Appendix A

sustainable Peterborough

Greater Peterborough Area Climate Change Action Plan

Chapter 1 – City of Peterborough

Community and Corporate Climate Action Plans

September 30, 2016

LURA
LISTEN · UNDERSTAND · RELATE · ADVANCE

ICLEI
Local Governments for Sustainability

Memorandum

To: **Ken Doherty, Director of Community Services**

From: **John Kennedy, City Clerk**

Date: **December 14, 2016**

Subject: **Report CSD16-031**
Adoption of the Climate Change GHG Reduction Targets and Action Plans

---

The following resolution, adopted by City Council at its meeting held on December 12, 2016 is forwarded for your information and necessary action. Thank you.

That Council approve the recommendations outlined in Report CSD16-031 dated December 5, 2016 of the Director of Community Services, as follows:

a) **That the revised Greater Peterborough Area Climate Change Action Plan be adopted and that the City's portion be implemented as budgets permit; and**

b) **That the City of Peterborough's Community Sector and Corporate Sector greenhouse gas emission reduction targets of 30% and 30% respectively, and associated local action plans, be adopted and implemented as budgets permit.**

John Kennedy
City Clerk

Contents

Section 1: Introduction and Overview

Greater Peterborough Area Climate Change Action Plan

In 2014, the Greater Peterborough Area's (GPA) member communities joined more than 250 other communities across Canada to address climate change through participation in the Partners for Climate Protection (PCP) program aimed at reducing GHG emissions from both municipal/First Nation corporate operations and community sources.

As part of the PCP program, the Climate Change Action Plan sets a course to reduce local contributions to climate change and prepare communities for present and expected changes that will occur as a result of climate change. This plan represents an integrated approach to dealing with some of the most important issues related to the sustainability of our diverse region. The overall objective of the CCAP is to reduce our greenhouse gas emissions through a reduction in fossil fuel use and lowering our energy consumption, and to better prepare for our changing climate. The Plan identifies strategies, actions, and emission reduction targets that fit with and address the needs of each municipality and First Nation within the GPA. This regionally coordinated approach will ensure that we act together to safeguard the health of our residents and ensure the stability of our local economic and natural resources against impacts related to climate change.

Climate Change Vision

In 2010, the GPA embarked on an exciting journey – the development of an Integrated Community Sustainability Plan, coined *Sustainable Peterborough*. Within the Sustainable Peterborough Plan, climate change was identified as one of the eleven key theme areas of focus. Each community of the GPA is working together to collectively achieve the following vision, as originally identified as the climate change goal in the Sustainable Peterborough Plan:

We will reduce our contributions to climate change while increasing our ability to adapt to climate change conditions.

The City of Peterborough's Community and Corporate Action Plans

Chapter 1 of the CCAP includes the City of Peterborough's Community (Section 2) and Corporate (Section 3) Action Plans. Both of these build on the overarching components outlined in the main CCAP, but provide greater detail specific to the City of Peterborough. They both include the following:

- *Where are we now* – a brief discussion of community and corporate baseline GHG emissions.
- *Where do we want to go* – GHG emissions reductions targets for the community and corporation.
- *How are we going to get there* – actions that the community and corporation will take to achieve its emissions reduction targets.

Section 2: Community Action Plan

Where are we now?

In 2011, 349,743 tonnes of CO_2e were emitted by the City of Peterborough community. Based on the projected growth for the City of Peterborough, community emissions are expected to grow to 389,587 tonnes CO_2e by 2031 if nothing is done to reduce GHG emissions. For further details on the City of Peterborough's baseline community emissions (PCP Milestone 1), please see the Appendix attached to this chapter entitled *City of Peterborough Corporate and Community Emissions Inventory*.

Where do we want to go?

The City of Peterborough community is aiming to achieve a 30% reduction in its GHG emissions from the 2011 baseline by 2031. This is equivalent to 104,923 less tonnes of CO_2e emitted per year by 2031, which would put the City's community emissions at 244,820 tonnes of CO_2e per year by 2031 compared to the current 349,743 tonnes per year.

How are we going to get there?

The following tables detail the strategies and actions that the City of Peterborough will use to achieve its community GHG emissions reduction target. Further detail on each strategy is provided in the main *Climate Change Action Plan* document.

Our Homes

Strategy H1: Help existing homes become more energy and water efficient and be more adaptable to climate risks	
	Mitigation impact: direct Adaptation impact: direct
Primary Action	Develop and implement a comprehensive multi-year deep energy retrofit program focused on existing households to achieve efficiency gains of at least 30% to 50% depending on the age and type of building.
Primary Action Assumptions	Implement retrofits in 40% of the residential housing stock by 2031.
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Develop a Municipal Energy Plan (MEP) to better understand the existing housing stock to target efforts • Implement a Flood Reduction Subsidy Program to help prevent flooding on private properties • Implement a program to encourage low water use and flood adaptive landscaping
GHG Emission Reduction Potential	22,661tonnes of CO_2e/per year

Strategy H2: Build new homes to be more efficient and have a smaller environmental footprint	
	Mitigation impact: direct Adaptation impact: direct
Primary Action	Implement gradual improvement in new building stock efficiency aimed at achieving near net-zero or equivalent (0.14 to 0.24 GJ/m2) in all new buildings by 2031.

