



Municipality of Port Hope Corporate Climate Action Plan 2010

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Presented to:

Municipality of Port Hope

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Executive Summary

The Municipality of Port Hope herein referred to as the “Municipality” has developed 2008 baseline greenhouse gas (GHG) emissions inventories and corresponding business as usual (BAU) forecasts for the Corporate sector (Municipal operations) and the Community as a whole. Based on these inventories, GHG reduction targets were set for the Corporate and Community sector. The Municipality conducted these efforts in order to fulfill Milestones 1 and 2 of the Partners for Climate Protection (PCP) program. This report addresses the Corporate component of Milestone 3 – the Corporate Climate Action Plan.

The Municipality will use its Corporate GHG inventory, along with agreed-upon reduction targets, as a tool for realizing emissions reductions; “The first step towards managing carbon emissions is to measure them because in business what gets measured gets managed”¹

Municipal governments are in direct or indirect control of almost half of Canada’s greenhouse gas (GHG) emissions.² Municipalities are capable of achieving significant reductions in their GHG inventories since many actions that can reduce Corporate energy use and emissions are within the powers of Municipal Council and staff. The cumulative annual reduction reported by municipal governments in Canada is **1.4 million tonnes**, the equivalent of removing 325,600 light vehicles from the road.²

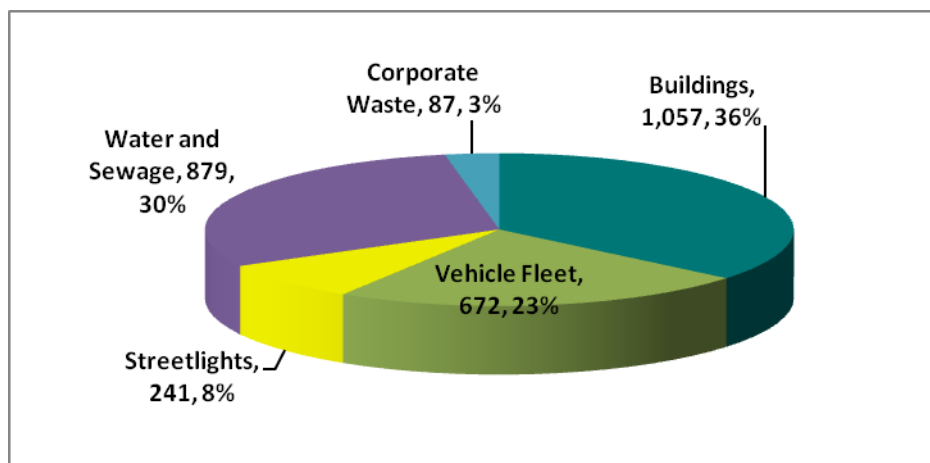
Corporate Baseline GHG Inventory (2008)

Corporate GHG emissions result from the energy consumption and solid waste generated during the delivery of municipal services and operation of facilities. The activities associated with these emissions are: building operations (heat and lighting), vehicle fleet operations, and infrastructure operations (water, wastewater, and solid waste). For the base year of 2008, the Corporate GHG emissions totaled **2,937 t eCO₂**. The figure below demonstrates the relative contribution to GHG emissions from the various sectors within the Corporate portfolio. From this figure it can be seen that Municipal Buildings (36%) and Water & Sewage treatment facilities (30%) are the largest contributors to GHG emissions, with the Corporate Vehicle fleet (including off-road vehicles and equipment) following at 23%. The streetlights are less significant, generating only 8% of Corporate GHG emissions, while consuming 19% of the electricity. The waste generation and landfill activities only account for 3% of the GHG emissions.

¹ Lord Adair Turner, Director of Standard Chartered plc, 2006.

² FCM, Partners for Climate Protections, “*Demonstrating Results: Municipal Initiatives for Reducing GHGs, National Measures Report*”, 2009.

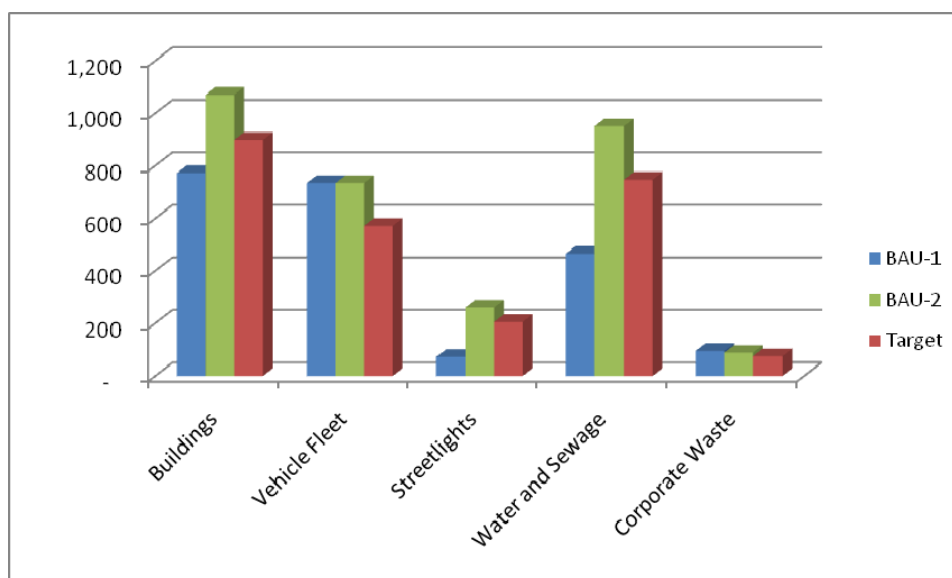




2008 Corporate eCO₂ Emissions Breakdown by Sector

Corporate BAU Forecast (2018)

2018 business as-usual (BAU) GHG emissions represent the emissions that would be expected to occur in the absence of any additional GHG reductions actions. The BAU forecast emissions are based on sector growth estimations presented in the Port Hope 2009 Background Developmental Charge Study report. The chart below presents two business-as-usual GHG emissions forecasts, BAU-1* (blue) and BAU-2** (green) for the various sectors comprising the Corporate entity, along with the target emissions (red) representing a 15% GHG reduction from the 2008 baseline for each sector.



