



Community Local Action Plan Update

Greenhouse Gas Emission Reductions and Monitoring

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Table of Contents

- 1 Introduction 3**
 - 1.1 Background 3
 - 1.2 PCP Requirements for Recognition of Milestones 4 & 5 3

- 2 Community Local Action Plan Implementation Update 4**
 - 2.1 Integrated Sustainability Program 4
 - 2.2 Sustainable Home Program 4
 - 2.3 Sustainable Workplace Program 8
 - 2.4 Sustainable School Program 10
 - 2.5 Sustainable Transportation Program 11
 - 2.6 Summary of Community Emissions Reductions 12

- 3 Community GHG Inventory Update..... 16**
 - 3.1 Inventory Basis..... 16
 - 3.1 Community Inventory Update 17
 - 3.1.1 Population Forecast Update and Revised 2016 Target 17
 - 3.1.2 Summary of GHG Emissions and Energy Inventory 17
 - 3.1.3 Trends By Community Sector 19

- 4. Community Engagement..... 23**

- Appendix A – City of Pickering PCP Local Action Plan - 2006 26**

1 Introduction

1.1 Background

In 2007, the City successfully completed milestones 1, 2 & 3 of the Partners for Climate Protection (PCP) program, a joint partnership between the Federation of Canadian Municipalities and ICLEI-Local Governments for Sustainability, for both the corporation and the community, which includes establishing a greenhouse gas (GHG) baseline inventory, setting reduction targets and developing a local action plan.

Milestones 4 & 5 in the PCP framework are the implementation of the local action plan initiatives and development of a monitoring and reporting system to verify GHG reductions, respectively.

This report provides an update of community GHG emissions inventory for 2007 (when implementation actions commenced) and 2011 to measure progress towards the 2016 targets and to measure to what degree the local action plan has been implemented.

1.2 PCP Requirements for Recognition of Milestones 4 & 5

The PCP program requires each municipality provide the following for recognition of Milestones 4 & 5:

Milestone 4 – Implementation of the local action plan

- Description of the degree to which measures in the local action plan have been implemented, including any implementation partners, financing mechanism and variations from the original local action plan.
- Outline of the implementation schedule.

Milestone 5 – Monitoring and reporting of GHG emissions reductions

- Update of GHG emissions inventory for current (or near current) year.
- Quantification of the GHG reduction impact of each individual GHG reduction measure contained within the local action plan.
- Report on how stakeholders and decision makers have been included throughout the PCP Milestone process.

2 Community Local Action Plan Implementation Update

The local action plan provided in Appendix A is segregated by specific community initiatives. This implementation update provides a qualitative description by each initiative, as well as a quantitative summary of GHG emission reductions, where appropriate, at the end of this section.

2.1 Integrated Sustainability Program

The City of Pickering established the “Office of Sustainability” with a Director, Sustainability and Coordinator, Sustainability in 2007. The Office of Sustainability coordinates corporate and community sustainability initiatives through the “Sustainable Pickering” program. The Sustainable Pickering Advisory Committee was established in 2007 to oversee the program, which is comprised of the Mayor, three Councilors and the Office of Sustainability staff. Since then, the Office of Sustainability has amalgamated with the City’s planning, building, and economic development services to form a new department, titled City Development. This structural change accommodated for three new positions under the Sustainability Section, including a Manager, Sustainability & Special Projects, a Supervisor, Energy Management, and a Coordinator, Environmental Services.

The GHG reductions associated with the Sustainable Pickering Program cannot be quantified separately, however many of the subsequent initiatives could not have been coordinated and implemented effectively without this oversight and integrating function.

The Office of Sustainability developed the “Measuring Sustainability Report” that includes community GHG emissions and community energy consumption updates as shown on the Sustainable Pickering webpage - <http://measuringsustainability.ca>.

Private financial contributions to the Sustainable Pickering program are approximately \$15,000 per year. These funds are being used for a new program, “Celebrating Sustainable Neighbourhoods”, launched in March 2013. This program encourages residents to actively engage in sustainable activities that address one or more of the 55 indicators of sustainability outlined in the City’s Measuring Sustainability Report. One neighbourhood will be voted as the winner and, in consultation with the City, will work on a special infrastructure project of up to \$10,000 to benefit a particular area of the community. This new program won Durham’s “Art of Transition Creative Award” in November, 2013 for best use of creativity to advance social and environmental sustainability.

2.2 Sustainable Home Program

2.2.1 Responsible Electricity Consumption, Natural Gas Consumption, and Home Audits and Energy Clinics (Three Subprograms)

The preliminary intention of the above three strategies is to leverage and promote a variety of provincial and federal government residential energy efficiency programs to Pickering residents. Over the past six years some of these programs are still being delivered by a utility, others have evolved and some have been withdrawn from the market.

The City sets up educational displays at special events such as Sustainable Pickering Days and at other events and facilities throughout the community to distribute information on energy conservation, micro-FIT, Ontario Power Authority (OPA) conservation programs and greenhouse gas emissions. For the most part the government programs are marketed and delivered to residents through utility channels and promoted by the City at events and on their website. The website also supports energy conservation through tips and the provision of interactive energy calculators.

City staff have been active members of the Durham Environmental Coordinating Committee for the past six years, engaging in a number of Region-wide initiatives, including a variety of programs outlined in the Region's Community Climate Change Local Action Plan.. The city has supported and promoted Durham Sustain Ability's local "We Have The Power" program between 2006 and 2009, which included residents' pledges to reduce energy use in their home with follow-up surveys.

The City's Sustainability staff also partnered with the local media, Durham Region News Advertiser, to produce a series of videos for their online educational feature, 'Your Life'. Staff participated in a total of 14 videos aimed at educating the public on a variety of sustainability topics ranging from local food to responsible energy consumption.

The City's Sustainability staff were also involved in the City's corporate-wide social media campaign aimed at providing the public with expert advice, feedback, and tips on department services. The campaign, 'Pickering Pros' featured multiple sustainability staff engaging in two way dialogue on subject matters such as waste, energy, food and gardening.

As noted in the City's "Measuring Sustainability 2012 Report", between 1995 and 2008, average Pickering household energy use has declined by 28%, which suggests many people have taken action to reduce energy. This decline in residential energy use can be attributed to:

- Continual improvement of appliance efficiencies in the marketplace,
- Increased national minimum fuel efficiency standard for gas furnaces from 78% to 90% (as of December 31, 2009)
- Participation in the Ontario Power Authority's saveONenergy programs as delivered through the electric and gas utilities. Initiatives available to Ontario residents achieved 53 MW of peak demand reductions and saved 143 GWh of energy in 2011. The following program results are extracted from the OPA 2011 Conservation Results Report:
 - Over 56,000 inefficient fridges, freezers, and window air conditioners and dehumidifiers were picked up and recycled through the Fridge and Freezer Pickup program,
 - Over 550,000 coupons were redeemed by Ontarians purchasing energy-efficient product at thousands of retailers across the province;
 - Over 55,000 energy efficient furnaces and air conditioners were installed with the Heating and Cooling Incentive

Between 2010 and 2014, all provincial electric utilities are required, as a condition of their operating license, to offer conservation demand management programs to their customers. The residential programs include:

- Fridge and freezer pickup
 - free pickup of older, but working refrigerators and freezers, also includes older dehumidifiers and window air conditioners
- Heating and cooling system upgrade incentives

- financial incentives to purchase a higher efficiency central air conditioner system or to choose a higher efficiency motor in a furnace
- Peaksaver PLUS program
 - free installation of a programmable thermostat that provides the utility with the ability to remotely control air conditioning load to avoid a brown or black out
- Coupons for energy efficient products
 - in conjunction with major retailers across the province every spring and fall for products such as: CFL and LED bulbs, weather-stripping, pipe wrap, water heater tank insulation, outdoor clothesline etc.
- Equipment exchange events
 - one day events with major retailers exchanging lower efficient appliances such as dehumidifiers, window air conditioners and Christmas lights for higher efficiency units or credits towards new product

2.2.2 Responsible Water Consumption

Water is a precious resource that should not be wasted. It requires energy for purification, pumping, and distribution. As such, responsible water consumption is an important element to consider when working toward greenhouse gas emissions and energy use reduction targets.

In 2009, Pickering's residents used on average 260 litres per person per day (LPCD) of water, compared with the Durham average of 278 LPCD. This is a 2.3% increase over Pickering's 2008 levels.

New homes in Durham use an average of 190 LPCD and homes fitted with WaterSense/Energy Star toilets, dishwashers, and clothes washers use on average 150 LPCD.

In 1996, the Region launched Water Efficient Durham to encourage the efficient use of water among all users. Through the distribution of rain gauges and a comprehensive Household Guide to Water Efficiency booklet, the Region educates residents on their role in conserving water both indoors and outdoors.

The City presents displays at events and facilities providing information on water conservation at home, in the garden, and promotes Durham Region's water efficiency programs through the distribution of literature and rain gauges and through annual gardening workshops. Pickering hosts several free Lush Lawns & Gorgeous Gardens workshops each year. In part, these workshops teach residents about appropriate lawn watering and gardening with native and drought-tolerant plants and grasses. The City leads by example through its use of drought-tolerant plants in its own landscaping efforts, wherever feasible.

2.2.3 Responsible Waste Management

The residential diversion rate has increased from 22% in the 1995 base year to 57% in 2011. However, since 2007 the diversion rate has essentially remained same (56% to 57%) and yet the residential waste sent to landfill has been reduced by 12% due to the reduction in total waste generated. GHG emissions has been reduced by 81% during the period from 2007 to 2011 as a

result of the reduction of organics in the mix to landfill as well as volume and the change in landfill disposition to more modern methane-capture landfills.

The City offers recycling at all facilities and green bin collection at 10 out of 11 facilities where feasible. When attendance is large at a public event and there will be food served, such as for Ribfest, biodegradable options are used and green bins provided. Volunteers assist event participants in making the right choice with the disposal of their items.

Leading by example the City staff also reuse office items; use double-sided printing; and recycles batteries, printer cartridges, old cell phones, and milk bags. The City has also created a staff checklist for sustainable meetings and events, and provides documents online to avoid the need to print paper copies. For meetings and events, staff use reusable plates, napkins, cutlery, etc.

Since 2008, the City has partnered with the Region of Durham to increase awareness of various recycling initiatives, including the annual electronic waste and household hazardous waste (HHW) collection events. The City presents displays at events and facilities providing information on waste reduction at home, work, and school, and on Durham Region's waste programs, including specialty diversion programs for used tires, bulky and metal goods, signs, plastic bags, and agricultural bale wrap.

The City promotes Waste Reduction Week every year by carrying out internal and external education campaigns and waste reduction challenges with City employees, residents, schools, and businesses.

Pickering's Dog Waste Diversion Program allows residents to use biodegradable bags provided by the City when stooping and scooping after their dogs in parks. 14 diversion stations have been strategically placed in parks throughout the City, including the leash free park, Grand Valley. Instead of going to a landfill, the dog waste is processed at a Region of Durham's Pollution Control Plant.

Pickering's dedicated sustainability section on the municipal website provides residents with comprehensive information on how to deal with e-waste, HHW, recycling of CFL bulbs and batteries.

In ground recycling and waste units positioned in high traffic parks and sporting venues result in less staff time for maintenance and clean up as they only need emptying twice per year, thus further reducing GHG emissions.

In 2013, a new initiative was targeted for 2014 to curtail illegal garbage dumping via the use of new signage and surveillance.

2.2.4 Responsible New Home Development

The Local Action Plan recommended the development of guidelines for more stringent housing standards for all new homes built in Pickering. This has proven to be a difficult task in that legally a municipality cannot require a builder to construct homes to a higher standard than the Ontario Building Code (OBC). Fortunately, the OBC has upgraded the standard to ENERGY STAR as of January 1, 2012. Although this code is lower than the suggested LEED-ND standards it is more stringent than most North American jurisdictions for improved energy efficiency.

In an effort to support responsible new home development, the City has developed two sets of guidelines, one for new neighbourhoods and one for new developments. The 2007 Sustainable Development Guidelines provides guidance for development within urban Pickering. In 2011, the Sustainable Placemaking Guidelines were created for Seaton, a new major planned community in north Pickering.

Both guidelines focus on:

- Compact mixed use community structure
- Pedestrian-scaled neighbourhoods
- Transit-supportive neighbourhoods
- Linked open space system
- Natural and cultural heritage preservation
- Significant employment areas
- Pedestrian and bicycle routes
- Minimized impacts to natural features and stream crossings
- Integration with south Pickering

As of 2011, Coughlin Homes has completed the first homes to a certified green standard in Pickering. These 80 townhomes with a total of 5600 m² floor space are registered with the ENERGY STAR for New Homes Program.

2.3 Sustainable Workplace Program

2.3.1 Building Audits and Retrofits, Employee Education and Awareness, and Recognition of Responsible Businesses and Institutions (Three Subprograms)

This initiative leverages existing programs provided to the business community by Enbridge, Veridian and through performance contracts with Energy Saving Companies (ESCO's). The City supports and promotes the Ajax-Pickering Board of Trade's (APBoT) Eco-Business program, which provides check lists for companies to assist in planning their environmental action, and hosts quarterly Eco-Chats to provide networking opportunities for local businesses looking to build on their sustainability objectives. The City also participates in the Ajax-Pickering Board of Trade Business Excellence Award by nominating deserving Pickering businesses for the Sustainability Champion Award.

To-date, there are 13 local business registered as Eco-Businesses, they include: Addmore Office Furniture (2009) Ltd., Aspect Retail Logistics Inc., City of Pickering, Eco Environment Plus, First Durham Insurance and Financial, Indaco Manufacturing Ltd., Matheis Financial Group, Minuteman Press, Monarch Kitchen and Bath Centre, Ontario Power Generation, Pearly Gates Cleaning Services Inc., Solera Sustainable Energies Company, and Wardell Professional Development.

The City financially supports, actively promotes and sits on the steering committee for Durham Partners in Project Green (DPPG) a region-wide program that provides opportunities for businesses to work together to green their bottom line and build a stronger, greener and more productive regional economy. DPPG delivers programming that helps businesses reduce energy and resource costs, uncover new business opportunities, and address everyday operational challenges in a green and cost effective manner. DPPG was established in May 2012, and eco-efficiency assessments

commenced shortly thereafter. Since August 2012, three of the 25 regional businesses that have undertaken the eco-efficiency assessments are from Pickering and over 30 individuals representing Pickering businesses have attended DPPG education and training events.

The City hosts civic awards for business recognizing their efforts in environmental measures and sustainability. The Environment Award is given to one or more individuals, groups or businesses from Pickering who has made a significant contribution to conserving or enhancing the City's natural environment. The Sustainability Award is awarded to one or more individuals, groups or businesses who have made a significant contribution to the Sustainable Pickering journey. Recent past recipients include: Ajax Pickering Board of Trade, Dunbarton High School, Hubbell Canada, Rotary Club, Home Depot, Monarch Kitchen Bath Centre, Ontario Power Authority and the Pickering Town Centre.

Under the Community Cleanup initiatives, the City provides any business, community group, neighbourhood group, families and schools with litter bags & gloves, and will pick up and dispose of the waste at the end of their clean up. Groups can host a Pitch-in Party anytime from April to November to donate some time to cleaning up a local green space, creek, trail or neighbourhood. The City can even suggest some areas that need a helping hand. Furthermore any business, community group, neighbourhood group, or school can participate in the Adopt-a-Park program and pledge to take care of a local park or green space. At present there are seven businesses registered under the Adopt-a-Park program.

The City participates in and promotes two major community-wide cleanup events each year: the Pickering 20 Minute Makeover held in April, and the Great Canadian Shoreline Clean-up in September. In 2013, over 2200 volunteers participated in the 20-minute makeover, and over 100 residents volunteers for the Great Canadian Shoreline Cleanup at three registered sites.

2.3.2 Responsible New Building Development

In 2009, City Council passed a resolution requiring all development in the City to attain a minimum number of points under the City's [Sustainable Development Guidelines](#). The guidelines outline three levels of sustainability and Council requires all new development to meet at least Level 1. Developers are required to submit a Sustainable Development Report comparing their proposal to the City's guidelines.

The City also discusses and promotes sustainable development opportunities during initial consultations with potential developers and investors and expedites development applications seeking to achieve a "green" rating under a recognized certification program.

Approximately 100,000 m² of new commercial floor space has been built in the last six years in Pickering. Of these new buildings, approximately 40% have been built to certified green building standards such as LEED and the Building Owners and Managers Association (BOMA) of Canada BEST level 3 or greater.

To lead by example, the City is in the process of designing a new Operations Centre, which is expected to meet the equivalent of LEED Silver standards. Within the last four years, the City has included a green roof as part of a renovation of the Don Beer Arena and a 3,000 square feet green roof at the Recreation Complex.

2.4 Sustainable School Program

2.4.1 EcoSchools and Beyond EcoSchools (Two Subprograms)

The Local Action Plan goal to engage all Pickering schools to become EcoSchools was achieved in the 2009/2010 school year.

The City supports EcoSchools on its website with extensive information and activity resources for teachers and their students. In addition, the City actively engages with schools to Adopt-A-Park adjacent or near their school, requiring regular litter clean-ups. The City provides gloves and garbage and recycling bags for this event, as well as when requested for other clean up initiatives such as Pitch In Parties and 20-Minute Makeover events. Parks department also provides free wood chips to schools with gardens to promote reduced watering.

Encouraging schools to engage in initiatives that are above and beyond EcoSchool requirements requires additional staff time and administrative commitment. Dunbarton High School, in particular has been engaged in an extensive list of activities within and beyond their school property. Dunbarton High School's environmental club have strategically planted over 50 trees on their school property to provide shade for the buildings, outdoor classrooms and sport fields. The students are actively involved with the City of Pickering's Environmental Stewardship program, providing volunteer assistance at many City events. Under the leadership of science teacher David Gordon, his Urban Watershed class, and the DHS Environmental Club, here are some examples of the environmental work accomplished by Dunbarton students that are beyond Ecoschool requirements:

- Students obtained 1000 signatures on a petition to have the Rouge River become a National Park
- Twenty-five DHS students volunteered to consult with Parks Canada Youth on the development of the Rouge National Park
- Organized a community clean-up with townhouse complex across from the school
- Organized a community viewing of a Great Lakes film for World Water Week, spring 2012
- Organized a community rain barrel sales last year and e-waste collection for past two years
- Conducting peizometer monitoring for TRCA in Altona Forest
- Conducted water quality monitoring of Petticoat Creek during Altona Road widening (we found no effect)
- Conducted 8 years of water quality data at 4 sites (2 Rouge River, 2 Duffins Creek) through watershed course
- Conduct an annual community presentation on "ecological" future of Pickering from watershed class to 50-100 community members, including table top displays from local environmental organizations, local colleges, the City and TRCA
- Students provide volunteer labour at the City's annual Stewardship Pickering conference (past 5 years)
- Students involved in volunteer planting for Frenchman's Bay rehab project, Rouge River, plus several other natural sites within Pickering
- Organized a variety of school/community environmental presentations over the years from Friends of the Rouge Watershed (FRW), Land Over Landings, Tom Rand (energy conservation), Dr. David Suzuki

- Organized two presentations on climate change by Eric Noval, Climate Project Canada to 1500+ kids and the general public
- Ongoing energy monitoring in school that led to the free installation of a solar hot water heating system
- Planted and maintain a pollinator garden with over 1000 native plants
- Designed and built an outdoor classroom
- Planted 51 trees representing 12 native species for shading and biodiversity on the school yard and covering some sports fields that are used by city leagues.
- Provide 10-15 co-op students each spring to a variety of organizations, such as Duffins Creek Outdoor Centre, Durham Sustain Ability,
- Launched a water awareness campaign that will include the distribution of reusable water bottles to all incoming grade 9's. They can be easily filled in the recently installed refillable water bottle drinking fountains.
- Latest new project is the operation of a salmon hatchery to raise fry as part of the Lake Ontario salmon restoration program
- Pilot school for the new provincial Platinum EcoSchool program

2.5 Sustainable Transportation Program

2.5.1 Anti-Idling Program, Responsible Commuting and Responsible Fleet Management (Three Subprograms)

The City of Pickering established an anti idling bylaw in 2004. Although there has been no further modifications to the bylaw since then, the City educates the public through information in its by-annual Leisure Guide, and drive thru businesses are limited in certain areas. The City leads by example through its staff training to discourage unnecessary idling.

