Hamilton

# INFORMATION UPDATE

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| **TO:** Mayor Eisenberger, Members of Council, and Senior Management | **WARD(S) AFFECTED:** CITY WIDE |
| **DATE:** September 14, 2010 | |
| **SUBJECT:** Hamilton Climate Change Update: 2008 – 2009 (City Wide) | |
| **SUBMITTED BY:** Tim McCabe General Manager Planning & Economic Development Department | **SIGNATURE:** |

In 2008, the City adopted corporate emission targets of a 10% reduction of 2005 greenhouse gases levels by 2012, followed by a 20% reduction of 2005 greenhouse gases levels by 2020 under the Corporate Air Quality and Climate Change Strategic Plan (PED06336 (a)). This is an update to inform you of the progress in 2008 and 2009 for the Corporation and the community with regard to reducing greenhouse gas emissions.

## Background

In 2009, the City undertook an Air Pollutants and Greenhouse Gas (GHG) Emissions Inventory (PED09287) to keep track of emissions released by the City. Corporate emissions were identified at 139,401 tonnes in 2007, a 3.2% increase from the 2005 base year emissions of 135,038 tonnes. Community emissions were identified at 12,758,652 tonnes of greenhouse gases in 2006, and were projected to rise to 13,131,097 tonnes by 2008, an increase of 2.9%.[1]

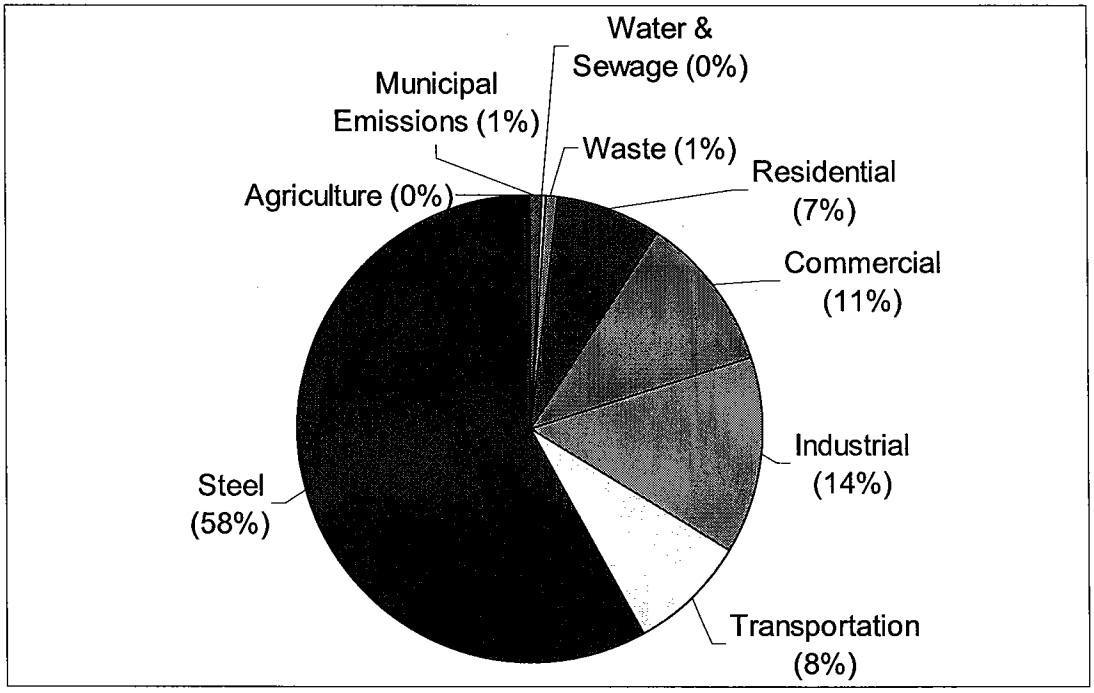
## Community Emissions – 2008

In fact, the total greenhouse gas emissions for Hamilton in 2008 was 11,928,322 tonnes, a reduction of 6.5% since 2006. **Figure 1** identifies the sources of local greenhouse gas emissions and includes both community and municipal emissions. The greenhouse gas emissions from the industrial and steel sectors dropped by 1,097,436 tonnes or 11% through energy conservation and decreased production due to the downturn in the economy. It is not clear if this industrial reduction is a permanent change. Greenhouse gas emissions from waste dropped by 18,833 tonnes or 18%.

[1] These emissions were estimated based on available information in 2007. Estimates were made by the consultants based on population growth and energy usage.