Strategy H2: Build new homes to be more efficient and have a smaller environmental footprint	
Primary Action Assumptions	Results in full electrification of energy end uses.
Supporting Actions/ Policies	**Supporting Policies** • 'Solar Ready' Official Plan Updates • Decrease minimum parking requirements for new residential development where supporting public transit exists **Supporting Actions & Initiatives** • Identify potential amongst new developments to build a pilot neighbourhood to meet net-zero emissions
GHG Emission Reduction Potential	6,383 tonnes of CO_2e/per year

Strategy H3: Reduce the amount of waste generated by residents that contribute to greenhouse gas emissions		
	Mitigation impact: direct	Adaptation impact: none
Primary Action	Explore feasibility of capturing energy from waste (e.g. anaerobic digestion) to manage organic material and to reduce emissions of methane gas.	
Primary Action Assumptions	Assumes 50% of household waste that contributes to GHG emissions (i.e. organic material) is managed through the determined technology.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Implement a "less waste challenge" to encourage reduction in waste generation, with a particular focus on food waste • Review efficiency of waste collection program and implement changes to reinforce diversion programs and reduce collection truck emissions	
GHG Emission Reduction Potential	2,468 tonnes of CO_2e/per year[1]	

Our Workplaces and Schools

Strategy W1: Improve energy and water efficiency of existing buildings and business operations		
	Mitigation impact: direct	Adaptation impact: indirect
Primary Action	Work with utilities (PDI, Hydro One, Enbridge as appropriate) to deliver a coordinated deep energy retrofit program to industrial, commercial, and institutional organizations.	
Primary Action Assumptions	Implement retrofits in 60% of industrial, commercial, and institutional facilities by 2031.	
Supporting Actions/ Policies	**Supporting Policies** • Community Improvement Plans	

[1] Note that GHG emissions avoided through managing organic waste have been attributed to the City's corporate GHG reduction target because the landfill is owned by the City of Peterborough and is included in the City's corporate baseline inventory.

Strategy W1: Improve energy and water efficiency of existing buildings and business operations	
	Supporting Actions & Initiatives • Encourage local businesses to participate in energy benchmarking through the use of Energy Star Portfolio Manager provided through Natural Resources Canada • Work with the Building Owners and Managers Association (BOMA) to expand their Operator Training program to the Greater Peterborough Area (County and City partnership)
GHG Emission Reduction Potential	25,623 tonnes of CO_2e/per year

Strategy W2: Build new buildings to be more efficient and have a smaller environmental impact	
	Mitigation impact: direct Adaptation impact: direct
Primary Action	Implement gradual improvement in efficiency of industrial, commercial, and institutional buildings.
Primary Action Assumptions	• Commercial & Institutional: full electrification, and uses 70% less energy • Industrial: only 20% of the energy mix consists of fossil fuels (i.e. natural gas), and uses 40% less energy
Supporting Actions/ Policies	**Supporting Policies** • Implement zoning requirements and policy direction to encourage cycling and other sustainable modes of travel for new commercial development (e.g. reduced parking requirements, bike storage, employee showers)
GHG Emission Reduction Potential	6,143 tonnes of CO_2e/per year

Strategy W3: Facilitate climate change friendly business operations and practices	
	Mitigation impact: indirect Adaptation impact: direct
Primary Action	Support Sustainable Peterborough Business Initiative to build a toolkit for Greater Peterborough Area businesses to assist with climate change impact analysis and business continuity planning for extreme weather.
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Engage with businesses and institutions to implement corporate sustainability initiatives aimed at reducing greenhouse gas emissions • Work with institutions and businesses to support implementation of food waste reduction and/or diversion
GHG Emission Reduction Potential	Impact on GHG emissions nominal

Strategy W4: Support local economic resilience and growth of the local green economy	
	Mitigation impact: indirect Adaptation impact: indirect
Primary Action	Support GreenUP as a “one-stop shop” for businesses to learn about and advance sustainability through the Green Business Peterborough Program.

Strategy W4: Support local economic resilience and growth of the local green economy	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Support Evergreen to deliver the mid-sized cities pilot program in Peterborough to help strategically position Peterborough as a green/sustainable community and economy • Explore opportunity and locations to establish a local eco business zone or "Partners in Project Green" program to share resources amongst businesses and encourage green industries (County and City partnership) • Support the Greater Peterborough Chamber Of Commerce to establish a business leadership and mentorship program to support energy and climate leadership amongst businesses as part of the Peterborough Business Excellence Awards
GHG Emission Reduction Potential	Impact on GHG emissions nominal

Strategy W5: Facilitate low carbon energy generation and local energy security		
Primary Action	Mitigation impact: direct	Adaptation impact: direct
	Conduct a regional study to explore the potential to implement local renewable energy generation and storage (institutional, commercial, industrial, and residential).	
Primary Action Assumptions	Solar PVs are to generate 10% of the electricity demand in IC&I and residential buildings, while 4% of the natural gas consumed in all buildings are to come from renewable sources by 2031.	
GHG Emission Reduction Potential	13,595 tonnes of CO_2e/per year	

On the Move

Strategy M1: Build an active transportation network and support active transportation		
Primary Action	Mitigation impact: direct	Adaptation impact: none
	Reduce vehicle trips and foster greater walking and cycling mode share through a coordination of efforts.	
Primary Action Assumptions	Active transportation (i.e. walking and cycling) to represent 8% of the mode share by 2031.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Develop a Complete Streets Policy and Guidelines, including consistent sidewalk requirements and guidance on paved shoulders/cycle lanes • Install bike racks on buses • Support GreenUP and B!KE's existing cycling education programs for adults and children • Promote and support the City's long-standing Active and Safe Routes to School partnership and related programming and campaigns	
GHG Emission Reduction Potential	3,496 tonnes of CO_2e/per year	

