Item No. DS-10-217
Attachment No. 1

Oshawa Community Greenhouse Gas Emissions Inventory

January 2010

Prepared for:

City of Oshawa

Prepared by:

Durham SustainAbility

1709 Highway #7
Brougham, ON
L0H 1A0
www.sustain-ability.ca

Contents

1.0 Introduction

1.1 Background

In 2008, the Region of Durham initiated a multi-stakeholder advisory committee called the Durham Region Roundtable on Climate Change ("the Roundtable") to address climate change challenges in the Region both through mitigation and adaptation. In May 2009, Durham Sustain Ability (DSA) was retained to provide a community baseline greenhouse gas (GHG) emissions inventory for the Region as a whole, which was completed in October 2009.

The City of Oshawa has been able to leverage this initiative by retaining DSA to unpack the regional data and provide a community baseline GHG emissions inventory specifically for Oshawa.

1.2 Climate Change – Local Actions in a Global Context

Greenhouse gas concentrations in the atmosphere (the most common of which include carbon dioxide CO_2, methane CH_4, and nitrous oxide N_2O) have been increasing significantly over the past 150 years contributing to tangible global climate change effects. This is mainly caused by human activity: primarily burning fossil fuels as well as creating landfill waste methane and removing carbon sinks such as deforestation and agricultural practices.

An excellent summary paper outlining the current climate change science, GHG emission reduction targets and current/proposed strategies to meet those targets on the international, national and provincial/state levels along with comments and conclusions was endorsed by Regional Council in September 2009. The document can be found at http://www.durhamclimatechange.ca/report2009-J-37.htm

Climate change is a global issue requiring local action, mainly in the areas of responsible energy consumption and shifting to renewable energy sources. In Canada, FCM and the International Council for Local Environmental Initiatives (ICLEI) have developed a framework for reducing greenhouse gas (GHG) emissions for municipalities called Partners for Climate Protection (PCP). Currently, 194 Canadian municipalities have registered in the PCP program. The City of Oshawa became a member in April 2009.

The PCP program consists of five milestones:

1. Conduct a baseline GHG emission inventory analysis for municipal operations and the community.
2. Establish GHG reduction targets for municipal operations and the community.
3. Develop a local action plan outlining actions that reduce GHG emissions and energy consumption for municipal operations and the community at large.

4. Establish a program to implement adopted actions that will reduce GHG emissions as outlined in the local action plan.
5. Establish a monitoring and reporting system to verify GHG reduction achievements. Revise the action plan periodically to reflect new ideas and strategies.

Milestone 1 will be deemed complete with the submission to the PCP program of this work (Community Inventory) along with the corporate inventory to be completed by the City of Oshawa.

1.3 Methodology

Establishing a GHG emissions inventory involves gathering data on fuel, energy and waste from all sectors comprising the community at large. This community data includes the municipal operations data gathered specifically for the corporation by the City of Oshawa. Energy consumption data in the residential, industrial, commercial and institutional (IC&I), and transportation sectors are gathered along with waste generation and disposal information.

Early in the process, the major Durham energy providers of electricity and natural gas were gathered at a summit meeting in which they endorsed the program and participation in the energy data gathering as the start of a longer-term partnership. They were willing to become partners in subsequent stages of the program including participation in working teams addressing milestone 3 local action plan work.

The following energy providers supplied the energy data specifically for Oshawa:

Residential, IC&I sector electricity usage and prices – Oshawa PUC

Residential, IC&I sector natural gas usage and prices – Enbridge

Transportation sector data was gathered from existing survey information for Oshawa residents based on annual average daily trips and kilometers driven.

Durham Region provided waste generation and disposal data.

Once energy consumption and waste generation data were collected, appropriate emission coefficients can be applied for each source of energy and waste to landfill to calculate the resulting GHG emissions. Annual emissions are expressed in absolute terms and are not corrected for weather or population growth, however emissions are also expressed on a per capita basis for trend analysis.

The equivalent carbon dioxide coefficient (eCO2) for electricity is based on the annual average amount of fossil fuel (coal, natural gas, oil) used at Ontario's electricity power plants. Other sources such as hydropower, nuclear and renewable energy do not directly produce eCO2 emissions. As Ontario's electrical generation mix changes from year to year so does the eCO2 electricity coefficient. This means that the GHG emissions

associated with electricity consumption in Oshawa can vary year to year even if there is no significant change in energy usage, in fact when a municipality reduces its energy consumption, its GHG emissions may even increase if the provincial fossil fuel mix significantly increases. All municipalities participating in the PCP program use this GHG calculation methodology (PCP Protocol) in Canada and throughout the world.

2.0 Community Inventory, Trends and Forecast

2.1 Background

The community baseline year of 2005 was selected to coincide with the contemplated corporate inventory year. A number of cap-and-trade programs (e.g. Western Climate Initiative which Ontario has joined, US proposed program) use 2005 as the baseline year and Canada currently uses 2006 as a baseline (although this may change in order to harmonize with the US). In order to potentially harmonize with these programs and to provide trend data, it was decided that inventories would be established for the years 2005, 2006, 2007 and 2008. A business-as-usual (BAU) forecast for the year 2020 will also be provided based on population and household forecasts and the absence of any further efforts to reduce GHG emissions.

2.2 Community Summary

Oshawa's population has grown by 2.2% from 147,180 in 2005 to 150,365 in 2008. The population is forecasted to grow by 17.4% to 172,834 by 2020.

Table 1 summarizes the annual energy consumption, energy cost and GHG emissions on an absolute and per capita basis.

Table 1: Summary of Energy Consumption, Energy Cost and GHG Emissions

	2005	2006	2007	2008	BAU 2020
Energy Use (GJ)	17,859,997	16,831,738	17,073,199	15,368,086	17,664,535
Per Capita Energy (GJ/capita)	121.3	114.3	114.5	102.2	102.2
Energy Costs ($'000)	$333,746	$325,274	$320,781	$319,555	$367,306
Per Capita Energy Costs ($/capita)	$2,268	$2,208	$2,151	$2,125	$2,125
GHG Emissions (t eCO2)	1,033,219	938,595	949,102	862,803	991,732
Per Capita GHG Emissions (t eCO2/capita)	7.02	6.37	6.36	5.74	5.74

From 2005 to 2008, GHG emissions on an absolute basis have significantly dropped by 16.5% even with a modest growth in population. Energy consumption has declined by 14%, while total energy costs have dropped by only 4% as higher energy prices have offset much of the economic gain of reduced consumption.

In figure A, the business-as-usual (BAU) forecast for 2020 assumes no further efforts to reduce energy consumption such that the per capita GHG emissions remain the same as 2008. This results in an emissions increase of 128,929 t or 15% from 2008 levels. However, due to the significant reduction in emissions from 2005, the 2020 BAU forecast results in a 4% absolute reduction in GHG emissions from the 2005 baseline year. The difference between the 2005 GHG emissions of 1.03 million t and the BAU 2020 forecast of 0.99 million t results in a decline of over 40,000 t of eCO2 from the baseline.

The per capita eCO2 emissions provide additional trend analysis as it removes population as a variable. From 2005 to 2008, the per capita GHG emissions have been reduced by 18.3% from 7.0 t/capita to 5.7 t/capita.

