



Energy Conservation and Demand Management Plan Update

June 11, 2019



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TABLE OF CONTENTS

SECTION #	TOPIC	PAGE #
1.0	INTRODUCTION	5-8
1.1	Background	5-6
1.2	Purpose of the Energy Conservation Demand Management Plan	6-7
1.3	Key Implemented Actions	7-9
2.0	CARLETON PLACE'S COMMITMENT	9-11
2.1	Declaration of Commitment	9
2.2	Vision	9
2.3	Policy	9
2.4	Goals	10
2.5	Objectives	10
2.6	Overall Target	10
2.7	Establishing a Green Team	11
3.0	CARLETON PLACE'S ORGANIZATIONAL UNDERSTANDING	11-18
3.1	Our Municipal Energy Needs	11
3.2	Stakeholder Needs	11-12
3.3	Current Municipal Energy Situation	12-17
3.4	How Energy is Currently Managed	17
3.5	Changes from Previous Plan to Achieve our Goals and Objectives	18
3.6	Renewable Energy Utilized or Planned	18
4.0	STRATEGIC PLANNING	18-21
4.1	Long-term strategic issues	18
4.2	Links with other municipal plans and management processes	18
4.3	Benchmarking	18-19
4.4	Departmental responsibilities	19
4.5	Behavioural Measures	19
4.6	Working with Other Organizations	19
4.7	Consideration of energy efficiency for all projects	19
4.8	Resources Planning	20
4.9	Staff Training and Communication	20
4.10	Development of Energy Projects	20
4.11	Investment in Energy Projects	20-21
4.12	Procurement	21

5.0	CURRENT AND PROPOSED ENERGY CONSERVATION MEASURES	21
6.0	EXECUTION OF ENERGY CONSERVATION AND MANAGEMENT PLAN	22-29
7.0	EVALUATION OF ENERGY CONSERVATION AND MANAGEMENT PLAN	30

1.0 INTRODUCTION

1.1 Background

Municipal environmental, societal, and fiscal pressures accentuate the need for an Energy Conservation and Demand Management (CDM) Plan.

Environmental

Canada's total greenhouse gas (GHG) emissions in 2012 were 699 megatonnes (Mt) of carbon dioxide equivalent (CO₂eq), or 18% (108 Mt) above the 1990 emissions of 591 Mt. GHGs trap heat in the Earth's atmosphere, just as the glass of a greenhouse keeps warm air inside. Human activity increases the amount of GHGs in the atmosphere, contributing to a warming of the Earth's surface. This is called the enhanced greenhouse effect. Over the past 200 years, humans have released GHGs into the atmosphere primarily from burning fossil fuels. As a result, more heat is being trapped and the temperature of the planet is increasing. Sea levels are rising as Arctic ice melts, and there are changes to the climate, such as more severe storms and heat waves. All of this impacts the environment, the economy and human health.¹

Societal

The 2003 electricity blackout heightened societal concerns surrounding the stability and security of our energy supply. Energy has been imbedded into most societal practices. If energy consumption is not managed appropriately the frequency of energy interruption and the subsequent societal disruption will increase.

Fiscal

The fossil fuels traditionally used for the generation of energy are becoming no longer financially accessible or environmentally acceptable. This has resulted in the promotion of renewable energy generation which comes with an additional expense. The Province of Ontario's long-term energy plan released in December of 2013 projected a 42-per-cent jump in home energy bills by 2018, climbing to 68 per cent by 2032. The cost for industrial enterprises will also rise by 33 per cent in the next five years and 55 per cent in the next 20 years. Natural gas prices are also projected to trend upward in the long-term as stricter US air pollution rules aimed at

¹ Environment Canada website (<http://www.ec.gc.ca>)

reducing emissions from utility smoke stacks (mainly at coal plants) will most likely prompt US electricity generators to close as many as 20% of the coal burning facilities in the US.²

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-names 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 requiring broader public sector (BPS) organizations such as municipalities to develop a CDM plan and update it every five years. This updated CDM plan was developed in compliance with the regulation and covers the period from 2020 to 2024.

These recent developments set the foundation for developing a corporate Energy Conservation Demand Management Plan.

1.2 Purpose of the Energy Conservation and Demand Management Plan

The Town of Carleton Place's CDM is a strategic plan that aims to provide a basis for the Town to move forward on implementing improvements to its facilities and operations that reduce energy use, their associated costs as well as the environmental effects of the Town's activities.

The plan aims to give the Town a leading edge in energy while enhancing its economic vitality. Therefore, it goes beyond the short-term, "least financial cost" objective and considers the Town's long-term economic, environmental and social well-being.

Energy management includes electricity and natural gas commodity management. The CDM describes the Town's:

- New energy conservation goals and objectives;
- Current and proposed energy conservation measures;
- Results from the first CDM plan; and
- Changes made from the previous plan to help achieve the new goals and objectives.

The updated CDM plan builds on the Town's first CDM plan developed in 2014 and the experience gained in energy conservation over the last 5 years.

² Local Authority Services February 2013 newsflash publication

In addition, to energy conservation, the updated CDM plan supports our capital plan, tangible capital asset policy and resiliency plans for both the Water and Waste Water Treatment Plants.

The CDM defines actions in the following key areas:

- Energy management information systems
- Energy training and awareness
- Facility operations
- Energy conservation in existing facilities
- New construction
- On-site generation and demand response
- Development of culture of energy conservation
- Financial considerations

1.3 Key Implemented Actions

1.3.1 Lighting Upgrades

In the past five (5) years, LED lighting upgrades were completed in a number of municipal facilities including: Town Hall, Fire Hall, Arena (inside and outside), Canoe Club (inside and outside), Water Treatment Plant in the basement, at the Waste Water Treatment Plant and in various parks buildings. In addition, many of the Town's Christmas decorations have been converted to LED lights. No funding was received through the local hydro conservation demand programs to help offset the cost of these lighting upgrades.

