TOWN OF AJAX

AJAX CORPORATE GREENHOUSE GAS EMISSIONS INVENTORY

PARTNERS FOR CLIMATE PROTECTION: MILESTONE 1

6/3/2011

1 INTRODUCTION

Global climate change is arguably the most significant environmental concern of our time. Over the last 150 years, atmospheric concentrations of several heat-trapping gases (Greenhouse Gases) have increased. As a result we are starting to see new trends including shifting weather patterns, an increase in the force and frequency of catastrophic weather events and changes in seasonal migration patterns. However, the impacts of climate change go beyond environmental; there are societal impacts such as changes in vector-borne disease dispersal and economic impacts such as the costs associated with flood damage and degraded farm land. For these reasons and many more, it is clear that Greenhouse Gas (GHG) emissions reduction should be a top priority for governments, organizations, communities and residents.

Partners for Climate Protection (PCP) is a program that is supported by the Federation of Canadian Municipalities (FCM) and ICLEI-Local Governments for Sustainability and provides a network for Canadian municipalities that have committed to reducing their Greenhouse Gas emissions. Using a five Milestone framework, PCP is able to provide recognition to municipalities that achieve each milestone: inventory and forecasts; emissions reduction targets; a plan to achieve targets; plan implementation; monitoring and results reporting.

This report is meant to fulfill the requirements of the corporate component of Milestone 1: Inventory and Forecasts. This is an essential step in the GHG reduction process, as it provides a baseline that can be used to set targets and compare against future emissions to determine results.

2 CORPORATE SUMMARY – INCLUSIONS AND EXCLUSIONS

The Corporation of the Town of Ajax manages various services and facilities to the community. In 2005 this included waste management, parks and recreation, road and walkway lighting, and the operation of 15 facilities:

1. Town Hall
2. Main Library
3. Ajax Community Centre
4. McLean Community Centre
5. Operations Centre
6. Fire Hall #1
7. Fire Hall #2
8. Mill Street Community Centre
9. St. Andrews Seniors Centre, Community Centre and Gym
10. Village Arena and Community Centre
11. Village Senior Centre
12. Rotary Pavilion
13. Memorial Pool
14. Village Library
15. Sportsplex

As a township in Durham Region, Ajax is not responsible for any of the costs or emissions associated with water and sewage infrastructure. This section of the Corporate Emissions Inventory has been left blank, but is presumably included in the Regional Greenhouse Gas Inventory.

3 METHODS

3.1 SELECTION OF BASELINE YEAR AND ESTABLISHING BUSINESS AS USUAL FORECAST

The corporate baseline year of 2005 was selected for this inventory to coincide with the U.S. Western Climate Initiative's Cap-and-Trade and Canada's federal baseline. In order to harmonize with these programs and to provide trend data, inventories were established for the years 2005, 2006, 2007 and 2008. A business-as-usual (BAU) forecast for the year 2020 was created based on the premise that the Town makes no further efforts to

reduce corporate emissions and waste. This BAU forecast is based on the increased emissions observed between 2005 and 2008.

3.2 DATA COLLECTION

Representatives of the Town of Ajax provided data for this project. It was necessary, in most cases, to assemble data from archived records. In some cases, data sources varied depending upon the type of expenditure required to calculate emissions.

For 2005-2008, actual records were available for utilities (natural gas and electricity) and corporate vehicle fuel use.

Waste collection frequency and bin size data (for Town facilities only) was available for 2005, but not for trend years. The mass of waste was estimated assuming that dumpsters were full at collection and using the FCM 150kg/yard estimate; the Town's contract with the waste management provider was based on frequency of collection, because dumpsters were not weighed prior to collection. The amount of waste calculated for 2005 has remained constant across trend years; the number of bins and their size has remained the same (employee knowledge) and there is no way for us to determine if the bins were any more or less full.

In the case of personal vehicle mileage, personal expense reports provided the number of kilometers driven, but did not provide information regarding the kind of vehicle or its mileage. Personal vehicle mileage is a record of the number of kilometers driven by Town employees in their own personal vehicles for the purpose of Town business. This may include driving to a conference in another city, or a meeting across town. It is important that the emissions associated with personal vehicle use are taken into account in this inventory; however, for the previously mentioned reasons, it is not possible to get an exact fuel usage from which emissions can be calculated. In order to estimate fuel use, average fuel mileage for vehicles between 2000 and 2005 was determined using NRCAN data. Average fuel mileage for vehicles was determined based on a 2000-2005 timeframe to account for the diversity of vehicles on the road.