Strategy M2: Facilitate alternatives to single-occupant vehicle use to reduce frequency of personal vehicle use		
	Mitigation impact: direct	Adaptation impact: none
Primary Action	Explore feasibility of a carpool lot network (formal and informal spaces) (in partnership with the County and other Townships).	
Primary Action Assumptions	Carpooling, or travel as a passenger in a vehicle, to represent 22% of the mode share by 2031.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Work with businesses and schools to implement preferred parking for carpoolers	
GHG Emission Reduction Potential	1,165 tonnes of CO_2e/per year	

Strategy M3: Make public transportation more appealing to increase its usage		
	Mitigation impact: direct	Adaptation impact: none
Primary Action	Expand public transit service in the City as per the City of Peterborough Public Transit Operations Review.	
Primary Action Assumptions	Travel via public transportation to represent 6% of the mode share by 2031.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Implement a trip planning program/service for public transit • Implement technology for real-time bus tracking system and make available on the web and smart phone apps • Explore opportunities to increase number of students using public transportation to get to school • Explore transitioning from transit hub model to a grid model of public transit during next Public Transit Operations Review	
GHG Emission Reduction Potential	2,331 tonnes of CO_2e/per year	

Strategy M4: Help transition vehicles to use cleaner and lower greenhouse gas emitting fuel sources		
	Mitigation impact: direct	Adaptation impact: none
Primary Action	Support a shift in vehicle technology to Electric Vehicles (EVs).	
Primary Action Assumptions	15% of all vehicles on the road in 2031 are to be EVs.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Install electric vehicle charging stations for public usage • Support [local organizations] to work with local businesses to transition corporate fleets to EV	
GHG Emission Reduction Potential	38,268 tonnes of CO_2e/per year	

Our Food

Strategy F1: Support localization of the food system		
	Mitigation impact: indirect	Adaptation impact: indirect
Primary Action	Undertake a community food system assessment to better understand local food production and movement within the GPA.	
Supporting Actions/ Policies	**Supporting Policies** • Update Official Plan policies to support urban agriculture and the growing, processing and distribution of locally-produced food for all residents **Supporting Actions & Initiatives** • Continue to expand the network of community gardens throughout the Greater Peterborough Area and engage the broader community in the value of gardening • Support local organizations to provide community skill sharing programs to increase awareness among community members on how to grow, process, and store food • Support local organizations in training, facilitating access to land and promoting successful entrepreneurship of new farmers and food business to increase the production and processing, distribution and retailing of local food	
GHG Emission Reduction Potential	Impact on GHG emissions nominal	

Strategy F2: Encourage purchasing of locally produced food		
	Mitigation impact: indirect	Adaptation impact: indirect
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Support local organizations to promote the marketing of locally-produced food through initiatives such as the Purple Onion Festival and Local Food Month • Expand and promote the Farmers Market Network across the Greater Peterborough Area • Support and encourage farm gate sale of produce	
GHG Emission Reduction Potential	Impact on GHG emissions nominal	

Strategy F3: Reduce the amount of wasted food		
	Mitigation impact: direct	Adaptation impact: none
Primary Action	Implement a residential awareness campaign to encourage elimination of wasted food in the home, workplaces, and schools.	
Primary Action Assumptions	Generally could achieve a reduction in the proportion of wasted food in the waste stream by 11%.	
Supporting Actions/ Policies	**Supporting Actions & Initiatives**	

Strategy F3: Reduce the amount of wasted food	
	• Promote current regional programs, such as the Recycle Rangers Program, which educates school children about waste reduction, composting, and food waste • Work with institutions and businesses to support implementation of food waste reduction and/or diversion • Support establishment of a food rescue program in partnership with local food retailers, manufactures, restaurants, caterers to collect and redistribute excess food to those in need that would otherwise be disposed of (County and City partnership)
GHG Emission Reduction Potential	Non-quantifiable with available information

Our Land

Strategy L1: Strengthen land use policy and the development review process to better support climate change mitigation and adaptation	
	Mitigation impact: indirect Adaptation impact: direct
Primary Action	Establish a multidisciplinary review team to assess provincial and local land use planning legislation and tools and make recommendations to decision-makers on how to best implement an ecosystem-based approach to the development application process (partnership amongst all communities).
Supporting Actions/ Policies	**Supporting Policies** • Integrate climate change policies into Official Plans • Continue to implement land use policy that supports building complete communities that are mixed-use, compact, and higher density to achieve intensification targets outlined in the Provincial Growth Plan **Supporting Actions & Initiatives** • Sustainability metrics tool to predict, measure and report the sustainability performance (including GHG emissions) of proposed developments focusing on the built environment, mobility, natural environment, and infrastructure and buildings (e.g. Richmond Hill/Vaughan/Brampton) • Continue/enhance education opportunities on the need for increased housing density and implications related to climate change at all points of contact with decision-makers, stakeholders, and the public
GHG Emission Reduction Potential	Non-quantifiable with available information

Strategy L2: Identify climate change risks and prepare for potential impacts	
	Mitigation impact: none Adaptation impact: direct
Primary Action	Conduct a Greater Peterborough Area-wide vulnerability assessment of expected climate change impacts (including drought and lake levels) (in partnership with all communities).