*BAU-1 is based on the assumption that the provincial electricity grid mixes changes drastically by 2018, resulting in a significant reduction of the carbon intensity of electricity generation

**BAU-2 is a conservative estimation based on the assumption that the provincial electricity grid mix remains the same

2018 Business-as-usual (BAU) forecasts and Targets for GHG emissions from Corporate Sectors



The BAU-2 forecast (assuming a constant electricity grid factor) reflects that the Municipality should take action to reduce future emissions in order to meet the target.

This forecast suggests that in 2018 the Corporate Municipality would release **3,101 t eCO₂**; an overall increase in GHG emissions by 6% relative to the 2008 baseline.

Corporate Action Plan

The Corporate Action Plan is developed to guide the Corporate Municipality along the path to achieving its energy and GHG reduction targets, and is structured in a hierarchy of:

- Subject Area (3 main areas for activity)
 - Initiatives: 1 or more major initiatives within each subject area
 - Actions: 1 or more activities to execute to fulfill the initiative.

PROPOSED TARGET: The municipality will target to reduce Corporate greenhouse gas emissions by **15%** from **2008** levels by the year **2018**.

Three (3) major subject areas that the Municipality plans to target to enable the reduction of energy use and GHG emissions under the Corporate sector are:

1. Energy Efficiency in Civic Buildings
2. Mobile Fleet Efficiency
3. Municipal Operations and Utility Services

In order to achieve its reduction targets, the Municipality should prioritize proposed initiatives and actions. The following is a list of criteria for evaluating the priority in which reduction measures should be tackled:

- Magnitude of Potential Emission Reduction
- Permanence of GHG Emission Reductions (e.g. offsetting by planting trees is not necessarily permanent in the case of forest fires)
- Technical ease of implementation of Emission Reduction Measures
- Cost of implementation

A scoring matrix (“Decision Matrix”) is populated with the above criteria, and is used to prioritize actions to reduce greenhouse gas emissions.



Emission Reduction Action	Magnitude of Emission Reduction Potential	Technical Ease of Implementation	Cost of Implementation	Staff/Community Engagement	Comment	SCORE
<i>RELATIVE IMPORTANCE</i>	1	0.4	0.4	0.7		*/10
CORPORATE SECTOR						
Inventory for Business Travel	1	3	3	1	Technically feasible, but limited reduction potential	5
Inventory for use of personal vehicles for Municipal work	1	2	3	1	Technically feasible, but limited reduction potential	5
Driver Training	2	3	2	2	Technically feasible, but limited reduction potential	7
Ride sharing program	0	2	3	3	Difficult to implement; depends on staff involvement / willingness. Does not have direct impact on Corporate GHG inventory	5
Provide incentives for employees involved in active and sustainable commuting	0	2	2.5	3	Difficult to implement; depends on staff involvement / willingness. Does not have direct impact on Corporate GHG inventory	5
Showers/lockers for active transportation participants	0	3	2.5	3	Easy to implement. Does not have direct impact on Corporate GHG inventory	6
Greening the fleet- replace with hybrids and high efficiency vehicles. Use alternative fuels e.g biofuels	3	3	2	3	Cost is reasonable if high efficiency vehicles replace others at end of useful life. Significant reduction potential	9
Conduct energy audits and implement recommendations	3	2	2	2.5	Cost/ease of implementation depends on the individual recommendations. To be assessed on case-by-case basis	8
Develop Energy Saving Training Program	2	2	3	3	Effectiveness depends on staff involvement / willingness.	8
Develop Employee Waste Minimization/Diversion Program	2	2	3	3	Effectiveness depends on staff involvement / willingness.	8
Establish Emission Reduction Share Program	0	1	3	3	Relatively difficult to implement. Does not have direct impact on Corporate GHG inventory	5
Develop water conservation program	1	2.5	2.5	2.5	Results in less gas usage for water heating, and less electricity for Municipal pumping and treatment cost.	6
Generate Electricity on site	2	0.5	0.5	3	Costly to implement, but has sustainability benefits and engages staff and community	6
Purchase electricity from renewable sources	2	2	3	2	More cost effective, but less staff engagement	7

While the GHG reduction initiatives and actions presented here will allow for the Municipality to move towards realizing emission reduction targets by 2018, continuous monitoring is recommended to ensure that reduction potentials are being met, and to enlighten the Municipality of those areas where modifications to the plan should be made, and where more attention should be focused.

The next step for the Municipality is to work towards Milestone 4- Implementation of the GHG reduction initiatives and actions presented in Corporate Climate Action Plan. In this way the Corporate Municipality can lead the Community by example, and then develop the Community Action Plan based on lessons learned from Corporate implementation.



1. Introduction

1.1 Climate Change and Greenhouse Gas Emissions

Two enormous challenges that will define this century are global warming and energy supply. The changing climate is already impacting the world in many ways and these impacts are predicted to increase significantly over the next 100 years. At the same time, our reliance on fossil fuels and rising energy costs are elevating concerns with respect to future availability of economically viable fossil fuels.

Human activities, primarily the burning of fossil fuels, are resulting in increased concentrations of carbon dioxide and other greenhouse gases (GHGs) in the atmosphere.

These excess (above and beyond natural sources) GHGs accelerate the heat trapping 'greenhouse effect' within the atmosphere, and contribute to global climate change. The effects of climate change include disruptions to our climate and weather systems, with resulting impacts to the natural systems that humans rely upon.

