



City of Mississauga

5 Year Energy Conservation Plan

2014 - 2019





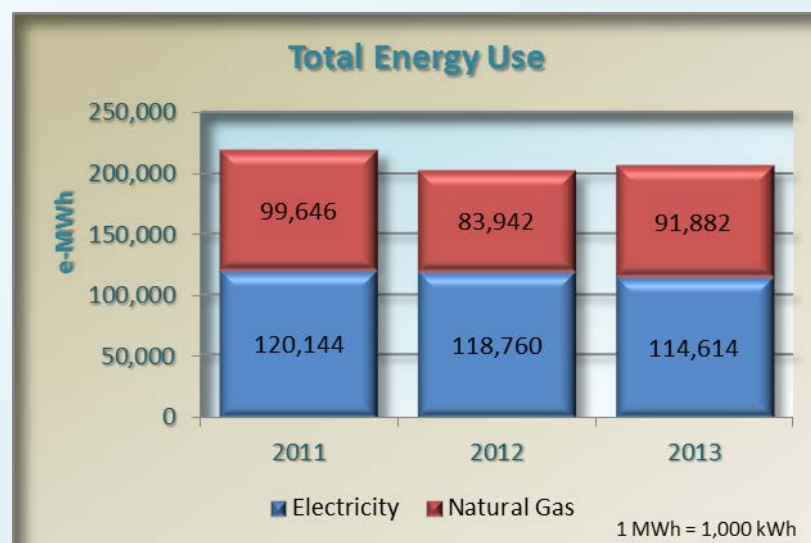
Version 1.0

EXECUTIVE SUMMARY

The City of Mississauga is dedicated to finding new ways to conserve energy, and help reduce our electricity and fossil fuel-related emissions.

Since 2001, the City has implemented two successful Energy Conservation Plans. The 5 Year Energy Conservation Plan (2014-2019) is now the third. It targets a 1% reduction in energy use and greenhouse gas emissions (GHGs) per year for facilities, over the next five years.

CURRENT ENERGY USAGE AND EMISSIONS

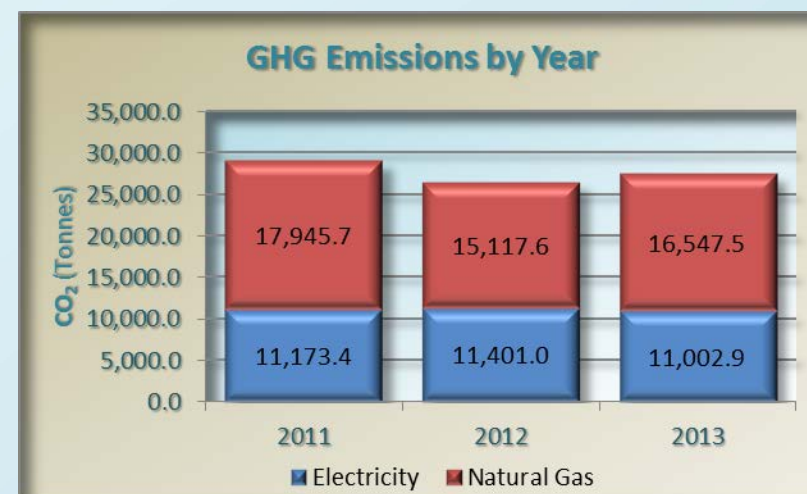


In 2013, the City used over 206 million equivalent kilowatt hours (e-kWh) of electricity and natural gas in:

- facilities, e.g. City-owned and operated buildings; and
- operations, e.g. energy use in parks, streetlighting and traffic signals.

That total was equal to the amount of energy used in over 16,500 homes. This energy consumption was down 6% from 2011.

GHG emissions from City facilities and operations were over 27,500 tonnes in 2013, down 8.7% from 2011. That equalled the emissions from 5,400 cars.



EXPECTED ENERGY, FINANCIAL AND ENVIRONMENTAL BENEFITS

Under the 5 Year Energy Conservation Plan (2014-2019), the City will meet its conservation targets by:

- Re-commissioning facilities (i.e. ensuring that the design and operation of a building are in sync and working efficiently);
- Performing a City-wide energy audit (visiting the majority of facilities to review equipment, such as HVAC and lighting, and determine where energy efficiency can be improved);
- Implementing newer and broader energy efficiency measures; and
- Increasing and promoting energy awareness.

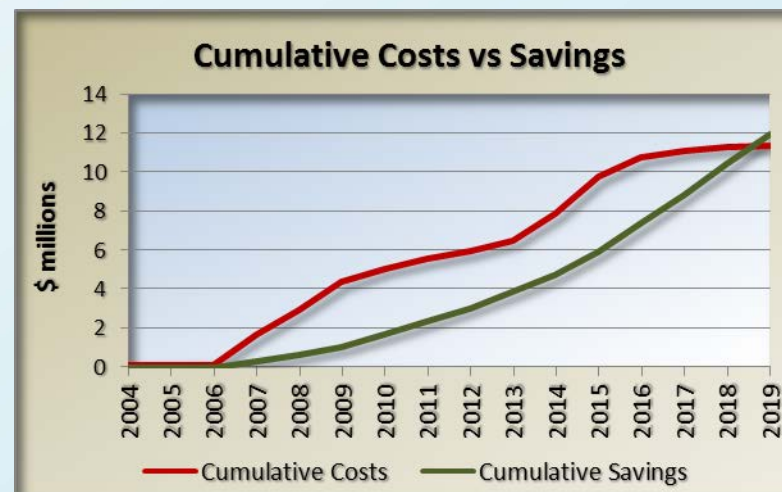
The new plan builds on a strong record of reducing energy consumption, for positive financial and environmental results.

ENERGY USAGE

The Energy Measure Implementation Plan shows past successes and those planned until 2019. The savings from energy measures are cumulative, i.e. the impact grows every year. In 2013, the savings from completed energy measures reached 4,855 MWh of electricity and 471,000 m³ of natural gas. By 2019, with additional improvements, these annual savings are expected to increase to 9,100 MWh and 749,000 m³.

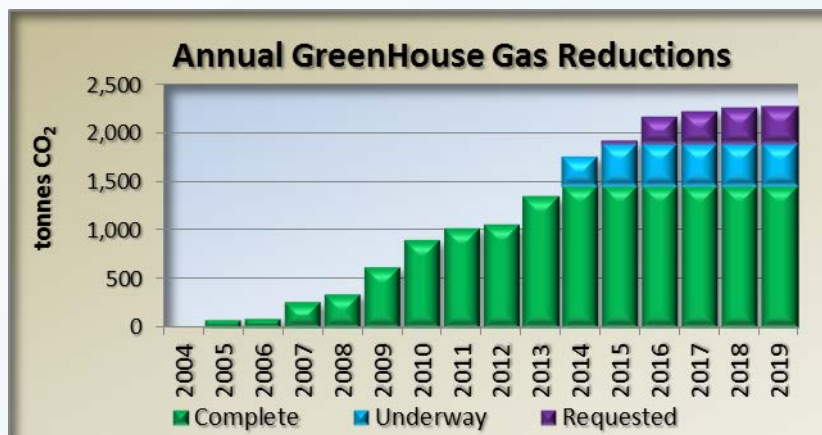
COST SAVINGS

Reduced usage has translated into significant cost savings. From 2004 through 2013, the energy measures completed have saved an estimated \$3.9 million. By 2019, the total savings from energy measures should exceed the total investments in those measures.



GHG EMISSIONS

Also by 2019, the GHG reductions from energy measures are expected to reach 2,290 tonnes per year, more than double where the City was at in 2012, and almost a fourfold improvement in 10 years (from 2009).



By closely monitoring how energy is used, and taking steps to manage it cost-effectively, the City continues to nurture a strong culture of improved energy conservation and performance.

LOOKING AHEAD

The Provincial Green Energy Act requires public agencies, including municipalities, to publicly report their annual energy use and GHG emissions. That began in 2013. This report (available both in print and on the City's website by July 1, 2014) carries on that obligation, as well as the requirement to develop a new five-year plan.

Each year until 2019, the City will update the Energy Conservation Plan, providing the most recent energy and GHG data, and highlighting changes in the status of energy measures and the implementation plan.

The Green Energy Act calls for a new Energy Conservation Plan in 2019, and every five years after. That next plan will show the progress achieved from 2014-2019, and objectives for the following five years.



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1.0 INTRODUCTION

The City of Mississauga is dedicated to finding new ways to conserve energy, and help reduce our electricity and fossil fuel-related emissions.

The 5 Year Energy Conservation Plan (2014-2019) builds on the successes of two previous plans, created in 2001 and 2009.

1.1 BACKGROUND

The initial Energy Conservation Plan was created when utility costs were rising at 2 to 3 times the general rate of inflation. The goal was to reduce energy costs by \$600,000 (5% of utility costs in 2002) and reduce greenhouse gas (GHG) emissions by 4,000 tonnes/yr.

The plan exceeded these goals, and updated several times, including the Energenius program in 2002.

In 2009, the City introduced a new Energy Conservation Plan. This time, new developments – like the Green Pillar of the City's Strategic Plan, the goal of being a net-zero carbon city, and the Province's *Green Energy Act, 2009* – necessitated a more aggressive approach.

The 2009 plan involved an energy evaluation of City owned and operated facilities, as well as a review of new building construction proposals. It established Green Building Standards for new construction and major renovations, and increased use of renewable energy.

The main objectives included identifying energy and water saving opportunities that will lower utility costs, improving operational efficiency, and contributing to the City's overall Environmental Management Plan. Improved energy procurement in a deregulated market was another important objective.

For results for the 2001 and 2009 Energy Conservation Plans, see [Section 7.2.5 Energy Savings](#).

1.2 2014 PLAN

The **5 Year Energy Conservation Plan (2014-2019)** was developed, in part, in response to the requirements of Regulation 397/11 of the Green Energy Act (see [Section 1.4](#)).

The 2001 and 2009 plans were intended as internal documents, meant for City staff. Now, the *Green Energy Act* requires public agencies, including municipalities, to publicly report their annual energy use (electricity and natural gas) and GHG emissions.

The new plan includes:

- The City's vision and objectives relating to energy efficiency and GHG emissions.
- A summary of the energy use and GHG emissions by City operations for the previous three years.
- An outline of the team responsible for energy efficiency and energy procurement for the City of Mississauga.

- Completed and planned energy measures for the City, covering 2004 to 2019, including descriptions, costs, savings, and expected GHG reductions.

The 2014 plan will be updated periodically, possibly annually, to include:

- the status of energy measures (completed, approved, cancelled, etc)
- new energy measures to be implemented as a result of energy audits and re-commissioning activities; and
- new energy and GHG information.

1.3 LINK TO OTHER PLANS

The 5 Year Energy Conservation Plan (2014-2019) takes its vision and goals from the City's Strategic Plan (Living Green pillar) and resulting Action Plan, and is related to the Living Green Master Plan.

1.3.1 STRATEGIC PLAN

The Strategic Plan is Mississauga's vision document, which since 2009, has set priorities and shaped decision-making for the City. The five Strategic Pillars for Change are Move, Belong, Connect, Prosper and Green.

The Green pillar provides the long-term goal of a "zero carbon" City. The measure laid out in the 5 Year Energy Conservation Plan will help the City reduce its carbon footprint and move closer to realizing that goal.

Information:

For more information on the City of Mississauga's Strategic Plan, see:

<http://www.mississauga.ca/portal/strategicplan>.

Copies of the Strategic Plan and Action Plan can be downloaded from:

<http://www.mississauga.ca/portal/strategicplan/plan>

1.3.2 LIVING GREEN MASTER PLAN

The Living Green Master Plan (LGMP) is Mississauga's first environmental master plan. It prioritizes City policies and programs into 49 actions, over 10 years, to meet the environmental objectives of the Strategic Plan.

Information:

For more information on the Living Green Master Plan, see:

http://www5.mississauga.ca/marketing/websites/livinggreen/downloads/LGMP2012_Final.pdf

1.4 GREEN ENERGY ACT

Ontario's Green Energy Act (GEA) was created to expand renewable energy generation, encourage energy conservation and promote the creation of clean energy jobs.

Building a clean energy economy

The energy sector is one of the engines that drives our provincial economy. The GEA is sparking growth in renewable energy sources such as wind, solar, hydroelectricity and bioenergy. Ontario is continuing to bring clean sources of energy into the supply mix and investing to modernize the transmission and distribution of electricity.

Promoting energy conservation

Conserving energy not only saves money, it also lowers demand on the electricity system and helps reduce GHG emissions. Through conservation, Ontario homeowners, businesses and industry have saved more than 1,900 megawatts of peak demand electricity since 2005 – the equivalent of taking more than 600,000 homes off the grid.

The GEA continues to promote conservation by:

- making energy efficiency a key element of Ontario's building code
- creating new energy efficiency standards for household appliances
- working with local utilities to reach assigned conservation targets
- protecting low-income Ontarians through targeted conservation programs

Information:

For more information on the Green Energy Act, see:

<http://www.energy.gov.on.ca/en/green-energy-act/>

1.4.1 REGULATION 397/11

Under the Act, Ontario Regulation 397/11 requires public agencies – municipalities, municipal service boards, school boards, universities, colleges and hospitals – to:

- report on their energy consumption and greenhouse gas (GHG) emissions annually beginning in 2013; and
- to develop and implement energy Conservation and Demand Management (CDM) plans starting in 2014.

The regulation requires that the public agency develop, and make public, the CDM plan by July 1st, 2014. Public agencies must also update the plan every 5 years beginning in 2019.

Information:

More information on Regulation 397/11, including a copy of the regulation, can be found at:

<http://www.energy.gov.on.ca/en/green-energy-act/conservation-for-public-agencies/>

1.5 ENERGY AUDIT AND RE-COMMISSIONING MEASURES

Currently, the plan does not list many measures beyond 2016, offering instead the generic measures “Energy Audit Measures” and “Re-commissioning Measures”. These would cover the expected measures that the City Wide Energy Audited (scheduled between 2014 and 2015) and Re-Commissioning activities will identify. As measures are determined, they will be included in upcoming updates to this plan.

More information can be found in [Section 7.2.9 Energy Audits and Re-Commissioning](#).

1.6 ESTIMATED SAVINGS

Some savings provided in this document are based on estimates. Due to the nature of the facility types and/or the type of measure being implemented, it can sometimes be difficult to determine precise savings. For example, in the case of a change made to a heating system, how much savings can be attributed to the measure versus how much can be due to weather changes versus changes in use of the facility? In these cases, engineering estimates and calculations are used to determine savings, with reviews of energy use patterns to verify those savings.

1.7 NAVIGATING THIS DOCUMENT

This document is separated into seven chapters (including this Introduction) as well as seven Appendices. For quick reference:

- To find information on the City of Mississauga's Vision and Goals, see Chapter 2.
- To find information on the City's energy or water use, or greenhouse gas emissions, see chapters 3 to 5. Go to Appendix 5.0 to see the energy use and GHG emissions for the individual facilities in the City.
- For information on past and future energy measures for City facilities, see:

- Chapter 7.0 - general overview of the measures implemented, total costs, expected savings, and GHG emission reductions.
- Appendix 1.0 - more detailed Energy Measure Implementation Plan. This provides the start and estimated completion dates. Some items may be delayed due to outside circumstances.
- Appendix 2.0 - description of the Energy Measures. Note: For simplicity, some items and measures may fall under a single measure type, e.g. repairing a damper motor or fixing a pump may both fall under Equipment Maintenance.
- Appendix 3.0 - breakdown of the total costs and savings for each measure type. Information is provided for completed as well as yet to be implemented measures.
- Appendix 4.0 - locations for each measure to be implemented.
- Appendix 5.0 - measures that were implemented at each facility. The locations are listed in alphabetical order for easier searching.
- Appendix 6.0 - definitions of the various terms that are found in this document.

The online version of this document will contain links to various sections. From the Table of Contents page, you can click on the section you would like to go to.

Clicking on the facility names in Appendix 5 will take you to the information page for that location.

Throughout the document, there are references to other sections. Generally clicking on the reference will navigate to that section.

2.0 COMMITMENT

2.1 DECLARATION OF COMMITMENT

*Keeping in line with the City of Mississauga's Strategic Plan, chiefly the Living Green Pillar, the senior management Leadership Team for the City of Mississauga fully supports the **5 Year Energy Conservation Plan (2014-2019)***

The City's Strategic Plan identifies Living Green as one of the Strategic Pillars for Change.

The City of Mississauga's **5 Year Energy Conservation Plan (2014-2019)** demonstrates the City's leadership in green initiatives and commitment to reducing greenhouse gas emissions to transform Mississauga into a net-zero carbon city.

2.2 VISION

Mississauga will inspire the world as a dynamic and beautiful global city for creativity and innovation, with vibrant, safe and connected communities; where we celebrate the rich diversity of our cultures, our historic villages, Lake Ontario and the Credit River valley.

A place where people choose to be.

Our Future Mississauga is a city that co-exists in harmony with its ecosystems, where natural areas are enhanced, forests and valleys are protected, the waterfront connects people to Lake Ontario, and communities are nurtured so that future generations enjoy a clean, healthy lifestyle.

Mississauga is a city that values its shared responsibility to leave a legacy of a clean and healthy natural environment.

2.3 POLICY

In support of Energy Efficiency, the City of Mississauga has in place:

- **Green Building Standards:** All new City facilities are to be built to achieve LEED Silver certification, emphasizing energy efficiency. Large renovations of City facilities are to also meet LEED Silver standards, getting certification where feasible.
- **Purchasing By-Law (374-2006):** It includes the principle that "Efforts shall be made to acquire goods and services that will conserve energy and help to preserve and protect the ecosphere."

2.4 GOALS

- *To Transform Mississauga into a “Net-Zero” carbon corporation.*
- *To Lead and Encourage Environmentally Responsible Approaches.*
- *To Promote a Green Culture.*

To transform Mississauga into a “net-zero” carbon corporation

Becoming a net-zero carbon city is a long-term goal, one shared by several cities (including Melbourne, Australia and Abu Dhabi in the United Arab Emirates). This ambitious goal will likely take decades to achieve, but the City will continue to strive towards it by reducing GHG emissions.

Steps have already been taken to move in a more sustainable direction and create a net-zero corporation, a shorter term target.

Lead and Encourage Environmentally Responsible Approaches

The City will pursue and support renewable energy and the use of technology to: conserve energy and water; reduce GHG emissions; improve air quality; and protect our natural resources.

Promote a Green Culture

The City will lead a change in behaviours to support a more responsible and sustainable approach – one that will minimize

our impact on the environment and contribute to reducing climate change.

2.5 OVERALL TARGET

The City of Mississauga is targeting a 5% reduction in energy use per square meter for corporate buildings by 2020.

The City will achieve this target by reducing the Energy Use Intensity (EUI) of the City by 1% annually, for both electricity and natural gas consumption.

Mississauga still faces higher energy use due to development and an increase in services provided. However, the City strives to minimize the impact by developing more efficient facilities and operations.

The City will design new facilities to more stringent energy standards, while making existing facilities more energy efficient.

2.6 OBJECTIVES

- *Re-Commissioning of Facilities*
- *Perform a City Wide Energy Audit*
- *Implement Energy Efficiency Measures*
- *Increase and Promote Energy Awareness*

To achieve its goals, the City of Mississauga has developed an energy plan which will include:

- **Re-Commissioning of City's major facilities.**
Review of a previously commissioned facility as a whole, taking into account initial design, intended use, and current operations. The focus is on ensuring they are in sync and working energy efficiently.
- **City Wide Energy Audit**
Review equipment in all City facilities, focusing on energy using systems, to highlight areas that can be improved to increase energy efficiency.
- **Implement Energy Efficiency Measures**
Continue to implement energy efficiency measures as recommended by the Energy Audit and Re-Commissioning, to help increase the City's energy Efficiencies.

- **Increase and Promote Energy Awareness**

Continue to promote energy awareness within its facilities. This will lead to better use and operation of City facilities.

3.0 CITY OF MISSISSAUGA ENERGY PICTURE

3.1 ENERGY USE IN THE CITY

City of Mississauga locations use more than 200 million equivalent kilowatt hours per year.

Each year, City of Mississauga facilities and locations use in excess of 200 million equivalent kilowatt hours per year in both electricity and natural gas. That energy is used in:

- facilities, e.g. City-owned and operated buildings; and
- operations, e.g. energy use in parks, streetlighting and traffic signals.

This energy consumption was down 6% from 2011.

Did you know...?

The City of Mississauga's 2013 energy use would be about equal to the energy use of over 16,500 homes (assuming 12,000 e-kWh per home)

Of this 200 million kilowatt hours, about 57% of it is comprised of electricity use, or 114 million kilowatt hours.

The majority of the remaining 84 million kilowatt hours plus of energy use would be made up of natural gas consumption.

Oil consumption only makes up a very small fraction (less than 0.5%) of the City's energy use.

Information:

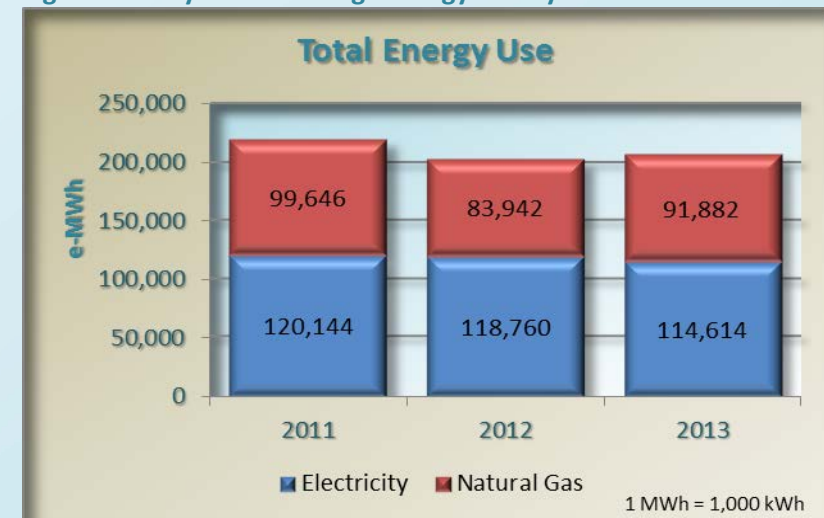
What is an e-kWh? In order to better compare different energy sources (i.e.: natural gas and electricity), it is normal to convert one or both types into a single common unit.

In this plan, we are converting the natural gas volume of cubic meters into "equivalent kilowatt hours" (e-kWh). That allows the comparison of natural gas to the electrical unit of kilowatt hours (kWh).

Conversion: 1 m³ natural gas = 10.5 e-kWh

Figure 3-1 shows the approximate split in electricity and gas use over the years 2011 to 2013.

Figure 3-1 City of Mississauga Energy Use by Year



3.2 ELECTRICITY

Street lighting and traffic signals account for 35% of the City of Mississauga's electricity consumption.

In 2013, the City of Mississauga's electricity use was 114,600 MWh. This was a reduction over both 2012 (118,700 MWh) and 2011 (120,100 MWh).

Did you know...?

To use 114,600 MWh of electricity, you would need to run:

- over 215,000 60 watt light bulbs continuously for a full year, OR
- 1.9 billion 60 watt light bulbs for one hour.

Information:

1 megawatt hour is equal to 1,000 kilowatt hours
(1 MWh = 1,000 kWh)

The largest user of electricity for the City was street lighting and traffic signals - 35% of the total. Next, recreation type facilities - community centres, arenas and the Hershey Sports Zone - accounted for 30% of the electricity used by City facilities.

3.3 NATURAL GAS

City of Mississauga buildings use over 8 million cubic meters of natural gas annually.

City of Mississauga facilities used 8.75 million cubic meters (91,900 e-MWh) of natural gas in 2013. This was down from 2011 (9.5 million cubic meters), but up from 2012 (8.0 million cubic meters). The latest increase can be attributed to the milder winter in 2012. As the majority of natural gas use in the City is for space heating, weather has a large impact.

Did you know...?

The City's natural use in 2013 would be the same as the gas used in 3,660 typical Ontario homes.