Strategy L2: Identify climate change risks and prepare for potential impacts	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Adopt the Low Impact Development Stormwater Management Planning and Design Guide (CVC/TRCA) for landscape-based stormwater management planning and low impact development stormwater management practices • Update engineering design standards to improve climate change readiness of new infrastructure by taking a green infrastructure approach first and increasing flood standards to a 200-year storm standard rather than the current 100-year standard
GHG Emission Reduction Potential	None

Strategy L3: Protect and enhance natural assets		
	Mitigation impact: indirect	Adaptation impact: direct
Primary Action	Develop and implement a Natural Heritage System Plan (City and County with Townships).	
Supporting Actions/ Policies	**Supporting Policies** • Place restrictions on cutting down trees on private property and/or a tree replacement policy • Update Official Plan policies to require greater buffers around wetlands to protect them from surrounding land uses **Supporting Actions & Initiatives** • Continue to implement an Urban Forest Strategic Plan • Support and promote local Conservation Authorities' tree planting programs to encourage planting trees on public and private property • Support local Conservation Authorities to deliver planting and restoration projects at strategic high priority areas with climate ready species	
GHG Emission Reduction Potential	Non-quantifiable with available information	

Our People

Strategy P1: Prepare for the health impacts associated with a changing climate		
	Mitigation impact: none	Adaptation impact: direct
Primary Action	Conduct a local community vulnerability assessment of public health impacts from climate change to identify climate risks on vulnerable populations (in partnership with all communities).	
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Establish a protocol for extreme weather alerts and flooding updates	
GHG Emission Reduction Potential	None	

Strategy P2: Foster a culture of climate change awareness		
	Mitigation impact: indirect	Adaptation impact: indirect
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Support Sustainable Peterborough and other local organizations in hosting regular events focused on climate change (speaker series, annual event, etc.) • Support Sustainable Peterborough in seeking buy-in and endorsement/support for the shared vision and goals of Community Climate Change Action Plan from existing groups and organizations in the Greater Peterborough Area • Support Sustainable Peterborough to host a community, youth, adult, and senior climate change champion through the annual Sustainable Peterborough Awards	
GHG Emission Reduction Potential	Impact on GHG emissions nominal	

Strategy P3: Encourage civic engagement around climate change		
Primary Action	Develop a charter and guidelines (engagement strategy) to foster meaningful community engagement in climate change issues and environmental stewardship (partnership amongst all communities).	
	Mitigation impact: indirect	Adaptation impact: indirect
Supporting Actions/ Policies	**Supporting Actions & Initiatives** • Support Sustainable Peterborough to establish a youth advisory committee on climate change to empower youth to take action on climate change	
GHG Emission Reduction Potential	Impact on GHG emissions nominal	

Decarbonization of the Electric Grid

Since the baseline year of 2011, the Province of Ontario has taken steps to reduce the GHG emissions associated with the electrical grid. For example, it closed all of its coal-fired power plants. This in turn will result in significant GHG Emission Reduction Potential for the City of Peterborough community, totalling 27,529 tonnes of CO_2e/per year.

Section 3: Corporate Action Plan

Where are we now?

In 2011, 15,129 tonnes of CO_2e were emitted by the City of Peterborough's corporate operations. The business-as-usual forecast for the corporate operations is based on annual growth rates derived from official population projections. Emissions from corporate operations are projected to increase to 16,852 tCO_2e per year by 2031 if the City continued to operate as it did in the baseline year without taking any actions to reduce GHG emissions. For further details on the City of Peterborough's baseline corporate emissions, please see the Appendix attached to this chapter entitled *City of Peterborough Corporate and Community Emissions Inventory*.

Where do we want to go?

The City of Peterborough is aiming to achieve a 30% reduction in its corporate GHG emissions from the 2011 baseline by 2031. This is equivalent to 4,539 less tonnes of CO_2e emitted per year by 2031, which would put the City's corporate emissions at 10,590 tonnes of CO_2e per year by 2031 compared to the current 15,129 tonnes per year.

How are we going to get there?

The following table details the strategies and actions that the City of Peterborough will use to achieve its corporate GHG emissions reduction target.

City of Peterborough Corporate Action Plan	Timeframe			
	Underway or Complete	Short (1-4 years)	Med (5-9 years)	Long (10+ years)
Buildings				
Strategy 1: Institutionalize energy efficiency and low carbon thinking into the organization				
Implement employee training for energy efficiency	X	X	X	X
Implement staff behaviour change programs to reduce usage of electricity and heating in day-to-day activities	X	X	X	X
Establish a policy to consider highest energy efficiency as part of procurement requirements and evaluation (City and PU)	X	X	X	X
Continue to monitor incentive programs offered through utilities and other third party funding source to be leveraged for implementing energy efficiency improvements	X	X	X	X
GHG Emission Reduction Potential: In-direct GHG reductions				
Strategy 2: Enhance operational efficiency of existing buildings				
Develop and deliver an equipment preventative maintenance program on an ongoing basis	X	X	X	X
Conduct regular energy audits of City facilities on a rotational basis to identify opportunities for improved efficiency	X	X	X	X
Explore installation of building automation systems to optimize building operations where feasible	X		X	X