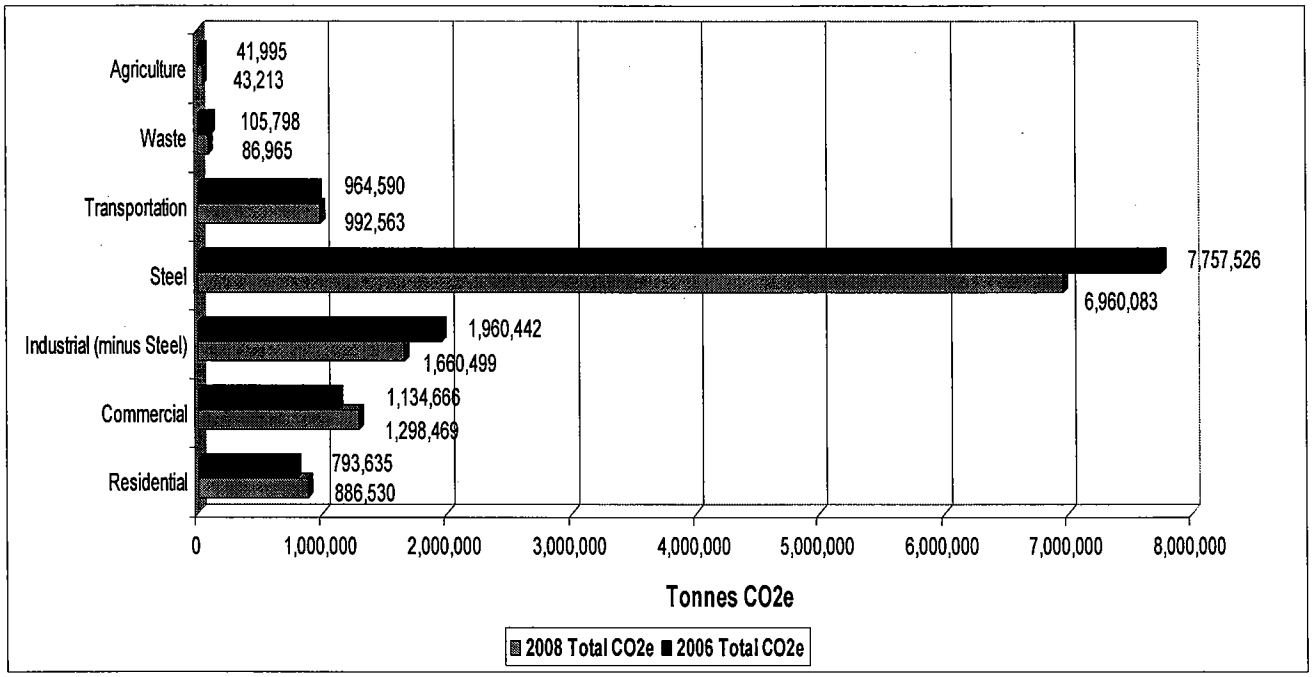
This is a permanent change effected by waste management through waste reduction and capture of landfill methane emissions (**Figure 2**). Unfortunately these emission reductions are offset by increases of 11.7% and 14.4% in emissions from the residential and commercial sectors, respectively. These increases are partially due to Ontario's energy mixture shifting slightly away from oil and natural gas towards increased coal production (a 2% increase) between 2005 and 2008 [2] . In addition, 2008 was a cooler year compared to 2006 and 2007 in Hamilton and heating of residential and commercial buildings increased. It cannot be determined from this data whether conservation programs are having any effect on energy consumption and whether our community will likely reach our GHG emission reduction targets.

**Figure 1: Total Greenhouse Gas Emissions Corporate and Community (2008)**




[2] From 2005 to 2006, the average emission factor associated with the generation of electricity in the Province decreased from 0.00021 to 0.00018 t CO2e/kWh. From 2006 to 2008, this emission factor increased from 0.00018 to 0.00022 t CO2e/kWh. On an annual basis, these emission factors can change substantially. Therefore, these changes must be considered when interpreting the changes in emissions from year to year for sources consuming electricity.