Personal Vehicle mileage was only available for the baseline year (2005). For 2006-2008 trend calculations, an estimate was calculated using the baseline mileage and the percent change in number of town employees. Given the small percentage of overall fuel consumption associated with personal vehicle use, and that the number of Town employees only varied nominally, we believe this to be an adequate determinate of emissions associated with this facet of the vehicle fleet.

3.3 DATA ANALYSIS

Data was analyzed using the FCM emissions inventory spreadsheet (provided as an appendix to this report).

4 CORPORATE (TOWN) INVENTORY, TRENDS AND FORECAST

4.1 INVENTORY BASELINE YEAR – 2005

In the 2005 baseline year, the corporation of the Town of Ajax generated 6353T of eCO_2. Buildings were associated with the highest eCO_2 emissions followed by Streetlights, Vehicle Fleet, and finally Waste.

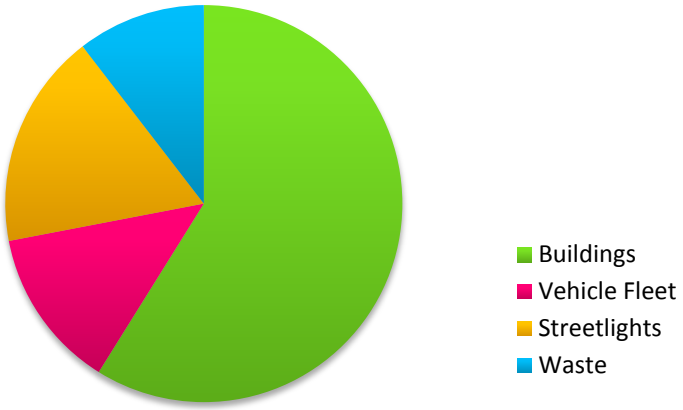
Table 1 provides an absolute and percentage breakdown of Greenhouse Gas emissions by sector.

TABLE 1. 2005 GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	Absolute Emissions (t)	Percentage Emissions (%)
Buildings	3,741	59
Vehicle Fleet	833	13
Streetlights	1,116	18
Waste	664	10

Figure 1 illustrates corporate Greenhouse Gas emissions by sector.

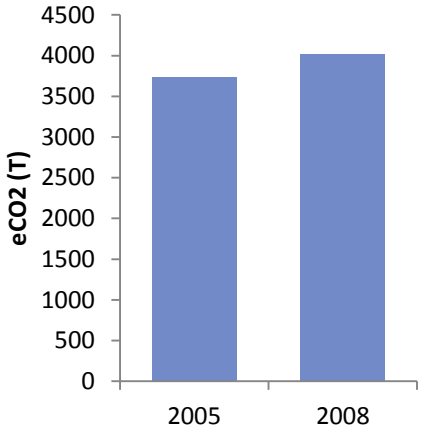
FIGURE 1. 2005 GREENHOUSE GAS EMISSIONS BY SECTOR



4.2 GHG TRENDS AND BUSINESS AS USUAL FORECAST

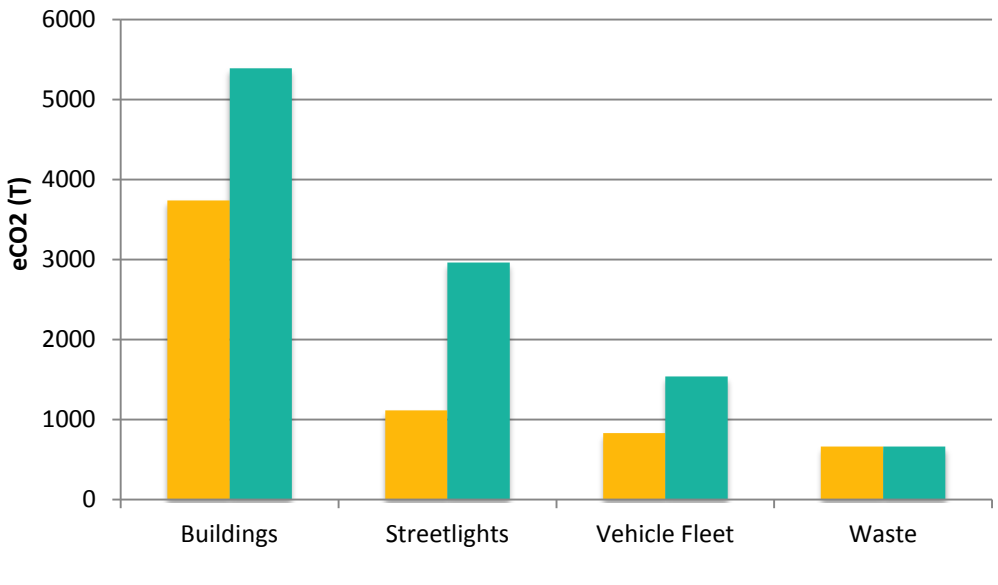
Overall, corporate GHG emissions increased by approximately 10% from 2005-2008. This is attributed to an increase in the Town's Vehicle Fleet, and additional infrastructure to support the growing town. Figure 2 illustrates the overall increase in emissions across all sectors.