The Municipality of Port Hope (Municipality) and other local governments need to work collectively to mitigate and adapt to current and future impacts. Although the Municipality of Port Hope represents a relatively small portion of the national emissions inventory, there is an opportunity to set an example for local governments across the province while at the same time, making Port Hope a better place to live and work. Municipalities are in a unique position to deal with the global climate change problem by establishing a culture of sustainability and resilience for residents and businesses.

The Partners for Climate Protection Program

Climate change is a global issue, yet addressing it will require countless local actions worldwide. To this end, the Federation of Canadian Municipalities (FCM) has developed the Partners for Climate Protection (PCP) Program to guide municipal governments towards reducing GHG emissions. As a background, the International Committee on Local Environmental Issues (ICLEI) formed the Cities for Climate Protection Program (CCP) in 1993, and the FCM formed the "20% Club" in 1995 (Port Hope joined the 20% club in 1997). ICLEI's CCP Programs and FCM's 20% club merged in 1998 to form PCP initiative in Canada.

Over 200 (207³ as of July 2010) municipalities from across Canada, representing 50% of Canada's population, have joined the PCP program. The PCP program defines a process for municipal governments to quantify their GHG emissions and then to develop and implement action plans that can achieve emissions reductions. The PCP program consists of five milestones as listed below:

³ FCM, PCP Members and Milestone Status, http://www.sustainablecommunities.fcm.ca/Partners-for-Climate-Protection/Milestone_Status.asp



1. Conduct a baseline emission analysis for municipal operations and the community (completed).
2. Establish GHG reduction targets for both municipal operations and the community (completed).
3. Develop a local action plan outlining action items to reduce energy use and greenhouse gas emissions from municipal operations and throughout the community (this document presents Corporate Climate Action Plan).
4. Establish a program to implement action items that will reduce GHG emissions.
5. Continue to monitor, verify, and report GHG reduction achievements and amend the action plan accordingly to reflect new strategies.

The Municipality has already conducted Milestones 1 & 2, and this report covers the Corporate portion of Milestone 3. The Municipality will use its Corporate GHG inventory, along with agreed-upon reduction targets, as a tool for realizing emissions reductions; "The first step towards managing carbon emissions is to measure them because in business what gets measured gets managed"⁴

1.2 Corporate GHG Emissions

Municipal governments are in direct or indirect control of almost half of Canada's greenhouse gas (GHG) emissions, and their decisions on public transit, waste management, building energy performance, and land use planning greatly influence the amount of emissions produced in Canada.⁵ Municipalities are capable of achieving significant reductions in their GHG inventories, since many actions that can reduce Corporate energy use and emissions are within the powers of Municipal Council and staff.

The cumulative annual reduction reported by municipal governments in Canada is **1.4 million tonnes**, the equivalent of removing 325,600 light vehicles from the road⁴. Municipal governments across Canada are taking action to improve quality of life and air quality in their communities, and to reduce operating costs with investments generating significant savings on tax-payers dollars – over **\$56 million** in savings to date⁴.

Corporate GHG emissions result from the energy consumption and solid waste generated during the delivery of municipal services and operation of facilities. Primary sources are:

- combustion products from natural gas and liquid fuels,
- consumption of electricity generated at other facilities (indirect sources),
- decay products of waste generated by Municipal operations.

The activities associated with these emissions are: building operations (heat and lighting), vehicle fleet operations, and infrastructure operations (water,

⁴ Lord Adair Turner, Director of Standard Chartered plc, 2006.

⁵ FCM, Partners for Climate Protections, "Demonstrating Results: Municipal Initiatives for Reducing GHGs, National Measures Report", 2009.



wastewater, and solid waste). Table 1 below shows the electricity and fuel consumed, as well as waste generated by Corporate activities in 2008.

Table 1: Corporate Energy/Fuel Consumption for 2008

Energy Type	Total Use
Electricity (kWh)	7,413,857
Natural Gas (m3)	431,980
Fuel Oil (L)	35,322
Diesel (L)	158,317
Gasoline (L)	101,617
Waste (t)	182

For the base year of 2008, the GHG emissions from Corporate activities in Port Hope totaled **2,937 t eCO₂**. Table 2 below presents the breakdown of GHG emissions and associated cost for each Corporate sector.

Table 2: 2008 Corporate GHG Emissions & Corresponding Energy Cost

Sector	Total eCO ₂ (t)
Buildings	1,057
Vehicle Fleet	672
Streetlights	241
Water and Sewage	879
Corporate Waste	87
Total	2,937

Figure 1 below better demonstrates the relative contribution to GHG emissions from the various sectors within the Corporate portfolio. From this figure it can be seen that Municipal Buildings (36%) and Water & Sewage treatment facilities (30%) are the largest contributors to GHG emissions, with the Corporate Vehicle fleet (including off-road vehicles and equipment) following at 23%. The streetlights are less significant, generating only 8% of Corporate GHG emissions, while consuming 19% of the electricity. The waste generation and landfill activities only account for 3% of the GHG emissions.