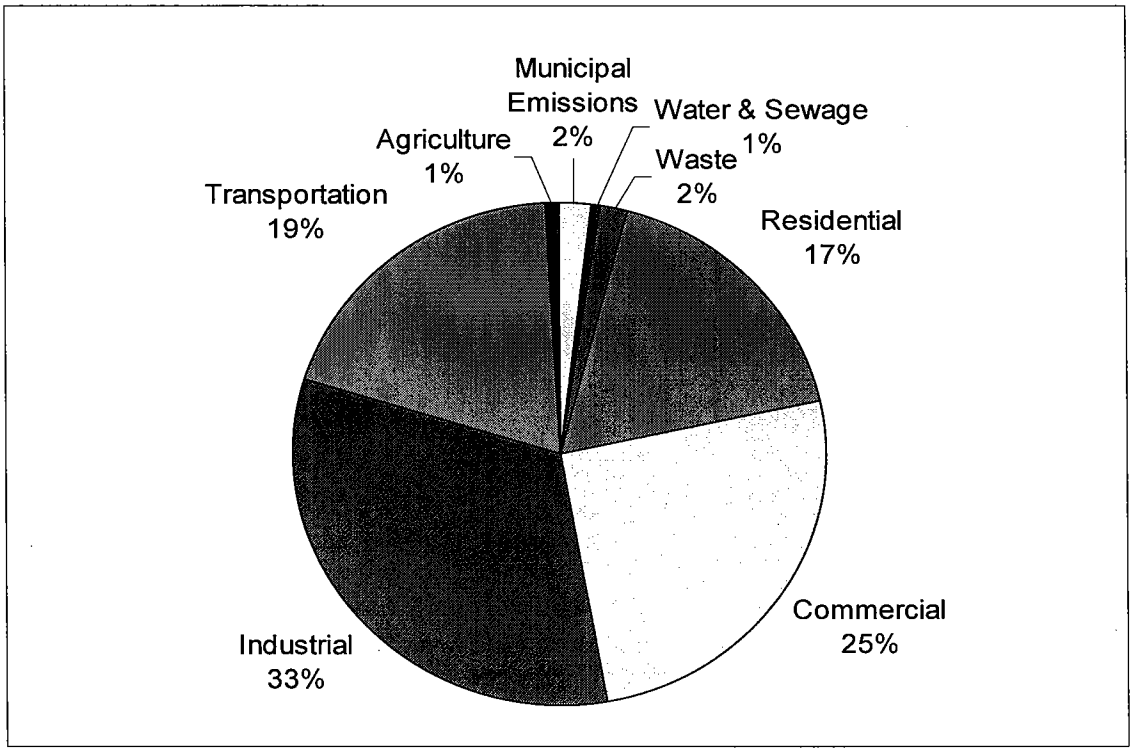
**Figure 2: Changes in Community Emissions from 2006 to 2008**




Municipal operations contribute to only 1% of our community's GHG emissions (**Figure 1**). However, municipal policies influence GHG emissions from waste, transportation, and residential and commercial buildings and to some aspects of industrial emissions. The Steel Sector (58% of **Figure 1)** is regulated by the federal government to address greenhouse gas and energy emissions. **Figure 3** removes the steel sector to highlight the areas that Hamilton can influence through local and provincial policies, programs and partnerships in the community including transportation (19% of **Figure 3**), industrial, commercial and residential energy usage (totalling 75% of **Figure 3**).

**Figure 3: Total Greenhouse Gas Emissions Corporate and**

**Community (2008) Minus Steel**




Significant emission reduction in community emissions was achieved in waste management through the capturing of landfill gases to convert to energy at the City owned and operated Glanbrook landfill site.[3] 2009 data shows a 90% reduction in emissions from 120,414 tonnes in 2005 to 12,567 tonnes in 2009 from capturing of methane emissions.

Further actions in energy conservation, "green" energy production (decreasing the usage of coal generated electricity by 2014 and increased alternative energy options – wind, solar, co-generation), encouraging multi-modal personal transportation and increased transit, and increased green and efficient development by the Province, local utilities, business, and local government can influence community emissions closer to the interim community target of 11,482,787 (10%) tonnes by 2012. However, City Council, the industrial and commercial community, and residents will have to work together to implement these actions to reduce emissions locally and influence other levels of government to support actions which the City cannot directly control to achieve emissions targets.

**Community Engagement**

[3] Although the operation of the Glanbrook Landfill is owned and operated by the City and is considered a Corporate operation, International Greenhouse Gas Standard Protocols require that Municipal and privately owned and operated landfills be considered in the Community Inventory.

The City released a discussion paper titled "Taking Stock: Greenhouse Gas Emissions in Hamilton" in June 2010 to inform and engage citizens on climate change in Hamilton (Available at: www.hamilton.ca/climatechange). It seeks partnerships and input from citizens on taking further action to reduce emissions. Engagement of the public, stakeholders, and partners is an important step towards the development of a City-wide Community Climate Change Plan.