Information:

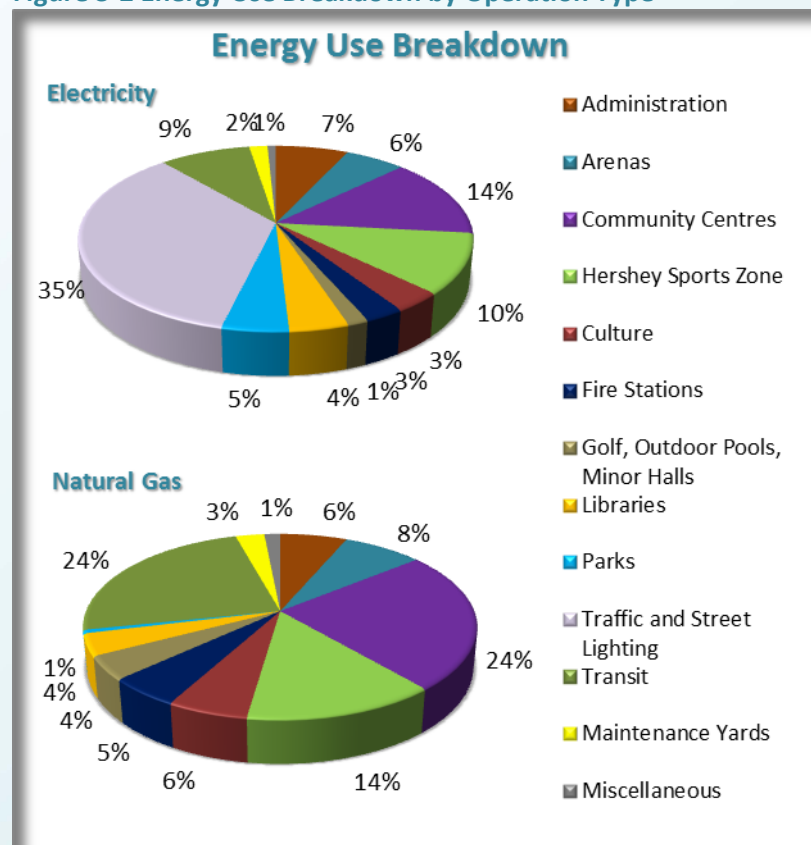
From Statistics Canada, a typical home in Ontario uses 2,390 m³ of natural gas in a year.

Arenas and community centres (including facilities with shared community centre and ice rink facilities) are responsible for about 45% of the natural gas used in City of Mississauga facilities. Transit buildings account for almost 24% of the total gas used.

Figure 3-2 shows a breakdown (by percentage) of the electricity and natural gas used in City of Mississauga facilities for 2013.

A more detailed breakdown of energy use and GHG emissions for individual facilities can be found in [Appendix 4.0: Energy Measure Locations](#).

Figure 3-2 Energy Use Breakdown by Operation Type



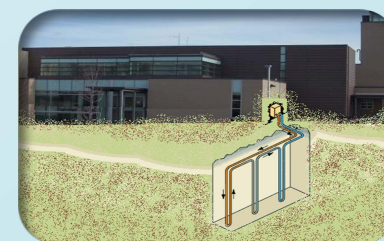
3.4 RENEWABLE ENERGY

Like the province, Mississauga has placed a priority on expanding the use of clean and renewable sources of energy. These energy projects can provide both environmental and economic benefits.

In 2013, City Council issued a resolution that offers municipal support to parties who wish to apply to the provincial Feed-In Tariff (FIT) program to install a solar generating system on their rooftop within Mississauga. The FIT program is a program designed to encourage the development of renewable energy technology, attract investment and create new clean energy jobs.

The City's support of renewable energy and sustainability includes the following renewable energy installations:

- **25 kW solar photovoltaic installation** on the roof of Hershey Arena, installed in 2007. Between 2008 and 2013, the system has generated 161,000 kWh, just under 27,000 kWh per year.
- **Solar Water Heating** at Huron Park Community Centre, installed in 2010. Since then, the system has produced enough hot water to offset 22,700 m³ of natural gas use each year.
- **Ground Source Heat Pumps** at Fire Station 116. These pumps, sometimes referred to as geothermal heat pumps, are a central heating and cooling system that transfers heat to and from the ground. It uses the earth as a heat source (in the winter)



or a heat sink (in the summer). This design takes advantage of the moderate temperatures in the ground to boost efficiency and reduce the operational costs of heating and cooling systems.

Other measures taken related to renewable power:

- Purchase of Green Power to offset the electricity consumption at Mississauga City Hall from 2008 to 2013.
- Leasing rooftop space on City facilities for a solar photovoltaic generation system (awaiting the award of a generation contract from the Ontario Power Authority).

3.5 ENERGY USE INTENSITY

Energy Use Intensity (EUI) is a measurement that expresses a building's energy use as a function of its size or other characteristics. It is used to give a better picture of the energy efficiency of a facility. The more efficient a building is, the lower its EUI will be.

When reviewing EUI, the facility operation type and hours should be taken into account. For example, a facility that operates 24 hours a day will most likely have a higher EUI than one that operates 10 hours a day. Similarly, a facility with an energy intensive system, such as an indoor pool, will have a higher EUI than a building just used for storage.

With those variables, it is best to use EUI to compare facilities of similar operation types.

This report uses equivalent kilowatt hours per square meter (e-kWh/m²) as the unit of EUI.

The overall EUI for the City of Mississauga in 2013 was 366 e-kWh/m². This is a 2.4% increase over 2012, but an 8.0% reduction over 2011 values.

Did you know...?

The Mississauga City Hall had a EUI of 161.5 e-kWh/m² in 2013. The facility has been recognized as one of the more efficient city halls in Canada.

With a target reduction of 5% over the next five years, (1% each year), the City's EUI would reduce to 345 e-kWh/m².

Figure 3-3 shows the Energy Use Intensity for City of Mississauga facilities for 2011 to 2013, and includes the targeted EUI for 2014 to 2019.

Figure 3-4 shows the EUI range for both the low end (more efficient facility) to the higher end (less efficient facility) for some typical facility types.

Figure 3-3 Energy Use Intensity for City of Mississauga Facilities

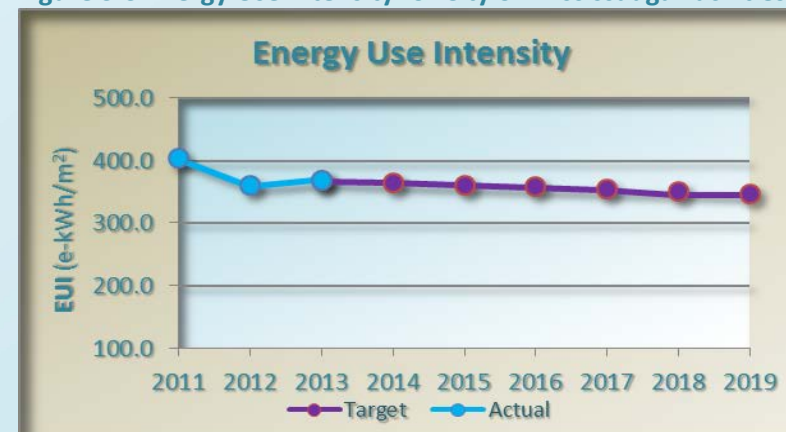
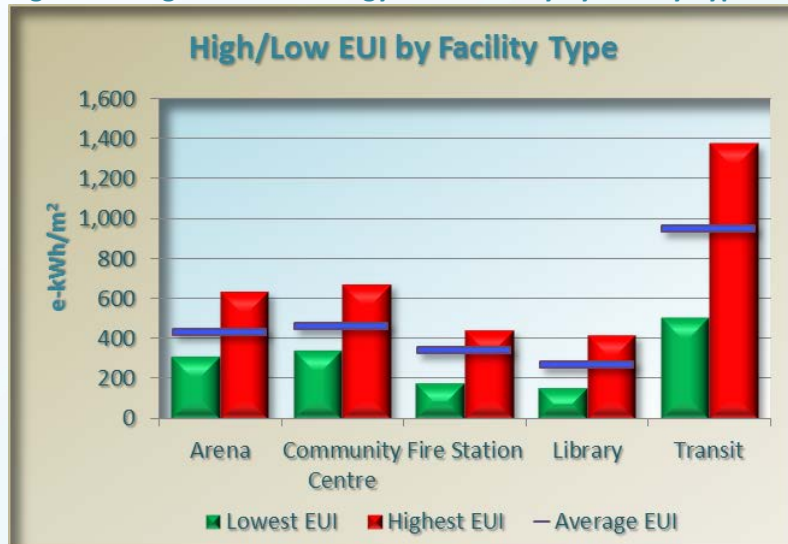


Figure 3-4 High and Low Energy Use Intensity by Facility Type



4.0 GREENHOUSE GAS EMISSIONS

City of Mississauga facilities and operations emit 27.6 thousand tonnes of CO₂ each year from electricity and natural gas use.

A major component of Greenhouse Gas (GHG) is carbon dioxide (CO₂). The CO₂ emissions described in this report come from the combustion of fuels to generate electricity, or from the direct combustion of natural gas.

With CO₂, you look at the emission factor – the lower that is, the better for the environment. The amount of CO₂ emitted per cubic meter of natural gas burned remains pretty much constant year to year. Very slight variations may occur due to the quality of the gas and the efficiency of the equipment burning it.

Information:

The natural gas emission factor for Ontario is 1.891 kilograms of CO₂ emitted for every cubic meter of natural gas burned (1.891 kg/m³).

For electricity, the emission factor - the amount of CO₂ emitted per kilowatt hour generated - can vary more year to year. It depends on the fuels used by the generators. A generating plant using coal, for instance, would have a higher emission factor than one using natural gas, which burns 'cleaner' than coal.

Information:

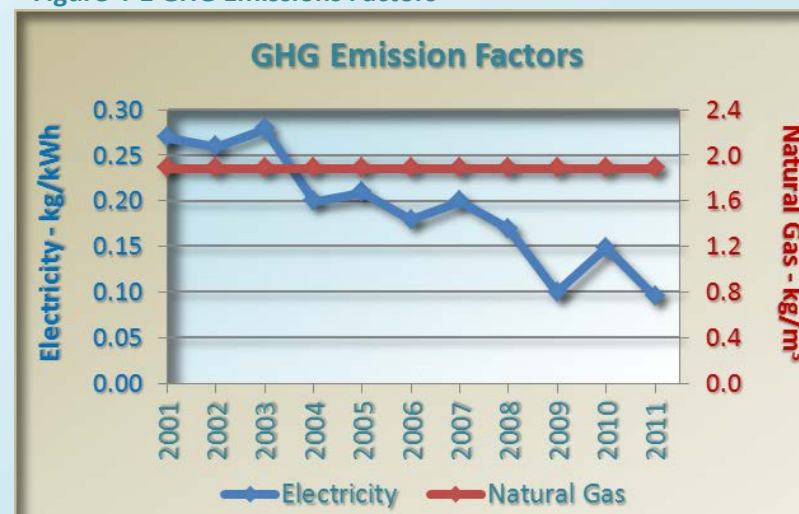
Due to changes in electricity generation, the average electricity gas emission factor for Ontario over the past 10 years has ranged from 0.28 kg/kWh in 2003, to 0.093 kg/kWh in 2011.

The main reasons behind the reduction have been the decrease in coal burning for generation, and the increase of renewable and clean electricity generation.

(Where kg/kWh = kilograms of CO₂ emitted for each kilowatt hour of electricity generated)

Figure 4-1 below shows the emission factors for both electricity and natural gas from 2001 to 2011.

Figure 4-1 GHG Emissions Factors



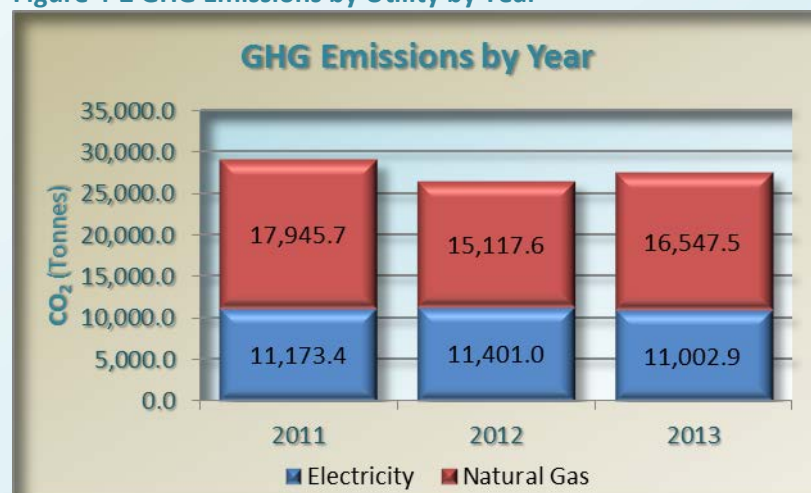
4.1 CITY OF MISSISSAUGA GHG EMISSIONS

City of Mississauga operations and facilities produced 27.6 thousand metric tonnes of Carbon Dioxide (CO₂) emissions from electricity and natural gas use in 2013. This is up from the 2012 emission level of 26.5 thousand metric tonnes, but a reduction from the 2011 levels of 29.1 thousand metric tonnes of CO₂. The chief factor behind both the increase and the decrease in each year is the change in natural gas used each year as highlighted in Section 3.3.

Of the 2013 emissions, 64% of the CO₂ came from natural gas combustion in heating (space and water) City facilities, and 36% from electricity use.

Figure 4-2 shows the CO₂ emissions for electricity and natural gas by City of Mississauga facilities for 2011, 2012, and 2013.

Figure 4-2 GHG Emissions by Utility by Year

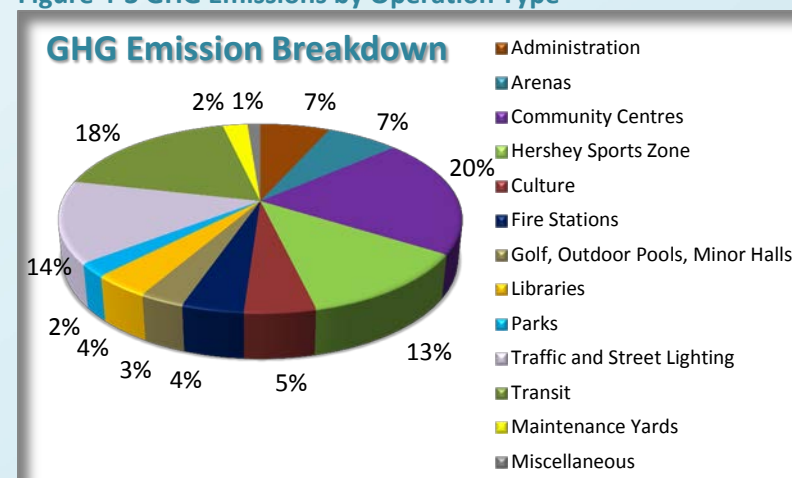


The largest contributor is arenas and community centres (including the Hershey Sports Zone), which accounted for 30% of the total CO₂ emissions in 2013.

The next highest contributors, transit and traffic/street lighting made up 18.5% and 12.4% respectively of the GHG emissions in 2013.

Figure 4-3 shows the CO₂ emissions by Operation Type for the City.

Figure 4-3 GHG Emissions by Operation Type



Note: Emissions from City operated vehicles (buses and cars) are not included.

4.2 GHG INTENSITY

Similar to EUI, GHG Intensity is a measurement that expresses a building's GHG emissions as a function of its size or other characteristics. The GHG Intensity figures used in this plan are

based on the kilograms of CO₂ emissions per square meter of area of a building, (kg_{CO2}/m²).

The values given in this section only include the CO₂ emissions for facilities. The emissions for other energy use - by street lighting, traffic signals, and many parks - are not factored in as they do not have a building area to associate to it.

The 2013 GHG Intensity for City of Mississauga was 52.9 kg_{CO2}/m². This is a 4.3% increase over 2012 due to increased natural gas use. However, 2013 also showed an 8.8% reduction from 2011.

The actual GHG intensity for a facility, as with the Energy Use Intensity (Section 3.5) is very dependent on the type and duration of the operations of a facility.

The GHG intensity for City facilities ranged from under 20 kg/m² for the Mississauga Central Library, to just over 200 kg_{CO2}/m² for Malton Satellite Terminal (a storage facility where buses stored outside are plugged into a heating system to keep from freezing systems).

4.3 TARGETED GHG REDUCTIONS

As per section 2.5, the City is targeting a 1% reduction in energy use per year in facilities, which should cut GHG emissions by 1% as well. This would reduce CO₂ by 1,327 tonnes in 2019 compared to 2013 levels.

Did you know...?

A reduction of 1,327 tonnes of CO₂ is like removing 260 cars from the road.

Information:

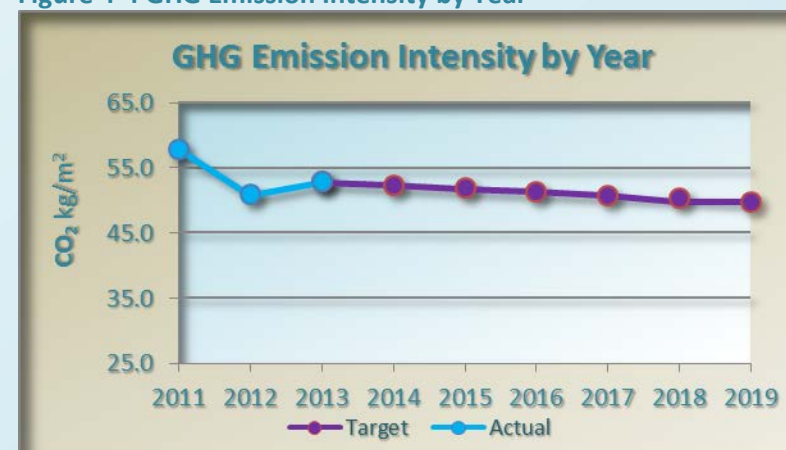
The average car emits 5.1 metric tonnes of CO₂ per year as per a report issued by the EPA in December 2011.

See following link for more information:

<http://www.epa.gov/otaq/climate/documents/420f11041.pdf>

The annual GHG Emission Intensity, including the levels based on the targeted reductions, are in Figure 4-4 below.

Figure 4-4 GHG Emission Intensity by Year



For more on the expected reductions from planned measures, see Section 6.2.6.

5.0 WATER USE

City of Mississauga facilities and parks use over 1 billion litres of water in 2013.

Did you know...?

1 million m³ of water would fill 400 Olympic sized swimming pools.

5.1 CITY OF MISSISSAUGA WATER USE

In 2013, City of Mississauga facilities and other locations (such as parks and tennis courts), used over 1 million cubic meters of water. This was a 15% reduction in water use compared to 2012, and roughly equal to the 2011 water use.

Figure 5-1, below shows the annual water use for the City of Mississauga for the last 3 years.

Figure 5-1 Water Use by Year



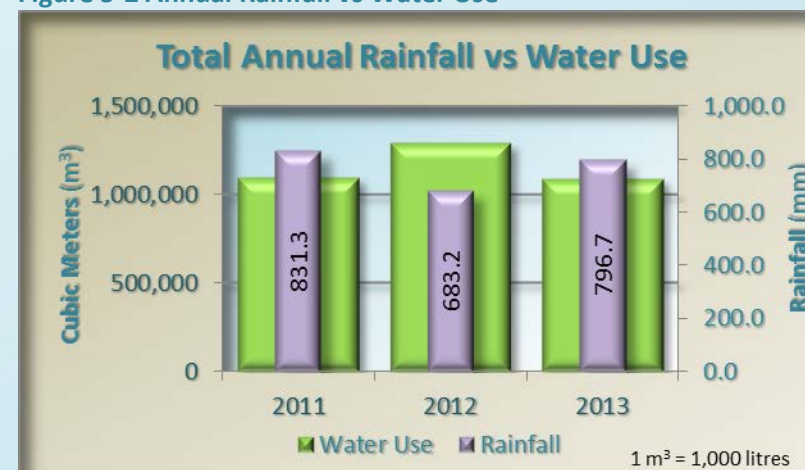
Information:

1 cubic meter is equal to 1,000 litres (1 m³ = 1,000 l)

For many locations in the City, water use is inversely proportional to rainfall. The more it rains, the lower the requirement for irrigation in parks and at golf courses. Rainfall in 2013 was about 17% higher than in 2012, so the requirement for irrigation dropped.

Figure 5-2 shows a comparison between the annual rainfall with the water use for the City.

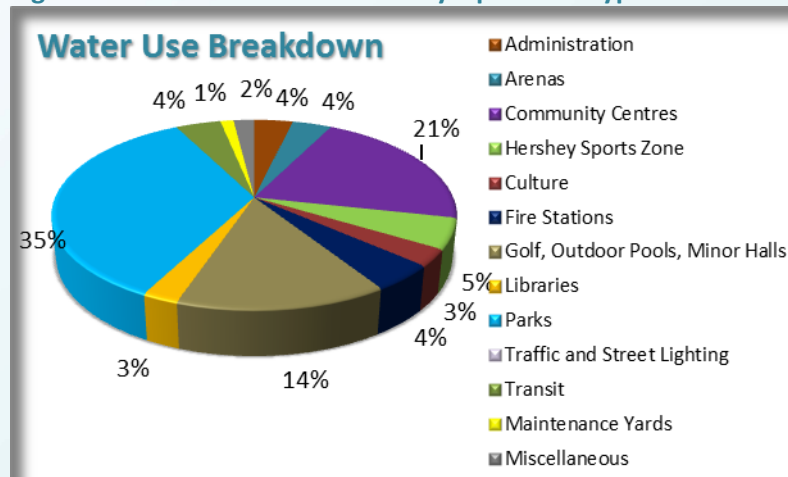
Figure 5-2 Annual Rainfall vs Water Use



Parks used 35% of the water consumed by the City in 2013, followed by community centres (21%) and golf courses and outdoor pools (14%).

Figure 5-3 shows the breakdown in percentage for the water use in the City for 2013.

Figure 5-3 Water Use Breakdown by Operation Type





6.0 ENERGY TEAM

The City of Mississauga Energy Management section is mandated with reducing the energy footprint and increasing the energy efficiency of the City of Mississauga facilities, as well as to help control the costs associated with the energy usage.

6.1 ENERGY MANAGEMENT TEAM

The Energy Management section for the City of Mississauga is the group primarily responsible for the energy efficiency of corporate facilities. Roles and responsibilities include:

Role	Responsibility
Manager, Energy Management	Manage and oversee various Energy Management actions and operations
Project Leader, Energy Management Awareness	Re-commission facilities, implement energy awareness program, initiate energy management measures and projects
Energy Management Coordinators	Monitor and verify energy consumption, prepare utility budgets, procure energy, carry out energy audits of facilities, implement energy management measures and projects
Energy Management Coop Student	Assist the team with various tasks.

6.2 ADDITIONAL ENERGY MANAGEMENT GUIDANCE AND SUPPORT

The Energy Management team works in partnership with several other departments and groups to help achieve improved energy efficiency for the City of Mississauga. Among the other positions that provide leadership, direction, and assistance would include:

Role	Responsibility
Environmental Advisory Committee (EAC)	This advisory committee offers advice and recommendations to Council to support the environmental direction of the Strategic Plan and Living Green Master Plan.
Commissioner, Corporate Services	Provide leadership to the department as a whole. Main sponsor of the various energy measures.
Director, Facilities and Properties Management	Provide over sight and direction to the division, including the Energy Management section.
Project Managers, Facilities and Property Development	Implement large projects involving new construction of facilities as well as large redevelopments of existing facilities (e.g. energy efficiency in the design and work).
Project Coordinators, Facilities and Property Development	Implement many energy measures and projects through capital life cycle replacements.
Buyer, Material Management	Assist Energy Management with contract implementation and energy procurement
Energy Champions	Help implement energy measures and improve energy awareness in facilities
Green Leaders	Employee Engagement program to help promote environmental sustainability
Environment Division	Provide environmental and sustainability awareness in the City, including residents and businesses

7.0 THE ENERGY CONSERVATION PLAN

All Energy Measures implemented from 2004 to 2018 will have paid for themselves fully by 2019, and will begin to pay for measures yet to come.

7.1 PLAN OVERVIEW

The City's **5 Year Energy Conservation Plan (2014-2019)** promises positive energy, financial and environmental results. Consider:

- **Energy usage.** The savings from energy measures are cumulative, i.e. the impact grows every year. For 2013, the savings from completed energy measures reached 4,700 MWh of electricity and 405,000 m³ of natural gas. By 2019, additional improvements will boost these annual savings to 8,900 MWh and 725,000 m³.
- **Cost savings.** Reduced usage means major cost savings - \$4.7 million resulting from energy measures completed from 2004-2013. By 2019, the total savings from energy measures should exceed the total investments in those measures.
- **GHG emissions.** By 2019, the GHG reductions from energy measures are expected to reach over 2,000 tonnes per year, double where the City was at in 2012, and almost a fourfold improvement in 10 years (from 2009).

To achieve these results, the City will implement a bold plan and a series of **Energy Measures** that will save on electricity, natural gas, oil, or other energy consumption within City of Mississauga facilities.

This section outlines the components that make up the 2014 – 2019 plan, organized by:

- Energy Monitoring and Benchmarking
- Energy Procurement
- Planning Process
- Energy Measure Implementation Plan
- Energy Savings
- Greenhouse Gas Savings
- Measure Costs and Savings
- LED Street Lighting Retrofit
- Energy Audit and Re-Commissioning

In the implementation plan, each measure can be classified as a Project, Process, or Program. Here's a simple way to differentiate them.

