



George Brown College

2014-2019 Energy Conservation and
Demand Management Plan

2014-2019 Energy Conservation and Demand Management (CDM) Plan

George Brown College's main Energy CDM objective is to improve energy efficiency throughout all of its campuses and to contribute to the Province of Ontario's long term energy plan through conservation practices.

Introduction

George Brown College is comprised of three Campus locations, Casa Loma Campus, St. James Campus and Waterfront Campus in downtown Toronto. The Casa Loma Campus has 5 buildings and 3 public parking lots. The St. James Campus has 5 buildings and 4 leased locations. The Waterfront Campus is a new campus comprised of one building that opened in August of 2012, designed to be LEED Gold certified building. George Brown College has 23,460 Full-time Students, 61,300 Continuing Education Students and 3,800 employees (full-time and part-time staff).

To facilitate the Energy CDM Plan's 5 year goals the Facilities Management Team is responsible for maintaining all the Campus locations and base building operations which includes implementation of energy efficiency and conservation measures to reduce cost and consumption.

Background

In 2007 the College released its first Green Plan (Phase I) which included an Energy Management Plan with the following targets:

- Increase energy efficiency of existing College buildings
- Maintain greenhouse gas emissions at 2006 levels.
- Reduce consumption of energy from fossil-fuel based sources.

In 2012 the College released the Green Plan Phase I Report which reported on the following results compared to the 2006 baseline:

- The College decreased energy intensity (energy intensity per square foot) by 10%
- The College reduced its carbon footprint by 20% compared to 2006 levels in spite of adding approximately 100,000 square feet of buildings (excluding the Waterfront Campus) and increasing occupancy as student population has increased from approximately 18,000 to 24,000 full time students, not including Continuing Education Students.

Overview:

George Brown College's Strategy 2020 commits to "creating a college experience that enhances student satisfaction by ensuring resources are used as responsibly, ethically and efficiently as possible." The goal is to guide financial and physical resources so that the College can grow responsibly and enhance the College environment to the benefit of the entire community. This includes the need to operate facilities as efficiently as possible, by saving energy, reducing waste and conserving resources.

As per the requirements of Reg. 397/11, this Energy CDM Plan outlines goals, measures and expected results in terms of energy efficiency, conservation and demand management. As the College continues to grow, both in terms of student population and occupancy in existing buildings, George Brown is also growing in terms of its overall building footprint with an additional 175,000 square foot of building to come on line with the addition of a new student residence in September 2016.

The 2014-2019 Energy CDM Plan is an important component of the College's Green Plan which commits George Brown College to reduce the College's ecological footprint, to engage and educate the College community in conservation and environmental stewardship practices and to use the College campuses as learning laboratories.

2012 Baseline Energy Consumption Data

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Electricity*	26,030,762 kWh
Natural Gas	1,862,606 cubic meters
Gross Square Footage (GSF)**	1,673,414 sqft
Energy Intensity per GSF	26.09 ekWh/sqft
Full Time Student Enrollment (FTE)***	23,460 FTE
Energy Intensity per FTE	1,847 ekWh/FTE

*17% of Electrical supply is from Renewable sources

** Gross Square Footage as reported in 2012 Energy Consumption Data Report for O.Reg 397/11

***Data from 2012/2013 OCFMA Benchmarking Report

Energy CDM Plan 5 year Goals

George Brown College has three main goals for the Energy CDM Plan over the next 5 years.

1. To achieve a 2% reduction in total energy consumption associated with our 2012 building portfolio.
2. Maintain or reduce the Energy Intensity on a per student basis (ekWh/FTE)
3. Meet LEED Gold Energy standard requirements of all new construction built by George Brown College.

The College has identified four types of measures on which this Energy CDM plan is based: Technical, Organizational, Behavioural and Educational; a combination of these measures will be required to achieve College's energy conservation goals. Technical and physical plant measures will be important to reduce energy consumption in College buildings. Three of these measures relate to ways that the College can work as an institution to build a culture of conservation through policies and operational measures; creating opportunities for the College community and individuals to learn about, contribute to and participate in energy conserving and demand management activities; and finally, to educate students in practical and hands-on projects about the mechanics and real world applications of energy efficiency improvements and retrofits.

Technical Measures:

George Brown College will focus on achieving the Energy CDM goals by completing energy audits, upgrading equipment with new technology and by looking at processes to maximize the energy efficiency in key areas of the College.

Organizational Measures

Specify and install energy efficient equipment on any new renovation project or equipment replacement project. Investigate possible corporate policies to support demand reduction measures for peak load shedding and to reduce plug load in buildings.

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Behavioural Measures

1. 2014 – 2016: Energy Fairs to be held annually at each Campus on a rotating basis starting in the Fall of 2014
2. 2016: Eco-Rep program in the new student residence: peer mentoring on energy conservation and other “green” living tips.

Educational Measures:

The Green Team Monthly Go Green Campaign will continue to include regular communications related to energy savings initiatives and providing tips and resources on issues of conservation and sustainability.

As part of the College’s Centre for Construction and Engineering Technologies, a suite of courses including Capstone projects are providing students with real world learning about applications of building envelope and automation technologies that relate directly to energy conservation. The students are using the diverse range of building technologies found within the GBC group of campuses as their subjects.

Energy CDM Monitoring and Measuring

1. Review monthly energy bills on a per campus basis for overall performance to main goals
2. Install Real-time monitoring devices on key equipment to track energy performance
3. Provide updates on key measures through the GBC Green Team
4. Provide updates annually to Senior Management progress towards achieving goals.

Energy CDM Cost and Savings Estimates

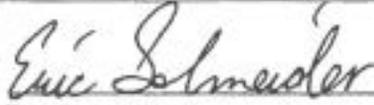
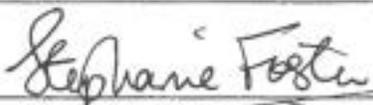
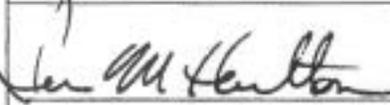
The estimated costs and savings for the proposed Technical Measures are:

- a) Casa Loma Energy Audit estimated cost is \$150,000, projected savings is \$100,000
- b) Casa Loma Capital Replacement Project to replace Space Heating Boilers and Domestic Hot Water Boilers estimated costs \$900,000, projected energy savings is \$12,000 annually
- c) St. James 290 Adelaide Chiller Replacement estimated cost \$350,000, saving to be determined
- d) St. James 193 King Roof-top HVAC units estimated cost \$100,000, savings to be determined
- e) St. James Water Riser Replacement Project estimated at \$250,000, savings to be determined.

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George Brown College Management Approval

The 2014-2019 Energy Conservation and Demand Management (CDM) Plan has been reviewed and approved by:

Name/Signature	Responsibility	Date
 Eric Schneider	Campus Manager, Casa Loma Campus	June 26, 2014
 Stephanie Foster	Green Team/Sustainability Coordinator	
 Ian Hamilton	Director, Facilities	June 26, 2014
 Mark Nesbitt	Vice President, Corporate Service	06/26/2014