Figure A: Absolute and Per Capita GHG Emissions with BAU Forecast

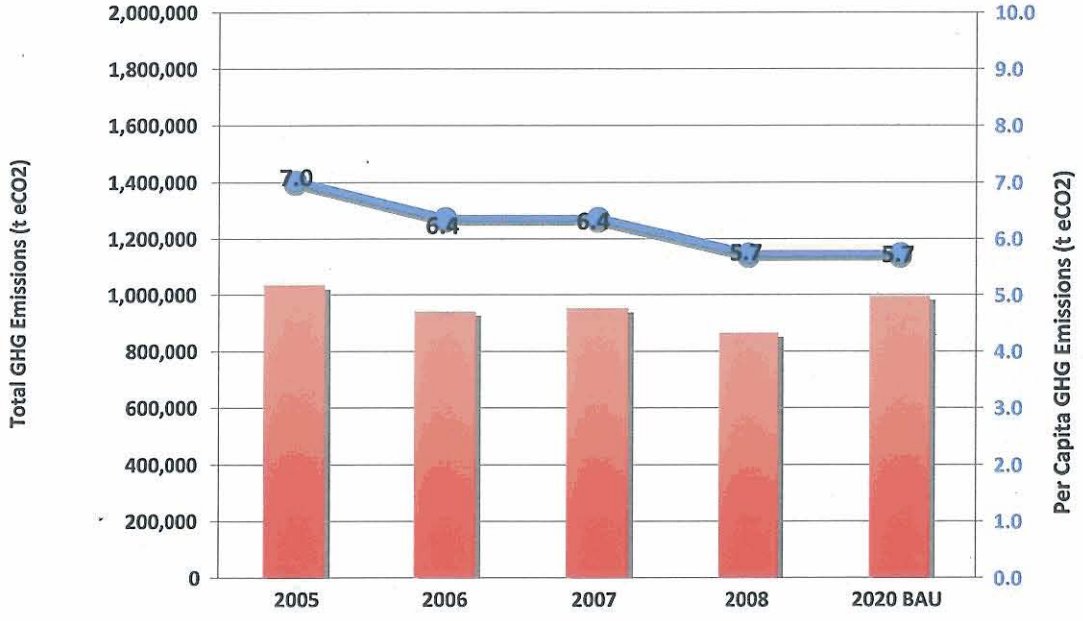
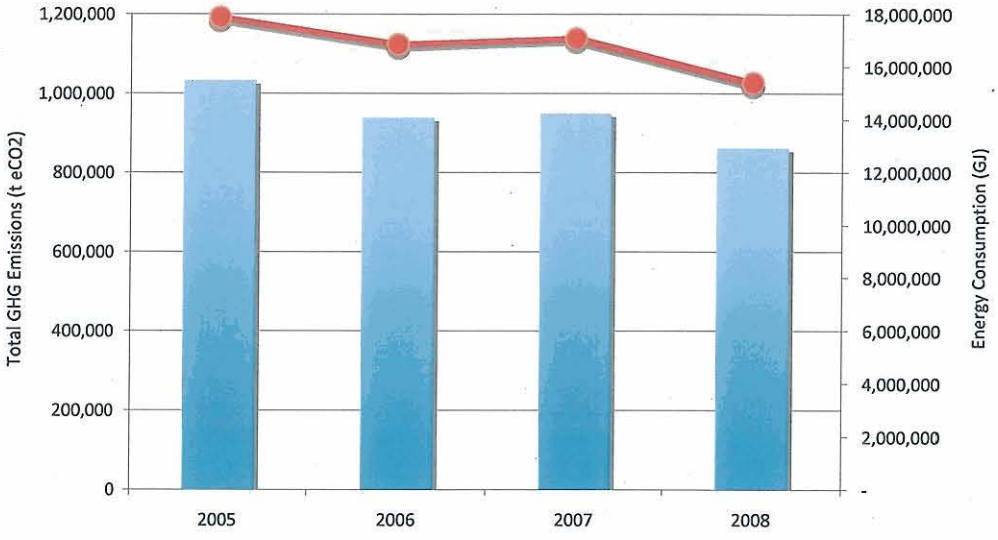


Figure B shows the close relationship between GHG emissions (blue bars) and energy consumption (red line). The energy consumption provides further refinement as it removes the effect of annual changes in the provincial electricity eCO2 emission coefficient. From 2005 to 2008, energy consumption was reduced by 14%, whereas GHG emissions have dropped by 16.5%. The 2.5% difference is mainly the result of the change in the provincial electricity eCO2 coefficient between 2005 and 2006 (the latest published year).

Figure B: GHG Emissions and Energy Consumption



2.3 Inventory Baseline Year - 2005

In the baseline year of 2005, the community generated 1.03 million t of GHG emissions from energy consumption and waste disposal. On a per capita basis, this equates to 7.0 t per person.

Refer to Figures C and D for a breakdown of energy consumption and GHG emissions by sector, respectively.

The institutional, commercial and industrial (IC&I) sector is the largest consumer of energy (56%) and emitter of GHG emissions (51%) followed by the residential sector (energy 30% and GHG emissions 28%) and vehicle transportation (energy 14% and GHG emissions 17%).

The community produced 118,364 t of waste of which 27% was diverted from landfill. The landfill waste produced 41,792 t of GHG emissions, corresponding to 4% of the total community emissions.

Figure C: 2005 Energy Consumption By Sector

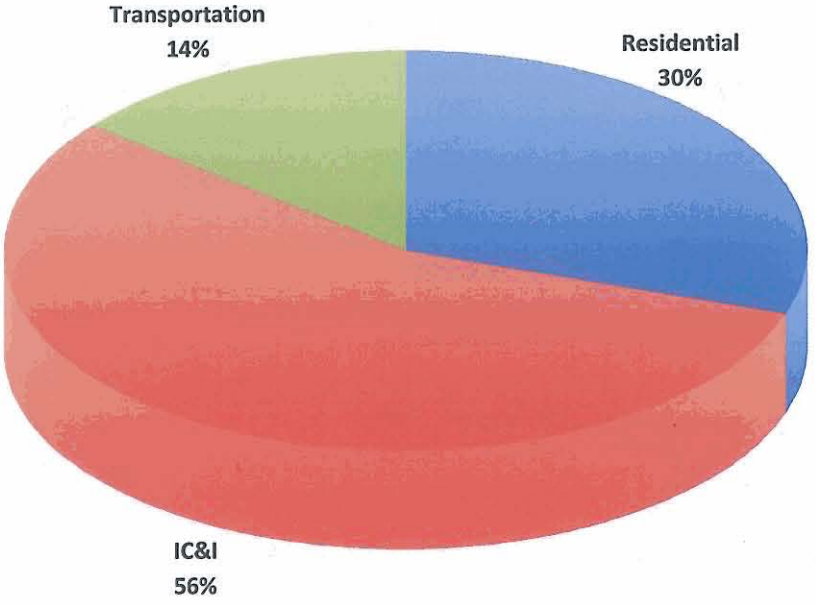
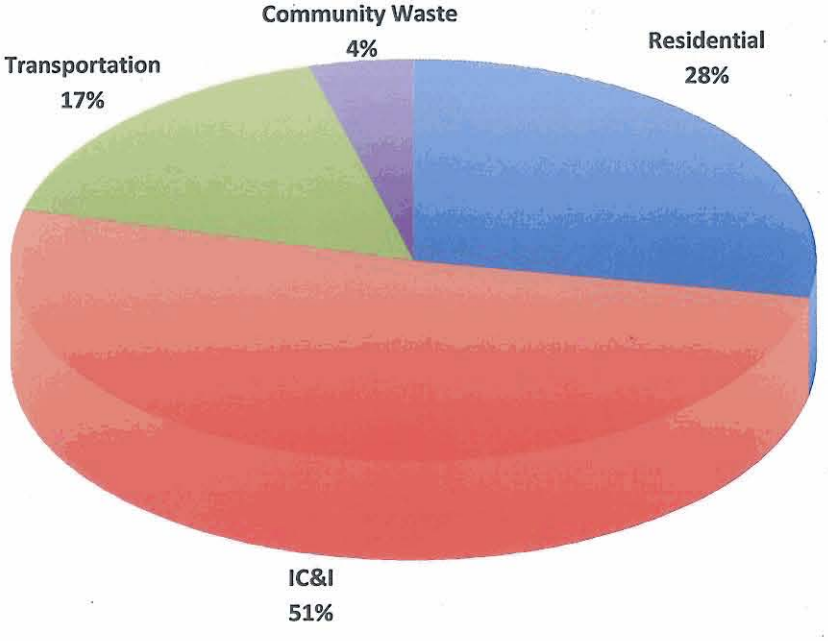