- **Project** = Technological – operational and technological actions. Examples: Lighting retrofit, new controls, efficient boiler, etc.
- **Process** = Organizational – building an energy conservation culture. Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.
- **Program** = People – Awareness, habits, procedures and feedback. Examples: Training staff in energy awareness,



Employee Participation Program-Identification of Improvements.

The only exceptions are the **City Wide Energy Audit** and **Re-commissioning**, which are covered later in this section and which can also be found in **Figure 7-1** under “**Other**”.

Neither of these measures results directly in energy savings. However, they are instrumental in identifying new measures and opportunities for energy savings in a facility.

7.1.1 ENERGY MONITORING AND BENCHMARKING

To control energy costs and consumption, it is very important to:

- know how much energy is being used in each facility; and
- compare consumption data with previous years.

Effective monitoring will help to identify and investigate variances at facilities, correct billing errors, or resolve the conditions causing an increase in consumption.

With benchmarking, energy use per unit of conditioned floor space (Energy Use Intensity – see **Section 3.5**) is compared to similar municipal buildings (after adjusting for weather differences). Looking at features of high-performance buildings helps to identify buildings where energy performance can be improved.

The City of Mississauga has been monitoring its energy use for over a decade, and maintains a historical database predating the year 2000 for most facilities. As it’s received, new energy data is added to this database.

Section 3.0 City of Mississauga Energy Picture provides the City of Mississauga’s energy use over the last three years.

7.1.2 ENERGY PROCUREMENT

The City’s total energy budget in 2013 was over \$18.5 million. With this spend, it is essential not only to work to reduce energy consumption, but also to have in place effective energy procurement policies and buying strategies. The policies and strategies need to factor in both cost savings and price stability, which are often at odds with one another.

7.1.3 PLANNING PROCESS

When creating an Energy Conservation Plan, some necessary steps are:

- Identify potential measures. Two good methods - energy audits or re-commissioning.
- Review the potential measure. Is it feasible? Will it adversely affect the facility in any way? Will facility staff or users accept it?
- Review available resources, i.e. budget and personnel.
- Implement the project.
- Monitor and verify the savings.

7.1.4 ENERGY MEASURE IMPLEMENTATION PLAN

In the following chart, **Figure 7-1**, measures fall under one of three categories:

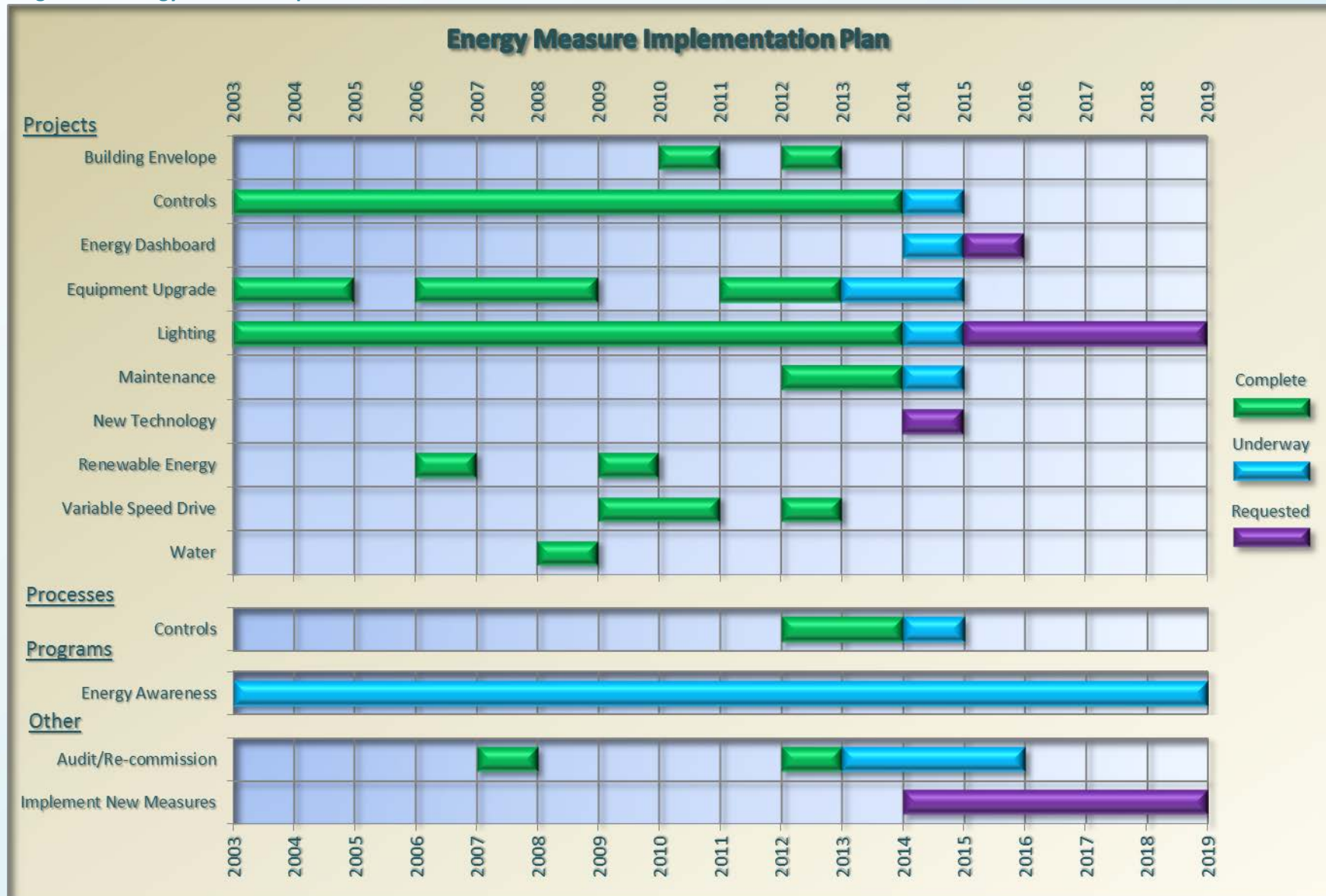
- **Completed** – has been successfully implemented.
- **Underway** – in the process of being implemented, or approved but installation has not yet started.
- **Requested** – being planned, where funding has been requested, but not yet approved.

Note that some measures under the **Requested** status may not be approved. In order to be fiscally responsibly, the City of Mississauga limits the capital budget allocated for each year. As a result, many projects and requests may be deferred for a request of a higher importance or priority.

Figure 7-1 shows the implementation schedule for individual measures under Projects, Processes, Programs, and Other. For a more detailed schedule of energy measures, see **Appendix 1.0: Energy Measure Implementation Plan**. For a description, see **Appendix 2.0: Energy Measure Descriptions**. The measures in each Appendix are sorted by Type, then Group.

Once the Energy Audit is completed, many more energy measures will be identified and added to the schedule, and this plan will be updated periodically to reflect that. In the meantime, the line item “Implement New Measures” covers those expected measures.

Figure 7-1 Energy Measure Implementation Plan



7.1.5 ENERGY SAVINGS

In the last decade, the Energy Management Measures implemented by the City of Mississauga have saved a total of 23.7 thousand MWhs of electricity and 1.8 million cubic meters of natural gas.

The City has been implementing Energy Measures in City facilities for well over a decade.

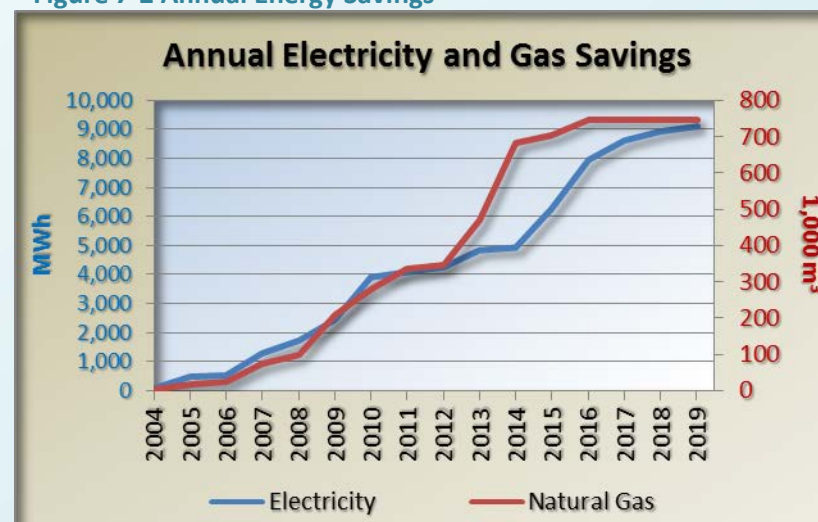
Since 2004, these projects have resulted in a total reduction of 23,700,000 kilowatt hours of electricity, and 1,850,000 cubic meters of natural gas.

Most of these measures provide cumulative savings. That means a project implemented in 2004, for example, would continue to save in 2013. The annual savings increase every year as additional measures are implemented. By 2013 the cumulative annual savings of electricity and natural gas were 4.73 million kilowatt hours and 405 thousand cubic meters respectively.

By 2019, the annual energy savings due to implemented Energy Measures will increase to 9,100,000 kilowatt hours of electricity, and 749,000 cubic meters of natural gas.

Figure 7-2 shows the annual savings from Energy Measures implemented since 2004, including the projected savings from the requested Energy Measures.

Figure 7-2 Annual Energy Savings



Information:

The annual savings are the savings each year, not to be confused with cumulative total savings.

The cumulative total is the sum of the annual savings in the given time period.

7.1.6 GREENHOUSE GAS SAVINGS

The GHG reductions from the completed and planned Energy Measures, like the energy savings, are cumulative. That is, for each measure implemented, the GHG reductions would increase that year, and every year after, as long as the measure is in place.

The annual reduction of CO₂ for the projects completed since 2004 is estimated to be 1,357 tonnes per year, as of 2013.

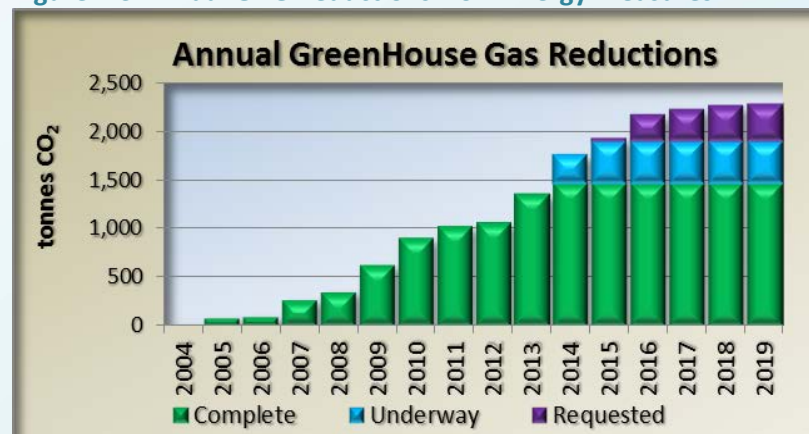
Did you know...?

Reducing 1,357 tonnes of CO₂ is equal to removing 266 cars off the road.

By 2019, with the planned measures implemented, the annual reduction should reach 2,290 tonnes, or an additional 183 cars off the road.

Figure 7-3 shows the annual reductions for the Completed, Underway, and Requested energy measures.

Figure 7-3 Annual GHG Reductions from Energy Measures

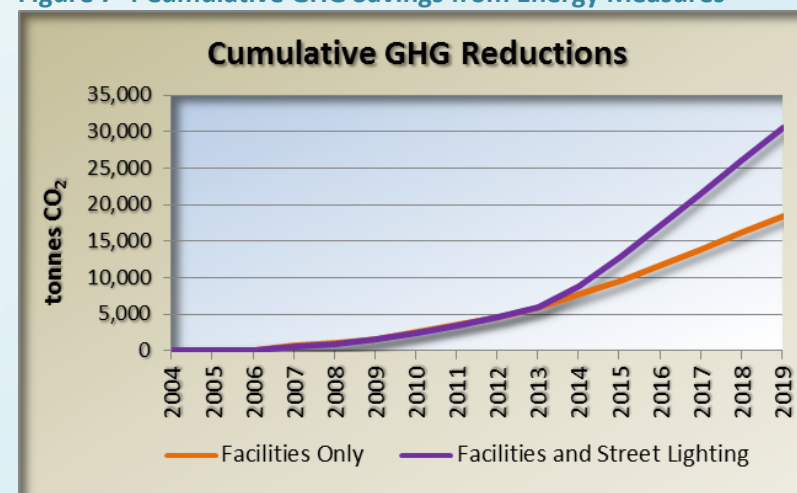


Looking at the cumulative reduction in GHG emissions since 2004, the implemented energy measures have reduced the City's CO₂ emissions by 5,800 tonnes. By 2019, implementing all the requested measures should raise the total CO₂ savings to 18,480 tonnes.

Including the implementation of the LED Street Lighting (see **Section 7.2.8**), the 2019 total increases to 30,500 tonnes.

Figure 7-4 below shows the cumulative GHG reductions over the years, with reductions in facilities alone, and reductions including the LED Street Lighting Retrofit project.

Figure 7-4 Cumulative GHG Savings from Energy Measures

**Information:**

All GHG savings from Energy Measures are calculated using the 2012 emission factors of 0.096 kg/kWh for electricity, and 1.891 kg/m³ for natural gas.

GHG Emissions = Energy Use x Emission Factor

7.1.7 MEASURE COSTS AND SAVINGS

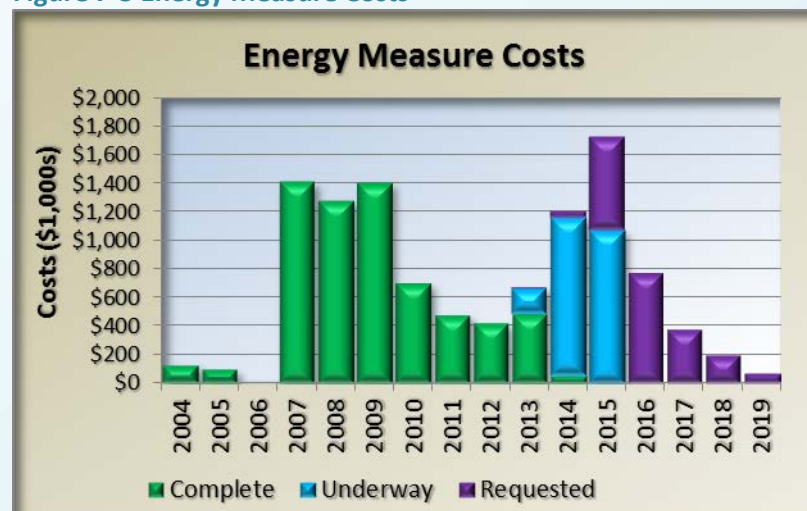
Costs:

The total expenditure on completed measures between 2004 and 2014 was just over \$6.63 million. That includes the cost of

replacing equipment that had reached end of life with higher efficiency equipment. By 2019, the total investment of the planned measures for Energy Efficiency will reach an estimated \$11 million.

Figure 7-5 shows the year by year investment on Energy Measures by the City of Mississauga.

Figure 7-5 Energy Measure Costs



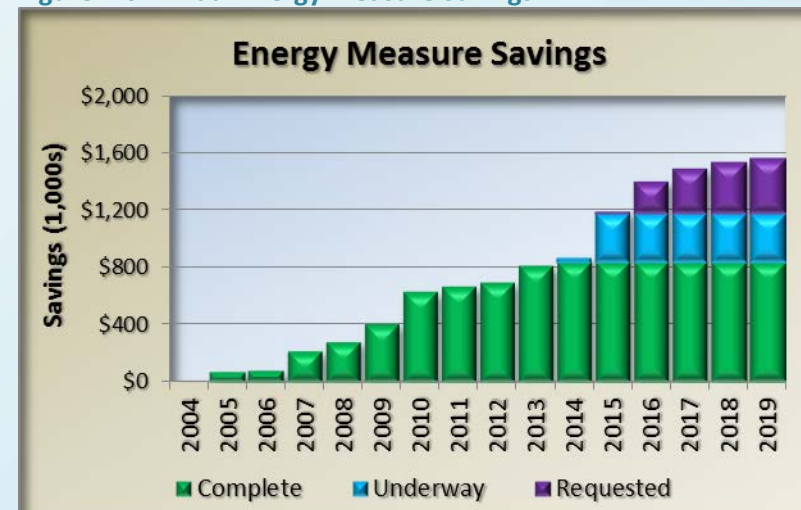
Savings:

The annual savings from energy measures implemented since 2004, was an estimated \$813,000 in 2013. The total cumulative savings (the sum of all the annual savings) from energy measures over this time period reached an estimated \$3.9 million. Including the expected results of upcoming measures increases the projected savings to \$12 million by 2019.

Figure 7-6 shows the annual expected utility cost savings from Energy Measures.

Note: Savings for 2014 to 2019 are based on estimated escalating electricity rates for those years.

Figure 7-6 Annual Energy Measure Savings



Note: The values above in **Costs** and **Savings** do not include expected costs to implement measures resulting from the 2014 Energy Audit and Re-Commissioning, or the savings from such measures. As these measures become known, their costs and savings will be included in future updates to this plan.

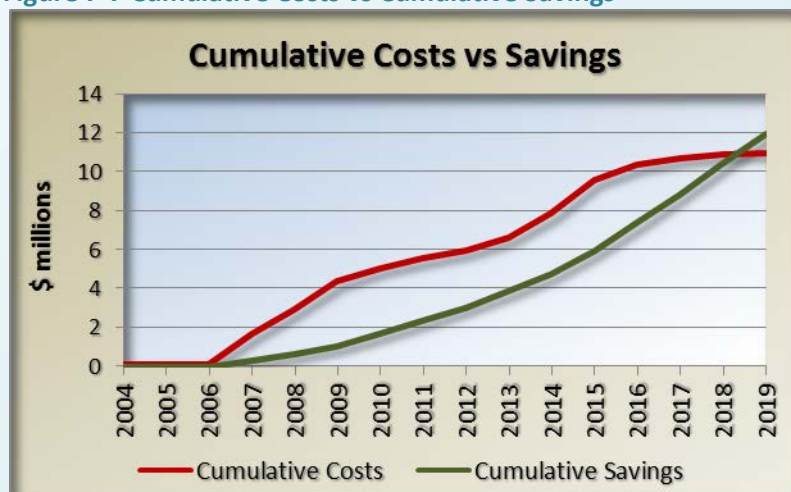
Cumulative Costs vs Cumulative Savings

Similar to the energy savings, the utility cost savings are cumulative. For example, a project completed in 2010 could save \$10,000 in electricity every year, while the cost of that measure will only be incurred once.

Although the incurred costs of the implemented measures vary year to year, the savings from these measures increase each year, as they are combined.

Figure 7-7 shows the Cumulative Costs vs Cumulative Savings from the Energy Measures.

Figure 7-7 Cumulative Costs vs Cumulative Savings



7.1.8 LED STREET LIGHTING RETROFIT

An additional measure not captured in the above **Costs** and **Savings**, is the retrofit of the City's street lighting to LED technology.

The project, which began in late 2012, should be completed by the end of 2014. It is expected to save upwards of 55% of the original electrical load, or 22,800 MWh each year.

Did you know...?

A reduction of 22,800 MWh each year is the same as turning off 43,350 sixty watt light bulbs that were left on continuously for a full year.

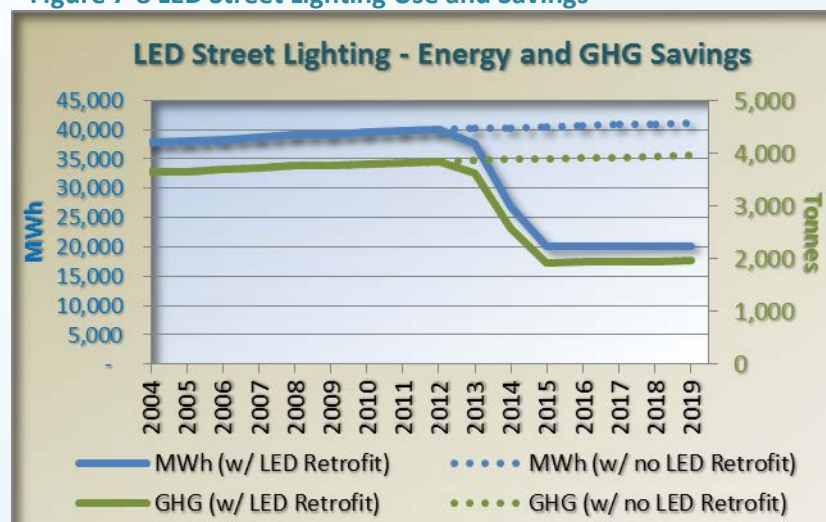
In addition to the electricity and cost savings, the LED Street Lights should also reduce the City's CO₂ emissions 1,960 tonnes each year.

Did you know...?

Savings 1,960 tonnes of CO₂ emissions each year is the same as removing 385 cars off the road.

Figure 7-8 shows the estimated energy and GHG use for the City's Street Lighting with the LED retrofit versus the energy use and GHG emissions if the LED retrofit was not implemented.

Figure 7-8 LED Street Lighting Use and Savings



7.1.9 ENERGY AUDITS AND RE-COMMISSIONING

The Energy Measures to be identified through the Energy Audit and Re-commissioning will be implemented between 2015 and 2019.

As details for these measures are not yet known, they are not included in the reported savings or costs.

Energy Audit

An Energy Audit reviews a facility's equipment to look for ways to:

- identify opportunities for energy efficiency, capital retrofits or investments as well as operational and maintenance (O&M) improvements;
- enhance the occupants comfort, health and safety, and productivity;

- enhance building functionality; and
- help reduce environmental impact and GHG emissions.

A previous City-Wide Energy Audit of a majority of facilities, in 2007, led to energy measures that were implemented over 2008 to 2012.

Re-commissioning

This is a process for existing buildings. It ensures that equipment and systems are operating optimally to meet current occupant needs.

Re-commissioning provides a rigorous investigation approach to identify problems and integration issues. The primary focus is on identifying "low cost/no cost" operational improvements given the building's current usage to obtain comfort and energy savings. It may be done alone or in concert with a retrofit project.

This is a collaborative process. It looks at how and why a building's systems are operated and maintained as they are, and then identifies ways to improve overall building performance.

As a process, rather than a set of prescriptive measures, re-commissioning adapts to meet the specific needs of each building owner. Re-commissioning plays an important role in addressing whole building performance. That perspective looks at buildings as integrated systems, rather than a set of individual components.

Specifically, re-commissioning:

- Improves the building's overall performance by optimizing energy efficient design features and directly addressing equipment performance and system integration issues.
- Ensures that building staff have the knowledge and documentation needed to operate and maintain the building.

- Evaluates the building's environmental quality and optimizes existing systems for current loads and configuration.