1.3.2 Natural Gas Heaters and Furnaces, and Water Heaters

Furnaces were replaced with natural gas high efficiency models at the following facilities in the years indicated:

- in 2016 in the Public Works Area of the Town Hall
- in 2018 at the Carleton Place and Beckwith Heritage Museum and at the former Train Station

The roof top heating and cooling systems were replaced with more efficient models in the year and facilities indicated:

- in 2016 in the Police/Fire Station
- in 2016 at the main pool and the lobby air conditioner at the Carambeck Community Centre
- in 2018 at the Carambeck Community Centre
- in 2018 in the Tower of the Town Hall

In 2016, the heaters at Arena No. 1 were replaced with high efficiency gas heaters and in 2017, at Arena No. 2.

In 2018, the natural gas hot water tank at the Carleton Place Pool was replaced with a high efficiency gas model.

1.3.3 Windows, Doors, Siding, Repointing and Insulation

Between 2013 and 2018, windows were replaced, and some exterior walls were repointed at the Town Hall. In addition, a number of windows were replaced at the Carambeck Community Centre and a new front door was installed on the Carleton Place and Beckwith Heritage Museum. Doors to the play yard at the Francis Street Centre were replaced in 2016. In 2014, the siding at the Canoe Club was replaced.

1.3.4. Boilers

Boilers were replaced with more efficient modes in the year and facilities indicated:

- in 2015 at the Police/Fire Station
- in 2016 at the Town Hall
- In 2016 and 2017, boilers to heat the small pool and main pool were replaced at the Carleton Place Pool respectively.

1.3.5. Roofing, Low E Ceiling, Garage Doors

In 2014, the roof over the main pool was replaced.

1.3.6. Pump Replacements and Upgrades

The following pumps were replaced:

- Joseph, Princess and Bridge Pumping Stations Hydromatic pumps in 2014

- Raw sewage pump #02 was changed to variable frequency drive in 2016
- Industrial pump no. 2, Princess and Bridge Pumping Stations in 2016

1.3.7. Miscellaneous

- An upgrade to the snow melt pit in Arena No. 1 was completed in 2017
- The exhaust fan at the pool was upgraded in 2018
- High Lift Pump #4 at the Water Treatment Plant was upgraded to variable frequency drive in 2014
- The Unit Heater at the Water Treatment Plant was replaced in 2017
- Replaced raw sewage check valve 01 at the Waste Water Treatment Plan in 2017
- Turbo blower at the Waste Water Treatment Plant rebuilt and changed to variable frequency drive in 2018

2.0 CARLETON PLACE'S COMMITMENT

2.1 Declaration of Commitment

The Town of Carleton Place will use existing resources and leverage outside agencies where appropriate to reduce our energy consumption and its related environmental impact.

This report has received the approval of the Town's Senior Management as required by O. Reg 507/18.

2.2 Vision

We exercise stewardship in our use of finite energy resources to demonstrate leadership, optimize our delivery of services, and enhance the overall quality of life in our community.

2.3 Policy

We will attempt to incorporate energy efficiency into all areas of our activity including our organizational and human resources management procedures, procurement practices, financial management and investment decisions, and facility operations and maintenance.

2.4 Goals

Consistent with the vision of this plan, the Town of Carleton Place's goal is to be viewed as a leader in energy management and conservation in the BPS. We are also committed to working with other BPS organizations to better manage energy use across our community. The Town establishes the following triple bottom line goals:

Economy:	1. Manage energy costs.
Society:	2. Support a vibrant, prosperous community.
Environment	3. Reduce greenhouse gas (GHG) emissions.

2.5 Objectives

Implementation of the CDM will achieve the following objectives aligned with the above goals:

1. To create a culture of energy efficiency and sustainability.
2. To promote sustainable use of resources through:
• Energy conservation
• Energy efficiency
• Renewable energy
3. To reduce energy operating costs through implementation of best practices and advanced technologies.
4. To increase the comfort and safety of occupants in Town facilities.
5. To increase equipment reliability and reduce maintenance costs.
6. To be seen as a leader in the community for energy conservation in the hopes that it will generate interest in the community to reduce its GHG emissions

2.6 Overall Target

Concerns over sharp increases in energy prices and the negative environmental impact of fossil fuel consumption have raised interest in energy conservation, sustainability, local control and predictable energy rates.

The Town of Carleton Place's CDM includes comprehensive actions to manage the Town's energy use.

Using 2018 as a baseline, the following targets are established with this five-year CMD:

1. 10% overall reduction of electricity consumption
2. 5% overall reduction of natural gas consumption
3. Integrating the energy conservation plan with the capital plan, tangible capital asset policy and any resiliency plans for the Water and Waste Water Treatment Plants.

2.7 Establishing a Green Team:

We have appointed the following positions to act as the green team members:

1. Town's Chief Administrative Officer (CAO)
2. Director of Roads and Public Works
3. Recreation Manager
4. Manager of Library Services
5. Manager of Childcare Services
6. Treasurer
7. Director of Protective Services

3.0 CARLETON PLACE'S ORGANIZATIONAL UNDERSTANDING

3.1 Our Municipal Energy Needs:

We need reliable, low-cost, sustainable energy sources delivering energy to the most efficient facilities and energy-consuming technology feasible.

3.2 Stakeholder Needs:

Internal stakeholders (Council, Committees of Council, CAO, staff) need:

- a) An up-to-date and relevant energy management plan with clear vision, goals, and targets in order to clearly communicate the corporate commitment to energy efficiency;
- b) Time, regular reports and information on energy use from the Treasury Department to persons responsible for Town facilities to maintain awareness of energy use; and

- c) Training and support to develop the skills and knowledge required to implement energy management practices and measures.