Figure D: 2005 GHG Emissions By Sector



Figures E, F and G provide a breakdown of energy consumption, energy cost, and GHG emissions by source. Natural gas represents the largest source of energy consumption and GHG emissions followed by electricity. Natural gas is over half of all energy usage,

however it represents only about one-third of the total energy costs. Electricity cost is much more significant at 42%; and therefore, a much greater economic driver for energy conservation.

Figure E: 2005 Energy Consumption By Source

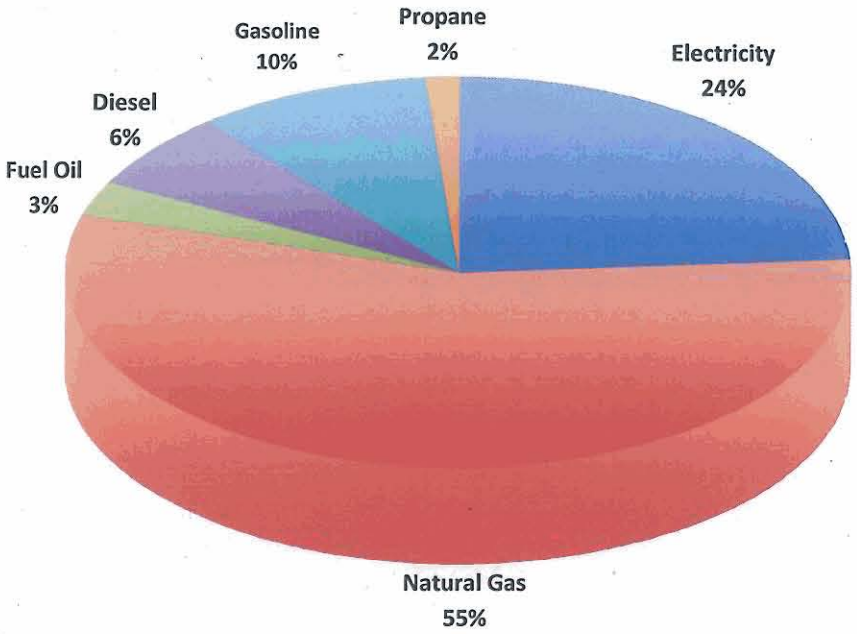


Figure F: 2005 Energy Cost By Source

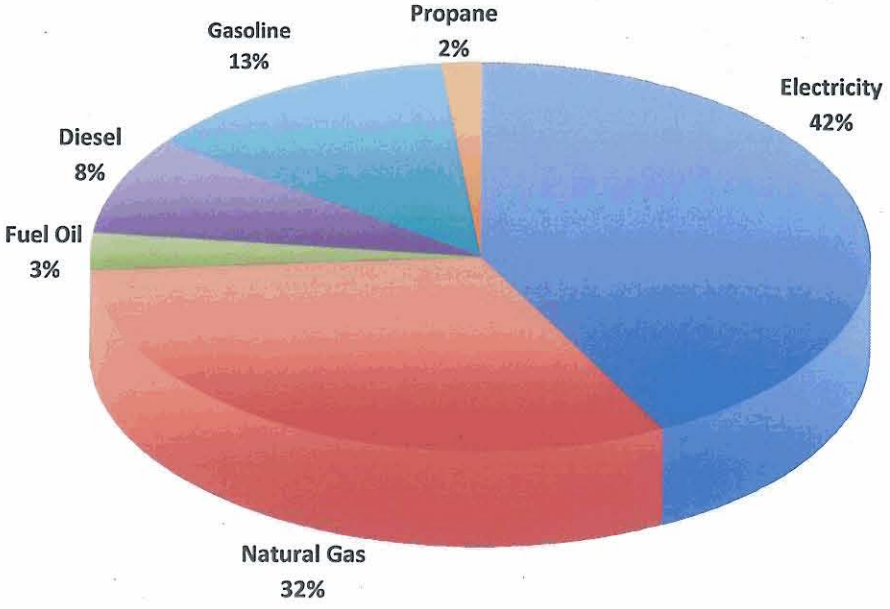
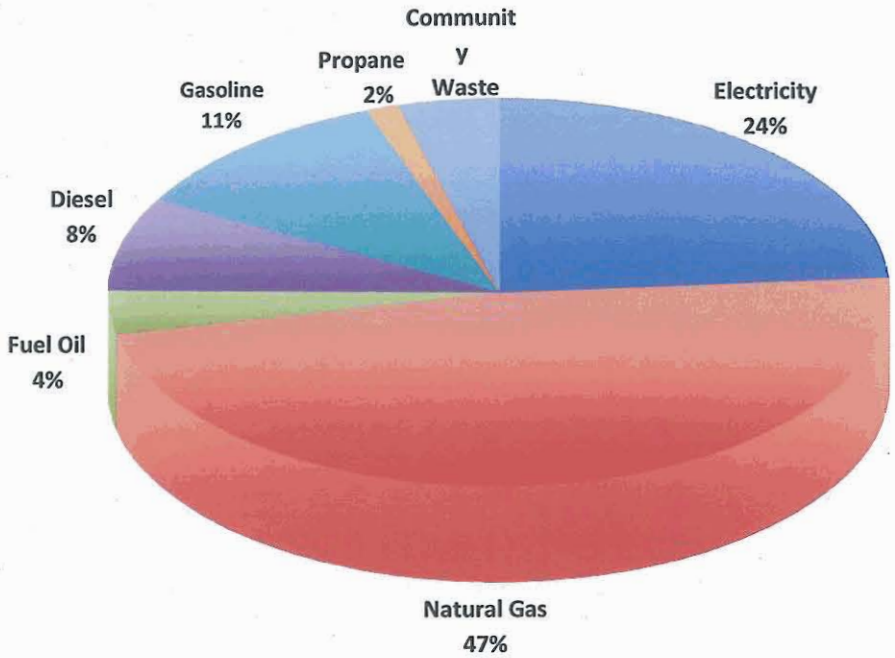


Figure G: 2005 GHG Emissions by Source



2.4 GHG Emissions Trends and Forecast By Sector

2.4.1 Summary

Table 2 summarizes the GHG emissions by sector on an absolute and per capita basis for the years 2005 through 2008 and the 2020 BAU forecast.