7.2 CONCLUSION

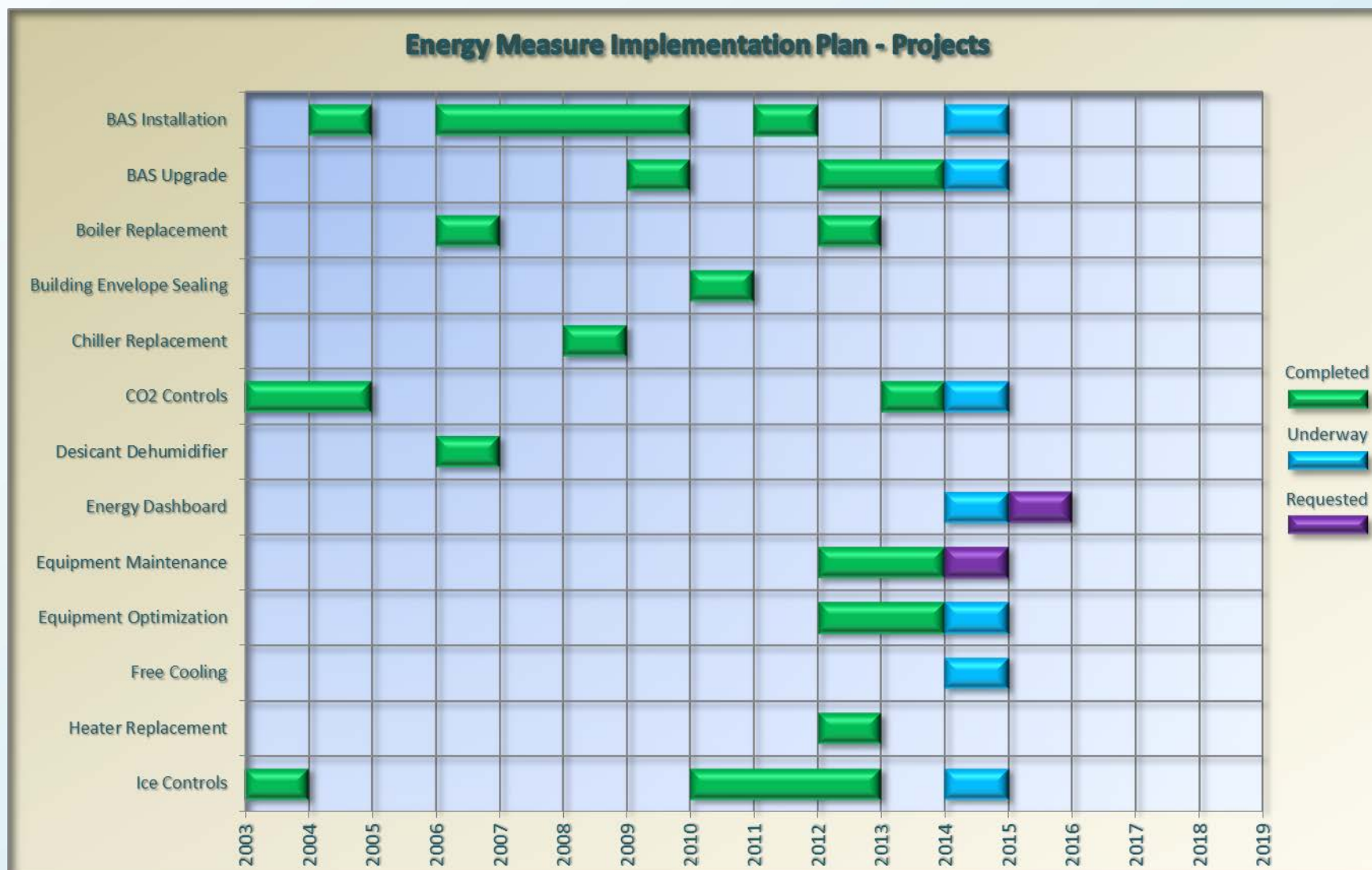
Along with implementing the necessary measures, the City will update this Energy Management Plan each year until 2019. This will provide the most recent energy and GHG data, and highlighting changes in the status of energy measures. In 2019, a new plan will show the progress achieved from 2014-2019, and objectives for the following five years.

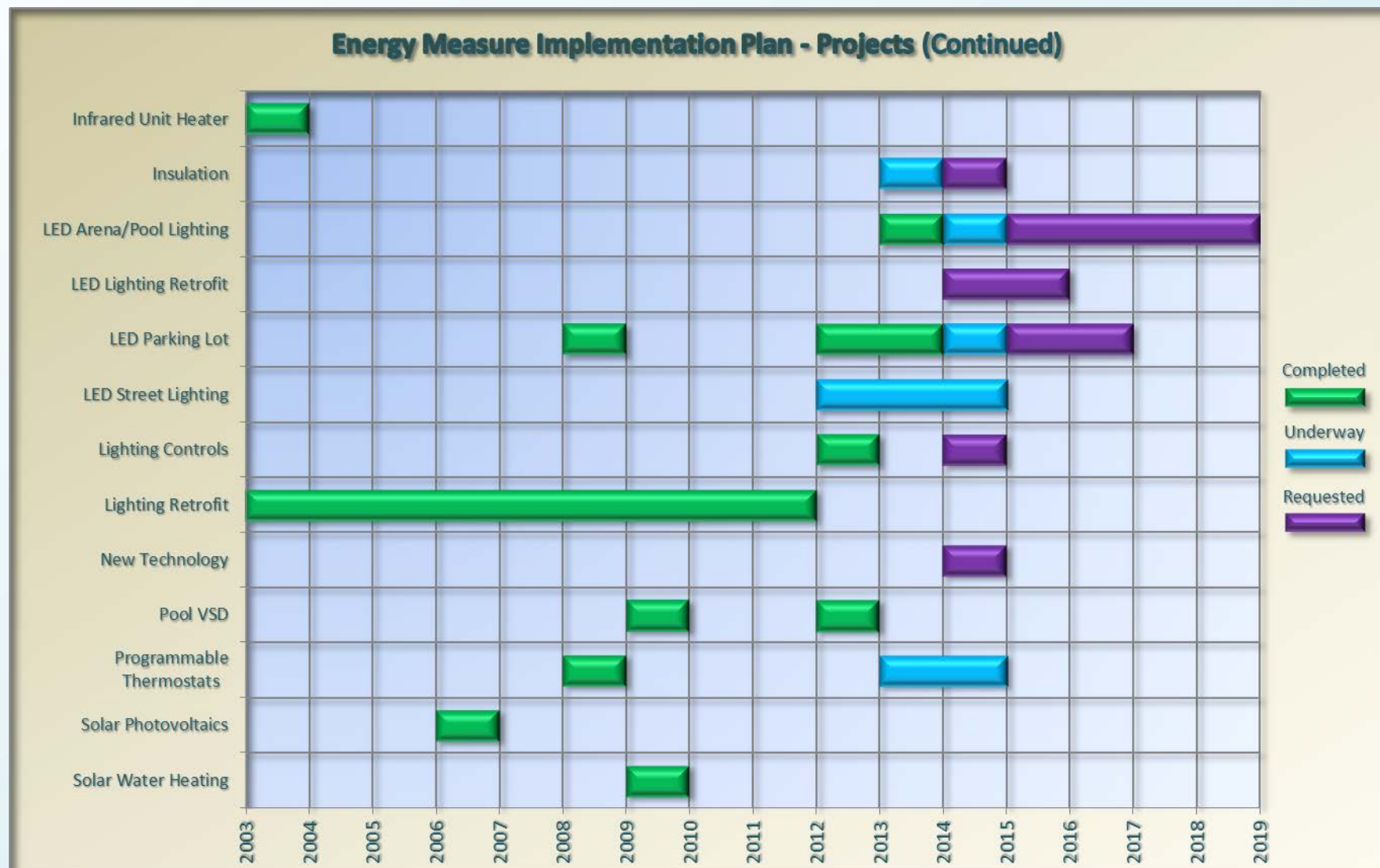
Since 2001, the City has implemented two comprehensive energy management plans. This third plan – with an ambitious yet achievable target of a 5% reduction in energy use and GHG emissions – builds on previous successes.

By closely monitoring how energy is used, and taking steps to manage it cost-effectively, the City continues to nurture a strong culture of improved energy conservation and performance

APPENDIX 1.0: ENERGY MEASURE IMPLEMENTATION PLAN

The charts below show the schedule of the various Energy Measures that the City of Mississauga has implemented, or plan to implement.

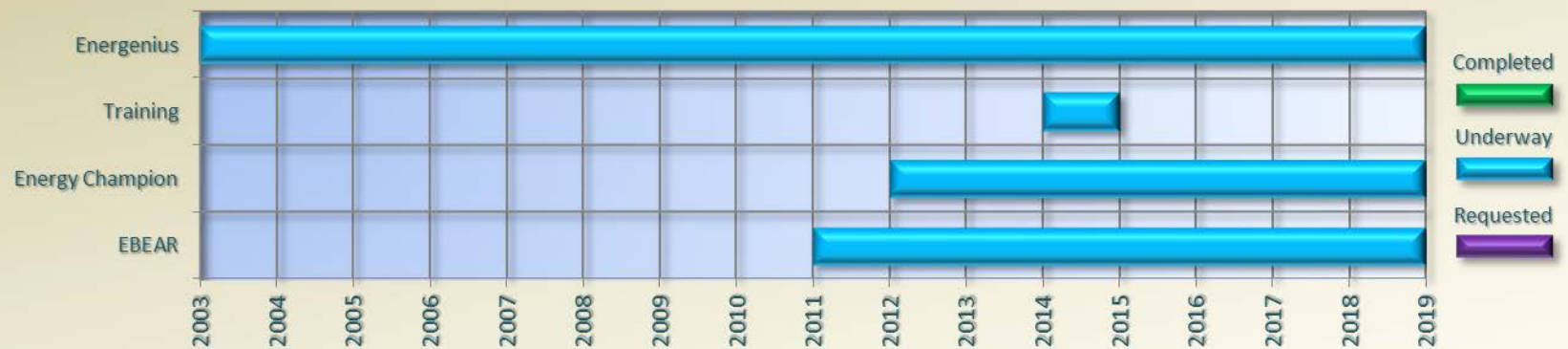


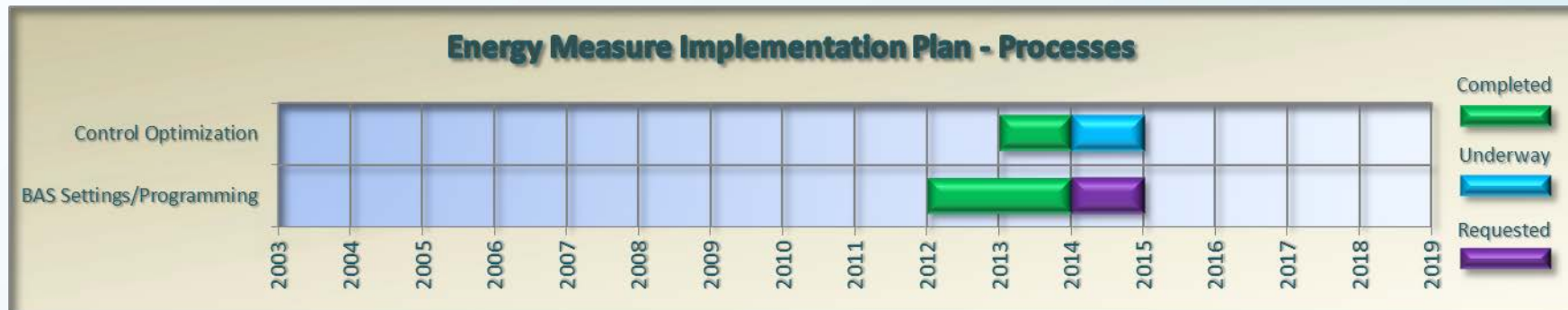


Energy Measure Implementation Plan - Projects (Continued)



Energy Measure Implementation Plan - Programs





For brief outlines of all these measures, see [Appendix 2.0: Energy Measure Descriptions](#).

For financial details, see [Appendix 3.0: Energy Measure Costs and Savings](#).



APPENDIX 2.0: ENERGY MEASURE DESCRIPTIONS

This section provides brief descriptions of the projects, processes and programs that make up the Energy Measures in the Energy Conservation Plan. For costs and associated savings, see [Appendix 3.0](#).

A2.1 PROJECTS

Project = Technological – operational & technological actions.

Examples: Lighting retrofit, new controls, efficient boiler, etc.

A2.1.1 BUILDING ENVELOPE

Building Envelope Sealing

Minimizing heat loss by installing weather stripping on windows and doors, improving the building envelope. Saves natural gas for heating.

Window Coating

Installing a film on building windows to: a) reduce heat loss in winter, cutting heating load; and b) reduce heat gain in summer, cutting air conditioning load. Saves both natural gas and electricity.

A2.1.2 CONTROLS

BAS Installation

Installation of a Building Automation System (BAS). Can also be known as a Building Management System. A BAS is a network of controllers designed to monitor and control the mechanical (HVAC, ventilation, and dehumidification) and lighting systems of a building.

The BAS can be used to operate the equipment on a schedule, i.e. setting back, or turning off, during unoccupied periods.

BAS Upgrade

An upgrade or modification to an existing Building Automation System. Usually entails new equipment, or improvements to the controls and/or control strategy.

CO2 Controls

Controls used to monitor CO2 levels in a space and adjust fresh air ventilation according to needs. That reduces outside air brought into the building during unoccupied periods, reducing the need to heat/cool the air.

Ice Controls	Controls used to monitor ice temperature and control the ice plant in an arena. Allows for adjustments to ice temperature depending on use type, and save energy during unoccupied periods by setting back temperatures.
Lighting Controls	<p>Installation of new controls to better operate lighting. Could include:</p> <ul style="list-style-type: none"> • Occupancy sensors to turn off lighting when a room is unoccupied. • Scheduling control (through a BAS or other control system), enabling the lighting to be on or off as required.
Programmable Thermostats	Designed to adjust the temperature according to a series of programmed settings that take effect at different times. Programmable thermostats may also be called setback thermostats or clock thermostats.
Unit Heater Disconnect	Controls that sense when a large garage or bay door is left open and turns off the unit heaters in the immediate area.
Vending Miser	Special controls that turn off a vending machine, and turn it on when someone approaches by means of a sensor. The controls also cycle the compressors in the unit to ensure the contents stay cold.

A2.1.3 ENERGY DASHBOARD

Energy Dashboard	<p>Computerized display showing a facility's energy (electricity and natural gas) and water usage, both current, and over a period of time.</p> <p>The Energy Dashboard helps increase the energy awareness of facility operations staff and the public.</p>
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A2.1.4 EQUIPMENT UPGRADE

AHU Replacement	Replacing an Air Handling Unit (or rooftop, furnace or other general HVAC piece of equipment) with a higher efficiency unit.
Boiler Replacement	Replacing an existing boiler with a higher efficiency boiler. Normally performed when the existing equipment is at or near the end of its useful life.
Chiller Replacement	Replacing a chiller (used in air conditioning and ice plants) with a more efficient unit. Normally performed when the existing equipment is at or near the end of its useful life.
Desiccant Dehumidifier	Installation of a gas fired dehumidifier to replace an electric unit.

Free Cooling	Using outside air to provide cool a facility rather than an air conditioning unit. Generally done during shoulder seasons (i.e. spring and fall) when the temperatures are cool.
Heater Replacement	Replacing a heater with a more efficient unit.
Infrared Unit Heater	Replacing an electric or forced air unit heater with a more efficient infrared unit heater. An infrared unit heater heats the objects in the space, rather than the air, avoiding the loss of heat when doors are opened. Usually installed in areas with large garage doors (fire stations, truck bays, etc.).
Insulation	Adding/fixing insulation on piping carrying hot fluids, on ductwork or equipment. The insulation helps reduce heat loss and saves on energy required for heating.

A2.1.5 HEAT RECOVERY

Waste Heat Recovery	A process that takes advantage of waste heat, i.e. the heat from exhaust air, the ice-making process in an arena or water drained from a pool. This waste heat can be used for preheating incoming air, space heating or pre-heating the hot water in the facility.
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A2.1.6 IMPLEMENT NEW MEASURES

Energy Audit Measures	Implementation of measures determined by the Energy Audit
Re-commissioning Measures	Implementation of measures determined by Re-commissioning

A2.1.7 LIGHTING

LED Arena/Pool Lighting	Replacing the lighting, usually metal halide or mercury vapour, in an arena and/or pool with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).
LED Lighting Retrofit	Replacing the standard lighting with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).
LED Parking Lot	Replacing the standard lighting in a parking lot with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming, on/off control).

LED Street Lighting Replacing the standard street lighting with LED fixtures. The LED fixture would provide higher efficiency (lower energy use), better life (lower maintenance costs), and better control (dimming during shoulder hours).

Lighting Retrofit Modification to the lighting of a facility to save energy. Can involve:

- Replacing existing lighting with more efficient type lamps and fixture.
- Reducing lighting where areas are over lit.
- Installation of occupancy sensors and other controls to turn off lights when spaces are unoccupied.

A2.1.8 MAINTENANCE

Equipment Maintenance Repairing existing equipment for energy efficiency. This does not include all maintenance performed on equipment.

Equipment Optimization Adjustments of the operation or controls of equipment to make it operate more efficiently in general and energy efficiently.

A2.1.9 NEW TECHNOLOGY

New Technology Installation of a new or recent technology or equipment meant to improve energy efficiency. Generally, unproven technology is installed at a single location for testing. Once proven, it is then installed in more facilities/locations.

A2.1.10 RENEWABLE ENERGY

Solar Photovoltaic Installation of solar panels to generate electricity from the energy of the sun.

Solar Water Heating A system that uses heat from the sun to pre-heat the domestic hot water of a building.

A2.1.11 VARIABLE SPEED DRIVE

Pool VSD A Variable Speed Drive (VSD) that installed to control the speed of a pools filtration pump.

The filtration system, the system that removes contaminants from the pool water, is generally designed to operate at speeds based on full occupancy of the pool.

The VSD controls allows the pump motor to operate at lower speeds during periods of low to no occupancy (periods where the contaminant levels are low), savings large amounts of energy.

Variable Speed Drive Installation of controls on electric motors which allows the motor speed to be reduced when the requirements on the motor or equipment are lower.

A slight reduction in the speed of an electric motor can have huge savings in electricity.

A2.1.12 WATER

Water Retrofit

A water retrofit generally involves installing more efficient washroom fixtures, including:

- low flow toilets;
- faucet aerators and low flow shower heads;
- faucet/tap sensors; and
- toilet/urinal flush sensors.

Reducing hot water use saves the natural gas (or electricity) required for heating the water.



A2.2 PROCESSES

Process = Organizational – building an energy managing culture.

Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.

A2.2.1 CONTROLS

Control Optimization Optimizing the controls for equipment to provide more efficient operation. Includes:

- Improving equipment schedules to better match usage patterns and setback during periods of non-occupancy or non-use.
- Adjusting set points such as temperatures and outside air volumes, to save energy while maintaining building comfort.
- Adjusting the way equipment runs to improve its efficiency.

A2.3 PROGRAMS

Program = People – Awareness, habits, procedures & feedback.

Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.

A2.3.1 ENERGY AWARENESS

Energenius A strategy to help staff understand and accept the importance of energy conservation at all City facilities, and the initiatives of the Energy Management Team.

Includes a program that recognizes City employees for providing energy efficiency ideas.

EBEAR Stands for Energy Benchmarking, Energy Awareness and Retro-commissioning (EBEAR). The City launched the program in January 2012 to improve energy performance in City-owned and operated facilities. The three elements:

1. Energy Benchmarking compares a facility's EUI to other facilities of the same type, ranks a facility relative to the best in the portfolio of facilities, and sets targets for energy cost reduction.
2. Energy Awareness efforts help train and educate facility staff and users on how energy resources are being



used in a facility, and how their actions can help bring down operating costs, reduce greenhouse gas emissions, and create a better environment.

3. Retro-commissioning identifies less-than-optimal performance in a facility's existing equipment and control systems, and makes necessary upgrades or enhancements to save energy and cost.

Energy Champion

An Energy Champion is the “voice of energy efficiency” committed to improve the energy performance of City facilities by:

- Promoting energy conservation and building an energy-saving culture in our workplace.
- Being a point of contact for energy-related issues within a facility.
- Advocating for energy efficiency and conservation in regular staff or departmental meetings.
- Motivating staff to help maintain efficient operations within a facility.

Green Leaders

An ongoing program to provide information and incentives to staff to take sustainable actions and monitor environmental sustainability in the workplace. The ultimate goal is to create a green culture throughout the corporation.

Training

Providing training to City staff to help improve their energy awareness in key areas, such as BAS operation.

APPENDIX 3.0: ENERGY MEASURE COSTS AND SAVINGS

This section provides the total costs and annual savings (both for energy use, GHG, and utility costs). For descriptions of the measures, see [Appendix 3.0](#).

A3.1 PROJECTS

Total Expenditure and Savings for Energy Measure Projects:

Status	Measure Cost	Annual Savings			
		\$	kWh	m3	GHG (tonnes)
Complete	\$6,254,100	\$818,300	4,770,200	552,600	1,502.9
Underway	\$29,667,500	\$3,017,000	23,940,100	39,500	2,372.9
Requested	\$2,093,300	\$369,100	2,898,900	44,100	361.7
Totals	\$38,014,900	\$4,204,400	31,609,200	636,200	4,237.5

A breakdown by Measure Type is provided in the following tables.

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.1 BUILDING ENVELOPE		\$152,000	\$29,600	111,100	58,600	121
Building Envelope Sealing	Complete	\$115,800	\$13,500	0	56,700	107.2
	Underway	\$0	\$0	0	0	0.0
	Requested	\$0	\$0	0	0	0.0
Window Coating	Complete	\$36,200	\$16,100	111,100	1,900	14.3
	Underway	\$0	\$0	0	0	0.0
	Requested	\$0	\$0	0	0	0.0



Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.2 CONTROLS		\$1,989,800	\$296,300	\$1,378,100	\$185,100	482
BAS Installation	Complete	\$1,317,200	\$143,900	862,000	97,000	266.2
	Underway	\$84,000	\$1,500	6,300	200	1.0
	Requested	\$0	\$0	0	0	0.0
BAS Upgrade	Complete	\$16,300	\$13,000	20,900	31,000	60.6
	Underway	\$42,000	\$70,200	139,100	5,400	23.6
	Requested	\$0	\$0	0	0	0.0
CO2 Controls	Complete	\$16,400	\$5,400	19,000	12,400	25.3
	Underway	\$2,000	\$3,300	2,800	9,200	17.7
	Requested	\$4,500	\$200	0	900	1.7
Ice Controls	Complete	\$408,200	\$32,000	228,300	0	21.9
	Underway	\$1,000	\$7,000	0	0	0.0
	Requested	\$0	\$0	0	0	0.0
Lighting Controls	Complete	\$5,000	\$900	9,200	0	0.9
	Underway	\$0	\$0	0	0	0.0
	Requested	\$2,500	\$300	2,700	0	0.3
Programmable Thermostats	Complete	\$5,300	\$2,200	11,900	2,800	6.4
	Underway	\$5,300	\$4,300	2,300	18,200	34.6
	Requested	\$0	\$0	0	0	0.0
Unit Heater Disconnect	Complete	\$40,700	\$1,800	0	8,000	15.1
	Underway	\$0	\$0	0	0	0.0
	Requested	\$0	\$0	0	0	0.0
Vending Miser	Complete	\$39,400	\$10,300	73,600	0	7.1
	Underway	\$0	\$0	0	0	0.0
	Requested	\$0	\$0	0	0	0.0



Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.3 EQUIPMENT UPGRADE		\$1,540,800	\$146,200	909,600	49,800	181
Boiler Replacement	Complete	\$120,000	\$9,300	0	38,200	72.2
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Chiller Replacement	Complete	\$1,047,600	\$31,900	226,900	0	21.8
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Desiccant Dehumidifier	Complete	\$322,600	\$88,600	630,000	0	60.5
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Free Cooling	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$25,100	\$11,800	29,100	0	2.8
	Tentative	\$0	\$0	0	0	0.0
Heater Replacement	Complete	\$10,300	\$1,900	23,600	-1,800	-1.1
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Infrared Unit Heater	Complete	\$10,500	\$1,100	0	5,200	9.8
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Insulation	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$4,000	\$1,300	0	6,500	12.3
	Tentative	\$700	\$300	0	1,700	3.2

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.4 ENERGY DASHBOARD		\$238,000	\$58,300	344,800	41,500	112
Energy Dashboard	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$30,000	\$0	0	0	0.0
	Tentative	\$208,000	\$58,300	344,800	41,500	111.6
A3.1.5 HEAT RECOVERY		\$610,500	\$42,200	59,400	129,900	251
AHU Heat Recovery	Complete	\$595,500	\$39,200	59,400	129,900	251.3
	Ongoing/Pending	\$15,000	\$3,000	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.6 LIGHTING		\$32,167,700	\$3,413,700	27,664,100	0	2,656
LED Arena/Pool Lighting	Complete	\$79,600	\$0	0	0	0.0
	Ongoing/Pending	\$313,800	\$45,000	346,300	0	33.2
	Tentative	\$1,160,900	\$187,400	1,446,200	0	138.8
LED Lighting Retrofit	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$464,700	\$86,100	842,200	0	80.9
LED Parking Lot	Complete	\$24,400	\$2,100	15,100	0	1.4
	Ongoing/Pending	\$645,300	\$74,400	596,100	0	57.2
	Tentative	\$251,000	\$36,200	259,900	0	25.0
LED Street Lighting	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$28,500,000	\$2,795,200	22,818,100	0	2,190.5
	Tentative	\$0	\$0	0	0	0.0

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
LIGHTING (CONTINUED)		\$32,167,700	\$3,413,700	27,664,100	0	2,656
Lighting Retrofit	Complete	\$728,000	\$187,300	1,340,200	0	128.7
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.7 MAINTENANCE		\$231,600	\$27,000	0	113,400	214
Equipment Maintenance	Complete	\$115,800	\$13,500	0	56,700	107.2
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Equipment Optimization	Complete	\$115,800	\$13,500	0	56,700	107.2
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.8 NEW TECHNOLOGY		\$1,000	\$300	3,100	0	0
New Technology	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$1,000	\$300	3,100	0	0.3
A3.1.9 RENEWABLE ENERGY		\$515,100	\$26,600	29,500	22,700	46
Solar Photovoltaic	Complete	\$274,700	\$21,200	29,500	0	2.8
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Solar Water Heating	Complete	\$240,400	\$5,400	0	22,700	42.9
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.10 VARIABLE SPEED DRIVE		\$492,600	\$158,600	1,109,500	11,700	129
Pool VSD	Complete	\$114,700	\$42,800	305,600	0	29.3
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Variable Speed Drive	Complete	\$377,900	\$115,800	803,900	11,700	99.3
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.11 WATER		\$75,800	\$5,600	0	23,500	44
Water Retrofit	Complete	\$75,800	\$5,600	0	23,500	44.4
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0

A3.2 PROCESSES

Total Expenditure and Savings for Energy Measure Processes:

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.2.1 NEW TECHNOLOGY		\$43,000	\$41,800	30,900	150,700	288
BAS Settings/Programming	Complete	\$10,600	\$10,300	30,900	28,000	55.9
	Ongoing/Pending	\$14,300	\$19,800	0	86,100	162.8
	Tentative	\$6,300	\$700	0	3,400	6.4
Control Optimization	Complete	\$2,000	\$1,100	0	5,600	10.6
	Ongoing/Pending	\$9,300	\$9,800	0	27,200	51.4
	Tentative	\$500	\$100	0	400	0.8

A3.3 ENERGY AUDIT/RE-COMMISSIONING

Total Expenditures for Energy Auditing and Re-Commissioning.

