Status Report on the Corporate Climate Action Plan

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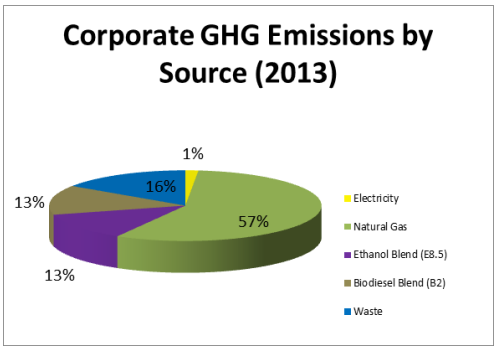
Executive Summary

The City of Winnipeg has committed to a reduction in its corporate greenhouse gas emissions equivalent to 40% below 1998 levels[1]. As of 2013, the City has achieved 0.2% of its targeted reductions. The latest inventory (2013) shows that the 20.5% increase since 2007 is primarily attributed to buildings (15.4%) and waste (6.2%), marking a consistent upward trend since Council's adoption of the present target. Similarly, energy use has increased by 21.3% and with it, a growing vulnerability to cost inflation. Both energy use and emissions have grown at three times the pace of overall population growth through this period. 2013 energy use and emissions and annual emission trends are summarized in Table 1 below.

Table 1: 2013 Corporate Energy Consumption and Greenhouse Gas Emissions

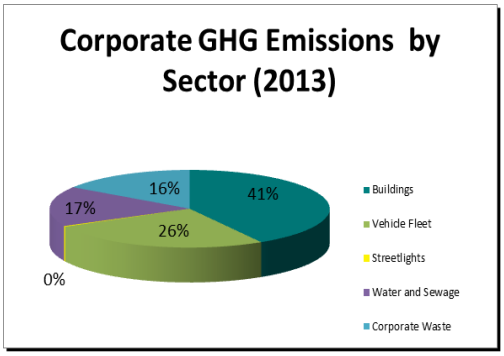
2013 Inventory by Emissions Source

	Energy Use (GJ)	CO_2e (Tonnes)	%
Electricity	993,927	1,104	1.5%
Natural Gas	829,702	40,775	57%
E8.5 Gasoline	137,568	9,012	12.5%
B2 Diesel	141,360	9,720	13.5%
Solid Waste	-	11,220	15.5%
Total	2,100,618	71,832	100%



2013 Inventory by Emissions Sector

	Energy Use (GJ)	CO_2e (Tonnes)	%
Buildings	987,268	29,704	41%
Fleet	276,989	18,732	26%
Streetlighting & Traffic Signals	204,187	227	0%
Water & Sewage	632,174	11,948	17%
Solid Waste	-	11,220	16%
Total	2,100,618	71,832	100%



Emissions Trends to Date

The City has completed or continues to implement actions proposed in the City of Winnipeg Corporate Climate Change Action Plan and Proposed Strategy for a Further 20% Reduction in Corporate Greenhouse Gas Emissions, hereinafter referred to as "City of Winnipeg Corporate Climate Action Plan"[2] (actions and status are summarized in Section 1). Nevertheless, corporate

[1] Winnipeg City Council approved a motion (Council Minute 540, Sep 30, 2009), committing to a further 20% reduction beyond the original 20% reduction commitment adopted in the 2006 Corporate Climate Change Action Plan.

[2] Winnipeg City Council adopted the City of Winnipeg Climate Change Action Plan 2008 Annual Report and the City of Winnipeg Corporate Climate Change Action Plan and Proposed Strategy for a Further 20% Reduction in Corporate Greenhouse Gas Emissions on September 23, 2009 (Council Minute 540, Sep 30, 2009).

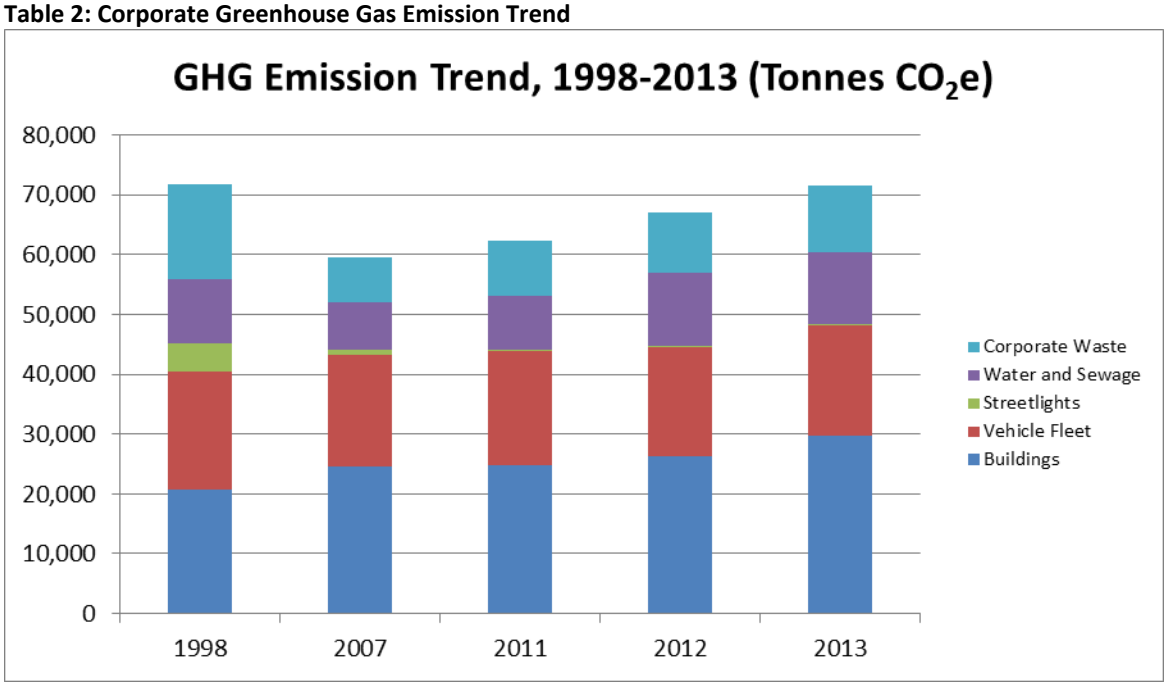
emissions have climbed 20.5% between the period 2007 and 2013. A number of factors have independently contributed to this increase, namely:

- The completion of 10 new City buildings;
- Acquisition of the future WPS Headquarters;
- Water Pollution Control Centres regulated upgrades;
- A one-time spike in natural gas use at the Millennium library in 2013 associated with parkade construction activities.

The reported increase in greenhouse gas emissions has been moderated by the following activities over the same period:

- Introduction of the City's *Green Building Policy for New City-owned Buildings and Major Additions* (adopted by Council in July 2010) which has resulted in six green building projects that have either received or are pending third-party designation;
- The phase out of coal-fired electric generation associated with the provincial *Climate Change and Emissions Reduction Act* leading to a decrease in emissions from electrical consumption beginning in 2010;
- The introduction of landfill gas collection and flaring at Brady Landfill;
- The continued conversion of Traffic Signals to LED lighting;
- Building energy efficiency upgrades resulting in over 1,200 tonnes CO2e reduced;
- The removal of City-generated landscaping materials from the landfill (derived from managed green spaces and forestry operations) for use in future composting operations.

Table 2: Corporate Greenhouse Gas Emission Trend



Climate Plan Actions Contribute Sustained Operational Savings and Investment in City Assets

Projects associated with the corporate *Climate Change Action Plan* are saving the City at least $1.2 Million/year through avoided or reduced energy use and have garnered at least $600,000 in incentives to date. Additionally, the City has invested over $8 Million in building energy efficiency since 2002 through partnerships.[3]

Short-term Forecast of Corporate Emissions

Fulfillment of the actions adopted in the City of Winnipeg Corporate Climate Action Plan will contribute towards an estimated 10.1% decrease from 2013 levels through 2019, leaving a 30% target gap remaining. The Public Service is not on track to achieve reduction commitments due to slow progress on existing Council-approved strategies, an absence of new strategies, significant physical and operational growth in the public sector, and colder than average weather in 2013.