External stakeholders (residents, community organizations, businesses, Province) need:

- a) The Town is to be accountable for energy performance and to minimize the energy component of the costs of municipal services; and,
- b) The Town to reduce the carbon footprint associated with its corporate energy use.

3.3 Current Municipal Energy Situation

Annual energy reporting is required under the Regulation and allows our Town to understand how energy is used in our buildings, identify potential energy conservation opportunities and track progress on energy conservation efforts. In addition to including the Town’s 2017 annual energy report as required under the Regulation, we have also included and considered our 2018 annual energy consumption information which helped us to report on our achievements and inform the development of new measures.

Energy Consumption and Demand:

The total annual energy consumption, cost and greenhouse gas emissions for the years 2017 and 2018 are outlined in the chart below:

Facility Name	Address	Facility Total Area (m2)	Fuel Types	Consumption in 2017	Total Annual Energy Cost in 2017	Green House Gas Emissions (tonnes CO2e/year) 2017	Consumption in 2018	Total Annual Energy Cost in 2018
Town Hall	175 Bridge Street	7,000	Natural Gas	12,646 m3	\$6,408	23.91	14,015 m3	\$6,896
Town Hall	175 Bridge Street	7,000	Electricity	188,147 kWh	\$28,767	3.25	210,317 kWh	\$26,796
Moore House	170 Bridge Street	700	Natural Gas	1,140 m3	\$753	2.16	1,422 m3	\$830
Moore House	170 Bridge Street	700	Electricity	7,818 kWh	\$1,273	.14	6,939 kWh	\$1,052
Train Station	132 Coleman Street	5,200	Natural Gas	n/a Tenant Paid	n/a Tenant Paid	n/a Tenant Paid	673 m3 (6 months)	\$1,042
Train Station	132 Coleman Street	5,200	Electricity	n/a Tenant Paid	n/a Tenant Paid	n/a Tenant Paid	12,002 kWh (6 months)	\$1,981

Facility Name	Address	Facility Total Area (m2)	Fuel Types	Consumption in 2017	Total Annual Energy Cost in 2017	Green House Gas Emissions (tonnes CO2e/year) 2017	Consumption in 2018	Total Annual Energy Cost in 2018
Library	101 Beckwith St	10,800	Natural Gas	6,396 m3	\$4,184	12.09	7,050 m3	\$4,186
Library	101 Beckwith St	10,800	Electricity	49,840 kWh	\$7,776	.86	50,128 kWh	\$6,869
Museum	267 Edmund St	2,325	Natural Gas	7,175 m3	\$4,059	13.57	7,506 m3	\$3,950
Museum	267 Edmund St	2,325	Electricity	15,763 kWh	\$2,941	.27	23,754 kWh	\$3,622
Fire / Police Station	15 Coleman Street	18,000	Natural Gas	12,248 m3	\$5,496	23.16	12,327 m3	\$6,049
Fire / Police Station	15 Coleman Street	18,000	Electricity	245,287 kWh	\$34,813	4.24	257,657 kWh	\$32,626
Public Works	95 Franklin Street	6,500	Natural Gas	28,618 m3	\$12,454	18.60	28,618 m3	\$15,919
Public Works	95 Franklin Street	6,500	Electricity	56,615 kWh	\$9,661	.98	60,602 kWh	\$11,699
Water Tower	Nelson Street	1,200	Electricity	11,281 kWh	\$2,115	.20	14,903 kWh	\$2,065
Water Treatment Plant	John Street	5,300	Electricity	1,132,488 kWh	\$176,481	19.59	1,201,032 kWh	\$180,966
Pumping Station No. 1	Sussex Street	200	Electricity	8,577 kWh	\$1,451	.15	9,281 kWh	\$1,708
Pumping Station No. 2	Charles Street	200	Electricity	24,888 kWh	\$4,206	.43	24,888 kWh	\$3,237
Pumping Station No. 3	Princess Street	200	Electricity	10,832 kWh	\$1,753	.19	10,872 kWh	\$1,585
Pumping Station No. 4	Joseph Street	200	Electricity	25,886 kWh	\$4,155	.45	19,402 kWh	\$2,617
Pumping Station No. 5	Findlay Avenue	200	Electricity	15,441 kWh	\$2,656	.27	13,075 kWh	\$1,865
Pumping Station No. 6	Patterson Crescent	200	Electricity	33,345 kWh	\$5,249	.58	31,554 kWh	\$4,082
Pumping Station No. 7	Ferrill Crescent	200	Electricity	11,575 kWh	\$2,397	.20	10,698 kWh	\$1,578
Pumping Station No. 8	Industrial Avenue	200	Electricity	24,876 kWh	\$4,136	.43	24,876 kWh	\$3,514
Pumping Station No. 9	Johnston Street	200	Electricity	24,343 kWh	\$3,714	.42	24,651 kWh	\$3,256