FIGURE 2. CHANGES IN OVERALL EMISSIONS 2005-2008



If this same 10% increase occurred every 3 years, by 2020 our emissions would be 161% their current levels: 10229T. Figure 3 illustrates this increase for each sector based on individual trends.

FIGURE 3. ACTUAL EMISSIONS BY SECTOR 2005 COMPARED TO FORECASTED BAU EMISSIONS 2020



**Note:
Waste data remained the same over the trend years (2005-2008). Therefore, projections for 2020 assume no change as well.

4.3 GHG EMISSIONS TRENDS AND FORECAST BY SECTOR

4.3.1 BUILDINGS

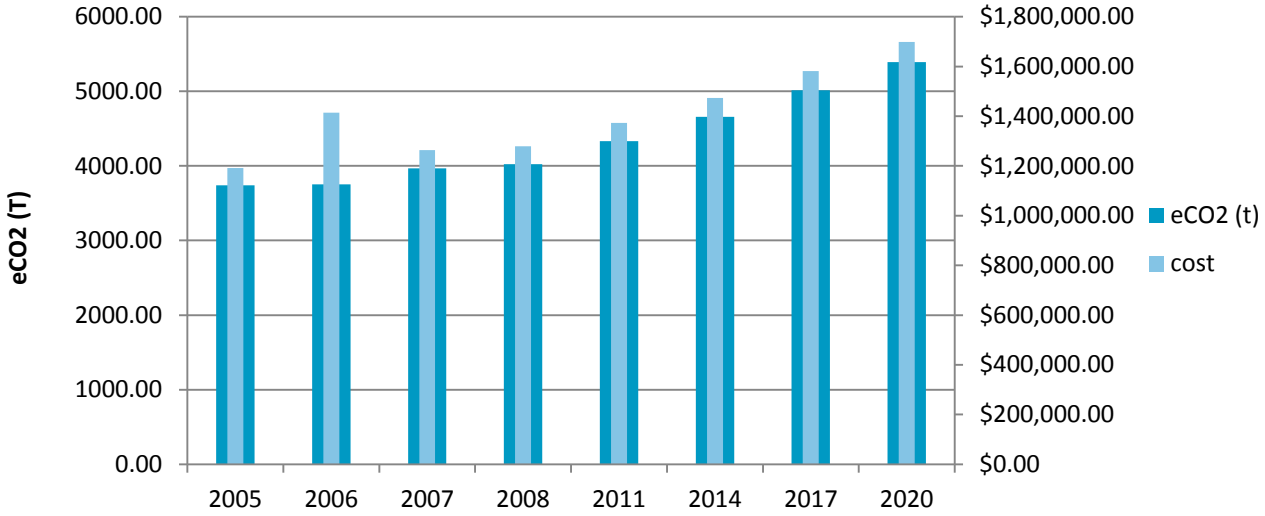
The Buildings category includes all the Greenhouse Gases directly or indirectly associated with the electricity and natural gas required to heat/cool and light Town buildings. The energy used by the equipment in these facilities is also accounted for in this category. While natural gas is burned on site and produces carbon emissions directly, the indirect emissions associated with electricity generation outside of the Town still must be accounted for; this calculation is a component of the PCP Inventory Quantification Spreadsheet and takes into account the provincial electricity mix.

Overall, Greenhouse Gas emissions for Town Buildings have increased 7.6% from 2005-2008. If this trend continues, the Town can expect a 34% increase in emissions, amounting to 5013T of eCO_2 by 2020. This trend and the associated costs are presented in Table 2 and Figure 4.

