



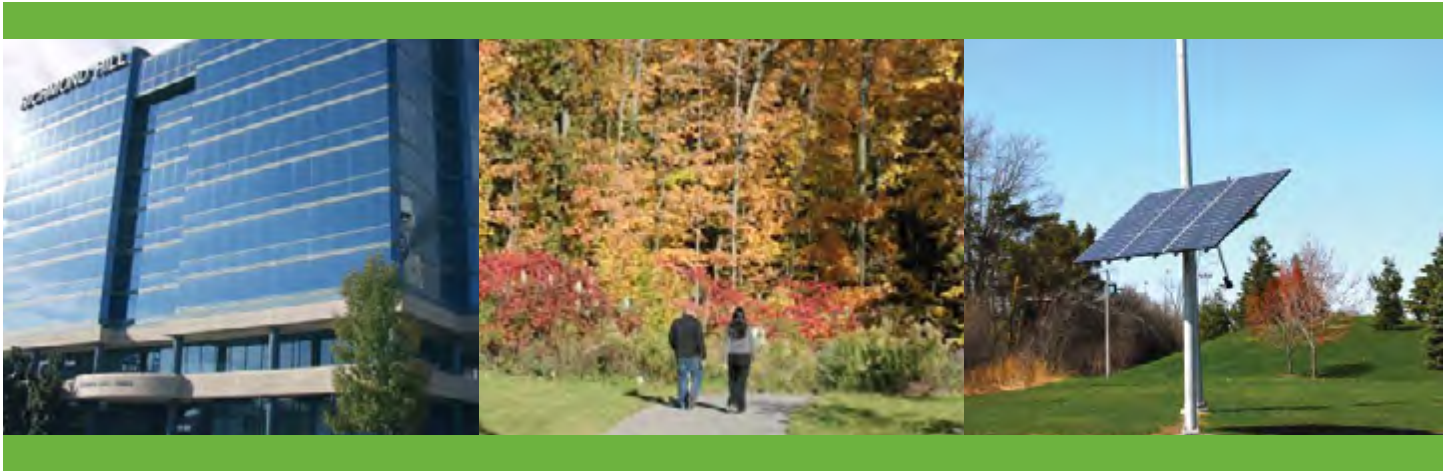
# Clean Air Local Action Plan Corporate Update “Achieving Milestone Five”

February 2011



Partners for Climate Protection Program

Prepared For:  
The Federation of Canadian Municipalities



## Table of Contents

Introduction and Summary of Findings.....	1
Town of Richmond Hill Local Action Plan Background.....	2
Local Action Plan Approach.....	3
Local Action Plan Methodology.....	5
Corporate Inventory Analysis: 2000 - 2009 .....	5
Corporate Measures and Results by Sector: 2000 - 2009.....	7
Buildings .....	8
Building Measures and Results .....	10
Vehicle Fleet .....	12
Vehicle Fleet Measures and Results .....	14
Streetlight.....	14
Streetlight Measures and Results.....	15
Water & Sewage .....	16
Waste .....	17
Corporate Employee Environmental Programs.....	18
Conclusion.....	19
Appendix .....	19

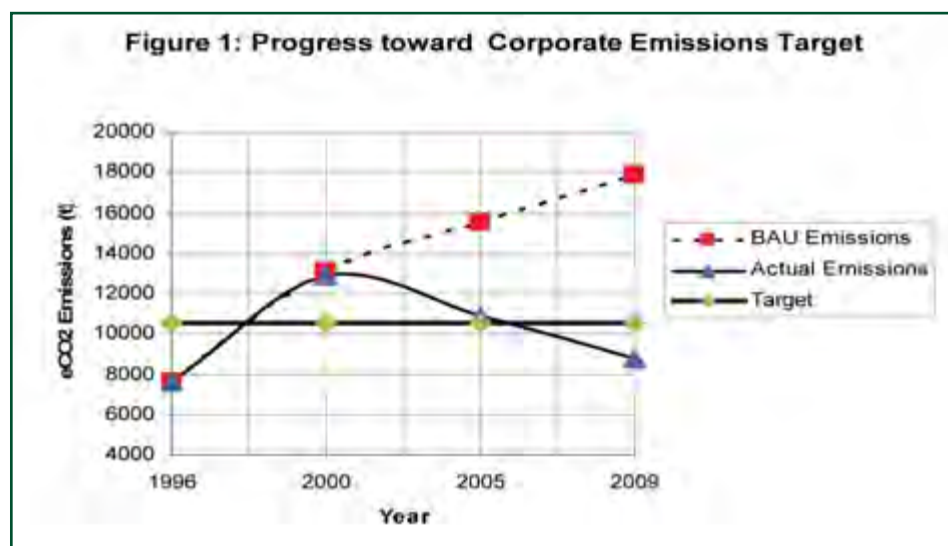
## Introduction and Summary of Findings

The Town of Richmond Hill established itself as an environmental leader over a decade ago. As early as June 2000, Richmond Hill was recognized nationally by the Federation of Canadian Municipalities (FCM) for its Clean Air Program. Winning the first-ever “Sustainable Community Award” led to the development of a Local Action Plan. In April 2004, Richmond Hill Council endorsed the Town’s first Clean Air Initiatives Local Action Plan with a target of reducing corporate greenhouse gas emissions to 20 per cent below 2000 levels by the end of 2009.