Facility Name	Address	Facility Total Area (m2)	Fuel Types	Consumption in 2017	Total Annual Energy Cost in 2017	Green House Gas Emissions (tonnes CO2e/year) 2017	Consumption in 2018	Total Annual Energy Cost in 2018
Pumping Station No. 10	Joseph Street	200	Electricity	24,876 kWh	\$4,189	.43	24,876 kWh	\$3,573
Pumping Station No. 11	Comba Street	200	Electricity	13,223 kWh	\$4,842	.25	10,815 kWh	\$2,388
Pumping Station No. 12	Hwy #7	200	Electricity	10,920 kWh (5 ½ months)	\$3,998	.19	48,890 kWh	\$10,795
Carambeck Community Centre	351 Bridge Street	31,000	Natural Gas	49,337 m3	\$18,913	93.28	58,710 m3	\$21,228
Carambeck Community Centre	351 Bridge Street	31,000	Electricity	147,005 kWh	\$22,719	2.54	230,529 kWh	\$41,408
Indoor Pool	359 Bridge Street	16,200	Natural Gas	80,608 m3	\$37,417	152.40	104,122 m3	\$37,869
Indoor Pool	359 Bridge Street	16,200	Electricity	383,419 kWh	\$60,337	6.63	374,764 kWh	\$59,255
Childcare Centre	3 Francis Street	18,000	Natural Gas	11,482 m3	\$5,426	21.71	13,275 m3	\$5,844
Childcare Centre	3 Francis Street	18,000	Electricity	166,815 kWh	\$28,081	2.89	187,205 kWh	\$26,564
Wastewater Treatment Plant	122 Patterson Crescent	9,500	Natural Gas	42,864 m3	\$12,135	81.04	63,739 m3	\$17,043
Wastewater Treatment Plant	122 Patterson Crescent	9,500	Electricity	1,080,576 kWh	\$173,554	38.41	1,295,784 kWh	\$183,566
Streetlights	All over	N/A	Electricity	635,913 kWh	\$146,596	11.00	677,468 kWh	\$130,105
Traffic Lights	All over	N/A	Electricity	113,460 kWh	\$17,841	1.96	108,475 kWh	\$16,073
Neelin Street Arena	75 Neelin Street	90,410	Natural Gas	47,837 m3	\$21,489	90.44	59,754 m3	\$21,858
Neelin Street Arena	75 Neelin Street	90,410	Electricity	1,144,200 kWh	\$183,115	19.79	1,081,128 kWh	\$175,679
Canoe Club	179 John Street	5,000	Electricity	65,222 kWh	\$9,669	1.13	77,758 kWh	\$8,864
TOTAL					\$1,040,018	620.77		\$1,053,505