Table 2: Absolute and Per Capita GHG Emissions By Sector

GHG Emissions (tonnes of eCO2)	2005	2006	2007	2008	2020 BAU
Residential	289,306	258,512	264,016	257,036	295,444
Residential Per Capita	1.97	1.76	1.77	1.71	1.71
IC&I	527,260	469,616	474,817	393,829	452,679
IC&I Per Capita	3.58	3.19	3.18	2.62	2.62
Transportation	174,861	174,615	176,778	178,248	204,884
Transportation Per Capita	1.19	1.19	1.19	1.19	1.19
Waste	41,792	35,853	33,490	33,690	38,724
Waste Per Capita	0.28	0.24	0.22	0.22	0.22
Total GHG Emissions	1,033,219	938,595	949,102	862,803	991,732
Total Per Capita	7.0	6.4	6.4	5.7	5.7

Figure H: Absolute GHG Emissions by Sector and Total Per Capita Trend Line

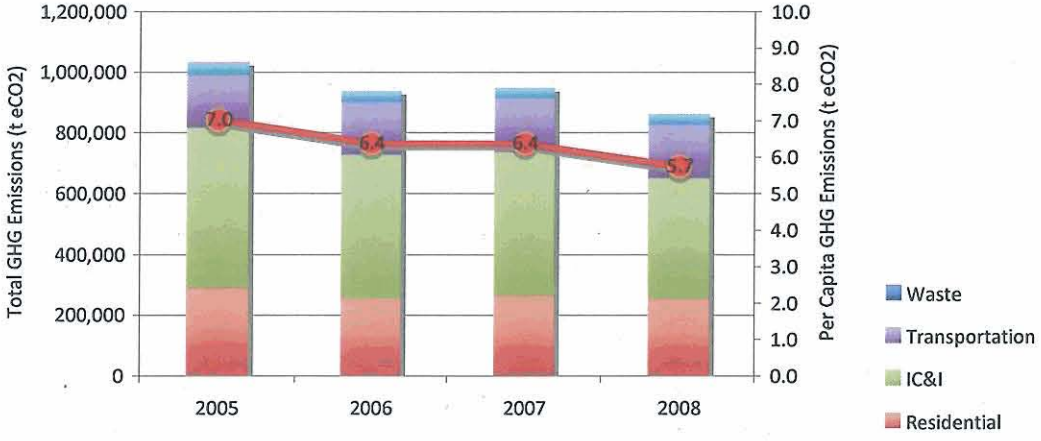
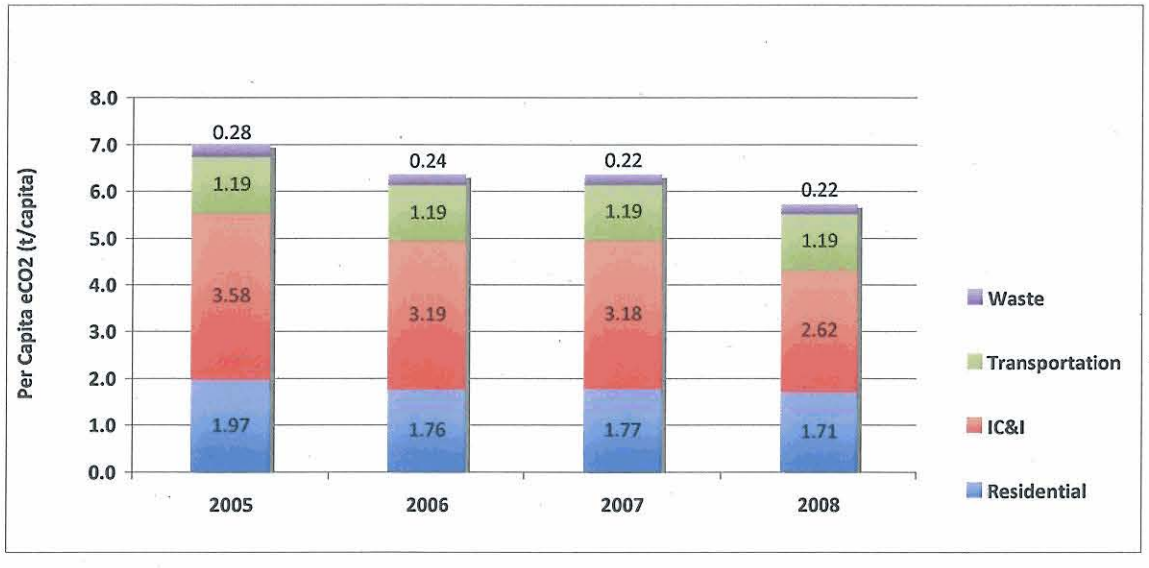


Figure H provides an indication of the absolute changes by sector and Figure I provides a sectorial per capita break down of the overall per capita trend line in Figure H.

The IC&I sector reduced GHG emissions by 25% on an absolute basis and 27% on a per capita basis over the four years. Improved waste diversion rates reduced absolute and per capita emissions from landfill waste by 19% and 21%, respectively. The residential sector decreased its absolute and per capita emissions by 11% and 13%, respectively. There was no appreciable change in GHG emissions from transportation vehicles.

Figure I: Per Capita GHG Emissions by Sector



2.4.2 Residential

The residential sector for purposes of this analysis comprises of single-family and semi-detached homes. Condominiums and apartments are generally on single meters and as such are regarded by the electricity local distribution companies (LDC's) as commercial accounts and cannot be readily segregated from other IC&I customers.

The residential sector accounted for 28% of total community GHG emissions in 2005 and its share increased to 30% by 2008. Table 3 shows the residential energy consumption, energy cost and GHG emissions on an absolute and per capita basis.

From 2005 to 2008, the population grew by 2.2% while the number of households increased by 4.0%. Despite the increase in population and households, the energy consumption has dropped by 6% and the GHG emissions have decreased by 11%. The difference between the two measures can be attributed to the change to the provincial electricity eCO2 coefficient from 2005 to 2006. The eCO2 coefficient for the year 2006 has also been used for the years 2007 and 2008 as it's currently the last published figure.

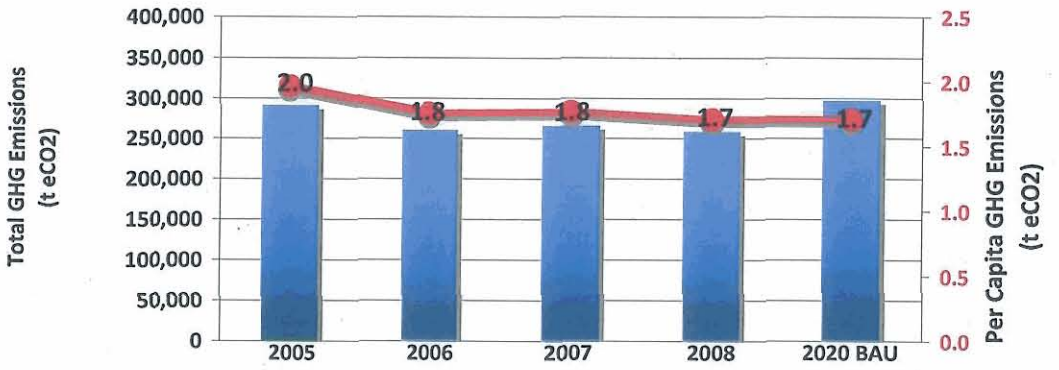
Changes in annual weather will also effect annual energy consumption and GHG emissions. Drops in per capita energy consumption from 2005 to 2006 and from 2007 to 2008 may be partially due to relatively warmer winters in 2006 and 2008 versus 2005 and 2007, respectively.