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.3.1 AUDIT/RE-COMMISSION		\$1,490,400	\$0	0	0	0
Energy Audit	Complete	\$290,700	\$0	0	0	0.0
	Ongoing/Pending	\$709,400	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Re-commissioning	Complete	\$106,000	\$0	0	0	0.0
	Ongoing/Pending	\$384,300	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0

Note: For the Energy Audits and Re-Commissioning, the savings come from the new Energy Measures and Opportunities that are identified from the procedure.

Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.3.2 IMPLEMENT NEW MEASURES		\$0	\$0	0	0	0
Energy Audit Measures	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
Re-commissioning Measures	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0

Note: Costs and savings are not yet known for Energy Audit and Re-commissioning measures. Details will become available once the audit/re-commissioning is performed.

APPENDIX 4.0: ENERGY MEASURE LOCATIONS

The following tables list the locations where energy measure have been or will be implemented. These are sorted by measure grouping (projects, processes, programs), then measure type, then measure status (Complete, Underway, Requested)

A4.1 PROJECTS

Measure	Status	Locations
A4.1.1 BUILDING ENVELOPE		
Window Coating	Complete	City Centre Transit Terminal
	Underway	
	Requested	



Measure	Status	Locations
Building Envelope (Continued)		
Building Envelope Sealing	Complete	Adamson Estate - Derry House, Adamson Estate - Main House, Animal Control Centre, Benares Estate - House, Benares Estate - Visitor Centre, Bradley Museum - Museum, Bradley Museum - The Anchorage, Burnhamthorpe Community Centre & Arena, Burnhamthorpe Library & Maja Prentice Theatre, Carmen Corbasson Community Centre, Cawthra Elliot Estate - House, Chappel Estate - House, City Centre Transit Terminal, Clarke Memorial Hall, Clarkson Community Centre Library Arena & Pool, Clarkson Yard, Credit Village Marina, Fire Station 101 (HQ), Fire Station 102 (Lakeview), Fire Station 103 (Clarkson), Fire Station 106 (Dixie), Fire Station 107 (Erindale), Fire Station 108 (Streetsville), Fire Station 109 (Training), Fire Station 110 (Queensway), Fire Station 111 (Meadowvale), Fire Station 112 (Creditview), Fire Station 114 (Heartland), Fire Station 115 (Erin Mills), Fire Station 116 (Old West Malton), Fire Station 117 (North Dixie), Fire Station 118 (East Credit), Frank McKechnie Community Centre, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Lakefront Promenade Maintenance Depot, Lakefront Promenade Marina, Lakeview Golf Course, Lakeview Library, Living Arts Centre, Lorne Park Hall, Lorne Park Library, Malton Community Centre, Malton Day Care Centre, Malton Hall (Victory), Malton Satellite Terminal, Malton Yard, Mary Fix House, Mavis Maintenance Hut, Mavis North, Mavis South, Meadowvale 4 Rinks, Meadowvale Community Centre, Meadowvale Community Theatre, Meadowvale Depot, Meadowvale Village C.C. Hall, Mississauga Senior Citizen Centre, Mississauga Canoe Club, Mississauga City Hall, Mississauga Valley Community Centre, Ontario Court of Justice, Port Credit Arena, Port Credit Library, Rivergrove Community Centre & Pool, Semenyk Crt - T&W Administration-TEP, South Common Community Centre Library & Pool, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair
	Underway	
	Requested	



Measure	Status	Locations
A4.1.2 CONTROLS		
BAS Installation	Complete	Burnhamthorpe Community Centre & Arena, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Frank McKechnie Community Centre, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Malton Community Centre, Malton Satellite Terminal, Malton Yard, Mavis South, Meadowvale 4 Rinks, Meadowvale Community Centre, Meadowvale Depot, Mississauga Valley Community Centre, Semenyk Crt - T&W Administration-TEP
	Underway	City Centre Transit Terminal
	Requested	
BAS Upgrade	Complete	Clarkson Yard, Hershey Centre, Meadowvale 4 Rinks, South Common Community Centre Library & Pool
	Underway	Hershey Centre, Huron Park Community Centre Pool & Arena, Meadowvale 4 Rinks, Mississauga Valley Community Centre, Tomken Twin Arena
	Requested	
CO₂ Controls	Complete	Burnhamthorpe Library & Maja Prentice Theatre, Huron Park Community Centre Pool & Arena, Living Arts Centre
	Underway	City Centre Transit Terminal
	Requested	Hershey Centre Sports Complex
Ice Controls	Complete	Hershey Centre, Iceland Arena
	Underway	Meadowvale 4 Rinks
	Requested	
Lighting Controls	Complete	Iceland Arena
	Underway	
	Requested	South Common Community Centre Library & Pool



Measure	Status	Locations
Controls (Continued)		
Programmable Thermostats	Complete	Adamson Estate - Derry House, Adamson Estate - Main House, Mississauga Canoe Club
	Underway	Malton Yard, Transit Campus Bldg A B C D - Storage Admin Repair, Transit Campus Bldg E - Storage Garage, Transit Campus Bldg F - Body Shop
	Requested	
Unit Heater Disconnect	Complete	Carmen Corbasson Community Centre, Clarkson Community Centre Library Arena & Pool, Clarkson Yard, Erin Mills Twin Arena, Frank McKechnie Community Centre, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Lakefront Promenade Maintenance Depot, Malton Arena, Mavis North, Meadowvale 4 Rinks, Mississauga Valley Community Centre
	Underway	
	Requested	
Vending Miser	Complete	Various
	Underway	
	Requested	

A4.1.3 ENERGY DASHBOARD

Energy Dashboard	Complete	
	Underway	Mississauga City Hall
	Requested	Burnhamthorpe Community Centre, Carmen Corbasson Community Centre, Clarkson Community Centre, Erin Mills Twin Arena, Frank McKechnie Community Centre, Hershey Centre, Hershey Centre Sports Complex, Huron Park Community Centre, Iceland Arena, Living Arts Centre, Malton Community Centre, Meadowvale 4 Rinks, Meadowvale Community Centre, Mississauga Central Library, Mississauga Valley Community Centre, Port Credit Arena, Rivergrove Community Centre, South Common Community Centre, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair



Measure	Status	Locations
A4.1.4 EQUIPMENT UPGRADE		
Boiler Replacement	Complete	Meadowvale Community Centre, South Common Community Centre Library & Pool
	Underway	
	Requested	
Chiller Replacement	Complete	Mississauga City Hall
	Underway	
	Requested	
Desicant Dehumidifier	Complete	Iceland Arena, Meadowvale 4 Rinks
	Underway	
	Requested	
Free Cooling	Complete	
	Underway	Huron Park Community Centre Pool & Arena, Mississauga Valley Community Centre
	Requested	
Heater Replacement	Complete	City Centre Transit Terminal, Malton Yard, South Common Community Centre Library & Pool
	Underway	
	Requested	
Infrared Unit Heater	Complete	Fire Station 106 (Dixie), Fire Station 109 (Training)
	Underway	
	Requested	
Insulation	Complete	
	Underway	Hershey Centre, Iceland Arena
	Requested	Hershey Centre Sports Complex, Huron Park Community Centre Pool & Arena



Measure	Status	Locations
A4.1.5 HEAT RECOVERY		
Waste Heat Recovery	Complete	Hershey Centre, Iceland Arena, Malton Hall (Victory), Mississauga Canoe Club, Mississauga Valley Community Centre, Tomken Twin Arena
	Underway	Tomken Twin Arena
	Requested	
A4.1.6 LIGHTING		
LED Arena/Pool Lighting	Complete	Tomken Twin Arena
	Underway	Clarkson Community Centre Library Arena & Pool, Frank McKechnie Community Centre, Hershey Centre, Mississauga Valley Community Centre
	Requested	Burnhamthorpe Community Centre & Arena, Carmen Corbasson Community Centre, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Malton Arena, Malton Community Centre, Meadowvale 4 Rinks, Meadowvale Community Centre, Mississauga Valley Community Centre, Rivergrove Community Centre & Pool, South Common Community Centre Library & Pool
LED Lighting Retrofit	Complete	
	Underway	
	Requested	Hershey Centre Sports Complex, Mississauga City Hall
LED Street Lighting	Complete	
	Underway	Streetlights - Mississauga
	Requested	



Measure	Status	Locations
Lighting (Continued)		
LED Parking Lot	Complete	Hershey Centre, Ontario Court of Justice
	Underway	BraeBen Golf Course, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Huron Park Community Centre Pool & Arena, Malton Arena, Malton Community Centre, Malton Satellite Terminal, Malton Yard, Mavis South, Port Credit Library, Rivergrove Community Centre & Pool, South Common Community Centre Library & Pool, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair
	Requested	Adamson Estate - Derry House, Adamson Estate - Main House, Animal Control Centre, Benares Estate - House, Benares Estate - Visitor Centre, Cawthra Elliot Estate - House, Clarkson Yard, Credit Village Marina, Fire Station 101 (HQ), Fire Station 102 (Lakeview), Fire Station 103 (Clarkson), Fire Station 104 (Port Credit), Fire Station 105 (Malton), Fire Station 106 (Winding Trail), Fire Station 107 (Erindale), Fire Station 108 (Streetsville), Fire Station 109 (Training), Fire Station 110 (Queensway), Fire Station 111 (Meadowvale), Fire Station 112 (Creditview), Fire Station 114 (Heartland), Fire Station 115 (Erin Mills), Fire Station 117 (North Dixie), Fire Station 118 (East Credit), Fire Station 119 (Airport-Leased), Fire Station 121 (Meadowvale Village), Fire Station 122 (Churchill Meadows), Frank McKechnie Community Centre, Iceland Arena, Lakefront Promenade Maintenance Depot, Lakeview Library, Lorne Park Library, Mary Fix House, Mavis Maintenance Hut, Mavis North, Meadowvale 4 Rinks, Meadowvale Community Theatre, Meadowvale Depot, Meadowvale Village C.C. Hall, Mississauga Senior Citizen Centre, Port Credit Library, Streetsville Library



Measure	Status	Locations
Lighting (Continued)		
Lighting Retrofit	Complete	Adamson Estate - Derry House, Adamson Estate - Main House, Animal Control Centre, Bradley Museum - The Anchorage, Burnhamthorpe Community Centre & Arena, Burnhamthorpe Library & Maja Prentice Theatre, Carmen Corbasson Community Centre, Cawthra Elliot Estate - House, City Centre Transit Terminal, Clarke Memorial Hall, Clarkson Community Centre Library Arena & Pool, Clarkson Yard, Credit Village Marina, Erin Mills Twin Arena, Fire Station 101 (HQ), Fire Station 102 (Lakeview), Fire Station 103 (Clarkson), Fire Station 104 (Port Credit), Fire Station 105 (Malton), Fire Station 106 (Dixie), Fire Station 106 (Winding Trail), Fire Station 107 (Erindale), Fire Station 108 (Streetsville), Fire Station 109 (Training), Fire Station 110 (Queensway), Fire Station 111 (Meadowvale), Fire Station 112 (Creditview), Fire Station 114 (Heartland), Fire Station 115 (Erin Mills), Fire Station 116 (Old West Malton), Fire Station 117 (North Dixie), Fire Station 118 (East Credit), Fire Station 119 (Airport-Leased), Fire Station 121 (Meadowvale Village), Frank McKechnie Community Centre, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Lakefront Promenade Maintenance Depot, Lakeview Golf Course, Living Arts Centre, Lorne Park Hall, Malton Arena, Malton Community Centre, Malton Satellite Terminal, Malton Yard, Mary Fix House, Mavis North, Mavis South, Meadowvale 4 Rinks, Meadowvale Community Centre, Meadowvale Community Theatre, Meadowvale Village C.C. Hall, Mississauga Canoe Club, Mississauga Central Library, Mississauga Senior Citizen Centre, Mississauga Valley Community Centre, Ontario Court of Justice, Port Credit Arena, Rivergrove Community Centre & Pool, South Common Community Centre Library & Pool, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair, Various
	Underway	
	Requested	



Measure	Status	Locations
A4.1.7 MAINTENANCE		
Equipment Maintenance	Complete	City Centre Transit Terminal, Iceland Arena, Malton Yard, South Common Community Centre Library & Pool
	Underway	
	Requested	Huron Park Community Centre Pool & Arena, Malton Yard
Equipment Optimization	Complete	Hershey Centre, Iceland Arena, Port Credit Arena
	Underway	Huron Park Community Centre Pool & Arena, Iceland Arena, Tomken Twin Arena, Transit Campus Bldg E - Storage Garage
	Requested	Hershey Centre Sports Complex, Port Credit Arena
A4.1.8 NEW TECHNOLOGY		
New Technology	Complete	
	Underway	
	Requested	City Centre Transit Terminal, Malton Yard
A4.1.9 RENEWABLE ENERGY		
Solar Photovoltaics	Complete	Hershey Centre
	Underway	
	Requested	
Solar Water Heating	Complete	Huron Park Community Centre Pool & Arena
	Underway	
	Requested	



Measure	Status	Locations
A4.1.10 VARIABLE SPEED DRIVE		
Pool VSD	Complete	Frank McKechnie Community Centre, Huron Park Community Centre Pool & Arena, Mississauga Valley Community Centre, Rivergrove Community Centre & Pool, South Common Community Centre Library & Pool
	Underway	
	Requested	
Variable Speed Drive	Complete	Iceland Arena, Living Arts Centre, Meadowvale 4 Rinks, Mississauga Central Library, Mississauga City Hall
	Underway	
	Requested	
A4.1.11 WATER		
Water Retrofit	Complete	Various
	Underway	
	Requested	



A4.2 PROCESS

Measure	Status	Locations
A4.2.1 CONTROLS		
BAS Settings/Programming	Complete	Hershey Centre Sports Complex, Huron Park Community Centre Pool & Arena, Iceland Arena, Port Credit Arena, South Common Community Centre Library & Pool, Transit Campus Bldg E - Storage Garage
	Underway	Hershey Centre Sports Complex, Iceland Arena, Transit Campus Bldg A B C D - Storage Admin Repair, Transit Campus Bldg F - Body Shop
	Requested	Hershey Centre Sports Complex, Huron Park Community Centre Pool & Arena
Control Optimization	Complete	Huron Park Community Centre Pool & Arena
	Underway	Mississauga Valley Community Centre, Transit Campus Bldg A B C D - Storage Admin Repair
	Requested	Hershey Centre Sports Complex



A4.3 OTHER

Measure	Status	Locations
A4.3.1 BUILDING ENVELOPE		
Energy Audit	Complete	Adamson Estate - Derry House, Adamson Estate - Main House, Animal Control Centre, Applewood Heights - Outdoor Pool, Benares Estate - House, Benares Estate - Visitor Centre, Bradley Museum - Museum, Bradley Museum - The Anchorage, Burnhamthorpe Community Centre & Arena, Burnhamthorpe Library & Maja Prentice Theatre, Carmen Corbasson Community Centre, Cawthra Elliot Estate - House, Chappel Estate - House, City Centre Transit Terminal, Clarke Memorial Hall, Clarkson Community Centre Library Arena & Pool, Clarkson Yard, Credit Village Marina, David Ramsey - Outdoor Pool, Don McLean Westacres - Outdoor Pool, Erin Mills Twin Arena, Erindale - Outdoor Pool, Fire Station 101 (HQ), Fire Station 102 (Lakeview), Fire Station 103 (Clarkson), Fire Station 104 (Port Credit), Fire Station 105 (Malton), Fire Station 106 (Dixie), Fire Station 106 (Winding Trail), Fire Station 107 (Erindale), Fire Station 108 (Streetsville), Fire Station 109 (Training), Fire Station 110 (Queensway), Fire Station 111 (Meadowvale), Fire Station 112 (Creditview), Fire Station 114 (Heartland), Fire Station 115 (Erin Mills), Fire Station 116 (Old West Malton), Fire Station 117 (North Dixie), Fire Station 118 (East Credit), Fire Station 119 (Airport-Leased), Fire Station 121 (Meadowvale Village), Fire Station 122 (Churchill Meadows), Frank McKechnie Community Centre, Hershey Centre, Huron Park Community Centre Pool & Arena, Iceland Arena, Lakefront Promenade Maintenance Depot, Lakefront Promenade Marina, Lakeview Golf Course, Lakeview Library, Lewis Bradley Park - Outdoor Pool, Lions Club of Credit Valley Pool Building, Living Arts Centre, Lorne Park Hall, Lorne Park Library, Malton Arena, Malton Community Centre, Malton Day Care Centre, Malton Hall (Victory), Malton Satellite Terminal, Malton Yard, Mary Fix House, Mavis Maintenance Hut, Mavis North, Mavis South, Meadowvale 4 Rinks,



Measure	Status	Locations
BUILDING ENVELOPE (CONTINUED)		
Energy Audit	Complete (continued)	Meadowvale Community Centre, Meadowvale Community Theatre, Meadowvale Depot, Meadowvale Library, Meadowvale Village C.C. Hall, Mississauga Canoe Club, Mississauga Central Library, Mississauga City Hall, Mississauga Senior Citizen Centre, Mississauga Valley Community Centre, Ontario Court of Justice, Port Credit Arena, Port Credit Library, Rivergrove Community Centre & Pool, Semenyk Crt - T&W Administration-TEP, Sheridan Library, South Common Community Centre Library & Pool, Streetsville - Outdoor Pool, Streetsville Library, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair, Woodlands Library
	Underway	A.E. Crookes Park - Clubhouse & Concession Stand, Animal Control Centre, Applewood Heights - Outdoor Pool, Benares Estate - House, Benares Estate - Visitor Centre, Bradley Museum - Museum, Bradley Museum - The Anchorage, BraeBen Golf Course, Brickyard Park, Burnhamthorpe Community Centre & Arena, Burnhamthorpe Library & Maja Prentice Theatre, Carmen Corbasson Community Centre, Cawthra Elliot Estate - House, Chappel Estate - House, Churchill Meadows Library, City Centre Transit Terminal, Clarke Memorial Hall, Clarkson Community Centre Library Arena & Pool, Clarkson Park, Clarkson Yard, Courtney Park Athletic Park, Credit Village Marina, David Ramsey - Outdoor Pool, Douglas Kennedy Park, Dr. Martin Dobkin Park, Dunton Athletic Field, Erin Mills Twin Arena, Erindale - Outdoor Pool, Fallingbrook Community Park, Fire Station 101 (HQ), Fire Station 102 (Lakeview), Fire Station 103 (Clarkson), Fire Station 104 (Port Credit), Fire Station 105 (Malton), Fire Station 106 (Winding Trail), Fire Station 107 (Erindale), Fire Station 108 (Streetsville), Fire Station 109 (Training), Fire Station 110 (Queensway), Fire Station 111 (Meadowvale), Fire Station 112 (Creditview), Fire Station 114 (Heartland), Fire Station 115 (Erin Mills), Fire Station 117 (North Dixie), Fire Station 118 (East Credit), Fire Station 121 (Meadowvale Village), Fire Station 122 (Churchill Meadows), Frank McKechnie Community Centre, Garry W Morden Centre, Hershey Centre, Hershey Centre Sports Complex,



Measure	Status	Locations
BUILDING ENVELOPE (CONTINUED)		
	Underway (Continued)	Huron Park Community Centre Pool & Arena, Iceland Arena, Lakeview Golf Course, Lakeview Library, Lewis Bradley Park - Outdoor Pool, Lions Club of Credit Valley Pool Building, Living Arts Centre, Lorne Park Library, Malton Arena, Malton Community Centre, Malton Day Care Centre, Malton Satellite Terminal, Malton Yard, Mavis North, Mavis South, Max Ward Park, Meadowvale 4 Rinks, Meadowvale Community Theatre, Meadowvale Depot, Meadowvale Sports Park, Miss. Valley Gymnastics Centre, Mississauga Canoe Club, Mississauga Central Library, Mississauga City Hall, Mississauga Senior Citizen Centre, Mississauga Valley Community Centre, Ninth Line Sports Park, Ontario Court of Justice, Port Credit Arena, Port Credit Library, Port Credit Memorial Park, Quinnepecon Meadows Park, River Grove Park, Rivergrove Community Centre & Pool, South Common Community Centre Library & Pool, South Common Park, Springfield Park, Streetsville - Outdoor Pool, Streetsville Library, Streetsville Memorial Park, Tom Chater Memorial Park, Tomken Twin Arena, Transit Campus Bldg A B C D - Storage Admin Repair, Transit Campus Bldg E - Storage Garage, Transit Campus Bldg F - Body Shop, Transportation and Works Department, Wildwood Park, Wildwood Park Softball Field
	Requested	
Re-Commissioning	Complete	City Centre Transit Terminal, Iceland Arena, Malton Satellite Terminal, South Common Community Centre Library & Pool, Transit Campus Bldg A B C D - Storage Admin Repair
	Underway	Animal Control Centre, Carmen Corbasson Community Centre, Clarkson Community Centre Library Arena & Pool, Fire Station 101 (HQ), Huron Park Community Centre Pool & Arena, Malton Community Centre, Meadowvale 4 Rinks, Meadowvale Community Theatre, Miss. Valley Gymnastics Centre, Mississauga City Hall, Mississauga Valley Community Centre, Tomken Twin Arena
	Requested	

APPENDIX 5.0: FACILITY DETAIL AND DATA INFORMATION

The following pages provide information on the various facilities in Mississauga, including:

- Year built
- Area
- Average weekly hours of operation
- Energy measures completed/planned
- Energy data
- Energy Use Intensity
- GHG data

For details of planned energy measures, see [Appendix 3.0: Energy Measure Descriptions](#).

The locations are listed in alphabetical order for easier searching. If using the online version of this document, just click on the facility name to go to the information page for that location.