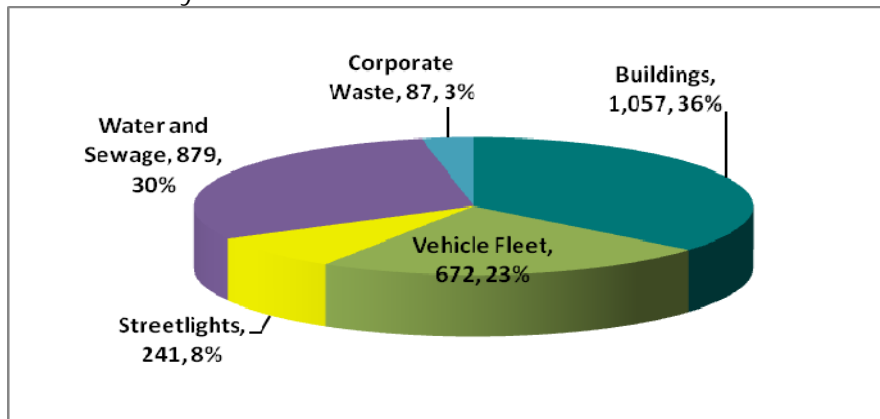


Figure 1: 2008 Corporate eCO₂ Emissions Breakdown by Sector



1.3 Corporate GHG Emissions Forecast

Forecasting the amount of emissions that would occur ten years later (2018) is necessary to assess the scope of reductions Port Hope has to make in order to meet targets. 2018 business as-usual (BAU) GHG emissions represent the emissions that would be expected to occur in the absence of any additional GHG reductions actions. The BAU emissions from electricity, natural gas and other fuel consumption, as well as waste generation, are based on sector growth estimations presented in the Port Hope 2009 Background Developmental Charge Study report. The forecasted electricity and fuel consumption, as well as waste generation based on the growth and development projections in Port Hope for 2018 is shown in Table 3 below.

Table 3: 2018 Corporate Electricity & Fuel Consumption Forecast for 2018

Corporate Sector	Electricity	Natural Gas	Oil	Gasoline	Diesel	Other
	kWh	m3	L	L	L	tonnes
Buildings	2,420,973	337,473	7,106			
Vehicle Fleet				111,068	173,041	
Streetlights	1,529,253					
Water and Sewage	3,939,217	102,069	30,697			
Corporate Waste						196
Total	7,889,443	439,542	37,803	111,068	173,041	196

For forecasted electricity emissions calculations, significant changes in electricity generation mix are expected to occur after 2014. The reduced carbon equivalency (eCO₂) emission intensity factors are based on Ontario's proposed plan for a 'cleaner' grid mix including more nuclear, hydro and renewables and no coal generation in future years; the eCO₂ intensity for 2018 is therefore projected to be 47 t eCO₂/MWh in 2018. Since there is some uncertainty on the actual grid mix several years from now, and the Municipality is committed to initiate GHG reduction strategies independently from Provincial initiatives, a second BAU estimate (BAU-2) was projected keeping all external factors constant; i.e. assuming no change in the grid mix.

All efforts in the Corporate Climate Action plan are therefore based on the BAU-2 projections; the Municipality would undertake initiatives and actions to realize carbon reductions that would take the Municipality from BAU-2 carbon projections to the proposed target of 15% reductions from the 2008 baseline.

Figure 2 below presents the business-as-usual GHG emissions forecasts, BAU-1 (blue) and BAU-2 (green) for the various sectors comprising the Corporate entity, along with the target emissions (red) representing a 15% GHG reduction from the 2008 baseline for each sector.



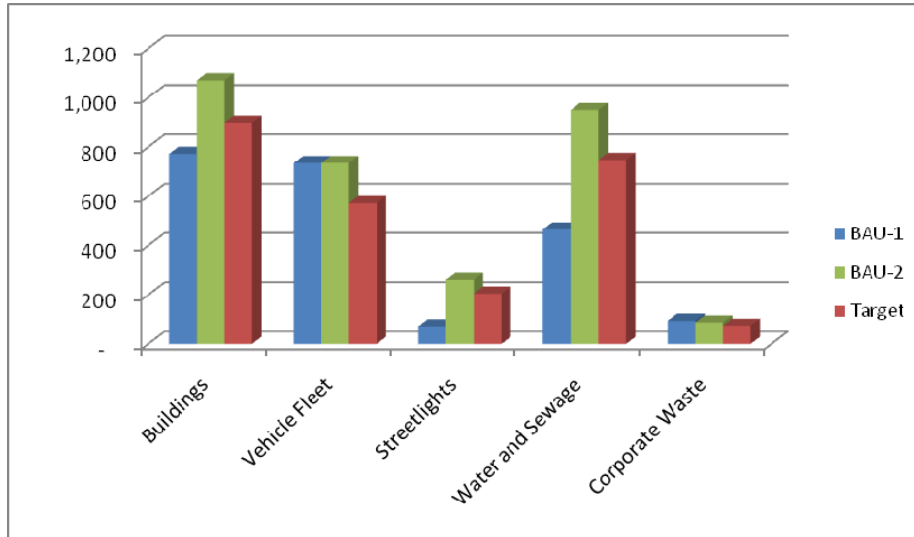


Figure 2: 2018 Business-as-usual (BAU) forecasts and Targets for GHG emissions from Corporate Sectors

While the BAU-1 forecast (assuming a large provincially-driven reduction in electricity grid factor) shows an emissions forecast that is below the target for those sectors reliant on electricity consumption, the BAU-2 forecasts (assuming a constant electricity grid factor) reflects that the Municipality should take action to reduce future emissions in order to meet the target. Since it has been established that the BAU-2 forecasts are more reliable, and not reliant on external driving forces that are independent of the Municipality's initiatives, Port Hope has committed to 10-year reduction strategies based on these projections (BAU-2).

Table 4 below shows that it is forecasted (BAU-2) that in 2018 the Corporate Municipality would release **3,101t eCO₂**; an overall increase in GHG emissions by 6% (200 t eCO₂) relative to the 2008 baseline. This increase is a result of the projected population growth and corresponding increase in the Municipal level of service and facility/fleet expansions.

Table 4: 2018 Corporate BAU-2 GHG Forecast

Corporate Sector	2008	2018
	eCO ₂	eCO ₂ t
	tonnes	tonnes
Buildings	1,057	1,070
Vehicle Fleet	672	735
Streetlights	241	260
Water and Sewage	879	950
Corporate Waste	87	87
Total	2,937	3,101



2. Corporate Climate Action Plan

This section presents the proposed plan components for a Corporate Climate Action Plan. The objective and purpose of this Corporate Action Plan is presented first, followed by sections on “Data Collection” and management of the Corporate GHG inventories. Finally the GHG reduction initiatives and action items that comprise the plan are presented, along with a decision matrix for prioritizing the proposed action items.

