

AGENDA



ENVIRONMENTAL ADVISORY COMMITTEE

THE CORPORATION OF THE CITY OF MISSISSAUGA

TUESDAY, JUNE 10, 2014 – 9 A.M.

**COUNCIL CHAMBERS
SECOND FLOOR, CIVIC CENTRE**

300 CITY CENTRE DRIVE, MISSISSAUGA, ONTARIO, L5B 3C1

<http://www.mississauga.ca/portal/cityhall/environmentaladvisorycommittee>

Members

Councillor George Carlson, Ward 11 (CHAIR)
Michael DeWit, Citizen Member (VICE-CHAIR)
Councillor Jim Tovey, Ward 1
Councillor Frank Dale, Ward 4
Dr. Brad Bass, Citizen Member
Dr. André Plante, Office for Sustainability, Sheridan College,
Steven Jia, Peel Environmental Youth Alliance
Lea Ann Mallett, Citizen Member
Val Otori, Citizen Member
Maureen Ricker, Citizen Member
Carl Rodgers, Citizen Member
Lucia Salvati, University of Toronto Mississauga
Amy Zi-Xuan Liou, Peel Environmental Youth Alliance

Agency Liaison

Stephanie Crocker, Executive Director, EcoSource

CONTACT PERSON: Mumtaz Alikhan, Legislative Coordinator
Office of the City Clerk, Telephone: 905-615-3200, ext. 5425; Fax 905-615-4181

Mumtaz.Alikhan@mississauga.ca

CALL TO ORDER

APPROVAL OF AGENDA

DECLARATIONS OF CONFLICT OF INTEREST

PRESENTATIONS/DEPUTATIONS

- A. Partners for Climate Protection Award – Julius Lindsay, Community Energy Specialist, Environment Division, and Rajan Balchandani, Manager, Energy Management, Facilities and Property Management.
- B. 5 Year Energy Management Plan (2014-2019) - Rajan Balchandani, Manager, Energy Management, Facilities and Property Management, and Daryl Martin, Energy Management Co-ordinator, Facilities and Property Management

MATTERS TO BE CONSIDERED

- 1. Approval of Minutes of Previous Meeting held on May 6, 2014
- 2. 5 Year Energy Management Plan (2014-2019)
Corporate Report dated June 2, 2014 from the Commissioner of Corporate Services on the 5 Year Energy Management Plan – 2014 to 2019
RECOMMEND RECEIPT
- 3. Enbridge Line 9B Reversal and Capacity Expansion Pipeline Project (the “Project”)
Memorandum dated May 28, 2014 from Annie Thuan, Legal Counsel, Environmental Law, Legal Services Division.
RECOMMEND RECEIPT
- 4. Upcoming Agenda Items
Chart from Brenda Osborne, Director, Environment Division, with respect to pending and upcoming agenda items dated June 10, 2014.
RECOMMEND RECEIPT

INFORMATION ITEMS

- (a) Clean Air Council Correspondence
- (b) Green Pack for Kids
A Pilot Project with the Mississauga Library System – Brenda Osborne, Director

DATE OF NEXT MEETING – January 2015 (To be confirmed)

OTHER BUSINESS

ADJOURNMENT



DRAFT MINUTES

ENVIRONMENTAL ADVISORY COMMITTEE

THE CORPORATION OF THE CITY OF MISSISSAUGA

TUESDAY, MAY 6, 2014 – 9:00 A.M.

COMMITTEE ROOM 'A'

SECOND FLOOR, CIVIC CENTRE

300 CITY CENTRE DRIVE, MISSISSAUGA, ONTARIO, L5B 3C1

www.mississauga.ca

MEMBERS

Councillor George Carlson, Ward 11 (CHAIR)
Councillor Jim Tovey, Ward 1 (Left at 10:21am)
Councillor Frank Dale, Ward 4
Brad Bass, Citizen Member
Lea Ann Mallett, Citizen Member
Maureen Ricker, Citizen Member
Amy Zi-Xuan Liou, Peel Environmental Youth Alliance

AGENCY LIAISONS PRESENT:

Stephanie Crocker, EcoSource

ABSENT:

Michael DeWit, Citizen Member (VICE-CHAIR)
André Plante, Office for Sustainability, Sheridan College
Carl Rodgers, Citizen Member
Val Otori, Citizen Member
Lucia Salvati, University of Toronto Mississauga
Steven Jia, Peel Environmental Youth Alliance

STAFF PRESENT:

Brenda Osborne, Director, Environment Division
Andrea J. McLeod, Environmental Specialist, Environment Division

CONTACT PERSON: Mumtaz Alikhan, Legislative Coordinator
Office of the City Clerk, Telephone: 905-615-3200, ext. 5425; Fax 905-615-4181
Mumtaz.Alikhan@mississauga.ca

CALL TO ORDER - 9:02 a.m.

The Chair called the meeting to order. Brenda Osborne, Director, Environment Division, introduced, Diana Suzuki, the new Environmental Outreach Coordinator.

APPROVAL OF AGENDA

The Agenda was approved as presented.

Approved (Councillor Dale)

DECLARATIONS OF CONFLICT OF INTEREST - NilPRESENTATIONS/DEPUTATIONS

- A. Presentation on Chloride Concentrations Observed Last Winter by Amanjot Singh, Water Quality Engineer, Credit Valley Conservation Authority

Mr. Amanjot Singh, Water Quality Engineer, Credit Valley Conservation Authority (CVC), gave a PowerPoint Presentation on chloride concentrations from road salt observed last winter in Mississauga. The sampling focuses on creeks in Mississauga and the impact on the quality of local water courses. The levels of chloride in the Main Credit, Sheridan and Cooksville Creeks over January and February 2014 were significantly in excess of the established levels. He spoke of municipal challenges such as slips and falls and the detrimental impact on the environment. Mr. Singh noted that the City of Mississauga's initiative to replace sand-salt mixture with treated salt has resulted in significant reduction in chloride loading. He noted that more action was needed such as education, insurance or making snow tires mandatory, timing and monitoring of salt applications and collaboration with Region of Waterloo's *Smart About Salt* Program.

In response to questions regarding population growth and extrapolation of its impact, as well as salt testing in Lake Ontario, Mr. Singh responded that the CVC will be collecting more information on population growth, and that salt testing in Lake Ontario will require a joint effort with the Province and the Federal Government.

The Chair thanked Mr. Amanjot Singh for his informative presentation.

Recommendation

EAC-0012-2014

That the PowerPoint Presentation on May 6, 2014 entitled *Chloride Concentrations Observed Last Winter* by Mr. Amanjot Singh, Water Quality Engineer, Credit Valley Conservation Authority, be received.

Received (Councillor J. Tovey)

B. Stormwater Financing Initiative by Jeremy Blair, Storm Drainage Programming Engineer, Transportation and Works Department

Jeremy Blair, Storm Drainage Programming Engineer, Transportation and Works Department, spoke to the increasing pressure on the City's stormwater infrastructure and the need for an effective funding method to keep it in good working order. He gave an overview of the Stormwater Program including the introduction of the Stormwater Charge and its calculation, exemptions, credits for non-residential properties, incentives for home owners and grants for places of worship, the billing system and the implementation timeline of 2014 to 2016. The Stormwater Charge is a user fee authorized under the *Municipal Act, 2001*, and the intent is that it will be assessed to all properties except those exempted. Billing will appear as a line item on the Peel Water Utility Bill.

In response to the Committee's question regarding the use of the funds from the Stormwater Charge, Mr. Blair advised that the funds will be used for capital programs aimed at reducing the risk of flooding such as dredging ponds, maintaining creeks and water courses from debris and erosion, as well as introducing low impact development of roads and reconstruction projects. He noted that staff will take the comments with respect to lack of industry knowledge and options in the marketplace for permeable surfaces, grading of residential areas to prevent water collection, and rebates to homeowners by developers of new housing, under consideration.

The Chair thanked Mr. Blair for his informative presentation.

Recommendation

EAC-0013-2014

That the PowerPoint Presentation to the Environmental Advisory Committee on May 6, 2014 entitled *Stormwater Charge Implementation Project* by Mr. Jeremy Blair, Storm Drainage Programming Engineer, Transportation and Works Department, be received.

Received (Councillor F. Dale)

C. Future Directions 2014 Plan for Parks and Forestry by Eric Lucic, Team Leader – Parks Assets, Parks and Forestry Division

Eric Lucic, Team Leader – Parks Assets, Parks and Forestry Division, spoke to the 2014 Future Directions Master Plan Update for the Parks and Forestry Division. The Future Directions Plan is reviewed every 5 years with the previous one completed in 2009. Mr. Lucic reviewed the key findings related to parkland provision and the downtown growth area and intensification, service delivery and capital projects and the key recommendations. The next steps for finalizing the 2014 Future Directions Master Plan will be public information sessions to be held in April and May 2014, developing prioritization plans, with the final report to Council in June 2014.

In response to the Committee's questions, Mr. Lucic advised that in addition to community gardening, the recommendations include expansion of woodlots around sports fields which

will not require maintenance. The recommendations also include a look at the Transit system as the demand for waterfront parks will increase the need for public access.

The Chair thanked Mr. Lucic for an informative presentation.

Recommendation

EAC-0014-2014

That the PowerPoint Presentation to the Environmental Advisory Committee on May 6, 2014 with respect to the 2014 Future Directions Master Plan Update for Parks and Forestry by Mr. Eric Lucic, Team Leader – Parks Assets, Parks and Forestry Division, be received.

Received (Dr. B. Bass)

MATTERS CONSIDERED

1. Approval of Minutes of Previous Meeting held on April 1, 2014

Approved (A. Zi-Xuan Liou)

2. Let Your Green Show Awareness Campaign – Phase 3

Andrea J. McLeod, noted that the theme for Phase 3 of the Let Your Green Show Awareness Campaign is *Give your Car a Break* which invites Peel residents to give their cars a break to reduce greenhouse gas emissions, improve health and save money. The Campaign will run from June to October 2014. Ms. McLeod noted that based on evaluations of Phases 1 and 2, changes have been made to improve the Campaign with respect to monthly themed actions, a monthly Greenback Contest which will run on a social media platform, and the Greenest Resident Award which will recognize individuals who have participated in the most actions. In addition to promotion on the Let Your Green Show website, increased use of social media will help track participation with greater ease.

The Committee raised the following issues/concerns:

- Change from the previous Greenest Ward Award to Greenest Resident Award will affect participation;
- Value of face to face interaction encouraging people to ride or walk to events such as Canada Day;

Ms. McLeod advised that she will take the Committee's comments and concerns under advisement.

Recommendation

EAC-0015-2014

That the Memorandum dated April 22, 2014 from Andrea J. McLeod, Environmental Specialist, entitled *Let Your Green Show Awareness Campaign – Phase 3*, be received.

Received (Councillor J. Tovey)

3. Update on Environmental Community Appreciation Evening

Ms. Andrea J. McLeod noted that the Environmental Community Appreciation Evening will be held on June 4, 2014. It is an invitation only event to recognize and thank volunteers, community groups, schools and businesses involved in actions that support and advance environmental and forestry initiatives.

Recommendation

EAC-0016-2014

That the Memorandum dated April 28, 2014 from Andrea J. McLeod, Environmental Specialist, entitled *Update on Environmental Community Appreciation Evening*, be received.

Received (L. Mallett)

4. Upcoming Agenda Items

Councillor Tovey noted that at a recent meeting he attended with the Great Lakes and Saint Lawrence Cities Initiative and the Ministry of Environment in Ottawa, his suggestion to put forward a request to Parliament for soap companies to remove micro-plastics from their products, was well received by Mr. Tom Mulcair, Leader of the NDP, and the Ministry.

Dr. Bass spoke of inviting the Toronto Science Fair student who has developed a low cost green wall bio-filter that removes 100% of plastic micro-beads from soaps when Dr. Sherri Mason, Professor of Chemistry, SUNY Fredonia, New York, is invited to address the Committee.

Dr. Bass felt that the Nuisance Weed and Tall Grass Control By-law discussion should be brought forward. Ms. Osborne advised that this is part of the Natural Heritage & Urban Forest Strategy and she will seek an update as to its status.

Recommendation

EAC-0017-2014

That the chart from Brenda Osborne, Director, Environment Division with respect to pending and upcoming agenda items dated May 6, 2014, be received.

Received (Councillor F. Dale)

INFORMATION ITEMS

- (a) Growing the Greenbelt – Referred by Council to Environment Division on April 2, 2014

Recommendation

EAC-0018-2014

That the Resolution No. 116/13 dated December 13, 2013, from the Credit Valley Conservation Authority, with respect to Growing the Greenbelt in Mississauga, referred to the Environmental Division by Council on April 2, 2014, be received for information.

Received (M. Ricker)

- (b) Councillor Carlson thanked Ms. Stephanie Crocker, Executive Director, EcoSource, for the invitation to EcoSource's Open House at their new address.
- (c) Ms. Amy Zi-Xuan Liou, updated the Committee with respect to her attendance at the 2014 Provincial EAC Symposium held on May 3, 2014. She found it both inspirational and a great opportunity for youth to make a difference.

DATE OF NEXT MEETING – Tuesday, June 10, 2014 at 9 a.m., **Committee Room 'A'**

OTHER BUSINESS

ADJOURNMENT – 10:44 a.m. (Councillor F. Dale)



Corporate Report

Clerk's Files

Originator's
Files

2-1

DATE: June 2, 2014

TO: Chair and Members of the Environmental Advisory Committee
Meeting Date: June 10, 2014

FROM: Gary Kent
Commissioner of Corporate Services and Chief Financial Officer

SUBJECT: **5 Year Energy Conservation Plan (2014 - 2019)**

- RECOMMENDATION:**
1. That the Corporate Report titled "5 Year Energy Conservation Plan (2014-2019)" dated June 2, 2014, be received for information.
 2. That Facilities and Property Management present the 5 Year Energy Conservation Plan to Council in early 2015. To coincide with this presentation, staff will provide information on overall environmental best practices that Facilities and Property Management continue to promote and implement within City facilities.

**REPORT
HIGHLIGHTS:**

- The Provincial Green Energy Act, Regulation 397/11 requires that municipalities prepare and make public a five year energy conservation plan by July 1, 2014.
- The City of Mississauga 5 Year Energy Conservation Plan includes past energy conservation measures since 2004, present and proposed initiatives from 2014 to 2019 along with energy conservation target of 1% reduction per year over next five years.

- The Plan's target of 1% reduction in energy consumption per year, once the 5 year period is completed, will amount to a total annual savings of \$575,000 per year.
- The Plan was presented to the City's Leadership Team on May 15th, 2014 and received their support.

BACKGROUND:

The Green Energy Act was introduced by the Ministry of Energy in 2009. One of the regulations under the Act, Regulation 397/11, requires municipalities to report their energy consumption in buildings, and the resulting greenhouse gas emissions released to the environment.

The City has complied with this requirement to date; however, the regulation now requires the City to prepare and report on a 5 year Conservation and Demand Management Plan. It should be noted that the Ministry does not have a standard template for each municipality to fill out nor is there a baseline that each municipality must adhere to.

We have renamed the 5 year Conservation and Demand Management Plan and called it the "5 Year Energy Conservation Plan" for simplicity and for public consumption going forward. The regulation requires senior management approval and that the plan be made available to the public, both on the municipality's web site and in printed form by July 1, 2014.

COMMENTS:

The City spends approximately \$20 million per year on utilities (gas, water and electricity) and this includes about \$5 million for street lighting. Our 5 Year Energy Conservation Plan provides detailed information on approximately 100 buildings or properties that consume 90% of our total utility bill as well as the LED street lighting program.

The 5 Year Energy Conservation Plan includes the following information:

- An Executive Summary of the 5 Year Energy Conservation Plan.
- The vision and objectives of the City of Mississauga relating to energy efficiency and greenhouse gas emissions.

- A target reduction in energy use and GHG emissions per square meter of building area of 1% average per year for the next 5 years. Note: The above target reduction excludes the street lighting program. Additionally, the Green Energy Act does not, at this time, include any penalties for failure to meet any stated target.
- A summary of the energy use and greenhouse gas emissions by City of Mississauga operations for the most recent 3 year period.
- An outline of the energy team responsible for energy efficiency and energy procurement for the City of Mississauga.
- Energy efficiency measures or projects completed in the past 10 years and planned measures or projects slated for the next 5 years.
- A summary of the costs, savings, and GHG reductions achieved, or expected to be achieved, for each energy measure.
- An information page for each of the approximately 100 facilities included in the Plan, showing:
 - Measures that have been or will be implemented in the facility.
 - Energy use data for a 3 year period.
 - Greenhouse gas emissions for a 3 year period.
- Furthermore, the intent of the 5 Year Energy Conservation Plan is to provide updates on an annual basis as follows:
 - Changes in energy measure implementation status (completed, approved, cancelled, etc.)
 - New energy measures to be implemented as a result of energy audits and re-commissioning activities.
 - Updated energy and greenhouse gas emission information.

For a copy of the Plan, refer to Appendix 1 at the end of this report.

The 5 Year Energy Conservation Plan was presented to the Leadership Team on May 8, 2014. At that meeting, LT provided their support for the plan.

The 5 Year Energy Conservation Plan will be published on the City's Living Green web site. The Plan will also be printed and made available to the public via hard copy at City Hall. The Energy Management section will work with Communications and Environment Divisions to promote the Plan through a media release and other measures prior to the July 1, 2014 publication date as required by the regulation.

STRATEGIC PLAN: The Vision and Goals laid out in the 5 Year Energy Conservation Plan (2014-2019) are captured in the Living Green Pillar of the Strategic Plan. Refer to Appendix 2 for an environmental context primer, as prepared by the Environment Division, stating the benefits of energy conservation for climate change mitigation.

FINANCIAL IMPACT: The Plan requires capital investment in implementation of energy conservation measures that would provide corresponding savings in energy and operating costs with an average simple payback of less than 8 years. The extent of additional capital investment will be known after completion of the City Wide Energy Audit in 2015. This capital expenditure will be requested as part of the annual capital budget process.

The target of 1% reduction in energy consumption per year, once the 5 year period is completed, will amount to a total annual savings of \$575,000 each year, beginning after 2019, based on 2014 average rates. Additionally, the GHG emissions from facilities will reduce 1,327 tonnes per year in 2019 as compared to 2014 levels. This is equivalent to removing 260 cars from the road.

