

2019-2024

Energy Conservation and Demand Management Plan



Contents

- Electricity Act, 1998..... 1
- Introduction to the Energy Conservation and Demand Management Plan..... 1
- Terminology..... 1
- Energy Conservation and Demand Management Plan Framework 2
- Vision Statement 3
- Commitment 3
- Energy Management and Leadership..... 3
 - Energy Conservation Champion 3
 - Energy Conservation Committee..... 4
- Renewable Energy 4
- Summary of Current Energy Consumption, Cost and GHGs 5
- Energy Conservation Efforts – 2014-2019..... 7
- How Energy Is Currently Managed 10
 - Energy Supply Management 10
 - Energy Data Management..... 10
 - Energy Use Management 11
- Energy Initiatives 11
- Goals..... 13
- Focus Areas..... 13
- Objectives 13
- Quantitative Goals – 2019-2024..... 14
- Monitoring Progress..... 15
- Reporting..... 15
 - City Stakeholders..... 15
 - Electricity Act..... 15
- Reviewing and Moving Forward..... 15
- Appendix A 16
 - Energy Conservation Committee 16
- Appendix B..... 17
 - Facility Category Lists 17
- Appendix C..... 18
 - Objectives Outline 18



Introduction

Electricity Act, 1998

Formerly a requirement of regulations made under the Green Energy Act, the Corporation of the City of Port Colborne is required, under Ontario Regulation 507/18: Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans under the Electricity Act, 1998, to compile and submit energy consumption data by July 1st annually and to develop and implement an updated five year Energy Conservation and Demand Management Plan (Plan) every five years.

The City's first Plan was endorsed by Council by the July 1, 2014 deadline, and the regulated deadline for updated Plans to be prepared, endorsed by City Council and posted to the City's website is on or before July 1, 2019 and on or before every fifth anniversary. As such, the City of Port Colborne has developed and updated this Plan to meet the requirements set out by the Electricity Act under Ontario Regulation 507/18.

Introduction to the Energy Conservation and Demand Management Plan

The Plan has been developed to guide the City of Port Colborne in establishing energy management practices, promoting energy conservation, and integrating these measures into all aspects of the organization. Doing so will reduce energy consumption, increase energy efficiency, and ultimately reduce the environmental, social, and economic impacts of energy consumption. The Plan will evolve as the understanding of the City's energy demands and conservation opportunities develop. Outlined in the Plan are the City's commitment to energy conservation, previous and current energy practices, and the goals and objectives to which the City shall aim. The overall approach to the development and post development of the Plan is detailed in Figure 1.

Terminology

A commonly used unit in energy analysis is ekWh, which means equivalent kilowatt-hours. This unit allows comparisons to be made between natural gas and electricity consumption. Energy intensity is a measurement of how much energy is consumed per square meter, and uses a unit of ekWh/m². Normalized energy intensity measures the rate of energy consumption per square meter, and removes variation due to weather. Normalized energy intensity is measured in units of ekWh/m²/HDD. Heating and cooling degree days (HDD and CDD respectively) is a measurement used to normalize annual weather conditions and quantify the impact on facility heating and cooling systems. The greater the variability from ideal indoor climate control, the more energy is needed to reach the ideal condition. Heating Degree Days (HDD) is contrasted to that of natural gas, and Cooling Degree Days (CDD) is contrasted to electricity. This is because air conditioning systems typically use electricity and heating systems use natural gas.

Energy Conservation and Demand Management Plan Framework



Figure 1: ECDM Plan Framework



Port Colborne's Commitments

The Energy Conservation and Demand Management Plan has been developed and updated to reflect the values and strategic directions of the City of Port Colborne. These values and directions are encapsulated in the Vision Statement and Commitments that follow.

Vision Statement

To carry out the strategic and proactive pursuit of responsible energy management, in order to contribute to the environmental, economic, and social wellbeing of the residents, businesses and visitors of the City of Port Colborne.

Commitment

The City of Port Colborne aims to lead the community by example, and therefore commits to the following:

- 1) Allocation of the resources necessary to develop and implement a strategic energy management plan, aimed at reducing our energy consumption and its related environmental impact
- 2) Promotion of responsible energy management throughout the City, implementing economically viable energy conservation projects, organizational measures, and renewable energy initiatives where possible
- 3) Compliance with legislated environmental requirements and standards
- 4) Continual improvement of the Plan and its projects and initiatives

The vision and subsequent commitments of the Plan outline the approach towards improving energy management within City facilities and act as a foundation for the remainder of the Plan.

Energy Management and Leadership

The development and implementation of the Plan is the responsibility of the City's Environmental Compliance Supervisor and the Energy Conservation Committee.

Energy Conservation Champion

The City's Environmental Compliance Supervisor, Darlene Suddard, has been designated as the City's Energy Conservation Champion, tasked with chairing the Energy Conservation Committee (ECC) and guiding the City in matters of energy conservation and of the Plan. As the Champion, the Environmental Compliance Supervisor ensures that the City is in compliance with legislative requirements, stays current with municipal energy related topics, organizes regular meetings of the ECC,

and works closely with City Council and Staff to promote energy management throughout the City.