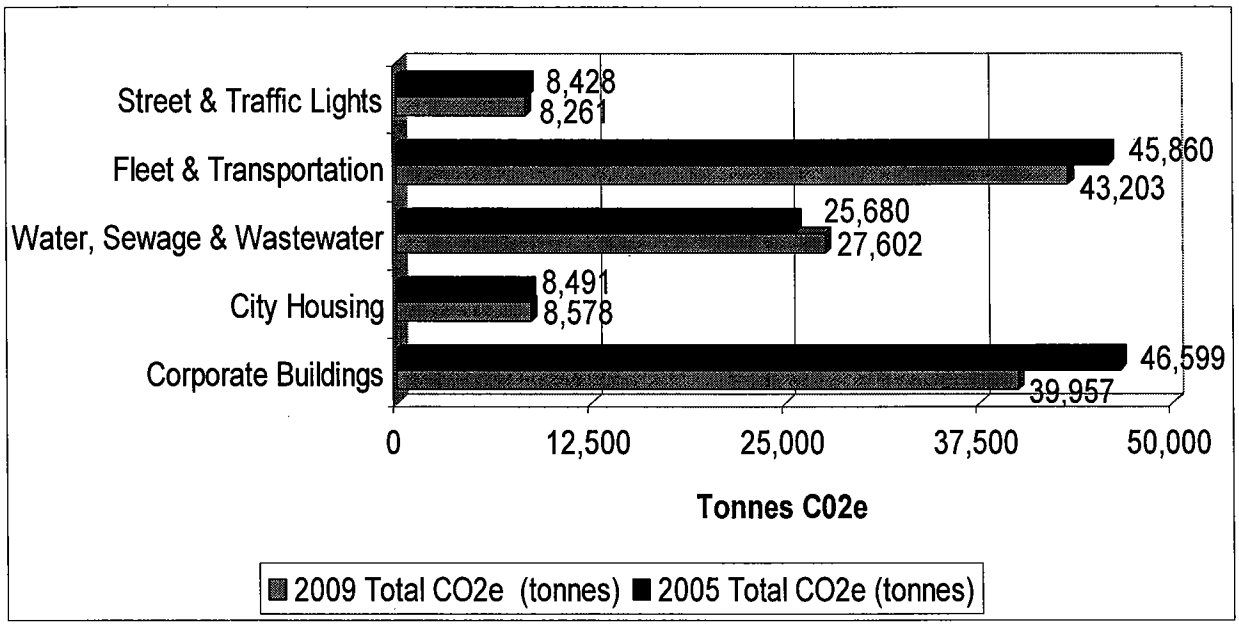
The "Taking Stock" discussion paper also prepares the community for a proposed Climate Change Community Summit to take place in Hamilton in Winter 2011. The discussion paper and feedback from citizens will be incorporated into the program for the 2011 Summit.

Preliminary responses from the community indicate support for taking action on addressing climate change in the community. Areas of interest include active and sustainable transportation, energy conservation and alternative energy sources, more green spaces and trees, improved development and re-using existing building stock, light rail rapid transit, less consumption, and more information and communication to make informed decisions. The community also wishes to see stronger support, communication and leadership from Council on climate change actions.