Leading by example, the City of Pickering is an active member of Smart Commute Durham, encouraging Pickering employees to explore various sustainable commuting options. The City engages its staff in a number of activities and events, including Bike to Work Day, Clean Air Commute Week, Carpool Week, and more, as well as provides priority parking spots for carpoolers, and the use of shower/changeroom facilities for those biking/walking. Bike racks are also strategically sprinkled around the City, typically in conjunction with the parks and facilities and continue to be added with new development. The City of Pickering received the 2012 Smart Commute Durham Employer of the Year in recognition of its continued efforts. , Other Pickering businesses that have become members of Smart Commute Durham include:

- Pickering Town Centre
- Hubbell Canada
- OPG
- Municipal Property Assessment Corp
- Ajax Pickering Board of Trade
- Purdue Pharma

The City of Pickering is also working with Durham Region to plan a comprehensive network of on-road and off-road bicycle lanes and multi-use paths. Staff is also working with the Region on

developing a Bus Rapid Transit System along Kingston Road. The first phase of the system will be constructed through Pickering and Ajax.

Pickering spearheaded the Highway 401 Pedestrian Bridge project that links the high-density downtown core and Pickering Mall to the Go Train station. The fully enclosed bridge opened in late 2012 and encourages greater use of GO transit and helps reduce parking congestion at the station by providing the opportunity for passengers to walk or park in the underused Pickering Mall lot.

Other positive actions to encourage transit use are the installation of Rapid Bus Transit lanes on Highway 2 and the installation of PRESTO passes at the GO Stations. In addition, in July 2013, GO train service has doubled, moving from hourly to every thirty minute departures. The Pickering GO train parking lot will also increase in capacity by 50% with the opening of a multi-level parking tower in the fall of 2014.

The City has a Bikeway and Trail Master Plan for south Pickering, and a Master Trails Plan is being prepared for Seaton. The [2008 Region of Durham Cycling Plan](#) and the [2003 Durham Transportation Master Plan](#) are available online.

Leading by example the City has invested in alternative fuel options for its fleet by purchasing eight hybrid-electric vehicles, as well as a street sweeper certified by the Air Quality Management District (AQMD) Rule 1186.

2.6 Summary of Community Emissions Reductions

Table 1 provides quantification of annual cost savings, energy savings and GHG emissions reductions for the community Local Action Plan programs, where applicable. In some cases the individual initiatives cannot be quantified, so the overall sector program is quantified as a summary.

Table 1: Quantification of Local Action Plan Community Programs

Program / Subprogram Name	Year	Sector	Implementation Description and Partners	Implementation Resources and Timeline	Cost Savings (\$'000)	2007 to 2011 Energy / Waste Savings	2007 to 2011 GHG Savings (t eCO2)
Integrated Sustainability Program	2007	Overall Community	Hire new full time position at City and establish Office of Sustainability	No additional salary cost – Office of Sustainability positions filled by existing staff - \$50K/y budget for consultants	Save on hiring staff - \$80 / yr.	Included below	Included below
Responsible Electricity Consumption	2007 to 2011	Residential	Leverage and support OPA/Veridian and DSA programs and future Durham Region residential program	Staff time to coordinate with Veridian and DSA programs - DSA to 2009 - OPA to 2014 - Potential Durham Region	\$912	7,081,579 kWh	36,295

Program / Subprogram Name	Year	Sector	Implementation Description and Partners	Implementation Resources and Timeline	Cost Savings (\$'000)	2007 to 2011 Energy / Waste Savings	2007 to 2011 GHG Savings (t eCO2)
				program starting in 2014			
Responsible Natural Gas Consumption	2007 to 2011	Residential	Leverage and support Enbridge and DSA programs and future Durham Region residential program	Staff time to coordinate with Enbridge and DSA programs - DSA to 2009 - Enbridge - ongoing - Potential Durham Region program starting in 2014	\$1,433	3,963,599 m3	6,755
Home Audits and Energy Clinics (Energy savings includes above, except Fuel Oil & Propane)	2007 to 2011	Residential	Promotion of Home Audits (and federal and provincial subsidies, when available) and Energy Conservation Education. Leverage and support DSA program and future Durham Region residential program	Staff time to coordinate with DSA and other local educational organizations – ongoing basis. Local renewable energy capacity increased to 225 kW based on home audits and MicroFit program.	\$1,570	1,380,488 litres fuel oil and (173,719) litres of propane	3,790
Responsible Water consumption	2008 to 2009	Residential	Promotion of Durham Region's water conservation programs	Staff time – ongoing Increase from 254 to 260 litres/person/day		N/A (Durham Region)	N/A (Durham Region)
Responsible Waste Management	2007 to 2011	Residential Waste	Promotion of Durham Region's recycling initiatives and City's corporate initiatives	Staff time – ongoing. Diversion rate increased from 56% to 57%; waste generated reduced by 11%; waste to landfill reduced by 12%		1,703 tonnes to landfill	6,800
Responsible New Home Development	2007 to 2011	Residential	Promotion of Green building standards for new homes. Work with developers.	Staff time to develop Sustainable Development Guidelines and work with developers on an ongoing basis. 5,600 m2 of new	Included in above savings	Included in above energy savings	Included in above GHG savings

Program / Subprogram Name	Year	Sector	Implementation Description and Partners	Implementation Resources and Timeline	Cost Savings (\$'000)	2007 to 2011 Energy / Waste Savings	2007 to 2011 GHG Savings (t eCO2)
				homes certified under Energy Star for New Homes			
Subtotal – Residential Sector	2007 to 2011	Residential - Energy			\$3,915	201,267 GJ	46,840
Building Audits and Retrofits	2007 to 2011	IC&I	Partner with Enbridge, Veridian, and DSA programs	Staff time working with utilities and DSA on DPPG program Sponsorship - \$5K/y to 2014			
Employee Education and Awareness	2007 to 2011	IC&I	Partner with Ajax Pickering Board of Trade and DSA programs	Staff time working with APBoT Eco-Business and DPPG programs			
Recognition of Responsible Businesses and Institutions	2007 to 2011	IC&I	Civic Awards for Businesses: Environmental and Sustainability awards	Member of APBoT awards committee. Staff time – ongoing basis.			
Responsible New Building Development	2007 to 2011	IC&I	Promotion of LEED silver or equivalent for all new commercial and institutional buildings	Staff time to develop Sustainable Development Guidelines and work with builders and businesses on ongoing basis. 39,547 m2 of certified green commercial buildings (LEED and BOMA BESt Level 3)			
Ecoschool	2009 to 2010	IC&I	All Pickering Schools to be registered as an EcoSchool	Completed by 2010 at no cost.			
Beyond EcoSchools	2009 to 2011	IC&I	Encourage extra initiatives by schools that, encourage water conservation, outdoor classrooms, involvement in	Staff time to support school boards and ongoing initiatives.			

Program / Subprogram Name	Year	Sector	Implementation Description and Partners	Implementation Resources and Timeline	Cost Savings (\$'000)	2007 to 2011 Energy / Waste Savings	2007 to 2011 GHG Savings (t eCO2)
			city's environmental initiatives etc				
Subtotal – IC&I Sector	2007 to 2011	IC&I - Energy			\$(5,550)	(238,517) GJ	86,325
Anti-Idling Program	2007 to 2011	Transportation	Promotion of City's anti-idling bylaw	Staff time including leading by example with corporate fleet.			
Responsible Commuting	2007 to 2011	Transportation	Promotion of alternative transportation and Smart Commute Durham program	Staff time supporting Smart Commute Durham and working with Region on master transportation plan. Home-based businesses – 6% of work force Commuting by walking, cycling, carpooling or public transit – 22% of work force			
Responsible Fleet Management	2007 to 2011	Transportation	Promotion of Durham Transit and business fleet management through DSA and Ajax Pickering Board of Trade programs	Staff time supporting business education through DSA's DPPG program and APBoT Eco-Business programs – ongoing basis.			
Subtotal – Transportation Sector	2007 to 2011	Transportation			\$4,073	117,746 GJ	5,312
Subtotal – Waste Sector	2007 to 2011	Waste	Refer to residential waste program above. Promote IC&I waste recycling through DSA and Ajax Pickering Board of Trade programs	Refer to residential waste program above. Staff time supporting business education through DSA's		390 tonnes	15,539

Program / Subprogram Name	Year	Sector	Implementation Description and Partners	Implementation Resources and Timeline	Cost Savings (\$'000)	2007 to 2011 Energy / Waste Savings	2007 to 2011 GHG Savings (t eCO2)
				DPPG program and APBoT Eco-Business programs – ongoing basis. Total waste and GHG savings is combined residential and IC&I programs.			
Total – All Sectors	2007 to 2011	Total Community			\$1,894	80,497 GJ	154,016

3 Community GHG Inventory Update

3.1 Inventory Basis

Since the Local Action Plan was developed, the community GHG inventory has been updated in 2007 coinciding with the establishment of the Office of Sustainability and the start of implementation of the LAP, and then again in 2011 to measure progress towards the 2016 target.

Tables 2 and 3 provide the emission coefficients used in the GHG inventory calculations.

Table 2: GHG Emission Coefficients

Energy Source	Base Unit	eCO2 Coefficient (t eCO2 / base unit)
Diesel	(litres)	0.002732
Fuel Oil	(litres)	0.002735
Gasoline	(litres)	0.002440
Natural Gas	(cubic metres)	0.001891
Propane	(litres)	0.001544

Table 3: Electricity Emission Coefficients

Inventory Year	Electricity eCO2 Coefficient (kg eCO2 / kWh)
1995 (Baseline)	0.120
2007	0.240
2011	0.110

The 2007 and 2011 electricity coefficients were updated as per the latest National Inventory Report 1990-2011 – Greenhouse Gas Sources and Sinks in Canada, Annex 13 released April 15, 2013.

3.1 Community Inventory Update

3.1.1 Population Forecast Update and Revised 2016 Target

In 2006, the Pickering community GHG inventory was developed for the year baseline year of 1995 and a 2016 emissions target was established based in part on population growth projections.

Table 4 provides the original and updated population forecast for the target year 2016 along with absolute and per capita GHG emission targets.

Table 4: Original and Updated 2016 Population Forecasts and Targets

	2016 Population Forecast	2016 GHG Target (t eCO₂)	2016 Per Capita Target (t / capita)
2006 Original	141,099	744,634	5.28
2013 Update	111,339	587,870	5.28

The original 2016 population forecast included significant urban development in Seaton in north Pickering. As a result of delays in the Seaton expansion, the current 2016 forecast does not include significant population growth in Seaton as the expansion is projected to commence in 2016.

The original 2016 GHG emissions target of 744,634 t was based on the original population forecast of 141,099. With the reduced growth, it is recommended that the absolute emissions target be revisited as it is no longer a stretch target. Using the same per capita target of 5.28 t/capita, **the recommended revised 2016 absolute target is 587,870 t.**

3.1.2 Summary of GHG Emissions and Energy Inventory

Table 5 summarizes the annual GHG emissions, energy consumption, and energy cost on an absolute and per capita basis from the 1995 baseline to 2011 as well as the 2016 targets.

Table 5: Community GHG Emissions, Energy Use and Energy Cost

	1995	2007	2011	2016 Target
GHG Emissions (t)	511,839	672,121	518,105	587,870
Per Capita GHG (t)	6.52	7.34	5.61	5.28
Energy Use (GJ)	9,264,042	10,822,417	10,741,920	8,537,726
Per Capita Energy (GJ)	118.0	118.2	116.3	76.7
Energy Cost (\$'000)	N/A	\$231,436	\$252,744	\$200,882
Per Capita Cost (\$)	N/A	\$2,529	\$2,737	\$1,804

From 1995 to 2007, absolute and per capita GHG emissions increased by 31.3% and 12.7%, respectively. The per capita increase is mainly attributable to the change in the provincial electricity emissions coefficient.

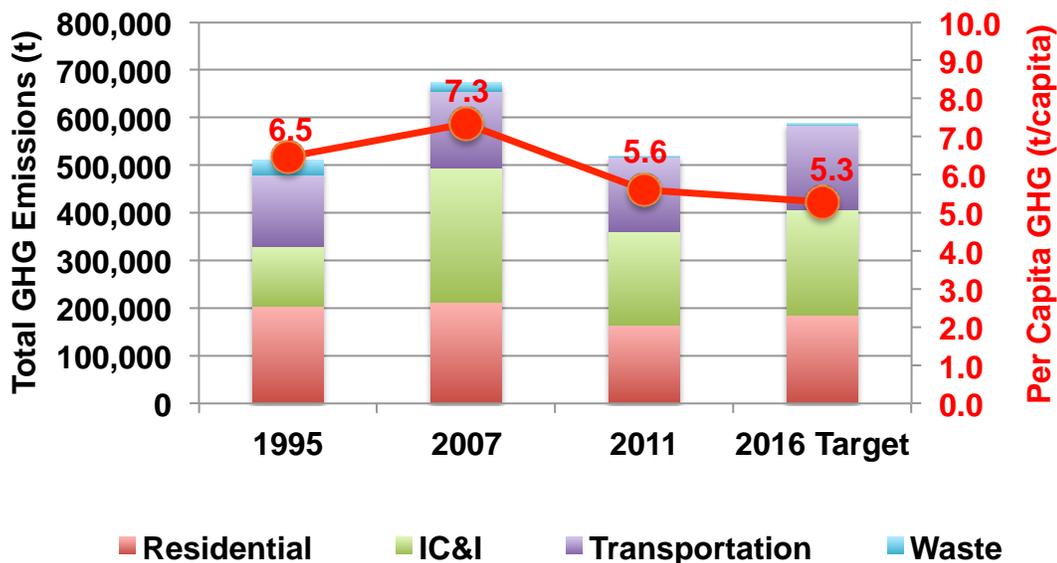
During this period, the absolute community energy consumption increased by 16.8% while the per capita energy use remained essentially unchanged, so the absolute change in energy use aligns exactly with population growth.

Since 2007, the absolute and per capita GHG emissions have declined by 22.9% and 23.6%, respectively, as the electricity emissions intensity has also significantly been reduced. However, between 2007 and 2011, the per capita energy use declined by 1.6%, from 118.2 GJ/person to 116.3 GJ/person.

Despite growth in population over the last four years, the absolute energy use was reduced by 0.7%, which may indicate a possible reversal of the upward trend, on an absolute basis, from 1995 to 2007.

Figure A provides total GHG emissions by sector with the total per capita GHG emissions trend line in red. Section 3.2.3 will provide further discussion on each community sector.

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



Although the 2011 absolute GHG emissions are below the 2016 absolute target, the forecasted population growth between 2011 and 2016 will require further GHG reductions. The per capita trend line shows a further decline from 5.6 t/capita in 2011 to 5.3 t/capita in 2016 is required to meet the absolute target.

3.1.3 Trends By Community Sector

3.1.3.1 Summary

Table 6 provides a summary of absolute and per capita GHG emissions by sector. Each sector will be discussed in the next sections.

Table 6 – GHG Emissions by Sector

GHG Emissions (t)	1995	2007	2011	2016 Target
Residential	203,900	210,193	163,353	185,349
Residential Per Capita	2.60	2.30	1.77	1.66
IC&I	127,020	281,505	195,180	221,462
IC&I Per Capita	1.62	3.08	2.11	1.99
Transportation	150,048	161,203	155,892	176,883
Transportation Per Capita	1.91	1.76	1.69	1.59
Waste	30,872	19,219	3,680	4,176
Waste Per Capita	0.39	0.21	0.04	0.04
Total	511,839	672,121	518,105	587,870
Total Per Capita	6.52	7.34	5.61	5.28

Figure A above provides a summary of the GHG emissions by sector.

The increase in absolute and per capita GHG emissions from 1995 to 2007 is mainly due to the significant rise in emissions in the IC&I sector. All sectors reduced emissions on an absolute and per capita basis from 2007 to 2011.

3.1.3.2 Residential

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

The residential sector accounted for 31% of total community GHG emissions in 2011. Table 7 provides the residential GHG emissions, energy consumption, and energy cost on an absolute and per capita basis.

Table 7: Residential GHG Emissions, Energy Use and Energy Cost

Residential	1995	2007	2011	2016 Target
GHG Emissions (t)	203,900	210,193	163,353	185,349
Per Capita GHG (t)	2.60	2.30	1.77	1.66
Energy Use (GJ)	4,258,460	3,835,654	3,634,386	2,888,626
Per Capita Energy (GJ)	54.2	41.9	39.4	25.9
Energy Costs (\$'000)	N/A	\$66,417	\$62,175	\$49,417
Per Capita Cost (\$)	N/A	\$726	\$673	\$444

From 1995 to 2011, the population grew by 17.6% while the number of households increased by 22.5%. Despite the increase in population and households, the absolute energy consumption has dropped by 14.7% and the GHG emissions have been reduced by 19.9%. This is a major accomplishment for the residential sector, which provides real per capita energy savings despite an increasing energy unit price trend.

The difference between the GHG and energy measures is attributable to the small change in the annual provincial electricity eCO₂ coefficient between 1995 and 2011 as shown in Table 3 in section 3.1.

Based on the current trend, the GHG emissions target likely will be met.

3.1.3.3 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 and food service establishments, and industrial facilities. It also includes apartments and condominiums in this analysis for reasons discussed in residential Section 3.2.3.2.

This sector accounts for the largest portion of total community GHG emissions. In 2011, it generated 38% of emissions. Table 8 shows the IC&I GHG emissions, energy consumption, and energy cost on an absolute and per capita basis.

Table 8: IC&I GHG Emissions, Energy Use and Energy Cost

IC&I	1995	2007	2011	2016 Target
GHG Emissions (t)	127,020	281,505	195,180	221,462
Per Capita GHG (t)	1.62	3.08	2.11	1.99
Energy Use (GJ)	2,824,208	4,645,899	4,884,416	3,882,155
Per Capita Energy (GJ)	36.0	50.8	52.9	34.9
Energy Cost (\$'000)	N/A	\$101,446	\$113,664	\$90,341
Per Capita Cost (\$)	N/A	\$1,108	\$1,231	\$811

From 1995 to 2007, total energy consumption and GHG emissions grew significantly by 64.5% and 121.6%, respectively. The difference between the GHG and energy measures is attributable to the significant change in the annual provincial electricity eCO₂ coefficients in 1995 and 2007 as shown in table 3 in section 3.1.

From 2007 to 2011, per capita energy use continued to increase although at a reduced rate of 1.0% per year between 2007 and 2011 versus an average of 3.4% per year between 1995 and 2007.

From 2007 to 2011, the absolute and per capita GHG emissions were reduced by 30.7% and 31.3%, respectively. With energy use continuing to increase during this period, the emissions decline is entirely due to the significant reduction in the provincial electricity coefficient from 2007 to 2011. The 2016 target requires a further 6% reduction in per capita emissions from 2011, which seems to be quite achievable if the provincial electricity coefficient continues to decline as forecasted by the Ministry of Energy.

3.1.3.4 Transportation

The transportation sector includes travel by all Pickering residents in personal vehicles and public transportation vehicles, but not rail, marine or air transportation. It also includes commercial vehicles used by Pickering 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 2011, transportation accounted for the third largest portion of total community GHG emissions generating 30% of emissions. Table 9 shows the GHG emissions, energy consumption, and energy cost on an absolute and per capita basis.

Table 9: Transportation GHG Emissions, Energy Use, and Energy Cost

Transportation	1995	2007	2011	2016 Target
GHG Emissions (t)	150,048	161,203	155,892	176,883
Per Capita GHG (t)	1.91	1.76	1.69	1.59
Energy Use (GJ)	2,181,374	2,340,864	2,223,118	1,766,944
Per Capita Energy (GJ)	27.8	25.6	24.1	15.9
Energy Cost (\$'000)	N/A	\$63,573	\$76,905	\$61,124
Per Capita Cost (\$)	N/A	\$695	\$833	\$549

From 1995 to 2007, total transportation fuel consumption and GHG emissions increased by 7.3% and 7.4%, respectively. Since 2007, fuel consumption and GHG emissions have declined through to 2011 by 5.0% and 3.3%, respectively. The small differences between energy and GHG emissions are likely due to changes in fuel use mix between gasoline and diesel.

On a per capita basis, energy and GHG emissions declined by 13.4% and 11.7%, respectively, from 1995 to 2011. Despite the decline in fuel use, the per capita energy cost has escalated by 20% from 2007 to 2011.

3.1.3.5 Waste

The community waste sector includes all waste collected by Durham Region from residents and institutions within Pickering. 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 estimate commercial waste disposal, which is added to Durham Region records.