Figure 3.3 Facilities Energy Cost Break Down by Source for 2018

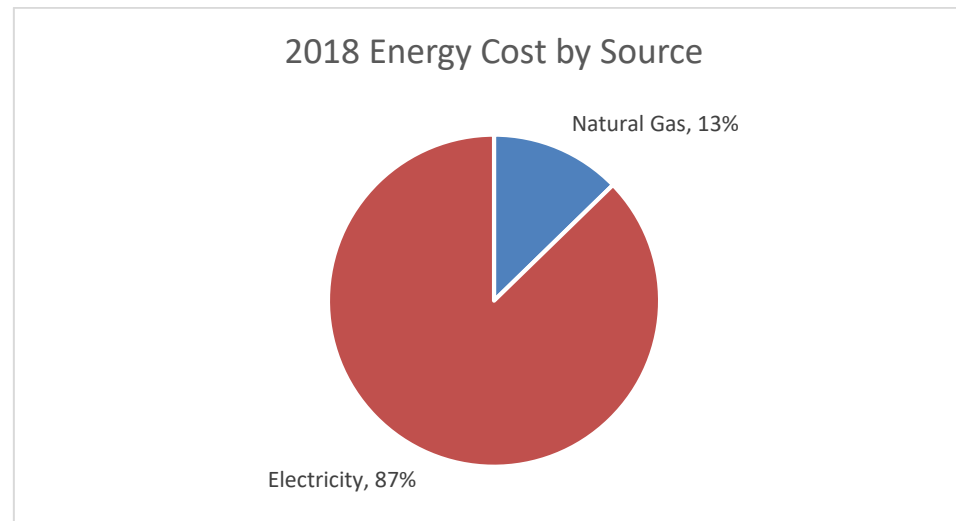


Figure 3.4 Facilities GHGs by Source for 2017

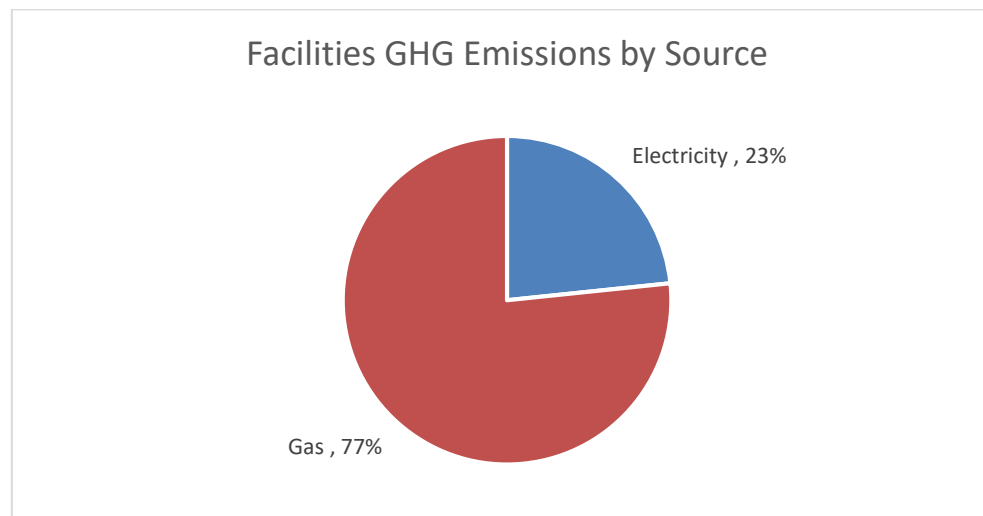
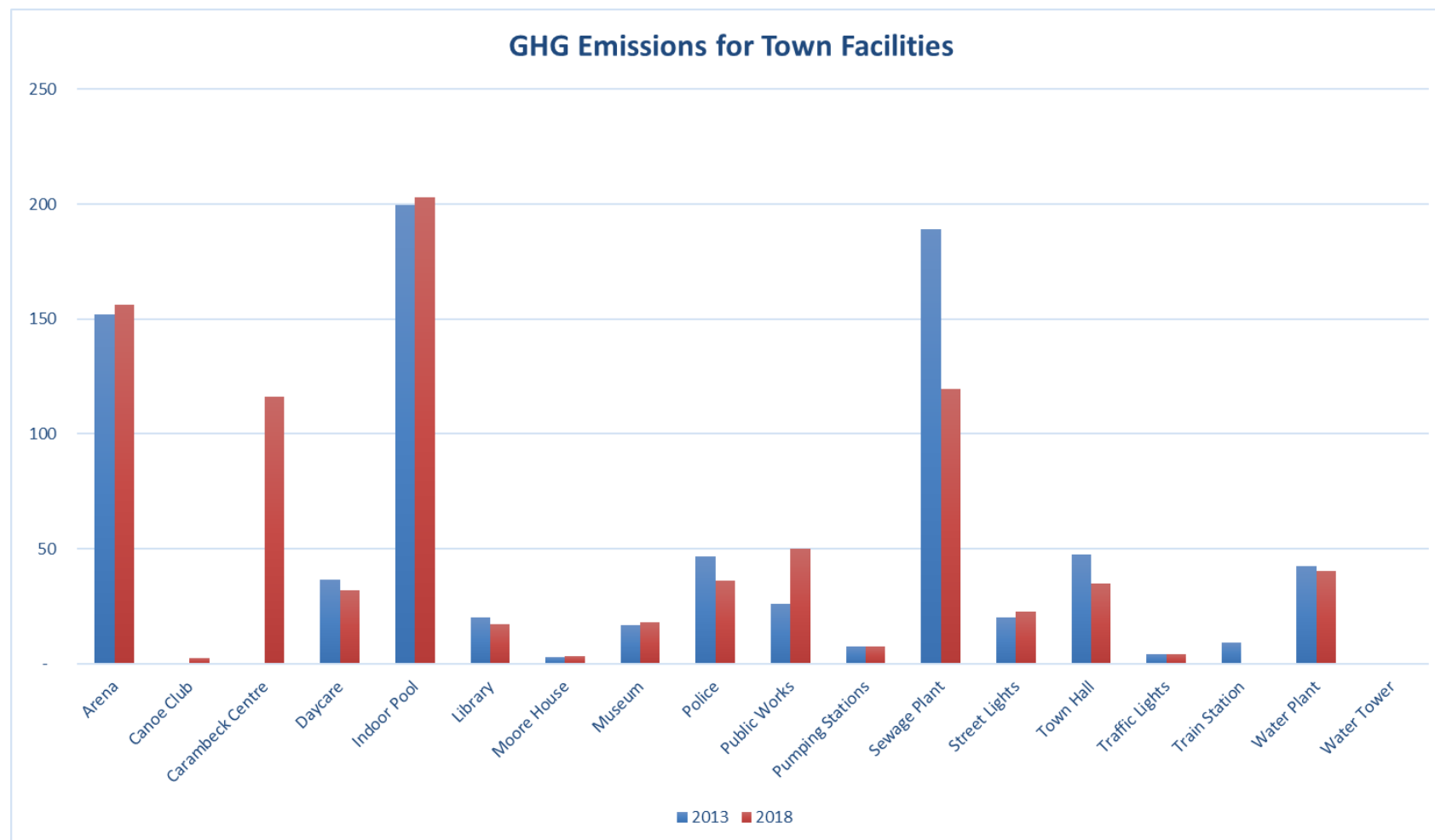


Figure 3.5GHG Comparison of Emissions for Town Facilities for 2013 and 2018



The greatest reductions were:

- Sewage Treatment Plant emissions reduced by 37%
- Town Hall emissions reduced by 27%
- Police/Fire Station emissions reduced by 22%

Energy Supply:

The types of energy used in the operation of the Town of Carleton Place's facilities and delivery of services include:

- Electricity – provided by Hydro One
- Natural Gas – provided by Enbridge Gas

3.4 How Energy is Currently Managed

The management of our energy is a combination of energy data management, energy supply management, and energy use management.

Energy Data Management: Our municipal energy data is managed through the Treasury Department. The data on our energy usage is obtained from our hydro and natural gas invoices and well as from reports received through Local Authority Services for natural gas purchases.

Energy Supply Management: Our municipal energy is supplied via providers as outlined below:

- Electricity: Carleton Place purchases its electricity directly through Hydro One. In 2019, the Treasurer will be registering applicable Town facilities into the Local Authority Services' bulk electricity program so that future purchases of electricity will be made through Local Authority Services bulk electricity program. Once completed, the Town will adopt a hedging strategy
- Natural Gas: Carleton Place purchases our natural gas through Local Authority Services bulk gas purchasing program with other municipalities across the province.

Energy Use Management: Day to day management of energy has been primarily the responsibility of managers responsible for Town facilities. Currently, there are no tools available to the facility managers to aid in their efforts to reduce energy use though the Town's Treasurer will be signing all applicable facilities up to participate in LAS' Energy Management Tool (EMT) and Energy Planning Tool (EPT) once facilities have been added under LAS' electricity and gas programs.

3.5 Changes from Previous Plan to Achieve our Goals and Objectives

While the Town met its conservation objectives from the 2014 plan, we recognize other measures could take place to ensure savings continue and that new conservation measures are identified and acted upon. Our key changes to ensure the success of our updated plan include establishing a Green Team and ensuring staff are trained in energy conservation and building operations.

The CDM plan will be reviewed by our Green Team on an annual basis to review the results of the proposed measures and determine if adjustments to the plan are required. Initiatives may be added to the plan as new opportunities arise. Updates to the plan will be posted on the Town's Energy Management page on its website <https://carletonplace.ca/municipalservicesinfoc15.php>.

3.5 Renewable Energy Utilized or Planned

The Town of Carleton Place aspires to show leadership in the promotion and development of renewable energy systems that are compatible with our asset management and land use planning objectives. As a result, we will consider the potential to develop solar photovoltaic systems on the rooftops of all corporate facilities with sound, south-facing roofs and evaluating the Town's fleet (cars and light duty trucks) to determine which vehicles are suitable for replacement with electric vehicles (EV).