The corporate greenhouse gas inventory update for 2009, which was completed in September 2010, indicates that the Town has not only met its 20 per cent reduction target, but has exceeded the target, having reduced greenhouse gas emissions by 33 per cent below 2000 levels (See Figure 1 below). The achievement of this goal means that the Town is the first municipality in Ontario to achieve its reduction target under the FCM’s Partners for Climate Protection (PCP) program. This accomplishment is even more significant given the Town’s population grew by 50,000 to over 185,000 people during that time. Had the Town not taken action, greenhouse gas emissions were forecast to increase significantly.

The Town’s success is measured using a corporate greenhouse gas inventory that is consistent with the PCP program and includes buildings, vehicle fleet (excluding transit), streetlights and traffic signals, water and sewage and solid waste. Richmond Hill followed the established methodology of the PCP program which includes the five milestones listed below

1. Creating a greenhouse gas emissions inventory and forecast;
2. Setting an emissions reduction target;
3. Developing a local action plan;
4. Implementing the local action plan or a set of activities; and
5. Monitoring progress and reporting results.



Richmond Hill exceeded its target, having reduced greenhouse gas emissions by over 30 per cent below 2000 levels. Had the Town not taken action, greenhouse gas emissions were forecast to increase significantly.

Business as Usual (BAU) emissions are the amount of emissions that would have resulted from population growth in the absence of any actions taken to reduce emissions.

## Town of Richmond Hill Local Action Plan Background

In the late 1990's and early 2000's, the Town of Richmond Hill was implementing measures to improve municipal energy efficiency and reduce greenhouse gas emissions. Done as part of its normal business practices, the changes made financial sense and resulted in lower energy costs. In 2004 the Town formally implemented the Clean Air Initiatives Local Action Plan which involved taking a leadership role to investigate and evaluate new technologies and implement those technologies that demonstrated the most potential for environmental benefits relative to the cost. Apart from helping to mitigate a global climate change problem, there are numerous reasons for the Town to take part in implementing the action plan which were as follows:

- *Improved Service Delivery* – Through the implementation of energy efficiency initiatives in its corporate facilities and operations and throughout the community, the Town will be able to offer its services more efficiently and economically.
- *Reduced Costs* – By reducing its energy consumption, the Town and its citizens will save money on their energy bills.
- *Improved Air Quality and Public Health* – The combustion of fossil fuels used to generate energy emits a variety of pollutants into the atmosphere that are known to have negative health impacts and reduce local air quality. By reducing energy consumption, local air pollutants will also be reduced.
- *Asset Management* – By taking a proactive approach to facility improvements, the value of the Town's assets is improved by reducing facilities' operating costs, modernizing equipment and decreasing deferred maintenance. Not only does asset management make good business sense, it also reduces greenhouse gas emissions.
- *Leadership* – The Town has a long history of taking the lead on environmental issues. By taking specific steps to address climate change within its own operations, the Town is able to 'practice what it preaches' and provide an example to the community.
- *Quality of Life for Citizens* – By reducing expenditures on energy, the Town can apply savings towards improving its community services. This may include more green space or improved water and waste services. These types of measures can help build healthier, more sustainable communities.

### ***Council and Senior Management "Environment First" Commitment***

The Clean Air Initiatives Local Action Plan and its implementation are fully supported by the Town of Richmond Hill's Strategic Plan and Vision statement, and its goals and objectives. A multi-disciplinary project team was formed in 2003 with representatives from Town departments made up of Engineering, Finance, Transportation & Traffic, Environment, Asset Management and Fleet. The team was involved in the development of the plan to ensure that it was financially and technologically feasible prior to its adoption by Council. The Clean Air Plan is further supported by a Council direction to implement, monitor and report back on the results of the plan. Results were communicated to municipal staff and Council through presentations to Council and Senior Management at the Town. Progress results were also communicated through internal staff newsletters and Council highlights made available to the public.

In 2001, Town staff partnered with other GTA local and regional municipalities to share best practices and better understand how other municipalities in the Greater Toronto Area are addressing climate change. Richmond Hill Council in 2001 further showed its commitment and supported and joined the GTA Clean Air Council and subsequently signed the 2002 Toronto and Inter-Governmental Declaration on Clean Air to help address climate change issues affecting Richmond Hill and Greater Toronto Area municipalities. The Town has continued to be a signatory on the subsequent annual declarations.

## ***ISO 14001 - Environment Management System***

In 2006, the Town was the first municipality in Ontario to have its entire Engineering & Public Works Department ISO 14001 certified. ISO 14001 is an internationally-recognized standard of excellence for environmental management systems and pertains to all activities and services of the department as they relate to the environment. The certification provides assurances to the community and regulatory agencies that the Town follows strict environmental policies in accordance with a recognized international standard. Mandatory re-certification, which is required every three years, was completed in November 2009 through a rigorous process involving a three-day audit of the department's policies, procedures and facilities. Achieving certification is significant in showing the Town's commitment to environmental leadership performance and supports our efforts to be a sustainable community.