In 2011, waste accounted for only 0.7% of total community GHG emissions. Table 10 shows the GHG emissions and waste tonnage to landfill on an absolute and per capita basis.

Table 10 – Waste GHG Emissions and Waste to Landfill

Waste	1995	2007	2011	2016 Target
GHG Emissions (t)	30,872	19,219	3,680	4,176
Per Capita GHG (t)	0.39	0.21	0.04	0.04
Waste to Landfill (t)	64,089	39,899	39,509	48,060
Per Capita Waste (t)	0.82	0.44	0.43	0.43

From 1995 to 2011, total waste to landfill was reduced by 38.4% through successful diversion programs. However, GHG emissions was reduced by 88.1% as a result of the change in composition of waste to landfill due to the organics recycling program, and due to the change in landfill disposition from no methane recovery to methane recovery landfills in New York State.

In 2011, the per capita waste to landfill is 0.43 t/person, which equals the 2016 per capita target. The absolute and per capita GHG targets are achievable.

4. Community Engagement

In 2007 Pickering formed the *Sustainable Pickering Advisory Committee*, which includes three Councilors and the Mayor, and established the first municipal *Office of Sustainability* in Ontario, including Director and Coordinator positions. At this time various avenues were used to interact with the public including an Ideas Challenge, film screenings, Sustainable Pickering Day events, and town hall meetings. In 2009, the Office developed the sustainablepickering.com website, a new program logo, launched Sustainable Pickering Community challenge and continues with sustainability benchmarking work. Results of this benchmarking work were reported in a 2010 preliminary Measuring Sustainability Report. In 2011, the results and indicators were revised. The final Measuring Sustainability Report was released in 2012.

During this period, the City and various community partners have successfully implemented many community sustainable initiatives. Table 11 is not a complete list but the following initiatives are indicative of successful community engagement.

Table 11: City of Pickering Community Engagement Initiatives 2007 to Present

Initiative	Number of times conducted	Approximate number of participants	Sector – Business or Residents (includes community groups)
Development of <i>Measuring Sustainability Report</i> – town hall meetings, working groups, web-based community survey	Multiple meetings held over the course of 2 years (preliminary report 2010, full report 2012)		All
Annual Sustainable Pickering Day	8 th annual held in 2013	Thousands of residents attend this annual event	All
Litter Cleanups: <ul style="list-style-type: none"> • <i>Great Cdn Shoreline Cleanup event</i> • <i>Pickering 20 Minute Makeover</i> • <i>Community Pitch-In Parties</i> • <i>Adopt A Park</i> 	<ul style="list-style-type: none"> • Once per year • Once per year • On going event • On going event 	<ul style="list-style-type: none"> • Up to 300/year • Between 4500-6000/yr • 7 businesses, 15 community groups, and 15 schools are Adopt-a-Park partners 	All
Community Gardens	NA	71 gardens, in partnership with Valley Plentiful Community Garden	Residents
Farmers' Market - Pickering Town Centre parking lot Tuesday afternoon and evening	Annually from June to October since 2011		All
Waterfront and cycling trail development, annual tree planting, adding of boulevard /park trees especially around children's play areas	As needed basis	All residents benefit	City Staff

Initiative	Number of times conducted	Approximate number of participants	Sector – Business or Residents (includes community groups)
Smart Commute – City Staff Educational program including: Bike to Work Day, Carpool Week, Clean Air Commute, Smart Commute Week	Ongoing	680 full and part time City employees and seasonal staff	City staff
Eco-Business and Durham Partners in Project Green (DPPG) membership	Ongoing	<ul style="list-style-type: none"> • 13 registered Eco-Businesses • 25 businesses have participated in DPPG activities • 48 business representatives attended DPPG workshops • 58 companies using the DPPG website • 4 businesses have conducted DPPG audits 	Business
<ul style="list-style-type: none"> • Lush Lawns Workshops • Gorgeous Gardens Workshops • Vertical Vegetables Workshops • Fall Garden Workshops 	All workshops conducted once per year since 2010	<ul style="list-style-type: none"> • 160 participants • 220 participants • 240 participants • 170 participants 	Residents
General Education and Awareness: <ul style="list-style-type: none"> • Articles in city and community newsletters, community page in local newspaper, website, transit shelter and Pickering Mall advertisements, etc. 	Weekly newspaper announcements, bi-annual inclusion in recreation guide, extensive website page	Potentially all residents and businesses will read one	
Dog Waste Diversion Program	Stations located at 13 parks	Not known	Residents
Environmental Leadership Forum (partnered with Environmental Stewardship Pickering)	Annual event since 2009	50-60 participants per year for an approximate total of 250-300	Residents
Rouge Days-Western Gateway in Pickering in partnership with TRCA	Annual event since 2010	15 participants per year for a total of 60	Residents
Sustainability and Environmental Awards	Awarded annually for over 10 years	2 winners per year	All sectors
Community Sustainability Survey – compilation of attitudes and knowledge regarding various areas of community sustainability including energy conservation and waste management	In 2011	Over 200 completed the survey	Residents

Initiative	Number of times conducted	Approximate number of participants	Sector – Business or Residents (includes community groups)
Celebrating Sustainable Neighbourhoods	New program as of 2013	Hundreds of residents have participated in a number of neighbourhood groups	Residents

Appendix A – City of Pickering PCP Local Action Plan – 2006



City of Pickering Partners for Climate Protection Local Action Plan

A Greenhouse Gas Emissions Reduction Strategy and Energy Management Plan

June 2006

Prepared by:

Durham Sustain Ability
www.sustain-ability.ca



PROJECT SPONSORS:



Federation of Canadian Municipalities



Contents

Acknowledgments	31
Introduction	32
Background.....	32
Purpose of the LAP	33
Climate Change – Local Actions in a Global Context	34
General Approach and Guiding Principles	34
Local Benefits.....	35
Developing the Plan of Action.....	37
GHG Emissions Inventory, Trends and Forecasts	38
Background.....	38
Community Growth Plan.....	38
Emissions Performance Indicators	39
Emissions Inventory Baseline	40
GHG and Energy Management Trends.....	42
Emissions Forecasts.....	45
Emission Targets.....	47
Action Plan Initiatives and Programs.....	48
Working Group Framework.....	48
Municipal Operations Action Plan	51
Community Action Plan.....	60
Summary - Program GHG Reductions.....	84
Recommendations and Next Steps	85
Recommendations for Council	85
Next Steps.....	85
Appendix A - Municipal Operations Energy, GHG Emissions and Forecast Data	60
Appendix B - Community Energy Use, GHG Emissions and Forecast Data	67
Appendix C - GHG Emissions Inventory and Forecasted Absolute GHG Emissions Changes as per Protocol.....	74

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- Enbridge
- Ontario Power Generation
- Veridian

This Local Action Plan (LAP) report was prepared by Greenpath in consultation with the City of Pickering. The project consulting team included Terry Green, project manager and primary author of this report, Gail Lawlor of Energy Matters, senior advisor for the study and primary facilitator of the working group meetings. Project support, communications consulting and guidance was provided by Angela Wheeler and Jack McGinnis of Durham Sustain *Ability* (DSA), a local non profit sustainability organization.

A special thanks to the many individuals and organizations that contributed to the development of this program. In particular, Tom Melymuk, Division Head Corporate Projects & Policy and Ron Taylor, Coordinator, Business Development & Investment for the City of Pickering who have championed this initiative from its very beginnings. Ron chaired the municipal working group and championed the project as the key representative of the City on the Project Team.

This LAP report includes valuable input from five working groups that met a number of times from October, 2005 to March, 2006. The Municipal, Residential, IC&I, Transportation and Community Outreach working groups were chaired by Ron Taylor, George Armstrong of Veridian, Susan Clinesmith of Enbridge, Craig Oldman of Siemens Canada, and Jack McGinnis of Durham Sustain *Ability*, respectively. We wish to thank each chair and the representatives that offered their time and support to these working groups including city staff, local businesses (industrial, commercial, retail), local institutions (school, church, hospital), Durham Region, local and regional transit authorities, and community and neighbourhood associations.

A special recognition is extended to the mayor and councillors who have given their full support to this program and to the overall Sustainable Pickering vision, which is paramount to the success of this action plan.

Introduction

Background

The City of Pickering recognizes the importance of environmental stewardship within its municipal operations and within the entire community. In recent years, the City has been a committed partner within the Greater Toronto Area (GTA) Clean Air Council and has demonstrated its commitment to the environment through various ongoing programs such as park clean-ups, the Frenchman's Bay environmental program and establishment of an anti-idling bylaw.

In 2005, the City's commitment to environmental stewardship and sustainable development was elevated to a new level with the commencement of a number of key initiatives:

- i) Creation of a new environmental co-coordinator position to support and develop environmental awareness programs within municipal operations (through the City's Corporate Green Committee) and in the community at large.
- ii) Commencement of the Sustainable Neighbourhood Plan (SNP) project to provide a design framework for responsible development and integration of new neighbourhoods.
- iii) Development of a "Partners for Climate Protection" (PCP) plan, to provide a greenhouse gas emissions reduction plan primarily focusing on responsible energy consumption for municipal operations and the community, which this report addresses. PCP is a program developed and delivered jointly by the Federation of Canadian Municipalities (FCM)

The SNP and PCP programs are "sister projects" that are supported by the federal Green Municipal Enabling Fund administered by FCM, both commencing in May, 2005.

- iv) Establishment of a Benchmarking Sustainability initiative to clarify what sustainability means for Pickering, how to become a sustainable community and how to measure the progress on an ongoing basis.

In order to support, co-ordinate and provide guidance for these initiatives, an "umbrella program" was developed called Sustainable Pickering. For further information on this program and these various initiatives, refer to City's website www.sustainablepickering.com.

Purpose of the LAP

The City of Pickering is committed to developing a sustainable community as outlined in the Benchmarking Sustainability program. A number of objectives have been identified to define what a Sustainable Pickering would look like:

- i) Healthy Environment
- ii) Healthy Society
- iii) Healthy Economy
- iv) Responsible Development
- v) Responsible Consumption

The Local Action Plan (LAP) was initiated to identify greenhouse gas (GHG) emissions reduction opportunities to enable the community to move towards its sustainable objectives. The objective of Responsible Consumption is particularly relevant for the LAP as well as viewing all opportunities through the three lenses of healthy economic, social and environmental benefits.

The focus on GHG emission reduction targets and actions catalyzes progress in achieving a number of sustainable goals:

- i) An overarching goal that engages all sectors of the community fostering a healthier community social fabric.
- ii) Direct link with energy management and its long term economic benefits.
- iii) Direct link with reduction of air pollution and smog caused by fossil fuel combustion and its related social and health co-benefits.
- iv) Indirect link with many other sustainable environmental, economic and social benefits such as an increased local focus – employment, food, renewable energy, etc.
- v) Provides a global context through the Kyoto protocol while focusing on local tangible benefits.

The LAP emphasizes the link with energy management and responsible energy consumption as viewed through the three lenses of sustainability. It also recognizes the importance of waste management, which affects GHG emissions through landfill methane production, and the importance of water management which directly impacts energy consumption and GHG emissions. Most of the initiatives are focused on the existing community and municipal operations; however there are several initiatives that target the Responsible Development objective with synergistic overlap with the Sustainable Neighbourhood Plan project.

Climate Change – Local Actions in a Global Context

Greenhouse gas concentrations in the atmosphere (the most common of which include carbon dioxide CO₂, methane CH₄, and nitrous oxide N₂O) has been increasing significantly over the last 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 forests.

Climate change is a global issue requiring local action, mainly in the area of responsible energy consumption. 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).

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 and energy consumption.
5. Establish a monitoring and reporting system to verify GHG reduction achievements. Revise the action plan periodically to reflect new ideas and strategies.

In May 2005, the City of Pickering launched the program to complete Milestones 1, 2 & 3. Greenpath was contracted to assist the City in developing a program to complete these milestones and develop this LAP. When this report is reviewed by Council in June 2006 and the PCP Secretariat has approved the milestone documentation, these three milestones will have been deemed to be completed.

General Approach and Guiding Principles

In order to ensure consistency and guidance for this project, a general approach with a number of guiding principles were established by the Project Team while aligning with the overall Sustainable Pickering program:

- **Engage community partners and the public** - establish working groups representing all sectors and conduct a public forum for general public input
- **Foster diverse stakeholder collaboration through common over-arching goal** – “doing our part to reduce GHG emissions for future generations”
- **Emphasize local benefits** – provide tangible justification for action through the ‘three lenses of sustainability’ – economic, environmental and social benefits

- **Foster community ownership with local champions** – e.g. Whitevale and District Residents Association – door to door compact fluorescent light bulb distribution
- **Engage “bottom-up” community-based social marketing** – change behaviour through community-based programs – e.g. Durham Conservation Centre’s (now Durham Sustain *Ability*) original Blue Box recycling program, Durham Region’s water efficiency program
- **Support “top-down” leadership** – e.g. City of Pickering corporate leadership, key programs by project partners – Enbridge, OPG, Veridian
- **Establish benchmarking, monitoring and feedback systems** – Sustainable Pickering benchmarking elements includes GHG emission data, ongoing monitoring and community feedback through multiple avenues and channels
- **Lever existing programs** – create efficiencies by integrating programs and combining top-down and bottom-up approaches
- **Focus on action** - commenced initiatives in parallel with developing action plan e.g. Veridian Lunch n’ Learns for IC&I sector; Municipal staff Lunch n’Learn sessions; Whitevale relamping program; Dunbarton-Fairport United Church energy efficiency retrofit with Enbridge assistance. Rosebank Road Public School and Dunbarton High School’s commitment to implement the EcoSchools program
- **Challenge stakeholders to establish pilot programs** - e.g. fuel additive program for improved efficiency and reduced pollution

Based on these guiding principles, the basic approach was to engage as many diverse perspectives as possible including “blue sky” ideas, while being pragmatic and action oriented at the same time. Rather than an “either/or” mentality concerning ideas versus action, the project principles allows for honoring the multitude of motivations and perspectives of the stakeholders.

Local Benefits

One of the key principles is to emphasize local benefits. Without local benefits there is little motivation to act. However without an overarching goal such as greenhouse gas reduction targets there is little room to work together and align the diverse motivations and agendas of the residents, businesses, institutions, community organizations and municipal government. The topic of global climate change is quite abstract for most people, yet the overarching goal of greenhouse gas emission targets are tangible enough to catalyze and align the many diverse perspectives of the various sectors of the community. However, this is not enough to enable and motivate stakeholders to act: the overarching goal must be translated to local benefits. “What does this mean to me, my family, my job or business, my community?”

In keeping with the three lenses of the Sustainable Pickering program, the following generic local benefits of this program are grouped into these three categories and yet they can be and should be seen through all three perspectives:

Economic Benefits

- Energy and operating cost savings in all sectors
- Physical asset renewal in municipal operations and private sector
- Improved municipal service delivery
- Reduced healthcare costs
- Increased productivity and employee morale
- Greater support for local businesses – significant multiplier effects
- New local business opportunities in sustainable development sector
- Local job creation in new “green” businesses and services

Environmental Benefits

- Improved air quality
- More green space and trees in the community
- Improved health of natural ecosystems
- Reduced “urban heat island effect”
- Better indoor living and working environments (e.g. improved lighting, better indoor air quality, reduced noise, increased comfort)
- Doing our part in creating a globally sustainable future for our children and the planetary biosphere

Social Benefits

- Improved health of residents
- Reduced traffic congestion
- Increased community investment and services
- Opportunity for the municipal government to show leadership and influence other community stakeholders to take action
- Greater sense of community; enhanced quality of life

These are a few of the generic local benefits, and there are many more specific benefits that can accrue from GHG emission reductions and responsible energy management. A key project principle is that these local benefits as seen through the three lenses of sustainability need to be emphasized to fully engage collective action.

Developing the Plan of Action

In following the guiding principle of engaging community partners, a number of key steps were taken:

A. Founding Project Partners

Early in the process, Enbridge, OPG and Veridian stepped-up to be founding project partners providing valuable support for this project and completing the funding contributed by the City of Pickering and the federal GMEF administered by FCM. Durham Sustain *Ability*, a non-profit local sustainability organization, also provided valuable in-kind support throughout the project.

B. Working Groups

To engage diverse sector perspectives and knowledge, five working groups were developed during a public project kick-off workshop: Community Outreach, Industrial, Commercial and Institutional (IC&I), Municipal, Residential, and Transportation. Once chairs were established, each group met separately at least twice to brainstorm ideas within their relevant area and then to prioritize the initiatives using common criteria. In March 2006, all the groups met together in a workshop to brainstorm implementation strategies for each prioritized initiative including potential funding, responsibilities (coordinator and support), and timing. In all, over 50 community stakeholders representing a variety of sectors contributed their time to the program: from various City departments, small and medium size businesses, large corporations, energy companies, retailers, institutions such as school, hospital and church, Durham Region, neighbourhood associations, environmental organizations, transit authorities and organizations, conservation authority, residents and councillors.

C. Public Forum

In May 2006, A public forum was held in the form of a celebration at the Pickering Town Centre: Sustainable Pickering Day. This was an integrated effort that provided information on all Sustainable Pickering programs and initiatives with the support of many exhibitors of sustainable technology, products and services as well as business sustainability presentations for the local business community. Public feedback was obtained through a "Passport to Sustainability" survey during the day.

GHG Emissions Inventory, Trends and Forecasts

Background

For PCP Milestone 1, a GHG emissions inventory and forecast was established for both municipal operations and the community. This work was done in parallel with engagement of community partners and stakeholders in developing a local action plan as part of completing PCP Milestone 3.

PCP Milestone 2 requires the establishment of GHG emissions targets. The Pickering Council approved a resolution with provisional targets subject to the work in developing Milestones 1 and 3. This report recommends new emission targets based on this work.

The Partners for Climate Protection (PCP) Inventory Spreadsheet was used to gather energy inventory data and convert this information to GHG emissions inventory. Greenpath utilized its forecasting model to develop several scenarios to arrive at a recommended emissions target based on Pickering's growth plans and its commitment to responsible consumption and development.

A baseline year of 1995 was selected due to a number of considerations. The Kyoto protocol uses a baseline year of 1990, so in a perfect world 1990 should be used to mirror the protocol; however 1995 was the earliest year that community and municipal information was available. For trend analysis, the latest energy and waste information was gathered for the year 2004.

A forecast and target year of 2016 provides a 10 year window of opportunity from commencing the full program in 2007 based on PCP recommendations. Also, 10 years allows for a good portion of the substantial growth of the Seaton development with its significant effect on community emissions and energy management planning.

Community Growth Plan

The City of Pickering is in a unique situation in that much of its central and northern lands were expropriated by the provincial and federal governments in the early 1970's. The federal lands were designated for a new airport which is now being proposed in a downsized form as a regional airport. The provincial lands include a land swap with developers which will be part of the new urban development of Seaton, a development that may eventually double Pickering's current population of 94,200. As no development has occurred on these lands for several decades, Pickering's growth has been slower than most municipalities in Durham Region, however this now presents a tremendous opportunity for the City: as the Seaton lands open up to development in the next few years, there is an opportunity to develop neighbourhoods in accordance with new cutting edge sustainable urban designs as are being developed in the Sustainable Neighbourhood Plan (SNP) project.

Pickering's population is projected to grow by 50% from 2004 to 2016 as part of the Seaton expansion (see Figure 1). This represents 80% growth from the baseline year of 1995.