Conduct building re-commissioning to optimize building operations where applicable	X	X	X	X
Continue to implement a utility bill validation process to identify and correct any billing issues and variations in energy usage	X	X	X	X
Work with utilities to install sub-metering capacity at each City facility where feasible to better monitor energy usage	X	X		
GHG Emission Reduction Potential: 212 tonnes of CO_2e/per year				
Strategy 3: Build municipal facilities to ensure high environmental performance				
Establish a Green New Building Policy to require new municipal buildings and major renovations be built to high environmental standards		X		
Install electric vehicle charging facilities as part of new facility builds	X	X		
Formalize and continue to implement a full lifecycle analysis costing process for new buildings or major renovations to consider the sustainability of the building over its life	X	X	X	X
Install geothermal heating and cooling systems for new buildings and major renovations if feasible			X	X
Explore feasibility of district energy for new facilities (e.g. social housing)			X	X
GHG Emission Reduction Potential: 330 tonnes of CO_2e/per year				
Strategy 4: Improve environmental performance of existing municipal facilities				
Conduct annual assessments of each facility to identify opportunities to improve energy efficiency	X	X	X	X
Continue implementation of interior and exterior LED lighting retrofit program in facilities where feasible	X	X	X	
Install programmable thermostats and occupancy sensors in all facilities where feasible	X	X	X	
Establish policy direction to replace appliances with Energy STAR rated appliances as needed	X	X	X	X
Upgrade insulation/building envelope while conducting other essential building work (where feasible)	X	X	X	X
Replace windows and doors with high efficiency according to replacement schedule/need	X	X	X	X
Replace mechanical equipment with high efficiency according to replacement schedule/need	X			X
GHG Emission Reduction Potential: 712 tonnes of CO_2e/per year				
Strategy 5: Utilize renewable energy sources				
Conduct an assessment to explore opportunities for solar photovoltaic panels and other renewable energy options at all municipal facilities	X	X		
Converting electric hot water heaters to solar			X	X
GHG Emission Reduction Potential: 138 tonnes of CO_2e/per year				

Fleet				
Strategy 6: Transition the municipal fleet to be more efficient and less carbon emitting				
Develop and implement a Green Fleet Strategy and replacement schedule • Right sizing vehicle/appropriate vehicle class (fit-for purpose vehicles) through replacement schedule • Transitioning to low emission and alternative fuel vehicles (e.g. clean diesel, advanced natural gas, ethanol, or hybrid) • Use of anti-idling technology • Fuel and vehicle performance monitoring	X	X	X	X
Implement an operator training and education program (e.g. eco driving and anti-idling)	X	X	X	X
Continue preventative maintenance program for vehicles and equipment	X	X	X	X
Continue conducting vehicle/fuel performance audits	X	X	X	X
GHG Emission Reduction Potential: 1,274 tonnes of CO_2e/per year				
Water & Sewage				
Strategy 7: Enhance operational efficiency of the water services system				
Review and optimize pumps and blowers at Waste Water Treatment Plant	X	X		
Continue to deliver preventative maintenance program	X	X	X	X
Continue to deliver operator training and education program	X	X	X	X
Conduct regular energy performance audits of water and waste water treatment facilities	X	X	X	X
Monitor and track energy performance of water and waste water treatment facilities	X	X	X	X
GHG Emission Reduction Potential: 175 tonnes of CO_2e/per year				
Streetlighting				
Strategy 8: Improve energy efficiency of the streetlighting system				
Retrofit all remaining street lighting to LED		X		
Retrofit all decorative lights and street signage to LED		X		
Retrofit all rental lights to LED (Peterborough Utilities)		X		
Retrofit all parking lot lighting to LED			X	
Explore retrofitting of media boards and other digital signage			X	
GHG Emission Reduction Potential: 271 tonnes of CO_2e/per year				
Solid Waste				
Strategy 9: Reduce the amount of organic waste generated through municipal operations				
Continue to participant in and enhance the office waste reduction and diversion initiatives	X	X	X	X
Implement collection of organic waste from City offices/facilities	X		X	X
Implement staff education and awareness program related to waste minimization and diversion	X	X	X	X
Conduct annual corporate waste audits at each facility to understand waste composition and identify opportunities for improvement	X	X	X	X
Develop a corporate waste diversion target and strategy	X	X		
Monitor and track corporate waste generation and diversion	X	X	X	X

Redevelop and implement the corporate green procurement policy	X		X
Develop and implement a green event policy	X	X	
GHG Emission Reduction Potential: 1,974 tonnes of CO_2e/per year			

Decarbonization of Electricity Grid

Since the baseline year of 2011, the Province of Ontario has taken steps to reduce the GHG emissions associated with the electrical grid. For example, it closed all of its coal-fired power plants. This in turn will result in significant GHG Emission Reduction Potential for the City of Peterborough's corporate emissions, totalling 1,287 tonnes of CO_2e/per year.

sustainable Peterborough

Peterborough Area Climate Change Action Plan

City of Peterborough –Corporate and Community Emissions Inventory

Partners for Climate Protection Milestone 1

Updated November 3, 2016 (Original version October 27, 2015)

LURA
LISTEN · UNDERSTAND · RELATE · ADVANCE

ICLEI Local Governments for Sustainability

1 Introduction and Overview

Greater Peterborough Area Climate Change Action Plan

Sustainable Peterborough is developing a Climate Change Action Plan (CCAP) for the Greater Peterborough Area to reduce local contributions to climate change and prepare the community for present and expected changes that will occur as a result of our changing climate. This Plan represents an integrated approach to dealing with some of the most important issues related to the sustainability of this diverse region. The overall objective of the CCAP is to reduce greenhouse gas (GHG) emissions, reduce the use of fossil fuels, lower energy consumption, and adapt to changing climate.

The Plan will identify goals, actions, and emission reduction targets that fit with and address the needs of each municipality and First Nation within the Greater Peterborough Area. This report summarizes the baseline greenhouse gas emissions for the City of Peterborough, both from corporate operations and from community sources to satisfy Milestone 1 of the Partners for Climate Protection (PCP) Program.

Partners for Climate Protection Program

The PCP program is a network of Canadian local governments that have made a commitment to reduce GHG emissions and act on climate change. Administered by the Federation of Canadian Municipalities, the program has over 225 local and regional governments participating. The City of Peterborough joined the program in December 2000. The County of Peterborough and the eight Townships have all joined in 2014 and 2015.

