geographic Information System (GIS) based model will help planners quantify emissions by source, activity, and geographic location. It will be able to identify key demographic, land use and transportation factors influencing emissions levels and model the effects of various policy instruments designed to lower emissions. Results can be mapped to illustrate spatial variation within a community and to identify target areas for programs. Information can also be communicated and displayed effectively to the general public and decision-makers.

A prototype model (Phase 1) was completed in 1998 which allows for the visual display, analysis and manipulation of demographic data, land use and transportation patterns and building energy consumption characteristics.

Year 2000 Direction of Community Energy Management:

Phase 2 of this project will involve testing the model produced in 1998 to adapt it to the needs of the consumer. The Environmental Management Branch, Natural Resources Canada, City planners, and planning and engineering staff at the RMOC will assist with the development of this tool which will be used to enhance understanding of energy use within the National Capital Region.

2. Urban Forestry

Offsetting CO₂ emissions through enhancements to forests is a measure being considered in the National Climate Change Strategy. Before humans began to clear forests, vegetation stored about 900 billion tonnes of carbon, 90% of this sequestration occurring in forests. Today, only 560 billion tonnes of CO₂ are sequestered in forests, and this number is diminishing. There is considerable interest in off-setting some CO₂ emissions through the use of forests as carbon reservoirs or sinks (Freedman, Bill and Todd Keith "Planting Trees for Carbon Credits: A Discussion of the Issues, Feasibility, and Environmental Benefits." Prepared for the Tree Canada Foundation. Department of Biology and School for Resource and Environmental Studies, Dalhousie University, Halifax, N.S., August 1, 1999) A system of carbon credits for forest enhancement, including expansions to urban forests is being explored at the national level. The City needs to explore this issue further to examine the potential for federal support for urban greening programs and future carbon credits.

Urban trees offer numerous social and environmental benefits in addition to their ability to sequester carbon. Many municipalities have developed tree planting programs which can become important components of community GHG management strategies. This is especially true if the municipality has the capacity to monitor and forecast GHG sequestration from tree planting. The City has recently completed a comprehensive study of its natural and open spaces (NOSS), which may serve as a useful base inventory of the urban forest for monitoring and credit purposes.

Year 2000 Direction for Urban Forest

The EMB will explore opportunities to harness federal support for an urban greening strategy that will enhance the City's urban forest and help the City meet its climate change and other social and environmental goals. Environmental Management staff will work with Operation Branch staff to integrate climate change information with urban forest and other green space outreach material produced by the City. Methods of measuring the carbon sequestration potential of existing trees and tree planting measures will be explored.

8. Impact of the Corporate Plan to Reduce Greenhouse Gas Emissions

1. Tracking our Energy use and Greenhouse Gas Emissions

Energy use and greenhouse gas emissions from City facilities, fleets and street lighting are detailed in Figure 1 and Table 2. Table 2 shows two different totals. The first, *absolute total*, is the total amount of energy used and greenhouse gases emitted in 1998. The second amount, *Net Total*, is used to gain a better sense of how well energy efficiency measures are performing in City facilities. The Net Total removes the influence of some external factors that affect corporate energy use to allow for a better indication of the actual impact of energy efficiency measures. For example, the Net Total does not include facilities that were purchased or sold after 1990 and it is corrected to factor out the influence of varying weather conditions. 1998 was an exceptionally warm year resulting in a lower than average heating load which is accounted for in the Net Total.