The City of Winnipeg Corporate Climate Action Plan included a "check and re-plan" phase as an early action, knowing that detailed analysis and forecasting was not available at the time the plan was drafted. This analysis was conveyed to senior administration in 2013, noting that we were not on track to meet Council's target, and that additional actions would be required to meet Council's target by 2019.

Opportunities

Considerable opportunities for energy and greenhouse gas emission reductions remain.
Key areas of opportunity for reductions include:

- Targeting carbon neutrality in new City buildings;
- Creating a comprehensive energy management program for existing buildings;
- Investing in renewable energy in buildings;
- Reducing vehicle emissions through the *Green Fleet Plan*;
- Investing in organics diversion programs for City facilities and operations.

[3] Refer to Table 4 for details.

1.0 Introduction

1.1 Decision Making History

The City of Winnipeg has been committed to reducing its greenhouse gas emissions for more than 15 years. On November 25, 1998, Council passed a resolution signing on to the Federation of Canadian Municipalities (FCM) *Partners for Climate Protection Program (PCP)*, and committed to reducing its corporate greenhouse gas emissions to 20% below 1998 levels and its community-wide greenhouse gas emissions to 6% below 1998 levels.

In 2006, an 18-point corporate *Climate Change Action Plan* was developed to reduce over 13,000 tonnes of greenhouse gas emissions from City operations. This target was reported as achieved in 2007, when a 20.2% reduction over the baseline year was reported[4].

Table 3: Overview of Council Targets

	Baseline (1998)	Initial Target (1998)	New Target (2009)
Target	-	20% Below 1998	40% Below 1998
Equivalent Emissions (tonnes CO2e)[5]	71,758	57,406	43,055

New Reduction Commitments in the City of Winnipeg Corporate Climate Action Plan

The fulfillment of the City's corporate commitment to PCP set the stage for a more ambitious Council target: A further 20% reduction in corporate greenhouse gas emissions. A strategy and action plan for achieving a further 20% reduction in corporate greenhouse gas emissions was adopted by Council in 2009.

1.2 City of Winnipeg Corporate Climate Action Plan Status Update

A summary of all actions adopted in the City of Winnipeg Corporate Climate Action Plan and their current status are captured in Table 4, below.

[4] Note: Following significant methodology improvements, the 2007 inventory was revised to 17.03% below 1998 levels. Refer to Section 3 for details.
[5] Totals from previous Action Plan Update have been updated, as detailed in Section 3.1.

Table 4: Status of Actions from the City of Winnipeg Corporate Climate Action Plan

***City of Winnipeg Corporate Climate Action Plan* Actions**		**General Description of Activities and Reduction Estimate (where applicable)**
1	Prepare a comparative analysis for Council's consideration of three GHG emission reduction scenarios, projected over the period 2010-2019	Reduction opportunities have been characterized in this report. Refer to Section 2.
2	Create a GHG inventory, reduction target, and action plan, for the transit operation over the period 2010-2019[6].	Emissions for the Winnipeg Transit Fleet were reported in Appendix A of the *2011 Green Fleet Plan Annual Report*, submitted to Council (2011 Minute No. 582).
3	Identify and quantify strategies and actions from the *OurWinnipeg* initiative that could further reduce GHG emissions.	Opportunities for corporate emission reductions have been identified in this report. Refer to Section 3. A community-wide reduction opportunities report is also in development.
4	Identify and pursue GHG reduction opportunities in other sectors of the City's operations	Addressed in actions 3 and 8, and Section 4 of this report.
5	Develop an environmental promotion web page on the City's intranet site, including information on reducing paper use, alternative forms of commuting and reducing energy consumption in civic facilities	Not initiated.
6	Develop a regular staff e-newsletter highlighting successful GHG reduction initiatives in the corporation and providing tips and informative weblinks	Not initiated.
7	Host a 'sustainability series' for staff with regular learning events related to sustainability and GHG emissions	A sustainability learning event kicked off an ongoing internal Leadership Series beginning in 2012. Staff engagement on sustainability issues related to City facilities is a priority for the civil service and will

[6] Note: Within the PCP program, municipal transit is typically categorized as a community-wide emission rather than corporate emission and therefore accounted for within a community-wide plan.

	reduction. Invite speakers, participate in online learning events and webinars	be further investigated in 2015-16. Action 8 describes selected staff initiatives exemplary of this priority.
8	Investigate other staff initiatives and programs to reduce GHG emissions	Several initiatives have been implemented or piloted. Examples include: ***Office Composting Pilot:*** The City's Urban Planning Division has been composting at its main office since mid-2014 in partnership with the Forks. This successful pilot will be expanded to additional Divisions in 2015. ***Bike Share Pilot:*** PP&D employees at Fort Garry Place are now able to reserve a fleet bicycle for meetings and site visits spring through fall. This efficient alternative helps to reduce total driving trips during the workday. ***Corporate Printing Strategy:*** The City implemented recommendations from a recently completed corporate print study resulting in, within the first 6 months of implementation, a 40% cost reduction, an 11% reduction in non-paper waste, a 12% reduction in energy use, and corresponding air quality improvements organization-wide. ***Corporate Waste Reduction Strategy:*** Directed by Council and described in Section 4.15 of this report, the development of this Strategy is expected to substantially reduce waste from municipal facilities and operations.
9	Ensure that all GHG reduction projects and initiatives have measures attached	In progress: Improvements in tracking and measurement are reflected throughout this report.
10	Continue annual collection of GHG indicators	GHG emissions data and indicators were not collected between 2008-2010. Since 2011, annual data collection has resumed, and a careful review of previous inventory years was undertaken leading to the revisions and improvements discussed in Section 3 of this report.
11	Publish results on the City's web page.	Emission reports received by Council are posted to the City's *Greenspace* webpage and will be included in the annual *OurWinnipeg: Report to the Community* whenever available.
12	Report to Council on the status of the Corporate GHG reductions on an annual basis.	GHG reduction initiatives have been reported to Council on an ad hoc basis since 2009. Annual reporting will resume in 2015.
13	Actively seek out potential partners for corporate GHG reduction initiatives	Ongoing action: City staff regularly meets with energy and environmental professionals to identify opportunities for new or enhanced climate actions. Some of the initiatives and organizations that we are actively engaged with to meet our sustainability goals include: the Urban Sustainability Directors Network (North America); Winnipeg's Sustainability Directors Network; Biomass Economy Network; Commuter Challenge; Climate Change Connection; Earth Hour; Province of Manitoba; and many others. Also, Winnipeg concluded a successful major partnership through Manitoba Hydro's PowerSmart