4.0 STRATEGIC PLANNING

4.1 Long-term strategic issues

We will develop and implement energy policies where necessary, develop the required skills and knowledge to help address energy management, manage energy information, communicate with our stakeholders, and invest in energy management measures.

4.2 Links with other municipal plans and management processes:

As an integral component of the management structure, the energy management plan is to be coordinated with the Town's budget planning process, preventative maintenance plans, and the Town's overall asset management plan.

4.3 Benchmarking

Benchmarking is a measurement which compares a building's energy use to its indoor floor area. The Broader Public Sector (BPS) reporting portal develops energy benchmarks by converting the energy used in a building to equivalent kilowatt hours of electricity (ekWh) and then divides it by the floor areas of the building. The resulting value is the energy intensity for a building. As weather can

impact the energy use of buildings (e.g. more energy is required to heat buildings in colder weather), the Ministry has provided weather normalized data on its website.

Benchmarking will be used to assess changes in energy performance of buildings over time, especially when energy conservation measures have been implemented in those buildings. As we have been reporting energy use data since 2011, the energy intensity in 2011 for a building can be used as a benchmark to compare with the energy intensity of the same building in more recent years. Benchmarking also allows an organization to compare the energy used in its buildings to the median for that building type to help determine if there are energy conservation opportunities.

Benchmarking can also identify potential data errors in the Town's energy reporting. If the energy intensity is significantly higher or lower in a particular year, the building's energy use should be reviewed.

4.4 Departmental responsibilities

We will incorporate energy budget accountability into departmental responsibilities.

4.5 Behavioural Measures

We will incorporate low to no cost behavioural measures into our practices to assist in achieving energy savings. Behavioural measures will include, but not be limited to: informing staff of the savings associated with shutting off lights; not re-adjusting the temperature in rooms; and using shades to take advantage of daylight harvesting, solar heat gain in the winter and cooling in the summer.

4.6 Working with Other Organizations

Where feasible, we will work with other municipalities to identify conservation issues and opportunities for different types of facilities and develop common measures to address those issues (i.e. hiring a consultant or coordinating the procurement of green products, etc.) that will benefit all participants.

4.7 Consideration of energy efficiency for all projects

We will incorporate life cycle cost analysis into the design procedures for all capital projects.

4.8 Resources Planning

We will incorporate energy efficiency into standard operating procedures and the knowledge requirement for operational jobs.

4.9 Staff Training and Communication

- **Communication programs:** We will develop a communication strategy that creates and sustains awareness of energy efficiency as a corporate priority among all employees and conveys our commitment and progress to our stakeholders.
- **Energy Awareness Training:** We will develop and deliver training focused on the energy implications of employees' job functions and the day-to-day opportunities for conserving energy found in the workplace and at home.
- **Energy Skills Training:** We will develop and deliver skills training for operators, maintainers and other employees that have “hands-on” involvement with energy consuming systems in order to improve the team's ability to achieve energy efficiency improvements.
- **Business Procedures:** We will carry out a comprehensive review of all business processes and modify them as necessary in order to incorporate any energy efficiency considerations.

4.10 Development of Energy Projects

- **Internal assessments:** We will develop a methodology for the internal assessment of energy performance of Town facilities and their energy loads. In addition, a process will be developed for identifying and cataloguing energy efficiency improvements.
- **Staff suggestions:** We will implement a process for submitting and processing staff suggestions for energy efficiency improvements.
- **Energy audits:** We will establish the criteria for the requirement and frequency of municipal facility energy audits. The energy audits will be carried out based on the developed policy.

4.11 Investment in Energy Projects

- **Investment criteria:** We will develop and/or clarify as necessary the financial indicators that are applied to investment analysis and prioritization of proposed energy projects, taking due consideration of the priority given to energy efficiency projects versus other investment needs (life cycle versus simple payback).

- Consideration of energy efficiency for all projects: Life cycle cost analysis will be incorporated into the design procedures for all energy projects.
- Budgetary resources for energy projects: Energy projects will be integrated into our capital planning and budget development procedures.
- Capital: Savings and incentives from previous energy efficiency projects will be incorporated into our annual capital planning procedures as a separate envelope.
- Other sources of funds for energy projects: the Green Team will be mandated to investigate, document, and communicate funding sources for energy projects, including government and utility grant incentives.

4.12 Procurement

- Energy purchasing: The Town uses Local Authority Services which is a division of the Association of Municipalities of Ontario to negotiate energy purchase contracts that appropriately address our cost considerations, available energy services, energy quality and reliability, and other performance factors.
- Consideration of energy efficiency of acquired equipment: Our purchasing procedures will be modified as required to incorporate energy efficiency into the criteria for selection and evaluation of materials and equipment.
- Standards for new buildings: We will develop criteria for the design and/or acquisition of new buildings that include energy performance factors and that use as appropriate the principles embedded in performance standards such as Leadership in Energy and Environmental Design (LEED) and the Model National Energy Code for Buildings.

5.0 CURRENT AND PROPOSED ENERGY CONSERVATION MEASURES

Energy conservation projects can be categorized as technical (i.e. switching street lighting from high pressure sodium to LED), organizational (i.e. establishing a green team) or behavioural (i.e. a turning off the lights program).

Energy conservation projects will be evaluated using an internal rate of return (the rate of interest the project could generate) along with simple payback (the number of years it would take to pay off the project from the savings). In addition, more costly conservation projects will be bundled with more cost-effective ones to lever their development.

6.0 EXECUTION OF ENERGY MANAGEMENT PLAN

Implementation of the proposed projects depends on:

- Funding allocated by Council;
- Using savings from previous conservation projects to help fund new projects;
- Incentives from the Independent Electricity System Operator and/or natural gas utilities;
- Availability of qualified staff; and
- Retaining a qualified contractor to implement initiatives.