Table 3: Residential Energy Consumption, Energy Cost and GHG Emissions

Residential	2005	2006	2007	2008	BAU 2020
Energy Use (GJ)	5,397,291	5,095,585	5,220,028	5,081,525	5,840,856
Per Capita Energy (GJ/capita)	36.7	34.6	35.0	33.8	33.8
Energy Costs ($'000)	$105,695	$101,792	$98,993	$99,796	$114,708
Per Capita Energy Costs ($/capita)	$718	$691	$664	$664	$664
GHG Emissions (t eCO2)	289,306	258,512	264,016	257,036	295,444
Per Capita GHG Emissions (t eCO2/capita)	1.97	1.76	1.77	1.71	1.71

Figure J shows the residential GHG emission trends. The bars illustrate the trend on an absolute basis and the red line provides the trend on a per capita basis. The residential GHG emissions are forecasted to rise slightly by 6,139 t or 2% from 2005 to 2020 if no further action is implemented.

Figure J: Residential GHG Emission Trends



2.4.3 Institutional, Commercial and Industrial (IC&I)

The IC&I sector comprises of institutions (government, schools, hospitals, churches, museums, and other public buildings), office buildings, retail establishments, and industrial facilities. It also includes apartments and condominiums for this analysis for reasons discussed in residential section 2.4.2.

This sector accounts for the largest portion of total community GHG emissions. In 2005, it generated 51% of community GHG emissions and by 2008 this was reduced to 46%. Table 4 shows the IC&I energy consumption, energy cost and eCO2 emissions on an absolute and per capita basis.

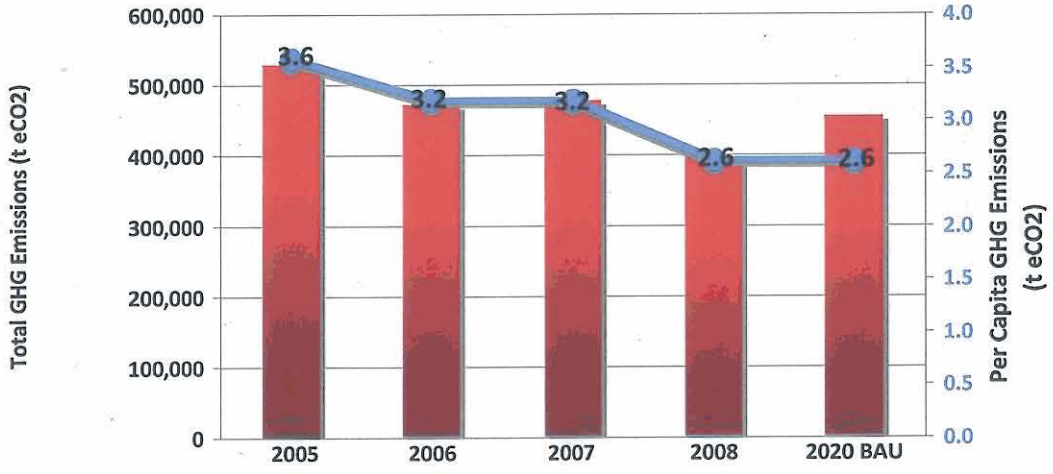
From 2005 to 2008, total energy consumption and GHG emissions declined by 25% and 27%, respectively. As in the residential sector, the difference between the two measures can be attributed to the change in the provincial electricity eCO2 coefficient from 2005 to 2006. A major change occurred between 2007 and 2008 in which energy consumption and GHG emissions dropped by 17%. This may be partially due to the effects of the recession starting in 2008 when some businesses started to reduce production and occupancy rates for commercial space declined, all of which effects energy consumption.

Table 4: IC&I Energy Consumption, Energy Cost and GHG Emissions

IC&I	2005	2006	2007	2008	BAU 2020
Energy Use (GJ)	9,923,513	9,200,533	9,286,135	7,698,180	8,848,517
Per Capita Energy (GJ/capita)	67.4	62.5	62.3	51.2	51.2
Energy Costs ($'000)	$164,526	$156,728	$152,073	$137,904	$158,511
Per Capita Energy Costs ($/capita)	$1,118	$1,064	$1,020	$917	$917
GHG Emissions (t eCO2)	527,260	469,616	474,817	393,829	452,679
Per Capita GHG Emissions (t eCO2/capita)	3.58	3.19	3.18	2.62	2.62

Figure K illustrates the IC&I eCO2 trends. The bars show the trend on an absolute basis and the line provides the trend on a per capita basis. The BAU 2020 forecast assumes that this sector will grow relative to anticipated population growth based on the 2008 per capita emissions. Due to the significant decline in emissions from 2005 to 2008, this sector's GHG emissions are forecasted to decrease from 527,260 t in 2005 to 452,679 t in 2020, a difference of 74,581 t corresponding to a 25% reduction.

Figure K: IC&I GHG Emission Trends



2.4.4 Transportation

The transportation sector includes travel by all Oshawa residents in personal vehicles and public transportation vehicles, but not rail, marine or air transportation by residents as per PCP protocol. It also includes commercial vehicles used by Oshawa businesses and institutions based on provincial proxy data. The total vehicle kilometers traveled is then used to calculate fuel and emission data based on average fuel efficiencies for different classes of vehicles.

In 2005, transportation accounted for the third largest portion of total community GHG emissions generating 17% of emissions. By 2008, the sector's share of emissions has risen to 21%. Table 5 shows the transportation consumption, energy cost and eCO2 emissions on an absolute and per capita basis.