		program between 2002-2012 refer to Action #17 of this table.
14	Pursue grants and alternate funding sources for corporate reduction initiatives.	Grants accumulated from Powersmart incentives total over $600,000 including $380,000 for LED conversions and $245,000 for buildings.
15	Water: Continue efforts to reduce water consumption.	Pursuant to the *Green Building Policy: New Buildings and Major Additions*, new City buildings are typically outfitted with water efficient fixtures and water efficient landscaping techniques. However, the City of Winnipeg does not currently benchmark water use in civic buildings. City-wide water consumption has experienced a 27% reduction between 1990 and 2011.
16	Solid Waste: Implement methane gas recapture project at the Brady Road Landfill	Phase 1 is operational as of 2013. Future expansion of the collection system is planned in 2016. With the additional collection capacity, 2017 reductions are estimated to be 210,000 tonnes CO_2e[6] Annual greenhouse gas emissions reduced: 131,950 tonnes CO2e6.
17	Civic Buildings: Continue to seek and implement opportunities for energy efficiency and renewable energy upgrades in civic facilities	In partnership with Manitoba Hydro, the City of Winnipeg initiated a broad, ten year building energy retrofit program between 2002 and 2012. As a direct consequence of this initiative, the City of Winnipeg invested over $14 million into energy efficiency projects, resulting in 1,200 tonnes CO2e reduced annually and $900,000/year in utility savings. The success of this partnership has significantly mitigated the overall increase in corporate emissions from the Buildings and Water & Sewage sectors resulting from operational growth. In 2011, the City adopted the Green Existing Buildings Strategy as Council Policy which directs the Public Service to benchmark energy use in all City-owned buildings above 33,000 Square feet and to advance energy efficiency measures through the Capital budget annually. To fulfill this commitment, the City is currently working with the Province of Manitoba, MB Hydro, and Natural Resources Canada to pilot the adoption of the *Portfolio Manager* online building analysis and benchmarking tool. Energy efficiency measures for existing buildings are brought forward to the capital budget through the Energy Conservation Program.
18	Civic Buildings: Adopt elements of green building standards for new civic facilities.	The *City of Winnipeg Green Building Policy: New Buildings and Major Additions* was adopted in July 2010 and stipulates minimum performance standards for new City-owned buildings and major additions in excess of 500m3. Projects must achieve a minimum LEED® Silver, 3 Green Globes, or equivalent certification and certification through the MB Hydro Power Smart New Buildings Program. Lifecycle costing, integrated design, and green building expertise are also policy requirements. The following is a list of City owned buildings that have achieved or targeted designation under a relevant third-party Green Building standard:

		• **Public Works East Yard Complex:** Achieved LEED® Gold Certification and a 51% energy cost savings below the reference standard (MNECB 1997). *Annual emissions avoided: 385 tonnes CO_2e.* *Annual energy cost avoided: $58,413.* • **Sinclair Park Community Centre:** Achieved LEED® Silver Certification and a 42% energy cost savings below the reference standard (MNECB 1997). *Annual emissions avoided: 90 tonnes CO_2e.* *Annual energy cost avoided: $16,422.* • **Sturgeon Heights Community Centre:** Achieved LEED® Gold Certification and a 47% energy cost savings below the reference standard (MNECB 1997). *Annual emissions avoided: 65 tonnes CO_2e.* *Annual energy cost avoided: $15,515.* • **Mayfair Recreation Centre:** Awarded a Power Smart for New Buildings Designation. (Did not qualify for the *Green Building Policy*). • **Linden Woods Community Centre:** Achieved 3 Green Globes® Certification. • **Winnipeg Transit Bus Parking and Service Garage:** Targets LEED® Silver (Minimum). • **CAO Office Renovation:** Achieved LEED® Silver Certification for Commercial Interiors program. • **West District Police Station:** Targets LEED® Silver Certification. • **North Centennial Recreation Centre:** Targets LEED® Silver Certification. • **East End Community Centre:** Targets Green Building Certification. • **Garden City Community Centre:** Targets Green Building Certification. • **East Elmwood Community Centre:** Targets Green Building Certification. • **Southdale Community Centre:** Targets Green Building Certification.
19	Civic Buildings: Retain membership in the Manitoba Chapter of the Canada Green Building Council and other relevant professional associations	Membership is current.
20	Civic Buildings: Ensure that building management and other key staff members are LEED accredited	6+ City staff are now LEED Accredited Professionals.
21	Traffic Signals: Continue to replace existing traffic signals with high-efficiency LED systems.	This project, initiated in 2004, is now 85% complete with over 17,800 LED's operational. *Annual energy savings (2015): 2.4M kWh.* *Annual energy cost avoided (2015): $295,000.*

		Annual GHG Savings: 10 tonnes CO_2e.
22	Completion of Green Vehicle Plan for consideration by Council.	Green Fleet Plan Adopted in 2010 (Council Minute No. 572, 2010). *Emissions reduced below 1998 baseline in 2011 Annual Green Fleet Plan Report: 559 tonnes CO_2e (3%).*

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2.0 Inventory & Forecast

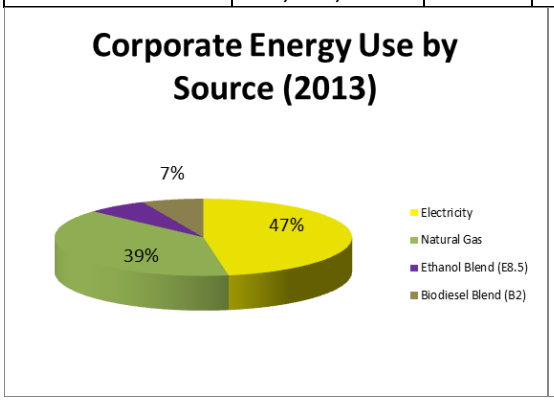
2.1 2013 Inventory

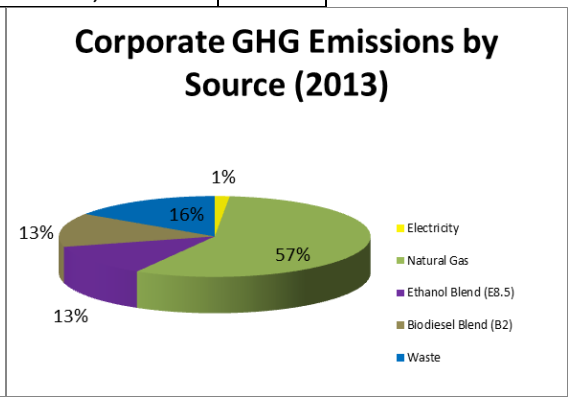
The 2013 inventory is summarized below. While electricity is by far the most significant source of energy consumed (47%), it accounts for a fraction (1.5%) of total greenhouse gas emissions in 2013. This is attributed to the relatively low emissions factor for electricity consumption, resulting from Manitoba's predominantly hydroelectric power generation[7].

Providing for 39% of the City's total energy consumption, natural gas is by far the most important source of greenhouse gas emissions for the City of Winnipeg accounting for 57% of emissions. The consumption of all fossil fuels combined (including automotive fuels) amounts to 84% of the City's total greenhouse gas inventory.

Table 5: 2013 Energy and Greenhouse Gas Emissions by Source

Energy Source	GJ	%	CO_2e (Tonnes)	%
Electricity	993,927	47.3%	1,104	1.5%
Natural Gas	829,702	39.5%	40,775	57%
E8.5 Gasoline	137,568	6.5%	9,012	12.5%
B2 Diesel	141,360	6.7%	9,720	13.5%
Solid Waste	-	-	11,220	15.5%
Total	2,100,618	100%	71,832	100%

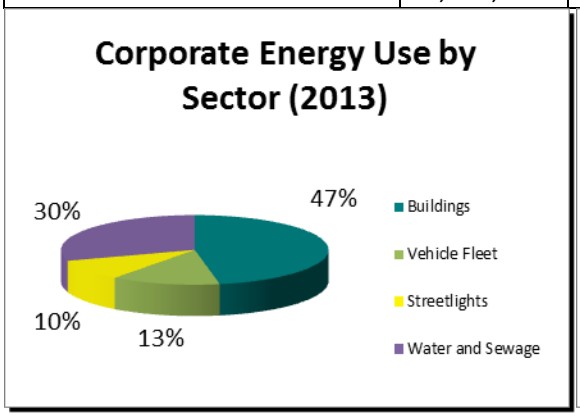


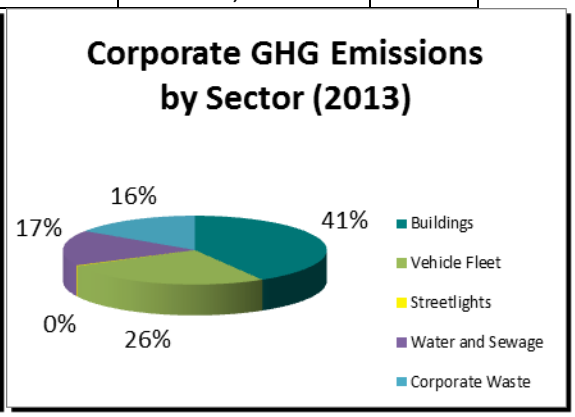


[7] According to the National Inventory Report 1990-2012 - Greenhouse Gas Sources and Sinks in Canada. Annex 13. Issued in 2014, only the Province of Quebec currently shares an equally low emissions factor for electricity consumption, providing an enormous advantage for Winnipeg's emissions inventory. For comparison, in 2012 our neighbours in Ontario and Saskatchewan would have produced 27.5 times and 200 times more greenhouse gases per Gigajoule of electricity than in Manitoba.