Energy Conservation Committee

The ECC is comprised of City Staff members, who have responsibility over energy-consuming facilities (Appendix A). An appointed member of Council is also a part of the ECC. Members are committed to the continual improvement of the City's energy conservation efforts, while ensuring the success of the Plan. The Committee meets regularly to discuss energy related issues, economic considerations of initiatives, regulatory requirements, and incorporation of proposed initiatives into current policies and operational standards. The integration of the Plan across the City, and the support of the ECC, will be instrumental in the success of Port Colborne's energy management efforts.

Renewable Energy

While there are no current renewable energy systems within the City of Port Colborne, the City commits to explore the viability of implementing and developing renewable energy systems in City facilities. Research regarding the technical and economic feasibility of incorporating renewable energy systems will be performed and presented to the Energy Conservation Committee. The City aims to establish a well-informed foundation for future development of renewable energy systems.



Current Energy State

A thorough understanding of the current state of energy use within the City is required in order to formulate the Plan. Developing this understanding will assist in determining which commitments and objectives to implement, as well as assist in identifying possible conservation opportunities. The following section outlines the historic energy consumption and greenhouse gas emissions from 2011-2017, and discusses current energy management and supply.

Summary of Current Energy Consumption, Cost and GHGs

The annual energy consumption of City facilities can be calculated from the Energy Baseline Report (2014), as well as the annual Energy Consumption and Greenhouse Gas Emissions Reports. Table 1, below, demonstrates that although total energy consumption and greenhouse gas (GHG) emissions have increased from 2011 to 2017, the overall GHG intensity and energy intensity (the amount of GHG and energy used per square metre of floor space), have been reduced by 50% and 40%, respectively. This reduction in GHG intensity and energy intensity is a direct result of the City constructing two new energy efficient buildings (Vale Health & Wellness Centre (2012) and Engineering and Operations Centre (2017)) to replace five old, inefficient buildings (Teeder Kennedy Arena, West Side Arena, Centennial Pool (2012) and Public Works, Parks Depot (2017)).

Continual energy tracking and reporting will provide a more accurate picture of patterns in energy consumption with these new energy efficient buildings over the years. Also of note is the cost associated with the City's energy consumption. Electricity cost, as shown in Table 2, has significantly increased. This cost increase is a result of both increased consumption and increased cost over the years, as demonstrated in Table 1.

Table 1: Summary of Port Colborne City Facility Energy Consumption, 2011-2017

Year	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (Kg CO ₂ e/yr)	GHG Intensity (kg CO ₂ e/m ²)	Energy Intensity (ekWh/m ²)
2011	2,116,820	377,222	885,169.61	851.12	5,840.99
2017	4,704,970	521,347	1,069,738.30	418.66	3,477.66
Change(+/-)	(+)2,588,150	(+)144,125	(+)184,568.69	(-)432.46	(-)2,363.33

Table 2: Summary of Port Colborne City Facility Energy Cost, 2011-2017.

Year	Electricity Cost (\$)	Natural Gas Cost (\$)
2011	160,485.78	77,260.53
2017	586,440.50	59,345.81
Change (+/-)	(+)439,290.95	(-)17,914.72

An analysis of facilities by category has been included for the 2017 year; this is to understand which facilities are consuming at the highest rates. A full list of facility categorization details is provided in Appendix B. Based on this analysis (as shown in Figure 2 below), it is clear that Recreation, Museum/Tourism, and Public Works are the most energy intense categories. While Figure 3 below shows that recreation has by far the highest consumption of both natural gas and electricity. It will be interesting to see how energy intensity will change due to the new Engineering and Operations Centre, where occupancy began in August 2017.