Figure 1: Corporate Energy and CO₂ emission Trends between 1990 and 1998

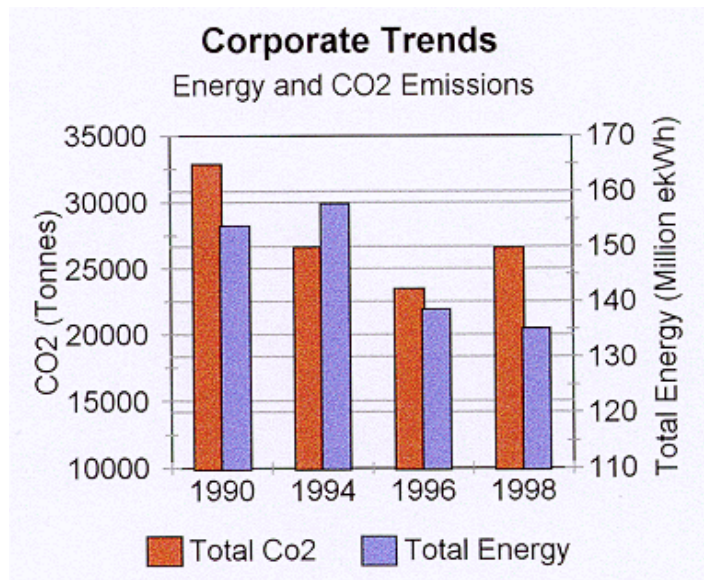


Figure 1 illustrates trends in the City of Ottawa's corporate energy use and CO₂ emissions. The success of Corporate emission reduction programs is evident by the continued decline in energy use since 1994. Absolute energy use in 1998 was 12% below 1990 levels while Net energy use was 17% below 1990 levels. CO₂ levels were showing a similar downward trend until 1998, where changes to the electrical fuel mix become apparent.

Table 2: Summary of Emission Reductions

Energy Source	1990		1996		1998	
	Energy Use (million ekw)	Tonnes of CO2 Equivalent	Energy Use (million ekw)	Tonnes of CO2 Equivalent	Energy Use (million ekw)	Tonnes of CO2 Equivalent
Facilities						
Electricity	48.6	9,711	46.6	5,586	45.94	8,853
Natural Gas	38.7	6,926	51.0	9,129	45.2	8,039
Oil	19.2	5,074	4.0	1,062	1.85	488
Sub Total: Facilities	106.2	21, 711	101.6	15,777	92.99	17,380
Fleets						
Gasoline	11.7	3,206	8.0	2,185	3.7	926
Diesel	12.2	3,235	9.3	2,481	14.5	3697
Ethanol Blend	--	--	2.2	600	1.8	441
Other	--	--	0.2	51	0.9	n/a
Sub Total: Fleets	23.9	6,441	19.7	5,317	20.9	5,064
Street lighting (electricity)	23.4	4,683	19.7	2,368	21.3	4,112
Absolute Total	153.8	32,835	138.6	23,462	135.2	26,556
% Change from 1990	n/a	n/a	-8%	-29%	-12.1%	-19%
Net Energy Total	153.8	--	129.5	--	128.4	
% Change from 1990	n/a		-16%	--	-17.76%	--

Discussion of Progress, 1990 to 1998

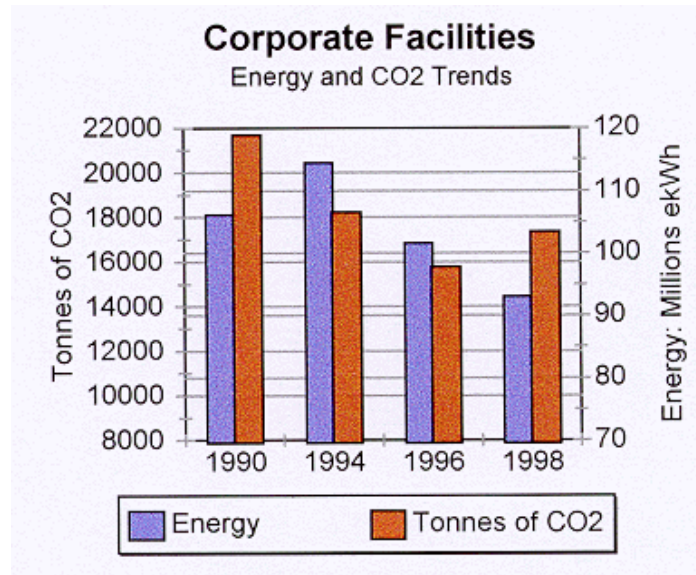
The Corporate Plan's original target was to reduce the City's Corporate greenhouse gas emissions to 20% below 1990 levels, by the year 2005. The City has made commendable progress towards achieving its CO₂ reduction target with 1998 corporate CO₂ levels at 19% below 1990 levels. Energy continues to decline from 1990 levels demonstrating the success of the various corporate initiatives developed to reduce emissions and save energy. Each sector is discussed more fully next.