CONCLUSION: The 5 Year Energy Conservation Plan (2014-2019) has been prepared to meet the requirements of Regulation 397/11 of the Green Energy Act, and is intended to be made available to the public, both on the City's web site as well as in hard copy, by July 1, 2014.

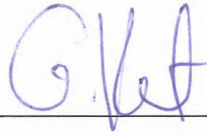
The plan provides an outline of energy efficiency measures that have been implemented since 2004 as well as those planned for the next 5 years. It provides information on the estimated capital costs, energy consumption and greenhouse gas emission data, as well as savings in utility costs, expected from implementing measures or projects at various City facilities.

The plan received the support and approval of the City of Mississauga's senior management, as required by the Regulation 397/11 of the Green Energy Act. Staff will be providing an overall energy presentation to Council in early 2015.

ATTACHMENTS:

Appendix 1: 5 Year Energy Conservation Plan (2014-2019)

Appendix 2: Environmental Context Primer



Gary Kent

Commissioner, Corporate Services and Chief Financial Officer

*Prepared By: Daryl Martin, Energy Management Coordinator
Facilities and Property Management*



City of Mississauga

5 Year Energy Conservation Plan

2014 - 2019

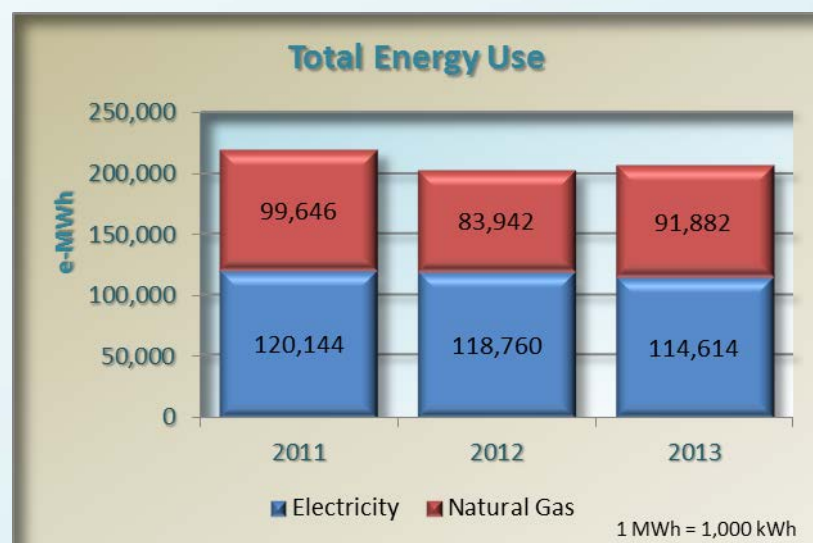


EXECUTIVE SUMMARY

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



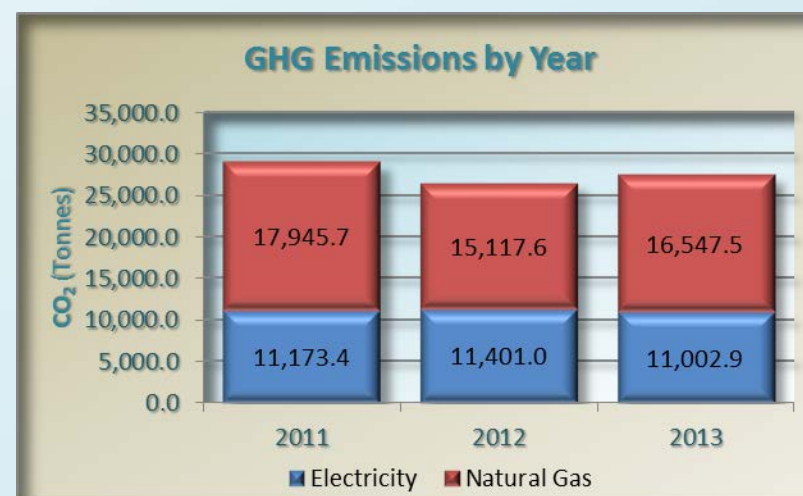
In 2013, the City used over 206 million equivalent kilowatt hours (e-kWh) of electricity and natural gas in:

- 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. For 2013, the savings from completed energy measures reached 4,700 MWh of electricity and 405,000 m³ of natural gas. By 2019, with additional improvements, these annual savings are expected to increase to 8,900 MWh and 725,000 m³.

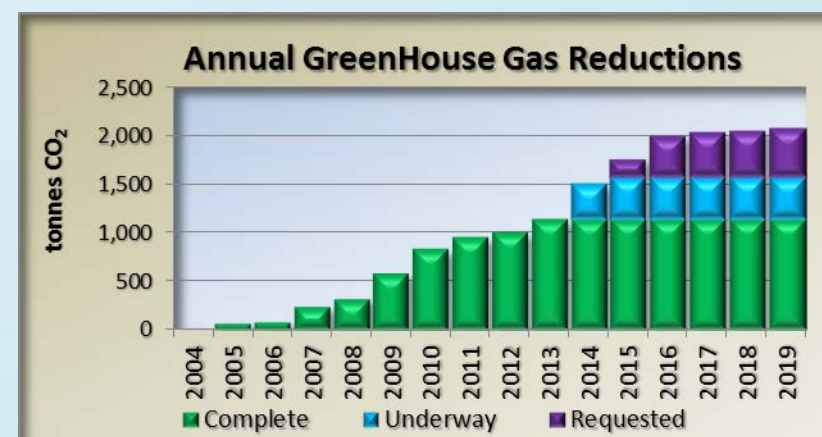
COST SAVINGS

Reduced usage has translated into significant cost savings. From 2004 through 2013, the energy measures completed have saved an estimated \$4.7 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 2,000 tonnes per year, double where the City was at in 2012, and almost a fourfold improvement in 10 years (from 2009).





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.

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.



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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.

1.1 BACKGROUND

Since 2001, the City of Mississauga has implemented two successful Energy Conservation Plans.

The initial Energy Conservation Plan was created in 2001 when utility costs were rising at a rate 2 to 3 times the general rate of inflation. The goal of the Plan was to reduce energy costs by \$600,000 (5% of utility costs in 2002) and reduce greenhouse gas emissions by 4,000 tonnes/ yr. The Plan provided good results and even exceeded the initial goals. The plan underwent a couple updates during its existence, including the inclusion of the Energenius program in 2002.

In 2009, a new Energy Conservation Plan was introduced in reaction to new developments in the environment and climate change which necessitated a more aggressive plan. Such developments included the Green Pillar of the City of Mississauga's Strategic Plan with the goal of being a net-zero carbon city, and the Ministry of Energy's introduction of the Green Energy Act.

The 2009 plan involved an energy evaluation of existing facilities owned and operated by the City, as well as a review of new building construction proposals, establishing Green Building Standards for new construction and major renovations and

increased use of renewable energy. The main objective of the plan was to identify energy and water saving opportunities that will lower utility costs, improve operational efficiency and contribute to the City's overall Environmental Management Plan. Improved strategy for energy procurement in a deregulated market was another important objective of the Plan.

Results for the 2001 and 2009 Energy Conservation Plans can be seen in [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 2009. A requirement of the Regulation is that the plan be made available to the public (the 2001 and 2009 plans were intended as internal documents, meant for City staff). More information on the Green Energy Act and Regulation 397/11 is provided in [Section 1.4](#). The plan will provide a framework for the energy efficiency actions for the City of Mississauga for the next 5 years.

The sections of the 2014 plan include:

- The vision and objectives of the City of Mississauga relating to energy efficiency and greenhouse gas emissions.
- A summary of the energy use and greenhouse gas emissions by City of Mississauga operations for the most recent past 3 years.

- An outline of the energy team responsible for energy efficiency and energy procurement for the City of Mississauga.
- The Energy Measure Implementation plan for the City of Mississauga, covering both completed and planned measures between 2004 and 2019.
- Further information on the Energy Measures, including a description, costs, savings, and expected GHG reductions.

It should be noted that this version of the Energy Conservation Plan focuses on energy use (electricity and natural gas) and the resultant greenhouse gas emissions as required by the Green Energy Act. It does not cover water use or water reduction measures. This information may be provided in a later update of the plan.

The intent with the 2014 plan is to provide updates periodically, possibly on an annual basis. The purpose would be to update for:

- Changes in energy measure implementation status (completed, approved, cancelled, etc)
- New energy measures to be implemented as a result of energy audits and re-commissioning activities.
- New energy and greenhouse gas information availability

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's Living Green Pillar as well as the City's Action Plan.

1.3.1 STRATEGIC PLAN

The Strategic Plan is Mississauga's visionary document. Since 2009, it has shaped and directed strategic decision-making for the City of Mississauga. The five Strategic Pillars for Change are Move, Belong, Connect, Prosper and Green.

The Strategic Plan will help guide decision-making, set priorities and focus the City's efforts on those specific areas of strategic change that will make our Vision for Our Future Mississauga a reality.

The 5 Year Energy Conservation Plan (2014-2019) would fall under the Green Pillar in the Strategic Plan.

1.3.2 ACTION PLAN

The City of Mississauga's Action Plan is directly linked to the Strategic Plan. It contains lists of actions to be implemented to help the City meet the tenets of the Strategic Plan.

The Green Pillar of the City's Strategic Plan provides the long term goal of a "zero carbon" City. The measure laid out in the 5 Year Energy Conservation Plan (2014-2019) 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>

1.3.3 LIVING GREEN MASTER PLAN

The Living Green Master Plan (LGMP) is Mississauga's first environmental master plan. It is primarily a document to prioritize City policies and programs into actions to meet the environmental objectives of the Strategic Plan. It identifies 49 actions for the City and its partners to implement over the next 10 years.

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

From the Ministry of Energy's website:

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. For example, its Feed-in Tariff (FIT) program provides stable prices for generators of energy from renewable sources.

Ontario is continuing to bring clean sources of energy into the supply mix and investing to modernize the transmission and distribution of electricity. Learn more in Ontario's Long-Term Energy Plan.

Promoting energy conservation

Conserving energy not only saves money for families and businesses, it also lowers demand on the electricity system and helps reduce greenhouse gas emissions.

Through conservation, Ontario homeowners, businesses and industry have saved more than 1,900 megawatts of peak demand electricity since 2005 – the equivalent of more than 600,000 homes being taken 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:

More information on the Green Energy Act can be found at the Ministry of Energy's website provided below:

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

1.4.1 REGULATION 397/11

Ontario Regulation 397/11 under the Green Energy Act 2009 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. In addition, the public agency is required to 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 NAVIGATING THIS DOCUMENT

This document is separated into seven (7) chapters (including this Introduction) as well as 7 Appendices.

The online version of this document will contain links to various sections. Some of the links include:

- From the Table of Contents page, you can click on the section you would like to go to.
- In Appendix 5.0 Facility Information, there is a list provided of the various facilities in the City of Mississauga included in this report. Clicking on the facility name will take you to the information page for that location.
(For those reading the printer version of this plan, the locations are listed in alphabetical order for easier searching).
- Throughout the document, there are some references to other sections. Generally clicking on the reference (for the online version only) will navigate to that section.

1.5.1 LOCATION OF INFORMATION

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 through 5. Additionally, see Appendix 5.0 to see the energy use and GHG emissions for the individual facilities in the City.

Information on the energy measures that have been, or will be, implemented in City of Mississauga facilities, see:



- Chapter 7.0 for a general overview of the measures implemented, the total costs, the expected savings, and the greenhouse gas emission reductions.
- Appendix 1.0 for a more detailed Energy Measure Implementation Plan. The measures are broken out by measure type.
- Appendix 2.0 for a description of the Energy Measures. Note: For simplicity, some items and measures may fall under a single measure type. For example, repairing a damper motor or fixing a pump may both fall under Equipment Maintenance.
- Appendix 3.0 for a breakdown of the total costs and savings for each measure type. The information is provided for the completed as well as the yet to be implemented measures.
- Appendix 4.0 provides the locations where each measure is to be implemented.
- Appendix 5.0 also provides the measures that were implemented at each facility.
(Note: Appendix 4 gives the location for each measure. Appendix 5 gives the measures for each location)

1.5.2 DEFINITIONS

Definitions of the various terms that are found in this document may be found in Appendix 6.0

1.6 OTHER ITEMS TO NOTE

1.6.1 UPDATES

This plan will be updated periodically.

Annually, a minor update will be provided to the plan: updated energy data; or change in energy measure status (complete, underway).

Every 5 years, a more detailed update will be provided. The more detailed update will provide feedback on the planned measures, as well as a plan for the next 5 years.

1.6.2 ENERGY AUDIT AND RE-COMMISSIONING MEASURES

Currently, the plan does not list many measures planned beyond 2016. Rather, a generic measure “Energy Audit Measures” is given. This measure is to cover the expected measures to be determined from the City Wide Energy Audited scheduled to be performed between 2014 and 2015. As measures are determined, they will be included in upcoming updates to this plan.

Similarly for “Re-commissioning Measures”.

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



1.6.3 TIME PERIODS FOR MEASURE IMPLEMENTATION

For Energy Measure Implementation, this plan only provides the year that the measure was started, and by what year it will be completed. More precise times and dates were not given due to a difficulty in predicting when a measure will be completed. Some items may be delayed to outside circumstances.

1.6.4 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 or measure exactly what kinds of savings are being achieved. For example, in the case of a change made to a heating system, how much savings can be attributed to the measure, and how much can be due to weather changes, or 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.

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 the following policies:

- **Green Building Standards:** All new City facilities are to be built to achieve LEED Silver certification, with special emphasis on energy efficiency. Large renovations of City facilities are to be built to LEED Silver standards, getting certification where feasible.
- **Purchasing By-Law:** The City's Purchasing By-Law (374-2006) includes the principle "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 and become a leader in green initiatives by reducing greenhouse gas emissions in the city.

Transforming the city to 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). It is an ambitious goal that will likely take decades to achieve, but that the City will continue to strive towards.

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 - to lead and promote the utilization of technologies and tactics to conserve energy and water, reduce emissions and waste, improve our air quality and protect our natural environment.

The City will pursue and support renewable energy production and use to reduce greenhouse gas emissions, improve air quality and protect natural resources.

Promote a Green Culture - to lead a change in behaviours to support a more responsible and sustainable approach to the environment, 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.

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

While the City still faces increases in total energy use due to development and an increase in services provided, it strives to minimize the impact by developing more efficient facilities and operations.

New facilities will be designed to more stringent energy standards, while existing facilities will be made 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*

- **Increase and Promote Energy Awareness**

The City will continue to promote energy awareness within its facilities. With better awareness comes better use and operation of its facilities.

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

- **Re-Commissioning of all City's major facilities.**

Re-Commissioning is a review of a previously commissioned facility as a whole, taking into account initial design, intended use, and current operations, with energy efficiency as its chief focus.

- **City Wide Energy Audit**

The City Wide Energy Audit is a review of equipment in all of the City's facilities, focusing on energy using systems. The audit will highlight areas and equipment that can be improved to increase energy efficiency.

- **Implement Energy Efficiency Measures**

The City will continue to implement energy efficiency measures (including lighting retrofits, equipment improvements, etc.) as recommended by the Energy Audit and Re-commissioning, to help increase the City's energy Efficiencies.

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.

Fun Fact:

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)

Information:

In order to better compare different types of energy sources (i.e.: natural gas and Electricity), it is normal to convert one or both types of energy into a single common unit.

In this plan, we are converting the natural gas volume of cubic meters into 'equivalent kilowatt hours' (e-kWh) to better compare to the electrical unit of kilowatt hours (kWh).

Conversion: 1 m³ natural gas = 10.5 e-kWh

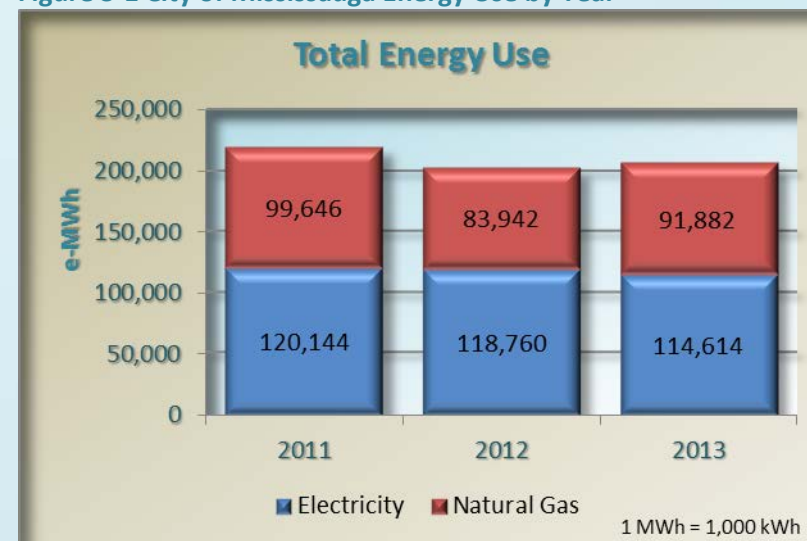
Of this 200 million kilowatt hours, about 57% of it is comprised of electricity use, or 114 million kilowatt hours.

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.

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, in City locations and facilities, was 114,600 MWh. This was a reduction over both 2012 (118,700 MWh) and 2011 (120,100 MWh).

Fun Fact:

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. These lights used 35% of the total electricity used by the City.

After street lighting, the next highest group for electricity consumption were recreation type facilities: community centres,

arenas and the Hershey Sports Zone. These groups totalled 30% of the total 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. This was a reduction over 2011 (9.5 million cubic meters), but an increase over 2012 (8.0 million cubic meters). This increase over 2012 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 on the natural gas use.