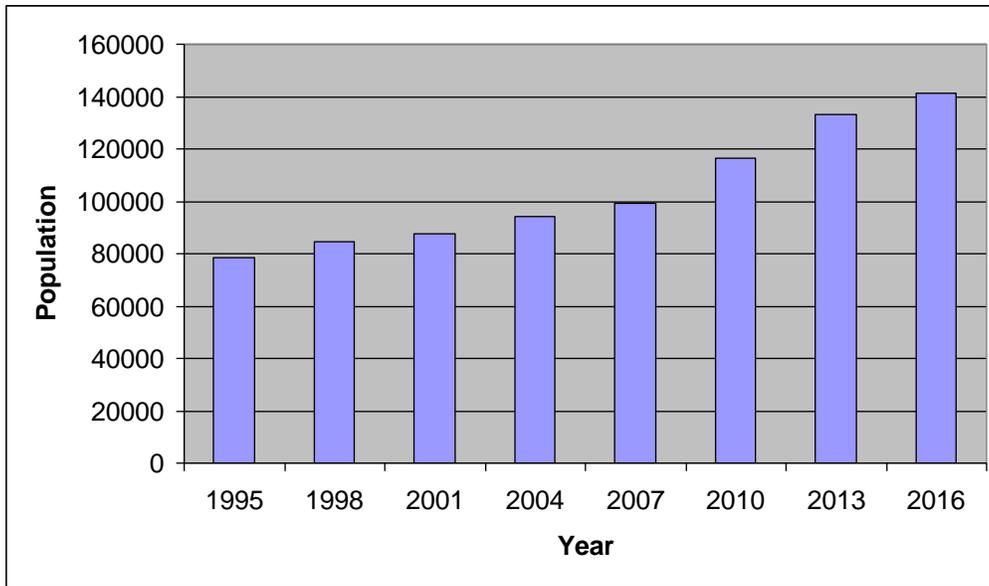


Figure 1: Pickering Population Trend and Forecast

Emissions Performance Indicators

The GHG emissions data is much more meaningful when translated into performance indicators. A key indicator used in this study is GHG emissions per capita, mostly per population or per household, which is used as the key basis for forecasting. Some relevant performance indicators developed for this study include:

Municipal Operations:

	<u>1995</u>	<u>2004</u>	
Municipal building floor space ('000 square metres)		52.6	53.2
Municipal fleet vehicles (excluding APTA buses)	112*	129	
Municipal Employees (including part-time)		697*	685
Energy Cost (\$'000/yr)	\$1,435	\$2,233	

* Not available in 1995, used 1999 data

<u>Community:</u>	<u>1995</u>	<u>2004</u>
Population	78,300	94,200
Households	23,872	29,346
IC&I building floor space ('000 square metres)		1,298
IC&I Employees		31,000

Emissions Inventory Baseline

Emissions inventories were established in 1995 for both municipal operations and the entire community through gathering energy and waste data. Refer to Appendix A and Appendix B for municipal operations and the entire community, respectively, for energy consumption and GHG emissions data by energy source and by sector.

Municipal Operations – Inventory Baseline

In 1995, municipal operations produced 7,874 tonnes of GHG emissions from energy usage that cost \$1.44 million. On a per capita basis, this equates to 0.10 tonnes per resident. Refer to Figure 2 for a breakdown of these emissions by sector. Municipal buildings use by far the most energy. Water and sewage operations are not included here as these operations are owned and operated by Durham Region; however they are included in community emissions within the IC&I sector.

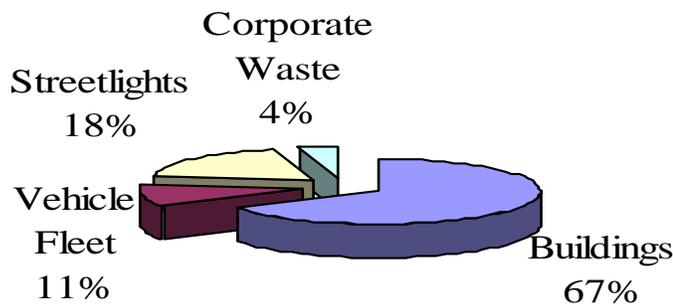


Figure 2: Breakdown of Municipal Operations GHG Emissions by Sector (1995)

Refer to Figure 3 for a breakdown of emissions by energy source. Electricity is by far the largest source of energy followed by natural gas.

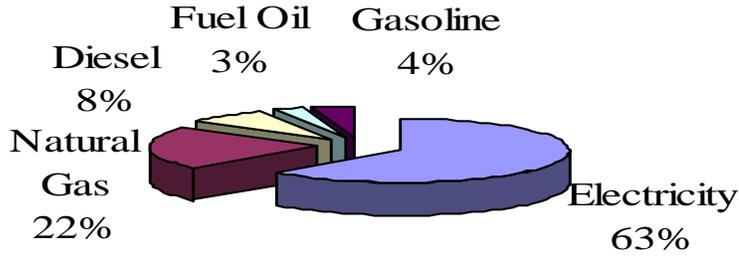


Figure 3: Breakdown of Municipal Operations GHG Emissions by Source (1995)

Community – Inventory Baseline

In 1995, the community generated 633,428 tonnes of GHG emissions from energy consumption and waste disposal. On a per capita basis, this equates to 8.1 tonnes per person. Refer to Figure 4 for a breakdown of these emissions by sector. The industrial sector within the overall sector “Industrial, Commercial & Institutional” is sometimes reported separately, however Veridian’s electricity data was not segregated between industrial and commercial/institutional so this differentiation could not be made for this analysis. The residential building sector is the largest consumer of energy followed by the industrial, commercial and institutional (IC&I) sector and vehicle transportation. The community produced 77,797 tonnes of waste of which almost 17.6% was recycled. The remainder that went to landfill produced 30,872 tonnes of GHG emissions.

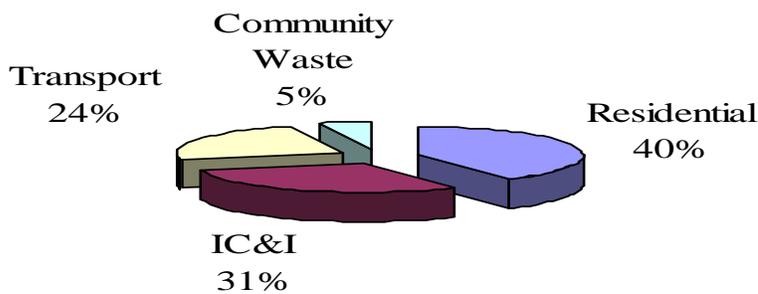


Figure 4: Breakdown of Community GHG Emissions By Sector (1995)

Refer to Figure 5 for a breakdown of emissions by source. Natural gas represents the largest source followed by electricity.

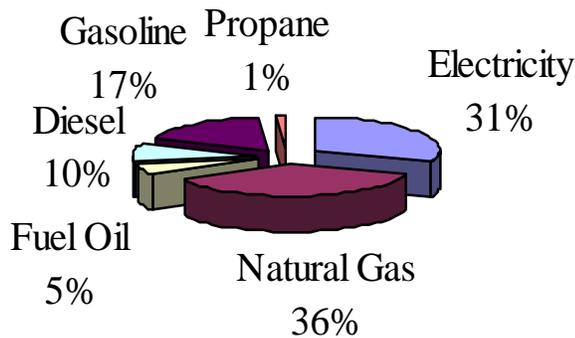


Figure 5: Breakdown of Community GHG Emissions By Source (1995)

GHG and Energy Management Trends

Energy use data (with all sources of energy converted to one common measurement – GigaJoules (GJ)) and performance indicators were collected for both the baseline year of 1995 and in 2004 for trend analysis. Energy use data has been translated into GHG emissions to provide a useful way of expressing energy management trends and for forecasting these trends to the year 2016. To ensure a meaningful comparison of GHG emissions in each year, the most recent electricity eCO₂ coefficient was used as provided by the PCP Spreadsheet and described further in Appendix A and Appendix B. The GHG emissions calculated in this manner provides a meaningful way of expressing per capita energy management trends and targets.

However, PCP protocol requires that GHG emissions are calculated on an absolute basis using the corresponding electricity eCO₂ coefficient in each year. The GHG emissions data calculated according to protocol is provided in Appendix C along with electricity eCO₂ coefficients used for each year. Appendix C provides the absolute changes to GHG emissions from the baseline year of 1995 to the forecast year of 2016 for both municipal operations and the entire community.

Municipal Operations – GHG and Energy Management Trend

Refer to Figure 6 for a comparison of municipal operations GHG emissions in 1995, 1999 and 2004. Most notable is the vehicle fleet fuel consumption and emissions have risen by 34% and streetlight energy consumption and emissions have risen by 22%.

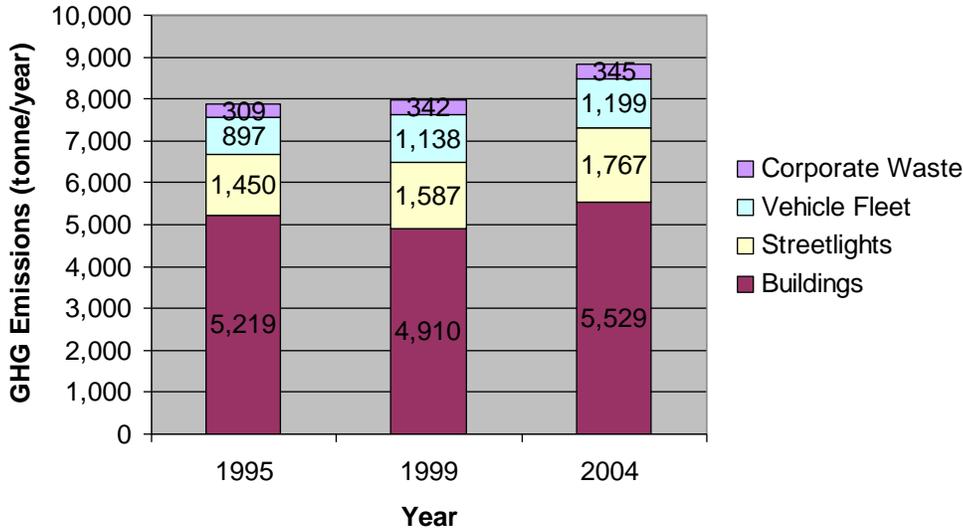


Figure 6: Municipal Operations GHG Emissions Trend By Sector

Some of this increase in emissions is due to an increase in level of services for a population that has risen by 20% from 1995 to 2004 such as the increase in street lighting. Refer to Figure 7 for the per capita trend in corporate GHG emissions and energy management.

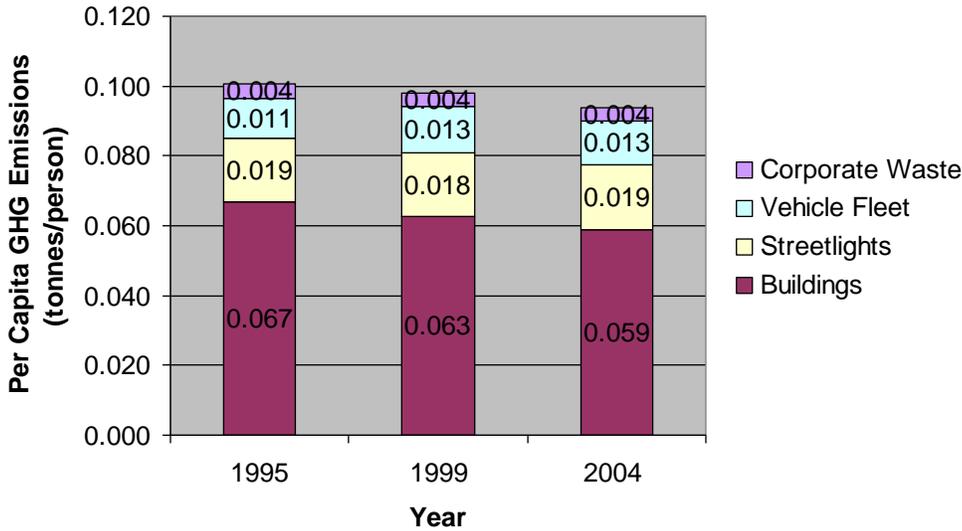


Figure 7: Municipal Operations Per Capita GHG Emissions Trend By Sector

Per capita emissions from buildings have dropped by 15% as there has been no significant new buildings constructed except replacement of a few facilities, which is reflected by only a 1% increase in floor space. The vehicle fleet per capita emissions has increased by 11% due to increases in fleet size which has outpaced the population growth.

One of the most significant trends is that total energy costs have risen dramatically from \$1.4 million in 1995 to \$2.2 million in 2004: a 50% increase in 10 years. One quarter of this increase is due to a net increase in energy consumption.

Community – GHG and Energy Management Trend

Refer to Figure 8 for community GHG emissions trend from 1995 to 2004. Even though the population increased by 20%, residential GHG emissions and energy consumption declined by over 7% mainly due to a reduction in natural gas and fuel oil consumption which suggests improvements in space heating for both existing homes and new home construction. Emissions from transportation rose significantly by over 22% as a result of the trend of increased “vehicle kilometers traveled” (VKT).

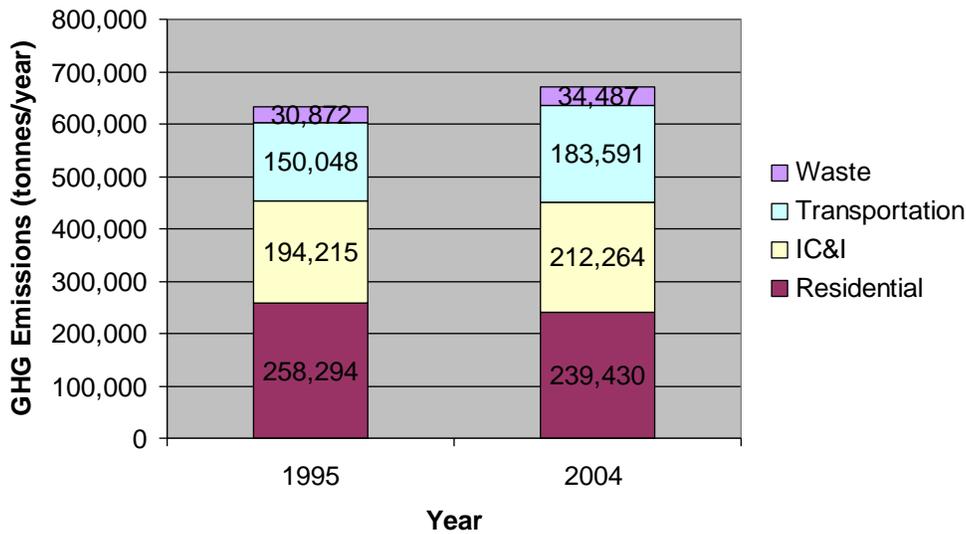
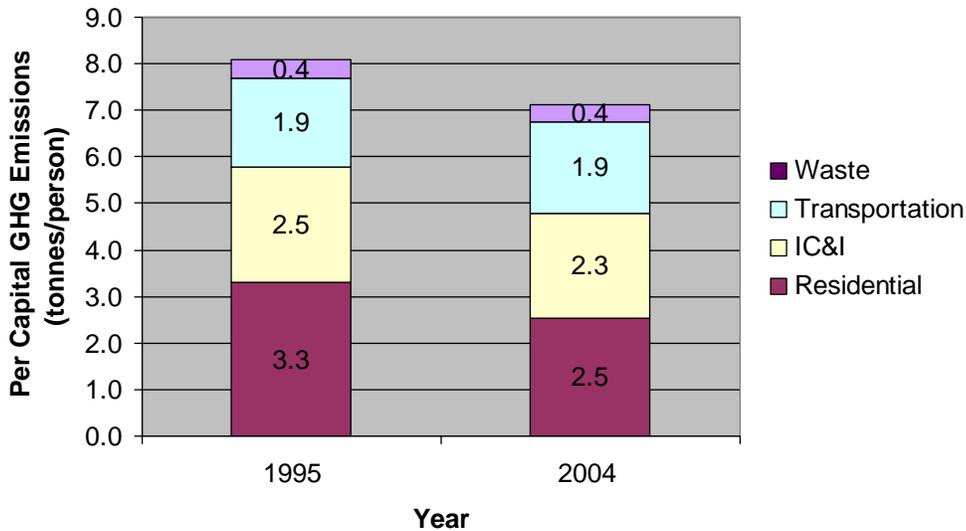


Figure 8: Community GHG Emissions Trend By Sector

Transportation emissions slightly increased more than the population growth by about 2%; however rounding shows it to be constant in Figure 9 below. Refer to Figure 9 for a per capita trend analysis by sector.



The residential sector saved 23% in energy consumption on a per capita basis on the strength of primarily space heating improvements (programmable thermostats have made a significant impact) and some electricity gains through replacement of appliances, etc.

Emissions Forecasts

A number of scenarios were run based on the per capita trend analysis for actual GHG emissions from 1995 to 2004 and scenario forecasts to 2016. The following is a summary of the scenarios:

No Change	Same per capita emissions as 2004 – 0.094 tonnes/person
Current Improvement Trend	Same % improvement from 1995 and 2004 – 0.085 tonnes/person
Responsible Development	Current Improvement Trend plus focus on reductions in new infrastructure – 0.069 tonnes/person
Responsible Consumption	Current Improvement Trend plus focus on reductions within existing infrastructure – 0.068 tonnes/person
Integrated Sustainability	Focus on both Responsible Development and Responsible Consumption – 0.050 tonnes/person

Municipal Operations – Emissions Forecasts

Refer to Figure 10 for representation of the various forecast scenarios to 2016.

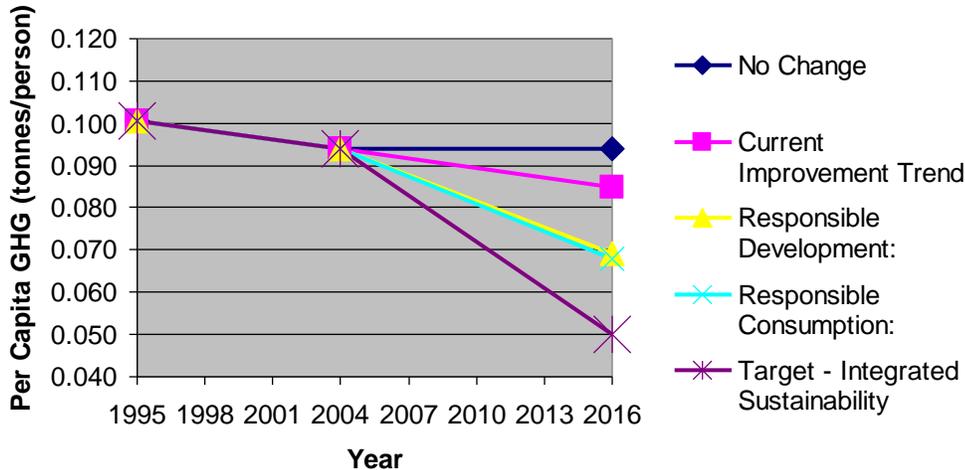


Figure 10: Municipal Operations Per Capita Forecast Scenarios and Target

The per capita target of 0.050 tonnes/person represents a 50% reduction from the 1995 baseline of 0.101 tonnes/person. On absolute terms, the 2016 target is 7,083 tonnes, which represents a 10% reduction of total GHG emissions despite an increase in population of 80% from 1995.

Community – Emissions Forecasts

Refer to Figure 11 for representations of these forecasts and the target.

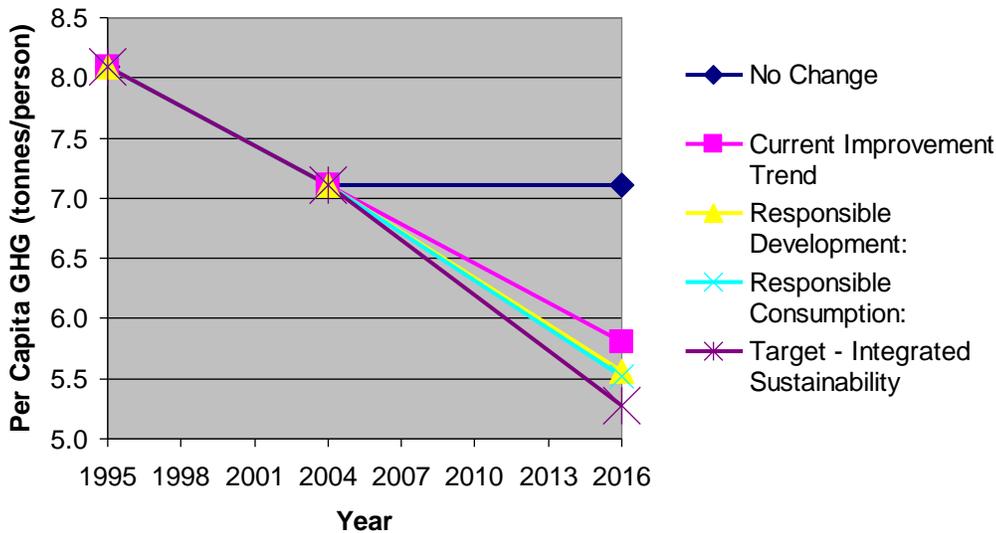


Figure 11: Community Per Capita Forecast Scenarios and Target

The per capita target of 5.3 tonnes/person represents a 35% reduction from the 1995 baseline of 8.1 tonnes/person. On absolute terms, the 2016 target is 744,634 tonnes, which represents an 18% increase in total GHG emissions despite an increase in population of 80% from 1995.