The Climate Change Action Plan is following the PCP's five-milestone framework for the reduction of greenhouse gas emissions (i.e. climate mitigation). The five-milestone framework is a performance-based model used to guide communities to reduce GHG emissions. Once a milestone is completed, the community – typically led by the local municipality – submits their material to the PCP program for a technical review and approval. To prepare the Climate Change Action Plan, the following 5 milestones will be completed:

1. Establish a GHG inventory and forecast
2. Set emission reduction targets
3. Develop Climate Change Action Plans
4. Implement the local action plans
5. Monitor progress and report on results

Milestone 1 – GHG Inventory and Forecast

A greenhouse gas inventory brings together data on community and municipal sources of greenhouse gas emissions to estimate emissions for a given year. For the Greater Peterborough Area Climate Action Plan, 2011 has been selected as the baseline year. Establishing a baseline is a useful tool to identified areas for improvement, inform development of a GHG reduction action plan, estimate cost savings from reductions, and serve as a reference point to track improvements. Associated with the baseline GHG inventory is also a forecast that projects future emissions based on assumptions about population, economic growth and fuel mix.

Two separate GHG inventories and forecasts have been created for the City of Peterborough: one for municipal corporate operations and one for community sources. The inventories consist of the following sources of GHG emissions.

Corporate Operations Inventory	Community Inventory
• Buildings • Streetlighting • Water and sewage treatment • Municipal fleet • Solid waste	• Residential • Commercial and institutional • Industrial • Transportation • Solid waste

Details of each inventory are provided in Sections 2 and 3 of this report.

2 City of Peterborough Corporate Emission Inventory

The Corporate inventory tracks emissions from municipal operations. The criteria for including emissions in the corporate inventory relies on the concept of *operational control*, and requires the municipality to report all emissions from operations over which it has control.

City of Peterborough Corporate Emissions Inventory

In 2011, 15,129 tonnes of CO2e were emitted by the City of Peterborough's corporate operations. Breakdowns of emissions by sector and source are presented visually in Figure 1 and summarized in Figure 2 below.

Fig 1. City of Peterborough Corporate Emissions by Sector and Source

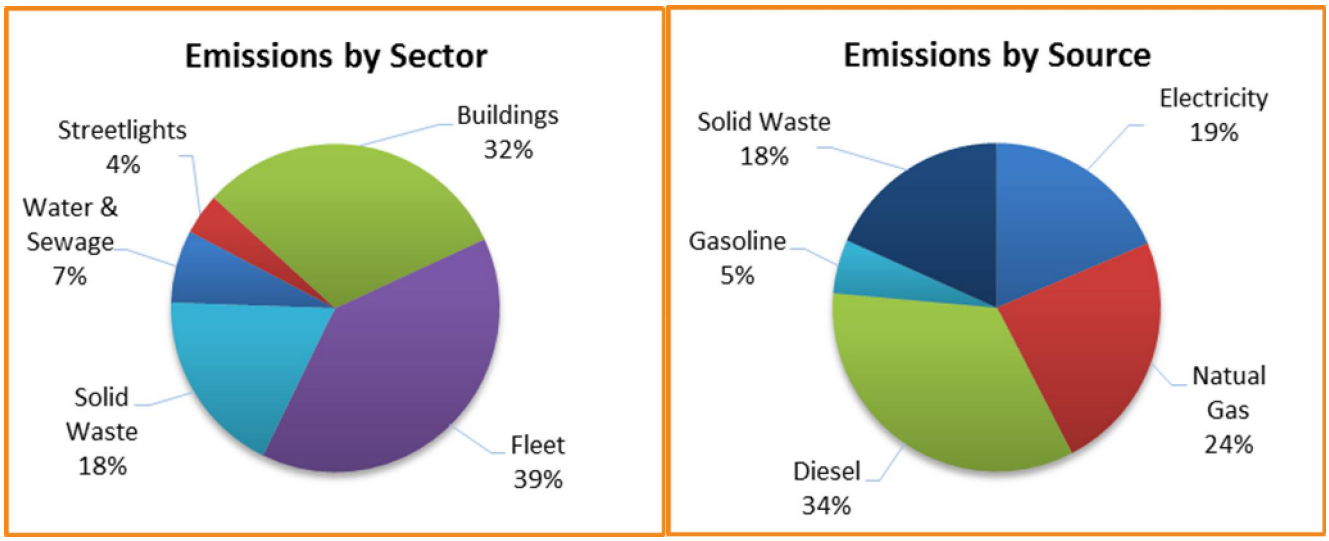


Fig 2. City of Peterborough Corporate Tonnes CO2e by Sector and Source

Sector	Emissions (tCO2e)
Buildings	4,747
Fleet	5,920
Water & Sewage	1,085
Streetlighting	608
Solid Waste	2,769
Total	**15,129**

Source	Emissions (tCO2e)
Natural Gas	3,599
Electricity	2,816
Gasoline	801
Diesel	5,144
Propane	0
Fuel Oil	0
Solid Waste	2,769
Total	**15,129**

Corporate Operations Data Summary

Energy consumption for **Buildings** and **Water and Sewage** were determined using actual billed electricity and natural gas consumption for those sectors provided by the City of Peterborough. No propane or fuel oil are used in the City of Peterborough's municipal buildings. Energy use for **Streetlighting** is also taken from real consumption data. **Fleet** emissions were calculated using actual fuel consumption data derived from municipal records.