Through this process, the Town established a Senior Environment Management Committee which reviews the department's environmental management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness. Reviews assess opportunities for improvement and the need for changes to the environmental management system including the environmental policy and environmental objectives and targets. This ensured that the ongoing targets and objectives established for the Town's commitment to reducing greenhouse gas emissions were met.

## ***Local Action Plan Approach***

### ***Phase 1 – Project Start-up (MILESTONE 1)***

The project started with the establishment of a team made up of key staff from Asset Management, Engineering & Public Works, Finance, Transportation, Traffic & Site Plans and Fleet who could provide valuable expertise. Their experience was augmented with consulting advice from ICLEI Energy Services Canada (IES).

This phase of the project also included a review of the Town's existing greenhouse gas emissions inventory and projection, which is PCP Milestone 1. An existing inventory had been completed for 1994 to 1999. The project team determined that it was necessary to update the inventory to 2000 and backcast the 1994 data to 1990 in order to get a clearer picture of the Town's current and historic emissions profile.



### ***Phase 2 – Quantify Historic & Existing Measures (MILESTONE 1)***



Geothermal heating and cooling at the Richmond Hill Centre for the Performing Arts

This phase of the project involved reviewing the historic and existing energy efficiency and greenhouse gas reduction measures the Town had already put in place. Information about each of the projects (e.g. municipal building retrofit or vehicle replacement) was gathered and compiled. With this information, IES used the PCP Software and Protocol to quantify the reduction impact of the measures (see Methodology section for more information).

### ***Phase 3 – Identify Potential New Measures (MILESTONE 1)***

In phase three of the project, potential new measures to be included in the Town's Local Action Plan were identified. The inventory and forecast completed by the Town provided a basis from which to identify target emission reduction areas/sectors. Additionally, the analysis of historic and current measures revealed the emission reductions accrued in each sector. With this information at hand, the project team gathered to brainstorm potential new measures (or expansion of current measures) that could be implemented within the Town to help reduce emissions. IES added to this process by providing information about best practices shared within their network. IES then reviewed the potential new measures and determined the potential greenhouse gas reductions of each measure utilizing the PCP Software and Protocol.



Solar water heating system at the Richmond Hill Municipal Offices

### ***Phase 4 – Identify a Greenhouse Gas Emission Target (MILESTONE 2)***

The previous phases led to the development of recommended emission reduction targets for corporate operations. The historic, current and potential future measures were analyzed and compiled to create future emission scenarios. By comparing the scenarios against the baseline inventory and Business as Usual forecast completed in Milestone 1, future emissions targets were established. At this stage in the project, the project team was brought together again to consider the results of the measures quantification process and agree upon a recommended emissions target.



Wave Pool – Upgrade to DRY-O-TRON temperature control unit

### ***Phase 5 – Formulate and Approve Local Action Plan (MILESTONE 3, 4 & 5)***

The last phase involved drafting the Local Action Plan report which was presented to the Senior Management Team and Council, prior to a public release of the plan. The results of the corporate analysis led to the recommendation of the plan – that the Town establish a target of reducing corporate greenhouse gas emissions to 20 per cent below 2000 levels by the end of 2009.



Wind turbine and solar panels at Richmond Green

Implementation of measures to improve municipal energy efficiency and greenhouse gas emissions has been ongoing for many years through the normal management practices of the Engineering & Public Works Department. In the past, energy efficiency measures were implemented because they made financial sense, resulting in avoided energy costs relative to the cost of implementing the measures. Staff recommended that the ongoing implementation of the Local Action Plan continue in the same manner, through the established process of annual budget submissions.

In some cases, staff recommended to Council that measures be implemented with slightly higher costs where significant emission reductions resulted from the measures, such as purchasing hybrid vehicles and biodiesel and ethanol enhanced gasoline for the fleet. In these cases, the benefits of reduced emissions were clearly outlined with reference to the Town's reduction target.

## Local Action Plan Methodology

A greenhouse gas emissions inventory was undertaken which involves collecting actual data on fuel, energy, and waste from all the sectors that make up the corporate operations. In a corporate emissions inventory, energy consumption in the buildings, vehicle fleet, streetlighting, and water and sewage sectors are collected along with the waste generation information from corporate operations. An understanding of this breakdown is important when designing a plan to reduce greenhouse gas emissions so that efforts can be focused in the sectors where they will have the most impact. Table 1 shows the sources for the inventory data.

**Table 1: Inventory Data Inputs**

Sector	Source
<b>Corporate Inventory</b>	
Buildings	Electricity bills Natural gas bills
Streetlighting	Electricity bills
Vehicle Fleet	Vehicle fuel consumption records
Water & Sewage	Electricity bills
Waste	Waste haulage records

Once energy consumption and waste generation data was collected, appropriate emission coefficients for each year were applied to calculate the resulting greenhouse gas emissions. Annual emissions are expressed in absolute terms and are not corrected for weather or community growth, in the same way that reduction targets are based on absolute amounts, not per capita figures.