The Corporate Action Plan is structured in a hierarchy of:

- Subject Area (3 main areas for activity)
 - Initiatives: 1 or more major initiatives within each subject area
 - Actions: 1 or more activities to execute to fulfill the initiative.

The action plan is developed to guide the Corporate Municipality along the path to achieving its energy and GHG reduction targets.

PROPOSED TARGET: The municipality will target to reduce corporate (i.e. municipal operations) greenhouse gas emissions by **15%** from **2008** levels by the year **2018**.

2.1 Plan Objectives and Purpose

This plan is intended to:

- Provide a road map towards achieving reductions in energy use and GHG emissions for Port Hope’s Corporate operations
- Propose a data collection plan to develop GHG inventories in future years
- Present the foundation of an Inventory Management Plan
- Define a list of **Initiatives** for GHG and energy reduction
- Define a list of **Actions** that can be implemented by 2018
- Define a high level monitoring plan

2.2 Data Collection

To report the Municipality’s Corporate GHG emissions in future years, the Municipality will need to gather and summarize energy use data from all of its facilities/offices, streetlights, water and sewage utilities, and also collect information on Corporate waste generation. It is important that the Municipality plans this process carefully to minimize the reporting burden, reduce the risk of errors that might occur while compiling data, and ensure that all departments are collecting information on an efficient and consistent basis.

Ideally, the Municipality will integrate GHG reporting with its existing reporting tools (e.g. financial reporting tools) and processes and take advantage of any



relevant data already collected and reported to the Finance department, herein referred to as the "*central repository*".

Data collection and management tools could include:

- Secure databases available over the Municipality's intranet or internet, for direct data entry by each department
- Spreadsheet templates filled out by each department's assigned representative and emailed to the *central repository* where data is further processed
- Paper reporting forms faxed to the *central repository* where data is entered into the corporate database. (This process might increase the likelihood of errors)

In a centralized system, departments collect the activity data and send it to the designated person/office where GHG emissions are calculated. It is recommended that standardized reporting formats be used to ensure that data received from the various departments is comparable.

In addition to the activity/fuel use data, facilities should include the following in their report submissions:

- A brief description of the sources included
- The reporting period covered
- Clear records of any calculations undertaken to derive activity/fuel use data
- A short discussion of uncertainties in data provided, and recommendation as to how data quality can be improved
- A description of events and changes that have an impact in the reported data (e.g. technology upgrades, etc.).

2.3 Inventory Management Plan (IMP)

Effective management of the GHG inventories would enable enhanced identification of opportunities for improvement and reduction in GHG emissions. "A corporate GHG inventory program includes all institutional, managerial and technical arrangements made for the collection of data, preparation of the inventory and implementation of steps to manage the quality of the inventory"⁶. As such the Municipality should develop an Inventory Management Team (IMT) of 3-4 people which would include representatives from the central repository to

⁶ World Resources Institute, The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Chapter 7, Managing Inventory Quality.



ensure proper development and management of the Corporate GHG inventories.

An important part of a GHG management program is the design of an efficient data collection system to construct and consistently replicate inventories from year to year. This will include the development of protocols for systematic data collection and submission to the central repository. These protocols, once agreed upon by the IMT, should be finalized and documented. This is particularly important when considering staff changes that can make consistency difficult to achieve.

The design of an Inventory Management Plan (IMP) should provide for the updating of GHG calculation methodologies as new techniques become available or changes are made to Municipal operations.

The Municipality should take the following steps to ensure effectiveness and efficiency in the development of its GHG inventories:

- Establish an Inventory Management Team (IMT) responsible for implementing the quality management system and coordinating interactions between reporting units (designated representatives from various departments) and external units such as Federation of Canadian Municipalities (FCM) representatives, and/or consulting firms.
- Perform quality checks on data, calculations procedures, and assumptions made
- Review final inventory and reports.
- Institute formal feedback loops to the IMT or a representative of the team so that errors can be corrected and improvements implemented.

2.4 Corporate Initiatives and Action Items

Three (3) major subject areas that the Municipality plans to target to enable the reduction of energy use and GHG emissions under the Corporate sector are listed below.

1. Energy Efficiency in Civic Buildings

Proposed initiatives to improve the energy efficiency of civic buildings include:

- Initiative 1: Evaluate and implement energy reduction opportunities for Municipal Buildings
- Initiative 2: Build all new municipal buildings to high energy efficiency standards#

2. Mobile Fleet Efficiency



The Municipality operates approximately 100 pieces of equipment including a mix of about 45 gasoline and diesel on-road vehicles, and 54 units of non-road vehicles and special purpose equipment including ATVs, tractors, trailers and other machinery. In 2008, this use accounted for 18% of the Municipality's energy consumption and about 23% of the GHG emissions. Proposed plan initiatives to reduce carbon-intensive fuel consumption and GHG emissions from this sector include:

- Initiative 3: Implement a Fleet Energy Management Strategy
- Initiative 4: Evaluate and implement bio-based fuels

3. Municipal Operations and Utility Services

Utility services including; water, sewage, streetlights accounted for 42% of the corporate energy consumption and resulted in 38% of the Municipality's GHG emissions. Proposed plan initiatives to improve the energy efficiency and reduce GHGs include:

- Initiative 5: Incorporate Energy Conservation and GHG reduction in Utility Operations
- Initiative 6: Promote Energy Efficiency in Purchasing Decisions

The tables in the sub-sections below present a comprehensive description of initiatives and recommended action items associated with each of these three subject areas. These tables provide guidance as to 'who' within the Corporate municipality may be responsible for initiating and running these actions, and also provides a summary of benefits and considerations associated with each initiative.

2.4.1 Energy Efficiency in Civic Buildings

The tables below present two (2) initiatives and four (4) action items related to energy efficiency in buildings.