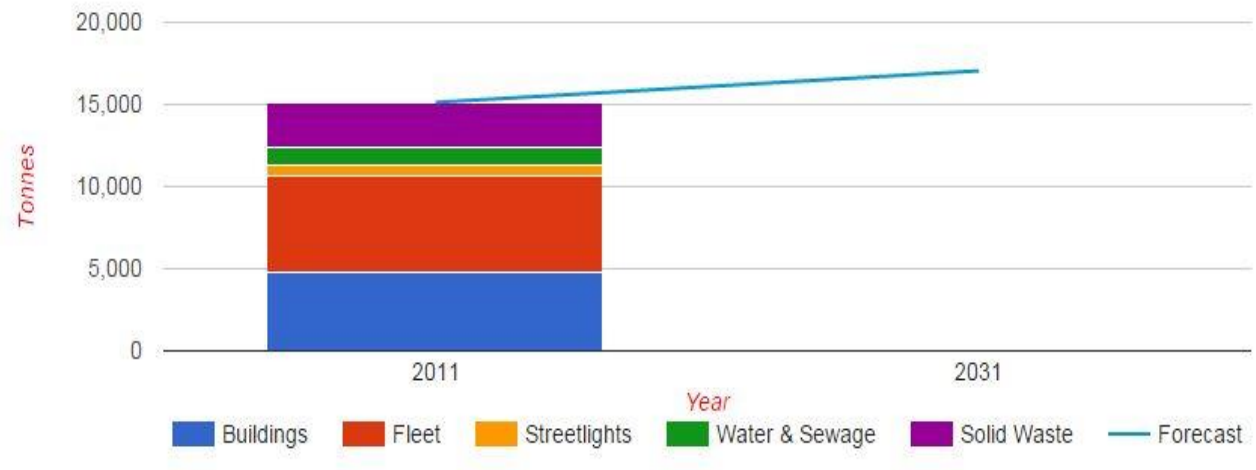
Solid Waste emissions are different from the other sectors in that they are not produced by the consumption of energy but instead reflect the impact of methane released through the decomposition of organic matter in landfills. Emissions from this sector were calculated based on total waste deposited in landfill, as well as waste stream estimates derived from municipal records. Estimates of landfill gas capture system performance were based on data from municipal sources as well as estimates of average performance for gas capture systems.

All **emissions coefficients** are derived from Canada's *National Inventory Report*, in line with PCP methodologies, and electricity emissions factors reflect the carbon intensity of Ontario's electricity grid for 2011. No significant assumptions were required to complete the corporate inventory as actual consumption data was available for all sectors and fuel types.

Business-As-Usual Forecast for City of Peterborough Corporate Operations

A business-as-usual (BAU) forecast is an estimate of annual GHG emissions into the future considered projected population growth if the City continues to operate exactly is it did in 2011 (i.e. if nothing is done to reduce emissions). The BAU forecast for the corporate operations is based on annual growth rates derived from official population projections. It was assumed that municipal operations would increase with population growth – this aligns with standard PCP methodology for creating BAUs. Emissions from corporate operations is projected to increase to 17,051 tCO2e per year by 2031, compared to 15,129 tCO2e per year in 2011. This BAU projection is presented in Figure 3 below.

Fig 3. City of Peterborough Corporate BAU Forecast – 2011-2031



3 Community Emission Inventory

The Community inventory tracks emissions from all community sources, including electricity use and heating in homes and businesses, transportation, waste generation, and agricultural production. The municipality may or may not have a direct influence over any of these emissions.

City of Peterborough Community Emissions Inventory

In 2011, 349,736 tonnes of CO2e were emitted by the City of Peterborough community. Breakdowns of emissions by sector and source are presented visually in Figure 4 and summarized in Figure 5 below.

Fig 4. City of Peterborough Community Emissions by Sector and Source

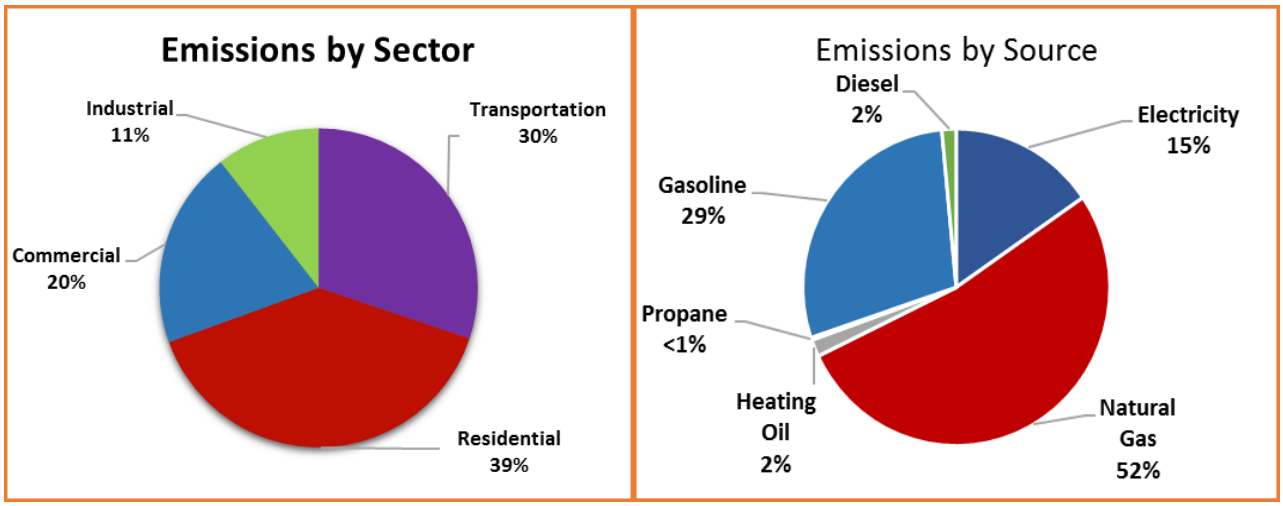


Fig 5. City of Peterborough Community Tonnes CO2e by Sector and Source

Sector	Emissions (tCO2e)
Residential	137,482
Commercial and Institutional	69,900
Industrial	36,863
Transportation	105,498
Waste	0
Total	**349,736**