Although electrical energy does not emit greenhouse gases when it is used, there are significant emissions at fossil fuel (coal, oil, natural gas) power plants where electricity is generated. These emissions are incorporated into the end use of electricity through the equivalent carbon dioxide coefficient (eCO<sup>2</sup>) for electricity. This coefficient is an annual average, and its value depends on how much fossil fuel generation is used in the electricity generation mix of all electricity power plants in Ontario, since the generation of electricity by hydropower, nuclear, or renewable energy does not produce eCO<sup>2</sup> emissions.

Because Ontario's electrical generation mix changes from year to year so does its eCO<sup>2</sup> electricity coefficient. This means that in some cases, even when a municipality reduces its energy consumption, its emissions may remain constant, decrease or even increase because the amount of fossil fuel electricity generation in the province's electricity generation mix has changed. This follows the protocol that all municipalities participating in the PCP program use the calculation methodology described above. The Town has also benefited from the work done at the Provincial level to reduce the impact from electricity generating stations, such as the phasing out of coal-fired plants, as this resulted in lower emissions associated with the Town's electricity usage

## Corporate Inventory Analysis: 2000 - 2009

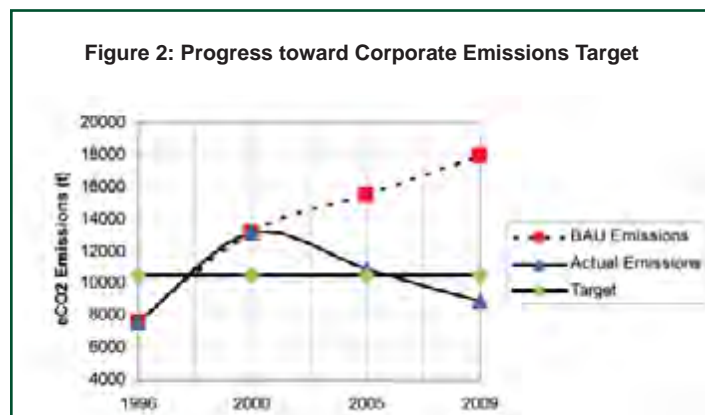
This section of the report summarizes the energy consumption, eCO<sub>2</sub> emissions and energy cost usage for corporate operations as a whole for the years 2000, 2005 and 2009. It includes buildings, vehicle fleet, streetlights, water and sewage as well as corporate waste. The implementation of the Clean Air Initiatives Local Action Plan involved taking leadership to investigate and evaluate new technologies and implement those technologies that demonstrated the most potential for environmental benefits relative to the cost.

**Table 2: Total GHG Emissions and Energy Consumption**

Year	eCO <sub>2</sub> (t)	Energy (GJ)
2000	13,136	182,493
2005	10,894	189,385
2009	8,795	178,140

The above table shows the Town's totals for greenhouse gas emissions measured in eCO<sub>2</sub> tonnes and energy consumption measured in gigajoules for the years 2000, 2005 (progress report year) and 2009. From 2000 to 2005 there was a 3.8 per cent increase in the total energy consumed by the Town and most importantly there was a 17 per cent decrease in total emissions. The increase in energy consumption reflects the overall growth in the Town and the growth in all corporate sectors. By the mid point of the 10-year target, the results were encouraging. The results reflected the Town's dedication and actions over the years to reducing greenhouse gas emissions, but they were also affected by the impact of a change in the electricity generation mix in Ontario. Calculations for 2005 indicated that the 20 per cent reduction target had almost been met (see Figure 2).

Thus, the Town in 2005 was 85 per cent of the way towards meeting our target of achieving a total 20 per cent decrease from 2000 levels.

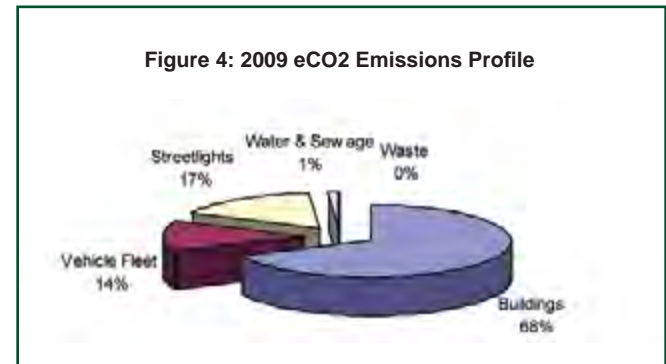
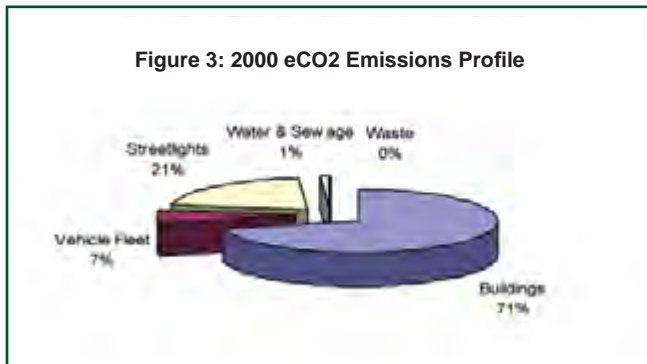


Note: Business as Usual (BAU) emissions are the amount of greenhouse emissions that would have resulted from population growth in the absence of any actions taken by the Town to reduce GHG emissions.