Initiative 1: Evaluate and Implement Energy Reduction Opportunities for Civic Buildings	
Description	<p>The Municipality will conduct energy audits of civic buildings to identify energy reduction opportunities. Notwithstanding the retrofits already completed, additional opportunities may include:</p> <ul style="list-style-type: none"> • Optimizing the use of building automation systems. • Building envelope retrofits, including glazing, insulation and air tightness, • Heating ventilation and air conditioning equipment upgrades, and • Domestic hot water system upgrades
Actions	<p>A- 1: Develop and implement an energy audit program with a goal to assessing all municipal buildings for retrofit opportunities by 2016.</p> <p>A- 2: Update or develop energy tracking and management systems to allow for effective analysis and reporting of energy consumption by the municipality.</p> <p>A- 3: Implement identified building retrofit for municipal buildings.</p>
Responsibility	<p>Environmental Initiatives Team formed by CAO, comprising all department directors. Possibility in the future of assigning a Coordinator who will be responsible for GHG initiatives</p>



Considerations

Audits generally range from zero-cost walk through reviews to several thousand dollars for a full engineering audit. Typical costs are in the range of \$0.10 to \$0.20 per square foot*

- Mechanical and electrical system retrofits range from \$3 - \$5 per sq.ft of building space*
- Building Envelope retrofits range from \$30 to \$50 per sq.ft of wall space*
- Payback periods for typical commercial or office building retrofits are in the range of 5 - 8 years*

* Unit cost estimates taken from City of Prince George Prince George Community Energy and GHG Management Plan, Final Draft, March 16, 2007



Initiative 2: Build all new municipal buildings to High Energy Efficient Standards	
Description	Municipality commits to build all major new buildings to high levels of energy efficiency. Plan target for new commercial buildings to exceed the Model National Energy Code for Buildings (the Federal CBIP standard) by 25%. According to the Ontario Building Code; new non-residential and larger residential buildings built under permits applied for in 2012 will be required to meet standards 25 per cent higher than the Model National Energy Code for Buildings.
Activities	A- 4: Require all new Municipal facilities greater than 500 m ² (approx 5382 square feet) to meet Ontario Building Code energy efficiency requirements
Responsibility	Relevant department director , will be responsible for these activities through tendering process
Considerations	This action is consistent with Ontario Building Code
Benefits	New building energy consumption will be up to 25% less than a standard building.

2.4.2 Mobile Fleet Efficiency

The tables below presents two (2) initiatives and four (4) action items related to mobile fleet efficiency.

Initiative 3: Implement a Fleet Energy Management Strategy	
Description	The Municipality will undertake a fleet management program focused on reducing energy consumption and greenhouse gas emissions. Components of such a program might include: <ul style="list-style-type: none"> • Driver training to increase awareness about efficiency and energy conservation actions (e.g., idling reduction, driving techniques) • Energy Efficient Vehicle Purchasing • GHG intensity-conscious fuel purchasing • Data Collection and Monitoring • Maintenance and Operation of Vehicles in an effort to conserve energy
Actions	A-5: Evaluate an appropriate system for fleet management, consider using a fleet management tools A- 6: Implement training with the objective of reducing energy consumption.
Responsibility	Relevant Department Director; each department is responsible for their own fleet. Applies mostly to Public Works, Police, Fire & EMS and PRC.



Considerations	<p>Several programs have been established to guide fleet managers in the process of developing and implementing management programs. These include:</p> <ul style="list-style-type: none"> • E3 Fleet available on FCM's website, presents an integrated analysis & green rating system for fleets. • 'Fleet Smart' - a program offered by Natural Resources Canada introducing fleets to energy-efficient practices that can reduce fuel consumption and emissions. FleetSmart offers free practical advice on how energy-efficient vehicles and business practices can reduce fleet operating costs, improve productivity and increase competitiveness. <p>Results can typically be a 10% reduction in fuel consumption and GHG emissions. This program does not include extensive monitoring and assessment processes.</p>
Benefits	Energy Savings: Estimated as 10 % of fleet consumption

Initiative 4: Evaluate and implement bio-based fuels	
Description	The Municipality will initiate a program to demonstrate, evaluate, and promote the use of bio-based fuels through use in the municipal fleet
Actions	<p>A- 7: Assess the applicability and availability of ethanol fuel blends at the time of the next fuel purchase contract.</p> <p>A- 8: Initiate efforts to implement the use of bio-diesel within the municipal vehicle fleet</p>
Responsibility	Relevant Department Director; each department is responsible for their own fleet. Applies mostly to Public Works, Police, Fire & EMS and PRC.
Considerations	Implementation of a bio-diesel program may be affected by climatic issues relating to storage. Bio diesel has been found to not be suitable for vehicles more than 20 years old
Benefits	<p>It is estimated that a B20 blend can result in up to a 15% reduction in GHG emissions per litre of fuel consumed.</p> <p>Bio-diesel and ethanol fuels also have air quality co-benefits in that they result in cleaner burning engines and so have reduced emissions of common air contaminants.</p>

2.4.3 Municipal Operations and Utility Services

The tables below presents three (3) initiatives and eleven (11) action items related to Municipal Operations and Utility Services.

Initiative 5: Incorporate Energy Conservation and GHG reduction in Utility Operations.