TABLE 2. TOWN BUILDINGS – PROJECTED GHG EMISSIONS AND COSTS TO 2020

Year	eCO2(T)	Cost ($)
2005	3741	1,191,267
2006	3752	1,414,767
2007	3968	1,263,036
2008	4025	1,278,834
2011	4331	1,372,838
2014	4659	1,473,752
2017	5013	1,582,083
2020	5394	1,698,378

FIGURE 4. TOWN BUILDINGS - PROJECTED GHG EMISSIONS AND COSTS TO 2020



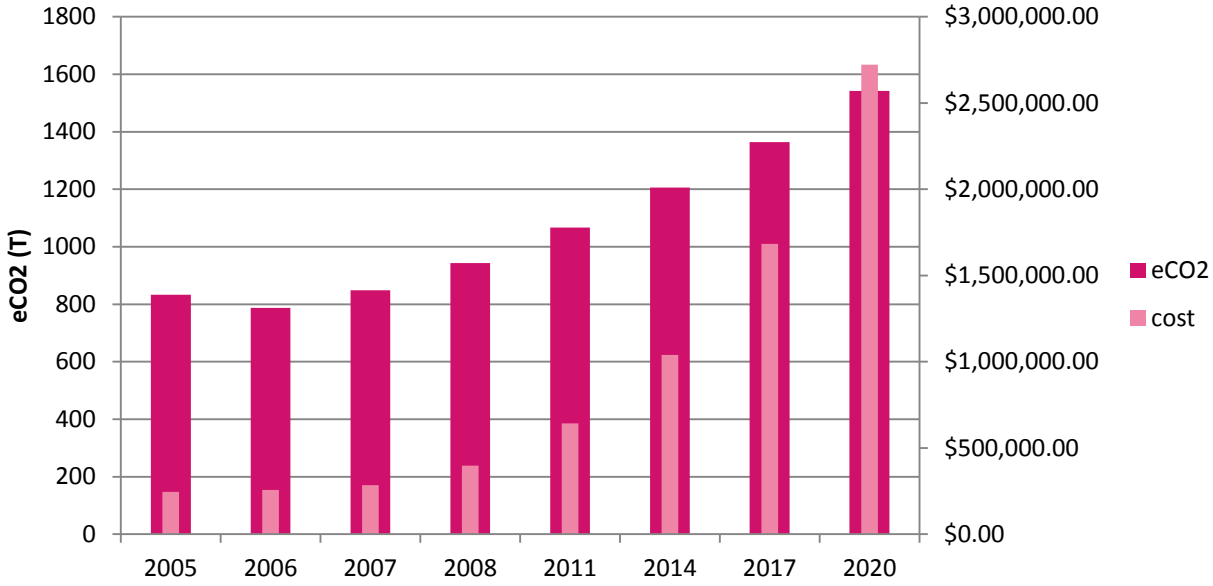
4.3.2 VEHICLE FLEET

The Vehicle Fleet category includes all GHG emissions produced by all vehicles in the Town's vehicle fleet; as per FCM guidelines, this does not include public transit. This inventory takes into account gas and diesel used by the entire municipal fleet, including lawn mowers, snow plows, etc. Between 2005 and 2008, emissions in this sector increased by 13%. If this trend continues, the Town can expect its vehicle fleet to contribute 1541T eCO_2 by 2020. This would represent an 84% increase in emissions in this sector. Table 3 provides emissions and cost data from 2005 and 2008 and forecast data for 2011, 2014, 2017 and 2020; this information is also presented graphically in Figure 5. Cost estimates do not include personal vehicle (although personal vehicles are included in eCO_2 estimates) use as mileage expenses account for aspects that are irrelevant to this inventory (such as car maintenance).

TABLE 3. VEHICLE FLEET – PROJECTED GHG EMISSIONS AND COSTS TO 2020

Year	eCO2 (T)	Cost ($)
2005	833	245,674
2006	787	255,952
2007	849	283,727
2008	943	397,461
2011	1065	643,028
2014	1205	1,040,316
2017	1362	1,683,064
2020	1541	2,722,926