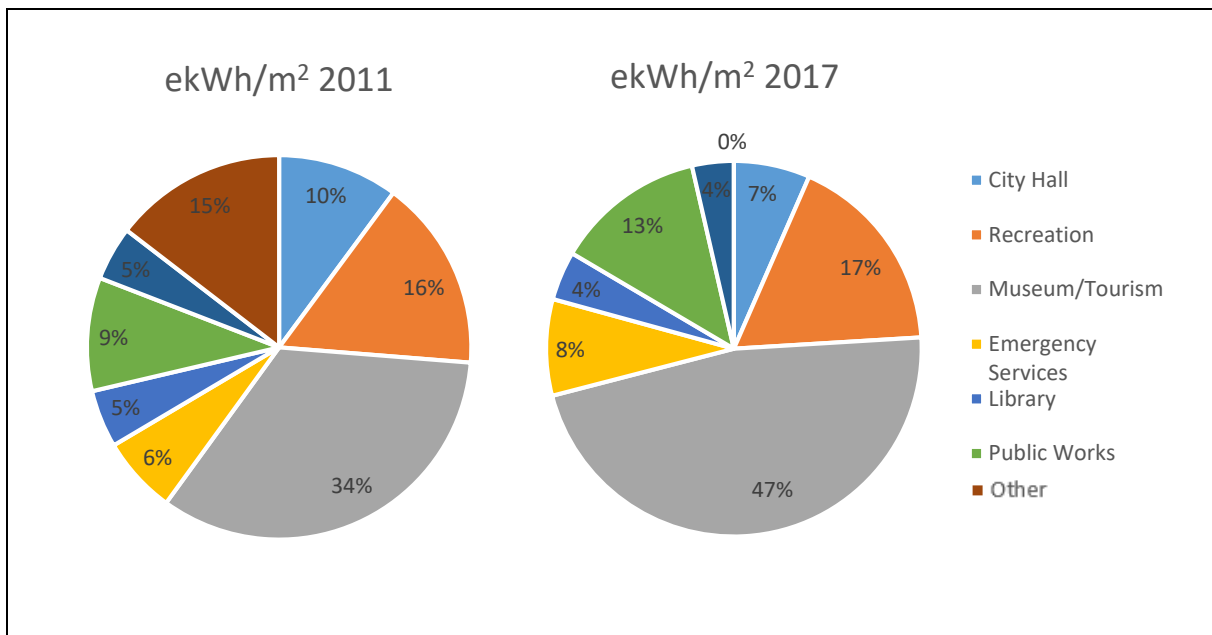


Figure 2: Energy intensity for each facility type in 2011 compared to 2017

Although the Recreation Category was the largest consumer of both electricity and natural gas in 2011, it is important to note that three of the facilities included in this category ceased operations between 2010 and 2013: West Side Arena, Centennial Swimming Pool, and Teeder Kennedy Youth Arena. Replacing these facilities is the new Vale Health and Wellness Centre (which contains a twin pad arena, swimming pools and recreational space). Since the opening of the Vale Health & Wellness Centre, recreation has continued to have the largest consumption of all the categories, and has in fact increased the recreation energy consumption. However, when comparing energy intensity (as seen in Figure 2 above) the recreation sector is contributing less to the City's overall energy intensity than some of the older facilities.

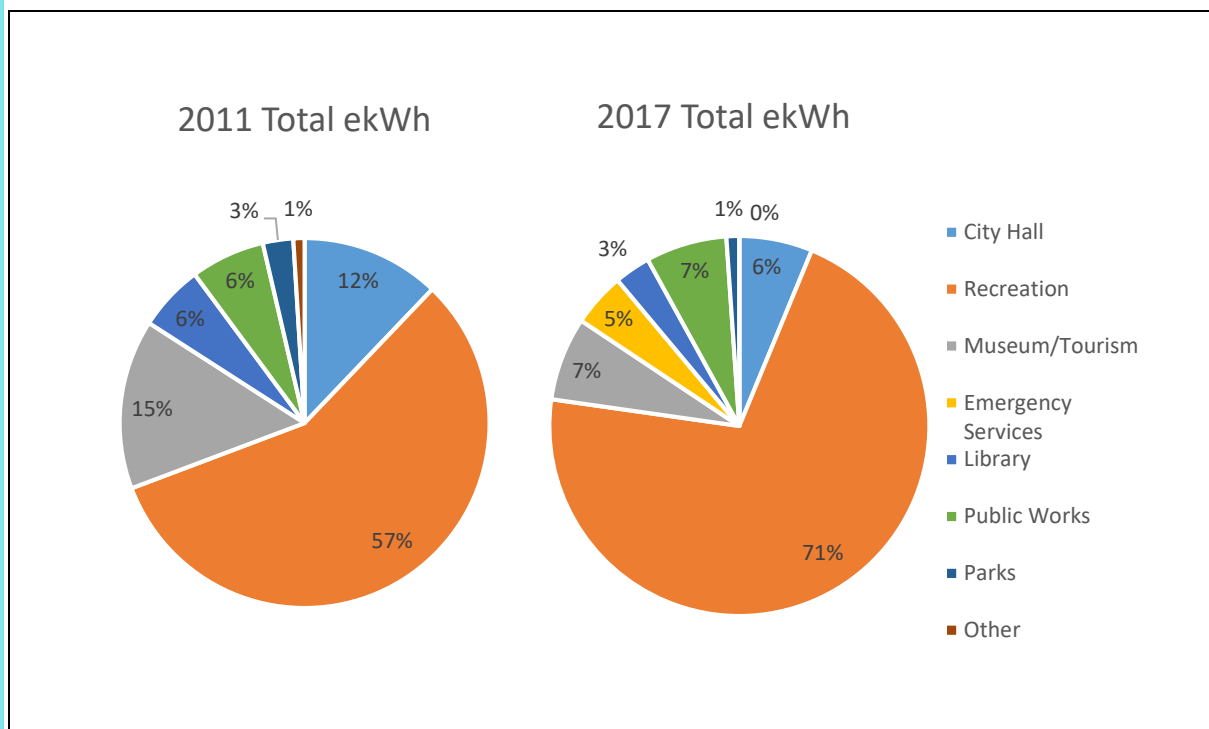


Figure 3: Total energy consumption per each facility type in 2011 compared to 2017.