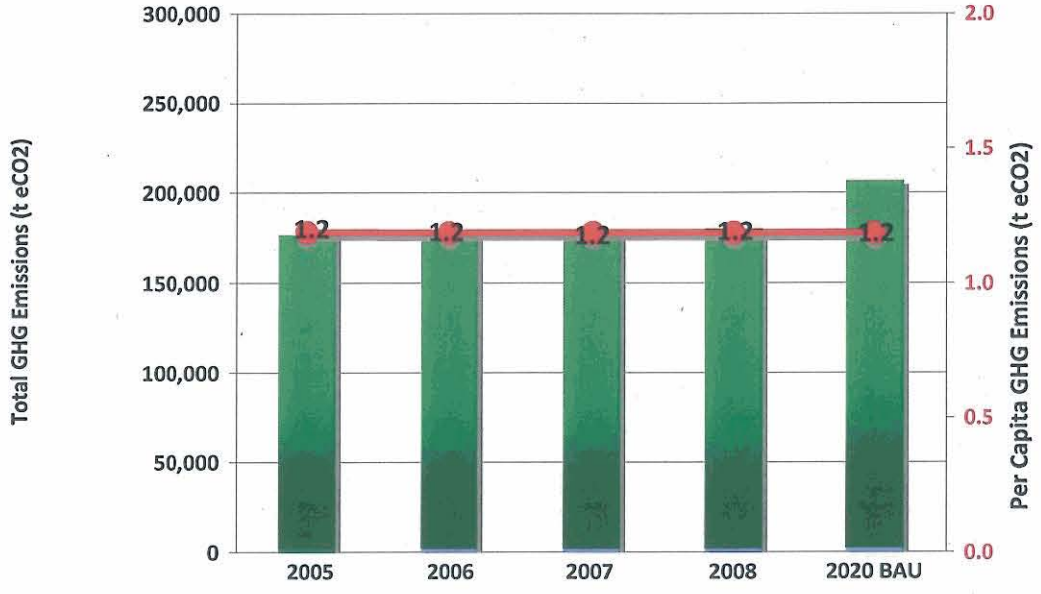
From 2005 to 2008, total transportation fuel consumption and eCO2 emissions increased by 2%. On a per capita basis, both energy and eCO2 emissions remained essentially constant showing the direct relationship between total vehicle kilometers traveled and population growth. Total energy costs in the transportation sector ballooned by 29% in four years much of which is attributable to the high fuel prices in the first three quarters of 2008.

Table 5: Transportation Energy Consumption, Energy Cost and eCO2 Emissions

Transportation	2005	2006	2007	2008	BAU 2020
Energy Use (GJ)	2,539,193	2,535,620	2,567,036	2,588,381	2,975,162
Per Capita Energy (GJ/capita)	17.3	17.2	17.2	17.2	17.2
Energy Costs ($'000)	$63,526	$66,755	$69,715	$81,855	$94,086
Per Capita Energy Costs ($/capita)	$432	$453	$467	$544	$544
GHG Emissions (t eCO2)	174,861	174,615	176,778	178,248	204,884
Per Capita GHG Emissions (t eCO2/capita)	1.19	1.19	1.19	1.19	1.19

Figure L shows the transportation eCO2 trends. The bars show the trend on an absolute basis and the line provides the trend on a per capita basis. It is assumed that this sector will grow relative to anticipated population growth as demonstrated by the current trend. The transportation GHG emissions are forecasted to increase by 30,023 t from 2005 to 2020, corresponding to a 17% rise if no further action is implemented.

Figure L: Transportation GHG Emission Trends



2.4.5 Waste

The community waste sector includes all waste collected by Durham Region from residents, institutions and businesses. It also includes waste collected by private companies from institutions and businesses except industrial waste and construction and demolition waste as very little of the organic portion of this waste ends up in municipal landfills and industrial landfill conditions do not foster decay. As little data is available on private collection, provincial proxy data was used to add to Durham Region records. GHG emissions in the waste sector are attributed to the anaerobic decomposition of organic waste sent to landfill. As most landfills have methane recovery, the credit for converting methane to CO2 and producing energy from it (50% of landfill gas is methane and methane has a global warming equivalent measure of 21 times that of CO2), is offset by the GHG emissions associated with transporting the waste to remote landfills, which is currently the case for Durham waste. Therefore, the net effect is the CO2 emissions from methane combustion.

In 2005, waste accounted for 4.0% of total community GHG emissions and in 2008 its share remains essentially the same at 3.9%. Table 6 shows the waste tonnage to landfill and eCO2 emissions on an absolute and per capita basis.

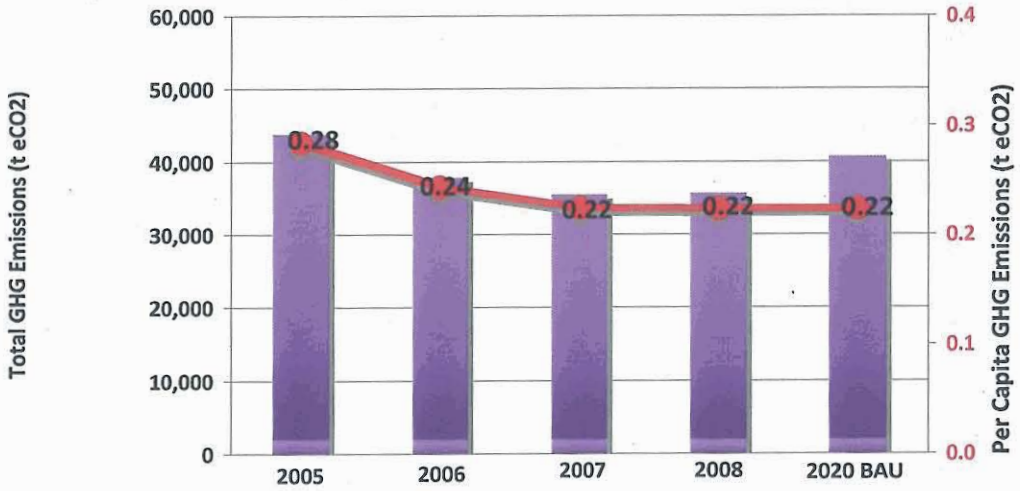
From 2005 to 2007, total waste to landfill and eCO2 emissions were reduced by 17% through successful diversion programs. However, it now appears to have flat-lined in 2008 on a per capita basis and has risen slightly on an absolute basis. The improvements in this sector are generally permanent systemic changes based on improvements in diversion rates. The question remains whether diversion rates can go to the next level in both the residential and institutional/commercial sectors.

Table 6: Waste to Landfill and eCO2 Emissions

Waste	2005	2006	2007	2008	BAU 2020
Waste to Landfill (t)	337,635	297,091	281,185	283,109	325,414
Per Capita Landfill Waste (t/capita)	2.29	2.02	1.89	1.88	1.88
GHG Emissions (t eCO2)	41,792	35,853	33,490	33,690	38,724
Per Capita GHG Emissions (t eCO2/capita)	0.28	0.24	0.22	0.22	0.22

Figure M shows the waste sector eCO2 trends. The bars show the trend on an absolute basis and line provides the trend on a per capita basis. The BAU forecast assumes that waste will grow relative to anticipated population growth. Due to the significant reduction in waste to landfill from 2005 to 2007, the GHG emissions are forecasted to decrease by 3,068 t from 2005 to 2020, corresponding to a 21% reduction if no further action is implemented.

Figure M: Waste GHG Emission Trends



3.0 Recommendations

This report recommends that the City of Oshawa consider the following future steps:

i) Complete the milestone 1 corporate energy and GHG emissions inventory and submit it along with this report for PCP approval.

ii) Proceed with PCP milestone 2 work in which GHG emissions targets are established for the community and the corporation.

iii) As part of milestone 2, review the concept of having more than one target with different timelines. Based on the science, 2015 is estimated to be a critical peak year and 2020 is a key target year for many programs.

iv) Establish a stakeholder and community engagement framework, scope of work, timeline and budget along with possible funding options for completing milestone 3 in which a comprehensive action plan is developed to achieve the reduction targets.

v) Assess the possibility of a collaborative approach with other Durham municipalities and Durham Region as partners in the process to complete PCP milestones 2 & 3.