In 2009, the overall energy consumption had decreased by 2.4 per cent from 182,493 GJ in 2000 to 178,140 GJ, and more significantly the eCO<sub>2</sub> emissions decreased by 33 per cent in the same time frame from 13,136 t in 2000 to 8,795 t in 2009. The Town not only reached its target of 20 per cent reduction from 2000 emission levels but surpassed it. A detailed analysis by sector is outlined in the Corporate Measures and Results section of the report.

## Sector Emissions Profiles

As noted previously, in order for the Town to focus its efforts and resources in the most efficient manner and have the biggest impact in reducing emissions, sector emissions profiles were created. In the year 2000, an analysis of the emissions profile by sector (See Figure 3 below) indicates that buildings contributed 71 per cent of the Town's emissions, followed by streetlights at 21 per cent, vehicle fleet at 7 per cent, corporate water and sewage was 1 per cent and waste at less than 1 per cent.



The profile shifted in 2009, with buildings at 68 per cent of the profile, streetlighting decreasing to 17 per cent, vehicle fleet increased to 14 per cent (largely due to a significant increase in the number of vehicles used by the Town), water and sewage remaining at 1 per cent and waste also remaining at less than 1 per cent (See Figure 4). The reduction in the building sector and streetlighting are reflective of the fact that the Town did focus on those key sectors reported in the 2000 eCO<sub>2</sub> emissions profile resulting in the shift.

These profiles are typical of municipal government operations. Generally buildings occupy a large portion of the profile. Water and sewage operations often occupy a large portion of the profile because the treatment process is energy intensive. However, in Richmond Hill, the Region of York is responsible for the majority of water and sewage services within the Town, therefore energy consumption, eCO<sub>2</sub> emissions and costs are included in the Region's corporate inventory. Streetlighting and the vehicle fleet typically take up a smaller portion of the profile, and waste from corporate operations is rarely significant.

## Corporate Measures and Results by Sector: 2000 - 2009

The following sections of the report focus on the base year 2000 and the target year 2009, elaborating on the trends experienced, highlighting the specific measures undertaken to reduce greenhouse gas emissions and the results in each sector

**Table 3: eCO<sub>2</sub> & Energy Sector Breakdown, 2000 & 2009**

Sector	2000		2009	
	eCO <sub>2</sub> (t)	Energy (GJ)	eCO <sub>2</sub> (t)	Energy (GJ)
Buildings	9,327	135,604	6,016	124,882
Vehicle Fleet	944	13,546	1,260	19,708
Streetlights	2,820	32,284	1,539	32,587
Water & Sewage	93	1,059	45	963
Waste	-48		-65	
<b>Total</b>	<b>13,136</b>	<b>182,493</b>	<b>8,795</b>	<b>178,140</b>

## Buildings:

The buildings sector represents all the buildings owned and leased by the Town of Richmond Hill. This includes administration facilities, recreation centres, arenas, pools, libraries, maintenance buildings etc.

In 2009, the Town was responsible for maintaining 58 Town-owned facilities representing a total of 1,205,742 sq. ft., which is a 27.8 per cent increase in the total floor area since 2000. With the exception of the administrative office buildings, all other buildings are open to the public on average 16 hours a day, 365 days a year. For the most part these facilities are located in urban areas and surrounded by parks, and some by commercial facilities. The hydro utility is supplied by PowerSteam and the gas utility is supplied by Enbridge Gas.

### *Building Measures and Results*

The Town reduced energy consumption by 8 per cent and saved over \$7 million (from 1992 to 2009) in energy costs. More significantly, from 2000 to 2009 is the reduction of eCO<sub>2</sub> emissions by 36 per cent from its buildings, even though the amount of total area increased by approximately one third. There has been approximately 40 building energy efficiency retrofits measures implemented since 2000 which have combined to achieve our target and are highlighted below:

- Building automation system
- Lighting retrofits
- Geothermal heating and cooling at the Richmond Hill Centre for the Performing Arts
- Solar hot water heating at the Municipal Offices
- Wind turbine and solar panels at Richmond Green
- Energy efficient equipment upgrades at 10 buildings

In addition in 2008, the Town implemented an Energy Management Plan which complements its Strategic Plan's goal of "Wise Management of Resources in Richmond Hill" by planning for and promoting energy efficient buildings and renewable energy. The Town's Energy Management Policy Statement is as follows: "We at the Town of Richmond Hill are committed to showcasing leadership in reducing energy consumption, stabilizing greenhouse gas emissions and implementing cost-effective measures."