In keeping with the principle that the City must be a leader by example, municipal operations has a more stringent per capita reduction target of 50% versus the community per capita reduction target of 35%.

Emission Targets

Refer to Table 1 for a summary of recommended GHG emission targets for the community and municipal operations. This is based on the targets associated with the “Integrated Sustainability” scenario outlined above.

The targets are stated on a per capita basis due to Pickering’s growth potential in the next 10 years and more. The table provides both per capita targets and corresponding total targets based on the growth in population as forecasted in the City’s official plan.

Table 1: Per Capita and Total Emissions in 1995 (Baseline) and 2016 (Target Year) and Total Gap from Target (Tonnes)

	1995		2016				
	Total GHG	Per Capita GHG	“No Change” Total	Per Capita Target	Per Capita Reduction	Target Total	Total Gap from Target
Municipal Operations	7,874	0.10	13,239	0.05	50%	7,083	6,157
Community Wide	633,428	8.1	1,003,229	5.3	35%	744,634	258,595

Actual progress to-date (2004) shows that the municipal operations per capita emissions have been reduced by 7% to 0.09 tonnes/person. Community-wide emissions have been reduced by 12% to 7.1 tonnes/person.

Refer to Appendix C for absolute GHG emissions in each year in accordance with the PCP protocol based on fluctuating annual Ontario electricity eCO₂ coefficients. The municipal operations target of 7,083 tonnes and the community target of 744,634 tonnes in 2016 correspond to a 41% and 45% absolute increase in GHG emissions, respectively, with a forecasted population growth of 80% during that same time period.

Action Plan Initiatives and Programs

Working Group Framework

The process of engaging working groups was crucial for this program. It provided the means by which the program could accomplish several objectives:

- i. Engage community partners and foster early stakeholder buy-in and involvement. This is crucial for the implementation and monitoring stages of the program (PCP milestones 4 & 5).
- ii. Develop a broad spectrum of ideas from multiple sectors and perspectives.
- iii. Prioritize ideas based on a broad level of experience and expertise.
- iv. Integrate and cross-fertilize ideas and stakeholder relationships.
- v. Focus on actions and “low-hanging fruit” through pragmatic implementation strategies and a “just do it” attitude.

The working group categories were established at a public project kick-off workshop, which also provided the context for enlisting interest in working group representation. The following working groups and chairs were established over the first two months of the project launch:

Municipal:	Ron Taylor – Coordinator, Business Development & Investment, City of Pickering and City representative on Project Team
IC&I:	Susan Clinesmith – Manager, Business Markets Development, Enbridge, a founding project partner
Residential:	George Armstrong – Manager, Regulatory Affairs and Key Projects, Veridian, a founding project partner
Transportation:	Craig Oldman – Account Manager, Siemens Canada, a project sponsor
Community Outreach:	Jack McGinnis - Chair, Durham Sustain Ability, a founding project partner

Over 50 community stakeholders volunteered from a large cross section of local organizations and businesses to form these working groups. The first four groups were categorized by sector to ensure that a broad cross-section of community representation was engaged in the process. The Community Outreach group was formed to provide an all encompassing perspective on community engagement and to address areas that might not fall within the other four sector categories (e.g. agriculture).

Four Sector Working Groups

The four sector working groups met twice each and were asked to meet two objectives:

1. Brainstorm ideas to reduce GHG emissions *and* to provide local benefits.
2. Categorize and merge ideas into project initiatives and prioritize them.

The process of prioritizing initiatives required a common set of criteria that was simple enough to use without impeding the process and yet had enough complexity to make the prioritization process

meaningful. The project team developed the following key criteria which was used to rate each initiative in order of favourability (1, 2, or 3):

Cost:	Sub-categories: program and end-user
Effort:	Sub-categories: program implementation and end-user implementation
Impact:	Sub-categories: GHG reduction, economic and other (including program awareness, social, and other environmental)
Timing:	Sub-categories: short, medium and long term

Over 40 initiatives were prioritized by the four sector working groups and these in turn were sorted as a whole and in some cases merged together and/or renamed to establish a “short list” of 25 prioritized initiatives.

The summary of the working group meetings including the matrices used for prioritizing initiatives are posted on the City’s sustainability website www.sustainablepickering.com.

Community Outreach Working Group

Community outreach is not a community sector but a critical *function* within this program. Therefore, this group had a somewhat different purpose as it was focused more on the “how” than the “what”. The four sector working groups were formed to establish **what** needed to be done to reduce GHG emissions and provide local benefits. The Community Outreach group was formed to address **how** these initiatives could reach the community in the most effective ways such that success rates were *maximized*.

The Pickering “community” includes residents, businesses, institutions and community organizations.

The Community Outreach group met on five occasions to address the following objectives:

- Identify effective ways and channels to reach the community that fosters action
- Brainstorm marketing and promotional ideas
- Develop criteria for prioritizing community outreach efforts
- Prioritize sector working group initiatives using this criteria
- Integrate prioritized initiatives into larger community outreach programs

The following criteria were established for prioritizing initiatives requiring community outreach support:

- Timing – focus on short term only within next year
- Program Cost
- Focus on Success (foundational)
- Community awareness
- Measurable action
- Representative (initiatives from different sectors or cross-sector)

Once the initiatives were sorted based on the first four criteria (the last 2 were checks only), a number of prioritized initiatives were integrated together into larger community outreach programs. These programs are based on “bottom-up” community-based social marketing to effect behaviour change and “top-down” leadership by example and incentive programs (eg. financial, recognition, etc). Five major programs were established:

1. Focus on conservation in the home – starting with green bin distribution in July, 2006 – lever as a channel for energy conservation action
2. Focus on conservation in the workplace – starting with Lunch n’ Learns
3. Focus on schools – lever provincial EcoSchools program and local programs
4. Focus on residential transportation – starting with anti-idling program
5. Focus on land use – starting with coordination of tree planting programs and addressing new development (eg. SNP project)

These larger scale community outreach programs each include a number of prioritized initiatives or “subprograms” that were addressed by the four sector working groups. These five programs were given names by the project team that align with the Sustainable Pickering theme and are straight forward enough such that they are understandable by anyone in the community:

1. Sustainable Home
2. Sustainable Workplace
3. Sustainable School
4. Sustainable Transportation
5. Sustainable Land

In addition, the municipal operations initiatives that are not specifically addressed by the Community Outreach programs have been integrated together and called “Sustainable Municipality”.

Municipal Operations Action Plan

Municipal Operations Action Plan

The following municipal operations action plan provides proposed initiatives that the City can implement to reduce GHG emissions as well as create many local benefits. These actions were prioritized by the municipal working group, however each program initiative will require further study and quantification prior to being presented to council for approval.

This municipal action plan named “Sustainable Municipality” provides sustainability leadership for the community by reducing municipal energy costs and GHG emissions and by delivering social, health and environmental benefits for City employees and the community it serves.

Refer to Appendix A for detailed municipal operations information on energy use, energy costs, and GHG emissions by source and by sector. All GHG emission reduction estimates were calculated on the same basis as Appendix A including using the most recent electricity eCO₂ coefficient provided in the PCP spreadsheet for the year 2000.

1. Sustainable Municipality

Sub-Program	1a. Municipal Building Audits and Retrofits	
Overview	<p>The City has an ongoing Energy Management Program which identifies retrofit opportunities through building audits. For example the following retrofit will be implemented at the Civic Complex which houses City Hall and the Central Library:</p> <ul style="list-style-type: none"> i. Lighting Retrofit – change to efficient T8 fluorescent lamps and LED EXIT signs ii. Lighting Controls – Automatic occupancy sensors throughout the building and photocell sensors for automatic control of exterior lighting and interior light level in specific locations. 	
Program Cost/Effort	Program Development	Ongoing
	<p>Civic Complex audit performed by Siemens Canada. Capital cost estimated at \$240,000.</p> <p>Next energy audit required for Recreation Complex which comprises more than 50% of all municipal building floor space.</p>	<p>Annual energy savings of \$68,000 and electricity reduction of 58%.</p>
Program Impact	Economic and Other Benefits	
	<p>A 3.5 year payback from energy savings plus reduction in maintenance costs. Also results in improved illumination levels and less eyestrain, improved ability to control workspace and task lighting, and improved colour rendering. These social and environmental benefits reduce stress and improve productivity.</p>	GHG Reduction Targets
Implementation	Timeline	Potential Funding
	<p>Complete Civic Complex retrofits by end of 2006.</p>	<p>Veridian PowerWISE incentives for relamping.</p>
<p>City of Pickering's Operations & Emergency Services Department</p>		

1. Sustainable Municipality

Sub-Program	1b. Municipal Employee Education and Awareness		
Overview	Work has already started in this area led by the Coordinator, Environmental Awareness Programs. Lunch n' Learn sessions have been organized on home energy efficiency. Sessions have been facilitated by Durham Sustain <i>Ability</i> . Veridian provided energy efficient light bulbs and night lights.		
Program Cost/Effort	Program Development		Ongoing
	Lever Lunch n' Learn program for businesses. No additional cost to City.	Target specific improvements in the workplace.	
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Education and awareness programs are difficult to quantify, yet they can catalyze change in the workplace and the home.	Included in other programs.	
Implementation	Timeline	Potential Funding	Responsibility
	Already launched	City of Pickering, Veridian, Enbridge	City of Pickering's Coordinator, Environmental Awareness Programs and Corporate Green Committee with support from Durham Sustain <i>Ability</i> and Veridian.

1. Sustainable Municipality

Sub-Program	1c. Municipal Water and Waste Management		
Overview	Over and above the water conservation and waste management efforts conducted at municipal offices, this initiative includes the installation of recycling receptacles in high traffic areas such as arenas (including change rooms), sports fields and parks. It also includes the use of recycling bins at all city events (and events held on city property) such as Frenchman's Bay Festival, July 1 st celebration, Art Fest etc. Water use can be reduced with water efficient landscape practices such as drought tolerant garden plants.		
Program Cost/Effort	Program Development		Ongoing
	Program to be coordinated by Operations for little incremental cost.		Part of City leadership campaign in community. Little incremental cost.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	To be quantified.		To be quantified.
Implementation	Timeline	Potential Funding	Responsibility
	2007	City of Pickering, Durham Region Works dept.	City of Pickering's Operations & Emergency Services Department

1. Sustainable Municipality

Sub-Program	1d. Municipal Green Procurement Policy		
Overview	Revise existing screening policy and provide higher weighting in purchasing selection criteria for green products and services. Include Energy Star and Ecologo Program criteria.		
Program Cost/Effort	Program Development		Ongoing
	Lever off Durham Region program and established York Region program. No additional cost required to revise procurement screening policy.		Lever FCM/AMO buying group for group discounts.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	To be quantified based on operating and maintenance costs of existing equipment, etc.		To be quantified.
Implementation	Timeline	Potential Funding	Responsibility
	2007	Discounts from municipal purchasing groups – e.g. FCM, Durham Region	City of Pickering's Supply and Services Division and Corporate Green Committee

1. Sustainable Municipality			
Sub-Program	1e. Municipal Communication and Recognition		
Overview	The OPA Conservation Bureau recognition program can be leveraged here or an additional municipal program created. Purpose is to provide public recognition to local businesses, schools and institutions for their efforts to be sustainable and reduce energy and waste. Communication and feedback can be conducted through multiple channels such as city website, councilor and city newsletters.		
Program Cost/Effort	Program Development		Ongoing
	Proposed new Sustainability Officer position to develop program (refer to the Integrated Sustainability Program (no. 2) in the Community Action Plan). No significant incremental costs.		No significant incremental costs.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Provides the IC&I sector will added incentive to become more sustainable based on public recognition and community awareness. Leverages success of other programs.		Included in Sustainable Workplace programs (refer to Community Action Plan)
Implementation	Timeline	Potential Funding	Responsibility
	2007	City of Pickering, with support from the OPA Conservation Bureau.	City of Pickering's proposed new Sustainability Officer.

1. Sustainable Municipality

Sub-Program	1f. Municipal New Building Standard		
Overview	Leadership in Environmental and Energy Design (LEED) standards have become a common framework for other municipalities to encourage integrated building design. It is proposed that the City mandate a minimum of LEED Gold for all new municipal buildings. It is critical that the City lead by example by stretching to a slightly higher level than the LEED Silver rating being required for new IC&I buildings in the community.		
Program Cost/Effort	Program Development		Ongoing
	City to review LEED Gold rating with Canadian Green Building Council who launched LEED Canada certification in 2005. In first year, over 200 applications received many of which are for Gold standard. Capital cost is 2-3% higher but declining.		Significant operating and maintenance savings creates a sound business case.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	At least 20-30% energy cost savings plus many environmental and social benefits. Creates visible leadership for the City.		2500 tonnes per year by 2016.
Implementation	Timeline	Potential Funding	Responsibility
	For next municipal building.	City, Enbridge, NRCan	City of Pickering's Planning & Development and Operations & Emergency Services Departments

1. Sustainable Municipality

Sub-Program	1g. Municipal Fleet Management		
Overview	<p>A number of initiatives have been identified:</p> <ul style="list-style-type: none"> i. Alternative fuels – review biodiesel and natural gas conversion options. Natural gas requires infrastructure that could be installed by Enbridge. Also City could provide a “green incentive” to city taxi cabs. A taxi fleet conversion usually has a pay back of less than one year with rebates. Fleet vehicles that use gasoline should use a 10% ethanol blend. This will be mandated by provincial and federal governments in the next few years for all gasoline. ii. Efficient fleet – need to initiate study on each fleet vehicle – currently report fuel consumption per vehicle only - require kilometers, trip and cargo log – assists in assessment of possible rationalization of fleet and optimum size of vehicles. iii. Fuel efficiency – Lever first hybrid vehicle purchase – review case for additional hybrids (possibly biodiesel) or smaller fuel efficient vehicles. Also, conduct pilot study on fuel additives (Jomini has committed to this) and fuel tank chip. iv. Driver training – Smart Driver program improves fuel efficiency (averages 5%) and can eliminate unnecessary idling. As fleets are visible in the community, the City can lead by example both negatively and positively. 		
Program Cost/Effort	Program Development		Ongoing
	Pilot programs are useful ways to commence many of these reviews. Each program to be quantified.		Each program to be quantified.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	The GHG emissions per vehicle have been reduced by 9% over the last 5 years, however the number of fleet vehicles has risen by 15%. As the vehicle fleet has net per capita increase in emissions over the last 5 years, significant action is required in this area which calls for a stretch target of a per capita reduction target of 50% GHG emissions by 2016 equating to reduced operating costs of \$160,000 per year.		<p>Recent improvement: 1 Hybrid vehicle – 1 tonne per year starting in 2006.</p> <p>Fleet target: 990 tonnes per year by 2016.</p>
Implementation	Timeline	Potential Funding	Responsibility
	Initiate in 2006/2007.	NRCan, City of Pickering, Enbridge, PST rebate	City of Pickering – led by Operations & Emergency Services and supported by all City departments. Additional support by Enbridge, NRCan, Jomini International

Community Action Plan

Community Action Plan

The following community action plan presents GHG reduction initiatives that have been integrated into subprograms for funding purposes and into larger sustainability programs in order to be more effective and cost efficient. Some initiatives and subprograms will need further study and quantification before they can be funded and implemented.

In addition to the Sustainable Municipal program, there are five community programs:

Sustainable Home
Sustainable Workplace
Sustainable School
Sustainable Transportation
Sustainable Land

Each of the community programs requires a concerted community outreach focus. However, it was apparent at the integrated working group meeting held in March 2006 that an overall coordinating role was required in order to make the community outreach programs more effective. The project team has called this overall coordinating function “Integrated Sustainability”.

Integrated Sustainability

It was suggested at the integrated working group meeting that was organized to address implementation issues and strategies, that a full-time position be created (preferably administered by the City) that would coordinate these programs. The founding project partners, Enbridge, OPG, and Veridian, as well as Siemens Canada were willing in concept to fund this position on a multi-year contract, subject to agreement on the position’s key objectives in addition to normal corporate approvals.

This provides a multi-tiered approach to effective and successful implementation:

- Initiative (Tier 1): A specifically targeted action that results in a measurable outcome. (eg. home relamping initiative in hamlet of Whitevale – door-to-door CFL distribution)
- Subprogram (Tier 2) Multiple initiatives that can be funded together. (e.g. Responsible Electricity Consumption funded by Conservation Fund and Veridian CDM programs which includes the Whitevale relamping initiative)
- Program (Tier 3) Multiple subprograms that are integrated into one community outreach program to substantially increase effectiveness – reduces cost, increases success rate
(e.g. Sustainable Home program which includes Responsible Electricity Consumption subprogram and other Home subprograms to eliminate duplication of effort)

Integrated Sustainability Reduces cost of implementing each program by

(Tier 4) providing an overall cohesiveness to the programs to enhance economies of **scope** (eg combine elements of Sustainable Home, Sustainable Workplace and Sustainable Transportation and Sustainable Land programs while facilitating Lunch n' Learns for employees).

Refer to Appendix B for detailed community information on energy use and GHG emissions by source and by sector. All GHG emission reduction estimates were calculated on the same basis as Appendix B including using the most recent electricity eCO₂ coefficient provided in the PCP spreadsheet for the year 2000.

2. Integrated Sustainability Program

Overall Program	2. Integrated Sustainability Program		
Overview	<p>This overall community-based program targets responsible consumption within the existing community and responsible development for a growing community.</p> <p>In order to make this program cost effective and successful, all programs and subprograms must be integrated and coordinated as a whole even though they're administered separately for funding purposes. A key principle to this integrated, layered approach is to compound the effectiveness of each subprogram through "bottom-up" community based social marketing that emphasizes behavioural change utilizing natural and organized networks of residents and organizations, while simultaneously utilizing a "top-down" approach of financial incentives, promotions and forms of recognition for each subprogram.</p>		
Program Cost/Effort	Program Development		Ongoing
	Requires a new full-time position at the City (or alternatively at a local sustainability organization) – for purposes of reference in this report this position will be called a "sustainability officer".		Total cost of position estimated at \$80,000 per year on a three year contract for ease of funding.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	An integrated program will leverage and create efficiencies between the subprograms. Cost savings and increased rates of success will be apparent but difficult to quantify.		Difference between integrated sustainability scenario and following current improvement trend. 70,500 tonnes per year by 2016.
Implementation	Timeline		Potential Funding
	Fill position by end of 2006.		Veridian, Enbridge, Siemens, OPG and provincial government
		Responsibility	
		Coordinated by proposed Sustainability Officer and supported by all City departments. Also supported by Durham Sustain <i>Ability</i> and funding partners.	