Facilities

City of Ottawa buildings have continued the trend towards lower energy consumption since 1990 and have achieved remarkable efficiency levels. Net energy use in 1998 was 17 percent lower than it was in 1990. Though facility electrical energy use actually declined slightly between 1996 and 1998, CO₂ emissions increased from 5,586 tonnes to 8,853 tonnes largely due to the change in fuel used to produce our electricity. Fortunately, increases in facilities CO₂ emissions were largely off-set by substantial decreases in fuel oil consumption due to fuel switching. Since 1990, the City has been replacing older, less efficient fuel oil heating systems with natural gas systems. Natural gas can produce the same levels of comfort with much reduced levels of CO₂ compared to fuel oil. Table 2 illustrates the difference in CO₂ emissions from fuel oil since 1990. Consumption has dropped from 19.2 million ekWh to 1.85 million ekWh, a 90% decrease. Natural gas use has increased as a result but only by 15%, resulting in only a small increase in CO₂ emissions.

Figure 2 shows a continuing trend to reduced energy use in City facilities since 1994. CO₂ emissions show a similar trend, though 1998 emissions are higher due to the changes in fuel mix used to produce electricity.

Figure 2: Trends in Greenhouse gas emission and energy use in City Buildings



Electricity

Figures 3 and 4 graphically illustrate the effect of changes to energy intensity of the City's electrical supply. Figure 3 illustrates the absolute level of CO₂ emissions that were produced at the City each year. Figure 4 attempts to normalize the influence of fluctuating electrical energy supply sources by calculating CO₂ emissions based on 1990 electricity coefficients. It is apparent that results can be greatly influenced by these coefficients, making it difficult to compare CO₂ emissions from year to year. The electricity fuel mix is expected to approach or exceed 1990 levels in the next several years and as a result the City's progress may be hindered.

As previously stated, the City currently has no control over the source of electrical power it consumes, when deregulation takes place, the energy intensity of fuel purchases will need to be assessed during purchasing.

Figure 3: CO₂ Levels Assuming a Constant 1990 Fuel Mix

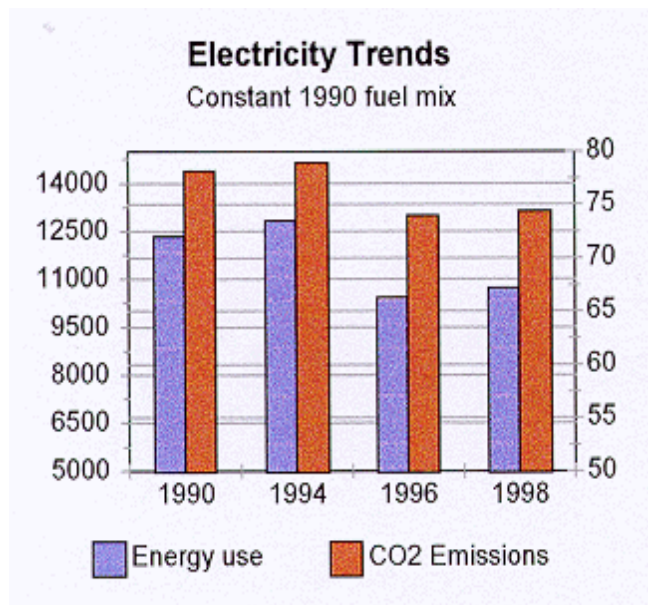
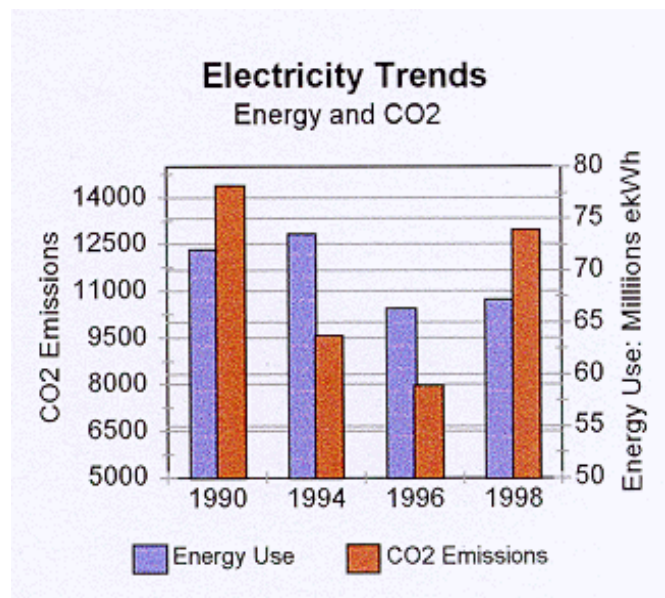