Energy Conservation Efforts – 2014-2019

The majority of energy conservation efforts from 2014-2019 focused on the Facility Energy Management goals

Energy Supply Management

The City was able to work with Canadian Niagara Power (CNP), our LDC (local utility distributing company), to explore conservation measures, and funding opportunities for energy conserving retrofits. The City was fortunate to have the individualized services of an Energy Manager through the LDC for a one year term, to assist with finding energy saving opportunities, rebates, and incentives.

Facility Energy Management

In 2012 and 2013, the City took advantage of small business lighting retrofit incentive programs, offered through the City's local distribution company (LDC). Through this program, all T12 fluorescent bulbs in qualifying City facilities were upgraded to more energy efficient T8 fluorescent bulbs and incandescent lights were upgraded to compact fluorescent lights (CFLs) in the same year. After the upgrade, these facilities saw a notable drop in normalized energy intensity, as demonstrated in Table 3. Note that values for Teeder Kennedy Youth Arena, West Side Arena, Centennial Swimming Pool, and Vale Centre are not included, as these facilities were not part of the retrofit.

Table 3: Overview of Electrical Energy Intensity Before and After Lighting Upgrade.

Year	Electricity Energy Intensity (ekWh/m ²)	HDD	Electricity Energy Intensity/HDD	Change
2011	1433.92	3642.8	0.394	21% decrease in normalized electrical energy intensity
2014	1266.26	4049.1	0.313	

In 2018 and into 2019, the City again took advantage of another lighting retrofit incentive program offered by the LDC. This time, all City facilities, including the larger facilities such as City Hall, the Fire Department and even the Vale Health & Wellness Center, qualified, and virtually all lamps and bulbs in all City facilities were retrofitted to LED, with speciality lighting where no compatible LED light was available retrofitted to CFL lights. The effectiveness of the retrofits completed in 2018/19 cannot be quantified until 2020/21; however, the City's LDC estimated that the annual savings would total 113,529 kWh.

Streetlighting retrofit to LED began in 2015, and was completed in 2016. The switch from high-pressure sodium lights to LED lights resulted in savings of \$135,182 (a 41% decrease in cost) from 2014-2018, as seen in Table 4, from reduced electricity use and reduced maintenance cost.

Table 4: Annual Streetlight Cost and Overall Change in Cost.

Year	Cost (\$)
2014	327,091
2015	284,488
2016	209,253
2017	198,657
2018	191,909
Overall Difference	\$135,182
% Change	41.33%

Heating, Ventilation and Cooling (HVAC) upgrades

New HVAC units were installed at two City facilities during the first five-year Plan. In 2016 the HVAC units at the Library and Roselawn were replaced with newer more energy efficient models. After the HVAC upgrade the Library saw a 20% reduction in normalized energy intensity associated with natural gas consumption, and Roselawn saw a 10% decrease in normalized energy intensity associated with natural gas.

In 2015 as part of the City's commitment to investigate energy conservation opportunities, the City received funding to complete an engineering evaluation study and additional funding for a subsequent detailed engineering study for a combined heat and power (CHP) system at the Vale Health & Wellness Centre. The CHP system was evaluated on the basis of saving energy and reducing overall energy costs in the facility. While the preliminary study was very promising, with a projected payback of just over 5 years, the final detailed engineering study revealed that the payback time was actually closer to 11 years. It was felt that 11 years was too long of a payback period and that it would be more cost effective to invest in multiple smaller energy savings projects with shorter projected payback periods.

Routine Maintenance and Building Assessments

Regular maintenance checks were successful in identifying energy waste; for example, maintenance staff discovered in December 2016 that a valve at the Vale Health & Wellness Centre had been installed incorrectly, and was contributing to excessive electricity consumption. Since this problem was corrected, the Vale Health & Wellness Centre has experience a 4% decrease in electricity contributed to a reduction in cooling requirements.

A building envelope assessment was conducted on City Hall in 2016. This report pinpointed the problem areas of heating loss at this facility, primarily the windows. Based on this assessment and other observations from maintenance staff, there are plans to make building envelope updates over the next three years. Similarly, the Marina has updated their office windows to improve the building envelope. The Marina also is continuously updating their dock lights to more efficient bulbs, whenever financially possible.

New Construction

The Engineering and Operations building, constructed between June 2016 and August 2017, was built with energy efficiency in mind. Although this particular facility is not LEED (Leadership in Energy and Environmental Design) certified; lighting, heating, and cooling fixtures are energy saving. The building automation system provides optimal indoor climate control with the most efficient use of energy, and the design of the building itself makes use of natural light, limiting the need for artificial light. As of yet, an energy audit has not been completed for this facility, so it is unclear at this time what changes can be made to energy usage.