Table 6: 2013 Energy and Greenhouse Gas Emissions by Sector

Sector	GJ	%	CO_2e (Tonnes)	%
Buildings	987,268	47%	29,704	41%
Fleet	278,927	13%	18,732	26%
Streetlighting & Traffic Signals	204,187	10%	227	0%
Water & Sewage	632,174	30%	11,948	17%
Solid Waste	-	-	11,220	16%
Total	2,102,556	100%	71,605	41%



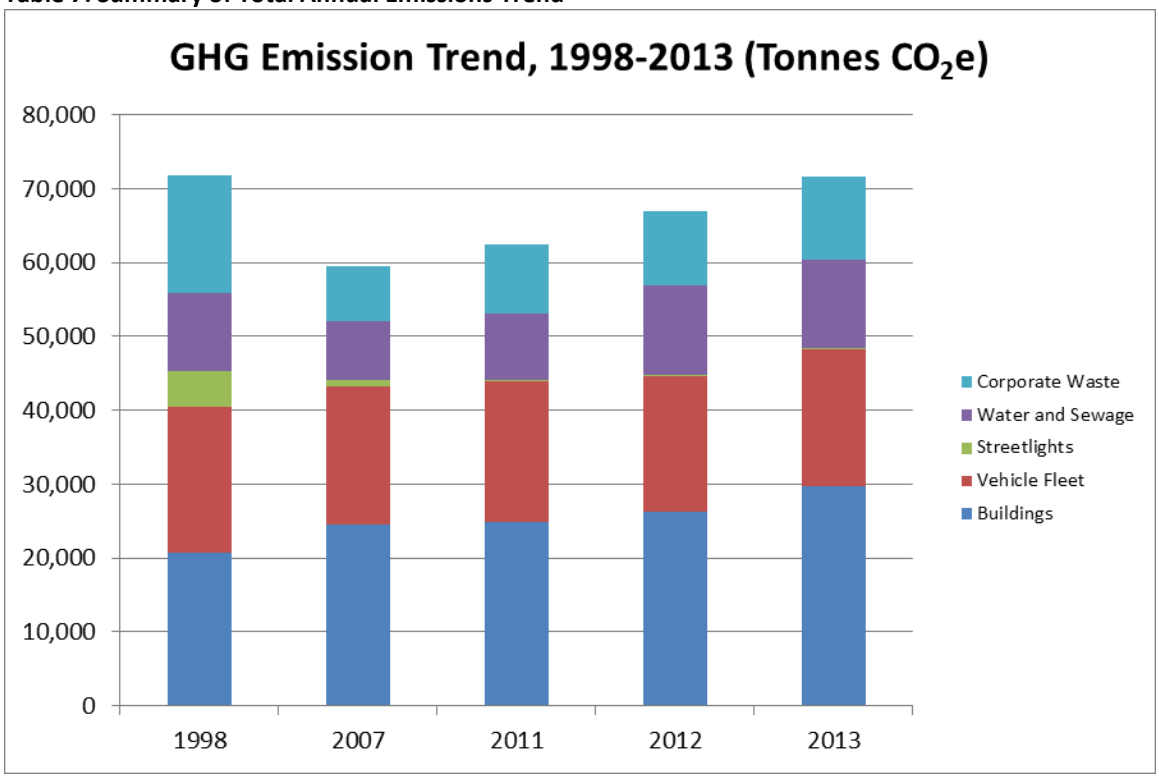


2.2 Inventory Trends and Key Drivers

The City undertook its first inventory and forecast of corporate greenhouse gas emissions for the year 1998. Subsequent corporate GHG emission inventories were conducted for the years 2003, 2006, 2007, and most recently 2011-2013. Inventory years 2003 and 2006 are based on less robust data and excluded from Table 7.

Following nearly a decade of decreasing emissions, City emissions have risen steadily since 2007, reversing initial progress following 1998. In 2013, City emissions were marginally above 1998 levels.

Table 7: Summary of Total Annual Emissions Trend



Sector	Greenhouse Gas Emissions (Tonnes CO_2e)				
	1998	2007	% Reduction Relative to Baseline	2013	% Reduction Relative to Baseline
Buildings	20,763[8]	24,516	(-18.8%)	29,704	(-43.1%)
Fleet	19,656	18,670	5.0%	18,732	4.7%
Streetlighting & Traffic Signals	4,813	851	82.3%	227	95.3%
Water & Sewage	10,680	7,962	25.4%	11,948	(-11.9%)
Solid Waste	15,846	7,535	47.5%	11,220	29.2%
Total	**71,758**	**59,535**	**17.03%**	**71,832**	**(-.01%)**

The increase in emissions since 2007 has been driven by a combination of important factors, summarized in Table 8.

[8] The 1998 Buildings total is considered to be less reliable, though insufficient data is available to provide greater accuracy at this time. Refer to Section 3.1.

Table 8: Key Drivers of Change, 2007-2013

Key Drivers	Detail	Year
Regulatory Service Improvements	Upgrades to Water Pollution Control Centres.	2007-
Completion of New City Buildings	WPS East District Police Station at 1750 Dugald	2007[9]
	Water treatment facility located at Deacon Reservoir	2009
	WFPS Station #27 at 27 Sage Creek Blvd.	2012
	WFPS Station #12 at 1780 Taylor	2012
	WFPS Station #18 on Roblin Blvd	2012
	WPS Canine Unit at 77 Durand	2012
	WFPS Station #11 on Portage @ Route 90	2013
	WPS West District Station at 2321 Grant Ave.	2013
	Winnipeg Transit Garage at 600 Brandon Ave.	2014[10]
	East Yard Public Works complex at 960 Thomas Ave.	2014[11]
Acquisition of City Buildings	The purchase of the future WPS Headquarters	2010
Electricity Emission Factors	Emissions associated with the consumption of electricity from the provincial grid have decreased by almost 75% since 2007. This is a consequence of the Provincial coal phase-out and average or above-average lake levels.	
Construction at Millennium Library	Work on the Millennium library parkade in 2013 resulted in a one-year spike in emissions of approximately 1,300 tonnes CO_2e.	
Growth in the City Vehicle Fleet	The number of City vehicles on the road, and total kilometres travelled grew between 2007 and 2013. Fuel efficiency gains were unable to compensate for this growth.	
Increase in Corporate Waste	City-generated waste has gradually increased since 2007. City-generated construction and demolition waste fluctuates year-over-year with no clear trend.	
Weather	2013 was significantly cooler than 2007, leading to increased use of natural gas for heating. 2011 and 2012 were warmer than 2007.	
LED Traffic Signal Conversion	A modest but continuous reduction in electricity use from the ongoing conversion of traffic signals to LED.	