*See Appendix I – Highlights of Corporate Measures and Results by Sector – 2000-2009 for Detailed Building Measure Results*

In addition in 2008, the Town implemented an Energy Management Plan which complements its Strategic Plan's goal of "Wise Management of Resources in Richmond Hill" by planning for and promoting energy efficient buildings and renewable energy. The Town's Energy Management Policy Statement is as follows: "We at the Town of Richmond Hill are committed to showcasing leadership in reducing energy consumption, stabilizing greenhouse gas emissions and implementing cost-effective measures."

The main objectives for the Town of Richmond Hill facilities are:

- To improve the efficiency of energy use through low-cost opportunities by:
  - implementing sound operating and maintenance practices
  - employee training and staff awareness
  - a monitoring and tracking system
  - re-commissioning of buildings
  - procuring energy on fixed rate contracts
  - maintaining an Energy Demand Management program
- To reduce energy operating costs through the initiation of an energy retrofit program that will help reduce greenhouse gas emissions.
- To improve efficiency of energy use by determining the feasibility of implementing comprehensive initiatives.
- To improve awareness of climate change and greenhouse gas emissions reductions.

A detailed summary of measures implemented can be found in the Town's Energy Management Plan (August 2010).

## Vehicle Fleet:

The vehicle fleet sector represents all the vehicles owned by the Town such as those used in parking control, administration, parks, roads, etc. This includes cars, trucks, mowers, loaders, trailers and sanders etc. Since employees' personal vehicles are used part of the time for the Town's purposes (e.g. permit inspection and by-law licensing), this portion is also included. In total, the vehicle fleet sector occupied 7 per cent of the Town's total corporate eCO<sup>2</sup> emission profile in 2000, and 14 per cent in 2009. This can be attributed to a 32 per cent increase in the amount of fleet and a more than 300 per cent increase in the amount of travel usage from 278,000 km in 2002 (earliest record of kilometres traveled usage) to 1,066,962 km in 2009.

## Vehicle Fleet Measures and Results

Since 2000, the Town has implemented many measures that have reduced the fuel consumption and costs per vehicle. However, due to the increase in the number of vehicles growing by 32 per cent in the vehicle fleet sector, the eCO<sup>2</sup> emissions have increased by 33 per cent. Listed below are some of the key initiatives implemented that have helped to reach our target:

- *Ethanol Blend Gasoline* – In 2000 the Town had implemented the use of ethanol blend gasoline as an alternative to regular gasoline.
- *Bio Diesel* – In 2004 the Town implemented the use of bio diesel as an alternative to high-grade diesel.
- *Battery Packs and Inverters* – This technology allows the unit to be shut off at the job site and still operate all necessary safety and warning lights, as well as power attachments.
- *Anti-Idling Campaign* – The Town purchased five anti-idling units in 2004 to install on vehicles to help control excessive speed and idling and by 2009, 83 of its 150 vehicles had the units (55 per cent of the fleet).
- *Purchase of Hybrid Vehicles* – In 2004 the Town purchased its first hybrid vehicle and by 2009 there were nine hybrid vehicles to improve fuel efficiency.
- *Vehicle Downsizing* – In 2003 and 2004 the pick-ups and minivans used by couriers, service and stand-by vehicles were downsized and were more fuel efficient for the type of service required.
- *Parks Equipment Replacement* – The entire stock of string trimmers was replaced with four-cycle engines (vs. two-cycle) due to air pollution. Four-cycle engines are 10 to 15 per cent more energy efficient than two-stroke engines.

*See Appendix I – Highlights of Corporate Measures and Results by Sector – 2000-2009 for Detailed Fleet Measure Results*



**Shift Gears**  
walk it. bike it.  
[RichmondHill.ca/BikeLanes](http://RichmondHill.ca/BikeLanes)

## Streetlight:

The streetlighting sector of this analysis includes the park lighting, traffic signals and streetlights operated by the Town. The Region of York is responsible for the traffic signals and illumination at the major intersections, therefore those streetlights would be included in the analysis of their operations. Streetlighting occupied 21 per cent of the Town's total corporate eCO<sup>2</sup> emissions profile in 2000 and 17 per cent in 2009 (14,000 street lights in 2009).

The majority of the energy consumption for the streetlighting sector was estimated because the electric utilities bill the Town a flat rate rather than billing based on the amount of electricity consumed. This figure can be estimated with reasonable confidence given imperial data available on the sunlight hours.

### ***Streetlight Measures and Results***

By implementing ongoing lighting retrofit programs the Town has reduced energy consumption and eCO<sup>2</sup> emissions since 2000. The streetlighting retrofit program, initiated in 1989, changed all the Town's incandescent and mercury streetlights to high- pressure sodium. Traffic signal retrofits, initiated by the Town in 2003, converted all traffic signals to light emitting diodes (LEDs). From 2000 to 2009, there was a 26 per cent increase in the total number of streetlights (10,000 – 14,000). However, because of the measures taken noted above, it has contributed to a 45 per cent decrease in eCO<sup>2</sup> emissions by 2009.