Item No. DS-10-217
Attachment No. 2

City of Oshawa

Corporate (Municipal Operations)
Energy Consumption, Energy Costs and Greenhouse Gas (GHG) Emissions
2007 Summary (Actual) and 2020 Business as Usual (BAU) Projections***

2007 Baseline Year	Owned & Operated Facilities	Street Lighting & Misc.	Fleet & Fire Services	Solid Waste	TOTAL
Energy Use (GJ)	226,947	34,547	26,018		**287,512**
Per Capita Energy Use (GJ/capita)	1.52	0.23	0.17		**1.93**
Energy Costs	$ 4,377,760	$ 1,041,478	$ 631,220		**$ 6,050,458**
Per Capita Energy Costs ($/capita)*	$ 29.34	$ 6.98	$ 4.23		**$ 40.54**
GHG Emissions (t eCO2)	12,443	2,111	1,807	412	**16,774**
Per Capita GHG (t eCO2)*	0.083	0.014	0.012	0.003	**0.112**

*** (Based on a 2007 population of 149,230)**

2020 Business as Usual (BAU)	Owned & Operated Facilities	Street Lighting & Misc.	Fleet & Fire Services	Solid Waste	TOTAL
Energy Use (GJ)	237,234	36,036	27,027		**300,297**
Per Capita Energy Use (GJ/capita)	1.37	0.21	0.16		**1.74**
Energy Costs	$ 5,012,535	$ 1,192,492	$ 722,747		**$ 6,927,774**
Per Capita Energy Costs ($/capita)**	$ 29.00	$ 6.90	$ 4.18		**$ 40.08**
GHG Emissions (t eCO2)	13,314	2,259	1,933	441	**17,947**
Per Capita GHG (t eCO2)**	0.077	0.013	0.011	0.003	**0.104**

**** (Based on a projected 2020 population of 172,834)**

***** (Reference Attachment 1 - Oshawa Community Greenhouse Gas Emissions Inventory, January 2010, Table 1: Summary of Energy Consumption, Energy Costs and GHG Emissions)**

Final version: 2010.08.25SE

Item No. DS-10-217
Attachment No. 3

Memorandum

TO: Durham Region Roundtable on Climate Change (DRRCC)

FROM: Jenna Dunlop, Policy & Research Advisor, DRRCC Staff Liaison

DATE: May 14, 2010

RE: Durham Region Community Greenhouse Gas Emissions Targets

RECOMMENDATION to Joint Committee:

THAT the Durham Region Roundtable on Climate Change recommend to the Joint Committee of Planning, Works, Health & Social Services, and Finance & Administration for approval and subsequent recommendation to Regional Council, that the following community Greenhouse Gas (GHG) emission targets be adopted as provisional targets until a local action plan is developed at which time the targets may be further refined:

- 5% reduction by 2015 from 2007 baseline
- 20% reduction by 2020 from 2007 baseline
- 80% reduction by 2050 from 2007 baseline.

REPORT:

1. Background

On October 8, 2008, Durham Region Council adopted the recommendation to join the Federation of Canadian Municipalities Partners for Climate Protection program. The Partners for Climate Protection (PCP) is a network of 203 Canadian municipal governments that have committed to reducing greenhouse gases and acting on climate change. The program is a partnership between the Federation of Canadian Municipalities (FCM) and the International Council for Local Environmental Initiatives (ICLEI).

The Partners for Climate Protection program is based on a five milestone framework to reduce greenhouse gas emissions. The milestones are as follows:

Milestone 1: Creating a GHG Emissions Inventory and Forecast. Complete baseline GHG and energy use inventories and forecasts for both municipal operations and the community as a whole.

Milestone 2: Setting an Emissions Target. Suggested PCP targets are a 20 percent reduction in GHG emissions from municipal operations and a minimum six percent reduction for the community, both within 10 years of making the commitment.

Milestone 3: Developing a Local Action Plan. Develop a plan that sets out how emissions and energy use in municipal operations and the community will be reduced.

Milestone 4: Implementing the Local Action Plan. Create a strong collaboration between the municipal government and community partners to carry through on commitments, and maximize benefits from GHG reductions.

Milestone 5: Monitoring Progress and Reporting Results. Maintain support by monitoring, verifying and reporting GHG reductions.

In October 2009, Durham Sustain Ability (DSA) provided a community baseline greenhouse gas (GHG) emissions inventory for the Region, which has fulfilled the PCP secretariat requirements for completing PCP Milestone 1 for the Region

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The Durham Region Community Greenhouse Gas Emissions Targets (Attachment A to this Memorandum) establishes GHG emission targets for the community, which will meet the requirements of the PCP secretariat for completion of PCP Milestone 2 for the community.

2. Purpose

The purpose of this report is to establish provisional GHG emissions targets for the years 2015, 2020, and 2050 in Durham Region.

3. Durham Region Greenhouse Gas Emissions Targets

In September 2009 Durham Regional Council endorsed Report No. 2009-J-37, Climate Change Science, Greenhouse Gas Emissions Reductions Targets, and Strategies to Meet Those Targets. This report outlined the current climate change science, GHG emission reduction targets and current/proposed strategies to meet those targets on the international, national and provincial/state levels.

A key finding highlighted in this report was from the International Panel on Climate Change (IPCC) that found in order to stabilize CO2 concentration at 450 ppm, global emissions will have to peak before 2015 and subsequently continue to decline. Therefore, 2015 is an important "tipping point" year for which Durham Region should have a reduction target. The other key target years put forth by the IPCC are 2020 and 2050, which are logical target years for Durham Region.

PCP provides guidelines for the community reduction target of 6% over a ten-year period based on alignment with Canada's Kyoto obligation of a 6% reduction by 2012. Of the 203 Canadian municipal members of PCP, approximately 30% have a community reduction target and of those, approximately 70% use the PCP guideline of 6%. This recommendation however has become less relevant for future targets and most large municipalities in the program have moved beyond this.

The following basis was developed by DSA to provide guidance in establishing targets:

1. *Long term alignment with the scientific consensus on mitigating climate change.*
   Minimum 80% reduction by 2050 and meaningful shorter-term targets including reductions by 2015.

2. *Alignment with neighbouring large municipalities that share infrastructure and flow of people and goods.*
   Toronto has established progressive community targets; however, no other GTA regional municipality has yet to do so.

3. *Alignment with provincial strategies.*
   Ontario has established progressive community targets with quantified actions.

4. *Guidance from exemplar large Canadian municipalities that have demonstrated results.*
   There are several key exemplars for corporate GHG reductions including Edmonton and Calgary however Vancouver has demonstrated credible community GHG reductions beyond other large municipalities to-date.

The City of Vancouver's community emissions have risen throughout the 1990's and this has now been fully turned around as of 2008 as emissions return to 1990 levels despite a population growth of 30%.

Toronto has the same aggressive absolute targets as Vancouver, however with a lower population growth rate its 2012 per capita target is significantly lower than Vancouver's.

Ontario also has similarly progressive targets for community reductions except the short-term target year is 2014 rather than 2012 and the 2020 target is 15% rather than 30% as its forecasted population growth is significantly higher than either city . All three jurisdictions meet the first criteria of basing their long-term 2050 target at a minimum 80% while establishing shorter-term absolute reduction targets in 2012 – 2014.

4. Community Greenhouse Gas Emissions Reductions Targets Summary

The following Table presents a summary of Durham Region's community GHG emission reduction targets based on the preliminary background and detailed analysis shown in Attachment A.