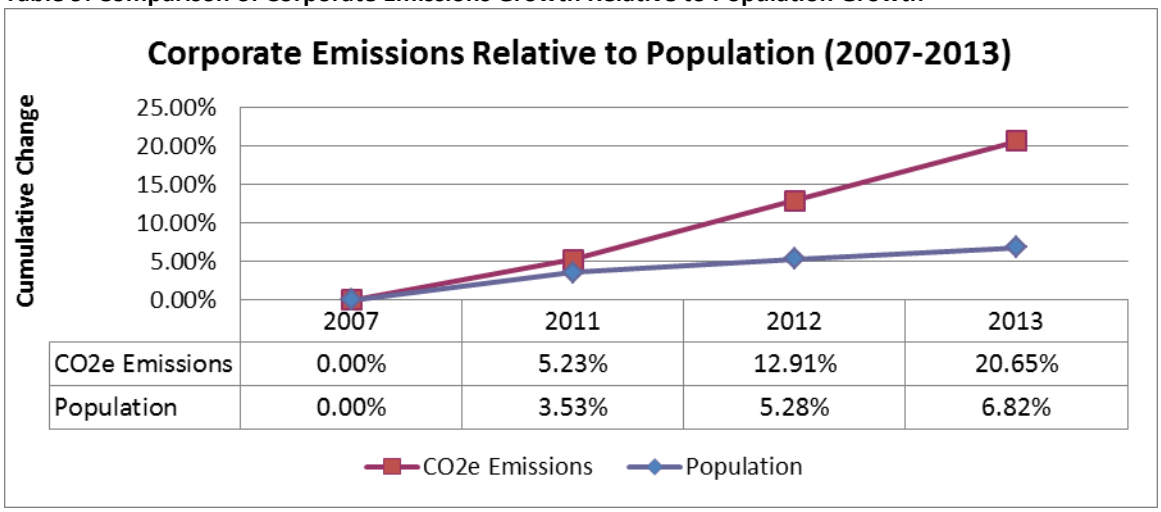
Since the first inventory in 1998, other notable changes have had significant impacts on the overall trend in corporate emissions, namely:

- In 2002, Winnipeg Hydro was sold to Manitoba Hydro, releasing the City's operational control over a significant proportion of Winnipeg Hydro's former fleet and building-related emissions. The sale of Winnipeg Hydro did not constitute an absolute reduction in emissions, though it did reduce the City's overall emissions portfolio by an estimated 1,500 tonnes CO_2e.

[9] Opened in late 2007, so did not consume a full year of energy until 2008.
[10] While the official opening was in 2014, this building began consuming energy in 2013.
[11] *Ibid.*

- Beginning in 2005, residential solid waste collection transitioned to 100% contracted services. This resulted in a significant reduction in municipal fleet emissions reported between 2003-2006. However, emissions from contracted services are not measured within the present scope of reporting, leading to a yet unquantified reduction.
- Since 1998, the relative emissions associated with electricity consumption have dropped significantly. As of 2012, the most recent year for which we have reliable emissions coefficient data, electricity has become approximately 7.5 times less carbon intensive than it was in the baseline year. Consequently, electricity intensive corporate sectors have realized significant reductions.
- The City experienced a significant population growth of 70,900 new residents between 1998 and 2013 (10.7% cumulative growth) over this period, and 6.8% since 2007 alone. Table 9 compares changes in corporate emissions relative to population growth since the 2007 emissions inventory was reported.

Table 9: Comparison of Corporate Emissions Growth Relative to Population Growth



2.3 Emissions Forecast

Forecasting corporate emissions is a challenging task considering the energy impact of future growth and change remains uncertain, and is subject to change and estimation. Annual emissions are further subject to the significant impact of weather conditions, which can vary annual totals in excess of 5%. Therefore, the following forecasts are intended to illustrate only the expected overall trend rather than a precise analysis of future greenhouse gas emissions from corporate operations.

2.3.1 2019 Business-As-Usual Forecast

The business-as-usual emissions forecast estimates the impact of known projects and assumes that energy use and emissions will change in each sector of municipal operations proportionate to Winnipeg's annual population growth rate of approximately 1%. This scenario presumes no new emission reduction actions will be introduced.

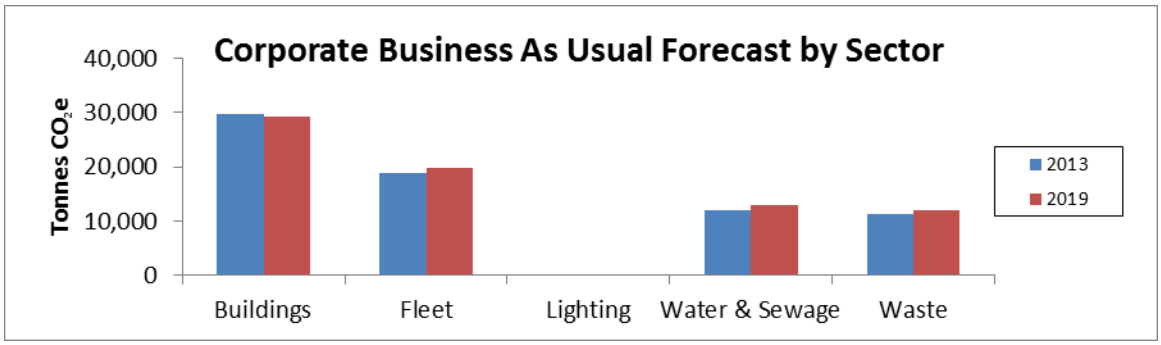
Significant factors considered in this forecast include:

- The anticipated sale/demolition of several major City buildings as a consequence of relocation to new facilities in the previous period;

- The anticipated closure of 3 City-operated arenas, whereas the replacement facilities will be operated through the GCWCC which falls outside the current scope of tracked facilities[12];
- Completion of the Manitoba Hydro initiated LED Streetlight conversion program;
- Minimal progress achieved via the approved Green Fleet Plan;
- New buildings will meet only the minimum energy efficiency requirement in the Green Building Policy for New Buildings;
- Negligible change to the energy efficiency of existing buildings;
- Anticipated upgrades to sewage treatment plants;
- No significant changes in total corporate solid waste;
- Weather adjustment estimate (because 2013 temperatures were below average, leading to unusually high building energy consumption).

Under the business as usual scenario, emissions would increase from 71,605 to 73,890 tonnes CO_2e (3.1%) by 2019, as illustrated by sector in Table 10.

Table 10: Business As Usual Emissions Forecast



2.3.2 2019 Forecast with Planned Actions

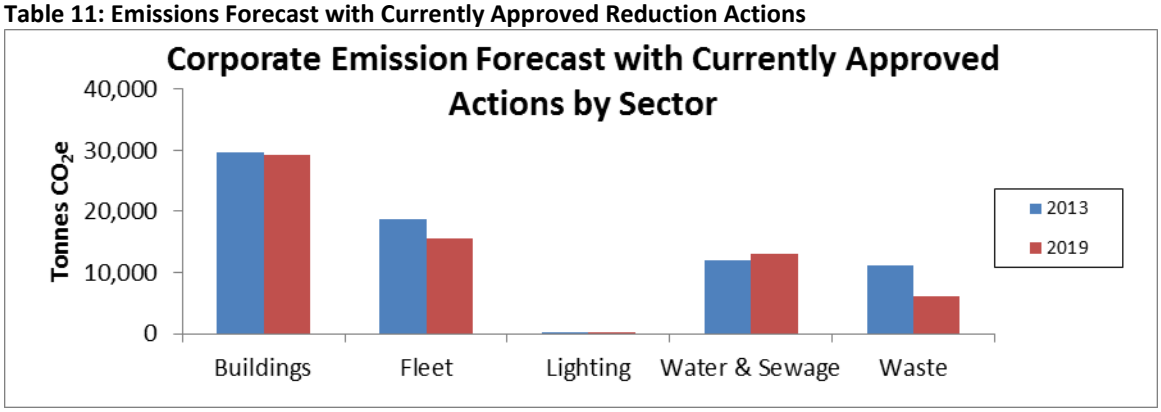
This forecast illustrates the expected impact if all previously adopted actions are fully implemented by 2019. The following specific actions have been modeled in this scenario:

- Completion of the LED Traffic Signals Conversion project;
- Achievement of the Green Fleet Plan's targeted 17.65% reduction below 1998.
- Modest energy efficiency improvements to existing buildings per Council's Green Building Strategy for Existing City-owned and Leased Buildings.
- Expansion of the Brady Road Resource Recovery Centre's landfill gas collection system.