*See Appendix I – Highlights of Corporate Measures and Results by Sector – 2000-2009 for Detailed Streetlight Measure Results*

## Water & Sewage:

The water and sewage sector of this analysis reviews the energy consumption, costs and eCO<sup>2</sup> emissions associated with the water and sewage services provided by the Town. Since water and sewage treatment falls under the Region of York's jurisdiction, the Town provides limited services in this area. All the energy use in this sector is for water and sewage pumping. Water and sewage operations occupied 1 per cent of the Town's corporate eCO<sup>2</sup> emission profile in 2000.

Since water and sewage services represent such a small portion of the Town's overall profile, the consultant recommended that the Town not focus its efforts on implementing any new measures in this sector.

## Waste

The corporate waste sector profiles the emissions associated with the waste produced from corporate operations. It is a very small portion of the corporate eCO<sup>2</sup> emissions profile at less than 1 per cent in 2000.

Since the waste is shipped to a landfill where the landfill gas emissions are captured, the amount of greenhouse gas emissions associated with the waste is balanced by the credit received from the burning of the captured landfill gas. In fact, since landfill gas is about 50 per cent methane, and methane has a global warming equivalent measure of 21 times carbon dioxide, it appears to be slightly beneficial to landfill waste rather than reduce it. However, this reduction in emissions is offset by the shipping associated with transporting waste to other community landfills and the avoided energy use that would come along with reusing and recycling waste.

Measures directed specifically at corporate waste production have not been implemented, nor were they recommended since they represent such a small portion of the emissions profile. The Town of Richmond Hill did implement a Green Bin program in 2005, to separate out all food wastes, pet wastes, diapers and sanitary products for composting. As part of the Town's commitment to waste reduction, by 2008 the Town had surpassed the Provincial target of 60 per cent diversion and achieved a curbside 67 per cent waste diversion rate. The Town continues to implement waste reduction programs that are incorporated into their own operations.

## Corporate Employee Environmental Programs

The Local Action Plan also includes programs and initiatives that have been implemented to encourage Richmond Hill's own employees to get involved and help reduce greenhouse gas emissions. Listed below are a number of the programs and initiatives that are promoted to employees and have helped the Town exceed its target:

**Earth Hour** – The Town participates in this world initiative to raise awareness about the direct correlation between energy consumption and greenhouse gas emissions. This initiative promotes the reduction of community-wide emissions by 6 per cent below 2000 levels by 2010.

**Clean Air Commute to Work Week** – Encourages Town employees to commute to work by walking, cycling, taking public transit, carpooling and/or telecommuting to protect air quality.

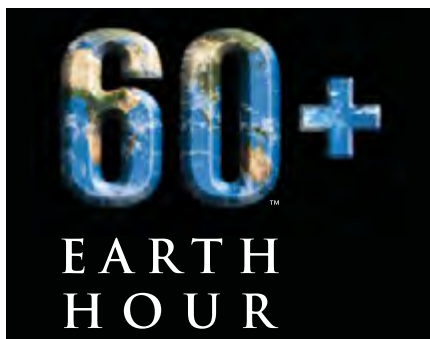
**Environment Week** – This week provides Town employees with environmental education and awareness and features several activities about water and energy conservation and protection of the natural environment.

**Pedestrian and Cycling Master Plan** – The Town completed its plan in 2009 which promotes self-propelled transportation, hence, a reduction of greenhouse gases. The Town has a network of 148 km of cycling routes and lanes already implemented. **Bike to Work Day** – Since 2007 the Town has encouraged staff to participate in the annual “Bike to Work Week” event.

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**Power Pledge Community Challenge** – Ontario municipalities are challenged to reduce their energy consumption and raise awareness about greenhouse gas emissions. The challenge encourages the reduction of emissions in Town-owned buildings and also in the community to help achieve a target of 6 per cent below 2000 levels by 2010.

In addition, the Environment Management System ISO 14001 is based on the principle of continual improvement that directs employees to make all reasonable efforts to minimize impact to the environment in their day-to-day activities.



Earth Hour



Clean Air Commute to Work Week



Environment Week



Pedestrian and Cycling Master Plan



Bike to Work Day



Power Pledge Community Challenge

## Conclusion

The Town of Richmond Hill has reduced its corporate greenhouse gas emissions by 33 per cent below 2000 levels by the end of 2009 under the Federation of Canadian Municipalities' Partners for Climate Protection program. This is a significant accomplishment in terms of reducing greenhouse gas emissions and demonstrating environmental leadership.

This has been a collective effort of Council, Town departments and other stakeholders. The Town also becomes the first municipality in Ontario to reach this milestone, and is a showcase for the success of the "Environment First" commitment that has guided the Town for many years.

This accomplishment is even more significant given the Town's population grew by 50,000 – to over 185,000 people – during that time and greenhouse gas emissions were forecasted to increase significantly had the Town not taken action.