3. Sustainable Home

Sub-Program	3a. Responsible Electricity Consumption	
Overview	<p>Electricity consumption in the average home in Pickering produces about 37% of residential GHG emissions, the majority of which is used for appliances, lighting, air conditioning and water heating. Some rural and older homes also use electricity for space heating.</p> <p>This initiative leverages two existing programs:</p> <ul style="list-style-type: none"> i. Ontario Conservation Bureau and PowerWISE programs – discounts for compact fluorescent lights, programmable thermostats, ceiling fans, electrical timers, air conditioners, water heater and air conditioner tune-ups, peak saver program, water heater tune-up, etc ii. Energy Star appliances – includes above discounts on air conditioners and ceiling fans plus working with specific retailers to provide incentives. <p>This is an integral part of a coordinated community based social marketing (CBSM) approach that will focus on changing behaviour at a grass roots level in existing homes.</p>	
Program Cost/Effort	<p style="text-align: center;">Program Development</p> <p>Requires a City “sustainability officer” to coordinate. Develop specific electricity conservation program and apply to the Conservation Fund. Co-ordinate with Veridian and local retailers.</p>	<p style="text-align: center;">Ongoing</p> <p>Estimated cost of this community based subprogram is \$50,000 per year.</p>
Program Impact	<p style="text-align: center;">Economic and Other Benefits</p> <p>Achieved average home electricity usage reduction of 15% between 1995 and 2004. An additional 25% savings is achievable in existing homes by 2016. This equates to a savings of \$230 per household at 2005 electricity pricing.</p>	<p style="text-align: center;">GHG Reduction Targets</p> <p>20,500 tonnes per year in existing homes by 2016.</p>
Implementation	<p style="text-align: center;">Timeline</p> <p>Launch by end of 2006.</p>	<p style="text-align: center;">Potential Funding</p> <p>Ontario Conservation Fund, Veridian, Siemens Canada, selected retailers such as Home Depot, Sears, etc.</p>
		<p style="text-align: center;">Responsibility</p> <p>Durham Sustain <i>Ability</i> (DSA) supported by City, Veridian, Siemens and retailers.</p>

3. Sustainable Home

Sub-Program	3b. Responsible Natural Gas Consumption		
<p>Overview</p>	<p>Natural gas consumption in the average home in Pickering produces about 69% of residential GHG emissions, the vast majority of which is used for space heating and water heating.</p> <p>This initiative leverages two existing programs:</p> <ul style="list-style-type: none"> v. Enbridge TAPS (programmable Thermostat, kitchen and bathroom Aerators, Pipe wrap and low-flow Showerhead) program – door to door initiative to install energy saving devices vi. Enbridge \$100 rebate for purchasing an Energy Star (high efficiency) furnace <p>This is also an integral part of a coordinated community based social marketing (CBSM) approach that will focus on changing behaviour at a grass roots level in existing homes.</p>		
<p>Program Cost/Effort</p>	<p>Program Development</p>		<p>Ongoing</p>
	<p>Integrate TAPS program with overall CBSM approach.</p>		<p>Estimated cost of this portion of program \$25,000 per year.</p>
<p>Program Impact</p>	<p>Economic and Other Benefits</p>		<p>GHG Reduction Targets</p>
	<p>Achieved average home natural gas consumption reduction of 26% between 1995 and 2004. An additional 30% savings is achievable in existing homes by 2016. This equates to a savings of \$290 per household at 2005 natural gas pricing.</p>		<p>40,700 tonnes per year in existing homes by 2016.</p>
<p>Implementation</p>	<p>Timeline</p>	<p>Potential Funding</p>	<p>Responsibility</p>
	<p>Launch by end of 2006</p>	<p>Enbridge, Natural Resources Canada, selected retailers such as Home Depot and Canadian Tire.</p>	<p>Durham Sustain <i>Ability</i> supported by City, Enbridge and retailers</p>

3. Sustainable Home

Sub-Program	3c. Home Audits and Energy Clinics		
Overview	This program was originally intended to support the federal EnerGuide for Houses audits and energy retrofit grants. With the recent cancellation of the federal program, the provincial government is considering a subsidy to homeowners for the audit process and possibly retrofits. In the meantime, EnerGuide for Houses evaluations can still be promoted with the full cost covered by the homeowner. Toronto Regional Conservation Authority (TRCA) and Home Depot have also launched a computer based Do-It-Yourself home audit		
Program Cost/Effort	Program Development		Ongoing
	Requires Sustainability Officer to market and coordinate with DSA for delivery of home evaluations.		Cost of marketing of program and the home audits is recovered in the fee to homeowners and possibly subsidized by government programs.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	The main benefits are reduced space heating costs which has been primarily quantified in the natural gas subprogram. The average energy savings is 30% for those who have implemented the home audit recommendations.		Refer to the natural gas subprogram.
Implementation	Timeline	Potential Funding	Responsibility
	Launch by end of 2006	Veridian, Enbridge, Provincial government, TRCA and Home Depot	DSA supported by City, Veridian, Enbridge, TRCA and retailers

3. Sustainable Home

Sub-Program	3d. Responsible Water Consumption		
Overview	<p>This initiative leverages two existing programs:</p> <ul style="list-style-type: none"> vii. Durham Region's Water Efficiency program – Outdoor water use program uses effective CBSM delivery methods to target high water use neighbourhoods. Program also includes literature and displays at garden centres and special events for reducing indoor and outdoor water use. viii. Enbridge's TAPS program (see sub-program 1b for details) and Veridian's water heater tune-up (see sub-program 1a for details) 		
Program Cost/Effort	Program Development		Ongoing
	Sustainability Officer to coordinate with Durham Region. No additional costs.		No dedicated cost allocation for this initiative.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Key benefit is overall awareness of responsible consumption of water levers responsible behaviour for energy consumption.		To be quantified by Durham Region.
Implementation	Timeline	Potential Funding	Responsibility
	Launch by end of 2006	Durham Region, Enbridge and Veridian	DSA supported by Durham Region, Enbridge and Veridian.

3. Sustainable Home

Sub-Program	3e. Responsible Waste Management		
Overview	<p>This initiative leverages an existing program:</p> <p>ix. Durham Region Green Bin program for the curbside collection of organics, starting July 1st, 2006, Information about home energy efficiency included with the green bin and a compact fluorescent (CFL) bulb from Veridian.</p>		
Program Cost/Effort	Program Development		Ongoing
	Coordination with the Region to locally promote the use of the green bin as well as energy conservation.		No ongoing cost allocated to this initiative.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Key benefit is overall awareness of responsible reduction and diversion of waste which levers responsible behaviour for all home conservation efforts.		Durham Region targets residential waste diversion rate of 60% which equates to reduction of 23,400 tonnes per year.
Implementation	Timeline	Potential Funding	Responsibility
	Launch July 1, 2006	Durham Region, Veridian (CFL bulb and brochure)	Durham Region with support by City of Pickering and Veridian

3. Sustainable Home

Sub-Program	3f. Responsible New Home Development					
Overview	<p>Pickering's Sustainable Neighbourhood Plan (SNP) Program has proposed the use of the LEED-ND framework to guide the construction of all new homes and neighbourhoods in Pickering. Leadership in Energy and Environmental Design (LEED) Green Building Rating System[®] is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. The Neighbourhood Design (ND) is a new initiative of the US and Canadian Green Building Council. Further details about this program are available through the SNP documents.</p> <p>Local builders are already constructing homes to the energy efficient Energy Star level and incorporating innovative technologies such as solar water heating and geo-thermal heating.</p>					
Program Cost/Effort	<p>Program Development</p> <p>City of Pickering to develop guidelines for more stringent housing standards for all new homes developed in Pickering. Recommend new homes be built to minimum Energy Star standards. Support and promote local builders who are already building to this standard.</p>	<p>Ongoing</p> <p>Currently adds about \$3500 - \$5000 to cost of standard new home although additional cost is declining as more Energy Star homes are built. The monthly energy savings well exceeds the increase in the home buyer's mortgage payment.</p>				
Program Impact	<p>Economic and Other Benefits</p> <p>Energy savings of 30-40% versus a standard new home. New home construction quality and comfort dramatically increases.</p>	<p>GHG Reduction Targets</p> <p>56,000 tonnes per year for new homes by 2016.</p>				
Implementation	<table border="1"> <thead> <tr> <th data-bbox="344 1213 493 1247">Timeline</th> <th data-bbox="493 1213 959 1247">Potential Funding</th> </tr> </thead> <tbody> <tr> <td data-bbox="344 1247 493 1325">2007</td> <td data-bbox="493 1247 959 1325">None required.</td> </tr> </tbody> </table>	Timeline	Potential Funding	2007	None required.	<p>Responsibility</p> <p>City of Pickering's Planning & Development Department</p>
Timeline	Potential Funding					
2007	None required.					

4. Sustainable Workplace

Sub-Program	4a Building Audits and Retrofits		
Overview	<p>This initiative leverages existing programs:</p> <ul style="list-style-type: none"> x. Enbridge Business Solutions – multiple programs/audit services, incentives and rebates for the industrial, commercial and institutional (IC&I) sectors. xi. Veridian and PowerWISE Business Incentive Programs that initiate energy conservation and load management projects through rebates and incentives xii. Performance contracts with Energy Saving Companies (ESCOs) 		
Program Cost/Effort	Program Development		Ongoing
	Sustainability Officer to coordinate. Segment and prioritize target market. Building size, organization size, etc.		Requires co-ordination of programs and focused targets. Estimated cost \$25,000 per year.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Pickering buildings represent over 1.3 million m ² of floor space. The sector reduced per capita GHG emissions by 9% between 1995 and 2004. A further 9% reduction by 2016 is quite achievable. The average building retrofit provides a payback of less than 5 years with an average of 30% energy savings. Improvements in indoor environment (temperature control, air quality) results in improved productivity.		16,000 tonnes per year from existing buildings by 2016. Equates to retrofitting 25% of existing buildings.
Implementation	Timeline	Potential Funding	Responsibility
	Launch by end of 2006	Enbridge, Veridian, ESCOs	City of Pickering's proposed Sustainability Officer with support of Veridian, Enbridge, ESCOs, Ajax-Pickering Board of Trade

4. Sustainable Workplace

Sub-Program	4b Employee Education and Awareness		
Overview	<p>Providing staff education and awareness programs at work benefit both the employer to ensure compliance to business energy conservation plans and helps reinforce the value of energy conservation for employees in their home. Both local utilities provide an education service to their IC&I market:</p> <ul style="list-style-type: none"> i. Veridian has hired a Lunch 'n Learn facilitator and offered this free service to local businesses. ii. Enbridge provides training for “influencers” of energy conservation programs such as engineering consulting firms. <p>In addition, the provincial government has provided the opportunity for all sectors of Pickering to participate in their annual Energy Forum. A targeted IC&I Energy Forum has been suggested as a means to boost the uptake of local businesses to benefit from the knowledge, incentives and rebates offered by the utilities.</p>		
Program Cost/Effort	Program Development		Ongoing
	Requires a coordinated marketing program on behalf of the utilities.		Cost of education programs is free to businesses - part of utility CDM/DSM programs.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Reinforces and levers other Sustainable Workplace, Transportation and Home initiatives.		Quantified in other subprograms. Part of market penetration strategy for building retrofits.
Implementation	Timeline	Potential Funding	Responsibility
	Started in Dec 2005	Veridian, Enbridge	Durham Sustain <i>Ability</i> with support from Veridian, Enbridge, Ajax-Pickering Board of Trade

4. Sustainable Workplace

Sub-Program	4c Recognition of Responsible Businesses and Institutions		
Overview	<p>Presently there are both provincial and federal recognition programs that can be leveraged for the purposes of Pickering's Local Action Plan. The Conservation Bureau of the Ontario Power Authority (OPA) awards their Certificate of Recognition for Energy Conservation to those who demonstrate leadership and take action to conserve energy in Ontario.</p> <p>The status of federal programs relating to energy conservation is unknown at this time, but it is anticipated that new programs will be developed in the near future.</p> <p>The City of Pickering could leverage and enhance the Conservation Bureau awards through a municipal recognition program to recognize community leaders/businesses who take action to reduce GHG emissions and energy consumption.</p>		
Program Cost/Effort	Program Development		Ongoing
	Sustainability Officer to coordinate. Relatively low effort to set-up recognition program – part of lunch & learn awareness program.		Insignificant ongoing cost – add to City's existing recognition programs.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Public recognition is an excellent motivator for many businesses and institutions. Usually enhances what is already a very good business case.		Taken into account in other subprograms.
Implementation	Timeline	Potential Funding	
	Launch by end of 2006	Conservation Bureau of the OPA, NRCan (possibly) Responsibility Coordinated by City of Pickering's proposed Sustainability Officer and conducted through Pickering City Council	

4. Sustainable Workplace

Sub-Program	4d. Responsible New Building Development	
Overview	<p>Leadership in Environmental and Energy Design (LEED) standards have become a common framework for other municipalities to encourage integrated building design. It is recommended that the City require a minimum of LEED Silver rating for all new commercial and institutional buildings.</p> <p>Many businesses are already designing more energy efficient buildings. OPG opened a new building in Pickering in 2005 that was 38% more energy efficient than standard design and won the first place Award of Excellence from Canadian Design – Build Institute.</p>	
Program Cost/Effort	Program Development	Ongoing
	<p>Planning Department to review other municipal programs with LEED criteria for new buildings and integrate best elements and incentives from the most successful programs.</p> <p>The incremental capital cost of LEED Silver is approximately 2%; however incremental costs are declining as it becomes more accepted and standardized.</p>	<p>Integrated as part of permitting process.</p> <p>LEED building operating and maintenance costs are substantially lower than standard buildings.</p>
Program Impact	Economic and Other Benefits	GHG Reduction Targets
	<p>LEED Silver rating reduces energy consumption by at least 20%, but it can be substantially greater. Many environmental, social and productivity benefits from this integrated design.</p>	<p>OPG building – 800 tonnes per year starting in 2006.</p> <p>25,200 tonnes per year for new buildings by 2016.</p>
Implementation	Timeline	Potential Funding
	<p>Launch in 2007.</p>	<p>Enbridge, NRCan</p>
		Responsibility
		<p>City of Pickering's Planning and Development Department</p>

5. Sustainable School

Sub-Program	5a EcoSchools		
Overview	<p>The Durham District School Board (DDSB) has adopted the Ontario EcoSchools program as a means to help schools play their part in responding to the great challenge of living more sustainably through the reduction of their energy use and waste production. As a new, voluntary program it takes time to engage individual schools, staff and parents. Through Sustainable Pickering two schools (Dunbarton High School and Rosebank Road Public School) have recently committed to becoming EcoSchools, with the goal to engage all Pickering schools within the next two years. EcoSchools supports the development of an EcoTeam consisting of representatives from staff, administration, custodial services, students and parents, which helps ensure its success at all levels.</p>		
Program Cost/Effort	Program Development		Ongoing
	EcoSchool program is already developed. Engage first two schools already signed up to lead by example.	Recognition program already in place with DDSB. No additional cost except EcoTeam volunteer time and effort.	
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	DDSB already has an energy and waste management system in place with regular feedback and reporting to all schools. Tangible improvements will be measured, however the intangible learning opportunities (by example and through curriculum) levers and impacts all other Sustainable programs, which is difficult to measure.	Included in Sustainable Workplace GHG reductions for buildings. Other reductions through this program are difficult to quantify.	
Implementation	Timeline	Potential Funding	Responsibility
	Pilot program launched in May 2006.	DDSB program support.	DDSB supported by Durham Sustain Ability and City of Pickering.

5. Sustainable School

Sub-Program	5b Beyond EcoSchools		
<p>Overview</p>	<p>EcoSchools primarily deals with energy use and waste reduction though it encourages schools to develop other programs such as anti-idling, the “Walking School Bus” and water conservation measures. Many schools have concerns for children’s health and the environment by the number of parents who idle their vehicles while waiting to pick up children. Signage, education materials and enforced local anti-idling bylaws need to be developed to support the schools. Better still is the creation of safe routes and walking buddies to encourage walking/biking to school.</p> <p>OPG has a “Green Sprouts” program which provides \$200 per classroom for tree planting.</p> <p>Pine Ridge Secondary School has created a unique program called “I am the change” which encourages leadership amongst students. One of their first programs is an anti-litter campaign at their school and adjacent park.</p>		
<p>Program Cost/Effort</p>	<p>Program Development</p>		<p>Ongoing</p>
	<p>Encourage add-on initiatives to the EcoSchool program and leverage Pine Ridge “I am the change” program with EcoSchools. Development costs to be quantified (eg signage for anti-idling, brochures)</p>		<p>Add new initiatives to recognition program. No additional ongoing costs – based on volunteer efforts.</p>
<p>Program Impact</p>	<p>Economic and Other Benefits</p>		<p>GHG Reduction Targets</p>
	<p>New initiatives can act as a pilot program for the community at large (eg. anti-idling zones at schools to selected community target zones). Can have a significant leveraging effect but difficult to quantify.</p>		<p>Anti-idling initiative quantified in Sustainable Transportation program.</p>
<p>Implementation</p>	<p>Timeline</p>	<p>Potential Funding</p>	<p>Responsibility</p>
	<p>Commence in 2007 with EcoSchool pilot program.</p>	<p>City of Pickering, OPG, Siemens Canada, TRCA (new school design)</p>	<p>City of Pickering’s proposed Sustainability Officer with support of Durham Sustain Ability and DDSB.</p>

6. Sustainable Transportation

Sub-Program	6a Anti-Idling Program	
Overview	There was a consistent message from all sector working groups to deal with vehicle idling in targeted zones for both private vehicles and fleet vehicles. The City of Pickering has an anti-idling bylaw in place, but it was suggested that it be modified and enforced with more stringent criteria including a fine. This initiative is being addressed by the Coordinator, Environmental Awareness Programs at the City of Pickering.	
Program Cost/Effort	Program Development	Ongoing
	Requires revision of bylaw and minimal cost for signage in targeted zones.	Enforcement would be incorporated into existing duties. Volunteer programs such as at schools (refer to 5b) can be highly successful.
Program Impact	Economic and Other Benefits	GHG Reduction Targets
	Reducing idling by 5 minutes per day results in annual fuel savings of \$50-\$100 per vehicle. Reduced air contaminants are a significant benefit in high vehicle intensity zones such as schools, drive-thru restaurants and pick-up areas at public transit stations.	6,900 tonnes per year by 2016. Based on reducing idling time by an average of 5 minutes per day.
Implementation	Timeline	Potential Funding
	2007	Municipal, OPG Responsibility City of Pickering's Municipal Law Enforcement Services and Coordinator, Environmental Awareness Programs

6. Sustainable Transportation

Sub-Program

6b Responsible Commuting

Overview

There are a wide variety of options for residents to reduce vehicle kilometers traveled (VKT) and improve fuel efficiencies, and many of these programs are already in existence, however they need more profile in the community through a CBSM approach. For example:

- xiii. Enbridge has successfully launched a corporate car/van pool program including a “guaranteed ride home” if you need to leave work early. Other companies could emulate this program.
- xiv. OPG has a shuttle bus service operated by Durham Transit, to provide frequent rides between the Pickering GO station and local OPG facilities. It also provides inter-office shuttling services during the day. This has resulted in a GHG emission reduction of 460 tonnes per year.
- xv. Many companies are encouraging flex hours, telecommuting / work from home and use of satellite offices to reduce the time lost to commuting in rush hour.
- xvi. Also included in this initiative is the promotion of alternative transportation (e.g. bicycling to work), use of fuel efficient vehicles (e.g. hybrid vehicles, smaller vehicles/engines) and fuel efficiency products. Improved driving habits and trip planning can also produce significant results.

Pickering is a commuter community with a ratio of 0.33 local jobs to population. GO train service is at capacity during rush hour but buses are under-utilized. GO Transit and Durham Region Transit acknowledge that when transit is convenient and comfortable people will use buses and trains. Program 4f looks at the long term infrastructure changes that need to be considered to provide more capacity and improve service.

Program Cost/Effort

Program Development

This initiative focuses on a CBSM approach to behavioural and attitudinal change with support of existing programs. The key to this program is a well coordinated strategy that integrates well with the community-based Sustainable Home initiative.

Ongoing

To be included in the integrated sustainability program. Estimated cost of \$25,000 per year to coordinate program.

Program

Economic and Other Benefits

GHG Reduction Targets

Impact	Energy consumed for light vehicles has remained the same from 1995 to 2004 on a per capita basis equating to GHG emissions of 4.2 tonnes per household. A resident transportation target of an 18% reduction by 2016 is feasible which equates to \$300 annual savings per household.		27,200 tonnes per year by 2016.
Implementation	Timeline	Potential Funding	
	2007	To be determined.	
		Responsibility	
		Durham Sustain <i>Ability</i> with support of Smart Commute Group (Durham wide), City of Pickering and Durham Transit.	

6. Sustainable Transportation

Sub-Program	6c Responsible Fleet Management		
Overview	The industrial, commercial and institutional sector (IC&I) has many existing programs available to help reduce GHG emissions, such as: Smart Driver Program (NRCan), employee incentives, fleet conversions (Enbridge), and fuel additives (eg Jomini International Inc.). This initiative includes sharing success stories (CN Rail's use of Jomini's fuel additives), and case studies that demonstrate fuel savings through targeted messages at business Lunch n' Learns and City awareness programs including its hybrid vehicle.		
Program Cost/Effort	Program Development		Ongoing
	Sustainability Officer to integrate program with IC&I building retrofit awareness. No additional cost.		Part of lunch & learns and other Sustainable Workplace initiatives – no additional cost.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Energy consumption from light and heavy-duty trucks and buses remained the same on a per capita basis from 1995 to 2004. The same residential per capita reduction target of 18% by 2016 is feasible.		15,500 tonnes per year by 2016.
Implementation	Timeline	Potential Funding	Responsibility
	2007	NRCan, Enbridge, Jomini International Inc.	City of Pickering's proposed Sustainability Officer with support from Durham Sustain <i>Ability</i> , OPG, Enbridge, Jomini, Ajax Pickering Board of Trade.