Description	Utilities will work to reduce energy consumption and waste generation in order to reduce greenhouse gas emissions.
Actions	<p>A- 9: Replace streetlights with more energy efficient units</p> <p>A-10: Implement the streetlights dimming program within the community where applicable.</p> <p>A- 11: Implement an energy recovery project at the Sewage treatment to use digester gas to generate electricity with micro-turbines.</p> <p>A- 12: Use energy efficient system components in new infrastructure</p>
Responsibility	Public Works
Considerations	A streetlights dimming pilot can be considered in partnership with local utilities e.g. Veridian.
Benefits	Electricity savings from streetlights dimming could be as much as 25% of total consumption within the streetlights sector

Initiative 6: Advance Energy Efficiency through municipal practices and “in-reach”	
Description	The Municipality will work to incorporate energy reduction and GHG emission reduction into daily operations at all levels of municipal facilities.
Actions	<p>A- 13: Develop and implement an ongoing internal (staff) program to raise awareness of energy conservation and climate change.</p> <p>A-14: Establish an Inventory Management Team (IMT) to oversee data collection efforts and ensure proper management of the future GHG inventories. The IMT will be responsible for implementing the quality management system and coordinating interactions between Municipal reporting units and external units such as Federation of Canadian Municipalities (FCM) representatives, and/or consulting firms.</p> <p>A- 15: Promote a reduction in single occupancy vehicle use for city staff through education and trip reduction programs such as car-pooling, and summertime bike to work events</p> <p>A- 16: Reduce the impacts of corporate waste generation at civic facilities through diversion and reduction activities</p>
Responsibility	(Environmental Initiatives Team formed by CAO and comprising all department directors. Possibility in the future of assigning a Coordinator who will be responsible for GHG initiatives
Considerations	Many of these activities can coincide with other activities such as Clean Air Day, "Bike-to-work" Day, and Earth Day
Benefits	Energy and GHG reduction potential is difficult to quantify



Initiative 7: Promote Energy Efficiency in Purchasing Decisions	
Description	The Municipality will endeavour to maintain the most cost effective and energy efficient operations possible through a consideration of both the up-front capital cost, and the long term life cycle (operating) costs of its purchasing activities.
Actions	<p>A- 17: Whenever available and suitable, the Municipality will purchase EnergyStar rated equipment. Where this rating is not available, the Municipality will endeavour to purchase the most energy efficient option where ever possible.</p> <p>A- 18: The Municipality will include a life cycle cost/benefits analysis for purchases. For example, will support a purchase price premium that is offset by long-term operating cost (energy) savings.</p> <p>A- 19: Where appropriate, and feasible, the Municipality will include energy conservation considerations in its purchasing criteria for tenders and RFPs.</p>
Responsibility	Finance Department in conjunction with all affected Departments since they have a technical expertise re: purchased goods
Considerations	The Energy evaluation of small purchases (computer monitors, appliances, heating and air conditioning equipment, etc.) can be simplified through the EnergyStar standard. Larger procurements (e.g. a new building) may require a full business case to support a premium in capital costs.
Benefits	Energy and GHG reduction potential is difficult to quantify

The initiatives and actions presented in the tables above will allow for the Municipality to move towards realizing emission reduction targets by 2018. However, continuous monitoring is recommended to ensure that reduction potentials are being met, and to enlighten the Municipality regarding those areas where modifications to the plan should be made, and where more attention should be focused.

2.5 Prioritizing GHG Emission Reduction Measures

In order to achieve its reduction targets, the Municipality should prioritize proposed initiatives and actions. The following is a list of criteria for evaluating which reduction measures should be tackled and when:

- Magnitude of Potential Emission Reduction
- Permanence of GHG Emission Reductions (e.g. offsetting by planting trees is not necessarily permanent in the case of forest fires)
- Technical ease of implementation of Emission Reduction Measures
- Cost of implementation

Table 5 below presents the emission reduction action items discussed above, in a scoring matrix, "Decision Matrix", as a method of evaluating the priority of addressing these actions. The scoring system is based on criteria listed above, i.e.; the relative magnitude of GHG reduction potential, the ease of filling the



gap technically and financially, and the benefits associated with staff and public engagement when these action items are addressed.

The scoring criteria for this matrix is based on ENVIRON's discussions with the Municipality. The Municipality is committed to address those actions which have significant GHG reduction potential; hence these criteria were given the highest weighting of 100%. The Municipality is also enthusiastic about addressing those gaps which could be feasibly and logistically addressed in a relatively short time frame, and so these criteria were given the second highest overall weighting of 80%. This was broken down into two criteria: technical ease of filling the gap weighted at 40%, and cost associated with filling the gap at 40%. Finally, the Municipality, in its pioneering GHG reduction efforts, is interested in creating awareness internally throughout the Corporate entity, as well as throughout the Community. It was therefore decided that it would be important to target those gaps that would create such awareness, so this engagement criterion was assigned a weighting of 70%.

The scores are assigned on a scale of 1-3:

- Magnitude of Emission Reduction Potential – 3 represents a large reduction potential, 1 represents a small emission reduction potential
- Technical Ease of Implementation – 3 represents easy implementation, 1 represents difficult implementation
- Cost – 3 represents a low cost, 1 represents a high cost to fill the gap
- Engagement – 3 represents a high level of engagement, 1 represents a low level of engagement

****Generally, high scores (3) apply to actions that are "good" for the given criterion, and low scores (1) apply to those actions that are "NOT good" for that criterion.***

The calculated scores (out of 10) presented Table 5 can be used to prioritize GHG emission reduction actions for the Corporate sector.