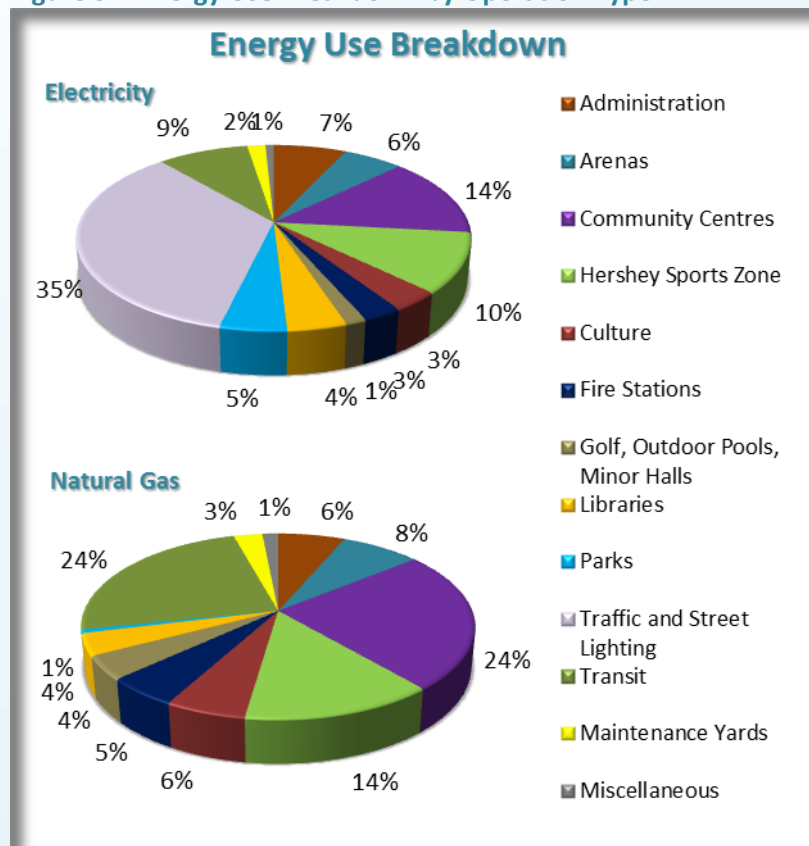
Arenas and community centres are responsible for about 45% of the natural gas used in City of Mississauga facilities. Transit buildings account for almost 24% of the total gas used.

It should be noted that the natural gas use in facilities is very dependent on weather.

Note: 'Community Centres' include facilities with shared community centre and ice rink facilities.

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

Figure 3-2 Energy Use Breakdown by Operation Type

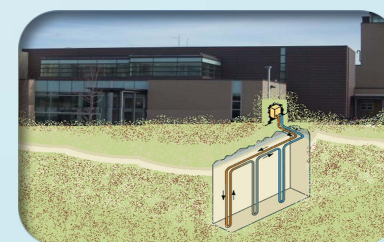


3.4 RENEWABLE ENERGY

The City of Mississauga is in support of renewable energy. In 2013, the City issued a Municipal Council Support Resolution, which offers municipal support to parties who wish to apply to the Provincial FIT program to install a solar generating system on their rooftop within the city of Mississauga.

In addition, in its support of renewable energy and sustainability, the City has installed the following renewable energy facilities:

- 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 installation, 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. The ground source heat 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.



Further to these implemented systems, other measures implemented, or to be implemented, related to renewable power includes:

- Purchase of Green Power to offset the electricity consumption of the Mississauga City Hall facility from 2008 until the end of 2013
- Leasing of rooftop space on 5 City facilities for the installation of a solar photovoltaic generation system (currently awaiting award of a generation contract from the Ontario Power Authority)

3.5 ENERGY USE INTENSITY

The Energy Use Intensity, the energy use per unit of area, gives a better picture of the energy efficiency of a facility. The lower the Energy Use Intensity, generally the more efficient, energy wise, a facility is. Energy Use Intensity is also referred to as a building EUI.

When reviewing the Energy Use Intensities of facilities, the facility operation hours, as well as the operation types should be taken into account. 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 Energy Use Intensity than a building just used for storage.

As such, EUI is generally best used when comparing facilities of similar operation types.

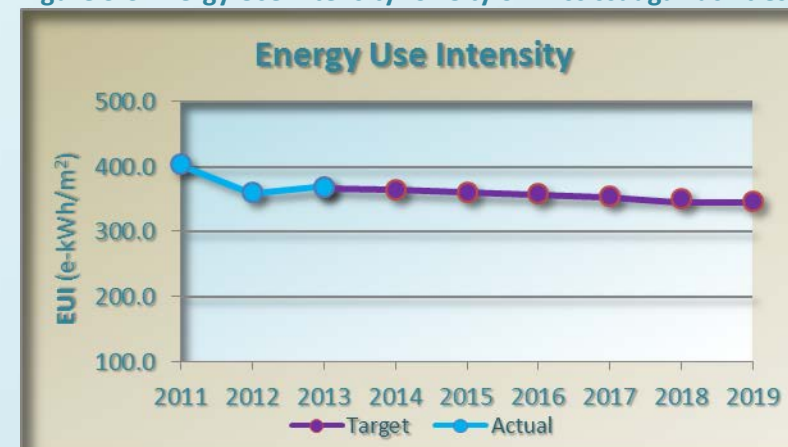
This report uses equivalent kilowatt hours per square meter (e-kWh/m²) as the unit of Energy Use Intensity.

The overall EUI for the City of Mississauga in 2013 was 366 equivalent kilowatt hours per square meter (34.0 e-kWh/ft²). This is a 2.4% increase over 2012, and an 8.0% reduction over 2011 values.

With a target reduction of 5% over the next 5 years, or 1% reduction each year, the City's Energy Use Intensity would reduce to 345 equivalent kilowatt hours per square meter (or 32.0 e-kWh/ft²)

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 3-3 Energy Use Intensity for City of Mississauga Facilities



3.6 UTILITY INFORMATION BY FACILITY

A more detailed breakdown of energy use and GHG emissions for individual facilities can be found in [Appendix 4.0: Facility Detail and Data Information](#).

4.0 GREEN HOUSE 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 Green House Gas (GHG) is Carbon Dioxide (CO₂). The CO₂ emissions described in this report are from the use of electricity and natural gas. For electricity, it is from the combustion of fuels to generate the electricity used. For natural gas, it is from the direct combustion of the gas.

The amount of CO₂ emitted per cubic meter (the emission factor) of natural gas burned remains fairly constant year to year. Very slight variations may occur due to quality of gas and efficiency of the equipment burning it.

For electricity, the emission factor, the amount of CO₂ emitted per kilowatt hour generated, can vary year to year depending on the fuels used by the generators. A generating plant using coal would have a higher emission factor than one using natural gas, which burns 'cleaner' than coal. The average emission factor for the year would depend on the overall makeup of the electricity generation types.

Fun Fact:

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).

Fun Fact:

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

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

The lower the emission factor, the better it is for the environment. The GHG emissions in this plan use the 2012 emission factor for electricity of 0.096 kg/kWh.

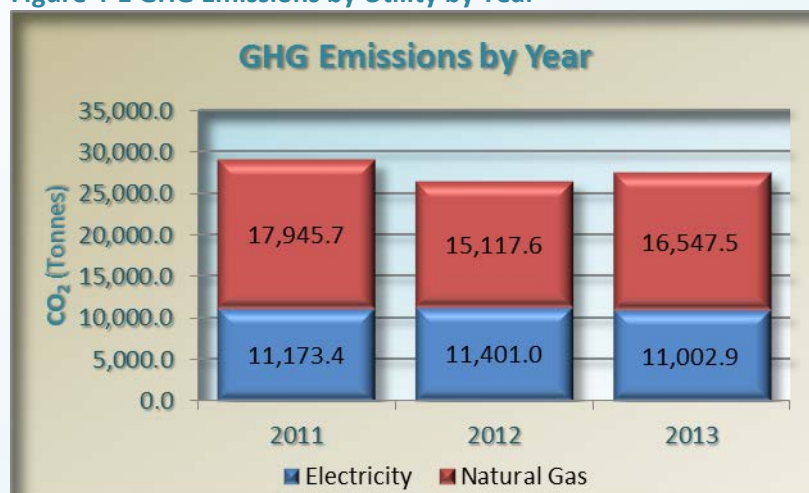
4.1 CITY OF MISSISSAUGA GHG EMISSIONS

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 (due to the increased gas use mentioned previously), but a reduction from the 2011 levels of 29.1 thousand metric tonnes of CO₂.

Of the 2013 emissions, 64% of the CO₂ was the result of natural gas combustion in the heating (space and water) of City facilities. Electricity use resulted the remaining 36% of CO₂ emissions.

Figure 4-1 shows the CO₂ emissions for electricity and natural gas by City of Mississauga facilities for 2011, 2012, and 2013.

Figure 4-1 GHG Emissions by Utility by Year

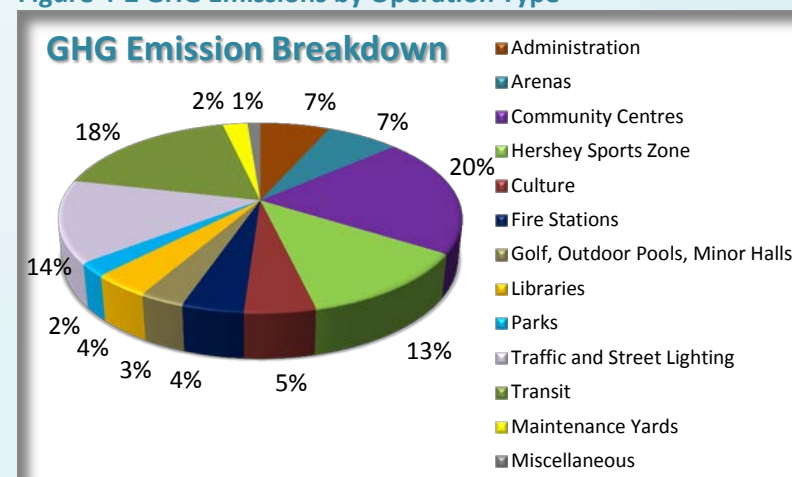


The largest contributor to the emissions for the City of Mississauga, is Arenas and Community Centres (including the Hershey Sports Zone), which accounted for 30% of the total CO₂ emissions in 2013.

The next highest contributors, Transit and Traffic/Street Lighting made up 18.5% and 12.4% respectively of the GHG emissions in 2013.

Figure 4-2 shows the CO₂ emissions by Operation Type for the City.

Figure 4-2 GHG Emissions by Operation Type



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

4.2 GHG INTENSITY

Green House Gas Intensity is the CO₂ emissions per square meter of building space for facilities (total CO₂ emissions divided by total floor space). The values given in this section would only include the CO₂ emissions for facilities. The emissions for energy use by street lighting, traffic signals, and many parks, are not factored into the value as they do not have a building area to be associated to it.

The 2013 GHG Intensity for City of Mississauga was 52.9 kilograms per square meter. This is a 4.3% increase over 2012 due to increased natural gas use. However, against 2011, 2013 shows an 8.8% reduction.

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 bus storage facility where buses stored outside year round are minimally heated. Adds to energy use, but not to area).

4.3 TARGETED GHG REDUCTIONS

As per section 2.5, the City is targeting a 1% reduction in energy use per year in facilities. Assuming a 1% reduction in both electricity and natural gas, this would result in a 1% reduction in GHG emissions as well. This would equate to a reduction of 1,327 tonnes of CO₂ in 2019 as compared to 2013 levels.

Fun Fact:

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

Information:

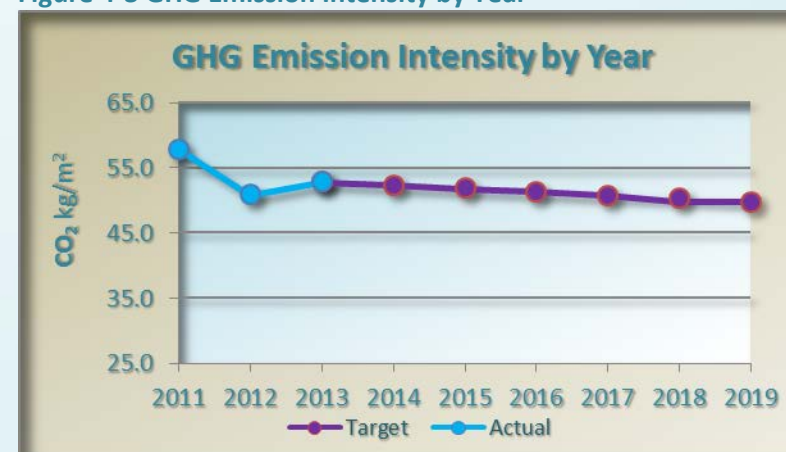
The average car emits 5.1 metric tonnes of CO₂ per year as per a report issued by the EPA in December 2011.

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, can be seen in **Figure 4-3** below.

Figure 4-3 GHG Emission Intensity by Year



The expected reductions from the planned measures are further detailed in **Section 6.2.6**.

5.0 WATER USE

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

Information:

1 cubic meter is equal to 1,000 litres ($1 \text{ m}^3 = 1,000 \text{ l}$)

5.1 CITY OF MISSISSAUGA WATER USE

In 2013, City of Mississauga facilities and other locations (such as parks and tennis courts), used over one million cubic meters of water. This was a 15% reduction in water use as 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.

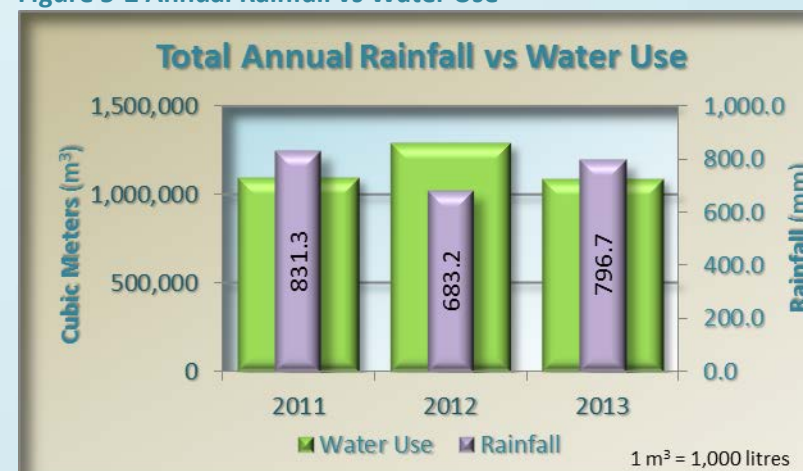
Figure 5-1 Water Use by Year



It should be noted that water use for many locations in the City 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. As such, there was a lower requirement for irrigation.

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

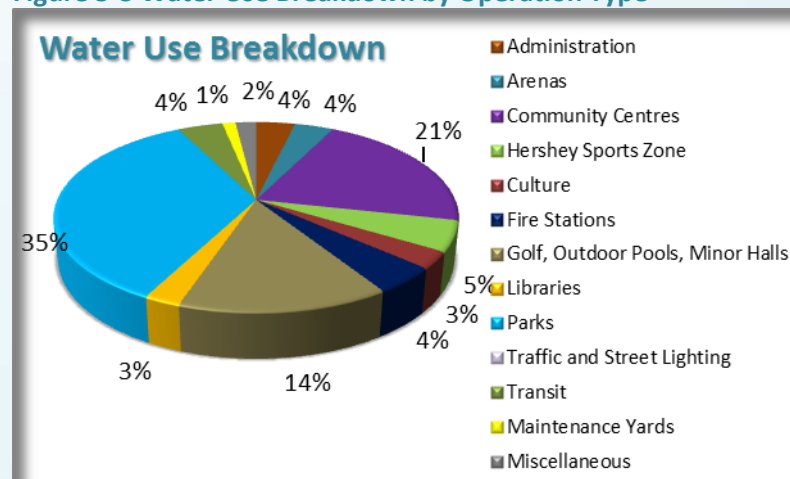
Figure 5-2 Annual Rainfall vs Water Use



The majority of the water use for the City was by Parks, which used 35% of the total water consumed by the City in 2013. Community centres used 21% of the total water use. The third highest water consumers in 2013 were Golf Courses and Outdoor Pools which used 14% of the total.

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 for the City. The section consists of the following positions:

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



6.2 OTHERS WHO PROVIDE ENERGY MANAGEMENT GUIDANCE, SUPPORT, AND ASSISTANCE

The Energy Management team does not work alone. They work with several other departments and groups to help achieve improved energy efficiency for the City of Mississauga. In addition to the main Energy Management Team, other positions that provide leadership and direction, and/or assist with energy matters for the City of Mississauga would include, though not be limited to, the following:

Role	Responsibility
Environmental Advisory Committee (EAC)	The Environmental Advisory Committee is an advisory committee of Council and offers advice and recommendations to Council in support of 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, F&PD	Implement large projects involving new construction of facilities as well as large redevelopments of existing facilities, including energy efficiency in the design and work.
Project Coordinators, F&PD	Carry out the implementation of 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 for promoting environmental sustainability
Environment Division	Provide environmental and sustainability awareness throughout the City, including residents and businesses

7.0 THE ENERGY CONSERVATION PLAN

By 2019, all Energy Measures implemented between 2004 and 2018 will have paid for themselves fully, and will begin to pay for measures not yet implemented.

7.1 PLAN OVERVIEW

The following pages will discuss the various aspects of the **5 Year Energy Conservation Plan (2014-2019)** of the City of Mississauga, including **Energy Measures** implementation.

For the intents of this report, **Energy Measures** will be defined as actions or work done with the intention to save on electricity, natural gas, oil, or other form of energy consumption, within City of Mississauga facilities.

Each measure can be classified as a Project, a Process, or a Program, where:

- **Project** = Technological – operational & 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 & feedback. Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.

The only exceptions to this would be the **City Wide Energy Audit** and **Re-commissioning**. These have been classified in the schedule as **‘Other’**. Both of these will be covered later in this section.

Further to the Measure Classifications, the plan will also refer to the status of the measure. The status would fall under one of the following:

- **Complete** – A measure which has been successfully implemented.
- **Underway** – Measures which are currently in the process of being implemented or that have been approved but installation has not yet started.
- **Requested** – Measures which are being planned and where funding has been requested, but not yet approved.

Of the measures under the **‘Requested’** status, some of them may not reach the approved status. 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.

7.2 PLAN COMPONENTS

The various components that make up the 2014 – 2019 CDM Plan are:

- Energy Monitoring and Benchmarking
- Energy Procurement
- Planning Process



- Energy Measure Implementation Plan
- Energy Savings
- Green House Gas Savings
- Measure Costs and Savings
- LED Street Lighting Retrofit
- Energy Audit and Re-Commissioning

7.2.1 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 to compare consumption data with previous years. Effective monitoring will help to identify and investigate variances at facilities and to correct billing errors or resolve the conditions causing increase in consumption.