FIGURE 5. VEHICLE FLEET - PROJECTED GHG EMISSIONS AND COSTS TO 2020



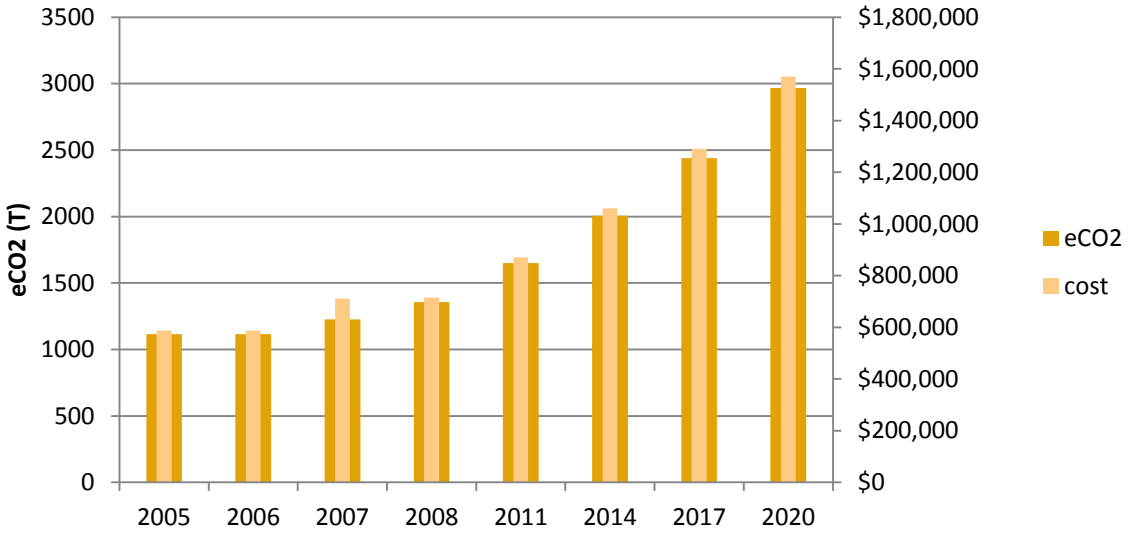
4.3.3 STREETLIGHTS

The Streetlights category includes all GHG emissions associated with the electricity required for traffic lights and street/path/walkway/park lighting. In 2005 Streetlights contributed 1116T eCO_2 to total corporate emissions. By 2008 this value had increased by about 22%, bringing absolute emissions associated with Streetlights to 1357T eCO_2. If this trend were to continue, by 2020 the Town can expect emissions in this sector to reach 2440T, or 219% of their 2005 values. This trend and the associated costs are presented in Table 4 and Figure 6.

TABLE 4. STREETLIGHTS – PROJECTED GHG EMISSIONS AND COSTS TO 2020

Year	eCO2 (T)	Cost ($)
2005	1116	587,560
2006	1116	587,560
2007	1226	711,055
2008	1357	715,279
2011	1650	870,760
2014	2006	1,060,039
2017	2440	1,290,462
2020	2966	1,570,972

FIGURE 6. STREETLIGHTS - PROJECTED GHG EMISSIONS AND COSTS TO 2020



4.3.4 WASTE

The waste category includes the landfill waste for Town facilities. Please note that landfill waste does not include recyclables – it only includes waste that goes directly to landfill. The Town provided records that included the number of garbage bins at each facility and the frequency of removal for 2005. From this, an estimate was calculated based on the assumption that bins were full at the time of collection using the FCM suggested estimate of 150kg/yard.

While data was not available for the trend years (2006-2008), staff stated that the number of bins and pick-up services remained the same for the duration of these trend years. As a result there is no increase in corporate waste from 2005 to 2008 and the estimate for 2020 is that it remains the same. However, as the Town expands and new facilities are built there is the possibility that new bins will be required and if there is no action plan in place to reduce the amount of waste to landfill, it is likely that there would be an increase in waste by 2020 indicative of that growth.

5 RECOMMENDATIONS

1. The Corporation of the Town of Ajax submit this document (Ajax Corporate GHG Emissions Inventory) and the Ajax Community GHG Emissions Inventory (prepared by Durham Sustain Ability for the Town of Ajax) to Partners for Climate Protection to fulfill the requirements of Milestone One.
2. The Corporation of the Town of Ajax review the emissions trends as presented in this document and set challenging, yet obtainable goals emissions reduction goals for 2020, thus fulfilling Milestone Two.
3. Integrate aspects of the creation of a Local Action Plan (LAP, Milestone Three) into the upcoming Integrated Community Sustainability Plan (ICSP) to avoid redundancy and overlap in the process of developing the two plans.

6 SUMMARY

In the baseline year (2005), the Corporation of the Town of Ajax produced 6353T of eCO_2. These emissions include those associated with the electricity and natural gas used by Town Buildings, fuel used by the Town's Vehicle Fleet, electricity required for Streetlighting and the indirect emissions associated with corporate Waste (not including recyclables). Energy required by water and sewage infrastructure was not included.

Using trend data from 2005-2008 it is estimated that Corporate GHG emissions for 2020 will be 10229 eCO_2 – 161% of 2005 values.

Setting an aggressive emissions reduction target will motivate Town operations and facilities to adopt leading edge environmentally responsible technologies and processes. It will also demand businesses and residents improve efficiencies and reduce their carbon footprints.

This is the first milestone of a five milestone program. There is still some ways to go, but knowing where the Town is in terms of emissions is essential to setting targets and monitoring success.