6. Sustainable Transportation

Sub-Program	6d. Short Term Infrastructure Improvements		
Overview	There is current activity pursuing improvements for pedestrians, bicyclists and local transit, such as the proposed 401 Pedestrian Bridge to link the GO train station with the city centre (mall, city hall, and intensive housing (high rises, condos and town homes), more bike lanes and walking paths (City investigating involvement with an international conference on encouraging walking and cycling, Toronto, 2007); increasing GO train capacity and GTA fare integration with smart cards (through newly established GTTA).		
Program Cost/Effort	Program Development		Ongoing
	Sustainability Officer to coordinate initiatives with various City departments, Durham Transit, GO Transit and GTAA.		Coordination of current initiatives, no additional cost.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Each initiative would need to be quantified separately, however short term infrastructure improvements will support the success of residential commuter programs in 6b.		Included in 6b.
Implementation	Timeline	Potential Funding	Responsibility
	2007	Municipal, Federation of Canadian Municipalities, GO Transit, Durham Transit	City of Pickering's proposed Sustainability Officer with support of transit organizations.

6. Sustainable Transportation

Sub-Program	6e. Responsible Long Term Infrastructure Development		
Overview	Newly formed Greater Toronto Transit Authority (GTTA) will be responsible for transit integration between regions and the City of Toronto. Long term strategy options include Light Rapid Transit lines that have both north/south and east/west connections through Durham and York regions, and a 407 corridor transit strategy (including studying feasibility of a magnetic-levitation train system between Pearson and proposed Pickering airports).		
Program Cost/Effort	Program Development		Ongoing
	A key initiative is the formation of the GTTA, which will lead program development; however it's important for the City (and Durham Region) to strongly influence these long-term strategies especially with the potential explosive growth of Seaton.		Part of GTTA's responsibility.
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	To be quantified with various options.		To be quantified with various options.
Implementation	Timeline	Potential Funding	Responsibility
	2012-2016	Sustainable Development Technology Canada (part of NRCan)	GTTA with support of the City of Pickering, the Region, Siemens Canada

7. Sustainable Land

Sub-Program	7a Greening Public Spaces		
Overview	<p>The Toronto Regional Conservation Authority (TRCA) in partnership with Ontario Power Generation (OPG) has created many opportunities for local tree plantings, especially around Frenchman's Bay. This has resulted in some 4700 trees and shrubs planted in the last 3 years equating to 33 tonnes per year of CO₂) absorbed continually for the next 80 years. This has been a very successful program that will be expanded to other areas.</p> <p>One area of focus is to plant more shade trees around schools and public buildings to cool and reduce air conditioning use.</p> <p>Another area is to promote other existing programs such as planting a new tree for every City tree that must be cut due to age, condition, or interference with overhead wires.</p>		
Program Cost/Effort	Program Development		Ongoing
	City's proposed Sustainability Officer to coordinate and provide recognition for existing and new initiatives.	No additional costs – based on volunteer efforts and City/TRCA/OPG staff.	
Program Impact	Economic and Other Benefits		GHG Reduction Targets
	Strategic placement of shade trees not only saves GHG emissions but reduces energy consumption for air conditioning in the summer. OPG/TRCA has saved 33 tonnes of GHG emissions per year since 2002. A target of tripling that effort by 2016 is realistic.		100 tonnes per year by 2016.
Implementation	Timeline	Potential Funding	Responsibility
	Coordinated program launch in 2007.	TRCA, OPG, Municipal	City of Pickering's proposed Sustainability Officer with support of TRCA, OPG

7. Sustainable Land

7. Sustainable Land			
Sub-Program		7b Responsible Land Use Development	
Overview		Urban sprawl is a challenge for most municipalities. Pickering has chosen to manage its anticipated growth with a smart growth management plan that includes the framework of the Leadership in Environmental and Energy Design – Neighbourhood Development (LEED-ND). As described in Program 1f New Houses LEED-ND sets a very high standard for home construction and neighbourhood integration within a real community context. Dillon Consulting, through the City's Sustainable Neighbourhood Plan (SNP) is working with the City on this leading edge growth plan design.	
Program Cost/Effort		Program Development	Ongoing
		SNP design document is nearing completion in which there will be recommendations for next steps. Costs to be quantified.	Based on SNP recommendations.
Program Impact		Economic and Other Benefits	GHG Reduction Targets
		Houses in the SNP design will be between 50% - 80% more energy efficient than standard design. Many other social and environmental benefits of this unique neighbourhood design.	Partially quantified in Sustainable Home section based on Energy Star rated new homes. Additional 38,000 tonnes per year if SNP is adopted.
Implementation		Timeline	Potential Funding
		2010 - 2012	FCM, City of Pickering
			Responsibility
			Dillon Consulting with support from City of Pickering's Planning and Development Department and Durham Sustain <i>Ability</i>

Summary - Program GHG Reductions

Municipal Operations

The municipal operations target requires a total GHG emission reduction from 1995 baseline of 6,157 tonnes by 2016. The contribution of the various Sustainable Municipal programs provides reductions of 1130 tonnes from existing buildings retrofits, 2500 tonnes from new buildings, 990 tonnes from fleet management and an undetermined amount from other programs. With a current reduction of 0.01 tonnes/yr as of 2004, this equates to a total per capita reduction of 0.04 tonnes/yr with another 0.01 tonnes/yr yet to be quantified to achieve the target reduction of 0.05 tonnes/yr.

Although relamping street lighting could theoretically provide a reduction of 0.01 tonnes/yr, the peak loading in Ontario is such that reduction in electricity in night time non-peak hours does not appreciably reduce GHG emissions as this tends to impact GHG-free nuclear power generation loading. Also, new off-peak hour electricity pricing will reflect this reality as smart meters are installed, so the economic case will also be less attractive. As the other programs are quantified such that they further compound savings in building and fleet efficiency, the remaining 20% reductions to achieve target will not be overly burdensome. To put this in perspective, roughly 2/3 of potential energy savings in buildings is from operational/behavioural changes and 1/3 from capital retrofits. Only the retrofit changes have been taken into account thus far.

Community

The community target requires a total GHG emissions reduction from 1995 baseline of 258,595 tonnes by 2016. The contribution of the various community programs provides reductions of 141,000 tonnes from the Sustainable Home program, 41,000 tonnes from the Sustainable Workplace and Sustainable School programs, 50,000 tonnes from the Sustainable Transportation program, and 38,000 tonnes from the Sustainable Land program. With a current reduction of 1.0 tonnes/person as of 2004, this equates to a total per capita reduction of 2.9 tonnes/person, which exceeds the target of a 2.8 tonne/person reduction.

Recommendations and Next Steps

Recommendations for Council

The following are recommendations to council concerning adoption of milestones 1, 2 & 3 of the PCP framework:

- 1) Adopt 1995 as the baseline year and 2016 as the target year for GHG inventory and forecast calculations. The GHG emission inventory and forecast information presented in this report completes the PCP requirements for Milestone 1.
- 2) Commit to reduce GHG emissions for the entire community by 35% on a per capita basis by 2016 from 1995 levels, which will include a 50% per capita reduction in municipal operation emissions. This commitment completes PCP Milestone 2.
- 3) Adopt this PCP Local Action Plan as a working document in proceeding to the next stage of implementation of programs and initiatives. Adoption of this report completes the requirements for PCP Milestone 3. Adoption of this report does not commit council to the approval of specific implementation initiatives. Initiatives and programs that require council approval will be submitted at a later date as part of Milestone 4 (implementation stage) when further program quantification and funding is ascertained.

Next Steps

There are many implementation suggestions in the action plan, however the following next steps are the most pertinent:

- 1) Obtain funding for the creation of new full-time position to coordinate all sustainability programs outlined in this action plan plus other relevant initiatives under the Sustainable Pickering program. Private sector funding could potentially be ascertained for this position on a three year contract.
- 2) Develop a phased implementation plan with estimated start-up costs and operating costs for each program.
- 3) Continue to engage stakeholders and potential funding partners for milestone 4 program implementation.
- 4) Develop funding strategies and applications for relevant programs.
- 5) Develop a budget for any of the above work that needs to be contracted.

Appendix A

Municipal Operations Energy Use, GHG Emissions Inventory and Forecast Data

- **Consumption by Energy Source, Energy Use (GJ), and eCO₂ Emissions Inventory* for 1995, 1999 and 2004**
- **2016 Business As Usual (BAU) and Target Forecast**
- **Data By Sector and by Source**
- **Energy Cost and Efficiency Indicators by Sector**

* The eCO₂ emissions calculated from electricity use utilizes the most recent year (2000) electricity eCO₂ coefficient for Ontario as provided by the PCP Inventory Spreadsheet. The year 2000 eCO₂ coefficient (which is the sum of the CO₂ coefficient, N₂O coefficient and CH₄ coefficient) is 0.3145 kg/kWh. This same electricity coefficient was used in all inventory and forecast years to provide a consistent basis for trend analysis and per capita calculations similar to using energy use data.

The approach of using corresponding electricity coefficients for each inventory year and for calculating the resulting absolute changes in eCO₂ emissions as required by protocol is provided in Appendix C.

Appendix A1

Summary of Municipal Operations By Source

Energy Use and eCO2 Emissions Inventories, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	1995	1999	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	15,149,760	15,569,561	17,249,320	25,837,174	14,023,236
	Energy Use (GJ)	54,539	56,050	62,098	93,014	50,484
	Per Capita Energy(GJ/person)	0.697	0.644	0.659	0.659	0.353
	eCO2 (tones)	4,764	4,896	5,424	8,125	4,410
	Per Capita eCO2 (t/person)	0.061	0.056	0.058	0.058	0.031
Natural Gas	Consumption (m3)	886,423	820,378	971,574	1,455,288	824,933
	Energy Use (GJ)	33,782	31,265	37,027	55,461	31,438
	Per Capita Energy(GJ/person)	0.431	0.359	0.393	0.393	0.210
	eCO2 (tones)	1,667	1,542	1,827	2,736	1,551
	Per Capita eCO2 (t/person)	0.021	0.018	0.019	0.019	0.011
Fuel Oil	Consumption (l)	84,263	20,501	15,761	23,608	13,382
	Energy Use (GJ)	3,259	793	610	913	518
	Per Capita Energy(GJ/person)	0.042	0.009	0.006	0.006	0.003
	eCO2 (tonnes)	238	58	45	67	38
	Per Capita eCO2 (t/person)	0.003	0.001	0.000	0.000	0.000
Diesel	Consumption (l)	213,178	270,258	308,022	461,376	207,247
	Energy Use (GJ)	8,246	10,454	11,914	17,846	8,016
	Per Capita Energy(GJ/person)	0.105	0.120	0.126	0.126	0.068
	eCO2 (tones)	582	738	844	1,264	568
	Per Capita eCO2 (t/person)	0.007	0.008	0.009	0.009	0.004
Gasoline	Consumption (l)	133,186	168,848	150,146	224,898	101,023
	Energy Use (GJ)	4,616	5,852	5,204	7,795	3,501
	Per Capita Energy(GJ/person)	0.059	0.067	0.055	0.055	0.030
	eCO2 (tones)	315	399	355	531	239
	Per Capita eCO2 (t/person)	0.004	0.005	0.004	0.004	0.002
Waste	Waste to Landfill (tonnes)	641	710	716	1,072	576
	eCO2 (tones)	309	342	345	517	278
	Per Capita eCO2 (t/person)	0.004	0.004	0.004	0.004	0.002
Total	Energy Use (GJ)	104,442	104,414	116,852	175,029	93,957
	% Absolute Change from 1995		0%	12%	68%	-10%
	Per Capita Energy(GJ/person)	1.334	1.199	1.240	1.240	0.666
	% Per Capita Change vs 1995		-10%	-7%	-7%	-50%
Total	eCO2 (tones)	7,874	7,975	8,839	13,239	7,083
	% Absolute Change from 1995		1%	12%	68%	-10%
	Per Capita eCO2 (t/person)	0.101	0.092	0.094	0.094	0.050
	% Per Capita Change vs 1995		-9%	-7%	-7%	-50%

Appendix A2 Summary of Municipal Operations By Sector

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Sector	Energy and eCO2 Parameters	1995	1999	2004	2016 BAU Forecast	2016 Target
Buildings	Energy Use (GJ)	74,981	69,943	79,509	119,095	67,509
	Per Capita Energy(GJ/household)	0.96	0.80	0.84	0.86	0.49
	eCO2 (tonnes)	5,219	4,910	5,529	8,281	4,694
	Per Capita eCO2 (t/household)	0.07	0.06	0.06	0.06	0.03
Streetlights	Energy Use (GJ)	16,599	18,165	20,224	30,293	14,930
	Per Capita Energy(GJ/household)	0.21	0.21	0.21	0.22	0.11
	eCO2 (tonnes)	1,450	1,587	1,767	2,646	1,304
	Per Capita eCO2 (t/household)	0.02	0.02	0.02	0.02	0.01
Transportation	Energy Use (GJ)	12,862	16,306	17,118	25,641	11,518
	Per Capita Energy(GJ/household)	0.16	0.19	0.18	0.19	0.08
	eCO2 (tonnes)	897	1,137	1,199	1,796	807
	Per Capita eCO2 (t/household)	0.01	0.01	0.01	0.01	0.01
Corporate Waste	Waste to Landfill (t)	641	710	716	1,072	576
	eCO2 (tonnes)	309	342	345	517	278
	Per Capita (Household)	0.00	0.00	0.00	0.00	0.00
Total	Energy Use (GJ)	104,442	104,414	116,852	175,029	93,957
	% Absolute Change from 1995		0%	12%	68%	-10%
	Per Capita Energy(GJ/household)	4.38	3.93	3.98	4.06	2.18
	% Per Capita Change from 1995		-10%	-9%	-7%	-50%
Total	eCO2 (tonnes)	7,874	7,975	8,839	13,239	7,083
	% Absolute Change from 1995		1%	12%	68%	-10%
	Per Capita eCO2 (t/person)	0.1	0.1	0.1	0.1	0.1
	Per Capita eCO2 (t/household)	0.3	0.3	0.3	0.3	0.2
	% Per Capita Change from 1995		-9%	-9%	-7%	-50%
Total	Energy Costs Projected Savings (1994 Prices)	\$1,435,854	\$1,487,295	\$2,233,352	\$3,345,262	\$1,789,595 \$1,555,667

Appendix A3 Municipal Operations - Buildings

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	Buildings				
		1995	1999	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	10,538,864	10,523,661	11,631,427	17,422,322	9,875,884
	Energy Use (GJ)	37,940	37,885	41,873	62,720	35,553
	Per Capita Energy(GJ/person)	0.485	0.435	0.445	0.445	0.252
	eCO2 (tonnes)	3,314	3,309	3,658	5,478	3,105
	Per Capita eCO2 (t/person)	0.042	0.038	0.039	0.039	0.022
Natural Gas	Consumption (m3)	886,423	820,378	971,574	1,455,288	824,933
	Energy Use (GJ)	33,782	31,265	37,027	55,461	31,438
	Per Capita Energy(GJ/person)	0.431	0.359	0.393	0.393	0.223
	eCO2 (tonnes)	1,667	1,542	1,827	2,736	1,551
	Per Capita eCO2 (t/person)	0.021	0.018	0.019	0.019	0.011
Fuel Oil	Consumption (l)	84,263	20,501	15,761	23,608	13,382
	Energy Use (GJ)	3,259	793	610	913	518
	Per Capita Energy(GJ/person)	0.042	0.009	0.006	0.006	0.004
	eCO2 (tonnes)	238	58	45	67	38
	Per Capita eCO2 (t/person)	0.0030	0.0007	0.0005	0.0005	0.0003
Total	Energy Use (GJ)	74,981	69,943	79,509	119,095	67,509
	% Absolute Change from 1995		-7%	6%	59%	-10%
	Per Capita Energy(GJ/person)	0.958	0.893	0.844	0.844	0.478
	% Per Capita Change vs 1995		-7%	-12%	-12%	-50%
Total	eCO2 (tonnes)	5,219	4,910	5,529	8,281	4,694
	% Absolute Change from 1995		-6%	6%	59%	-10%
	Per Capita eCO2 (t/person)	0.067	0.063	0.059	0.059	0.033
	% Per Capita Change vs 1995		-6%	-12%	-12%	-50%
Total	Energy Costs Projected Savings (1994 Prices)	\$939,324	\$940,615	\$1,365,292	\$2,045,025	\$1,159,227 \$ 885,798
eCO2 Efficiency Indicators:						
eCO2 tonnes / m2 floor space		0.099	0.093	0.104	0.122	0.069
eCO2 tonnes / resident		0.067	0.063	0.059	0.059	0.033
Economic Indicators:						
\$ / m2 floor space		\$17.85	\$17.73	\$25.65	\$25.65	\$14.54
\$ / resident		\$12.00	\$10.80	\$14.49	\$14.49	\$8.22

Appendix A4 Municipal Operations - Vehicle Fleet

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	Vehicle Fleet				
		1995	1999	2004	2016 BAU Forecast	2016 Target
Diesel	Consumption (l)	213,178	270,258	308,022	461,376	207,247
	Energy Use (GJ)	8,246	10,454	11,914	17,846	8,016
	Per Capita Energy(GJ/person)	0.105	0.120	0.126	0.126	0.057
	eCO2 (tonnes)	582	738	844	1,264	568
	Per Capita eCO2 (t/person)	0.007	0.008	0.009	0.009	0.004
Gasoline	Consumption (l)	133,186	168,848	150,146	224,898	101,023
	Energy Use (GJ)	4,616	5,852	5,204	7,795	3,501
	Per Capita Energy(GJ/person)	0.059	0.067	0.055	0.055	0.025
	eCO2 (tonnes)	315	399	355	531	239
	Per Capita eCO2 (t/person)	0.004	0.005	0.004	0.004	0.002
Total	Energy Use (GJ)	12,862	16,306	17,118	25,641	11,518
	% Absolute Change from 1995		27%	33%	99%	-10%
	Per Capita Energy(GJ/person)	0.164	0.187	0.182	0.182	0.082
	% Per Capita Change vs 1995		14%	11%	11%	-50%
Total	eCO2 (tonnes)	897	1,137	1,199	1796	807
	% Absolute Change from 1995		27%	34%	100%	-10%
	Per Capita eCO2 (t/person)	0.011	0.013	0.013	0.013	0.006
	% Per Capita Change vs 1995		14%	11%	11%	-50%
Total	Energy Costs	\$163,331	\$193,467	\$295,187	\$442,150	\$198,611
	Projected Savings (1994 Prices)					\$243,540
eCO2 Efficiency Indicators:						
	eCO2 tonnes / fleet vehicle	8.0	10.1	9.3	10.9	4.9
	eCO2 tonnes / resident	0.011	0.013	0.013	0.013	0.006
Economic Indicators:						
	\$ / fleet vehicle	\$1,311	\$1,727	\$2,288	\$2,288	\$1,028
	\$ / resident	\$1.88	\$2.22	\$3.13	\$3.13	\$1.41

Appendix A5 Municipal Operations - Streetlights

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

By Source	Energy and eCO2 Parameters	Streetlights				
		1995	1999	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	4,610,896	5,045,900	5,617,893	8,414,852	4,147,352
	Energy Use (GJ)	16,599	18,165	20,224	30,293	14,930
	Per Capita Energy(GJ/person)	0.212	0.209	0.215	0.215	0.106
	eCO2 (tonnes)	1,450	1,587	1,767	2,646	1,304
	Per Capita eCO2 (t/person)	0.019	0.018	0.019	0.019	0.009
Total	Energy Use (GJ)	16,599	18,165	20,224	30,293	14,930
	% Absolute Change from 1995		9%	22%	82%	-10%
	Per Capita Energy(GJ/person)	0.212	0.209	0.215	0.215	0.106
	% Per Capita Change vs 1995		-2%	1%	1%	-50%
Total	eCO2 (tonnes)	1,450	1,587	1,767	2646	1,304
	% Absolute Change from 1995		9%	22%	82%	-10%
	Per Capita eCO2 (t/person)	0.019	0.018	0.019	0.019	0.009
	% Per Capita Change vs 1995		-2%	1%	1%	-50%
Total	Energy Costs Projected Savings (1994 Prices)	\$349,701	\$353,213	\$572,873	\$858,087	\$422,918 \$ 435,170
eCO2 Efficiency Indicators:						
eCO2 tonnes / households		0.061	0.060	0.060	0.060	0.030
eCO2 tonnes / resident		0.019	0.018	0.019	0.019	0.009
Economic Indicators:						
\$ / households		\$14.65	\$13.30	\$19.52	\$19.52	\$9.62
\$ / resident		\$4.47	\$4.06	\$6.08	\$6.08	\$3.00

Appendix A6 Municipal Operations - Corporate Waste

eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

By Source	Energy and eCO2 Parameters	Corporate Waste				
		1995	1999	2004	2016 BAU Forecast	2016 Target
Waste	Waste to Landfill (tonnes)	641	710	716	1,072	576
	eCO2 (tonnes)	309	342	345	517	278
	Per Capita eCO2 (t/person)	0.004	0.004	0.004	0.004	0.002
Total	eCO2 (tonnes)	309	342	345	517	278
	% Absolute Change from 1995		11%	12%	67%	-10%
	Per Capita eCO2 (t/person)	0.004	0.004	0.004	0.004	0.002
	% Per Capita Change vs 1995		0%	-7%	-7%	-50%
eCO2 Efficiency Indicators:						
eCO2 tonnes / employee			0.49	0.50	0.59	0.32
eCO2 tonnes / resident		0.004	0.004	0.004	0.004	0.002

Appendix B

Community Energy Use, GHG Emissions Inventory and Forecast Data

- **Consumption by Energy Source, Energy Use (GJ), and eCO₂ Emissions Inventory* for 1995 and 2004**
- **2016 Business As Usual (BAU) and Target Forecast**
- **By Sector and by Source**

* The eCO₂ emissions calculated from electricity use utilizes the most recent year (2000) electricity eCO₂ coefficient for Ontario as provided by the PCP Inventory Spreadsheet. The year 2000 eCO₂ coefficient (which is the sum of the CO₂ coefficient, N₂O coefficient and CH₄ coefficient) is 0.3145 kg/kWh. This same electricity coefficient was used in all inventory and forecast years to provide a consistent basis for trend analysis and per capita calculations similar to using energy use data.