Benchmarking is a process where 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. Benchmarking helps to identify buildings where energy performance can be improved by looking at energy features of high performance buildings.

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. New energy data is added to this database as it is received.

[Section 3.0 City of Mississauga Energy Picture](#) provides the City of Mississauga's energy use over the last 3 years.

7.2.2 ENERGY PROCUREMENT

At a total energy budget in 2013 of over \$18.5 million, 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 as well as price stability, two things which are often at odds with one another.

7.2.3 PLANNING PROCESS

When creating an Energy Conservation Plan, the following steps are followed:

- Identification of potential measures. Two good methods for identifying potential measures are through energy audits or re-commissioning.
- Review of the potential measure. Is the measure feasible? Will it adversely affect the facility in any way? Will it be accepted by facility staff or facility users?
- Review of available resources: budget and manpower. Generally, only so much capital is granted any given year for Energy Measures. Additionally, it generally takes manpower to implement the measure. Work to be done must be scheduled around the available funds and persons to implement the project.
- Implementation of the project.
- Monitoring and verification of the savings.



7.2.4 ENERGY MEASURE IMPLEMENTATION PLAN

Figure 7-1 below shows both the completed as well as the ongoing, pending, and tentative schedule for Energy Measure implementation. The figure shows the implementation schedule for Projects, Processes, Programs, and Other. Under each, are various Measure Groups (a collection of individual measures).

A more detailed schedule, showing individual energy measures, can be found in **Appendix 1.0: Energy Measure Implementation Plan**.

A description of the Energy Measures, sorted by the Measure Group, is provided in **Appendix 2.0: Energy Measure Descriptions**.

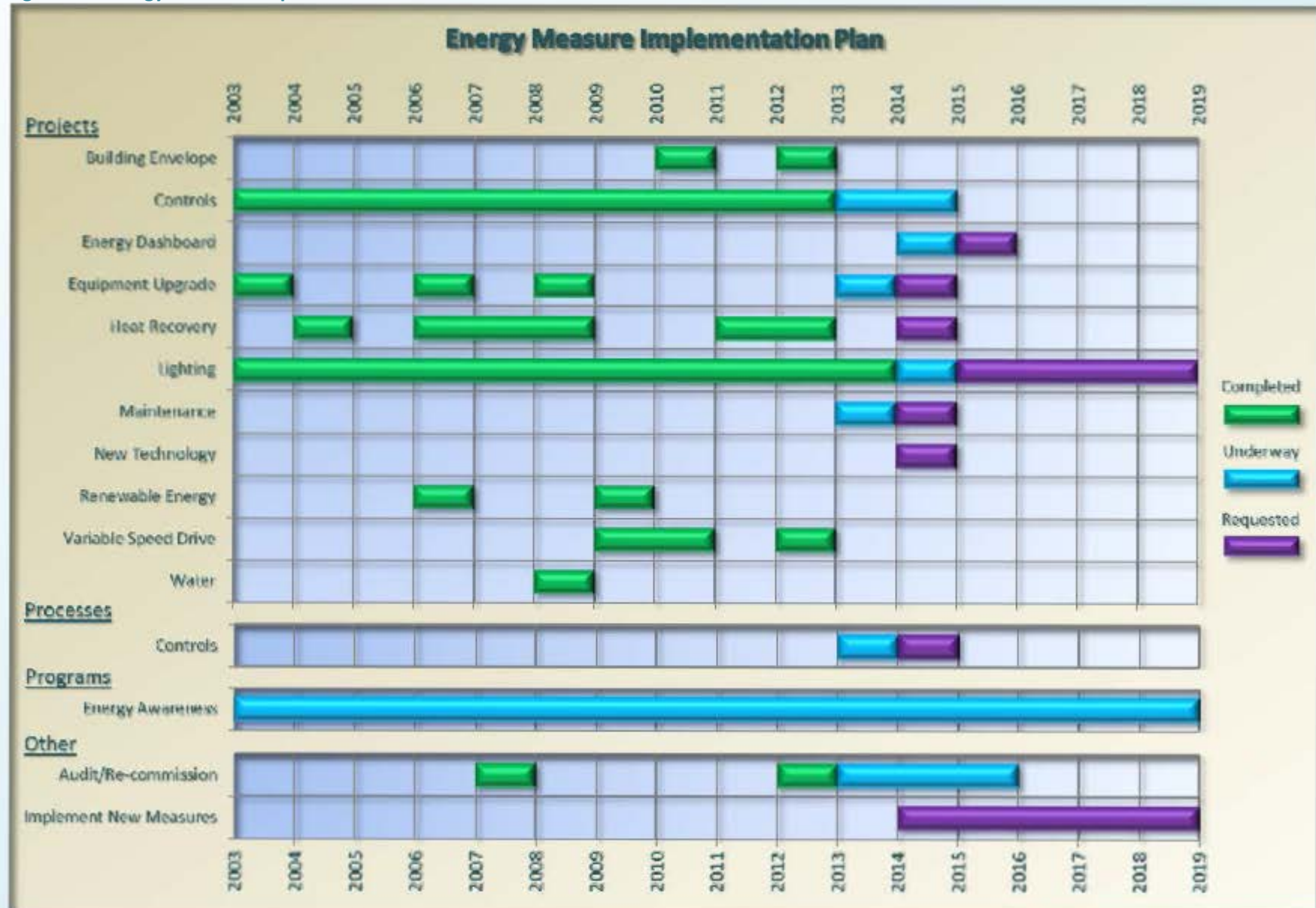
The measures in each Appendix are sorted by Type, then Group.

Once the Energy Audit is completed, many more Energy Measures will be identified and added to the schedule. This plan below will be updated periodically to reflect these new measures.

In the meantime, the line item “Implement New Measures” is being used to cover the Measures expected from the Energy Audit.



Figure 7-1 Energy Measure Implementation Plan



7.2.5 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 of Mississauga's Energy Management Section has been implementing Energy Measures in City facilities for well over a decade.

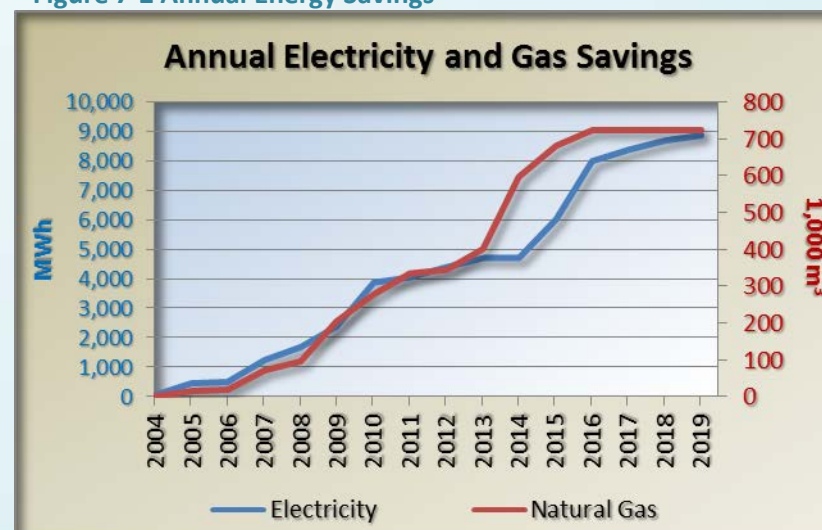
Since 2004 alone, energy projects resulted in a total reduction of 23,700,000 kilowatt hours of electricity, and 1,800,000 cubic meters of natural gas.

As the majority of measures implemented would provide cumulative savings (i.e.: a project implemented in 2004 would continue to save in 2013), the annual savings will 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 8.12 million kilowatt hours of electricity, and 735 thousand cubic meters of natural gas.

Figure 7-2 shows the cumulative savings from Energy Measures implemented since 2004, including the projected savings from the requested Energy Measures for future years.

Figure 7-2 Annual Energy Savings



Information:

The Cumulative Total is calculated by adding the annual savings for each year in the given time period. It is the sum of the annual savings.

7.2.6 GREENHOUSE GAS SAVINGS

The Greenhouse Gas reductions from the completed and planned (both underway and requested) Energy Measures, like the energy savings, would be 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 in 2013, of CO₂ in tonnes per year, for the completed projects since 2004, is estimated to be 1,219 tonnes per year.

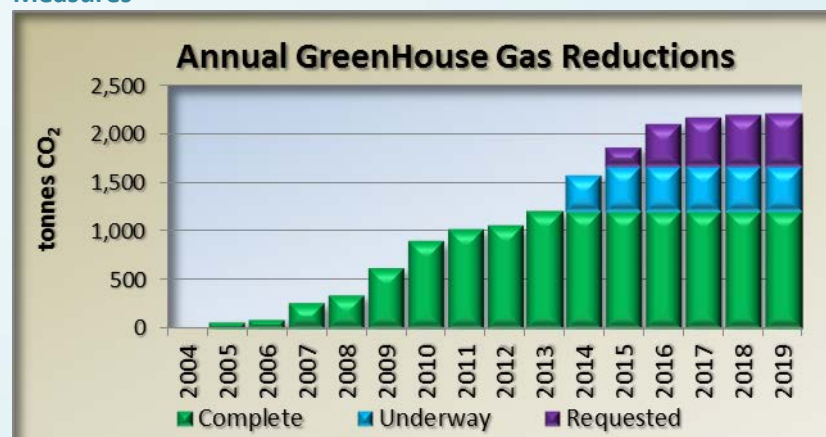
Fun Fact:

A reduction of 1,219 tonnes of CO₂ would be the equal to removing 239 cars off the road.

By 2019, with the planned measures implemented, the annual reduction is estimated to reach over 2,225 tonnes, or an additional 197 cars off the road.

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

Figure 7-3 Annual Greenhouse Gas Reductions from Energy Measures



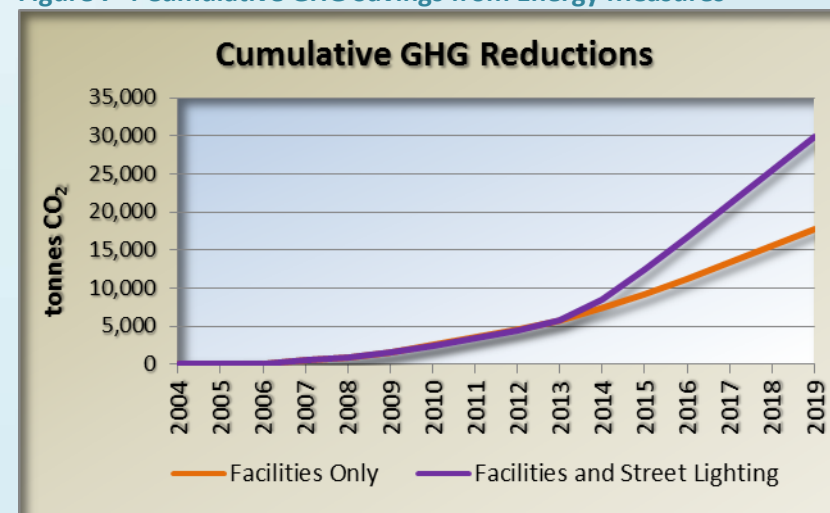
If we look at the cumulative total reduction in greenhouse gas emissions since 2004, the implemented energy measures are estimated to have reduced the City's CO₂ emissions by 5,650

tonnes. By 2019, if all the requested measures are implemented, the total CO₂ savings should reach 17,845 tonnes.

If the reduction due to the implementation of the LED Street Lighting (see [Section 7.2.8](#)) is included, the 2019 total increases to 29,890 tonnes.

Figure 7-4 below shows the cumulative GHG reductions over the years, showing both reductions in facilities alone, as well as reductions including the LED Street Lighting Retrofit project.

Figure 7-4 Cumulative GHG Savings from Energy Measures



Note: 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.

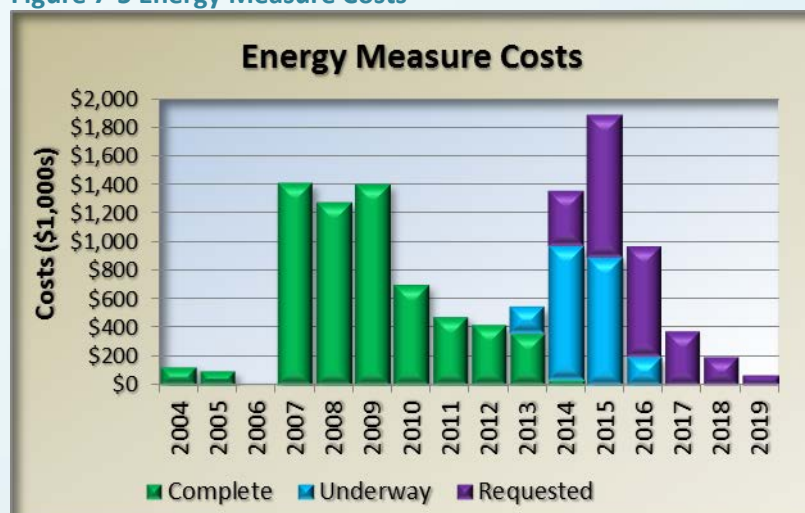
7.2.7 MEASURE COSTS AND SAVINGS

Costs:

The total expenditure on completed implemented measures between 2004 and 2014 was just under \$6.4 million (which includes replacement cost of equipment that had reached end of life and was replaced with higher efficiency equipment). By 2019, the total investment of the planned measures for Energy Efficiency is currently predicted to be \$11.6 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:

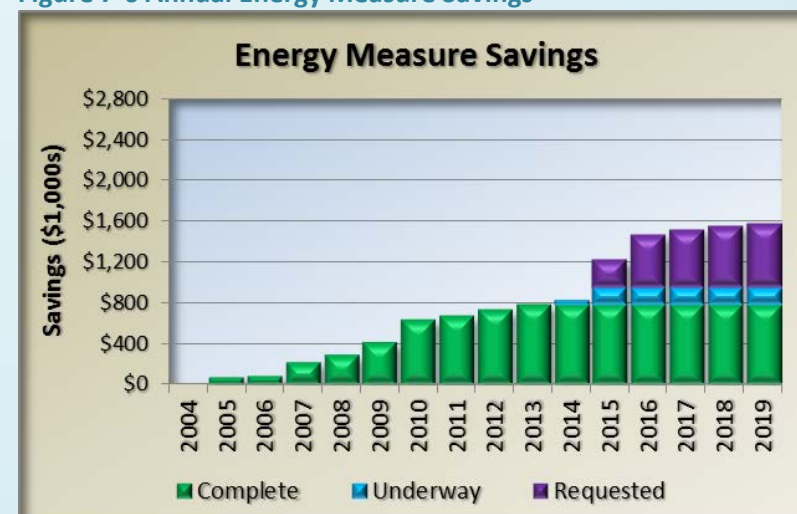
The total cumulative savings from energy measures completed since 2004 reached an estimated \$4.7 million in early 2014. The

savings, when including the projected savings from the upcoming measures, should approach almost \$12 million by 2019.

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

Note: Savings for future years (2014-2019) are based on estimated escalating electricity rates for those years.

Figure 7-6 Annual Energy Measure Savings



Cumulative Costs vs Cumulative Savings

Similar to the energy savings, the utility cost savings are cumulative. By this we mean that a project completed in 2010 that saves \$10 thousand in electricity a year, will save that \$10 thousand every year after 2010. Conversely, the cost of that measure will only be incurred once.

By this, while the incurred costs of the implemented measures vary year to year, the savings from these measures will 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



7.2.8 LED STREET LIGHTING RETROFIT

The above costs and savings do not include the retrofit of the City's street lighting to LED technology.

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

In addition to the electricity and cost savings, the LED Street Lights should also save over 900 tonnes of CO₂ emissions each year.

Fun Fact:

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.

7.2.9 ENERGY AUDITS AND RE-COMMISSIONING

As mentioned earlier, the other types of measures that do not fall under Project, Process, or Program, are Energy Audits and Re-Commissioning.

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. Energy Measures that are 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 from the previous section.

Energy Audit – An Energy Audit reviews a facility's equipment to:

- identify opportunities for energy efficiency, capital retrofits or investments as well as operational and maintenance (O&M) improvements at City-managed facilities;
- enhance occupants comfort, health and safety, and productivity as well as building functionality; and
- help reduce environmental impact and GHG emissions.



In 2007, the City performed a City Wide Energy Audit for a majority of its facilities. The energy measures that were suggested by the audit were then implemented from 2008 until 2012.

Re-commissioning – Re-commissioning (RCx) is a re-optimization process for existing buildings. It ensures building equipment and systems are operating optimally to meet current occupant needs. It provides a rigorous investigation approach to identify problems and integration issues. The RCx 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.