Source	Emissions (tCO2e)
Natural Gas	183,939
Electricity	53,939
Gasoline	100,184
Diesel	5,298
Propane	839
Fuel Oil	6,136
Total	**349,736**

(Note: totals are not equal due to rounding)

Community Data Summary

For emissions from stationary energy (residential, commercial and institutional, and industrial), where possible energy consumption was based on actual metered energy consumption data provided by local utilities. **Electricity** consumption data was provided by Peterborough Utilities Group, **Natural Gas** consumption data was provided by Enbridge. For **Fuel Oil** and **Propane,** no real consumption data could be acquired. As a result, consumption was estimated by taking the number of households not heated with Natural Gas and allocating those to electric heating, propane, and heat oil respectively based on Natural Resources Canada (NRCAN) averages for heating fuel type for Ontario. Once households had been allocated to each fuel type, total consumptions were estimated using average consumption rates for those fuel types by household for Ontario. No estimates of Fuel Oil and Propane consumption for non-residential categories could be determined.

Estimates for **Transportation** fuel consumption were based on a resident activity/vehicle kilometers travelled (VKT) model provided by the City of Peterborough Transportation Department. Fuel consumption was estimated by allocating kilometers across a vehicle mix derived from actual vehicle registration data provided by the Clean Air Partnership, and average fuel consumption rates for those vehicle types derived from NRCAN. The result was a model of Gasoline, Diesel, and Propane consumption for the Transportation sector. Because the transportation model is based on resident activity surveys, it does not include emissions from the commercial sector or non-automobile emissions (water travel and air travel), these are areas for future improvement.

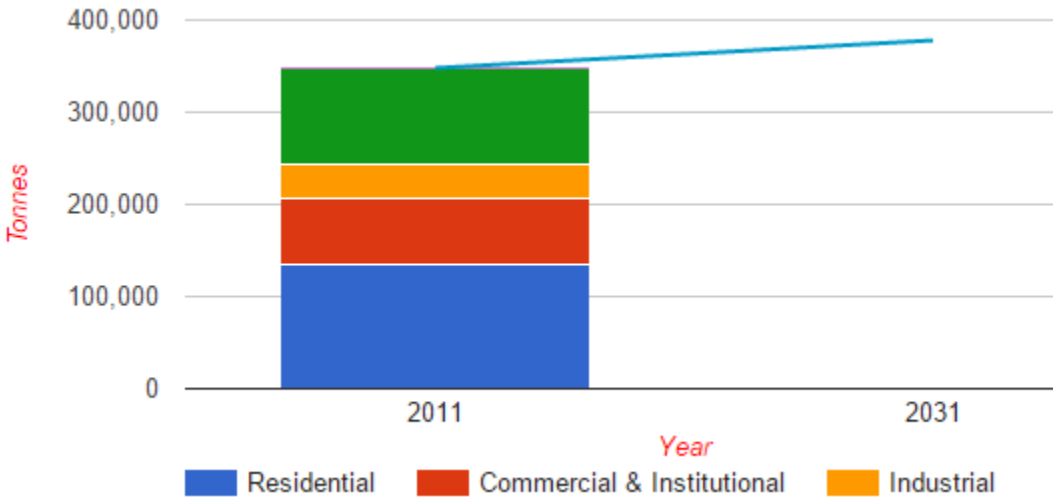
Since **solid waste** emissions for the City of Peterborough Waste Management facility have been allocated to the corporate inventory they have not been included in the community inventory.

All **emissions coefficients** are derived from Canada's *National Inventory Report*, in line with PCP methodologies. Electricity emissions factors reflect the carbon intensity of Ontario's electricity grid for 2011.

Business-As-Usual Forecast for City of Peterborough Community

A business-as-usual (BAU) forecast is an estimate of annual GHG emissions into the future considered projected population growth if the City continues to operate exactly is it did in 2011 (i.e. if nothing is done to reduce emissions). The Community BAU forecasts are based on annual growth rates derived from official population projections in the Growth Plan. In line with PCP protocol methodologies, emissions for residential and transportation sectors were assumed to increase with population growth, while commercial, institutional, and industrial emissions were assumed to increase with projected employment growth. Based on the projected growth for the City of Peterborough, community emissions are expected to grow to 389,587 tonnes CO2e by 2031. This BAU projection is presented in Figure 6 below.

Fig 6. City of Peterborough Community BAU Forecast – 2011-2031



4 Next Steps

Completion of the Milestone 1 baseline inventories is the first step in the Greater Peterborough Area Climate Change Action Plan. Next steps involve identifying opportunities to reduce GHG emissions based on the inventories and prepared itemized action plans with estimated GHG reductions and costs and establishing reduction targets. Actions identified in the action plans will be done in collaboration with the eleven other local governments in the Greater Peterborough Area to explore efficiencies and cumulative impacts. Ideas for actions will be based on best practice research, public input, and ongoing meetings 80+ community organizations and stakeholders.