Organizational Integration

Originally planned to be an annual event, energy awareness campaigns were completed on a more informal basis during the previous Plan. The awareness efforts provided insight into the regular uses of City facilities and created an opportunity for all staff to participate in reducing the City's energy usage.

In the beginning years of the 2014-2019 Plan, the City aspired to host quarterly Energy Conservation Committee meetings. This objective was not met; however, energy awareness opportunities were pursued by various student intern and summer student projects throughout the term of the Plan. These projects included facility energy audits, scheduling meetings with facility staff to discuss energy consumption at their facility and solicit suggestions for reducing energy consumption, and creating energy awareness materials.

During the original Plan, energy audits were completed of all major energy using facilities, and many have already been re-audited to evaluate the effectiveness of energy conservation initiatives. The work of student interns and summer students to complete these audits has involved little to no cost to the City for this valuable data. The current model is to re-audit each facility on a roughly five year cycle.

How Energy Is Currently Managed

The management of the City's energy consumption is divided into three categories: energy supply management, energy data management and energy use management.

Energy Supply Management

The municipality is serviced through the providers outlined in Table 5:

Table 5: City of Port Colborne Energy Suppliers

Supplier	Energy	Rate	Agreement
Canadian Niagara Power	Electricity	Standard Rates based on a Threshold	None
Enbridge	Natural Gas	Standard Rates	None

Prior to January 2012, the City held a supply agreement for natural gas through the Association of Municipalities of Ontario (AMO) Local Authority Services (LAS). However, through a suggestion submitted to the Employee Suggestion Program, it was detailed that the prices paid under the LAS agreement were significantly higher than the "market" prices provided by Enbridge. The agreement was cancelled in early 2012 as a cost savings measure. *Canadian Niagara Power*¹ and Enbridge are the City's utility providers.

Energy Data Management

Energy data is currently managed through various departments. Electricity and natural gas bills are received and saved electronically, paid, and filed by the Accounts Payable

¹ Please see Appendix C, page 19 for important information on Canadian Niagara Power

Clerk. The bills are then filed at City Hall (as of April 2017, all utility bills are saved electronically on the server) and copies retrieved by the Environmental Compliance Supervisor, or designate, when conducting energy audits or analyzing energy consumption trends. The Environmental Compliance Supervisor carries out the tracking, monitoring and analyzing of energy data, with utilization of the on-line Energy Planning Tool provided by the Local Authority Services. Suggested improvements to energy data management are discussed further in this Plan.

Energy Use Management

The management of energy consumption and the energy performance of City facilities and equipment are the responsibility of Department/Facility Managers and Maintenance.

Energy Initiatives

Port Colborne has been proactive in improving the energy conservation and efficiency of its facilities. Table 6 below is an outline of energy related projects that have already been implemented, and/or budgeted for. As many of these projects were carried out or began in 2018-2019, the impact of these measures has yet to be analyzed and accounted for in energy data. Future energy reports and Plans will highlight the effectiveness of various conservation projects and their impact on overall consumption.

Table 6: City of Port Colborne's Implemented Energy Initiatives.

Project	Facility	Year
HVAC Replacement	Museum- Heritage & Resource Centre	2019
	Museum- Complex	2019
Window Replacement	City Hall	2019-2021
	Roselawn Centre- Kitchen	2019
	Marina- Store and Restaurant	2024
Timed Lighting	Lion's Field	2019
Lighting Retrofit: T8 to LED	City Hall	2018
	Vale	2019
	Roselawn	2018
	Marina	2018
	Museum	2018
	Fire Hall	2018

One of the most significant initiatives being undertaken by the City during this Plan, is the implementation of a Greenhouse Gas (GHG) Emissions Reduction Plan project. The City received funding from the Federation of Canadian Municipalities (FCM) - Municipalities for Climate Innovation Program (MCIP), for a Climate Change Staff Grant, providing funding for a full time contract position from May 2019 to February 2021. This position will be

tasked with implementing the project, and the main goal is inventory the City's overall GHG emissions – not just for the buildings, but also those from day-to-day operations – and to create and finalize the GHG Emissions Reduction Plan. While the focus of this funded project is to reduce GHG emissions, it will incorporate the goals from this Plan and implementation of the project will result in reducing energy consumption for the City's facilities and assist with meeting the goal and targets of this Plan.



The Plan

Goals

The energy conservation goals set forth by the City of Port Colborne are long-term, high level strategies that support the energy vision of the City. They provide a framework within which conservation and demand management objectives have been developed.