Progress on projects will be monitored using the annual energy reports prepared under the Regulation.

The projects proposed to be completed over the next five (5) years include:

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2019	Every	All	All facilities	Organizational Program	Awareness	Add energy awareness to management meetings	N/A	CAO
2019	Every	All	All facilities	Organizational Process	Awareness	Energy reports to be distributed to building managers on an annual basis	N/A	Treasurer
2019	Every	Treasury	All facilities	Organizational Process	Awareness	Incorporate life-cycle costing into procurement process	N/A	Treasurer
2019	Q1	Recreation	Neelin Street Community Centre	Technical Project	Energy Efficiency	Replacement of Boiler System	\$25,000.00 Simple payback is 15 years	Manager of Recreation and Culture

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2019	Q2	Protective Services	Police/Fire	Technical Project	Energy Efficiency	Install new energy efficient air conditioner	\$7,000.00 Simple payback is 10 years	Manager of Recreation and Culture
2019	Q2	Childcare	Francis Street Centre	Technical Project	Energy Efficiency	Replace commercial washer/dryer	\$11,000.00 Simple payback is 5 years	Manager of Childcare Services
2019	Q3	Recreation	Neelin St. Community Centre	Technical Project	Energy Efficiency	Replacing Chiller No. 1	\$135,000.00 Simple payback is 15 years	Manager of Recreation and Culture
2019		Recreation	Neelin St. Community Centre	Technical Project	Energy Efficiency	Replace Dehumidifier in Arena No. 2	\$36,300.00 Simple payback is 15 years	Manager of Recreation and Culture
2019		Recreation	Neelin St. Community Centre	Technical Project	Energy Efficiency	Replace compressor in Arena No. 1	\$20,500.00 Simple payback is 10 years	Manager of Recreation and Culture
2019	Q3	Protective	Police/Fire	Project	Energy	Replacing Windows and Doors	\$30,000.00 Simple payback is 10 years	Manager of Recreation and Culture
2019	Q3	Recreation	Carambeck Community	Project	Energy	Replacing Windows and Doors in Tenant Side of Building	\$40,000.00 Simple payback is 10 years	Manager of Recreation and Culture
2019	Q3	Culture	Museum	Project	Energy Efficiency	Building Repointing	\$5,000.00	Manager of Recreation and Culture

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2019	Q4	Public Works	Water Treatment Plant	Technical Project	Energy	Upgrade Control for low lift pump #4 to Variable Frequency Drive	\$5,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2019	Q4	Public Works	Waste Water Treatment Plant	Technical Project	Energy	Raw sewage check valve replacement program	\$11,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2019	Q4	Public Works	Waste Water Treatment Plant	Technical Project	Energy	Heat Exchange Replacement	\$60,000.00 Simple payback is 15 years	Director of Public Works / OCWA
2019	Q4	Public Works	Waste Water Treatment Plant	Technical Project	Energy	Facility Light Upgrade	\$5,000.00 Simple payback is 7 years	Director of Public Works / OCWA
2020	Q2	Childcare	3 Francis Street Childcare Centre	Project	Energy	Replace 2 additional commercial washers/dryers	\$22,000.00 Simple payback is 5 years	Manager of Childcare Services
2020	Q3	Recreation	Neelin Street Community Centre	Project	Energy	Replace Arena No. 1 roof	\$150,000.00	Manager of Recreation and Culture
2020	Q3	Recreation	Pool	Project	Energy	Replace hot pool roof	\$50,000.00	Manager of Recreation and Culture
2020	Q3	Culture	Museum	Project	Energy Efficiency	Replace windows	\$25,000.00 Simple payback is 10 years	Manager of Recreation and Culture

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2020	Q3	Culture	Library	Project	Energy Efficiency	Replace windows	\$32,000.00 Simple payback is 10 years	Manager of Library Services
2020	Q3	Culture	Library	Project	Energy Efficiency	Replace furnace	\$25,000.00 Simple payback is 10 years	Manager of Library Services
2020	Q3	Culture	Library	Project	Energy Efficiency	Replace roof	\$100,000.00	Manager of Library Services
2020	Q4	Childcare	Francis Street Centre	Organizational Project	Efficiency	Install low flush toilets and energy efficient faucets in new addition	\$35,000.00 Simple payback is 4 years	Manager of Childcare Services
2020	Q4	Childcare	Francis Street Centre	Organizational Project	Efficiency	Install programmable thermostats and sensor lights in new addition	\$1,000.00 Simple payback is 2 years	Manager of Childcare Services
2020	Q4	Childcare	Francis Street Centre	Organizational Project	Efficiency	Purchase energy efficient appliances	\$15,000.00 Simple payback is 5 years	Manager of Childcare Services
2020	Q4	Public Works	Water Treatment Plant	Technical Project	Energy	Upgrade Control for low lift pump #4 to Variable Frequency Drive	\$5,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2020	Q4	Public Works	Waste Water Treatment Plant	Technical Project	Energy	Raw sewage check valve replacement program	\$11,000.00 Simple payback is 12 years	Director of Public Works / OCWA

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2020	Q4	Public Works	Streetlights	Organizational Project	Energy Efficiency	Replace Streetlights with LED fixtures	\$900,000.00 Simple payback is 10 years	Director of Public Works
2021	Q3	Administration	Town Hall	Project	Energy	Building Repointing	\$180,000.00	Manager of Recreation and Culture
2021	Q4	Recreation	Pool	Organizational Project	Energy	Replace lighting to LED fixtures	\$30,000.00 Simple payback is 7 years	Manager of Recreation and Culture
2021	Q3	Recreation	Canoe Club	Project	Energy	Replace windows and doors	\$35,000.00 Simple payback is 12 years	Manager of Recreation and Culture
2021	Q4	Public Works	Water Treatment Plant	Project	Energy	Complete building envelope repairs	\$10,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2021	Q4	Public Works	Water Treatment Plant	Technical Project	Energy	Upgrade Control for High Lift Pump #3 to Variable Frequency Drive	\$35,000.00 Simple payback is 12 years	Director of Public Works / OCWA
2021	Q4	Public Works	Waste Water Treatment Plant	Organizational Project	Energy	Facility Light Upgrade	\$5,000.00 Simple payback is 7 years	Director of Public Works / OCWA
2021	Q4	Public Works	Waste Water Treatment Plant	Project	Energy	Complete building envelope repairs	\$27,000.00 Simple payback is 10 years	Director of Public Works / OCWA