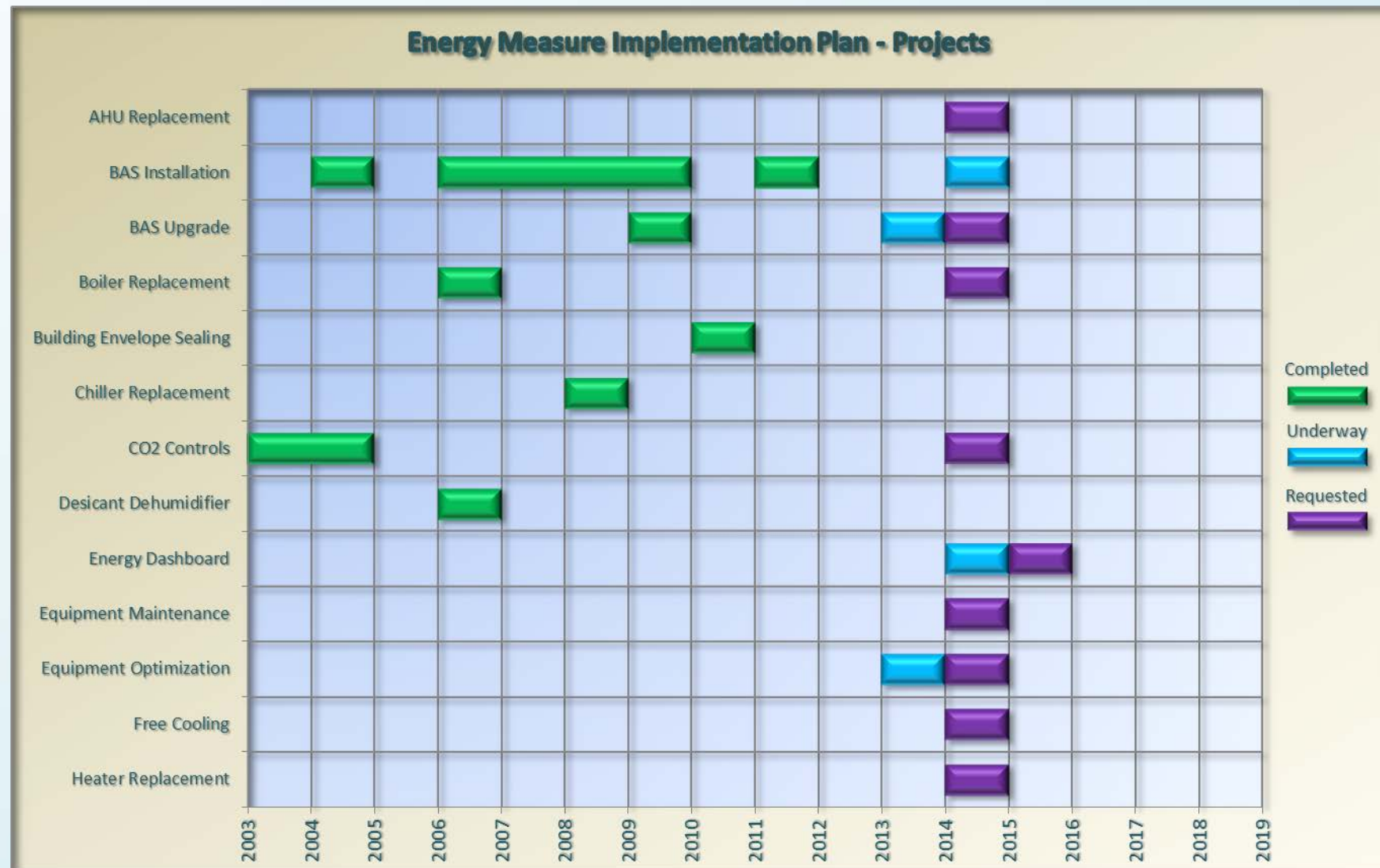
Re-commissioning is a collaborative process that looks at how and why a building’s systems are operated and maintained as they are, and then identifies ways to improve overall building performance. As a process, rather than a set of prescriptive measures, re-commissioning adapts to meet the specific needs of each building owner. Re-commissioning plays an important role in addressing whole building performance. The whole building perspective looks at buildings as integrated systems, rather than a set of individual components.

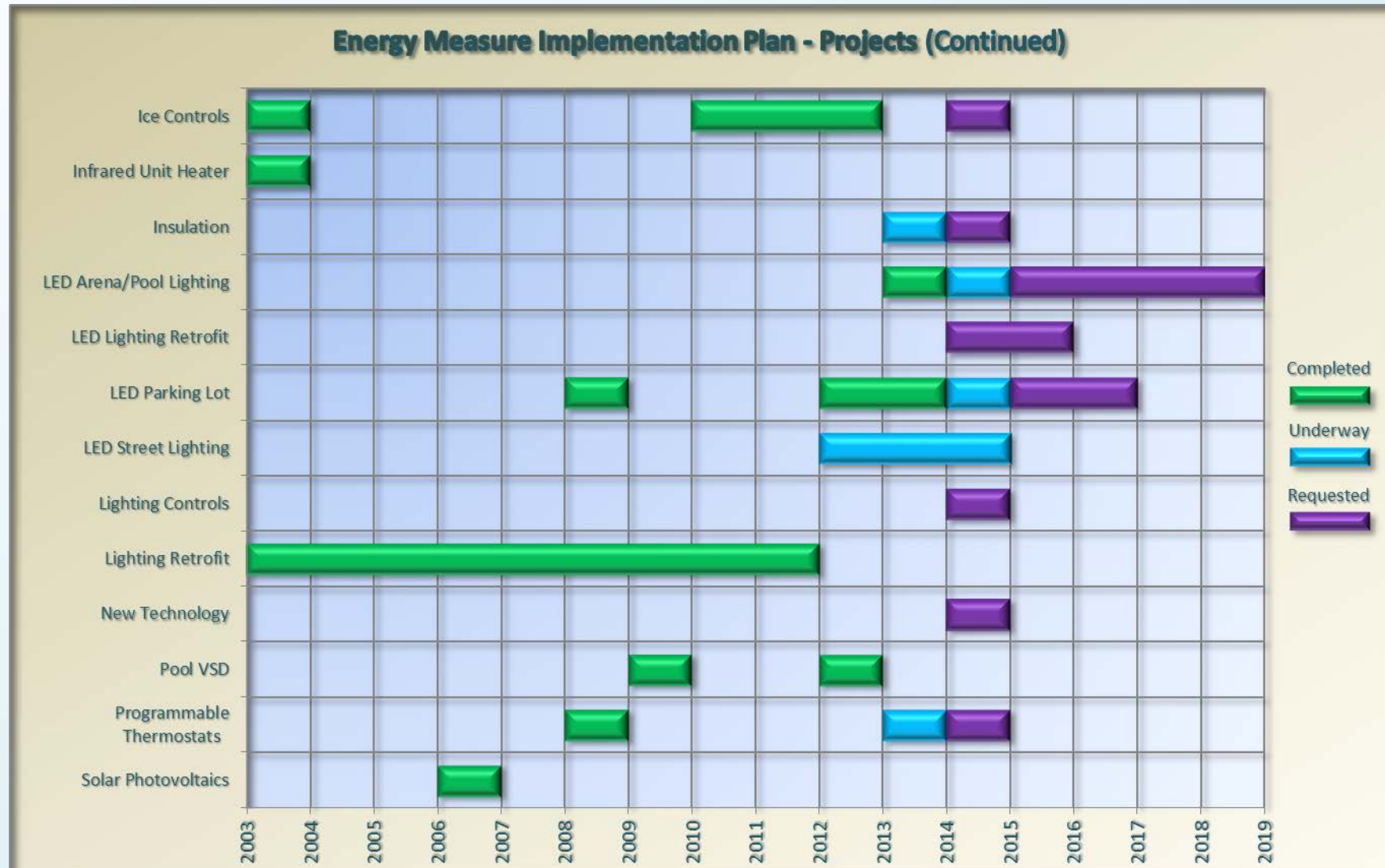
Specifically, re-commissioning:

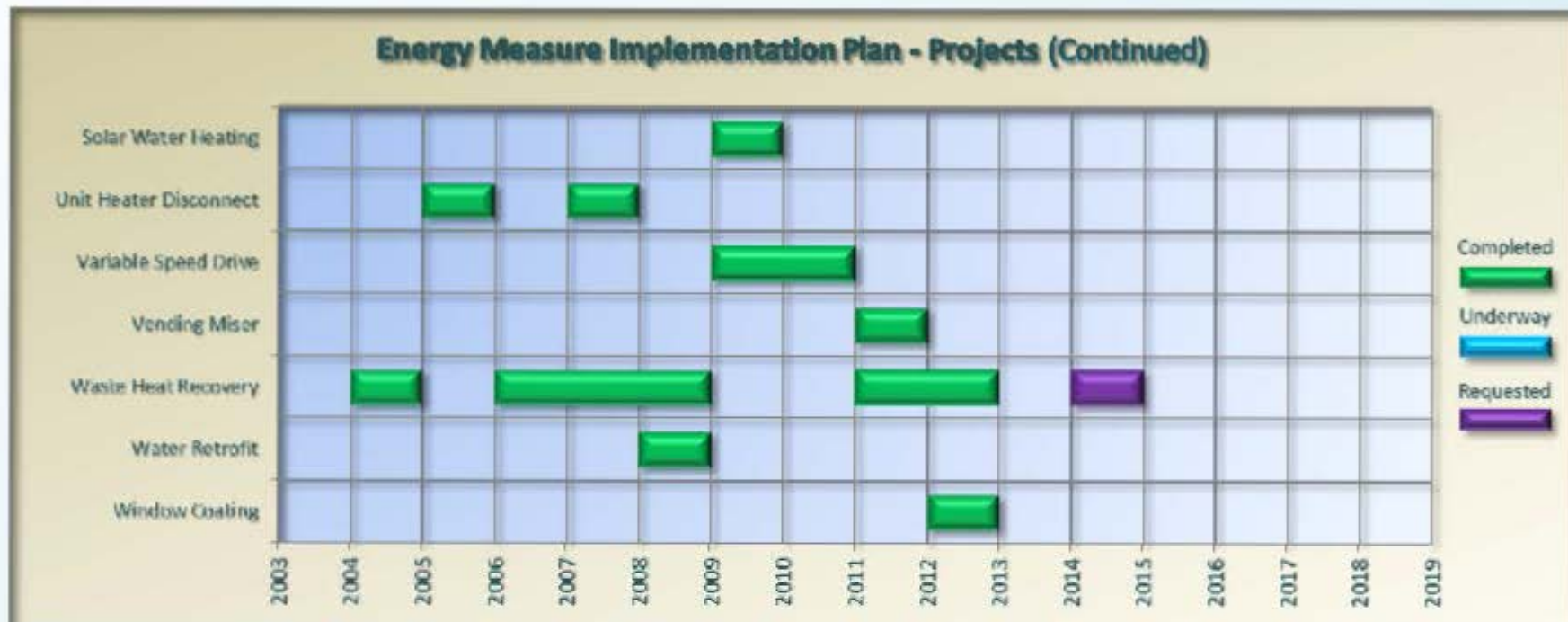
- Improves the building’s overall performance by optimizing energy efficient design features and directly addressing equipment performance and system integration issues.
- Ensures that building staff have the knowledge and documentation needed to operate and maintain the building.
- Evaluates the building’s environmental quality to reduce occupant complaints by optimizing existing systems for current loads and configuration.

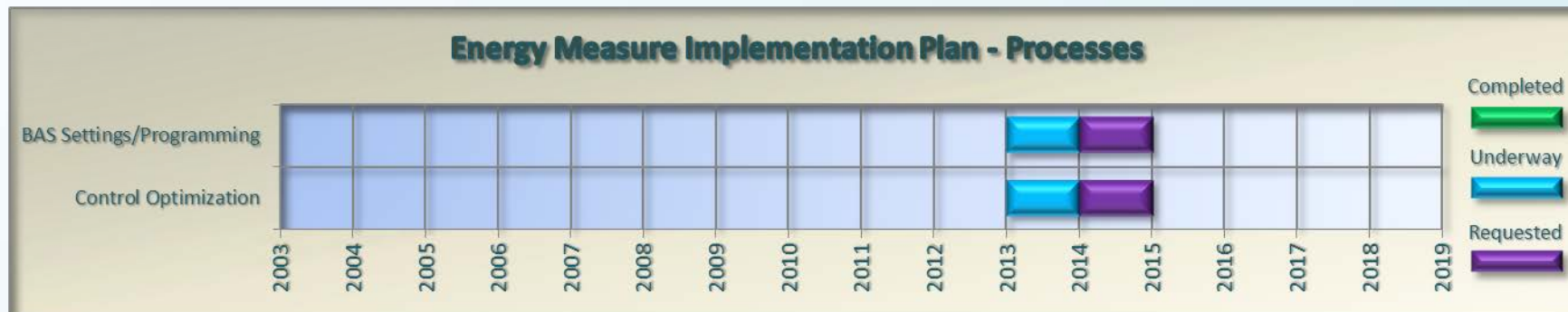
APPENDIX 1.0: ENERGY MEASURE IMPLEMENTATION PLAN

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









Descriptions of the measures listed in the above schedule can be found in **Appendix 2.0: Energy Measure Descriptions**.

Costs and savings associated with the measures can be found in **Appendix 3.0: Energy Measure Costs and Savings**.



APPENDIX 2.0: ENERGY MEASURE DESCRIPTIONS

The next section provides description of the different Energy Measures that make up the Energy Conservation Plan.

Costs and savings associated with the measures described in this section can be found in Appendix 4.0

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 in a building by installing weather stripping on windows and doors, improving the building envelope. Saves natural gas for heating.

Window Coating

Installing a window film on building windows to both a) reduce heat loss in winter, reducing heating load, and b) reduce heat gain in summer, reducing 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 based on a schedule, setting back, or turning off, during unoccupied periods.

BAS Upgrade

An upgrade or modification to an existing Building Automation System. Usually entails addition of new equipment, or improvements made 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. Enables reduction in outside air during unoccupied periods, reducing the need of heating/cooling the outside 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 as well as saving 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 building automation system or other control system), enabling the lighting to be scheduled on or off as required
Programmable Thermostats	A programmable thermostat is a thermostat which is designed to adjust the temperature according to a series of programmed settings that take effect at different times of the day. Programmable thermostats may also be called setback thermostats or clock thermostats.
Unit Heater Disconnect	Controls installed 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 for vending machines. The controls turn off a vending machine, turning it on when someone approaches by means of a sensor. The control also cycles the compressors in the unit to ensure the contents maintain their temperature (stay cold)

A2.1.3 ENERGY DASHBOARD

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

AHU Replacement	The replacement of an Air Handling Unit (or rooftop, furnace or other general HVAC piece of equipment) with a unit with higher efficiency.
Boiler Replacement	Replacement of an existing boiler, usually when the equipment has reached its end of life, with a higher efficiency boiler.



Chiller Replacement	Replacement of a chiller (a machine that removes heat from a liquid. 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	Making use of cooler outside air to provide cooling to a facility rather than using an air conditioning unit. Generally done during shoulder seasons when the temperatures are cool.
Heater Replacement	The replacing of a heater with a more efficient unit.
Infrared Unit Heater	Replacing 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 would help reduce heat loss and save on energy required for heating.
A2.1.5 HEAT RECOVERY	
Waste Heat Recovery	Using the waste heat from exhaust air, the ice making process in an arena or from water drained from the pool for preheating incoming air, space heating or to pre-heat the domestic hot water in the facility.
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 standard lighting 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

Repair of existing equipment to help it run more efficiently.

Note: This refers to maintenance work implemented for energy efficiency. It does not include all maintenance performed on equipment.

Equipment Optimization

Adjustments of the operation or controls of a piece of equipment to improve its operation and make it operate more energy efficiently.

A2.1.9 NEW TECHNOLOGY

New Technology

Installation of a new or recent technology or equipment meant to improve energy efficiency. Generally, for unproven technology, it 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 which 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 would generally involve the installation of more efficient washroom fixtures, including:

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

Energy use would be affected in that reduced hot water use would result in a savings in natural gas (or electricity) 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 of the equipment. 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.
- Adjust 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 gain staff acceptance and comprehension of the importance of energy conservation at all City facilities and for the initiatives the Energy Management Team is implementing.

Includes an Energy Awareness program where City employees are recognized for provided energy efficiency ideas.

EBEAR The Energy Benchmarking, Energy Awareness and Retro-commissioning (EBEAR) Program is a City initiative launched in January 2012 to improve energy performance in city-owned and operated facilities through the following three ways:

1. Energy Benchmarking compares a facility's energy use index 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 over time.



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 promoting energy conservation in the workplace and helping improve the energy performance of City facilities.

An Energy Champion is:

- A leader committed to building an energy-saving culture in our workplace.
- A point of contact for energy-related issues within a facility.
- An advocate for energy efficiency and conservation in regular staff or departmental meetings.
- A motivator to staff, helping maintain efficient operations within a facility.

Green Leaders

A program aimed to achieve environmental sustainability in the workplace by providing information and incentives to staff to take sustainable actions and monitor environmental sustainability in the workplace. An ongoing program with the ultimate goal of creating a green culture throughout the corporation.

Training

Providing of 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, Greenhouse Gas, and utility costs). Descriptions of the measures in this section can be found in [Appendix 3.0](#).