The goals are as follows:

- 1) Provide the leadership and organization necessary to promote a culture of energy conservation throughout City facilities
- 2) Reduce energy consumption and greenhouse gas emissions through energy conservation and management
- 3) Continuously improve the energy efficiency of City facilities and processes
- 4) Seek opportunities to utilize renewable energy sources where feasible and practical

Focus Areas

In order to better categorize and manage the objectives of the City, focus areas have been generated based on the goals and overall vision. These focus areas include:

- Organizational Integration
- Facility Energy Management
- Energy Data Management
- Energy Supply Management
- Procurement

Objectives

The objectives for the Plan have been designed to provide direction on how to achieve the goals and energy vision. Recognizing potential resource constraints, consideration has been given to the need for the City to build and enhance internal capacity in order to develop the necessary resources to implement the Plan. As the City progresses in its energy practices, it is expected that the objectives will evolve as well.

The objectives outlined in Appendix C contain information regarding the initiative category, required actions, estimated costs and savings, as well as timelines. The initiative categories organize objectives based on their implementation times and resources required. These categories are identified as Programs, Processes, and/or Projects which are explained in Table 7 below.

Table 7: Description of Initiative Categories

Initiative Category	Definition	Example
Program	Longer term objectives with broad applications	Awareness Programs
Process	Shorter term objectives with more specific applications	Facility energy tracking
Project	Specific actions (generally capital projects) to improve efficiencies	Retrofits and upgrades to building envelopes

In addition to these categories, cost and savings estimates, along with timeline estimates, have been provided to help guide decision making and planning of energy conservation and demand management objectives. These estimates have been categorized into Low (\$0-5,000), Medium (\$5,001-10,000), and High (\$10,001 +) levels. Where exact costs or savings values are known, they too are included.

Quantitative Goals – 2019-2024

The City has four main quantitative goals in regard to energy management, summarized in Table 8 below. These goals were determined through meetings with management and staff to generate attainable goals for the next five years. All targets are based on 2017 values as the baseline.

Table 8: Outline of quantitative energy management goals

Goal Number	Goal	Target	Year achieved by
(1)	Reduce annual energy intensity associated with electricity	10% reduction in annual energy intensity	2024
(2)	Reduce electricity consumption from computer server	25% reduction in electricity used by computer servers	2024
(3)	Electricity reduction from limiting unnecessary electricity usage	200,000kWh reduction from electricity consumption associated with lighting and plug load	2024
(*4)	Manage load demand and energy consumption for an overall reduction	15% reduction of yearly kWh/HDD	2024

Each goal uses 2017 as the baseline year for data.

In Appendix C all objectives have been assigned a goal number to indicate which target the objective will assist in meeting. No objectives are numbered (*4), since the 15% reduction of yearly kWh/HDD is an overall target.



Evaluation

Monitoring Progress

The implementation of the Energy Conservation and Demand Management Plan will allow for strategic and centralized monitoring of energy consumption. As part of the plan, a monitoring system will be developed to provide continuous information to key staff members. In addition, the Plan identifies the use of the Energy Planning Tool (EPT) as a method of monitoring and consolidating consumption data. Additionally, the EPT is used to track the progress and success of conservation and demand management initiatives. Continual monitoring will contribute to informed decision-making and the development of stronger objectives in future Plans.

Reporting

The development of reports based on progress monitoring will deliver key information to various stakeholders:

City Stakeholders

Reports regarding progress of the Energy Conservation and Demand Management Plan, including conservation measures, and changes in the processes and implementation of programs, will be developed by the Energy Conservation Committee and delivered to key identified audiences within the City. Suggested audiences include the Mayor and Council, Directors, and the Senior Management Team.

Electricity Act

Required legislative reports, under the Electricity Act, have been incorporated into this Plan and will be included in stakeholder reports.

Reviewing and Moving Forward

The City has committed to review and evaluate the Plan, revising and updating it as necessary. The progress towards identified goals and objectives will be evaluated and new objectives will evolve as the capacity for energy conservation and demand management within the City grows. The review and evaluation process is ongoing and will provide critical feedback that contributes to the commitment to continuous improvement in energy conservation and demand management of Port Colborne's facilities.

Appendix A

Energy Conservation Committee

Facility	Designated Member of ECC
City Hall	Pending
Vale Health & Wellness Centre	Pending
Engineering and Operations Centre	Darlene Suddard
Community Services (including Roselawn - may also include Community Service facilities such as Lions Field)	Pending
Museum	Pending
Marina	Pending
Library	Pending
Fire Hall	Pending
An appointed member of Council will also a part of the ECC.	
Environmental Compliance Supervisor, Darlene Suddard is the chair of this committee	

Appendix B

Facility Category Lists

City-owned facilities that are heated and/or cooled, which the City pays the utility bills for, are included in this list and, in most cases, have been accounted for in a broader category. The electrical and natural gas consumption, as well as the energy intensity for 2011 and 2017 for these categories was previously presented in Figures 2 and 3:

2011

City Hall

Library

Emergency Services

Parks Depot

Recreation

- Centennial Swimming Pool

- West Side Arena

- Lions Field Park Canteen

Public Works

- Public Works Yard

- Public Works Site Trailer

Museum/Tourism

- Marine Lighthouse Exhibit

- Port Colborne Museums

- Roselawn Center

- First Rose Lawn

- Sugarloaf Marina

- Tourism Info Center

- Harbour Master

- Tour Booth Lighthouse

Other

- Dog Pound

2017

City Hall

Library

Emergency Services

Parks Depot

Recreation

- Vale Health and Wellness Centre

- Lions Field Park Canteen

Public Works

- Public Works Yard

- Public Works Site Trailer

- Engineering and Operations Centre

Museum/Tourism

- Marine Lighthouse Exhibit

- Port Colborne Museums

- Roselawn Center

- First Rose Lawn

- Sugarloaf Marina

- Tourism Info Center

- Harbour Master

- Tour Booth Lighthouse

Appendix C

Objectives Outline

Focus Area: Energy Plan Management

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Continue Energy Conservation Committee meetings to effectively govern energy consumption in the City	Program	Host annual meetings (or as frequently as needed) to effectively monitor energy consumption and carry out energy conservation planning	Meeting minutes distributed to key staff	Cost: Low	2019-2024	(1-3)

Focus Area: Energy Supply Management

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Investigate alternative funding opportunities with utility distribution companies to enhance energy conservation and demand management opportunities	Program	Contact electricity and natural gas distributors to develop possible energy conservation measures (annually)	Development of relationship between utility distributors and the City	Cost: Low	2019-2024	(1)
	Process	Work with utility distributors to investigate public-private partnership (P ³) options	Documented research and feasibility analysis of P ³ options	Cost: Low	2019-2024	(1)
	Process	Work with utility distributors to research funding opportunities for energy conservation measures	Creation of a database of potential initiatives and funding	Cost: Low	2019-2024	(1)
Investigate the opportunity of creating a revolving fund based on energy cost avoidances, to be reinvested in energy initiatives	Program	Identify and analyze revolving fund models to determine viability of implementing one in the City	Documented research and analysis of funding models	Cost: Low	2019-2022	(1)
Strengthen partnerships with utility distribution companies to enhance energy conservation and demand management opportunities	Program	Contact electricity and natural gas distributors to develop possible energy conservation measures (when possible)	Documented contact with Utility providers	Cost: Low	2019-2024	(3)

1. Canadian Niagara Power

The greyed out entries will be more difficult to achieve after December 31, 2019, considering the change in how the incentive programs are delivered. The incentive programs themselves have not significantly changed in terms of offerings and/or incentive dollars. However, instead of applying directly to the City's local utility (CNP), the City will now apply through the new incentive portal to the IESO (Independent Electricity System Operator). The IESO (and their contracted third-party technical reviewer) is then responsible for reviewing the applications and issuing pre-approvals. CNP can still assist with the administrative work required (submission, responding to RFIs, gathering of paperwork), however this service will only be available for as long as the CDM team (conservation and demand management team) are still employed by CNP - which is effective until December 31st, 2019. These entries were included in this document to demonstrate the changes in incentive program delivery, as this is the first document affected by these changes.

There are also some other program changes, namely (and for the Retrofit program):

- Application post-project paperwork must be submitted within 6 months of receiving an application pre-approval
- The project must be in-service no later than December 31st, 2021
- Prescriptive incentives must be a minimum of \$500.00

Throughout the years of collaborating with our LDC's Conservation and Demand Management team, the City has benefitted through collaborating with CNP. Many energy saving initiatives and retrofits were made possible through our CDM team contacts at CNP; however, CNP will no longer be the City's main contact for incentive programs.

Focus Area: Facility Energy Management

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Create an enhanced understanding of energy use within facilities	Program	Continue to engage post-secondary students and/or summer student(s) to conduct energy audits on City facilities on a five year cycle	Completed audits	Cost: Low-Medium	2019-2024	(3)
	Program	Engage an audit consultant to complete audits on any equipment or facility identified as requiring more in-depth analysis	Completed professional audits (where needed)	Cost: Low-Medium	2019-2024	(1)
Establish an equipment inventory for each City facility, to be reviewed by facility managers and the ECC	Process	Create an inventory of energy consuming equipment (including motors, fans, HVACs, controls etc., and ages of equipment), and include energy rating of the equipment	Established energy consuming equipment inventory	Cost: Low	2020-2024	(1)
Establish rigorous building management and maintenance practices to increase energy efficiency of equipment and facilities	Project	Develop a maintenance optimization plan for each facility (highlighting optimized equipment standards and maintenance schedules to increase the efficiency of equipment)	Established maintenance optimization plan	Cost: Low	2020-2024	(3)
	Process	Create a walkthrough checklist based on the maintenance plan and conduct semi-annual inspections for facilities	Established checklist to ensure semi-annual maintenance inspections	Cost: Low	2020-2024	(3)