In this scenario, emissions would decrease from 71,832 to 64,157 tonnes CO_2e (10.6%) by 2019, as illustrated by sector in Table 11.

[12] Emissions from community recreation facilities owned by the City of Winnipeg are proposed for future inventory inclusion. Refer to Section 3 Table 14 which summarizes the current scope of the City of Winnipeg corporate emissions inventory.

Table 11: Emissions Forecast with Currently Approved Reduction Actions



Emissions Target Gap

Tables 12 and 13 illustrate the gap between Council's targeted 2019 corporate greenhouse gas emissions and the forecast emissions based on Business-as-usual and full implementation of existing actions.

Table 12: Comparison of Emissions Forecast to Council Target

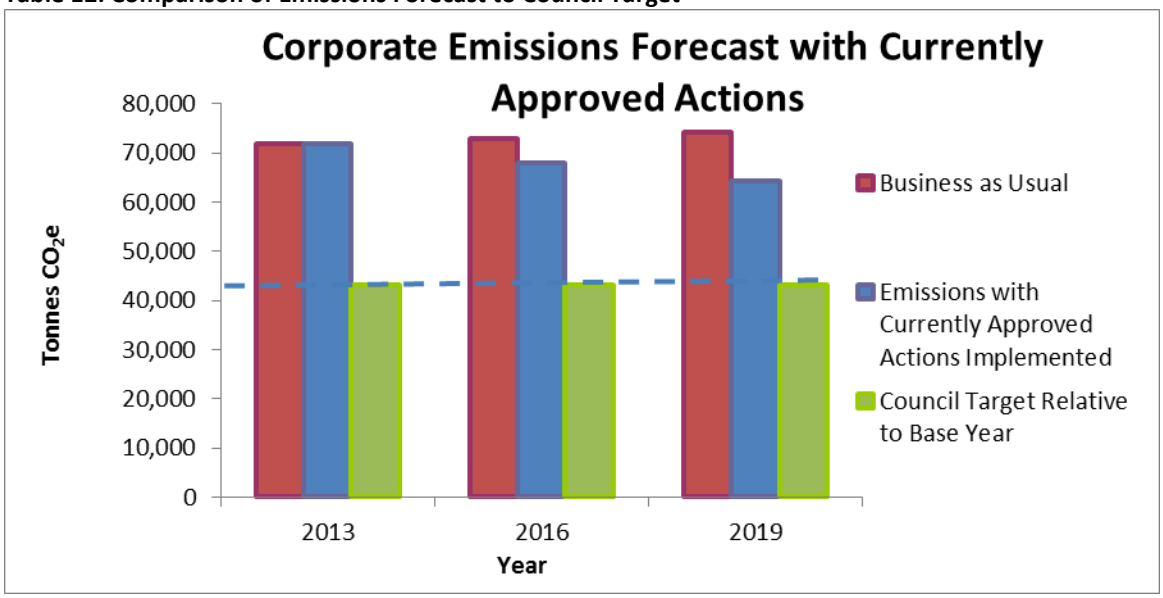


Table 13: Summary of Two Emission Scenarios

	2013 Emissions (tonnes CO2e)	2019 Council Target	2019 Forecast	Emissions Gap (tonnes CO2e)
Business as Usual	71,832	43,055	74,130	31,075
Implementation of Approved Actions			64,157	21,102

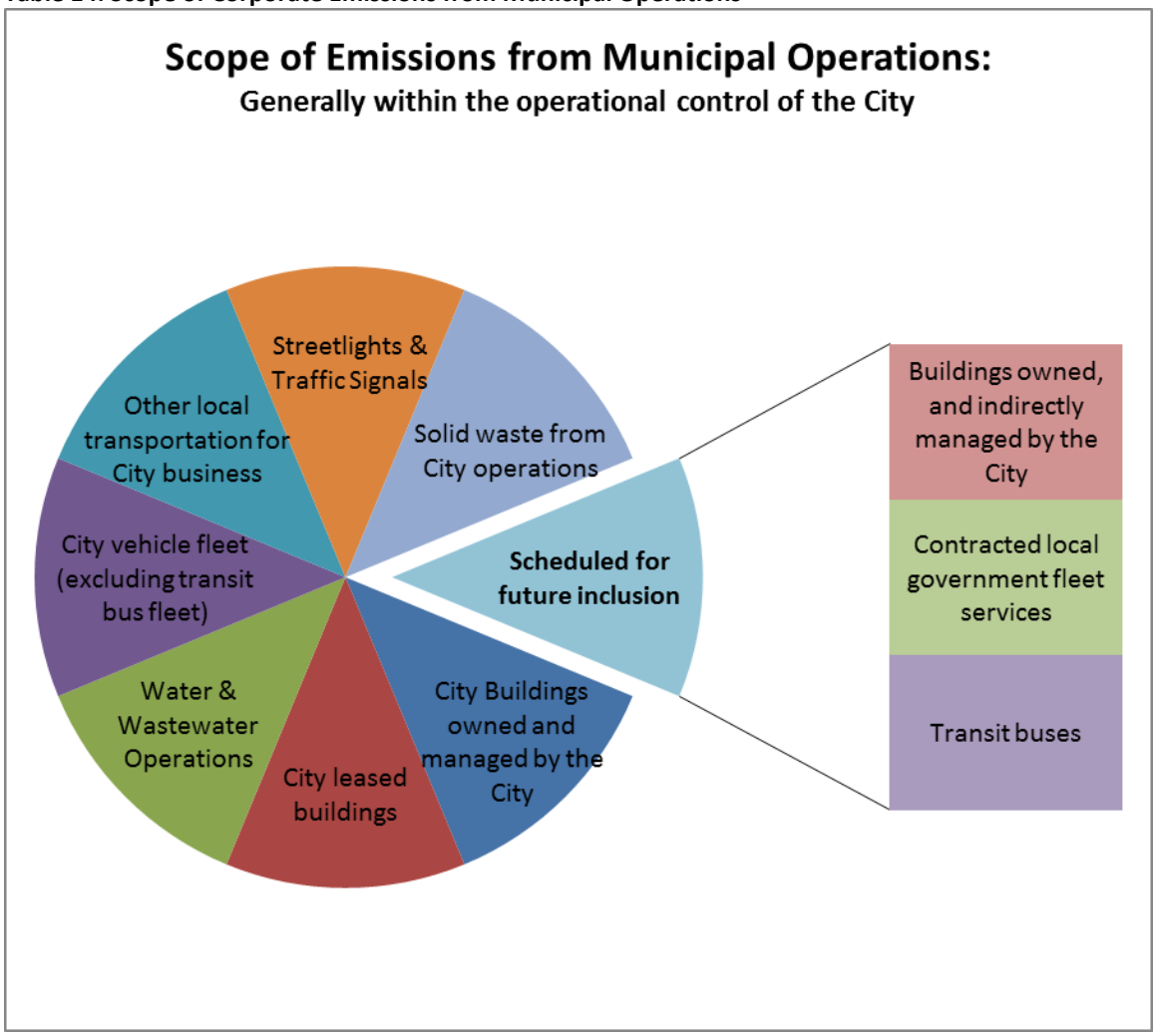
3.0 Methodology

3.1 What we Measure

The City of Winnipeg measures corporate emissions from municipal operations in general accordance with the *Partners for Climate Protection (PCP) Protocol: Canadian Supplement to the International Emissions Analysis Protocol*. Introduced in 2014, and based on the International Emissions Analysis Protocol (2009), the PCP Protocol offers modern guidance on good practice emissions accounting for local governments in Canada.