LEGEND (Measure Status):

- = **Completed**: Measures that have been fully implemented and completed
- = **Underway**: Measures that have been approved and funded, and are either underway, or soon to be implemented.
- = **Requested**: Measures that have been requested or considered, but not yet been approved or finalized. May or may not be implemented

A5.1 FACILITY INDEX

Click on Site Name to open that page:

- | | | |
|--|---|---|
| • Adamson Estate - Barn | • Churchill Meadows Library | • Fire Station 109 (Training) |
| • Adamson Estate - Main House | • City Centre Transit Terminal | • Fire Station 110 (Queensway) |
| • Animal Control Centre | • Clarke Memorial Hall | • Fire Station 111 (Meadowvale) |
| • Applewood Heights - Outdoor Pool | • Clarkson Community Centre Library
Arena & Pool | • Fire Station 112 (Creditview) |
| • Benares Estate - House | • Clarkson Yard | • Fire Station 114 (Heartland) |
| • Benares Estate - Visitor Centre | • Credit Village Marina | • Fire Station 115 (Erin Mills) |
| • Bradley Museum - Barn | • David Ramsey - Outdoor Pool | • Fire Station 116 (Old West Malton) |
| • Bradley Museum - Log Cabin | • Don McLean Westacres - Outdoor
Pool | • Fire Station 116 (West Malton) &
Peel Ambulance Reporting Centre |
| • Bradley Museum - Museum | • Erin Mills Twin Arena | • Fire Station 117 (North Dixie) |
| • Bradley Museum - The Anchorage | • Erindale - Outdoor Pool | • Fire Station 118 (East Credit) |
| • BraeBen Golf Course | • Erindale Community Hall | • Fire Station 119 (Airport-Leased) |
| • Brookmede Centre | • Fire Station 101 (HQ) | • Fire Station 121 (Meadowvale
Village) |
| • Burnhamthorpe Community Centre
& Arena | • Fire Station 102 (Lakeview) | • Fire Station 122 (Churchill
Meadows) |
| • Burnhamthorpe Library & Maja
Prentice Theatre | • Fire Station 103 (Clarkson) | • Frank McKechnie Community
Centre |
| • Carmen Corbasson Community
Centre | • Fire Station 104 (Port Credit) | • Garry W Morden Centre |
| • Cawthra Elliot Estate - House | • Fire Station 105 (Malton) | • Hershey Centre |
| • Chappel Estate - House | • Fire Station 106 (Dixie) | • Hershey Centre Change House |
| | • Fire Station 107 (Erindale) | |
| | • Fire Station 108 (Streetsville) | |



- Hershey Centre Sport Dome
- Hershey Centre Sports Complex
- Holcin Waterfront Centre
- Huron Park Community Centre Pool & Arena
- Iceland Arena
- Lakefront Promenade Maintenance Depot
- Lakefront Promenade Marina
- Lakeview Golf Course
- Lakeview Greenskeeper
- Lakeview Library
- Lewis Bradley Park - Outdoor Pool
- Lions Club of Credit Valley Pool Building
- Living Arts Centre
- Lorne Park Hall
- Lorne Park Library
- Malton Arena
- Malton Community Centre
- Malton Day Care Centre
- Malton Hall (Victory)
- Malton Satellite Terminal
- Malton Yard
- Mary Fix House
- Mavis North
- Mavis South
- Meadowvale 4 Rinks
- Meadowvale Community Centre
- Meadowvale Community Theatre
- Meadowvale Depot
- Meadowvale Library
- Meadowvale Village C.C. Hall
- Miss. Valley Gymnastics Centre
- Mississauga Canoe Club
- Mississauga Central Library
- Mississauga City Hall
- Mississauga Senior Citizen Centre
- Mississauga Valley Community Centre
- Old Fire Hall - Malton (Malton Boy Scouts)
- Ontario Court of Justice
- Port Credit Arena
- Port Credit Library
- Rivergrove Community Centre & Pool
- Riverwood Park/ McEwan Estate
- Russell Langmaid Property
- Semenyk Crt - T&W Administration-TEP
- Sheridan Library
- South Common Community Centre Library & Pool
- Streetlights - Mississauga
- Streetsville - Outdoor Pool
- Streetsville Library
- Tomken Twin Arena
- Transit Campus Bldg A B C D - Storage Admin Repair
- Transit Campus Bldg E - Storage Garage
- Transit Campus Bldg F - Body Shop
- Transit Drivers Lounge
- Woodlands Library

Facility: Adamson Estate - Barn

Address: 850 Enola Avenue, L5G 4B2

Year Built: 1920

Area: 390 m² (4,198 ft²)

Facility Type: n/a

Weekly Hrs: n/a


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	11,626	10,420	11,369
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	11,626	10,420	11,369
Total e-kWh/m ²	29.81	26.72	29.15
GHG (kg/yr)	930	834	910
GHG (kg/m ²)	2.38	2.14	2.33

Energy Measures and Status

Facility: Adamson Estate - Main House

Address: 850 Enola Avenue, L5G 4B2

Year Built: 1920

Area: 788 m² (8,482 ft²)

Facility Type: Other

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	21,445	58,579
Natural Gas (m ³)	0	6,292	19,182
Nat. Gas (e-kWh)	0	66,068	201,416
Total e-kWh	0	87,513	259,994
Total e-kWh/m ²	0.00	111.06	329.94
GHG (kg/yr)	0	13,637	41,030
GHG (kg/m ²)	0.00	17.31	52.07

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Programmable Thermostats

Facility: Animal Control Centre

Address: 735 Central Parkway W, L5C 4H4

Year Built: 1987

Area: 1,283 m² (13,810 ft²)

Facility Type: n/a

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	198,840	205,323	185,825
Natural Gas (m ³)	53,704	45,185	39,301
Nat. Gas (e-kWh)	563,893	474,440	412,663
Total e-kWh	762,733	679,763	598,489
Total e-kWh/m ²	594.49	529.82	466.48
GHG (kg/yr)	117,656	102,034	89,327
GHG (kg/m ²)	91.70	79.53	69.62

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning

Facility: Applewood Heights - Outdoor Pool

Address: 3119 Constitution Blvd., L4Y 2Z1

Year Built: 1976

Area: 374 m² (4,026 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	63,687	60,958	71,407
Natural Gas (m ³)	10,570	9,712	26,326
Nat. Gas (e-kWh)	110,983	101,973	276,421
Total e-kWh	174,670	162,931	347,828
Total e-kWh/m ²	467.03	435.64	930.02
GHG (kg/yr)	25,121	23,277	55,590
GHG (kg/m ²)	67.17	62.24	148.64

Energy Measures and Status

● ● Energy Audit

Facility: Benares Estate - House

Address: 1503 Clarkson Rd N, L5J 2W8

Year Built: 1857

Area: 437 m² (4,704 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	39,673	38,257	36,023
Natural Gas (m ³)	6,951	6,198	7,547
Nat. Gas (e-kWh)	72,988	65,079	79,241
Total e-kWh	112,661	103,336	115,264
Total e-kWh/m ²	257.80	236.47	263.76
GHG (kg/yr)	16,344	14,803	17,180
GHG (kg/m ²)	37.40	33.88	39.31

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

Facility: Benares Estate - Visitor Centre

Address: 1507 Clarkson Rd N, L5J 2W8

Year Built: 1995

Area: 327 m² (3,520 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	67,956	59,900	31,631
Natural Gas (m ³)	4,104	2,858	3,975
Nat. Gas (e-kWh)	43,089	30,007	41,742
Total e-kWh	111,046	89,907	73,372
Total e-kWh/m ²	339.59	274.94	224.38
GHG (kg/yr)	13,212	10,206	10,062
GHG (kg/m ²)	40.40	31.21	30.77

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

Facility: Bradley Museum - Barn

Address: 1620 Orr Rd, L5J 4T2

Year Built: 1830

Area: 116 m² (1,249 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	4,010	3,948	3,941
Natural Gas (m ³)	3,299	2,945	3,427
Nat. Gas (e-kWh)	34,643	30,923	35,987
Total e-kWh	38,653	34,871	39,928
Total e-kWh/m ²	333.22	300.61	344.21
GHG (kg/yr)	6,572	5,896	6,809
GHG (kg/m ²)	56.65	50.82	58.70

Energy Measures and Status

Facility: Bradley Museum - Log Cabin

Address: 1610 Orr Road, L5J 4T2

Year Built: 1830

Area: 126 m² (1,356 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	10,658	11,596	10,641
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	10,658	11,596	10,641
Total e-kWh/m ²	84.59	92.03	84.45
GHG (kg/yr)	853	928	851
GHG (kg/m ²)	6.77	7.36	6.76

Energy Measures and Status

Facility: Bradley Museum - Museum

Address: 1620 Orr Rd, L5J 4T2

Year Built: 1825

Area: 151 m² (1,625 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	10,363	9,715	10,752
Natural Gas (m ³)	2,332	1,758	2,190
Nat. Gas (e-kWh)	24,485	18,460	22,992
Total e-kWh	34,848	28,174	33,744
Total e-kWh/m ²	230.78	186.58	223.47
GHG (kg/yr)	5,247	4,108	5,009
GHG (kg/m ²)	34.75	27.21	33.17

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit

Facility: Bradley Museum - The Anchorage

Address: 1610 Orr Road, L5J 4T2

Year Built: 1830

Area: 164 m² (1,765 ft²)

Facility Type: Museum

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	149,377	110,820	66,167
Natural Gas (m ³)	0	1,025	3,673
Nat. Gas (e-kWh)	0	10,764	38,568
Total e-kWh	149,377	121,584	104,735
Total e-kWh/m ²	910.83	741.37	638.63
GHG (kg/yr)	11,950	10,808	12,253
GHG (kg/m ²)	72.87	65.90	74.71

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit

Facility: BraeBen Golf Course

Address: 5700 Terry Fox Way, L5V 2N7

Year Built: 2005

Area: 1,375 m² (14,800 ft²)

Facility Type: Recreation Complex

Weekly Hrs: 84 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	481,145	448,916	429,662
Natural Gas (m ³)	54,809	43,055	50,385
<i>Nat. Gas (e-kWh)</i>	575,497	452,081	529,041
Total e-kWh	1,056,641	900,997	958,703
Total e-kWh/m ²	768.47	655.27	697.24
GHG (kg/yr)	142,334	117,487	129,833
GHG (kg/m ²)	103.52	85.44	94.42

Energy Measures and Status

- Energy Audit
- LED Parking Lot

Facility: Brookmede Centre

Address: 2264 Council Ring Road, L5L 1B7

Year Built: 1973

Area: 200 m² (2,153 ft²)

Facility Type: n/a

Weekly Hrs: 84 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	2,469	2,122	2,605
<i>Nat. Gas (e-kWh)</i>	25,923	22,283	27,354
Total e-kWh	25,923	22,283	27,354
Total e-kWh/m ²	129.61	111.41	136.77
GHG (kg/yr)	4,677	4,021	4,936
GHG (kg/m ²)	23.39	20.10	24.68

Energy Measures and Status

Facility: Burnhamthorpe Community Centre & Arena

Address: 1500 Gulleden Drive, L4X 2T7

Year Built: 1974

Area: 6,008 m² (64,669 ft²)

Facility Type: Community Centre

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,387,297	1,260,450	1,134,726
Natural Gas (m ³)	83,013	87,641	98,077
Nat. Gas (e-kWh)	871,639	920,233	1,029,811
Total e-kWh	2,258,936	2,180,683	2,164,537
Total e-kWh/m ²	375.99	362.96	360.28
GHG (kg/yr)	268,262	266,883	276,597
GHG (kg/m ²)	44.65	44.42	46.04

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- Lighting Retrofit

Facility: Burnhamthorpe Library & Maja Prentice Theatre

Address: 3650 Dixie Rd, L4Y 3V9

Year Built: 1976

Area: 5,024 m² (54,078 ft²)

Facility Type: Library

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	942,781	850,195	593,342
Natural Gas (m ³)	87,306	41,992	44,108
Nat. Gas (e-kWh)	916,718	440,914	463,137
Total e-kWh	1,859,499	1,291,109	1,056,478
Total e-kWh/m ²	370.12	256.99	210.29
GHG (kg/yr)	240,835	147,574	131,036
GHG (kg/m ²)	47.94	29.37	26.08

Energy Measures and Status

- Building Envelope Sealing
- CO2 Controls
- ● Energy Audit
- Lighting Retrofit

Facility: Carmen Corbasson Community Centre

Address: 1399 Cawthra Road, L5G 4L1

Year Built: 1972

Area: 7,993 m² (86,036 ft²)

Facility Type: Community Centre

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,641,644	1,608,687	1,426,156
Natural Gas (m ³)	172,891	174,764	124,340
Nat. Gas (e-kWh)	1,815,360	1,835,025	1,305,566
Total e-kWh	3,457,004	3,443,711	2,731,722
Total e-kWh/m ²	432.50	430.84	341.76
GHG (kg/yr)	458,895	459,807	349,669
GHG (kg/m ²)	57.41	57.53	43.75

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- Lighting Retrofit
- Re-commissioning
- Unit Heater Disconnect

Facility: Cawthra Elliot Estate - House

Address: 1507 Cawthra Road, L5G 4L1

Year Built: 1926

Area: 897 m² (9,655 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	103,956	97,062	97,980
Natural Gas (m ³)	20,328	16,485	12,956
Nat. Gas (e-kWh)	213,441	173,091	136,038
Total e-kWh	317,397	270,153	234,018
Total e-kWh/m ²	353.84	301.17	260.89
GHG (kg/yr)	46,830	38,997	32,385
GHG (kg/m ²)	52.21	43.48	36.10

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Chappel Estate - House

Address: 4300 Riverwood Park Lane, L5C 2S7

Year Built: 1919

Area: 837 m² (9,009 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	108,312	105,788	106,264
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	108,312	105,788	106,264
Total e-kWh/m ²	129.40	126.39	126.96
GHG (kg/yr)	8,665	8,463	8,501
GHG (kg/m ²)	10.35	10.11	10.16

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit

Facility: Churchill Meadows Library

Address: 3801 Thomas St., L5M 7G2

Year Built: 2008

Area: 1,232 m² (13,261 ft²)

Facility Type: Library

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	32,549	25,809	25,318
Nat. Gas (e-kWh)	341,767	270,991	265,836
Total e-kWh	341,767	270,991	265,836
Total e-kWh/m ²	277.41	219.96	215.78
GHG (kg/yr)	61,668	48,898	47,967
GHG (kg/m ²)	50.06	39.69	38.93

Energy Measures and Status

- Energy Audit

Facility: City Centre Transit Terminal

Address: 200 Rathburn Rd W, L5B 4E5

Year Built: 1997

Area: 768 m² (8,267 ft²)

Facility Type: n/a

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	737,740	685,506	644,834
Natural Gas (m ³)	34,556	32,603	39,215
<i>Nat. Gas (e-kWh)</i>	362,841	342,332	411,753
Total e-kWh	1,100,581	1,027,838	1,056,587
Total e-kWh/m ²	1,433.05	1,338.33	1,375.76
GHG (kg/yr)	124,490	116,611	125,883
GHG (kg/m ²)	162.10	151.84	163.91

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- CO2 Controls
- Energy Audit
- Equipment Maintenance
- Heater Replacement
- Lighting Retrofit
- Misc. Controls
- New Technology
- Pipe Insulation
- Re-commissioning
- Window Coating

Facility: Clarke Memorial Hall

Address: 161 Lakeshore Rd W, L5H 1G3

Year Built: 1921

Area: 1,403 m² (15,102 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	107,448	112,040	90,651
Natural Gas (m ³)	35,030	29,311	27,122
Nat. Gas (e-kWh)	367,820	307,767	284,783
Total e-kWh	475,268	419,807	375,434
Total e-kWh/m ²	338.75	299.22	267.59
GHG (kg/yr)	74,965	64,497	58,638
GHG (kg/m ²)	53.43	45.97	41.79

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit

Facility: Clarkson Community Centre Library Arena & Pool

Address: 2475 Truscott Dr, L5J 2B3

Year Built: 1970

Area: 7,639 m² (82,225 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,429,640	1,521,740	1,976,248
Natural Gas (m ³)	188,640	153,772	193,445
Nat. Gas (e-kWh)	1,980,722	1,614,602	2,031,168
Total e-kWh	3,410,362	3,136,342	4,007,416
Total e-kWh/m ²	446.44	410.57	524.60
GHG (kg/yr)	471,773	413,078	524,604
GHG (kg/m ²)	61.76	54.07	68.67

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning
- Unit Heater Disconnect

Facility: Clarkson Yard

Address: 2167 Royal Windsor Dr, L5J 1K5

Year Built: 1977

Area: 2,466 m² (26,544 ft²)

Facility Type: Public Works

Weekly Hrs: 94.5 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	378,217	401,813	428,717
Natural Gas (m ³)	60,950	53,260	68,389
Nat. Gas (e-kWh)	639,972	559,231	718,087
Total e-kWh	1,018,189	961,044	1,146,804
Total e-kWh/m ²	412.89	389.72	465.05
GHG (kg/yr)	145,734	133,053	163,869
GHG (kg/m ²)	59.10	53.95	66.45

Energy Measures and Status

- BAS Upgrade
- Building Envelope Sealing
- ● Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect

Facility: Credit Village Marina

Address: 12 Stavebank Road South, L5G 2T1

Year Built: 1998

Area: 184 m² (1,981 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	118,067	113,755	110,535
Natural Gas (m ³)	4,403	3,676	3,894
Nat. Gas (e-kWh)	46,227	38,595	40,886
Total e-kWh	164,294	152,349	151,421
Total e-kWh/m ²	892.90	827.98	822.94
GHG (kg/yr)	17,787	16,064	16,220
GHG (kg/m ²)	96.67	87.31	88.15

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: David Ramsey - Outdoor Pool

Address: 2470 Thorn Lodge Dr., L5K 1K5

Year Built: 1976

Area: 374 m² (4,026 ft²)

Facility Type: n/a

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	67,490	54,569	67,102
Natural Gas (m ³)	13,765	21,622	32,514
Nat. Gas (e-kWh)	144,528	227,027	341,399
Total e-kWh	212,018	281,596	408,501
Total e-kWh/m ²	566.89	752.93	1,092.25
GHG (kg/yr)	31,478	45,330	66,970
GHG (kg/m ²)	84.17	121.20	179.06

Energy Measures and Status

● ● Energy Audit

**Facility: Don McLean Westacres - Outdoor Pool**

Address: 2166 Westfield Drive, L4Y 1P7

Year Built: 1962

Area: 223 m² (2,400 ft²)

Facility Type: n/a

Weekly Hrs: 100 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	12,248	39,833	2,219
Natural Gas (m ³)	16,207	14,093	1,600
<i>Nat. Gas (e-kWh)</i>	170,176	147,973	16,804
Total e-kWh	182,424	187,806	19,022
Total e-kWh/m ²	818.04	842.18	85.30
GHG (kg/yr)	31,686	29,887	3,210
GHG (kg/m ²)	142.09	134.02	14.39

Energy Measures and Status

- Energy Audit

Facility: Erin Mills Twin Arena

Address: 3205 Unity Dr, L5L 4L5

Year Built: 1985

Area: 6,132 m² (66,004 ft²)

Facility Type: Double-Pad Arena

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	901,164	954,867	932,834
Natural Gas (m ³)	90,392	85,660	91,993
Nat. Gas (e-kWh)	949,119	899,426	965,922
Total e-kWh	1,850,283	1,854,293	1,898,756
Total e-kWh/m ²	301.74	302.40	309.65
GHG (kg/yr)	243,352	238,682	248,918
GHG (kg/m ²)	39.69	38.92	40.59

Energy Measures and Status

- BAS Installation
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect

Facility: Erindale - Outdoor Pool

Address: 1244 Shamir Cres., L5C 1L1

Year Built: 1962

Area: 374 m² (4,026 ft²)

Facility Type: n/a

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	61,115	47,923	49,299
Natural Gas (m ³)	15,813	12,637	15,948
Nat. Gas (e-kWh)	166,038	132,691	167,450
Total e-kWh	227,152	180,615	216,748
Total e-kWh/m ²	607.36	482.93	579.54
GHG (kg/yr)	34,849	27,777	34,159
GHG (kg/m ²)	93.18	74.27	91.33

Energy Measures and Status

● ● Energy Audit

Facility: Erindale Community Hall

Address: 1620 Dundas St. W, L5C 1E6

Year Built: n/a

Area: n/a

Facility Type: n/a

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	1,993	22,051
Natural Gas (m ³)	0	901	5,422
Nat. Gas (e-kWh)	0	9,462	56,932
Total e-kWh	0	11,455	78,983
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	0	1,867	12,037
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

Facility: Fire Station 101 (HQ)

Address: 15 Fairview Road W, L5B 1K7

Year Built: 1974

Area: 2,652 m² (28,546 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	294,232	269,611	266,966
Natural Gas (m ³)	70,612	60,602	70,494
<i>Nat. Gas (e-kWh)</i>	741,429	636,319	740,189
Total e-kWh	1,035,660	905,930	1,007,154
Total e-kWh/m ²	390.52	341.60	379.77
GHG (kg/yr)	157,322	136,386	154,917
GHG (kg/m ²)	59.32	51.43	58.42

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning

Facility: Fire Station 102 (Lakeview)

Address: 710 Third Street, L5E 1B9

Year Built: 1979

Area: 452 m² (4,865 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	38,018	41,066	41,569
Natural Gas (m ³)	16,558	13,338	13,273
<i>Nat. Gas (e-kWh)</i>	173,861	140,050	139,363
Total e-kWh	211,879	181,116	180,932
Total e-kWh/m ²	468.76	400.70	400.29
GHG (kg/yr)	34,413	28,556	28,472
GHG (kg/m ²)	76.13	63.18	62.99

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 103 (Clarkson)

Address: 2035 Lushes Avenue, L5J 1H3

Year Built: 1985

Area: 568 m² (6,114 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	54,071	55,324	54,091
Natural Gas (m ³)	12,791	8,599	12,186
Nat. Gas (e-kWh)	134,308	90,288	127,956
Total e-kWh	188,379	145,612	182,047
Total e-kWh/m ²	331.65	256.36	320.51
GHG (kg/yr)	28,560	20,718	27,416
GHG (kg/m ²)	50.28	36.47	48.27

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 104 (Port Credit)

Address: 62 Port Street West, L5H 1E3

Year Built: 1950

Area: 820 m² (8,826 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	36,958	28,966	30,995
Natural Gas (m ³)	13,350	10,887	10,942
Nat. Gas (e-kWh)	140,171	114,311	114,891
Total e-kWh	177,129	143,277	145,886
Total e-kWh/m ²	216.01	174.73	177.91
GHG (kg/yr)	28,249	22,943	23,211
GHG (kg/m ²)	34.45	27.98	28.31

Energy Measures and Status

- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 105 (Malton)

Address: 7101 Goreway Drive, L4T 2T5

Year Built: 1980

Area: 773 m² (8,321 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	65,686	69,017	72,422
Natural Gas (m ³)	23,444	19,256	25,530
Nat. Gas (e-kWh)	246,160	202,184	268,061
Total e-kWh	311,845	271,201	340,483
Total e-kWh/m ²	403.42	350.84	440.47
GHG (kg/yr)	49,672	42,003	54,163
GHG (kg/m ²)	64.26	54.34	70.07

Energy Measures and Status

- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 106 (Dixie)

Address: 3450 Dixie Road, L4Y 2B2

Year Built: 1979

Area: 518 m² (5,576 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	54,305	51,228	15,931
Natural Gas (m ³)	15,656	14,134	16,664
Nat. Gas (e-kWh)	164,391	148,409	174,967
Total e-kWh	218,696	199,637	190,897
Total e-kWh/m ²	422.19	385.40	368.53
GHG (kg/yr)	34,007	30,877	32,845
GHG (kg/m ²)	65.65	59.61	63.41

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Infrared Unit Heater
- Lighting Retrofit

Facility: Fire Station 107 (Erindale)

Address: 1965 Dundas Street West, L5K 1R2

Year Built: 1970

Area: 537 m² (5,780 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	53,577	54,887	49,804
Natural Gas (m ³)	12,762	9,919	12,748
Nat. Gas (e-kWh)	133,999	104,147	133,852
Total e-kWh	187,576	159,034	183,656
Total e-kWh/m ²	349.30	296.15	342.00
GHG (kg/yr)	28,465	23,183	28,137
GHG (kg/m ²)	53.01	43.17	52.40

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 108 (Streetsville)

Address: 2267 Britannia Road West, L5M 2G6

Year Built: 1980

Area: 507 m² (5,457 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	40,696	42,457	42,535
Natural Gas (m ³)	10,553	9,707	12,914
Nat. Gas (e-kWh)	110,808	101,922	135,593
Total e-kWh	151,503	144,379	178,127
Total e-kWh/m ²	298.82	284.77	351.34
GHG (kg/yr)	23,250	21,787	27,869
GHG (kg/m ²)	45.86	42.97	54.97

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 109 (Training)

Address: 1735 Britannia Road East, L4W 2A3

Year Built: 1976

Area: 1,142 m² (12,292 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	127,079	90,231	84,090
Natural Gas (m ³)	25,904	20,103	24,141
Nat. Gas (e-kWh)	271,996	211,080	253,477
Total e-kWh	399,076	301,311	337,567
Total e-kWh/m ²	349.45	263.84	295.59
GHG (kg/yr)	59,245	45,306	52,465
GHG (kg/m ²)	51.88	39.67	45.94

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Infrared Unit Heater
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 110 (Queensway)

Address: 2316 Hurontario Street, L5B 1N1

Year Built: 1982

Area: 596 m² (6,415 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	60,234	57,478	61,994
Natural Gas (m ³)	8,936	6,557	10,693
<i>Nat. Gas (e-kWh)</i>	93,828	68,847	112,281
Total e-kWh	154,062	126,325	174,274
Total e-kWh/m ²	258.49	211.95	292.41
GHG (kg/yr)	21,749	17,021	25,219
GHG (kg/m ²)	36.49	28.56	42.31

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 111 (Meadowvale)

Address: 2740 Derry Road West, L5N 3N5

Year Built: 1983

Area: 588 m² (6,329 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	55,541	53,750	53,996
Natural Gas (m ³)	13,701	10,778	13,104
Nat. Gas (e-kWh)	143,863	113,165	137,589
Total e-kWh	199,405	166,914	191,585
Total e-kWh/m ²	339.12	283.87	325.82
GHG (kg/yr)	30,402	24,719	29,146
GHG (kg/m ²)	51.70	42.04	49.57