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2022	Q3	Recreation	Neelin Street Community Centre	Project	Energy	Replace condenser No. 1	\$90,000.00 Simple payback is 15 years	Manager of Recreation and Culture
2022	Q4	Recreation	Neelin Street Community Centre	Project	Energy	Replace elevator	\$100,000.00 Simple payback is 25 years	Manager of Recreation and Culture
2022	Q3	Recreation	Pool	Project	Energy	Replace front windows	\$25,000.00 Simple payback is 12 years	Manager of Recreation and Culture
2022	Q3	Culture	Museum	Project	Energy Efficiency	Building Repointing	\$5,000.00	Manager of Recreation and Culture
2022	Q4	Public Works	Water Treatment Plant	Technical Project	Energy	Upgrade Control for Low Lift Pump #4 to Variable Frequency Drive	\$35,000.00 Simple payback is 12 years	Director of Public Works / OCWA
2022	Q4	Public Works	Waste Water Treatment Plant	Organizational Project	Energy	Facility Light Upgrade	\$5,000.00 Simple payback is 7 years	Director of Public Works / OCWA
2022	Q4	Public Works	Waste Water Treatment Plant	Project	Energy	Building Envelope Program Upgrades	\$55,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2022	Q4	Public Works	Waste Water Treatment Plant	Project	Energy	Rebuild Raw Sewage Pumps	\$30,000.00 Simple payback is 12 years	Director of Public Works / OCWA

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2023	Q3	Recreation	Neelin Street Community Centre	Project	Energy	Replace Chiller No. 2	\$135,000.00 Simple payback is 15 years	Manager of Recreation and Culture
2023	Q3	Recreation	Pool	Project	Energy	Replace pool dehumidifier with high efficiency model	\$120,000.00 Simple payback is 15 years	Manager of Recreation and Culture
2023	Q3	Administration	Town Hall	Project	Energy	Building Repointing	\$120,000.00	Manager of Recreation and Culture
2023	Q4	Public Works	Water Treatment Plant	Project	Energy	Replace Windows and Doors	\$35,000.00 Simple payback is 12 years	Director of Public Works / OCWA
2023	Q4	Public Works	Waste Water Treatment Plant	Organizational Project	Energy	Facility Light Upgrade	\$5,000.00 Simple payback is 7 years	Director of Public Works / OCWA
2023	Q4	Public Works	Waste Water Treatment Plant	Project	Energy	Building Envelope Program	\$220,000.00 Simple payback is 10 years	Director of Public Works / OCWA
2023	Q4	Public Works	Waste Water Treatment Plant	Project	Energy	Rebuild Raw Sewage Pumps	\$30,000.00 Simple payback is 12 years	Director of Public Works / OCWA
2024	Q3	Recreation	Neelin Street Community Centre	Project	Energy	Replace Arena No. 1 Dehumidifier	\$45,000.00 Simple payback is 15 years	Manager of Recreation and Culture

Year	Quarter	Department	Location	Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner
2024	Q3	Recreation	Train Station	Project	Energy	Replace roof	\$30,000.00	Manager of Recreation and Culture
2024	Q3	Protective	Police/Fire	Project	Energy	Replace windows and doors	\$50,000.00 Simple payback is 12 years	Manager of Recreation and Culture
2019-2024	Every	All	All facilities	Organizational Project	Energy Efficiency	As lights in facilities are replaced, replace with LED fixtures	Unknown Cost depends on type of light fixture	Manager of Recreation and Culture
2019-2024	Every	All	All facilities	Organizational Project	Energy Efficiency	As toilets in facilities are replaced, replace with low-flush fixtures	Total cost unknown \$250.00 per toilet	Manager of Recreation and Culture
2019-2024	Every	All	All	Behavioural	Awareness	Celebrate successful projects and initiatives with pizza lunches	\$500.00	CAO
2019-2024	Every	All	All	Behavioural	Awareness	Encourage staff to lower shades in the summer to keep heat out and raise them in the winter to let heat in	None Simple payback is immediate	All Facility Managers
2019-2024	Every	All	All	Organizational	Awareness	Adopt a train-the-trainer policy where staff complete courses such as Dollars to \$ense Energy Management Workshops, Certified Energy Managers, and Certified Building Operators Programs	\$5,000.00 Simple payback is 5 years	All Facility Managers

*simple payback is defined as project cost/annual energy savings

7.0 EVALUATION OF ENERGY CONSERVATION DEMAND MANAGEMENT PLAN

The results of our energy management plan will be evaluated by monitoring our progress towards our targeted performance, and by reporting the findings to our various stakeholders. In addition, our evaluation will include a review and update of the energy conservation demand management plan as necessary. The evaluation process is ongoing and provides the critical feedback that leads to continuous improvement.

Monitoring Progress

Measurement and verification of energy projects: Standard methods for savings verification will be adopted.

Review & Reporting

Reporting for the *Green Energy Act* (GEA): Reporting requirements for the Green Energy Act and other pertinent provincial legislation will be factored into our reporting procedures.

Reports to accountable staff: The Green Team will be provided with timely and regular energy consumption reports.

We will review and evaluate our energy conservation demand management plan, revising and updating it as necessary, on an annual basis within our corporate planning process.