A3.1 PROJECTS

Total Expenditure and Savings for Energy Measure Projects:

Status	Measure Cost	Annual Savings			
		\$	kWh	m3	GHG (tonnes)
Complete	\$6,202,200	\$802,400	4,730,100	516,400	1,430.6
Underway	\$29,585,900	\$2,926,100	23,766,800	45,300	2,367.3
Requested	\$2,607,600	\$497,800	3,095,000	93,500	473.9
Totals	\$38,395,700	\$4,226,300	31,591,900	655,200	4,271.8

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		\$1,474,500	\$228,800	889,200	134,300	339
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	\$5,200	\$2,300	13,600	1,800	4.7
	Underway	\$3,800	\$4,600	0	20,400	38.6
	Requested	\$64,300	\$76,500	7,300	14,900	28.9
CO2 Controls	Complete	\$15,900	\$4,900	19,000	10,000	20.7
	Underway	\$0	\$0	0	0	0.0
	Requested	\$6,500	\$3,500	2,800	10,100	19.4
Ice Controls	Complete	\$408,200	\$32,000	228,300	0	21.9
	Underway	\$0	\$0	0	0	0.0
	Requested	\$1,000	\$7,000	0	0	0.0
Lighting Controls	Complete	\$0	\$0	0	0	0.0
	Underway	\$0	\$0	0	0	0.0
	Requested	\$18,500	\$15,700	150,000	0	14.4
Programmable Thermostats	Complete	\$5,300	\$2,200	11,900	2,800	6.4
	Underway	\$5,000	\$4,100	0	18,200	34.4
	Requested	\$300	\$200	2,300	0	0.2
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		\$475,000	\$16,600	7,300	59,900	114
AHU Replacement	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$350,000	\$8,700	7,300	26,500	50.8
Boiler Replacement	Complete	\$95,000	\$7,400	0	31,800	60.1
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$30,000	\$500	0	1,600	3.0
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	\$0	\$0	0	0	0.0
	Tentative	\$25,100	\$11,800	0	0	0.0
Heater Replacement	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$10,300	\$1,900	23,600	-1,800	-1.1
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	\$0	\$100	0	700	1.3



Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.4 ENERGY DASHBOARD		\$713,000	\$74,900	352,100	101,400	226
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	\$0	\$0	0	0	0.0
	Tentative	\$15,000	\$3,000	0	0	0.0
A3.1.6 LIGHTING		\$2,019,000	\$318,500	1,855,700	0	148
LED Arena/Pool Lighting	Complete	\$79,600	\$0	0	0	0.0
	Ongoing/Pending	\$313,800	\$45,000	346,300	0	27.7
	Tentative	\$1,160,900	\$187,400	1,446,200	0	115.7
LED Lighting Retrofit	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$464,700	\$86,100	63,200	0	5.1
LED Parking Lot	Complete	\$24,400	\$2,100	15,100	0	1.2
	Ongoing/Pending	\$645,300	\$74,400	596,100	0	47.7
	Tentative	\$251,000	\$36,200	259,900	0	20.8
LED Street Lighting	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$28,500,000	\$3,194,500	22,818,100	0	1,825.4
	Tentative	\$0	\$0	0	0	0.0



Measure	Status	Measure Cost	Annual Savings			
			\$	kWh	m3	GHG (tonnes)
A3.1.7 LIGHTING		\$2,019,000	\$318,500	1,855,700	0	148
Lighting Retrofit	Complete	\$728,000	\$187,300	1,340,200	0	107.2
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.8 MAINTENANCE		\$102,200	\$68,000	42,300	37,300	74
Equipment Maintenance	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$61,000	\$6,600	37,300	600	4.1
Equipment Optimization	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$3,300	\$0	0	16,600	31.4
	Tentative	\$37,900	\$61,400	5,000	20,100	38.4
A3.1.9 NEW TECHNOLOGY		\$791,800	\$49,000	67,600	22,700	48
New Technology	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$2,000	\$1,200	8,600	0	0.7
A3.1.10 RENEWABLE ENERGY		\$515,100	\$26,600	29,500	22,700	45
Solar Photovoltaic	Complete	\$274,700	\$21,200	29,500	0	2.4
	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)
A3.1.11 VARIABLE SPEED DRIVE		\$492,600	\$158,600	1,109,500	11,700	111
Pool VSD	Complete	\$114,700	\$42,800	305,600	0	24.4
	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	86.4
	Ongoing/Pending	\$0	\$0	0	0	0.0
	Tentative	\$0	\$0	0	0	0.0
A3.1.12 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		\$9,800	\$9,800	0	27,600	52
Control Optimization	Complete	\$0	\$0	0	0	0.0
	Ongoing/Pending	\$1,400	\$6,200	0	27,200	51.4
	Tentative	\$8,400	\$3,600	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						
Energy Audit	Complete	\$290,700	\$0	0	0	0
	Ongoing/Pending	\$487,600	\$0	0	0	0
	Tentative	\$0	\$0	0	0	0
Re-commissioning	Complete	\$106,000	\$0	0	0	0
	Ongoing/Pending	\$612,400	\$0	0	0	0
	Tentative	\$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.

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 various locations that the listed measure has been, or is planned to be implemented. The measures are sorted first by Measure Grouping, then Measure Type.

Each Measure Type is then sorted by 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
	Underway	Hershey Centre
	Requested	Huron Park Community Centre Pool & Arena, Malton Yard, Meadowvale 4 Rinks, Mississauga Valley Community Centre, South Common Community Centre Library & Pool, Tomken Twin Arena
CO2 Controls	Complete	Burnhamthorpe Library & Maja Prentice Theatre, Living Arts Centre
	Underway	
	Requested	City Centre Transit Terminal, Hershey Centre Sports Complex
Ice Controls	Complete	Hershey Centre, Iceland Arena
	Underway	
	Requested	Meadowvale 4 Rinks
Lighting Controls	Complete	
	Underway	
	Requested	City Centre Transit Terminal, Iceland Arena, 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	Transit Campus Bldg A B C D - Storage Admin Repair, Transit Campus Bldg E - Storage Garage, Transit Campus Bldg F - Body Shop
	Requested	Malton Yard
Unit Heater Disconnect	Complete	Clarkson Yard, Huron Park Community Centre Pool & Arena, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Mississauga Valley Community Centre, Hershey Centre, Carmen Corbasson Community Centre, Meadowvale 4 Rinks, Iceland Arena, Frank McKechnie Community Centre, Lakefront Promenade Maintenance Depot, Malton Arena, Mavis North
	Underway	
	Requested	
Vending Miser	Complete	Various
	Underway	
	Requested	

A4.1.3 ENERGY DASHBOARD

Energy Dashboard	Complete	
	Underway	Mississauga City Hall
	Requested	Burnhamthorpe Community Centre & Arena, Carmen Corbasson Community Centre, Mississauga Central Library, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Frank McKechnie Community Centre, Hershey Centre, Hershey Centre Sports Complex, Huron Park Community Centre Pool & Arena, Iceland Arena, Living Arts Centre, Malton Community Centre, Meadowvale 4 Rinks, Meadowvale Community Centre, Mississauga Valley Community Centre, 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



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



Measure	Status	Locations
Equipment Upgrade (Continued)		
Insulation	Complete	
	Underway	Hershey Centre, Iceland Arena
	Requested	Hershey Centre Sports Complex

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	
	Requested	Tomken Twin Arena

A4.1.1 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



Measure	Status	Locations
Lighting (Continued)		
A4.1.2 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 - Main House, Animal Control Centre, Benares Estate - House, Benares Estate - Visitor Centre, Cawthra Elliot Estate - House, Clarkson Yard, Credit Village Marina, Adamson Estate - Derry House, 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 Depot, Meadowvale Community Theatre, Meadowvale Village C.C. Hall, Mississauga Senior Citizen Centre, Port Credit Library, Streetsville Library



Measure	Status	Locations
Lighting (Continued)		
Lighting Retrofit	Complete	Ontario Court of Justice, Burnhamthorpe Library & Maja Prentice Theatre, Clarke Memorial Hall, Frank McKechnie Community Centre, Mississauga Valley Community Centre, Iceland Arena, Lakeview Golf Course, Malton Arena, Malton Satellite Terminal, Malton Yard, Mavis South, Meadowvale Community Centre, Meadowvale Community Theatre, Meadowvale Village C.C. Hall, Port Credit Arena, Rivergrove Community Centre & Pool, Transit Campus Bldg A B C D - Storage Admin Repair, Various, Carmen Corbasson Community Centre, Clarkson Community Centre Library Arena & Pool, Erin Mills Twin Arena, Huron Park Community Centre Pool & Arena, Meadowvale 4 Rinks, South Common Community Centre Library & Pool, Burnhamthorpe Community Centre & Arena, Mississauga Central Library, Hershey Centre, Malton Community Centre, Tomken Twin Arena, Clarkson Yard, 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), Mavis North, Adamson Estate - Derry House, Adamson Estate - Main House, Animal Control Centre, Bradley Museum - The Anchorage, Cawthra Elliot Estate - House, City Centre Transit Terminal, Credit Village Marina, Lakefront Promenade Maintenance Depot, Living Arts Centre, Lorne Park Hall, Mary Fix House, Mississauga Senior Citizen Centre, Mississauga Canoe Club
	Underway	
	Requested	



Measure	Status	Locations
A4.1.3 MAINTENANCE		
Equipment Maintenance	Complete	
	Underway	
	Requested	City Centre Transit Terminal, Iceland Arena, Malton Yard, South Common Community Centre Library & Pool
Equipment Optimization	Complete	
	Underway	Hershey Centre, Iceland Arena, Transit Campus Bldg E - Storage Garage
	Requested	Hershey Centre Sports Complex, Huron Park Community Centre Pool & Arena, Iceland Arena, Mississauga Valley Community Centre, Tomken Twin Arena
A4.1.4 NEW TECHNOLOGY		
New Technology	Complete	
	Underway	
	Requested	City Centre Transit Terminal, Malton Yard, South Common Community Centre Library & Pool
A4.1.5 RENEWABLE ENERGY		
Solar Photovoltaics	Complete	Hershey Centre
	Underway	
	Requested	
Solar Water Heating	Complete	Huron Park Community Centre Pool & Arena
	Underway	
	Requested	



Measure	Status	Locations
A4.1.6 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	Mississauga Central Library, Iceland Arena, Living Arts Centre, Meadowvale 4 Rinks, Mississauga City Hall
	Underway	
	Requested	
A4.1.7 WATER		
Water Retrofit	Complete	Various
	Underway	
	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

Descriptions of the Energy Measures Planned can be found in [Appendix 3.0: Energy Measure Descriptions](#).

The information can be navigated by either clicking on the site name in the list below, or by manually navigating the pages (the sites are organized in alphabetical order)

LEGEND (Measure Status):

- = **Completed:** Measures which have been fully implemented and completed
- = **Underway:** Measures which have been approved and funded, and are either underway, or soon to be implemented.
- = **Requested:** Measures which 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:

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Adamson Estate - Barn • Adamson Estate - Main House • Animal Control Centre • Applewood Heights - Outdoor Pool • Benares Estate - House • Benares Estate - Visitor Centre • Bradley Museum - Barn • Bradley Museum - Log Cabin • Bradley Museum - Museum • Bradley Museum - The Anchorage • BraeBen Golf Course • Brookmede Centre • Burnhamthorpe Community Centre & Arena • Burnhamthorpe Library & Maja Prentice Theatre • Carmen Corbasson Community Centre • Cawthra Elliot Estate - House • Chappel Estate - House | <ul style="list-style-type: none"> • Churchill Meadows Library • 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 • Erindale Community Hall • 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 107 (Erindale) • Fire Station 108 (Streetsville) | <ul style="list-style-type: none"> • 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 116 (West Malton) & Peel Ambulance Reporting Centre • 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 • Garry W Morden Centre • Hershey Centre • Hershey Centre Change House |
|--|--|--|



- 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

- Energy Audit

**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

- 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

- 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

- 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

- 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

- Energy Audit

**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

- Energy Audit

**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

- 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

- 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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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

- Energy Audit


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
- 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

- 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

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

**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

- 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

- 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
Nat. Gas (e-kWh)	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
- CO2 Controls
- Energy Audit
- Equipment Maintenance
- Heater Replacement
- Lighting Controls
- Lighting Retrofit
- Misc. Controls
- New Technology
- Pipe Insulation
- Re-commissioning

**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

- 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
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Unit Heater Disconnect
- Re-commissioning

**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
- 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

- 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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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

- 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
Nat. Gas (e-kWh)	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

- 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

- 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

- 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

- 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

- 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

- 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
Nat. Gas (e-kWh)	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

- 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

- 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

- 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
Nat. Gas (e-kWh)	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

- 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

- 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

- 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
Nat. Gas (e-kWh)	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

- 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

- 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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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
- Energy Audit
- Energy Dashboard
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Pool VSD
- Unit Heater Disconnect

**Facility: Garry W Morden Centre**

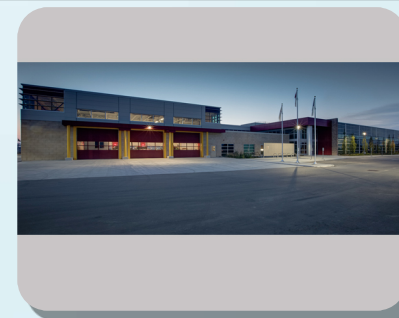
Address: 7535 Ninth Line, L5N 7C3

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
- 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**Energy Measures and Status**

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

**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

Year:	<u>2011</u>	<u>2012</u>	<u>2013</u>
Electricity (kWh)	0	0	0
Natural Gas (m ³)	0	31,950	192,418
Nat. Gas (e-kWh)	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

Energy Measures and Status

**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)	105,310	181,240	93,112
Natural Gas (m ³)	0	0	11,626
Nat. Gas (e-kWh)	0	0	122,072
Total e-kWh	105,310	181,240	215,184
Total e-kWh/m ²	n/a	n/a	n/a
GHG (kg/yr)	8,425	14,499	29,476
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 Upgrade
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- Free Cooling
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Pool VSD
- Solar Water Heating
- Unit Heater Disconnect
- Re-commissioning

**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
Nat. Gas (e-kWh)	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
- 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
- Training
- Unit Heater Disconnect
- Variable Speed Drive
- Waste Heat Recovery
- Re-commissioning


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
Nat. Gas (e-kWh)	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

- 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

- 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

- 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

- Energy Audit

**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

- 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

- 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

- 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

- 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
Nat. Gas (e-kWh)	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
- 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

- 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

- 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
Nat. Gas (e-kWh)	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
- 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

- AHU Replacement
- BAS Installation
- BAS Upgrade
- 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

- 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

- 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
- 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
- Desicant Dehumidifier
- Energy Audit
- Energy Dashboard
- Ice Controls
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Misc. Controls
- Unit Heater Disconnect
- Variable Speed Drive
- Re-commissioning

**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
- 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

- 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
- 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
Nat. Gas (e-kWh)	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

- 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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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

- 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

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

**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

- 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
- Control Optimization
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- Free Cooling
- LED Arena/Pool Lighting
- Lighting Retrofit
- Misc. Controls
- Pool VSD
- Unit Heater Disconnect
- Waste Heat Recovery
- Re-commissioning


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

- 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

- Energy Audit
- Energy Dashboard
- 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
Nat. Gas (e-kWh)	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

- 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

- 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**Energy Measures and Status**

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

**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
Nat. Gas (e-kWh)	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
- 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
Nat. Gas (e-kWh)	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

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

**Facility: Streetlights - Mississauga**

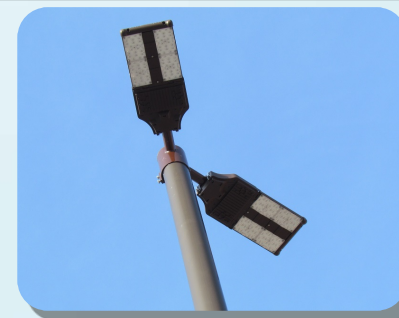
Address: Various, N/A

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
Nat. Gas (e-kWh)	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
- Energy Audit
- Energy Dashboard
- Equipment Optimization
- LED Arena/Pool Lighting
- LED Parking Lot
- Lighting Retrofit
- Misc. Controls
- Re-commissioning

**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
Nat. Gas (e-kWh)	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
- 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
Nat. Gas (e-kWh)	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
Nat. Gas (e-kWh)	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**Energy Measures and Status**

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

**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). It is a computer network of electronic devices designed to monitor and control the mechanical, security, fire and flood safety, lighting, HVAC and humidity control and ventilation systems in a building.
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 ($1 \text{ m}^3 = 10.5 \text{ e-kWh}$)
Energy Efficiency Measure	An Energy Efficiency Measure is an action or work done with the intention to save on electricity, natural gas, oil, or other form of energy consumption, within City of Mississauga facilities. Each measure can be classified as a Project , a Process , or a Program (see definition for each).
Energy Use Intensity	The Energy Use Intensity is a measurement that essentially expresses a building's energy use as a function of its size or other characteristics. Can also be denoted as EUI The measurement used in this plan for EUI is e-kWh/m^2
Equivalent kilowatt hour	An equivalent kilowatt hour is the conversion of an unit of energy to a common unit to better compare different types of energy sources. 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. Can also be denoted as e-kWh

1 e-kWh is comparable to 1 kWh in energy terms

EUI

See **Energy Use Intensity**

F&PD

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.

GHG

See **Greenhouse Gas**

Green Energy Act

Formally **Bill 150**, the **Green Energy and Green Economy Act, 2009**, introduced in the Ontario legislature on February 23, 2009, is intended to expand renewable energy production, encourage energy conservation and create green jobs.

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 (CO₂), methane (CH₄), nitrous oxide (NO₂), and water vapor.

HVAC

Heating Ventilation and Air Conditioning.

Kilowatt

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.

1 kilowatt = 1,000 watts

1 megawatt = 1,000 kilowatt

Can also be denoted as **kW**

Kilowatt Hour

A kilowatt hour is a measurement of power used over a period of time. It is commonly used as the amount of electricity used.

1 kilowatt hour = 1,000 watt hours

1 megawatt hour = 1,000 kilowatt hours

1 kilowatt hour = 1 watt x 1,000 hour OR 500 watts x 2 hour OR 2,000 watt x ½ hour

Can also be denoted as **kWh**

kW	see Kilowatt
kWh	see Kilowatt Hour
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
Process	Organizational Energy Efficiency Measure. Can involve building an energy conservation culture. Examples: Turning off equipment at night, implementing start up and shut down schedules, etc.
Program	People Energy Efficiency Measure. Would involve awareness, habits, procedures & feedback. Examples: Training staff in energy awareness, Employee Participation Program-Identification of Improvements.
Project	Technological type Energy Efficiency Measure. Involves operational & technological actions. Examples: Lighting retrofit, new controls, efficient boiler, etc.



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Climate change is an issue that has a rising profile in society today. The most recent assessment of climate change by the Intergovernmental Panel on Climate Change (IPCC) states with certainty that man-made emissions are the cause of recently observed global temperature increases and that if they are not significantly reduced those trends will continue. This would have a negative effect on the economy and many aspects of our community. The most prevalent source of greenhouse gas (GHG) emissions in urban settings is energy. Burning natural gas to heat buildings or using electricity emits GHGs into our atmosphere.

In 2009 the Provincial Government passed the *Green Energy Act*. This raised the profile of climate change and made energy efficiency and greenhouse gas emissions reductions a major priority in Ontario.

In 2011, the Regional council approved the Peel Climate Change Strategy. This strategy was developed in a partnership between the Region of Peel, City of Brampton, City of Mississauga, Town of Caledon, Credit Valley Conservation, and Toronto and Region Conservation. The City has been involved in the collaborative effort to implement those actions, including developing Community and Corporate greenhouse gas inventories.

The City of Mississauga's Strategic Plan identifies becoming a Net-Zero carbon city as a visionary goal. The City's Living Green Master Plan (LGMP), adopted in 2012 by City Council, incorporates climate change into priorities, actions and indicators. Specifically, the LGMP includes the following action: Action 18: "Continue to identify, invest in and implement energy efficiency and renewable energy actions..."

Increasing energy efficiency and reducing greenhouse gas emissions provides multiple benefits to the City. Firstly, reducing the amount of electricity and natural gas use in buildings saves the city money. Additionally, reducing the City's energy usage reduces the amount of carbon dioxide going into the atmosphere, which contributes to reducing the magnitude of climate change in the future. Energy retrofits can also have other positive effects on the natural environment.



TO: Environmental Advisory Committee
Meeting Date: June 10, 2014

FROM: Annie Thuan, Legal Counsel, Environmental Law
Legal Services Division

DATE: May 28, 2014

SUBJECT: Enbridge Line 9B Reversal and Capacity Expansion Pipeline Project (the
“Project”)

Background

On May 14, 2014, Council received for information a Corporate Report of the City Solicitor, dated April 28, 2014, regarding the Enbridge Line 9B Project.