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 112 (Creditview)

Address: 4090 Creditview Road, L5C 4E3

Year Built: 1984

Area: 649 m² (6,986 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	50,717	50,057	51,840
Natural Gas (m ³)	9,058	7,333	11,394
Nat. Gas (e-kWh)	95,114	77,001	119,640
Total e-kWh	145,831	127,058	171,480
Total e-kWh/m ²	224.70	195.77	264.22
GHG (kg/yr)	21,220	17,899	25,735
GHG (kg/m ²)	32.70	27.58	39.65

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 114 (Heartland)

Address: 5845 Falbourne St., L5R 3L8

Year Built: 1989

Area: 653 m² (7,029 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	60,762	66,443	60,082
Natural Gas (m ³)	18,230	15,693	15,691
<i>Nat. Gas (e-kWh)</i>	191,411	164,778	164,759
Total e-kWh	252,173	231,221	224,842
Total e-kWh/m ²	386.18	354.09	344.32
GHG (kg/yr)	39,399	35,048	34,536
GHG (kg/m ²)	60.34	53.67	52.89

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 115 (Erin Mills)

Address: 4595 Glen Erin Dr, L5M 4E8

Year Built: 1990

Area: 534 m² (5,748 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	49,325	45,886	43,242
Natural Gas (m ³)	17,629	14,173	14,389
Nat. Gas (e-kWh)	185,100	148,816	151,084
Total e-kWh	234,425	194,703	194,326
Total e-kWh/m ²	439.00	364.61	363.91
GHG (kg/yr)	37,345	30,523	30,721
GHG (kg/m ²)	69.94	57.16	57.53

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 116 (Old West Malton)

Address: 7033 Telford Way #23 & #24, L5S 1V4

Year Built: 1988

Area: 395 m² (4,252 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	35,732	0	0
Natural Gas (m ³)	9,612	0	0
Nat. Gas (e-kWh)	100,923	0	0
Total e-kWh	136,655	0	0
Total e-kWh/m ²	345.96	0.00	0.00
GHG (kg/yr)	21,069	0	0
GHG (kg/m ²)	53.34	0.00	0.00

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit

Facility: Fire Station 116 (West Malton) & Peel Ambulance Reporting Centre

Address: 6825 Tomken Rd, L5T 1N4

Year Built: 2011

Area: 3,627 m² (39,041 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	131,400	0	0
Natural Gas (m ³)	3,030	0	0
<i>Nat. Gas (e-kWh)</i>	31,815	0	0
Total e-kWh	163,215	0	0
Total e-kWh/m ²	45.00	0.00	0.00
GHG (kg/yr)	16,253	0	0
GHG (kg/m ²)	4.48	0.00	0.00

Energy Measures and Status

Facility: Fire Station 117 (North Dixie)

Address: 1090 Nuvik Court, L4W 5E6

Year Built: 1999

Area: 697 m² (7,502 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	71,663	69,499	73,810
Natural Gas (m ³)	16,542	13,124	17,487
Nat. Gas (e-kWh)	173,694	137,802	183,613
Total e-kWh	245,357	207,301	257,424
Total e-kWh/m ²	352.02	297.42	369.33
GHG (kg/yr)	37,074	30,425	39,036
GHG (kg/m ²)	53.19	43.65	56.01

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 118 (East Credit)

Address: 1045 Bristol Road West, L5V 2J8

Year Built: 1996

Area: 733 m² (7,890 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	75,184	85,585	85,359
Natural Gas (m ³)	13,797	13,711	14,142
Nat. Gas (e-kWh)	144,872	143,969	148,489
Total e-kWh	220,056	229,554	233,849
Total e-kWh/m ²	300.21	313.17	319.03
GHG (kg/yr)	32,155	32,825	33,622
GHG (kg/m ²)	43.87	44.78	45.87

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 119 (Airport-Leased)

Address: 3201 Elmbank Road, L4V 1A6

Year Built: 2000

Area: 729 m² (7,847 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	69,727	77,448	60,857
Natural Gas (m ³)	15,415	17,636	22,901
<i>Nat. Gas (e-kWh)</i>	161,855	185,178	240,461
Total e-kWh	231,583	262,626	301,317
Total e-kWh/m ²	317.67	360.26	413.33
GHG (kg/yr)	34,783	39,609	48,257
GHG (kg/m ²)	47.71	54.33	66.20

Energy Measures and Status

- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 121 (Meadowvale Village)

Address: 6745 Mavis Road, L5W 1L9

Year Built: 2002

Area: 760 m² (8,181 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	83,121	77,529	77,146
Natural Gas (m ³)	15,087	12,931	16,298
<i>Nat. Gas (e-kWh)</i>	158,417	135,780	171,134
Total e-kWh	241,538	213,309	248,280
Total e-kWh/m ²	317.81	280.67	326.68
GHG (kg/yr)	35,235	30,702	37,051
GHG (kg/m ²)	46.36	40.40	48.75

Energy Measures and Status

- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Fire Station 122 (Churchill Meadows)

Address: 3600 Thomas St, L5M 7E2

Year Built: 2003

Area: 769 m² (8,277 ft²)

Facility Type: Fire

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	82,283	75,674	73,658
Natural Gas (m ³)	13,338	15,859	17,259
<i>Nat. Gas (e-kWh)</i>	140,052	166,520	181,216
Total e-kWh	222,335	242,194	254,874
Total e-kWh/m ²	289.12	314.95	331.44
GHG (kg/yr)	31,854	36,101	38,591
GHG (kg/m ²)	41.42	46.95	50.18

Energy Measures and Status

- Energy Audit
- LED Parking Lot

Facility: Frank McKechnie Community Centre

Address: 310 Bristol Road East, L5R 2J8

Year Built: 2000

Area: 5,863 m² (63,109 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,326,690	974,684	1,380,720
Natural Gas (m ³)	247,327	172,451	202,536
Nat. Gas (e-kWh)	2,596,930	1,810,732	2,126,631
Total e-kWh	3,923,621	2,785,416	3,507,351
Total e-kWh/m ²	669.22	475.08	598.22
GHG (kg/yr)	574,725	404,703	494,187
GHG (kg/m ²)	98.03	69.03	84.29

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Pool VSD
- Unit Heater Disconnect

Facility: Garry W Morden Centre

Address: 7535 Ninth Line, L5N 7C3

Year Built: 2012

Area: n/a

Facility Type: Fire

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	75,647	1,490,696	1,733,057
Natural Gas (m ³)	12,447	84,846	99,863
Nat. Gas (e-kWh)	130,697	890,885	1,048,561
Total e-kWh	206,344	2,381,581	2,781,618
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	29,635	280,007	327,847
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

- Energy Audit

Facility: Hershey Centre

Address: 5500 Rose Cherry Place, L4Z 4B6

Year Built: 1998

Area: 23,407 m² (251,951 ft²)

Facility Type: Quad Arena

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	5,616,020	4,917,280	4,619,587
Natural Gas (m ³)	630,189	447,939	380,527
Nat. Gas (e-kWh)	6,616,986	4,703,354	3,995,529
Total e-kWh	12,233,006	9,620,634	8,615,116
Total e-kWh/m ²	522.62	411.02	368.06
GHG (kg/yr)	1,643,250	1,242,056	1,090,520
GHG (kg/m ²)	70.20	53.06	46.59

Energy Measures and Status

- BAS Installation
- BAS Upgrade
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- Ice Controls
- Insulation
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Solar Photovoltaics
- Unit Heater Disconnect
- Waste Heat Recovery

Facility: Hershey Centre Change House

Address: 5725 Rose Cherry Place, L4Z 4B6

Year Built: 2007

Area: n/a

Facility Type: Recreation Complex

Weekly Hrs: 70 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	220,926	363,161	598,090
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	220,926	363,161	598,090
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	17,674	29,053	47,847
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

Facility: Hershey Centre Sport Dome

Address: ??, L4Z 4B6

Year Built: 2007

Area: n/a

Facility Type: Recreation Complex

Weekly Hrs: 125 Hrs/Wk

Historical Energy and GHG Data				Energy Measures and Status
Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>	
Electricity (kWh)	0	0	0	
Natural Gas (m ³)	0	31,950	192,418	
<i>Nat. Gas (e-kWh)</i>	0	335,470	2,020,393	
Total e-kWh	0	335,470	2,020,393	
Total e-kWh/m ²	n/a	n/a	n/a	
GHG (kg/yr)	0	60,532	364,560	
GHG (kg/m ²)	n/a	n/a	n/a	

Facility: Hershey Centre Sports Complex

Address: 5600 Rose Cherry Place, L4Z 4B6

Year Built: 2007

Area: 18,000 m² (193,750 ft²)

Facility Type: Recreation Complex

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	2,295,197	2,388,096	2,127,916
Natural Gas (m ³)	142,057	158,250	148,318
Nat. Gas (e-kWh)	1,491,597	1,661,629	1,557,339
Total e-kWh	3,786,794	4,049,725	3,685,255
Total e-kWh/m ²	210.38	224.99	204.74
GHG (kg/yr)	452,759	490,872	451,240
GHG (kg/m ²)	25.15	27.27	25.07

Energy Measures and Status

- ● ● BAS Settings/Programming
- CO2 Controls
- Control Optimization
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- Insulation
- LED Lighting Retrofit

Facility: Holcin Waterfront Centre

Address: 2700 Lakeshore Rd W, L5J 1K3

Year Built: 1938

Area: n/a

Facility Type: n/a

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	0	0	0
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	0	0	0
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

Facility: Huron Park Community Centre Pool & Arena

Address: 830 Paisley Blvd W, L5C 3P5

Year Built: 1967

Area: 7,578 m² (81,569 ft²)

Facility Type: Community Centre

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,763,498	1,745,440	1,642,926
Natural Gas (m ³)	366,921	289,273	330,330
Nat. Gas (e-kWh)	3,852,669	3,037,365	3,468,470
Total e-kWh	5,616,167	4,782,805	5,111,396
Total e-kWh/m ²	741.12	631.14	674.51
GHG (kg/yr)	836,255	687,697	757,285
GHG (kg/m ²)	110.35	90.75	99.93

Energy Measures and Status

- BAS Installation
- BAS Settings/Programming
- BAS Upgrade
- Building Envelope Sealing
- CO2 Controls
- Control Optimization
- Energy Audit
- Energy Dashboard
- Equipment Maintenance
- Equipment Optimization
- Free Cooling
- Insulation
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Pool VSD
- Re-commissioning
- Solar Water Heating
- Unit Heater Disconnect

Facility: Iceland Arena

Address: 705 Matheson Boulevard East, L4Z 3X9

Year Built: 1996

Area: 16,490 m² (177,497 ft²)

Facility Type: Quad Arena

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	4,857,031	4,877,885	4,644,666
Natural Gas (m ³)	447,492	439,474	474,848
<i>Nat. Gas (e-kWh)</i>	4,698,668	4,614,472	4,985,899
Total e-kWh	9,555,699	9,492,357	9,630,565
Total e-kWh/m ²	579.49	575.64	584.03
GHG (kg/yr)	1,236,390	1,222,866	1,271,229
GHG (kg/m ²)	74.98	74.16	77.09

Energy Measures and Status

- BAS Installation
- BAS Settings/Programming
- Building Envelope Sealing
- Desiccant Dehumidifier
- Energy Audit
- Energy Dashboard
- Equipment Maintenance
- Equipment Optimization
- Ice Controls
- Insulation
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Controls
- Lighting Retrofit
- Misc. Controls
- Re-commissioning
- Training
- Unit Heater Disconnect
- Variable Speed Drive
- Waste Heat Recovery

Facility: Lakefront Promenade Maintenance Depot

Address: 725 Lakefront Promenade, L5E 3G9

Year Built: 1988

Area: 1,078 m² (11,603 ft²)

Facility Type: Storage Facility

Weekly Hrs: 63 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	18,157	16,433	13,702
<i>Nat. Gas (e-kWh)</i>	190,653	172,544	143,875
Total e-kWh	190,653	172,544	143,875
Total e-kWh/m ²	176.86	160.06	133.46
GHG (kg/yr)	34,401	31,134	25,961
GHG (kg/m ²)	31.91	28.88	24.08

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect

Facility: Lakefront Promenade Marina

Address: 135 Lakefront Promenade, L5E 3G9

Year Built: 1991

Area: 495 m² (5,328 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	21,217	17,659	19,889
Nat. Gas (e-kWh)	222,774	185,421	208,834
Total e-kWh	222,774	185,421	208,834
Total e-kWh/m ²	450.05	374.59	421.89
GHG (kg/yr)	40,197	33,457	37,682
GHG (kg/m ²)	81.21	67.59	76.13

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit

Facility: Lakeview Golf Course

Address: 1190 Dixie Rd, L5E 2P4
Year Built: 1939
Area: 1,908 m² (20,538 ft²)
Facility Type: Recreation Complex
Weekly Hrs: 84 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	324,869	315,884	290,369
Natural Gas (m ³)	28,804	21,177	31,550
Nat. Gas (e-kWh)	302,440	222,355	331,272
Total e-kWh	627,308	538,239	621,642
Total e-kWh/m ²	328.78	282.10	325.81
GHG (kg/yr)	80,562	65,393	83,004
GHG (kg/m ²)	42.22	34.27	43.50

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit

Facility: Lakeview Greenskeeper

Address: 1392 Dixie Road, L5E 2P4

Year Built: 1939

Area: 223 m² (2,400 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	3,032	7,434	6,052
Natural Gas (m ³)	714	1,037	2,124
Nat. Gas (e-kWh)	7,502	10,884	22,298
Total e-kWh	10,534	18,318	28,349
Total e-kWh/m ²	47.24	82.14	127.13
GHG (kg/yr)	1,596	2,559	4,508
GHG (kg/m ²)	7.16	11.47	20.21

Energy Measures and Status

Facility: Lakeview Library

Address: 1110 Atwater Ave., L5E 1M9

Year Built: 1967

Area: 705 m² (7,589 ft²)

Facility Type: Library

Weekly Hrs: 49 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	105,692	116,884	108,617
Natural Gas (m ³)	12,423	14,073	10,505
Nat. Gas (e-kWh)	130,444	147,766	110,299
Total e-kWh	236,135	264,650	218,916
Total e-kWh/m ²	334.94	375.39	310.52
GHG (kg/yr)	31,993	36,014	28,592
GHG (kg/m ²)	45.38	51.08	40.56

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

Facility: Lewis Bradley Park - Outdoor Pool

Address: 745 Inverhouse Drive, L5J 2X9

Year Built: 1976

Area: 374 m² (4,026 ft²)

Facility Type: n/a

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	72,276	61,239	72,331
Natural Gas (m ³)	10,204	17,030	19,674
Nat. Gas (e-kWh)	107,138	178,811	206,582
Total e-kWh	179,415	240,050	278,913
Total e-kWh/m ²	479.72	641.84	745.76
GHG (kg/yr)	25,114	37,164	43,062
GHG (kg/m ²)	67.15	99.37	115.14

Energy Measures and Status

● ● Energy Audit

Facility: Lions Club of Credit Valley Pool Building

Address: 20 Rosewood Ave, L5G 3H9

Year Built: 1953

Area: 374 m² (4,026 ft²)

Facility Type: n/a

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	71,404	64,553	62,249
Natural Gas (m ³)	11,797	14,481	23,651
Nat. Gas (e-kWh)	123,868	152,053	248,333
Total e-kWh	195,272	216,606	310,582
Total e-kWh/m ²	522.12	579.16	830.43
GHG (kg/yr)	28,063	32,601	49,789
GHG (kg/m ²)	75.03	87.17	133.13

Energy Measures and Status

● ● Energy Audit

Facility: Living Arts Centre

Address: 4141 Living Arts Drive, L5B 4B8

Year Built: 1997

Area: 34,387 m² (370,138 ft²)

Facility Type: Theatre

Weekly Hrs: 98 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	3,617,522	3,423,666	3,430,159
Natural Gas (m ³)	455,960	413,517	430,063
Nat. Gas (e-kWh)	4,787,583	4,341,932	4,515,666
Total e-kWh	8,405,105	7,765,597	7,945,824
Total e-kWh/m ²	244.43	225.83	231.07
GHG (kg/yr)	1,153,273	1,057,351	1,089,219
GHG (kg/m ²)	33.54	30.75	31.68

Energy Measures and Status

- Building Envelope Sealing
- CO2 Controls
- Energy Audit
- Energy Dashboard
- Lighting Retrofit
- Variable Speed Drive

Facility: Lorne Park Hall

Address: 1288 Lorne Park Road, L5H 3B1

Year Built: 1940

Area: 139 m² (1,496 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,402	2,082	2,668
Natural Gas (m ³)	2,780	2,483	2,493
Nat. Gas (e-kWh)	29,189	26,067	26,173
Total e-kWh	30,591	28,149	28,841
Total e-kWh/m ²	220.08	202.51	207.49
GHG (kg/yr)	5,379	4,870	4,936
GHG (kg/m ²)	38.70	35.04	35.51

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit

Facility: Lorne Park Library

Address: 1474 Truscott Dr., L5J 1Z2

Year Built: 1967

Area: 1,108 m² (11,926 ft²)

Facility Type: Library

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	123,026	134,346	141,334
Natural Gas (m ³)	32,325	15,515	26,253
Nat. Gas (e-kWh)	339,410	162,908	275,657
Total e-kWh	462,435	297,253	416,991
Total e-kWh/m ²	417.36	268.28	376.35
GHG (kg/yr)	71,085	40,143	61,046
GHG (kg/m ²)	64.16	36.23	55.10

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

Facility: Malton Arena

Address: 3430 Derry Rd E, L4T 1A9

Year Built: 1968

Area: 2,702 m² (29,084 ft²)

Facility Type: Single-Pad Area

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	509,369	485,717	462,094
Natural Gas (m ³)	36,674	32,593	36,158
Nat. Gas (e-kWh)	385,079	342,223	379,658
Total e-kWh	894,448	827,941	841,752
Total e-kWh/m ²	331.03	306.42	311.53
GHG (kg/yr)	110,233	100,608	105,473
GHG (kg/m ²)	40.80	37.23	39.04

Energy Measures and Status

- ● Energy Audit
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect

Facility: Malton Community Centre

Address: 3540 Morningstar Dr, L4T 1Y2

Year Built: 1977

Area: 6,962 m² (74,938 ft²)

Facility Type: Community Centre

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,712,066	1,964,679	1,869,805
Natural Gas (m ³)	149,974	231,391	244,858
<i>Nat. Gas (e-kWh)</i>	1,574,726	2,429,609	2,571,013
Total e-kWh	3,286,792	4,394,288	4,440,818
Total e-kWh/m ²	472.11	631.18	637.87
GHG (kg/yr)	421,109	595,573	613,498
GHG (kg/m ²)	60.49	85.55	88.12

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning

Facility: Malton Day Care Centre

Address: 3500 Morningstar Dr, L4T 1Y2

Year Built: 1977

Area: 535 m² (5,759 ft²)

Facility Type: n/a

Weekly Hrs: 55 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	12,456	12,872	15,616
Nat. Gas (e-kWh)	130,783	135,159	163,970
Total e-kWh	130,783	135,159	163,970
Total e-kWh/m ²	244.46	252.63	306.49
GHG (kg/yr)	23,599	24,388	29,587
GHG (kg/m ²)	44.11	45.59	55.30

Energy Measures and Status

- Building Envelope Sealing
- ● Energy Audit

Facility: Malton Hall (Victory)

Address: 3091 Victory Cres, L4T 1L5

Year Built: 1940

Area: 279 m² (3,003 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	7,482	7,664	9,170
Natural Gas (m ³)	5,463	6,776	7,656
Nat. Gas (e-kWh)	57,361	71,151	80,383
Total e-kWh	64,843	78,815	89,553
Total e-kWh/m ²	232.41	282.49	320.98
GHG (kg/yr)	10,949	13,452	15,238
GHG (kg/m ²)	39.24	48.21	54.62

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Waste Heat Recovery

Facility: Malton Satellite Terminal

Address: 6780 Professional Court, L4V 1X6

Year Built: 1991

Area: 2,070 m² (22,281 ft²)

Facility Type: Transit

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	895,358	807,089	845,246
Natural Gas (m ³)	159,958	201,353	177,735
<i>Nat. Gas (e-kWh)</i>	1,679,558	2,114,203	1,866,216
Total e-kWh	2,574,915	2,921,292	2,711,462
Total e-kWh/m ²	1,243.92	1,411.25	1,309.89
GHG (kg/yr)	374,688	446,054	404,360
GHG (kg/m ²)	181.01	215.48	195.34

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning

Facility: Malton Yard

Address: 7100 Fir Tree Dr, L5S 1G5

Year Built: 1977

Area: 2,466 m² (26,544 ft²)

Facility Type: Public Works

Weekly Hrs: 94.5 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	327,480	293,040	310,995
Natural Gas (m ³)	80,366	63,148	75,887
Nat. Gas (e-kWh)	843,838	663,059	796,811
Total e-kWh	1,171,318	956,099	1,107,806
Total e-kWh/m ²	474.99	387.71	449.23
GHG (kg/yr)	178,461	143,086	168,656
GHG (kg/m ²)	72.37	58.02	68.39

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- Equipment Maintenance
- Heater Replacement
- LED Parking Lot
- Lighting Retrofit
- New Technology
- Programmable Thermostats

Facility: Mary Fix House

Address: 25 Pinetree Way, L5G 0A2

Year Built: 1950

Area: 140 m² (1,507 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	46,617	7,049	0
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	46,617	7,049	0
Total e-kWh/m ²	332.98	50.35	0.00
GHG (kg/yr)	3,729	564	0
GHG (kg/m ²)	26.64	4.03	0.00

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Mavis North

Address: 3235 Mavis Rd, L5C 1T7

Year Built: 1982

Area: 2,799 m² (30,128 ft²)

Facility Type: n/a

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	376,833	375,086	379,303
Natural Gas (m ³)	42,779	43,876	48,690
Nat. Gas (e-kWh)	449,177	460,701	511,242
Total e-kWh	826,011	835,787	890,545
Total e-kWh/m ²	295.11	298.60	318.17
GHG (kg/yr)	111,196	113,136	122,593
GHG (kg/m ²)	39.73	40.42	43.80

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect

Facility: Mavis South

Address: 3185 Mavis Rd, L5C 1T7

Year Built: 1956

Area: 5,299 m² (57,038 ft²)

Facility Type: Public Works

Weekly Hrs: 94.5 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	973,356	935,868	909,294
Natural Gas (m ³)	84,676	68,221	73,246
Nat. Gas (e-kWh)	889,093	716,318	769,081
Total e-kWh	1,862,449	1,652,186	1,678,375
Total e-kWh/m ²	351.47	311.79	316.73
GHG (kg/yr)	238,296	204,122	211,516
GHG (kg/m ²)	44.97	38.52	39.92

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Meadowvale 4 Rinks

Address: 2160 Torquay Mews, L5N 2M6

Year Built: 1977

Area: 9,211 m² (99,146 ft²)

Facility Type: Quad Arena

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	3,170,633	3,035,221	2,933,926
Natural Gas (m ³)	293,703	249,312	277,497
Nat. Gas (e-kWh)	3,083,882	2,617,778	2,913,722
Total e-kWh	6,254,515	5,652,998	5,847,648
Total e-kWh/m ²	679.03	613.72	634.86
GHG (kg/yr)	810,106	715,169	760,466
GHG (kg/m ²)	87.95	77.64	82.56

Energy Measures and Status

- BAS Installation
- BAS Upgrade
- Building Envelope Sealing
- Desiccant Dehumidifier
- Energy Audit
- Energy Dashboard
- Ice Controls
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Misc. Controls
- Re-commissioning
- Unit Heater Disconnect
- Variable Speed Drive

Facility: Meadowvale Community Centre

Address: 6655 Glen Erin Dr, L5N 3L4

Year Built: 1981

Area: n/a

Facility Type: Community Centre

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	0	0	0
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	0	0	0
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

- BAS Installation
- Boiler Replacement
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- Lighting Retrofit

Facility: Meadowvale Community Theatre

Address: 6315 Montevideo Rd, L5N 4G7

Year Built: 1981

Area: 2,028 m² (21,829 ft²)

Facility Type: Theatre

Weekly Hrs: 40 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	394,534	329,133	357,259
Natural Gas (m ³)	46,755	47,416	52,975
Nat. Gas (e-kWh)	490,932	497,869	556,238
Total e-kWh	885,467	827,002	913,497
Total e-kWh/m ²	436.62	407.79	450.44
GHG (kg/yr)	120,147	116,166	128,948
GHG (kg/m ²)	59.24	57.28	63.58