**Corporate Greenhouse Gas Emissions- 2009**

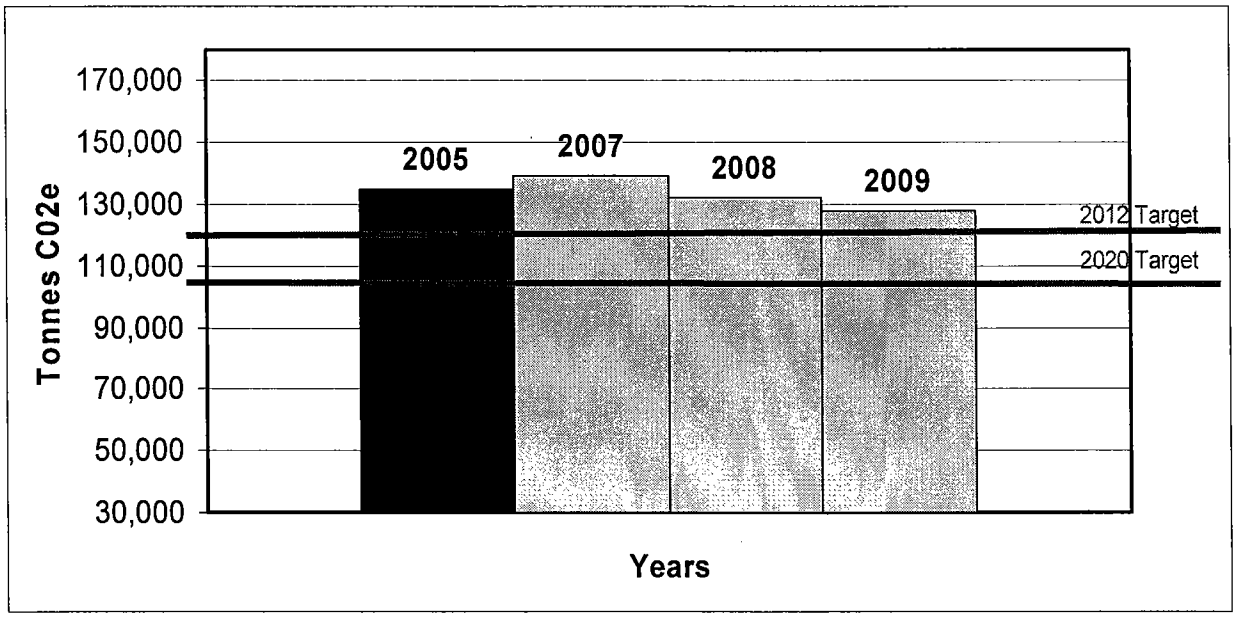
In 2009, the Corporation reduced its greenhouse gas emissions to 127,690 tonnes, a 5.4% reduction of emissions from the 2005 baseline of 135,052 tonnes. The Corporation is on course for achieving the 10% reduction target of 121,534 tonnes by 2012. The reductions in Corporate greenhouse gas emissions **(Figure 4)** have risen from increased energy and fuel conservation efforts by City operations and City staff through buildings, lighting, fleets and employee travel.

**Figure 4: Municipal emissions from 2005 to 2009**




The Corporation has made significant yearly progress since 2007 towards reducing greenhouse gas emissions (**Figure 5**). In 2009, emissions were reduced to 127,890 tonnes (5.4%) compared to the 2005 emissions baseline.

**Figure 5: Municipal Emissions Yearly Trends**




## Corporate Actions to date:

Under the Corporate Air Quality and Climate Change Strategic Plan (PED06336 (a)) Phase II and the City of Hamilton: Air Pollutant and GHG Inventory Project Report (PED09287), a number of short term to medium term (2007-2011) directions and recommendations were presented to Council to address greenhouse gas emissions and adapt to climate change. **Table 1,** below, provides an update on the actions the City has undertaken to address these recommendations.

**Table 1: Update on PED06336 (a) actions/recommendations**

| Category | Recommendation | Actions/Status |
|---|---|---|
| **Governance** | Establish the Corporate Air Quality and Climate Change Working Group. | Completed. Group formed in 2006 and work is on-going as new climate information and issues emerge under the Corporate Air Quality and Climate Change Strategic Plan (PED06336 (a)). |
| | Create a Climate Change Co-ordinator position to support the Corporate Air Quality and Climate Change Strategic Plan. | Work supported by Air Quality Co-ordinator in Planning and Economic Development. |
| | Undertake an emissions inventory for the Corporation (2005 base year) and the City of Hamilton (2006 base year) in 2008 and report to Council the results of the emissions inventory. | Completed (PED09287) and annual updates of Inventory to Council as part of Corporate Strategic Plan.<br><br>Future proposed enhancements to look at missing elements (i.e. forestry) to keep Inventory abreast of new information. |
| | Update the Corporate Smog Response Plan to improve air quality year-round and incorporate actions to address potential winter and fall smog advisories. | Completed. Corporate Smog Plan updated annually.<br><br>Need to examine incorporation of Government of Canada's Air Quality Health Index (AQHI) into Plan. |
| | Direct the inclusion of air | Inclusion through the City's |

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| | quality and climate change objectives in all Corporate and Department Strategic Plans. | 2008-2011 Strategic Plan in Focus Area 6: Environmental Stewardship, and Desired End Result 6.2 - reduce air and GHG emissions in City operations starting with a 10% reduction of 2005 levels, by 2012. |
| | Direct all Departments to take appropriate action and incorporate responses to potential climate change risks into corporate operations. | Human and financial resources are required in order to fulfil this requirement. Budget and funding proposal will be developed in 2011. |
| **Adaptation** | Invest in climate change adaptation planning, as well as continuing to invest in climate change mitigation programs. | Human and financial resources are required in order to fulfil this requirement. Budget and funding proposal will be developed in 2011. |
| | Undertake vulnerability scans of climate change impacts on municipal operations. | Human and financial resources are required in order to fulfil this requirement. Budget and funding proposal will be developed in 2011. |
| | Develop and maintain a comprehensive risk-based analysis, in conjunction with the vulnerabilities scan, to determine climate change based high risk events in order to support co-ordinated inter-departmental mitigation programs to reduce risks and vulnerabilities. | Human and financial resources are required in order to fulfil this requirement. Budget and funding proposal will be developed in 2011. |
| | Research climate adaptation strategies for buildings and city infrastructure. | Human and financial resources are required in order to fulfil this requirement. Budget and funding proposal will be developed in 2011. |
| | Enhance disaster | On-going through Hamilton's |