Pursuant to that Corporate Report, Council passed a resolution adopting the recommendation that City staff pursue discussions with Enbridge Pipeline Inc. (“Enbridge”), and follow-up with the National Energy Board (“NEB”), as required, relating to the NEB decision of March 6, 2014 and conditions in respect of key areas of concern for the City of Mississauga (the “City”), including pipeline integrity and valve placement, emergency management and response, and public consultation (Council Resolution 0089-2014).

This memorandum provides a summary of the Corporate Report of the City Solicitor dated April 28, 2014 regarding the Enbridge Line 9B Project.

Enbridge Line 9B Project

Enbridge operates the Line 9 pipeline, which flows from Sarnia to Montreal and traverses the City along the hydro corridor adjacent to Hwy. 403 and Eastgate Parkway (Appendix 1).

On August 8, 2011, Enbridge filed a project application with the NEB under *National Energy Board Act* (the “NEB Act”), s. 58, for approval to reverse the flow of crude oil within a section of pipeline referred to as Line 9 Phase I (Line 9A), which runs between Sarnia and North Westover, near Hamilton, Ontario. Enbridge obtained approval from the NEB, with certain conditions attached, for the reversal of the Line 9A pipeline in July 2012.

In 2012, Enbridge filed an application with the NEB seeking approval for the following:

- Reverse the flow of the remainder of Line 9 between North Westover, Ontario to Montreal, Quebec, which is known as Line 9B;

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- Increase the overall Line 9 capacity from 240,000 bpd to 300,000 bpd by using a “drag reducing agent”. This material is a waxy substance which increases the flow without changing operating pressure; and
- Revise the Line 9 tariff to allow for the transportation of heavy crude, which may contain diluted bitumen or “dilbit”. Dilbit is a mixture of bitumen with a diluting material such as naphtha to facilitate its handling.

In December 2012, the NEB announced it would consider Enbridge’s proposal with respect to Line 9B through a hearing process. Based on Council’s direction pursuant to a staff report, which was approved by Council Recommendation GC-0454-2013, the City participated in the hearing as an Intervenor. The hearing concluded in October 2013.

Throughout the process, the City participated in a municipal liaison working group comprised of the municipalities of Hamilton, Burlington, Oakville, Toronto, Ajax and Kingston, and the Toronto and Regional Conservation Authority and the Credit Valley Conservation Authority. This working group has shared information and materials relating to issues of common interest.

NEB Decision

The NEB released its decision on March 6, 2014, approving the Project subject to thirty conditions. The Board denied Enbridge’s request for an exemption from the requirement under the NEB Act to obtain leave to open (“LTO”) before placing the Project into operation. Enbridge must therefore apply to the NEB for permission before opening the pipeline for transmission. The Board imposed a number of conditions that Enbridge must satisfy before applying for LTO.

The NEB approval included many detailed conditions that imposed obligations on Enbridge for continued engagement with municipalities. Other conditions and requirements of Enbridge included the following:

- Complete certain works relating to the integrity of the pipeline before bringing the pipeline into service;
- Develop a Watercourse Crossing Management Plan and provide this information to municipalities, if requested;
- Meet annually with municipalities to share information, provide training and/or develop site-specific emergency response plans;
- Work with first responders to practice emergency response activities that are site-specific; and
- Continue a consultation program throughout the construction and operation phases of the project.

City's Areas of Concern and Follow-Up

Through the hearing process, City staff identified the following areas of concern: adequacy of emergency response and training, pipeline integrity and valve placement, corrosivity of dilbit, public consultation, and financial assurance.

Below is a discussion of how the NEB addressed each area. Staff will be following up on discussions with Enbridge on key areas of concern to the City and will continue to work with the municipal liaison working group to monitor and identify ongoing concerns.

Emergency Management, Response and Training

City staff and other members of the municipal liaison working group expressed concern that, in the event of an emergency, the closest Enbridge response crew was located at Westover Terminal, near Hamilton, which would result in a response time of two to four hours.

During the hearing, Enbridge committed to establishing a maintenance work crew in Mississauga in the Fall of 2014. Recent correspondence from Enbridge has confirmed that the maintenance crew will also be trained in emergency response and that the facility will include a cache of emergency response equipment.

Enbridge has contacted the Chief and the Chief Training Officer of Mississauga Fire and Emergency Services (MFES) to coordinate a "response simulation exercise" in Mississauga in 2015. In addition, Enbridge has indicated that they will be conducting a "Train the Trainer" (for first responders) workshop in the Fall of 2014. Staff will continue to engage in discussions with Enbridge relating to emergency response, training and equipment.

With respect to emergency management and preparedness, several conditions attached to the NEB's approval of the Project require that Emergency Plans and an Emergency Response Coordination framework be developed prior to LTO. Staff will follow up with Enbridge to ensure that the City is consulted on these issues and that the City's Emergency Management Office is provided with copies of the relevant materials.

Pipeline Integrity: In-Line Inspections, Integrity Digs and Valve Placement

As part of Enbridge's Integrity Management Program, Enbridge conducted a series of in-line inspections of Line 9B through 2012 and 2013. The inspections consisted of running tools through the pipeline that are capable of detecting flaws, cracks, and wall thickness of the pipe.

This data was analyzed throughout 2013 to identify sections of the pipe to be included in Enbridge's Integrity Dig program. The Integrity Dig program investigates the findings of the in-line inspections through excavation of the pipe and visual inspection. Remediation of the pipe can include encasement with a 'sleeve' or replacement of the pipe section.

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The NEB attached conditions to its approval of the Project that require Enbridge to prepare an Updated Pipeline Engineering Assessment and complete all required repairs to the pipe prior to applying for LTO.

Enbridge is currently planning 14 integrity digs in Mississauga. The majority of the digs are within the hydro corridor owned by Hydro One but two digs are within municipal road allowances. Enbridge has had discussions with City staff and the Ontario Ministry of Transportation, and is considering options that eliminate the need for road closures to complete this work.

With respect to the locations of valves along the pipeline, the City has raised the issue of installing an additional valve at Etobicoke Creek. In approving the Project, the NEB attached a condition requiring Enbridge to provide the NEB, prior to LTO, with the results of its program to update the Line 9 valves system, including demonstrating that the maximum release volume between valves is as low as practicable. In the NEB decision, the NEB pointed out that Enbridge was required to comply with a CSA standard, which required that valves be placed on both sides of all major water crossings. Currently, of the two major water crossings in Mississauga, the Credit River and Etobicoke Creek, there is only one valve located on the west side of the Credit and none adjacent to Etobicoke Creek. City staff will be following up with Enbridge on this issue.

Corrosivity of Dilbit

At the hearing, concerns were raised that heavy oil from the oil sands is more corrosive than conventional crude and that transporting heavy oil through pipelines will increase the likelihood of cracks and failures and, therefore, releases into the environment.

The United States National Academy of Sciences released its study on the effects of diluted bitumen (dilbit) on transmission pipelines in 2013. The study found that dilbit does not have properties that make it more likely than other crude oils to cause damage to transmission pipelines.

Adequacy of Public Consultation

Throughout the hearing process, staff made numerous requests to Enbridge to hold an open house in Mississauga so that local residents could be informed about the Project. The open houses that were held in closest proximity to Mississauga were in Etobicoke and Oakville and both were held during evening rush hour. In addition, the sessions were not well advertised.

The issue of an open house in Mississauga was not directly addressed in the NEB's decision. However, the NEB noted that there was room for improvement in Enbridge's consultation program, both in the design and implementation, including timely notification to stakeholders about the open houses. Enbridge is required to continue the consultation program throughout the

construction and operation phases of the Project. Given the concerns raised by the City and as shared by the NEB, staff will be seeking more consultation with local Mississauga residents.

Financial Assurance

The alignment of Line 9B intersects with components of the City's Bus Rapid Transit (BRT) infrastructure currently under construction, as well as many other major transportation routes and sensitive natural features. Enbridge has indicated that it would be responsible for repairs to the BRT should any damage be caused as a result of any pipeline incident.

It is important that Enbridge has sufficient insurance coverage to repair and restore any damages caused by a pipeline incident. At the hearing, the NEB was asked to consider requiring Enbridge to maintain at least \$1 billion in insurance. The majority of the NEB members were satisfied that Enbridge has the financial capability to address its responsibilities, beyond its current insurance level of \$685 million.

The Government of Canada has announced that it will be requiring companies operating major crude oil pipelines to have a minimum of \$ 1 billion in financial capacity. The legislative amendment necessary to give effect to this requirement has not yet been released.

Conclusion

Several of the conditions the NEB attached to its approval of the Project address concerns raised by City staff and other members of the municipal liaison working group. Enbridge must satisfy a number of conditions with respect to pipeline integrity, leak detection systems, valve placement and operation, and environmental protection, prior to applying to the NEB for LTO.

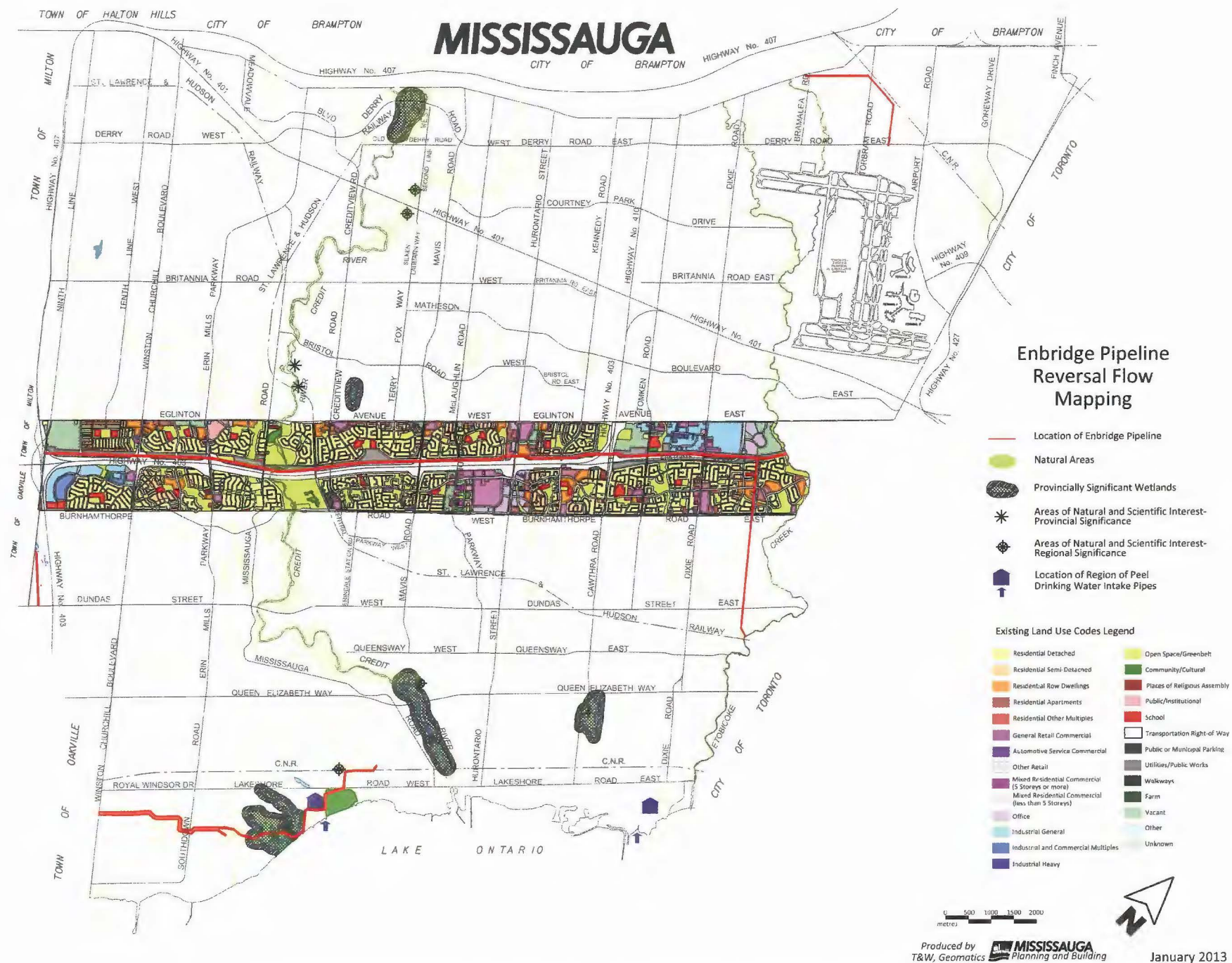
In addition, Enbridge's commitments to establish a maintenance facility and crew in Mississauga and to provide training opportunities for MFES and other first responders should result in an improved response to any spill. There is opportunity for staff to continue to pursue discussions with Enbridge with respect to issues of concern for Mississauga and staff will continue to do so.

Appendix 1: Map of Line 9B Pipeline



Annie M. Thuan

Legal Counsel, Environmental Law
Legal Services Division, City Manager's Office



Environmental Advisory Committee (EAC)

MEETING DATE: June 10, 2014

UPCOMING AGENDA ITEMS

PENDING ITEMS	
ITEM/DIRECTION	STATUS
<u>Transportation Strategy Presentation:</u> M. De Wit, Vice-Chair, indicated that a presentation on the transportation strategy would be beneficial to the Committee.	<u>EAC Meeting: Feb/12</u> Transportation Master Plan update anticipated early 2015.
<u>Urban Design Awards:</u> It was suggested that a report could be written to make a recommendation with respect to creating a green award in Urban Design.	<u>EAC Meeting: Dec/12 - COMPLETED</u> <i><u>Urban design included in 2014 community appreciation evening scheduled on June 4, 2014.</u></i>
<u>EAC November 2012 Off-Site Summary:</u> <u>(EAC-0068-2012)</u> That staff work with EAC to develop a recognition program and a community environmental grants program.	<u>EAC Meeting: Dec/12 - COMPLETED</u> 2014 Budget approved for environmental community grant to establish new community gardens; <i><u>Community environmental appreciation evening scheduled on June 4, 2014</u></i>
<u>Stormwater Financing Study (Phase 1):</u> <u>(EAC-0003-2013)</u> Staff directed to prepare an update regarding the Stormwater Financing Study (Phase 1) for consideration at a future EAC meeting.	<u>EAC Meeting: May/14 - COMPLETED</u> <u>(EAC-0013-2014)</u> That the PowerPoint Presentation to the Environmental Advisory Committee on May 6, 2014 entitled <i>Stormwater Charge Implementation Project</i> by Mr. Jeremy Blair, Storm Drainage Programming Engineer, Transportation and Works Department, be received.

ANTICIPATED ITEMS	
ITEM	DESCRIPTION
Nuisance Weed and Tall Grass Control By-law	By-law scheduled to be revised as per the Natural Heritage & Urban Forest Strategy. <i><u>Staff to provide a status update at June 10, 2014 EAC meeting</u></i>
Green Development Strategy (GDS)	Update on GDS implementation
Waste Management	Update on various corporate waste-related initiatives
Corporate Energy Conservation Plans	The new Provincial <i>Green Energy Act</i> (2009) requires municipalities to provide corporate energy conservation plans for all municipally owned and operated buildings and to report annually on actual performance against plans.
Stormwater Quality Control Strategy	Update of the City's strategy for managing and improving the quality of stormwater runoff
Public Art Project	Update on public art project along Burnhamthorpe Road
Let Your Green Show	Let Your Green Show – Phase 3
Plastic Sampling in the Great Lakes: Findings of Dr. Sherri Mason, Professor of Chemistry, SUNY Fredonia, New York	<ul style="list-style-type: none"> • Invite Dr. Mason to address a future EAC meeting • <i><u>Invite Toronto Science Fair student - project on bio-filter that removes 100% of plastic micro-beads from soaps.</u></i>
Green Leaders	An environment awareness/employee engagement pilot program at Civic Centre focusing on energy and waste in 2014.



May 30th, 2014

Dear Mayor McCallion and City of Mississauga Councillors:

The Clean Air Partnership, secretariat for the Greater Toronto and Hamilton Area Clean Air Council, would like to thank and recognize City of Mississauga for your contribution in forwarding the development, implementation, monitoring and reporting of the GTHA Clean Air Council Declaration on Clean Air and Climate Change actions and targets. Declaration actions are determined by member staff representatives who work collaboratively with various departments within your municipality and municipal peers across the Region to advance the implementation of clean air and climate change actions. Please see attached for City of Mississauga's Recognition Certificate highlighting your jurisdiction's contribution to the Clean Air Council actions and targets. Also attached is the Clean Air Council 2014 Progress Report highlighting the collective achievements of the GTHA region.

The Clean Air Council (a network of municipalities and health units from across the Greater Toronto & Hamilton Area) was established in 2001 to work collaboratively on the development and implementation of clean air and climate change mitigation and adaptation actions. The Clean Air Council is based on the premise that municipalities benefit from actions to reduce energy use in order to save money; limit emissions that impact health; make the movement of people and goods more efficient; and make communities more livable, competitive and resilient. Municipalities have shown significant leadership in addressing clean air, climate change and urban sustainability opportunities and are quick to recognize the synergies between environment, health, community livability, resilience and economic prosperity.

We look forward to continuing to work with you and your municipality's staff representatives in the future to support and build on implementation and share lessons learned across the region.