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit
- Re-commissioning

Facility: Meadowvale Depot

Address: 6300 Millcreek Dr, L5N 7K1

Year Built: 1980

Area: 1,640 m² (17,653 ft²)

Facility Type: Public Works

Weekly Hrs: 94.5 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	389,071	339,109	361,803
Natural Gas (m ³)	26,576	20,050	25,704
Nat. Gas (e-kWh)	279,043	210,522	269,890
Total e-kWh	668,114	549,632	631,693
Total e-kWh/m ²	407.39	335.14	385.18
GHG (kg/yr)	81,476	65,115	77,643
GHG (kg/m ²)	49.68	39.70	47.34

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

**Facility: Meadowvale Library**

Address: 6677 Meadowvale T.Cen., L5N 2R5

Year Built: 2002

Area: 1,552 m² (16,706 ft²)

Facility Type: Library

Weekly Hrs: 69 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	235,340	210,522	206,302
Natural Gas (m ³)	22,572	14,285	17,041
Nat. Gas (e-kWh)	237,007	149,989	178,931
Total e-kWh	472,348	360,511	385,233
Total e-kWh/m ²	304.35	232.29	248.22
GHG (kg/yr)	61,593	43,906	48,790
GHG (kg/m ²)	39.69	28.29	31.44

Energy Measures and Status

- Energy Audit

Facility: Meadowvale Village C.C. Hall

Address: 6970 Second Line W, L5W 1A1

Year Built: 1871

Area: 250 m² (2,691 ft²)

Facility Type: Community Centre

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	88,845	91,252	13,877
Natural Gas (m ³)	13,200	11,343	13,302
<i>Nat. Gas (e-kWh)</i>	138,596	119,104	139,667
Total e-kWh	227,441	210,355	153,544
Total e-kWh/m ²	909.76	841.42	614.18
GHG (kg/yr)	32,116	28,791	26,312
GHG (kg/m ²)	128.46	115.16	105.25

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Miss. Valley Gymnastics Centre

Address: 1395 Mississauga Valley Blvd, L5A 3R8

Year Built: 1984

Area: 1,939 m² (20,871 ft²)

Facility Type: Recreation Complex

Weekly Hrs: 98 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	343,828	347,984	312,059
Natural Gas (m ³)	25,927	15,489	19,932
<i>Nat. Gas (e-kWh)</i>	272,234	162,637	209,290
Total e-kWh	616,062	510,621	521,349
Total e-kWh/m ²	317.72	263.34	268.88
GHG (kg/yr)	76,628	57,185	62,729
GHG (kg/m ²)	39.52	29.49	32.35

Energy Measures and Status

- Energy Audit
- Re-commissioning

Facility: Mississauga Canoe Club

Address: 33 Front St N, L5H 2E1

Year Built: 1950

Area: 472 m² (5,081 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	15,270	12,311	10,606
<i>Nat. Gas (e-kWh)</i>	160,330	129,264	111,364
Total e-kWh	160,330	129,264	111,364
Total e-kWh/m ²	339.68	273.87	235.94
GHG (kg/yr)	28,930	23,324	20,095
GHG (kg/m ²)	61.29	49.42	42.57

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Lighting Retrofit
- Programmable Thermostats
- Waste Heat Recovery

Facility: Mississauga Central Library

Address: 301 Burnhamthorpe Rd. W., L5B 3Y3

Year Built: 1990

Area: 33,412 m² (359,643 ft²)

Facility Type: Library

Weekly Hrs: 64 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	3,318,482	3,516,369	3,353,498
Natural Gas (m ³)	182,098	174,116	172,893
Nat. Gas (e-kWh)	1,912,033	1,828,219	1,815,374
Total e-kWh	5,230,515	5,344,588	5,168,872
Total e-kWh/m ²	156.55	159.96	154.70
GHG (kg/yr)	610,486	611,193	595,846
GHG (kg/m ²)	18.27	18.29	17.83

Energy Measures and Status

- Energy Audit
- Energy Dashboard
- Lighting Retrofit
- Variable Speed Drive

Facility: Mississauga City Hall

Address: 300 City Centre Drive, L5B 3C1

Year Built: 1987

Area: 69,331 m² (746,272 ft²)

Facility Type: Town Hall

Weekly Hrs: 55 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	7,034,090	6,900,736	6,945,732
Natural Gas (m ³)	443,856	394,516	404,784
Nat. Gas (e-kWh)	4,660,493	4,142,421	4,250,236
Total e-kWh	11,694,583	11,043,157	11,195,968
Total e-kWh/m ²	168.68	159.28	161.49
GHG (kg/yr)	1,403,667	1,299,517	1,322,571
GHG (kg/m ²)	20.25	18.74	19.08

Energy Measures and Status

- Building Envelope Sealing
- Chiller Replacement
- Energy Audit
- Energy Dashboard
- LED Lighting Retrofit
- Re-commissioning
- Variable Speed Drive

Facility: Mississauga Senior Citizen Centre

Address: 1389 Cawthra Rd, L5G 4L1

Year Built: 1974

Area: n/a

Facility Type: n/a

Weekly Hrs: 72 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	0	0	0
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	0	0	0
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Mississauga Valley Community Centre

Address: 1275 Mississauga Valley Blvd, L5A 3R8

Year Built: 1977

Area: 10,640 m² (114,528 ft²)

Facility Type: Community Centre

Weekly Hrs: 138 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	2,135,575	2,325,803	2,553,266
Natural Gas (m ³)	203,867	214,880	360,283
Nat. Gas (e-kWh)	2,140,606	2,256,240	3,782,974
Total e-kWh	4,276,181	4,582,043	6,336,240
Total e-kWh/m ²	401.90	430.64	595.51
GHG (kg/yr)	557,097	593,180	886,861
GHG (kg/m ²)	52.36	55.75	83.35

Energy Measures and Status

- BAS Installation
- BAS Upgrade
- Building Envelope Sealing
- Control Optimization
- Energy Audit
- Energy Dashboard
- Free Cooling
- LED Arena/Pool Lighting
- Lighting Retrofit
- Misc. Controls
- Pool VSD
- Re-commissioning
- Unit Heater Disconnect
- Waste Heat Recovery

**Facility: Old Fire Hall - Malton (Malton Boy Scouts)**

Address: 3136 Victory Crescent, L4T 1L6

Year Built: 1954

Area: 226 m² (2,433 ft²)

Facility Type: n/a

Weekly Hrs: 70 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	7,538	6,691	3,354
Natural Gas (m ³)	122	117	118
Nat. Gas (e-kWh)	1,278	1,227	1,237
Total e-kWh	8,816	7,918	4,591
Total e-kWh/m ²	39.01	35.03	20.32
GHG (kg/yr)	834	757	492
GHG (kg/m ²)	3.69	3.35	2.18

Energy Measures and Status

Facility: Ontario Court of Justice

Address: 950 Burnhamthorpe Road W, L5C 3B4

Year Built: 1977

Area: 11,767 m² (126,659 ft²)

Facility Type: Other

Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,241,909	1,145,619	1,070,070
Natural Gas (m ³)	156,738	124,974	160,393
Nat. Gas (e-kWh)	1,645,753	1,312,230	1,684,129
Total e-kWh	2,887,661	2,457,849	2,754,199
Total e-kWh/m ²	245.40	208.88	234.06
GHG (kg/yr)	396,312	328,428	389,490
GHG (kg/m ²)	33.68	27.91	33.10

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot
- Lighting Retrofit

Facility: Port Credit Arena

Address: 40 Stavebank Rd, L5G 2T8

Year Built: 1959

Area: 4,937 m² (53,141 ft²)

Facility Type: Single-Pad Area

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,069,130	1,058,762	1,000,815
Natural Gas (m ³)	139,686	104,968	111,100
Nat. Gas (e-kWh)	1,466,706	1,102,160	1,166,551
Total e-kWh	2,535,836	2,160,922	2,167,366
Total e-kWh/m ²	513.64	437.70	439.01
GHG (kg/yr)	350,183	283,575	290,558
GHG (kg/m ²)	70.93	57.44	58.85

Energy Measures and Status

- BAS Settings/Programming
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- Lighting Retrofit

Facility: Port Credit Library

Address: 20 Lakeshore Rd. E, L5G 1C8

Year Built: 1962

Area: 754 m² (8,116 ft²)

Facility Type: Library

Weekly Hrs: 53 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	146,256	165,944	126,294
Natural Gas (m ³)	23,792	13,748	18,238
<i>Nat. Gas (e-kWh)</i>	249,818	144,351	191,500
Total e-kWh	396,074	310,296	317,794
Total e-kWh/m ²	525.30	411.53	421.48
GHG (kg/yr)	56,778	39,322	44,658
GHG (kg/m ²)	75.30	52.15	59.23

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- LED Parking Lot

Facility: Rivergrove Community Centre & Pool

Address: 5800 River Grove Avenue, L5M 4R9

Year Built: 1996

Area: 6,336 m² (68,200 ft²)

Facility Type: Community Centre

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	2,332,657	2,096,247	1,179,684
Natural Gas (m ³)	288,226	265,311	204,885
Nat. Gas (e-kWh)	3,026,369	2,785,763	2,151,290
Total e-kWh	5,359,026	4,882,010	3,330,974
Total e-kWh/m ²	845.81	770.52	525.72
GHG (kg/yr)	732,691	670,363	482,553
GHG (kg/m ²)	115.64	105.80	76.16

Energy Measures and Status

- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Pool VSD

**Facility: Riverwood Park/ McEwan Estate**

Address: 4170 Riverwood Park Lane, L5C 2S7

Year Built: 2005

Area: 342 m² (3,681 ft²)

Facility Type: n/a

Weekly Hrs: 72 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	346	223	806
Natural Gas (m ³)	5,504	4,142	4,561
Nat. Gas (e-kWh)	57,797	43,491	47,886
Total e-kWh	58,143	43,714	48,692
Total e-kWh/m ²	170.01	127.82	142.37
GHG (kg/yr)	10,457	7,865	8,705
GHG (kg/m ²)	30.57	23.00	25.45

Energy Measures and Status

Facility: Russell Langmaid Property

Address: 170 Church St., L5M 2M3

Year Built: n/a

Area: n/a

Facility Type: Other

Weekly Hrs: n/a

Historical Energy and GHG Data				Energy Measures and Status
Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>	
Electricity (kWh)	25,518	57,372	60,964	
Natural Gas (m ³)	19,259	18,726	23,720	
<i>Nat. Gas (e-kWh)</i>	202,221	196,622	249,061	
Total e-kWh	227,739	253,995	310,026	
Total e-kWh/m ²	n/a	n/a	n/a	
GHG (kg/yr)	38,530	40,068	49,818	
GHG (kg/m ²)	n/a	n/a	n/a	

Facility: Semenyk Crt - T&W Administration-TEP

Address: 3484 Semenyk Court, L5C 4R1

Year Built: 1989

Area: 2,422 m² (26,070 ft²)

Facility Type: Office

Weekly Hrs: 50 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	394,559	354,735	350,330
Natural Gas (m ³)	29,804	31,135	32,363
Nat. Gas (e-kWh)	312,940	326,914	339,811
Total e-kWh	707,499	681,649	690,141
Total e-kWh/m ²	292.11	281.44	284.95
GHG (kg/yr)	88,032	87,367	89,342
GHG (kg/m ²)	36.35	36.07	36.89

Energy Measures and Status

- BAS Installation
- Building Envelope Sealing
- Energy Audit

Facility: Sheridan Library

Address: 2225 Erin Mills Pky., L5K 1T9

Year Built: 1970

Area: 525 m² (5,651 ft²)

Facility Type: Library

Weekly Hrs: 57 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	65,060	67,159	90,253
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	65,060	67,159	90,253
Total e-kWh/m ²	123.92	127.92	171.91
GHG (kg/yr)	5,205	5,373	7,220
GHG (kg/m ²)	9.91	10.23	13.75

Energy Measures and Status

- Energy Audit

Facility: South Common Community Centre Library & Pool

Address: 2233 South Millway Dr, L5L 3H7

Year Built: 1981

Area: 6,979 m² (75,121 ft²)

Facility Type: Community Centre

Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,451,643	1,444,979	1,196,780
Natural Gas (m ³)	237,809	204,201	177,957
<i>Nat. Gas (e-kWh)</i>	2,496,998	2,144,108	1,868,553
Total e-kWh	3,948,641	3,589,087	3,065,333
Total e-kWh/m ²	565.79	514.27	439.22
GHG (kg/yr)	566,690	502,481	432,904
GHG (kg/m ²)	81.20	72.00	62.03

Energy Measures and Status

- BAS Settings/Programming
- BAS Upgrade
- Boiler Replacement
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- Equipment Maintenance
- Heater Replacement
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Controls
- Lighting Retrofit
- Misc. Controls
- Pipe Insulation
- Pool VSD
- Re-commissioning

Facility: Streetlights - Mississauga

Address: Various, N/A
Year Built: n/a
Area: n/a
Facility Type: Street Lighting
Weekly Hrs: 70 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	39,840,002	40,046,382	37,586,114
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	39,840,002	40,046,382	37,586,114
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	3,187,200	3,203,711	3,006,889
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

- LED Street Lighting

Facility: Streetsville - Outdoor Pool

Address: 335 Church St, L5M 1N1
Year Built: 1966
Area: 323 m² (3,477 ft²)
Facility Type: n/a
Weekly Hrs: 100 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	50,640	56,893	52,247
Natural Gas (m ³)	1,390	15,418	26,677
Nat. Gas (e-kWh)	14,600	161,893	280,112
Total e-kWh	65,240	218,786	332,359
Total e-kWh/m ²	201.98	677.36	1,028.98
GHG (kg/yr)	6,686	33,763	54,723
GHG (kg/m ²)	20.70	104.53	169.42

Energy Measures and Status

● ● Energy Audit

Facility: Streetsville Library

Address: 112 Queen Street South, L5M 1K8

Year Built: 1967

Area: 867 m² (9,332 ft²)

Facility Type: Library

Weekly Hrs: 59 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	149,433	149,459	168,164
Natural Gas (m ³)	14,318	12,012	11,077
Nat. Gas (e-kWh)	150,334	126,126	116,309
Total e-kWh	299,767	275,585	284,473
Total e-kWh/m ²	345.75	317.86	328.11
GHG (kg/yr)	39,081	34,715	34,440
GHG (kg/m ²)	45.08	40.04	39.72

Energy Measures and Status

- Energy Audit
- LED Parking Lot

Facility: Tomken Twin Arena

Address: 4495 Tomken Road, L4W 1J9

Year Built: 1990

Area: 6,594 m² (70,977 ft²)

Facility Type: Double-Pad Arena

Weekly Hrs: 125 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,540,125	1,431,044	1,323,760
Natural Gas (m ³)	191,518	157,185	156,298
<i>Nat. Gas (e-kWh)</i>	2,010,942	1,650,446	1,641,134
Total e-kWh	3,551,067	3,081,490	2,964,894
Total e-kWh/m ²	538.53	467.32	449.64
GHG (kg/yr)	486,064	412,290	402,027
GHG (kg/m ²)	73.71	62.53	60.97

Energy Measures and Status

- BAS Upgrade
- Building Envelope Sealing
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Misc. Controls
- Re-commissioning
- Waste Heat Recovery

Facility: Transit Campus Bldg A B C D - Storage Admin Repair

Address: 975 Central Parkway W, L5C 3B1

Year Built: 1975

Area: 31,175 m² (335,564 ft²)

Facility Type: Transit

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	7,364,645	6,604,759	6,489,628
Natural Gas (m ³)	1,817,522	1,265,216	1,331,794
<i>Nat. Gas (e-kWh)</i>	19,083,985	13,284,765	13,983,842
Total e-kWh	26,448,630	19,889,524	20,473,470
Total e-kWh/m ²	848.39	638.00	656.73
GHG (kg/yr)	4,032,686	2,925,484	3,042,415
GHG (kg/m ²)	129.36	93.84	97.59

Energy Measures and Status

- BAS Settings/Programming
- Building Envelope Sealing
- Control Optimization
- Energy Audit
- Energy Dashboard
- LED Parking Lot
- Lighting Retrofit
- Programmable Thermostats
- Re-commissioning

Facility: Transit Campus Bldg E - Storage Garage

Address: 3567 Erindale Station Rd, L5C 2S9

Year Built: 2009

Area: 10,412 m² (112,074 ft²)

Facility Type: Transit

Weekly Hrs: 168 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	1,771,576	1,540,800	1,639,200
Natural Gas (m ³)	571,916	355,451	341,055
<i>Nat. Gas (e-kWh)</i>	6,005,120	3,732,239	3,581,076
Total e-kWh	7,776,696	5,273,039	5,220,276
Total e-kWh/m ²	746.90	506.44	501.37
GHG (kg/yr)	1,225,290	796,709	777,305
GHG (kg/m ²)	117.68	76.52	74.65

Energy Measures and Status

- BAS Settings/Programming
- Energy Audit
- Equipment Optimization
- Programmable Thermostats

Facility: Transit Campus Bldg F - Body Shop

Address: 3585 Erindale Station Rd, L5C 2S9

Year Built: 2008

Area: 2,274 m² (24,477 ft²)

Facility Type: Transit

Weekly Hrs: 56 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	157,458	123,950	169,929
<i>Nat. Gas (e-kWh)</i>	1,653,308	1,301,470	1,784,250
Total e-kWh	1,653,308	1,301,470	1,784,250
Total e-kWh/m ²	727.05	572.33	784.63
GHG (kg/yr)	298,323	234,837	321,950
GHG (kg/m ²)	131.19	103.27	141.58

Energy Measures and Status

- BAS Settings/Programming
- Energy Audit
- Programmable Thermostats

**Facility: Transit Drivers Lounge**

Address: 7205 Goreway Dr, L4T 2T9

Year Built: 2009

Area: 56 m² (603 ft²)

Facility Type: Transit

Weekly Hrs: 168 Hrs/Wk

Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	59,750	54,012	60,448
Natural Gas (m ³)	0	0	0
Nat. Gas (e-kWh)	0	0	0
Total e-kWh	59,750	54,012	60,448
Total e-kWh/m ²	1,066.96	964.50	1,079.43
GHG (kg/yr)	4,780	4,321	4,836
GHG (kg/m ²)	85.36	77.16	86.35

Energy Measures and Status

Facility: Woodlands Library

Address: 1030 McBride Avenue, L5C 1L6

Year Built: 1975

Area: n/a

Facility Type: Library

Weekly Hrs: 57 Hrs/Wk


Historical Energy and GHG Data

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	0	0	2,902
Nat. Gas (e-kWh)	0	0	30,472
Total e-kWh	0	0	30,472
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	0	0	5,498
GHG (kg/m ²)	n/a	n/a	n/a

Energy Measures and Status

- Energy Audit

APPENDIX 6.0: DEFINITIONS

Below are definitions of some terms that may appear in this document.

AHU	Air Handling Unit. A device used to condition (heat or cool) and circulate air as part of a heating, ventilating, and air-conditioning (HVAC) system.
BAS	Building Automation System. Sometimes also referred to as a Building Management System (BMS). A BAS is a computer network of electronic devices designed to monitor and control a building's mechanical, security, fire and flood safety, lighting, HVAC and humidity control and ventilation systems.
CO₂	Carbon dioxide. A greenhouse gas that contributes to the greenhouse effect (See Greenhouse Gas)
Cubic Meter	Measurement of volume commonly used for natural gas. Can also be denoted as m³ 1 cubic meter of natural gas contains approximately 10.5 equivalent kilowatt hours of energy ($1 \text{ m}^3 = 10.5 \text{ e-kWh}$)
Conservation and Demand Management	The reduction or conservation of electricity and natural gas consumption and peak electricity demand.
Domestic Hot Water	Water used in washrooms, kitchens and showers. Does not include water used in pools or building heating.
Electricity Consumption	The electrical energy actually used. Measured in kilowatt hours. Example: ten 100-watt light bulbs used for 2 hours would consume 2,000 watt-hours, or 2 kilowatt-hours ($10 \times 100 \text{ watt} \times 2 \text{ hours} = 2,000 \text{ watt-hours} = 2 \text{ kWh}$)
Electricity Demand	The rate of using electricity. Measures in kilowatts. Example: ten 100-watt light bulbs consume electricity at a rate of 1,000 watts, or 1 kilowatt. The peak demand is the highest rate of electricity use during a given period of time.

Emission Factor	<p>Representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.</p> <p>Usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of CO₂ emitted per cubic meter of natural gas burned)</p>
Energy Efficiency Measure	<p>An action or work done to save on electricity, natural gas, oil, or other form of energy consumption, within City of Mississauga facilities.</p> <p>Each measure can be classified as a Project, a Process, or a Program (see definition for each).</p>
Energy Use Intensity	<p>Also referred to as EUI, a measurement that essentially expresses a building's energy use as a function of its size or other characteristics.</p> <p>The measurement used in this plan for EUI is e-kWh/m²</p>
Equivalent kilowatt hour	<p>An equivalent kilowatt hour (e-kWh) is the conversion of an unit of energy to a common unit to better compare different types of energy sources.</p> <p>Example: Converting a cubic meter (see Cubic Meter) of natural gas to an equivalent kilowatt hour measure to compare to electricity usage in kilowatt hours.</p> <p>1 e-kWh is comparable to 1 kWh in energy terms</p>
EUI	See Energy Use Intensity
Facilities and Property Development	A section of the City's Facility and Property Management division. The section is responsible for carrying out and implementing capital projects such as building construction, redevelopments, and life cycle replacement of equipment.
FIT	<p>Feed-In Tariff Program. Developed by the Province of Ontario to encourage and promote greater use of renewable energy sources including on-shore wind, waterpower, renewable biomass, biogas, landfill gas and solar photovoltaic (PV) for electricity generating projects in Ontario.</p> <p>See http://fit.powerauthority.on.ca/fit-program for more information.</p>
Fossil Fuel	A fuel (as coal, oil, or natural gas) formed in the earth from plant or animal remains.

GHG	See Greenhouse Gas
GHG Intensity	A measurement that essentially expresses a building's GHG emissions as a function of its size or other characteristics.
Green Energy Act	Formally Bill 150 , the Green Energy and Green Economy Act, 2009 , introduced in the Ontario legislature on February 23, 2009. It aims to expand renewable energy production, encourage energy conservation and create green jobs.
Green Power	Energy produced from renewable and non-hazardous technologies. Common sources of green power include solar, wind, geothermal, biogas, and low-impact hydroelectric.
Greenhouse Gas	Any of the atmospheric gases that contribute to the greenhouse effect by absorbing infrared radiation produced by solar warming of the Earth's surface. They include carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (NO ₂), and water vapour.
HVAC	H eating V entilation and A ir C onditioning.
Kilowatt	<p>Unit on measurement for the rate of power use (the power at any instance in time). Commonly used on electricity bills to show the electrical demand.</p> <p>1 kilowatt = 1,000 watts</p> <p>1 megawatt = 1,000 kilowatt</p> <p>Can also be denoted as kW</p>
Kilowatt Hour	<p>A measurement of power used (commonly electricity) over a period of time.</p> <p>1 kilowatt hour = 1,000 watt hours</p> <p>1 megawatt hour = 1,000 kilowatt hours</p> <p>1 kilowatt hour = 1 watt x 1,000 hour OR 500 watts x 2 hour² OR 2,000 watt x ½ hour</p> <p>Can also be denoted as kWh</p>
kW	See Kilowatt .

kWh	See Kilowatt Hour .
LED	Light Emitting Diode. An electronic device that emits light when an electrical current is passed through it. Modern LED lights are highly efficient (more light for less power) and have a long lifespan.
LEED	Leadership in Energy and Environmental Design. An ecology-oriented building certification program. Concentrates its efforts on improving performance across five key areas of environmental and human health: energy efficiency, indoor environmental quality, materials selection, sustainable site development and water savings.
m³	See Cubic Meter .
Megawatt	1 Megawatt is equal to 1,000 kilowatts (see Kilowatt).
Megawatt Hour	1 Megawatt hour is equal to 1,000 kilowatt hours (see Kilowatt Hour).
MW	See Megawatt .
MWh	See Megawatt Hour .
Net-zero Carbon	Also called carbon neutral, refers to achieving net zero carbon emissions by balancing a measured amount of carbon released with an equivalent amount sequestered or offset.
Process	Organizational Energy Efficiency Measure, involving building an energy conservation culture. Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.
Program	People Energy Efficiency Measure, involving awareness, habits, procedures and feedback. Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.
Project	Technological type Energy Efficiency Measure, involving operational and technological actions. Examples: Lighting retrofit, new controls, efficient boiler, etc.
Renewable Energy	Energy that comes from resources that are naturally replenished on a human timescale. Includes sunlight, wind, rain, tides, waves, and geothermal heat.

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