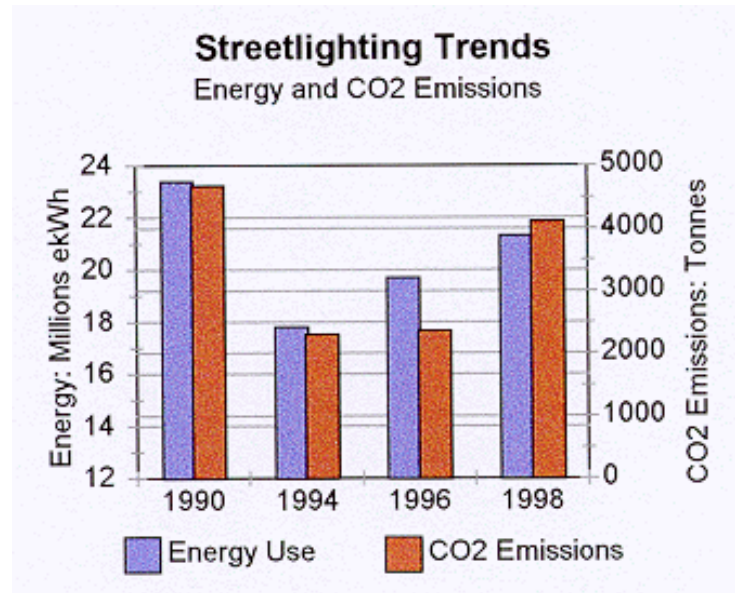
Figure 4: CO₂ Levels with Existing Fluctuating Fuel Mix



Street lighting

Energy use in street lighting is still down considerably from 1990 on a per unit basis. However, due to the significant increase of xx fixtures since 1990, energy use and CO₂ emissions are approaching 1990 levels.

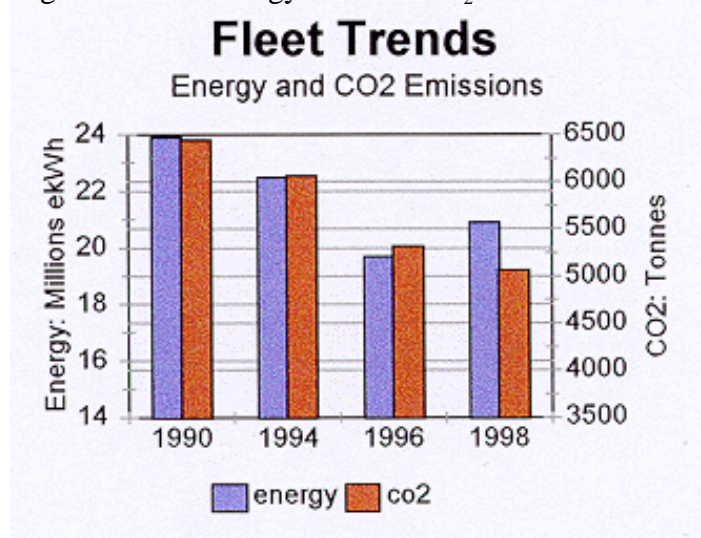
Figure 5: Street lighting Trends: Energy and CO₂ emissions.