Table 5: Corporate GHG Reduction Actions

Emission Reduction Action	Magnitude of Emission Reduction Potential	Technical Ease of Implementation	Cost of Implementation	Staff/Community Engagement	Comment	SCORE
<i>RELATIVE IMPORTANCE</i>	1	0.4	0.4	0.7		*/10
CORPORATE SECTOR						
Inventory for Business Travel	1	3	3	1	Technically feasible, but limited reduction potential	5
Inventory for use of personal vehicles for Municipal work	1	2	3	1	Technically feasible, but limited reduction potential	5
Driver Training	2	3	2	2	Technically feasible, but limited reduction potential	7
Ride sharing program	0	2	3	3	Difficult to implement; depends on staff involvement / willingness. Does not have direct impact on Corporate GHG inventory	5
Provide incentives for employees involved in active and sustainable commuting	0	2	2.5	3	Difficult to implement; depends on staff involvement / willingness. Does not have direct impact on Corporate GHG inventory	5
Showers/lockers for active transportation participants	0	3	2.5	3	Easy to implement. Does not have direct impact on Corporate GHG inventory	6
Greening the fleet- replace with hybrids and high efficiency vehicles. Use alternative fuels e.g biofuels	3	3	2	3	Cost is reasonable if high efficiency vehicles replace others at end of useful life. Significant reduction potential	9
Conduct energy audits and implement recommendations	3	2	2	2.5	Cost/ease of implementation depends on the individual recommendations. To be assessed on case-by-case basis	8
Develop Energy Saving Training Program	2	2	3	3	Effectiveness depends on staff involvement / willingness.	8
Develop Employee Waste Minimization/Diversion Program	2	2	3	3	Effectiveness depends on staff involvement / willingness.	8
Establish Emission Reduction Share Program	0	1	3	3	Relatively difficult to implement. Does not have direct impact on Corporate GHG inventory	5
Develop water conservation program	1	2.5	2.5	2.5	Results in less gas usage for water heating, and less electricity for Municipal pumping and treatment cost.	6
Generate Electricity on site	2	0.5	0.5	3	Costly to implement, but has sustainability benefits and engages staff and community	6
Purchase electricity from renewable sources	2	2	3	2	More cost effective, but less staff engagement	7

2.6 Monitoring Plan

A detailed monitoring process is actually Milestone 5 of the PCP program. However the Municipality considers it valuable to outline a monitoring strategy at this stage, as this will keep staff involved in measuring the performance of initiatives and actions taken. Performance evaluations and assessment will sustain momentum in the GHG reduction efforts and encourage involvement after initial implementation.

Most importantly, a monitoring program will enable the Municipality to assess progress towards the defined targets. Performance indicators are used to determine whether the actions implemented are having the desired effect and to identify where changes are needed.



In order to monitor the progress of the Corporate Action Plan, it is recommended that the following inventories be developed for future calendar years:

- Total corporate energy consumption (GJ/year)
- Total corporate energy expense (\$/year)
- Total corporate GHG emissions (tCO₂e/year)
- Energy consumption by Corporate Sector (GJ/sector/year)
- GHG emissions by Corporate Sector (tCO₂e/year)

If possible, and economically feasible, these inventories could be developed for each future calendar year, or at least at the frequency provided in the reporting schedule outlined below.

Additional indicators can be used to define the progress towards meeting the targets of various GHG reduction actions. Possible indicators could include:

- No. of buildings built to high energy efficiency standards (buildings/year or square footage/year).
- No. of energy audits conducted at Municipal facilities
- No. of vehicles replaced by hybrids, or other equivalent energy-efficient types

2.7 Monitoring Plan

Annual Reporting

It is proposed that brief annual progress reports be prepared by the program coordinator to monitor progress of implementation. The annual report will describe activities implemented in the previous year and define an annual action plan for implementing activities of the plan.

Annual reports can also be used to identify areas of change and provide an opportunity to update the plan by adding new actions or modifying existing actions.

Three Year Reporting

It is proposed that the Corporate inventory be updated every three years starting in 2012. This will include:

- A detailed review of the activities (initiatives and actions) and their success
- An updated energy and GHG baseline
- Recommendation for plan improvement.

The PCP website specifies four (4) main steps to achieving an effective Performance Monitoring Program (Milestone Five):

1. Track the results of specific emissions reduction measures. Tracking the results of specific actions involves quantifying the reduction in energy consumed or waste generated as a result of the actions undertaken, and then calculating the quantity of GHG emissions that was avoided. It is also recommended to assess implementation costs and track co-benefits,



such as reduced costs, increased use of innovative technologies, job creation and improvements to local air quality and community health.
Note: use the same data collection methods to update the inventory as used to create it for the baseline year (Milestone One).

2. Update inventories. In order to determine whether the Municipality is likely to meet its Corporate and Community emission reduction targets, it is necessary to update emissions inventory periodically. Updating the inventory every three to five years will help to ensure there is adequate time to refine the action plan if necessary. While tracking specific actions is a valuable exercise to ensure they are effective, updating the inventory enables the Municipality to account for outside factors contributing to the emissions profile, such as growth, economic development, legislation and behaviour changes.
3. Engage stakeholders and decision-makers. Throughout the milestone process, it is helpful to engage with various community stakeholders and decision-makers on the development of the GHG emissions inventory and the development and implementation of the local action plan. Engaging stakeholders and decision-makers in monitoring the results of your local action plan is also important to ensure that your municipality can meet the targets set in Milestone Two.
4. Report to stakeholders and to FCM. The final stage of Milestone Five is to report on activities to stakeholders and to FCM. Reporting to stakeholders provides them with the results of the processes to which they contributed, and can help earn support for future initiatives. Results can be included in existing reports produced by your municipal government, such as a sustainability progress reports, or in a stand-alone document. FCM will conduct a technical review of individually tracked actions and updated inventories.

Reporting to FCM enables the Federation to ensure consistency among PCP members and to report on the achievements made through participation in the PCP program. At Milestone Five, the Municipality will be able to report quantifiable results of its actions, which will tangibly illustrate the significance of action at the local level.



3. Next Steps

The Municipality has successfully completed Milestones 1, 2, and 3 (Corporate component) of the PCP program; it has developed its baseline GHG inventories and BAU forecasts for the Corporate and Community sector, set reduction targets based on these, and developed its Corporate Climate Action Plan. A performance monitoring strategy was also outlined, since it was determined that it would be beneficial for municipal staff involved in this program to be cognizant of the monitoring and reporting required throughout the program.

The next step for the Municipality is to work towards Milestone 4- Implementation of the GHG reduction initiatives and actions presented in Corporate Climate Action Plan. In this way the Corporate Municipality can lead the Community by example, and then develop the Community Action Plan based on lessons learned from Corporate implementation, and the framework for the Community GHG reduction strategy provided as a supplement to the Milestone 1 & 2 report.

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