The recent PCP Protocol represents a gradual evolution from earlier reporting standards. Consequently, Winnipeg's past and present scope of reporting does not always align perfectly. Many of these inconsistencies can be resolved with future updates to this inventory. At such time, significant additions to our scope of emissions may require a reconsideration of Council's targets. Table 14 summarizes the scope of emissions typically reported under the modern PCP Protocol.

Table 14: Scope of Corporate Emissions from Municipal Operations



3.2 Inventory Refinements

For this update, a comprehensive internal review of the corporate emissions inventory was undertaken, which included a careful review of previous emissions inventories reported to Council. The purpose of this exercise was to assure full accountability, transparency, and better alignment with the PCP Protocol. Since the original reporting year, 1998, data availability and reliability has drastically improved, as has the sophistication of municipal emission reporting methods.

As a consequence of this review, improved quantification methods have been applied to all inventories. Due to critical data limitations, it was not possible to fully re-assess all inventory years prior to 2007, meaning older data is considered to be less reliable. Because of these refinements:

- All inventory years have been revised to reflect the adjusted global warming potentials for methane gas, sulfur hexafluoride, and nitrous oxide per the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report.
- Emission reductions achieved in 2007 have been revised to 17.03% below 1998 levels.
- Inventory reports for 1998, 2003, and 2006 are presumed to be inconsistent with current reporting methods and are considered less accurate than subsequent reporting years.

Though it is impossible to verify 1998 emissions consistent with current reporting standards due to the above limitations, in order to maintain consistency with Council's adopted targets, the reported 1998 emissions will continue to stand as the baseline measure.

Table 15 summarizes significant emission sources, the impact of revisions to past inventories based on improved data, and current emission accounting methods.

3.3 Limitations

3.3.1 Disclaimer on Reporting Precision

Greenhouse gas inventories provide an imperfect measure of corporate emissions, and are subject to continuous improvement in scope of reporting, increased transparency, and robustness as the City improves its tracking and data collection methods. Alignment with modern reporting protocols and emission factors adjustments also require periodic inventory revisions. Consequently, inventory revisions are often necessary to provide the most robust and accurate data possible.

Table 15: Summary of Inventory Revisions and their Relative Impact

Emissions Sector: Sub-Sector	Protocol Interpretation	Accounting Method	1998 Revision[13]	2007 Revision[14]
Buildings: Owned & managed by the City	Required	Actual Consumption Data	N/A	12.3%
Buildings: Owned, indirectly managed[15]	Required	Future Inclusion	N/A	N/A
Buildings: Leased for City business.	Required	Estimated Data[16]	N/A	2.0%
Fleet: City owned vehicles (Ex. Transit)	Required	Actual Consumption Data	Negligible	-1.6%
Fleet: Transit Buses	Required	Future Inclusion[17]	N/A	N/A
Fleet: Personal vehicles for City Use	Optional	Distance Travelled	1.1%	1.4%
Fleet: Contracted City Services	Required	Future Inclusion[18]	N/A	N/A
Fleet: Other travel (e.g. air travel)	Optional	Not currently measured	N/A	N/A
Employee Commute To/from work	Optional	Not currently measured	N/A	N/A
Streetlights: Streetlighting	Required	Actual Consumption Data	N/A	-1.1%
Streetlights: Traffic Signals	Required	Actual Consumption Data	N/A	Negligible
Streetlights: Park & Pathway Lighting	Required	Actual Consumption Data	N/A	See 'Buildings'[19]
Water & Wastewater: Facilities	Required	Actual Consumption Data	N/A	2.4%
Water & Wastewater: Process & Fugitive Emissions	Optional	Not currently measured[20]	N/A	N/A
Solid Waste: Corporate Operations Only[21]	Required	Estimated; Methane Commitment	3.7%	-6.5%
Solid Waste: Corporate owned landfills	Recommended	Future Inclusion	N/A	N/A
Total Change in Reported Value			**4.8%**	**9%**

[13] Revised with updated IPCC emission factors (Global warming potentials) and estimated leased building data for consistency with subsequent reporting years. 2003 & 2006 revisions are not shown here.
[14] Revised based on improved data, accounting methods, and updated emissions factors.
[15] Refers to Local community centres associated with the GCWCC and to the Assiniboine Park Conservancy. City managed indoor & outdoor pools, arenas, recreation, and civic centres and park buildings are currently measured under the category *Buildings: Directly owned & managed by the City*.
[16] Estimated based on total square footage where we don't pay utilities directly.
[17] Historically this has been measured in the Community-wide inventory only.
[18] Includes contracted waste collection and snow clearing. Neither actual nor estimated data is currently available, but may become so in future years.
[19] Measured as part of the Buildings sector – utility meters are typically shared with buildings.
[20] Will be included in future Community-wide inventory updates.
[21] Does not include all waste emissions related to Brady Road Resource Management Facility. Rather, only the emissions from waste disposed as a result of municipal operations is estimated.

4.0 Opportunities

The following describes primary opportunities for greenhouse gas emission reductions.

4.1 Buildings & Infrastructure

4.1.1 Buildings

Buildings, including Water and Sewage operations, accounted for 77% of energy use and 58% of emissions in 2013.

Existing Buildings

In October 2011 Council adopted a *Green Building Strategy for Existing City-Owned and Leased Buildings*, recommending:

- The benchmarking of City-owned and operated buildings over 33,000 square feet;
- That the Public Service brings forward strategic recommendations for actions and investments to improve the environmental and energy performance of existing buildings.
- Dialogue with the Province on green building policy coordination.

To fulfill the intent of the above strategy, the City participates on the Province of Manitoba's NRCan Portfolio Manager building benchmarking pilot committee with a medium term goal of benchmarking all City-owned facilities. Building energy efficiency investments are integrated with renovation projects where possible, and also brought forward independently through the Energy Conservation Program in the Capital budget process.

In 2012, the City produced a preliminary analysis of opportunities and costs associated with emissions reductions in city-owned buildings, concluding that at least 5,000 tonnes CO2e could be reduced in the buildings sector through strategic investment in energy efficiency. However, at current energy prices, the average payback of these investments exceeds 15 years, and would require substantial capital investment over a 10 year period. The creation of a comprehensive energy management program and investment strategy would allow the City to prioritize investments and to re-invest energy savings into further reductions.

As natural gas use constitutes over 97% of building sector emissions, opportunities that tend to result in the greatest climate change impact include technologies, building management practices, and alternative energy sources that displace natural gas use through energy efficiency and conservation.

New Buildings

In July 2010, Council adopted the *City of Winnipeg Green Building Policy for New City-Owned buildings and Major Additions*. This policy fulfills a commitment of the City of Winnipeg Corporate Climate Action Plan and will ensure that City-owned new facilities and major additions above 500 square metres are designed, constructed, and operated to a high standard of performance in environmental, economic, and social sustainability.

Applicable projects must achieve minimum energy performance requirements, through 3rd party certification via the Manitoba Hydro Power Smart New Buildings Program and an acceptable 3rd party green building standard such as LEED® or Green Globes®.

The Green Building Policy has been highly effective at reducing business as usual energy consumption and operating costs, especially where they are replacing existing energy inefficient buildings. However, as new buildings generally increase the physical inventory of City-owned buildings, the primary outcome of this policy is an avoidance of new emissions as the public service grows, rather than an absolute reduction in total building emissions.

Leased Buildings

In addition to City owned buildings, the City of Winnipeg leases a significant amount of primarily office space. It is recommended that the City investigates the adoption of a green lease strategy to ensure compliance with the intent of the Climate Change Action Plan, consistency with the *City of Winnipeg Green Building Policy for New City-Owned buildings and Major Additions,* the *Green Building Strategy for Existing City-Owned and Leased Buildings* and as a demonstration of municipal leadership within its scope of influence.