In reaching and surpassing the 20 per cent reduction target the Town has continued to wisely manage resources in Richmond Hill. And the Town has also reaped many rewards including energy savings, cost savings, greenhouse gas emissions reduction, cleaner air and a better natural and living environment.

The Town of Richmond Hill would like to acknowledge the Partners for Climate Protection (PCP) program which is a joint partnership between the Federation of Canadian Municipalities and ICLEI – Local Governments for Sustainability

## Appendix I: Highlights of Corporate Measures and Results by Sectors – 2000 to 2009

Measure Name	Year	Sector	Description	Annual Saving in Energy or Waste	Annual Emission Reduction Impact (teCO <sub>2</sub> )
Solar water heating system	2008	Building	System is used to heat water at the Municipal Office	30,000 kWh	5.10
Wind turbine and solar panels at Richmond Green	2009	Building	Generates enough power for the facility or equivalent to power two households	36,792 kWh	6.25
Wave Pool – Upgrade to DRY-O-TRON temperature control unit	2008	Building	This dehumidification equipment uses leading-edge technology to recycle energy, conserve pool water and maintain accurate room and pool temperature under all climatic conditions year-round	36,792 kWh	30.98
Geothermal heating and cooling at the Richmond Hill Centre for the Performing Arts	2008	Building	Geothermal energy for heating and cooling a 43,000 square foot multi-use facility	96,100 kWh	16.34
Ethanol blend gasoline	2000	Fleet	Implementation of e-10 gasoline		31.99
Bio-diesel blend	2004	Fleet	Implementation of biodiesel-20 in the summer and biodiesel-5 in the winter		46.32
Engine oil recycling program	2007	Fleet	Installation of additional special filters to “super clean” the engine oil which allows for longevity of equipment and oil	544 L of engine oil	
Hydraulic oil recycling program	2004 - 2009	Fleet	Average fuel efficiency of Town fleet is 15 L/100 km, plus the Town owns nine hybrid vehicles with a fuel efficiency rating of 6.1L/100 km	1152 L of hydraulic oil saved	
Hybrid vehicles	2004 - 2009	Fleet	Average fuel efficiency of Town fleet is 15 L/100 km, plus the Town owns nine hybrid vehicles with a fuel efficiency rating of 6.1L/100 km	5,113.8 L of gasoline	10.77
Streetlighting retrofits	1989 - 1993	Street-light	Changed all incandescent and mercury streetlights to high-pressure sodium		128.10

## Appendix II: Energy Management Projects and Actions – 2000 to 2009

### Facility/Description of Work/Year

- Elgin Barrow Arena/power factor correction/2002
- Elvis Stojko Arena/power factor correction/2002
- Oak Ridges Arena/power factor correction/2002
- Ed Sackfield Arena/power factor correction/2002
- Operations Centre/power factor correction/2002
- Central Library/power factor correction/2002
- 225 East Beaver Creek/connect perimeter baseboard heaters to building automated system/2003
- Central Library/lighting control upgrade/2003
- 225 East Beaver Creek/lighting modifications during renovations (i.e.switching, emergency exit lighting retrofit)/2003
- 225 East Beaver Creek/building automated system upgrade/2003
- 225 East Beaver Creek/replace electric humidifiers/2004
- Central Library/modify chiller water piping/2004
- Bayview Hill CC/roof vapour barrier repair/2004
- Ed Sackfield Fitness Centre/install programmable controller on HVAC units/2004
- Central Library/re-commissioning of free cooling/2004
- Richvale CC/heat recovery unit for change room/2005
- Ed Sackfield Arena/HVAC automation/2005
- Arenas/energy auditing/2006
- Central Library/corrected power factor and power surge/2006
- R.G. Poultry Barn/installed light and temperature controls/2006
- R.G. Sports Centre/installed central AC and heating system/2006
- 225 East Beaver Creek/installed solar hot water system/2007
- Ed Sackfield Arena/installed energy efficient roof top unit/2007
- Farm House/upgraded the windows/2007
- Ed Sackfield Arena & 225 East Beaver Creek/replaced roof with high insulation/2007
- 225 East Beaver Creek/replaced and upgraded heat pumps/2008
- Central Library/reconditioned heat exchangers #1&2/2008
- R.G. Sports Complex/installed building automation system/2008
- Wave Pool/upgraded the Dry-O-Tron unit/2008
- Admin feasibility study for co-generation plant/2008
- McConaghy Centre/upgraded the condensing boilers/2009
- Centennial Pool/installed condensing boilers/2009
- 225 East Beaver Creek/replaced Exit signs with LED lamps/2009
- Farm House/installed high efficiency furnace/2009
- Shaw House/solar PV system/2009
- Bayview Hill CC/solar pool water heating system/2009
- Richvale CC/installed energy efficient roof top unit/2009
- Richmond Green/installed solar and wind power system/2009
- Energy auditing for 10 facilities/2009



Town of Richmond Hill  
225 East Beaver Creek Road  
Richmond Hill, ON L4B 3P4

**T 905 771 8800**  
**RichmondHill.ca**

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