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| | preparedness and emergency response plans. Strengthen emergency communications, emergency preparation, public education, and emergency response coordination (e.g. planning for the combat of infectious diseases, illness, temperature and poor air quality induced health impacts). | Emergency Management Program. |
| **Transportation** | Support public transit as a viable transportation mode within the City through a Transit Master Plan. | The City supports rapid Transit and Transit Orientated Development (PW08043 and PW09007).<br><br>City staff are integrating the Canadian Urban Transit Association (CUTA)Transit Vision 2040 (PW09081) into the Transit Division Operations Plan strategic initiatives that support Council's Strategic Plan, Public Works Business Plan, Transportation Master Plan, and the Transit Division Ridership Growth and Asset Management Plan. |
| | Commit to Transportation Demand Management by encouraging and expanding the number of employees using Transportation Demand Management services (car pooling, car sharing, use of transit, flexible work time, telework, and cycling). | On-going through Smart Commute Hamilton (PW10062). |
| | Continue to green the | On-going, Green Fleet |

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| | corporate and transit fleet through the investigation and incorporation of hybrid and new vehicle technologies, right sizing and alternative fuels to replace older vehicles coming out of service. | Implementation Plan Phase II (PW03147(c))<br>Continued replacement of City street sweepers (PW05095(b)). |
| | Investigate the feasibility of incorporating electric vehicles in the vehicle fleet, including investigating the potential for these vehicles to reduce emissions. | On-going, Green Fleet Implementation Plan Phase II (PW03147(c)). |
| | Continue to build on efforts to adjust signal lighting to allow traffic to flow during peak times. | On-going through Public Works. |
| | Require City employees and citizens to eliminate unnecessary vehicle idling. | City Idling Policy and City By-law (PED07070 and By-Law No. 07-160).<br><br>Enforcement needed. |
| | When developing contracts or soliciting quotations for contracted fleet services, incorporate emission considerations into the appropriate documentation, and consider optimization of vehicle travel associated with contracted fleets. | Under investigation by Public Works. |
| | Identify off road emission sources within the community and quantify emissions. | Under investigation by Clean Air Hamilton. |
| **Energy Management & Conservation** | Encourage energy conservation and demand management within City operations. | Corporate Energy Policy (PW07127). |
| | Examine the use of | Corporate Energy Policy |

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| | renewable technologies in supplying energy to new and existing City Facilities. | (PW07127).<br><br>The City partnering with Horizon Energy Solutions Inc. (HESI) on a pilot project to design and install solar photovoltaic (PV) systems on the rooftops of some City-owned facilities. |
| | Continue to investigate building and infrastructure components that can be targeted to reduce energy demand in existing and new City buildings and infrastructure. | On-going though the Corporate Energy Policy (PW07127). |
| | Consider the energy usage and associated air and greenhouse gas emissions in City equipment operations and purchase. | Corporate Energy Policy (PW07127). |
| | Investigate opportunities to reduce emissions associated with City Housing. | Installation of high efficient furnaces, boiler units, Energy Star appliances as well as other mechanical upgrades. Reduction of power via limiting switches, reduction of water consumption via low flow toilets, shower heads and tap sets. |
| | Encourage energy retrofits, especially in low income neighbourhoods and housing. | Green Venture and Horizon Utilities with the support of Federal and Provincial governments have undertaken programs to address energy retrofits in Hamilton neighbourhoods. |
| | Consider an energy asset mapping exercise to determine the extent to which local energy resources can be harnessed and used by the City and community. | Underway in Planning and Economic Development through the Community Energy Collaborative- Land Use Energy Mapping project. |
| | Collect data to improve the | Investigation of small engines |