Renewable Energy

Renewable energy sources that directly displace natural gas use such as geothermal, biomass, and passive solar technologies can result in substantial greenhouse gas emission reductions, especially during periods of sustained population and public sector growth. In fact, it will be very difficult to achieve Council's current emissions reduction target can be achieved without the introduction of significant renewable energy resources.

Additionally, an increasing number of commercial and multi-residential buildings in Winnipeg, including the new IKEA and the Assiniboine Park's Journey to Churchill demonstrate the benefit of installing geothermal and district geothermal systems. Additionally, the City has gained some experience with the installation of two solar walls at the Elmwood-Kildonans Pool and at the Cindy Klassen Recreation Centre, which use solar energy to pre-heat ventilation air. It is recommended that the City considers new requirements for the evaluation of renewable and carbon neutral energy systems in the next update to the City of Winnipeg Green Building Policy for New City-Owned buildings and Major Additions and the Green Building Strategy for Existing City-Owned and Leased Buildings.

On-site renewable energy opportunities for electricity generation, where they are cost effective, also present an opportunity for modest emissions reduction. However, emissions resulting from electricity use in Manitoba are expected to remain very low. Therefore, the displacement of electricity with on-site renewables would exhibit only modest positive impacts on corporate emissions.

Incorporation of Community Centres

Presently, the City does not directly track utilities and emissions associated with City-owned, community-operated community centres. While not directly managed, the City does influence emissions associated with these buildings, and there is a strong case for measurement and tracking following the City's standardized emissions measurement protocol described in Section 3 of this report.

Particularly, recent decisions to close City-operated arenas and to support the construction and expansion of community centre operated arenas will create a distortion in our emissions tracking, as management responsibility is transferred. Expanded tracking to include all City-owned assets, including Community Centres is therefore recommended.

4.1.2 Streetlighting & Traffic Signals

Streetlights and Traffic Signals account for 10% of corporate energy use in 2013, but less than 1% of total greenhouse gas emissions. From a greenhouse gas emissions standpoint, the street lighting sector greatly benefits from the low carbon-intensity of Manitoba's hydroelectric power generation.

Traffic Signals

Through the last decade, the City has been steadily upgrading traffic signals to LED fixtures and has realized a significant energy cost savings as well as reduced maintenance costs (incandescent signals are serviced about 4 times more often than LED's). Energy use for traffic signals has decreased by more than 30% since 2007 despite steady City growth. The conversion project is ongoing and is approximately 85% complete.

Streetlights

Manitoba Hydro owns and maintains all of the City of Winnipeg's street lighting on behalf of the City and has committed to a full LED conversion over 4 years beginning in 2015. This is anticipated to reduce energy use by 40% per fixture, and produce a cost savings to the City.

Park Lighting

Park and pathway lighting is owned and managed by the City of Winnipeg. As it is commonly metered in combination with other City-owned buildings, it is tracked under the Buildings, rather than the Streetlighting and Traffic Signals sector. Overall, the greenhouse gas emissions from park and pathway lighting are very low because it relies on predominantly renewable hydro-electricity.

As is the case with streetlights and traffic signals, there is a strong business case for conversion to LED's due to significantly reduced maintenance, up to 40% energy savings, and incentives offered by MB Hydro's PowerSmart program. This has already been demonstrated in recent projects including the Assiniboine river walk, and Mayfair Park.

As good practice, the City is committed to a gradual conversion of most park lighting to LED's. The implementation approach will generally be associated with scheduled park renewals and renovations determined through the budget process.

4.1.3 Vehicle Fleet & Equipment

Winnipeg's vehicle fleet comprises approximately 13% of corporate energy use and approximately 25% of emissions. Personal vehicles used for City-related business account for an additional 1% of total emissions. As a major contributor to Winnipeg's emissions inventory, the

Council-adopted Green Fleet Plan comprises a key component of the Corporate Climate Change Action Plan.

The *Green Fleet Plan* is a consolidation of strategies intended to reduce overall mobile fuel consumption in City-owned vehicles and equipment. The Green Fleet Plan was approved in 2010 with an emissions reduction target of 17.85% below 1998 levels by 2019.

Key strategies of the Green Fleet Plan are summarized as:

1. Right Sizing the fleet;
2. Purchase the most fuel efficient light duty, and lowest greenhouse gas emitting vehicles where operationally feasible;
3. Replace older diesel engines with low emitting diesel engines;
4. Evaluate and use alternative fuels;
5. Implement and enforce a corporate anti-idling policy and install idle reduction technologies;
6. Deploy fuel efficient driver training;
7. Evaluate new advanced vehicles and technologies;
8. Investigate maintenance and management practices to reduce fuel use;
9. Inclusion of personal vehicle use, rental vehicles, and outsourced work;
10. Transportation demand management;
11. Communication and outreach.

Contracted Fleet Services

The scope of the City's emissions measurement protocol described in Section 3 is inclusive of all services traditionally provided by municipal government, as well as services falling under the direct or indirect administrative control of municipal government. Therefore, services such as a winter snow clearing, and residential solid waste and recycling collection should be measured and reported, even if those services are delivered, in part or in full, by private contractors. This allows for meaningful year-over-year measurement *and* recognizes the responsibility of municipal government regardless of the method of service procurement.

Past emissions reports have not measured the impact of contracted traditional municipal services. Establishing a measurement and reporting protocol for these services will provide a fuller understanding of City's corporate emissions portfolio and assist in identifying future opportunities for mitigation. This also fulfils one of the *Green Fleet Plans'* key strategies.

4.1.4 Solid Waste

Solid waste contributes approximately 16% of corporate greenhouse gas emissions. These emissions are exclusively the result of organic waste sent to the landfill.

Current Initiatives:

Leaf Litter:

The vast majority of leaf and grass clippings waste in City Parks and Open spaces is shredded and left to compost/ mulch in place.

Tree Waste Diversion Program:
A successful partnership between the City and Wood Anchor allows the City to divert marketable wood products derived from the maintenance of Winnipeg's urban forest. The remaining unmarketable wood is chipped, used in trails maintenance, or composted.

Landscaping Waste Diversion program:
The remainder of organics from landscaping operations in City parks, planters, and boulevards are composted at the Brady Road Resource Recovery Facility.

Landfill Gas Capture:
An important component of the City of Winnipeg Corporate Climate Action Plan, the City has installed Phase 1 of a landfill gas capture system at Brady Road Resource Recovery Facility, operational in 2013, which will be gradually expanded over time and captures approximately 75% of total methane gas generated, which is currently flared to produce carbon dioxide, a far less potent greenhouse gas than methane.

As methane is the primary component of anthropogenic greenhouse gas emissions from corporate solid waste, it can be reasonably expected that the City corporate waste inventory will be reduced by the same proportion.

Diversion of Construction Waste:
Additionally, the Garbage and Recycling Master Plan targets increased diversion of materials, including wood waste from construction materials. By sorting and diverting all wood waste from construction and renovations sent to the landfill, the City can further reduce solid waste emissions.

Opportunities:
Corporate Waste Reduction Strategy:
In 2014, Council directed the Public Service to develop a waste reduction strategy for City operations. This strategy will identify recommended waste reduction targets and short, medium, and long term actions, and a progress reporting mechanism.

Composting of Food Waste at City-owned facilities:
Organic wastes such as food scraps, landscaping waste, and construction materials account for all of the estimated total emissions in the corporate waste sector. While much progress has been made in eliminating landscaping waste from the landfill, the source separation of organics for composting at City facilities has the potential to dramatically reduce the remainder of emissions in this sector. The *Corporate Waste Reduction Strategy* will propose near and long term targets and recommendations towards the eventual elimination of landfilled organic waste.