The approach of using corresponding electricity coefficients for each inventory year and for calculating the resulting absolute changes in eCO₂ emissions as required by protocol is provided in Appendix C.

Appendix B1 Summary of Community Data By Source

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	1995	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	592,358,000	628,660,355	941,649,123	697,229,984
	Energy Use (GJ)	2,132,489	2,263,177	3,389,937	2,510,028
	Per Capita Energy(GJ/household)	89.3	77.1	77.1	57.1
	eCO2 (tonnes)	186,268	197,684	296,104	219,246
	Per Capita eCO2 (t/household)	7.8	6.7	6.7	5.0
Natural Gas	Consumption (m3)	114,912,505	108,890,642	163,103,617	113,652,771
	Energy Use (GJ)	4,379,316	4,149,822	6,215,879	4,331,307
	Per Capita Energy(GJ/household)	183.5	141.4	141.4	98.5
	eCO2 (tonnes)	216,043	204,721	306,645	213,674
	Per Capita eCO2 (t/household)	9.1	7.0	7.0	4.9
Fuel Oil	Consumption (l)	10,416,412	8,018,087	12,010,022	8,352,018
	Energy Use (GJ)	402,907	310,140	464,548	323,056
	Per Capita Energy(GJ/household)	16.9	10.6	10.6	7.3
	eCO2 (tonnes)	29,479	22,691	33,989	23,637
	Per Capita eCO2 (t/household)	1.2	0.8	0.8	0.5
Diesel	Consumption (l)	21,694,865	28,286,086	42,368,773	35,048,985
	Energy Use (GJ)	839,157	1,094,106	1,638,824	1,355,475
	Per Capita Energy(GJ/household)	35.2	37.3	37.3	30.8
	eCO2 (tonnes)	59,240	77,238	115,692	95,689
	Per Capita eCO2 (t/household)	2.5	2.6	2.6	2.2
Gasoline	Consumption (l)	43,421,935	53,071,262	79,493,652	65,933,607
	Energy Use (GJ)	1,505,004	1,839,450	2,755,250	2,283,430
	Per Capita Energy(GJ/household)	63.0	62.7	62.7	51.9
	eCO2 (tonnes)	102,558	125,348	187,755	155,603
	Per Capita eCO2 (t/household)	4.3	4.3	4.3	3.5
Propane	Consumption (l)	5,861,511	4,968,914	7,442,768	5,555,718
	Energy Use (GJ)	153,689	130,285	195,149	145,670
	Per Capita Energy(GJ/household)	6.4	4.4	4.4	3.3
	eCO2 (tonnes)	8,968	7,603	11,388	8,500
	Per Capita eCO2 (t/household)	0.4	0.3	0.3	0.2
Waste	Waste to Landfill (t)	64,089	71,594	107,238	58,718
	eCO2 (tonnes)	30,872	34,487	51,657	28,285
	Per Capita (Household)	1.3	1.2	1.2	0.6
Total	Energy Use (GJ)	9,412,562	9,786,980	14,659,587	10,948,967
	% Absolute Change from 1995		4%	56%	16%
	Per Capita Energy(GJ/household)	394.3	333.5	333.5	249.1
	% Per Capita Change from 1995		-15%	-15%	-37%
Total	eCO2 (tonnes)	633,428	669,772	1,003,229	744,634
	% Absolute Change from 1995		6%	58%	18%
	Per Capita eCO2 (t/person)	8.1	7.1	7.1	5.3
	Per Capita eCO2 (t/household)	26.5	22.8	34.2	16.9
	% Per Capita Change from 1995		-12%	0%	-35%

Appendix B2 Summary of Community Data By Sector

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Sector	Energy and eCO2 Parameters	1995	2004	2016 BAU Forecast	2016 Target
Residential	Energy Use (GJ)	4,347,700	3,988,936	5,974,893	3,780,860
	Per Capita Energy(GJ/household)	182.13	135.93	135.93	86.01
	eCO2 (tonnes)	258,292	239,428	358,631	226,938
	Per Capita eCO2 (t/household)	10.82	8.16	8.16	5.16
IC&I	Energy Use (GJ)	2,883,783	3,129,453	4,687,503	3,855,410
	Per Capita Energy(GJ/household)	120.80	106.64	106.64	87.71
	eCO2 (tonnes)	194,216	212,266	317,946	261,507
	Per Capita eCO2 (t/household)	8.14	7.23	7.23	5.95
Transportation	Energy Use (GJ)	2,181,078	2,668,590	3,997,191	3,312,696
	Per Capita Energy(GJ/household)	91.37	90.94	90.94	75.36
	eCO2 (tonnes)	150,048	183,591	274,995	227,904
	Per Capita eCO2 (t/household)	6.29	6.26	6.26	5.18
Waste	Waste to Landfill (t)	64,089	71,594	107,238	58,718
	eCO2 (tonnes)	30,872	34,487	51,657	28,285
	Per Capita (Household)	1.29	1.18	1.18	0.64
Total	Energy Use (GJ)	9,412,562	9,786,980	14,659,587	10,948,967
	% Absolute Change from 1995		4%	56%	16%
	Per Capita Energy(GJ/household)	394.29	333.51	333.51	249.09
	% Per Capita Change from 1995		-15%	-15%	-37%
Total	eCO2 (tonnes)	633,428	669,772	1,003,229	744,634
	% Absolute Change from 1995		6%	58%	18%
	Per Capita eCO2 (t/person)	8.1	7.1	7.1	5.3
	Per Capita eCO2 (t/household)	26.5	22.8	22.8	16.9
	% Per Capita Change from 1995		-12%	-12%	-35%

Appendix B3 Community - Residential Sector

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	Residential			
		1995	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	256,221,680	271,924,093	407,305,919	257,739,616
	Energy Use (GJ)	922,398	978,927	1,466,301	927,863
	Per Capita Energy(GJ/household)	38.64	33.36	33.36	21.11
	eCO2 (tonnes)	80,569	85,507	128,078	81,047
	Per Capita eCO2 (t/household)	3.38	2.91	2.91	1.84
Natural Gas	Consumption (m3)	79,008,065	72,140,203	108,056,375	68,377,127
	Energy Use (GJ)	3,010,997	2,749,263	4,118,028	2,605,852
	Per Capita Energy(GJ/household)	126.13	93.69	93.69	59.28
	eCO2 (tonnes)	148,540	135,628	203,153	128,553
	Per Capita eCO2 (t/household)	6.22	4.62	4.62	2.92
Fuel Oil	Consumption (l)	8,738,762	5,370,857	8,044,826	5,090,695
	Energy Use (GJ)	338,015	207,745	311,174	196,908
	Per Capita Energy(GJ/household)	14.16	7.08	7.08	4.48
	eCO2 (tonnes)	24,731	15,200	22,767	14,407
	Per Capita eCO2 (t/household)	1.04	0.52	0.52	0.33
Propane	Consumption (l)	2,909,593	2,021,428	3,027,829	1,915,983
	Energy Use (GJ)	76,290	53,002	79,390	50,237
	Per Capita Energy(GJ/household)	3.20	1.81	1.81	1.14
	eCO2 (tonnes)	4,452	3,093	4,633	2,932
	Per Capita eCO2 (t/household)	0.19	0.11	0.11	0.07
Waste	Waste to Landfill (t)	21222	23101	34,602	21,896
	eCO2 (tonnes)	10,223	11,128	16,668	10,547
	Per Capita (Household)	0.43	0.38	0.38	0.24
Total	Energy Use (GJ)	4,347,700	3,988,936	5,974,893	3,780,860
	% Absolute Change from 1995		-8%	37%	-13%
	Per Capita Energy(GJ/household)	182.1	135.9	135.9	86.0
	% Per Capita Change from 1995		-25%	-25%	-53%
Total	eCO2 (tones)	258,292	239,428	358,631	226,938
	% Absolute Change from 1995		-7%	39%	-12%
	Per Capita eCO2 (t/person)	3.3	2.5	2.5	1.6
	Per Capita eCO2 (t/household)	10.8	8.2	8.2	5.2
	% Per Capita Change from 1995		-23%	-23%	-51%

Appendix B4 Community - Institutional, Commercial & Industrial (IC&I) Sector

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	IC&I			
		1995	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	336,136,320	356,736,262	534,343,204	439,490,368
	Energy Use (GJ)	1,210,091	1,284,251	1,923,636	1,582,165
	Per Capita Energy(GJ/household)	50.69	43.76	43.76	35.99
	eCO2 (tonnes)	105,699	112,177	168,025	138,199
	Per Capita eCO2 (t/household)	4.43	3.82	3.82	3.14
Natural Gas	Consumption (m3)	35,904,440	36,750,439	55,047,242	45,275,644
	Energy Use (GJ)	1,368,318	1,400,559	2,097,850	1,725,455
	Per Capita Energy(GJ/household)	57.32	47.73	47.73	39.25
	eCO2 (tonnes)	67,503	69,093	103,492	85,121
	Per Capita eCO2 (t/household)	2.83	2.35	2.35	1.94
Fuel Oil	Consumption (l)	1,677,649	2,647,230	3,965,196	3,261,322
	Energy Use (GJ)	64,891	102,395	153,374	126,148
	Per Capita Energy(GJ/household)	2.72	3.49	3.49	2.87
	eCO2 (tonnes)	4,748	7,492	11,222	9,230
	Per Capita eCO2 (t/household)	0.20	0.26	0.26	0.21
Diesel	Consumption (l)	4,717,183	7,462,487	11,177,808	9,193,602
	Energy Use (GJ)	182,461	288,649	432,358	355,609
	Per Capita Energy(GJ/household)	7.64	9.84	9.84	8.09
	eCO2 (tonnes)	12,881	20,377	30,522	25,104
	Per Capita eCO2 (t/household)	0.54	0.69	0.69	0.57
Propane	Consumption (l)	2,212,892	2,044,231	3,061,985	2,518,443
	Energy Use (GJ)	58,022	53,600	80,285	66,034
	Per Capita Energy(GJ/household)	2.43	1.83	1.83	1.50
	eCO2 (tonnes)	3,386	3,128	4,685	3,853
	Per Capita eCO2 (t/household)	0.14	0.11	0.11	0.09
Waste	Waste to Landfill (t)	42867	48493	72,636	59,742
	eCO2 (tonnes)	20,649	23,359	34,989	28,778
	Per Capita (Household)	0.86	0.80	0.80	0.65
Total	Energy Use (GJ)	2,883,783	3,129,453	4,687,503	3,855,410
	% Absolute Change from 1995		9%	63%	34%
	Per Capita Energy(GJ/household)	120.8	106.6	106.6	87.7
	% Per Capita Change from 1995		-12%	-12%	-27%
Total	eCO2 (tonnes)	194,216	212,266	317,946	261,507
	% Absolute Change from 1995		9%	64%	35%
	Per Capita eCO2 (t/person)	2.5	2.3	2.3	1.9
	Per Capita eCO2 (t/household)	8.1	7.2	7.2	5.9
	% Per Capita Change from 1995		-9%	-9%	-25%

Appendix B5 Community - Transportation Sector

Energy Use and eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	Transportation			
		1995	2004	2016 BAU Forecast	2016 Target
Diesel	Consumption (l)	16,977,682	20,823,599	31,190,965	25,855,383
	Energy Use (GJ)	656,697	805,457	1,206,467	999,866
	Per Capita Energy(GJ/household)	27.51	27.45	27.45	22.75
	eCO2 (tonnes)	46,359	56,861	85,170	70,585
	Per Capita eCO2 (t/household)	1.94	1.94	1.94	1.61
Gasoline	Consumption (l)	43,421,935	53,071,262	79,493,652	65,933,607
	Energy Use (GJ)	1,505,004	1,839,450	2,755,250	2,283,430
	Per Capita Energy(GJ/household)	63.04	62.68	62.68	51.95
	eCO2 (tonnes)	102,558	125,348	187,755	155,603
	Per Capita eCO2 (t/household)	4.30	4.27	4.27	3.54
Propane	Consumption (l)	739,026	903,255	1,352,955	1,121,291
	Energy Use (GJ)	19,377	23,683	35,474	29,400
	Per Capita Energy(GJ/household)	0.81	0.81	0.81	0.67
	eCO2 (tonnes)	1,131	1,382	2,070	1,716
	Per Capita eCO2 (t/household)	0.05	0.05	0.05	0.04
Total	Energy Use (GJ)	2,181,078	2,668,590	3,997,191	3,312,696
	% Absolute Change from 1995		22%	83%	52%
	Per Capita Energy(GJ/household)	91.4	90.9	90.9	75.4
	% Per Capita Change from 1995		0%	0%	-18%
Total	eCO2 (tonnes)	150,048	183,591	274,995	227,904
	% Absolute Change from 1995		22%	83%	52%
	Per Capita eCO2 (t/person)	1.9	1.9	1.9	1.6
	Per Capita eCO2 (t/household)	6.3	6.3	6.3	5.2
	% Per Capita Change from 1995		2%	2%	-16%

Appendix B6 Community - Waste

eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Energy and eCO2 Parameters	Waste			
		1995	2004	2016 BAU Forecast	2016 Target
Waste	Waste to Landfill (t)	64,089	71,594	107,238	58,718
	eCO2 (tonnes)	30,872	34,487	51,657	28,285
	Per Capita (Household)	1.29	1.18	1.18	0.64
Total	eCO2 (tonnes)	30,872	34,487	51,657	28,285
	% Absolute Change from 1995		12%	67%	-8%
	Per Capita eCO2 (t/person)	0.39	0.37	0.37	0.20
	Per Capita eCO2 (t/household)	1.3	1.2	1.2	0.6
	% Per Capita Change from 1995		-7%	-7%	-49%

Appendix C

GHG Emissions Inventory and Forecasted Absolute GHG Emissions Changes as per Protocol

- **eCO₂ Emissions Inventory* for 1995, 1999 and 2004**
- **2016 Business As Usual (BAU) and Target Forecast**
- **By Sector and by Source**

* The eCO₂ emissions calculated from electricity use utilizes the different corresponding Ontario electricity eCO₂ coefficients as provided by the PCP Inventory Spreadsheet as follows:

GHG Inventory year 1995: 0.1268 kg / kWh (eCO₂ coefficient for year 1995)
GHG Inventory year 1999: 0.2696 kg / kWh (eCO₂ coefficient for year 1999)
GHG Inventory year 2004: 0.3145 kg / kWh (eCO₂ coefficient for year 2000 – most recent)
GHG Forecast year 2016: 0.3145 kg / kWh (eCO₂ coefficient for year 2000 – most recent)

An alternative eCO₂ coefficient for the years 2004 and 2016 was considered. Environment Canada has published eCO₂ coefficients up to 2004 for each province; however they are calculated on a different basis than the PCP eCO₂ coefficients (as a result of a different approach regarding provincial electricity imports/exports). It was deemed more important not to mix approaches and so the appropriate PCP eCO₂ coefficients as listed above were used.

As per protocol, the data in this appendix C provides absolute eCO₂ values for both actual inventories and forecasted changes.

Appendix C1 Summary of Municipal Operations GHG Data as per Protocol

Municipal Operations By Source eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Consumption and eCO2 Emissions	1995	1999	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	15,149,760	15,569,561	17,249,320	25,837,174	12,216,945
	eCO2 (tonnes)	1,921	4,424	5,424	8,125	3,842
Natural Gas	Consumption (m3)	886,423	820,378	971,574	1,455,288	801,830
	eCO2 (tonnes)	1,667	1,542	1,827	2,736	1,507
Fuel Oil	Consumption (l)	84,263	20,501	15,761	23,608	13,007
	eCO2 (tonnes)	238	58	45	67	37
Diesel	Consumption (l)	213,178	270,258	308,022	461,376	324,323
	eCO2 (tonnes)	582	738	844	1,264	889
Gasoline	Consumption (l)	133,186	168,848	150,146	224,898	158,092
	eCO2 (tonnes)	315	399	355	531	373
Waste	Waste to Landfill (tonnes)	641	710	716	1,072	902
	eCO2 (tonnes)	309	342	345	517	435
Total	eCO2 (tonnes) % Absolute Change from 1995	5,032	7,503 49%	8,839 76%	13,239 163%	7,083 41%

Municipal Operations By Sector eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Consumption and eCO2 Emissions	1995	1999	2004	2016 BAU Forecast	2016 Target
Buildings	eCO2 (tonnes)	3,242	4,438	5,529	8,281	4,563
Streetlights	eCO2 (tonnes)	585	1,587	1,767	2,646	823
Transportation	eCO2 (tonnes)	897	1,137	1,199	1,796	1,262
Waste	eCO2 (tonnes)	309	342	345	517	435
Total	eCO2 (tonnes) % Absolute Change from 1995	5,032	7,503 49%	8,839 76%	13,239 163%	7,083 41%

Appendix C2

Summary of Community GHG Data as per Protocol

Community By Source

eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Consumption and eCO2 Emissions	1995	2004	2016 BAU Forecast	2016 Target
Electricity	Consumption (kWh)	592,358,000	628,660,355	941,649,123	697,229,984
	eCO2 (tonnes)	75,126	197,684	296,104	219,246
Natural Gas	Consumption (m3)	114,912,505	108,890,642	163,103,617	113,652,771
	eCO2 (tonnes)	216,043	204,721	306,645	213,674
Fuel Oil	Consumption (l)	8,246,339	8,018,087	12,010,022	8,352,018
	eCO2 (tonnes)	23,337	22,691	33,989	23,637
Diesel	Consumption (l)	20,793,296	28,286,086	42,368,773	35,048,985
	eCO2 (tonnes)	56,778	77,238	115,692	95,689
Gasoline	Consumption (l)	43,421,935	53,071,262	79,493,652	65,933,607
	eCO2 (tonnes)	102,558	125,348	187,755	155,603
Propane	Consumption (l)	4,657,416	4,968,914	7,442,768	5,555,718
	eCO2 (tonnes)	7,126	7,603	11,388	8,500
Waste	Waste to Landfill (t)	64,089	71,594	107,238	58,718
	eCO2 (tonnes)	30,872	34,487	51,657	28,285
Total	eCO2 (tonnes) % Absolute Change from 1995	511,839	669,772 31%	1,003,229 96%	744,634 45%

Community By Sector

eCO2 Emissions Inventory, Business As Usual (BAU) Forecast and Target

Source	Consumption and eCO2 Emissions	1995	2004	2016 BAU Forecast	2016 Target
Buildings	eCO2 (tonnes)	203,900	239,428	358,631	226,938
Streetlights	eCO2 (tonnes)	127,020	212,266	317,946	261,507
Transportation	eCO2 (tonnes)	150,048	183,591	274,995	227,904
Waste	eCO2 (tonnes)	30,872	34,487	51,657	28,285
Total	eCO2 (tonnes) % Absolute Change from 1995	511,839	669,772 31%	1,003,229 96%	744,634 45%