Fleets:

CO₂ emissions from City fleets have been declining since 1990 and are now over 20 % below 1990 levels. Even though fuel energy use rose slightly between 1996 and 1998, CO₂ emissions continued to decline, due in part to the switch from gasoline to Ethanol blended fuel which emits less CO₂ per litre than gasoline. Other factors that have influenced the decrease in fleet fuel consumption include continued vehicle downsizing and route optimization.

Figure 6: Fleet Energy Use and CO₂ Emission Trends



Summary

This report has demonstrated the tremendous progress the City of Ottawa has made towards reducing corporate greenhouse gas emissions and energy use. This has been achieved by measures to improve the energy efficiency of buildings, fleets and Street lighting. All of these measures have made sense from both an environmental viewpoint and an economic perspective. Examples included in this report have illustrated that reducing corporate energy use can also save money as well as reduce emissions. Benefits accruing to the community include reduced municipal costs, improved local air quality and climate change mitigation. As the federal government grapples with developing solutions to achieve its international climate change commitments, leadership from municipalities such as the City of Ottawa can help demonstrate the multiple benefits of mitigative action. The City is also well positioned to show leadership within the community as programs to reduce local emissions are implemented. City staff are looking forward to sharing their experiences with the private sector and local residents as we all begin to act to combat climate change.

Table 3 summarizes the Workplan for 2000, developed to ensure continuing progress towards achieving the City's climate change commitments and to demonstrate continued municipal leadership in climate change solutions. At this time no new funding is required and programs will proceed through existing staff resources.

Table 3: Summary of Goals and Priorities for 2000

Component	Proposed 2000 Activity	Lead Dep't.	New/ Existing Program	New Capital Funds
Corporate Programs				
Comprehensive Building Retrofit Strategy	1. Begin the implementation of City building retrofits through ESCOs when cost effective.	Asset Mgmt	Existing	TBA
	2. Capitalize on the lessons learned through the development of the City's <i>Comprehensive Building Retrofit Strategy</i> in the design of a community-wide program.	EMB	Existing	
	3. Investigate advanced efficiency design opportunities for new Corporate facilities being planned.	Asset Mgmt		
	4. Investigate a Corporate <u>energy use reduction target</u> in addition to CO ₂ emissions target.			
Fleets	1. Continue to assess the feasibility of using alternative fuels throughout the next year.	Asset Mgmt	Existing	No
	2. Identify potential for external support for alternative vehicle purchases, leasing.	EMB		
Employee Awareness	1. Year-long employee program. Three climate protection theme weeks will be key components of employee awareness programs at City Hall.	EMB	New Program	No
Monitoring	1. Work with departments to develop more effective system for annual reporting, on-going communication. 2. Annual report to Council, VCR, PCP.	EMB	Existing	No
Corporate Policies				
Land use Planning	1. Develop Phase 2 of GIS -based energy planning tool which determines the long term impact of planning decisions on energy emissions.	EMB	Existing	Existing Capital Fund Allocation
Corporate Transportation Demand Management (TDM)	1. With amalgamation of existing TDM measures and the addition of new ones, the City of Ottawa will develop a comprehensive TDM program for its employees	EMB, UPPW	New	No
Urban Forestry	1. Integrate climate change objectives with other urban greening strategies. 2. Solicit federal climate change funds for urban greening strategy. 3. Explore opportunities for carbon credits.	OP EMB	Integrate with Existing Programs	No



November 29, 1999 (3:33p)

Edward Robinson
Commissioner of Urban Planning and Public Works

MS:sf

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Contact: Mary Anne Strong - 244-5300 ext. 1-3819

Financial Comment

N/A.

A handwritten signature in black ink, appearing to read 'Mona Monkman', written in a cursive style.

November 29, 1999 (3:28p)

for Mona Monkman
City Treasurer

CP:cds