Sincerely,

Gabriella Kalapos
Executive Director, Clean Air Partnership
gkalapos@cleanairpartnership.org
Tel: 416.338.1288

c.c. Andrea J. McLeod, Environment Division, Community Services

Certificate of Recognition



City of Mississauga

has met the following targets of the Clean Air
Council 2012-2014 Inter-Governmental
Declaration on Clean Air and Climate Change:



- ♦ Active Transportation Plan
- ♦ Corporate Green Development Standard
- ♦ Community Green Development Strategy
- ♦ Community Energy Inventory
- ♦ Community Greenhouse Gas Reduction Target
- ♦ Green Energy Purchasing (2008–2013)
- ♦ Green Energy Production
- ♦ Community Action Plan
- ♦ Community Action Plan Implementation Progress Report
- ♦ i-Tree Urban Forest Study (in partnership with Peel Region)
- ♦ Urban Forestry Plan
- ♦ Urban Forest Infestation Plan
- ♦ Community Gardening Policy
- ♦ Climate Change Adaptation Plan (in partnership with Peel Region)
- ♦ Green Fleets Plan
- ♦ Green Fleets Plan Implementation Progress Report

Gabriella Kalapos,
Executive Director, Clean Air Partnership
May 30th, 2014



CLEAN AIR COUNCIL 2012 – 2014 INTER-GOVERNMENTAL DECLARATION ON CLEAN AIR & CLIMATE CHANGE MAY 2014 PROGRESS REPORT

PREAMBLE

Based on strong scientific evidence linking air pollutants to various illnesses and breathing problems, in 2000 the Ontario Medical Association (OMA) declared air pollution "a public health crisis". In addition to the respiratory and cardiovascular health impacts of exposure to air pollutants, there is also research linking them to adverse birth outcomes, neurodevelopment, cognitive function and chronic diseases such as diabetes. In 2013 the World Health Organization classified air pollution as carcinogenic to humans, and the 2014 Toronto Public Health update to their Burden of Illness report found that air pollution results in 1,300 premature deaths and 3,550 hospitalizations in the City of Toronto alone.

Climate change is the most pressing environmental, social and economic problem facing the planet. The consequences of climate change are global and long-term. The synergies between the actions that address air pollution and climate change enable communities to address the two problems with common solutions. The creation of lower carbon communities that are more efficient, sustainable and resilient are one of the main tools that will enable us to tackle the air pollution and climate change challenge and foster the Greater Toronto Area's competitiveness and livability.

Since 2001, the Greater Toronto Area Clean Air Council (a network of 24 municipalities and health units from across the Greater Toronto Area) was established to work collaboratively on the development and implementation of clean air and climate change mitigation and adaptation actions. The Clean Air Council is based on the premise that municipalities benefit from actions to reduce energy use in order to save money and limit emissions; make the movement of people and goods more efficient; and make communities more livable, competitive and resilient.

The members of the Clean Air Council work collaboratively on agreed upon priorities; track, analyze and determine the outcomes of actions; and bring experts and practitioners in the various activity areas together to share experiences and lessons learned. There are many benefits to a collaborative approach to addressing air quality and climate change issues. Having multiple jurisdictions at the same table enhances networking and the exchange of resources and information. It ensures that no one group is working in isolation, and that efforts are not unnecessarily duplicated. Inter-governmental and inter-regional cooperation also provides an opportunity to leverage scarce resources for research, outreach and other air quality and climate change mitigation and adaptation initiatives. Working together, the Clean Air Council enables members to achieve far more with fewer resources and reduced risk.

THE MANDATE OF CLEAN AIR COUNCIL IS TO:

- Address air quality and climate change challenges through a dynamic network that expands knowledge and encourages practical and successful policies and actions;
- Promote a better understanding of air quality and climate change problems and opportunities among municipalities, public health and policy makers to improve their ability to address these problems in an economically effective way;
- Explore opportunities for joint initiatives to reduce air pollution and greenhouse gas emissions and increase climate change adaptation and resilience actions;

- Develop and report on progress of Inter-governmental Declarations of Clean Air and Climate Change;
- Track and monitor the implementation and transfer of clean air and climate change actions across the jurisdictions; and
- Liaise with municipalities in Ontario, Canada and internationally, and with organizations that have compatible mandates to share best practices for reducing air pollution and greenhouse gas emissions and increasing community livability and resilience.

ACKNOWLEDGING AND THANKING the City of Toronto, Clean Air Council member jurisdictions, provincial, federal and other partners for providing financial and in-kind support for the Clean Air Council work program and assistance in developing, implementing and reporting on progress on actions listed in the *Clean Air Council Inter-governmental Declarations on Clean Air and Climate Change*.

ARTICLE 1 – STATEMENT OF COMMON UNDERSTANDING

1. Evidence based research has linked air pollution levels commonly experienced in the GTA to premature deaths, hospitalizations, increases in chronic heart and lung diseases including lung cancer, and acute respiratory and cardiovascular diseases. Even a small increase in air pollution elevates the risk of health impacts, particularly among those who are most vulnerable and sensitive to air pollution such as young children, the elderly and those with pre-existing respiratory and cardiovascular illnesses.
2. Climate change scenarios project an increased risk of extreme weather and other climate-related events in Canada such as floods, drought, forest fires, increased air pollution and heat waves – all of which increase health risks to Canadians.
3. Research has also indicated that air pollution has a detrimental impact on terrestrial and aquatic ecosystems.
4. Air pollution, through health effects, environmental degradation, building and property damage, adversely impacts the economy and quality of life.
5. Land use and transportation planning decisions that encourage sustainable urban development can have multiple benefits on air quality and human health.
6. Transportation is a major source of the emissions that contribute to both air pollution and climate change. Transportation is responsible for approximately 24% of PM_{2.5}, 71% of NO_x, 26% of VOCs, 87% of CO and 34% of CO₂ emissions in the Province of Ontario. Building energy use is also a significant contributor accounting for 39% PM_{2.5}, 8% of VOCs, and 18.6% of CO₂.¹
7. Air pollution and climate change are two atmospheric problems sharing common sources. For example, fossil-fuel combustion is a key contributor to air pollution and climate change, producing smog precursors and greenhouse gas emissions.
8. Actions to reduce greenhouse gas emissions are often associated with reductions in other atmospheric emissions that contribute to smog and its associated health, economic and ecosystem effects. In some cases, a co-benefit of reducing smog precursors is to reduce some greenhouse gas emissions.

¹ Source: Air pollutants emissions are from NPRI 2012 and CO₂ emissions are from Environment Canada's 2013 National Inventory Report.

9. Addressing key sources of major air pollutants and greenhouse gas emissions requires collaboration between all orders of government. By sharing the best practices from jurisdictions across the GTA, southern Ontario and beyond, we can support one another in achieving improvements in air quality and climate change at a local and regional level for the benefit of all.

ARTICLE 2 – SIGNATORIES TO THE 2012 CLEAN AIR COUNCIL INTER-GOVERNMENTAL DECLARATION ON CLEAN AIR AND CLIMATE CHANGE

Ajax, Town of	Mississauga, City of
Aurora, Town of	Newmarket, Town of
Brampton, City of	Oakville, Town of
Burlington, City of	Oshawa, City of
Caledon, Town of	Peel, Regional Municipality of
Clarington, Municipality of	Pickering, City of
Durham, Regional Municipality of	Richmond Hill, Town of
East Gwillimbury, Town of	Toronto, City of
Halton, Regional Municipality of	Vaughan, City of
Halton Hills, Town of	Whitby, Town of
Hamilton, City of	York, Regional Municipality of
King, Township of	Government of Ontario
Markham, City of	Government of Canada

ARTICLE 3 – CALL FOR CLEAN AIR COUNCIL ACTION

In view of the long-term nature of the air quality problems and climate change in our common airshed, the Clean Air Council agrees to on-going work on the commitments made in past Inter-governmental Declarations.

The Clean Air Council commits to continue its work to address smog and greenhouse gases and better prepare for climate change, to share information and, where possible, to share resources and undertake appropriate research and actions.

The 24 members of the Clean Air Council commit to work collaboratively to develop healthy, lower carbon and sustainable communities through the following:

Community Planning and Public Health

1. Monitor progress on the implementation of community Active Transportation and/or Complete Streets Plans and Policies to create a modal shift from single occupancy vehicle use to active transportation.

Approved Active Transportation Plans: Ajax, Aurora, Brampton, Burlington, East Gwillimbury, Halton Hills, Hamilton, Markham, Mississauga, Newmarket, Oakville, Region of Peel, Richmond Hill, Toronto, Vaughan, Whitby, York Region

Active Transportation Plans in Progress: Clarington, Halton Region, Oshawa, Pickering

2. Work collaboratively with members and partners to identify the connection between public health and land use planning to share, document and act on opportunities to improve public health via land use planning and development.

The goal of this Declaration action is to identify the connections between infrastructure, built form

and public health and community livability. Some of the actions undertaken include: development of Land Use Planning and Public Health Report and Toolkit Scan; working with Ontario Public Health Association Public Health and Planning Working Group; Development of Public Health Training Program for Planners; Development and use of Healthy Development Index and Sustainability Metrics; Complete Streets Policies and Visualizations.

Greening Development

3. Monitor progress on the implementation of corporate and community green development policies and practices and identify results and best practices.

Approved corporate green development policies/standards: Ajax, Burlington, Caledon, East Gwillimbury, Halton Region, Halton Hills, Hamilton, Markham, Mississauga, Newmarket, Oakville, Pickering, Richmond Hill, Toronto, Vaughan, York Region

Corporate Green Development Policies/Standards in Progress: Aurora, Brampton, King, Oshawa, Region of Peel

Approved community green development policies/standards/incentives: Brampton, Caledon, East Gwillimbury, Halton Hills, Hamilton, Markham, Mississauga, Pickering, Richmond Hill, Toronto, Vaughan, York Region

Community Green Development Policies/Standards/Incentives in Progress: Ajax, Aurora, Clarington, King, Oakville, Oshawa, Region of Peel

4. Provide recommendations and keep informed on energy and water efficiency updates to the Province of Ontario's Building Code standards.

The goal of this Declaration action is to work with the Canada Green Building Council and the Municipal Leaders Forum to provide municipal input into opportunities to incorporate energy efficiency and climate change adaptation into updates of the Ontario Building Code.

Energy

5. Participate in an Energy Efficiency, Green Energy and Emissions Inventory Community of Practice to share resources, experience, expertise and lessons learned.

Clean Air Council members work in collaboration to share experiences and expertise on energy efficiency, green energy and community energy planning opportunities and lessons learned.

6. Work collaboratively with the Province of Ontario, the Ontario Power Authority and the Association of Municipalities of Ontario to develop a more efficient mechanism for gathering energy use data.
7. Community Energy Inventories, Plans and Reduction Targets.

Community Energy Inventories

Community Energy Inventories undertaken: Ajax, Brampton; Burlington, Caledon, East Gwillimbury, Halton Hills, Hamilton, Markham, Mississauga, Oakville, Oshawa, Region of Peel, Pickering, Toronto, Vaughan

Community Energy Inventories in Progress: Richmond Hill

Community Greenhouse Gas Reduction Target

Approved Community Greenhouse Gas Reduction Targets: Ajax, Burlington, Caledon, Halton Hills, Hamilton, Markham, Mississauga, Oakville, Oshawa, Region of Peel, Pickering, Richmond Hill, Toronto, Vaughan

Community Greenhouse Gas Reduction Target in Progress: Brampton, York Region

Community Energy Plans

Approved Community Energy Plans: Burlington, East Gwillimbury, Halton Hills, Hamilton, Oakville, Toronto

Community Energy Plans in Progress: Markham, Vaughan

8. Increase the implementation of renewable energy purchasing or production.

Green Energy Purchasing: Aurora (2008-12), Caledon, Hamilton, Mississauga (2008 -2013), Oakville, Region of Peel, Toronto, Vaughan, York Region

Green Energy Production: Ajax, Aurora, Brampton, Burlington, Caledon, Halton Region, Halton Hills, Hamilton, King, Markham, Mississauga, Newmarket, Oakville, Region of Peel, Pickering, Richmond Hill, Toronto, Vaughan, Whitby, York Region

Air Quality

9. Monitor progress and outcomes of the Province of Ontario and the Government of Canada's proposed Air Quality Management System.

The goal of this Declaration is to foster coordination and collaboration between federal, provincial and municipal governments to ensure an air quality management system that will result in continuous improvements in air quality by incorporating interventions and policies to address emission reduction opportunities and reduce air pollution exposure in order to protect the health of residents.

Action Planning and Policy Development

10. Develop and implement Community Action Plans² outlining actions aimed at reducing energy use and mitigating air pollution and climate change.

Approved Community Action Plans: Ajax, Brampton, Burlington, Caledon, Durham Region, East Gwillimbury, Halton Hills, Halton Region, Markham, Mississauga, Oakville, Region of Peel, Pickering, Richmond Hill, Toronto, Vaughan, York Region

² A "Plan" must list actions that the jurisdiction commits to undertaking in order to reduce its corporate/community energy use. Actions must be approved by council and have a department that is responsible for implementation and a mechanism in place to provide updates on implementation.

Community Action Plans in Progress: Clarington, Halton Region (Implementation Plan Update), Hamilton, King Township, Whitby

11. Undertake a Monitoring and Reporting Scan to identify strategies being used by CAC members to report on progress of corporate and community Action Plans.

Approved Community Action Plan Implementation Progress Reports: Ajax, Halton Hills, Mississauga, Oakville, Toronto, Vaughan

12. Sustainability Training provided to municipal staff and all municipal departments required to report on sustainability actions and implications on Council reports.

The goal of the Declaration action is to work collaboratively to develop, update and evaluate sustainability training resources and activities in order to better enable CAC member jurisdictions to build the ability of staff to understand how sustainability relates to municipal planning and service delivery and how they can better integrate sustainability into their responsibilities, decision making and reporting.

13. Develop and implement corporate Green Procurement Policies that increase the implementation of environmental, energy efficiency zero-waste and sustainable criteria in purchasing, lease and contract decisions.

Approved Green Procurement Policies/Procedures: Ajax, Brampton (Energy Star and EcoChoice label criteria), Burlington; Caledon, Halton Region, Hamilton (life cycle costing policy), Pickering (built into purchasing policy), Oakville (green procurement procedure), Toronto (green procurement procedure), York Region

Green Procurement Policies in Progress: Aurora, Brampton, Clarington, Markham, Mississauga, Region of Peel, Oshawa, Richmond Hill, Vaughan, Whitby

Urban Forests

14. Develop Urban Forestry Plans that identify actions aimed at increasing, protecting and maintaining the urban forest.

i-Tree/Urban Forest Studies undertaken: Ajax, Burlington (street trees), Markham, Oakville, Region of Peel (in partnership with Brampton, Caledon and Mississauga), Pickering, Richmond Hill, Toronto, Vaughan, Whitby, York Region (including financial support for York municipalities)
i-Tree/Urban Forest Studies in Progress: Aurora

Approved Urban Forestry Plans: Ajax, Burlington, Halton Region, Mississauga, Oakville, Oshawa, Region of Peel, Toronto, Vaughan

Urban Forestry Plans in Progress: Richmond Hill, York Region

Approved Infestation Plans: Ajax, Aurora, Burlington, Hamilton, King Township, Markham, Mississauga, Oakville, Oshawa, Richmond Hill, Toronto, York Region

Infestation Plans in Progress: Region of Peel

15. Work with the Province of Ontario to build awareness of the economic and ecological value urban forests provide and development of mechanisms to ensure the increase, protection and maintenance of urban forests.

The goal of this Declaration action is to work with partners including provincial ministries, municipalities, conservation authorities and community groups to build the connections between economics, public health, and ecological value of urban forests and prioritize policy actions to protect, maintain and expand urban forests.

Food Sustainability

16. Develop municipal urban agriculture strategies that minimize barriers and actively promote and support increased urban food production.

Approved Community Gardening Policies: Brampton, Clarington, Hamilton, Mississauga, Oshawa, Toronto, Vaughan

Community Gardening Policies in Progress: Caledon, Richmond Hill

Approved Urban Agriculture Plans: Toronto

Urban Agriculture Plans in Progress: Caledon, Hamilton, Richmond Hill

17. Develop Local Food Procurement actions and policies that set local food targets for day cares, long term care centres and/or municipal cafeterias and food services.

Local Food Procurement Policies in Place: Halton Region, Markham, Toronto

Climate Change Adaptation

18. Develop Climate Change Adaptation Plans and integrate climate change adaptation into existing and future municipal plans, in order to identify potential climate change risks and incorporate short term and long term opportunities for increasing community resilience into decision making.

Approved Climate Change Adaptation Plans: Ajax, Durham Region (corporate), Region of Peel (in partnership with Brampton, Caledon and Mississauga), Toronto

Climate Change Adaptation Plans in Progress: Ajax (Implementation Plan), Durham Region (community plan and working collectively with local area municipalities), Oakville, Vaughan, York Region

Green Economic Development

19. Develop business cases for clean air and climate change actions most likely to move from pilot to mainstream taking into account costs of continuing business as usual as well as externalities.

The goal of this Declaration action is to build capacity and expectations to incorporate the true costs of energy, ecological valuation and public health into business cases, asset management and decision making.

20. Increase coordination and cooperation between economic development and environment/sustainability departments.

The goal of this Declaration action is to increase capacity to quantify the economic development associated with green policies and to identify opportunities to better act on synergies between green policies, economic development and growth management.

Transportation

21. Identify and prioritize municipal opportunities to reduce air pollution and greenhouse gas emissions from personal vehicles.

Work in partnership with partners (ex. Metrolinx, Smart Commute, Civic Action, Toronto Centre for Active Transportation) on regional transportation and electric vehicle infrastructure.

22. Develop a Green Fleets Actions and Results Scan to highlight actions aimed at reducing emissions through municipal vehicle purchases, operations and behaviours and to support the transfer of lessons learned and actions.

Green Fleets Plans Approved: Ajax, Brampton, Burlington, Halton Region, Hamilton, Markham, Mississauga, Oakville, Toronto, Vaughan

Green Fleets Plans in Progress: Clarington, Halton Hills, Richmond Hill, Whitby, York Region

Green Fleets Progress Reports Approved: Brampton, Hamilton, Mississauga, Oakville, Toronto

Green Fleets Progress Report being developed: Ajax

Community Engagement

23. Develop and deliver a Clean Air Council social marketing campaign to increase knowledge of clean air and climate change actions being implemented across the Region.

Clean Air Partnership and Clean Air Council social media via blog and twitter. Blog: <http://cleanairpartnership.wordpress.com/>; and Twitter: @CleanAirGTA.

24. Build collaboration with community partners to engage them in supporting the development and implementation of Actions Plans and share lessons learned with Clean Air Council members on how to develop and foster community partnerships.

Community Climate Action Funds in Place: Ajax, Caledon, Halton Hills, Halton Region, Markham, Oakville, Pickering, Toronto

Community Climate Change Action Funds in development: Vaughan

For more information on the above listed actions please visit the Clean Air Council section of the Clean Air Partnership website @ http://www.cleanairpartnership.org/gta_clean_air_council