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| | use of small engines by the City and consider a project to review regulatory, policy, and standards as it relates to small engines, an evaluation of alternatives to using two-stroke engines, and alternative landscape and maintenance practices to reduce the use of equipment that uses small engines. | is on-going as engines require replacement.<br><br>Pilot program on low-turf emissions mowing equipment (OM09-17).<br><br>Clean Air Hamilton working with Green Venture to deliver education program on small engines in 2010 (PED10119). |
| | Servers and storage rooms associated with information technology can consume substantial energy which produces emissions. Consider disaggregating this energy use from total energy consumption, and investigate opportunities to reduce emissions. | Future investigation by City staff. |
| **Land Use Planning** | Implement the approved land use planning related growth strategy (GRIDS and the recommendations of the associated Master Plans). | City's Official Urban Plan (PED09164).On-going. |
| | Examine and incorporate air quality and climate change policies into the City's Official Plan. | Policies were introduced into the City's Official Urban Plan (PED09164). |
| **Green Infrastructure** | Undertake a tree inventory with community support to provide information for a Forestry Management Plan. | Aerial mapping of forestry canopy completed by Forestry. Data being reviewed.<br><br>ReLeaf Hamilton and City working together to develop co-ordinated tree projects in the community. Future potential for tree inventory. |
| | Develop a comprehensive | Aerial mapping of forestry |

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| | Forestry Management Plan with sustainable canopy targets. | canopy completed by Forestry. Data being reviewed for future plan. |
| | Compile a complete inventory of trees in Hamilton and determine the carbon sequestration potential of these trees. | ReLeaf Hamilton and City working together to develop. Future potential tree inventory. |
| | Create a Fund to preserve and enhance parks and forests in the Hamilton community. | Work in progress with ReLeaf Hamilton. |
| | Incorporation of energy efficiency, waste management, water efficiency and low air and greenhouse gas emissions in the retrofitting of Hamilton City Hall. | Completed (PW08130). The total emissions reduced as a result of the City Hall renovations were 1,134 tonnes of $CO_2e$ per year and are expected to reduce energy consumption by 35 percent. |
| | Study the feasibility of green and white roofs in the downtown of Hamilton. | Under investigation by Public Works. |
| | Adopt green development standards (LEED, Energy STAR) for public and private developments and have City staff become LEED Accredited professionals. | Under the Corporate Energy Policy (PW07127), the Corporation is piloting a LEED 3 year program.<br><br>LEED Grant Program - City of Hamilton's LEEDing the Way Community Improvement Plan (PED08169 (a)). |
| **Water & Wastewater Management** | Encourage water conservation in Hamilton to ensure adequate supplies of water under extreme weather scenarios (flooding, drought, lower lake levels, brownouts). | Under investigation as a Water Conservation Master Plan. |
| | Incorporate air quality and | Identification of climate |

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| | climate change in the planning of water, wastewater and stormwater infrastructure and policies to ensure adaptive response to a changing climate. | change into water/waste water planning as part of updates to Storm and Water/Wastewater Master Plan in 2012 (PW06029). |
| | Consider impacts on local air quality and reduction of greenhouse gases in City water & wastewater operations. | Identification of impacts in City's Woodward Wastewater Treatment plant (WWTP) expansion of co-generation facility and sludge treatment (PW07047). |
| **Waste Management** | Continue the reduction and diversion of waste through the use of recycling, green carts and composting which reduces environmental impacts associated with landfills. | On-going. Staff reported back on diversion options to meet the 65% target for waste diversion (PW07151 (a), PW07151(b) and PW07151(c)).<br><br>The City of Hamilton's Solid Waste Management Master Plan (SWMMP) is under review. It is anticipated that the term of the SWMMP review will extend over sixteen months and be effective through September 2011 (PW07151(c)). |
| | Determine actions to address | The City is investigating the |

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| | the 35% of remaining waste, recognizing potential air pollutants, toxins and greenhouse gas emissions in actions. | integration of an Energy from Waste from the Glanbrook Landfill Site (PW08113(a)) as part of the City of Hamilton's Solid Waste Management Master Plan (SWMMP) review.<br><br>The City of Hamilton's Solid Waste Management Master Plan (SWMMP) is under review. It is anticipated that the term of the SWMMP review will extend over sixteen months through Fall 2011 (PW07151(c)). |
| **Procurement** | Consider developing green or sustainable procurement policies, in addition to the existing environmental purchasing considerations. | Under investigation as part of Procurement Policy review (COW 09-030). |
| | Consider the potential for future projects to generate carbon offsets. | Under investigation as part of Corporate Energy Policy (PW07127). |

In addition to these identified actions, further actions by the Corporation in 2009 and 2010 that will lead to further reductions in greenhouse gas emissions include:

- "Shifting Gears 2009" the City's Cycling Master plan (PW09068) promotes increased cycling infrastructure and maps the cycling network routes planned for the next 20 years. In 2009, approximately 7 kilometres of bike lanes were added in the City including King St (crossing Centennial Pkwy), Sanders Blvd, and Stone Church Rd. In 2010, an additional 2 kilometres was added on Dundurn St with additional bike lanes yet to install - including an up-bound bike lane on the Jolley Cut and other locations.
- Transportation Demand Management Programs that encourage active and sustainable transportation options for City staff and for the community that have been undertaken in 2009 and 2010 include Carpool Week, Clean Air Commute (replaces the commuter challenge), Open Streets Hamilton, increased carpooling (117% increase as of February 2010; the fastest growth rate in the GTHA), designing and installing new secure bike parking facilities, exploring bike shares with McMaster University, exploring the feasibility of augmenting or replacing

portions of the Corporate fleet with Carshare vehicles, and encouraging more pedestrian movement.

- Through the Smart Commute Hamilton initiative, the City is working with corporate partners to analyse travel demand and develop corporate travel demand plans and carpooling strategies for new partners including Horizon Utilities Corporation, Yale Properties, the Hamilton Chamber of Commerce and Arcelor-Mittal Dofasco.
- The City of Hamilton is moving forward with plans to bring rapid transit to Hamilton. Rapid Transit will help cut back single person vehicle use and help the City reach its target of a 20% decrease in vehicle kilometers traveled over current trends.
- The City of Hamilton's Corporate Energy Policy was approved in November of 2007 and set forth targets for energy reduction of 1.5% per year (3.0% by 2009, 7.5% by 2012 and 20% by the year 2020). Savings is compared against the base year of 2005. Efforts to meet these targets through the end of 2009 have resulted in an 8% overall reduction in energy consumption.
- The establishment of the Hamilton Community Energy Collaborative with the purpose of evaluating City-wide vulnerabilities by examining the most recent predictions with respect to peak oil[4] and evaluating Hamilton's energy profile. The energy collaborative can address the energy linkages to climate change and air quality as air pollutants and greenhouse gas emissions are combustion by-products of fossil fuels (oil, natural gas, diesel, coal).
- The City, in partnership with Horizon Utilities and the Canadian Urban Institute, is undertaking a Community Energy Mapping initiative that will assist in determining the extent to which local energy resources can be harnessed and used by the City and community. The mapping work will also help enhance and refine the community GHG inventory energy components by assisting to identify significant local energy and GHG sources.
- District Cooling Loop in downtown core – replacement of four new chillers at the Central Utilities Plant, along with new pumps and drives resulting in $400,000 in annual savings and reductions of GHG emissions by 1,040 tonnes per year. Expansion of the cooling loop to the new City Hall and also to the Lister Block. Redesign and replacement of chiller system at the Library/Market.
- The Glanbrook Landfill Gas to Energy project collects landfill gas to generate electricity and sell to the Ontario grid. The facility, which has been operating since November 2008, generates 26 million kilowatt-hours of electricity per year in renewable electricity and reduces GHG emissions and odours.
- In 2007, the City's Woodward WWTP implemented a 1.6 MW co-generation facility fueled entirely by methane sourced from the anaerobic digestion of sewage sludge treated at the plant. In 2010, the co-generation plant saved 9,228 tonnes of greenhouse gas emissions. City Staff have initiated steps to further

[4] Peak Oil refers to the point at which total global oil production cannot grow any further and begins to decline.

enhance the sludge treatment process and expand the City's ability to produce and utilize renewable energy now and as sludge volumes grow over the next 20 years. The initiative will see co-generation capacity alone double to 3.2 MW.

- The City's Community Food Security[5] Stakeholder Advisory Committee advises City Council, staff and related policies. They provide education and outreach to the local community on food security issues. A number of municipalities have begun to examine or incorporate urban agriculture and food policies as a part of their energy and climate activities examining the life-cycle greenhouse gas (GHG) emissions associated with food production against long-distance distribution, or "food-miles", of food. The committee is examining local food distribution and procurement, community garden policies (PW10044) and farmer markets.

## Next Steps

The Corporation is making good progress towards meeting the 10% emissions targets for 2012. City staff continue to take action and support programs that will reduce emissions further into 2012 in the City and community.

The community has also been engaged in climate change and the need to take action to reduce emissions through the "Taking Stock" Discussion Paper as well as staff presentations to both community and city committees. City staff will facilitate a Climate Change Community Summit in Winter 2011 to identify and develop actions with the community.

If you have any questions, please contact Brian Montgomery, Air Quality and Climate Change Co-ordinator, Brian.Montgomery@hamilton.ca or extension 1275.

BM/RA

[5] Food security refers to the availability and access to food.