

Conservation & Demand Management Plan

July 2019

UNIVERSITY
of GUELPH

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Introduction

Context

This report is in response to the University of Guelph's requirements under Ontario Regulation 507/18 – to submit an Energy Conservation and Demand Management (CDM) Plan.

Data reporting, also required under Ontario Regulation 507/18, is submitted through the Ministry of Energy (MOE) portal.

Intent

The intent of this CDM Plan is to promote good stewardship of the Energy and Water resources consumed at the University of Guelph.

Background

Regulation 507/18

On January 1st, 2012 the Ontario Regulation 397/11 came into effect under the Green Energy Act, 2009. Its goal to allow organizations and agencies within the Broader Public Sector (BPS) to better understand how and where their energy is used, as well as to provide public access to the usage and plans.

Starting in July 2013, organizations and agencies within the BPS are required to prepare and publish a summary of their 2011 energy consumption and greenhouse gas emissions. The regulation further requires the organizations and agencies to report their energy usage and Greenhouse Gas (GHG) emissions on an annual basis and to also develop a Five Year Energy Conservation and Demand Management (CDM) Plan by July 1, 2014 and every five years thereafter.

With the repeal of the Green Energy Act, 2009, O. Reg. 397/11 (Energy Conservation and Demand Management Plans) was moved to the Electricity Act, 1998 and re-named as O. Reg. 507/18 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans). No changes were made to the regulation's requirements.

For the purpose of this CDM Report the current Regulation is used - O. Reg. 507/18 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans).

The University of Guelph

The University of Guelph was established in 1964. The Campus consists of 160 buildings covering an area of approximately 6.7 million square feet with a central utility plant that provides chilled water and steam across the Campus. Research facilities represent 29% of the total floor area, followed by Residences at 28%, Academic facilities 19%, Libraries and Athletics at 11% Administration at 5%, Multi-Use at 4%, and other building usage types at 3%.

The University of Guelph is a public agency defined as “post-secondary educational institution” under the Regulation.

The University has Utility revenue meters on the main feeds to Campus and annual reporting for this Regulation is derived from data from these meters. There is an ongoing initiative to broaden the sub-metering to the building level, though not yet 100% complete; as such, specific energy and water usage by building or by building type or operation is not yet possible.

Baseline Usage

For the purpose of this CDM Report and as required by the Regulation, the initial baseline for the 2019 – 2024 period consists of energy consumption as reported for 2017. See Table 1. GHG emissions and energy intensity are calculated based on the upload of the 2017 energy use figures to the Ministry of Energy reporting portal.

Table 1. 2017 Baseline

Utility	Annual Usage		kgs of eCO2	ekWh/ft ²
Electricity	95,042,337	kWh	3,801,693	14.6
	175,231	kW		
Natural Gas	18,334,196	m ³	34,872,925	29.0
Water	694,570	m ³	-	-
Total	284,434,584	ekWh	38,674,618	43.6



Ongoing Commitment to Resource Conservation

The University has a long tradition of responsible stewardship of energy and water resources.

Since 2004/2005 the University, through its Energy Conservation Fund (student funded and University matched investment), initiated a wide range of energy conservation measures. This student led incentive opened up the campus sustainability dialog and resulted in our successful Community Energy Plans (CEP), which have been in place since 2004. The CEP was a comprehensive energy and water conservation program achieved through on-going deep retrofit projects and capital renewal projects with large energy components. Over a 10-year period, from 2004/05 to 2014/15, these projects have resulted in the reduction of over 50,000 tonnes of eCO₂.

Building on the success of these programs, and the continued engagement of the students and administration personnel, the University set increasingly ambitious goals to improve our Sustainability Plan and in 2015 launched the Green Gryphon Initiative – a \$26.2 million investment in sustainability and energy improvements. The project includes many innovative and challenging measures – including a chilled water Thermal Energy Storage system - one of the largest utilities projects ever undertaken at the University. More recently, through the Post-Secondary Greenhouse Gas Campus Retrofits Program (GGRP), the University has invested \$9 million in upgrades to the central heating plant boiler heat recovery system. The expansion heat recovery system will increase the efficiency of district heating natural gas combustion to previously unattainable levels. Further, the addition of heat pumps on the loop is the first step towards our long-term strategy to eliminate carbon based heating. Over a 5-year period, from 2014/15 to 2019/2020, these projects will have resulted in the reduction of over 15,000 tonnes of eCO₂

Conservation & Demand Management Plan

Planning Horizon and Scope

The Conservation & Demand Management Plan for the University of Guelph is a five-year plan covering the period July 1, 2019 to June 30, 2024. The CDM Plan is intended to provide a framework for energy and water management activities at the University.

Alignment with the Climate Change Action Plan

In June 2016 the Ontario Government announced the Climate Change Action Plan (CCAP) to reduce GHG emissions and help move the province towards a prosperous low-carbon economy.

Aligned with the CCAP and broader Federal commitments to the Pan-Canadian Framework on Clean Growth and Climate Change, the University will continue to move forward with energy initiatives that focus on Scope 1 and Scope 2 GHG reductions and support the provincial CCAP GHG emissions reduction targets of 37% by 2030, and 80% by 2050. The University has created an Environmental Sustainability Plan 2018 -2050 with an Action Plan targeted to meet these goals.

Action Plan

The cornerstone initiatives of the University's Environmental Sustainability Plan 2018 -2050 to meet the GHG reduction targets include:

- **Buildings** - improving energy efficiency of campus buildings, through campus wide energy efficiency upgrades, deep energy retrofits and new construction building performance standards.
- **Central Plant Services** - improving the efficiency of the Central Heating and Cooling Plant, including adding capacity from heat recovery and low carbon electric heating sources.
- **Renewable Energy Supply** - increasing reliance on renewable energy systems, including 'getting to Net Zero' buildings initiatives.

In support of the University's Environmental Sustainability Plan 2018 -2050, the actionable items for the CDM Plan (2019-2024) will include support of the ongoing initiatives:

- (1) Deep Energy Building HVAC VAV retrofits – Reducing GHG Emissions while improving Buildings Conditions**
- (2) Improving Heating Systems Efficiency – Central Heating Plant – Pilot for Long-term Strategy**
- (3) Getting to Net Zero Building Operation - Arboretum Centre – Pilot for Experiential Learning**
- (4) Renewable Energy Supply – Powering Building and Offsetting Emissions**
- (5) Investigation and Evaluation of Future Technologies**

The anticipated budget to support the entirety of these initiatives and meet the goals under University's Environmental Sustainability Plan 2018 - 2050 is estimated to be \$90M. The University has set the goal to reduce annual Scope 1 & 2 emissions by 10,000 by year 2030 and a further 15,000 by year 2050 [Tonnes eCO₂ per year].

The cumulative reduction in Scope 1 & 2 emissions is forecasted to be 82,000 tonnes eCO₂ by 2050.

While not targeted in this report, the University recognizes the importance of Scope 3 emissions. Transportation and Carbon inventory management will play a role in meeting the 2050 target.

The Sustainability Office, in partnership with Physical Resources, continues to promote a range of programs to encourage energy efficiency and behavioral change, including:

- Sustainability Week
- Sustainability Ambassador Program
- Residence Sustainability Ambassador
- Sustainable Orientation Week Certification
- Green Office Program
- Sustainability Website