Summary of GHG Emission Reduction Targets

	Baseline	Target GHG Emissions		
	2007	2015	2020	2050
GHG Emissions (t eCO2)	4,043,127	3,840,970	3,234,501	808,625
% Reduction from Baseline		5%	20%	80%
Per Capita GHG (t eCO2/person)	6.8	5.4	4.1	0.7
% Per Capita Reduction from Baseline		20%	40%	90%

260 a)

Figure 1 shows the 2007 baseline as the key reference point for the absolute reduction targets, while also showing that it's only half the story. The major issue of a fast growing population is reflected in the business as usual (BAU) levels above the 2007 baseline.

Figure 1 – GHG Emission Absolute Reduction Targets from Baseline

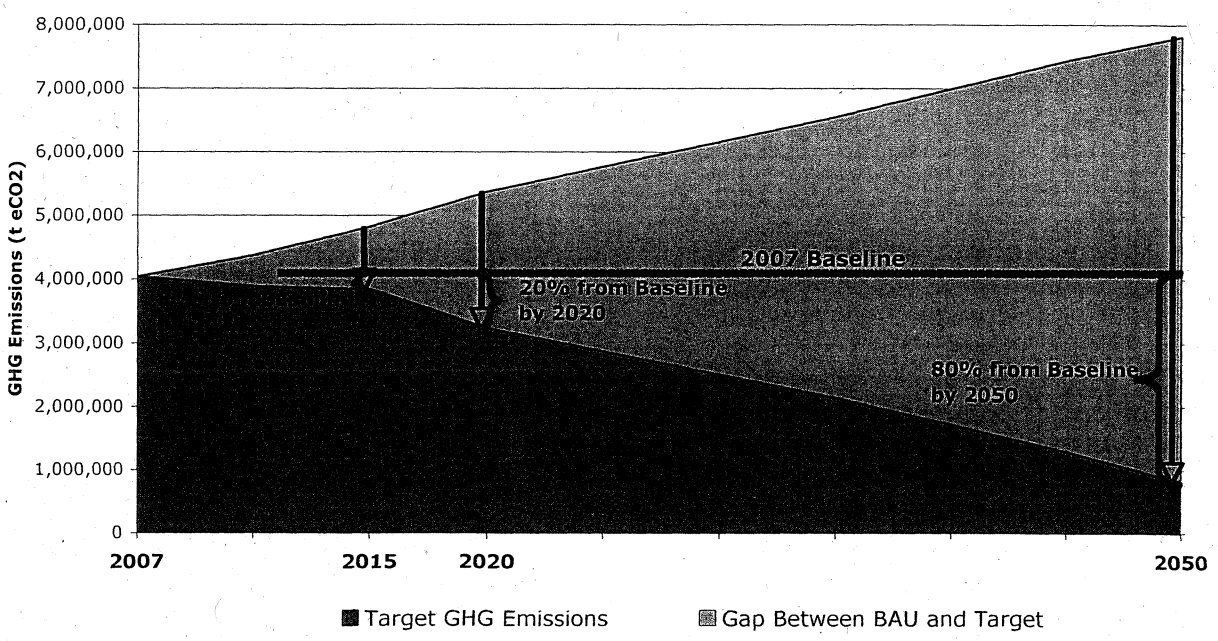
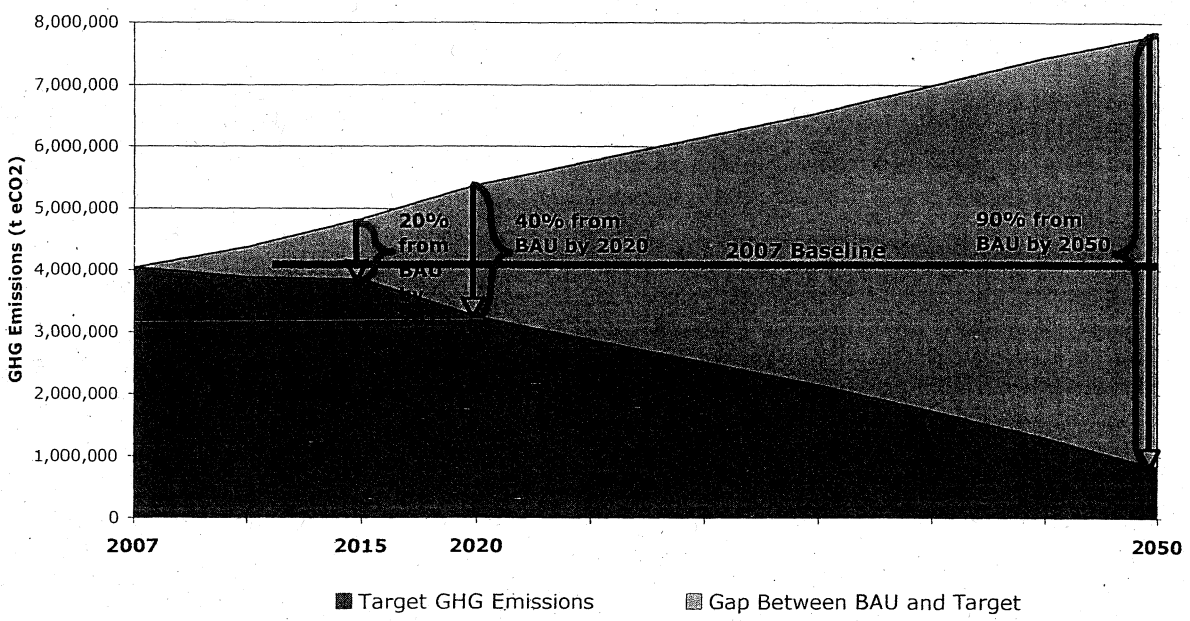


Figure 2 shows the extent of the whole wedge of total GHG emission reductions required to meet the targets. This represents the GHG per capita reduction targets.

Figure 2 – GHG Emission Reduction Targets from BAU - Per Capita Targets



5. Conclusion

The development of a community GHG emissions reductions targets is a significant step forward for Durham Region. Not only does it satisfy Durham Region's requirement to achieve the Community Milestone 2 under the PCP program, more importantly it serves as a key step in planning emissions reductions strategies in Durham Region.

These provisional emissions targets indicate that Durham will be well within the range of targets set by selected relevant comparators (See Attachment A). As the Durham Region Roundtable on Climate Change moves forward with its mandate of developing a Local Action Plan for Climate Change, the targets will continue to be refined in order to reflect the possibilities for reductions based on the comprehensive strategy with detailed actions that will be undertaken across the Region.

RECOMMENDATION to Joint Committee:

THAT the Durham Region Roundtable on Climate Change recommend to the Joint Committee of Planning, Works, Health & Social Services, and Finance & Administration for approval and subsequent recommendation to Regional Council that the following community GHG emission reduction targets be adopted as provisional targets until a local action plan is developed at which time the targets may be further refined:

- 5% reduction by 2015 from 2007 baseline
- 20% reduction by 2020 from 2007 baseline
- 80% reduction by 2050 from 2007 baseline.

Jenna Dunlop
Policy & Research Advisor

RECOMMENDED FOR PRESENTATION TO COMMITTEE

G.H. Cubitt, M.S.W.
Chief Administrative Officer

Attachment A: Durham Region Community Greenhouse Gas Emission Targets