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Carry out continual building envelope improvements on City facilities, when possible	Process	Establish a list of building envelope improvement opportunities	Documented list of buildings which require envelope improvements to be recorded in the Energy Planning Tool (EPT)	Cost: Low	2019-2024	(1)
	Project	Carry out building envelope improvements (weather-stripping, caulking, insulation) when financially and practically possible	Continue to update EPT to track current and proposed energy conservation measures	Cost: Low-Medium	2019-2024	(1)
Carry out continual energy retrofits and upgrades to City facilities, when possible	Process	Establish a comprehensive list of upgrading and retrofitting opportunities for each facility	Documented list in the Facility audit	Cost: Low	2019-2024	(1&2)
	Project	Carry out building energy retrofits and upgrades (i.e. lighting, HVAC, computer upgrades) when financially and practically possible	Continue to update EPT to track current and proposed energy conservation measures	Cost: Low-Medium	2019-2024	(1&2)
Develop a commitment to high level energy efficiency requirements for new construction buildings	Program	Research best practice energy efficiency building requirements and determine which will be applied to new constructions; implement the commitment in all new constructions	Developed formal commitment; new constructions will have followed this commitment	Cost: Low	2019-2024	(1)

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Update all facility lighting	Project	Carry out remaining lighting retrofits and upgrades when financially and practically possible	Continue to update EPT to track current and proposed energy conservation measures.	Cost: Low-Medium	2019-2024	(1)
	Project	Upgrade lighting fixtures to sensor lighting where possible				
Develop a plan to reduce energy used by computers	Project	Reduce the number of computer servers where possible (City Hall)	Continue to update EPT to track current and proposed energy conservation measures.	Cost: Low	2019-2024	(2)
	Project	Program auto shut-off on staff computers so that computers are not left on overnight				
Conserve energy through adjusted lighting and plug load	Program	Create a 'smart energy use' presentation to encourage staff to conserve energy	All staff have been educated on how to save energy through reduced lighting and plug load (when and where applicable and safe)	Cost: Low	2019-2024	(2&3)
			Electricity reduction from waste diversion			(3)
Increase the efficiency of HVAC units in select City Facilities	Project	Reduce humidity in Library and Marina to increase HVAC efficiency	Reduced humidity during the summer months	Cost: Low	2019-2024	(3)
Further investigation into the energy consumption, and conservation opportunities, for facilities older than 10 years	Program	Budget for further assessments (professional audits, building envelope assessments, etc.) of City facilities 10 years or older	Completed in-depth reports (where needed)	Cost: Low-Medium	2019-2024	(3)

Focus Area: Organizational Integration

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Conduct employee training and awareness to educate both new and existing City employees on energy consumption and conservation measures associated with their job functions	Program	Develop an Energy Training Program presentation to deliver at training events	Developed Energy Training Program and associated educational materials	Cost: Low	2019-2024	(3)
		Deliver Energy Training Program to new employees (including seasonal staff)	Incorporation of energy training into orientation package			(3)
	Program	Develop an annual Energy Awareness Campaign, developed and implemented by summer student(s) to educate employees and raise the awareness of the Energy Conservation and Demand Management Plan and associated energy conservation measures	Developed campaign and associated educational materials.	Cost: Low	2019-2024	(3)
		Deliver Energy Awareness Campaign to employees	Delivery of campaign material to targeted audiences annually			(3)
Incorporate energy management policies into all staff job functions	Program	Create broad energy management policies to assist staff to incorporate energy management practices into their job functions	Developed and distributed energy management policies	Cost: Low	2024	(3)

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Develop an energy communication strategy to sustain awareness of energy management, including consumption, reports, and initiatives	Program	Develop a communication strategy that outlines how energy management information will be distributed (i.e. emails), to whom (key staff/all employees), and how frequently the communication will be released	Documented strategy for energy communications, including consideration of using "Deck Hands" newsletter	Cost: Low	2019-2021	(3)
			Distributed energy communications to identified audiences			(3)
Allocate student intern resources to carry out Plan objectives and initiatives, when possible	Program	Engage students/interns to help carry out the energy conservation programs and initiatives when possible (i.e. energy auditing) and/or to evaluate the effectiveness of the programs/initiatives	Record of work completed by interns/students.	Cost: Low	2019-2024	(3)
Enhance communication concerning energy conservation success	Program	Report annually to council a summary of ECDM progress	Meeting minutes distributed to key staff	Cost: Low	2019-2024	(1&3)
	Program	Communicate energy conservation successes regularly	Successes documented and distributed through "Deck Hands" newsletter-when applicable	Cost: Low	2019-2024	(1&3)

Focus Area: Energy Data Management

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Establish a City-wide procedure for energy record keeping, monitoring and reporting, to be followed by key staff members	Program	Discuss the potential procedural options with the Energy Conservation Committee and outline a procedure (assign responsibilities, timelines, reporting and tracking procedures) to be followed by key staff members	Documented procedure for energy data management delivered to key staff members	Cost: Low	2021	(1&3)
	Process	Coordinate the training of assigned Staff on the EPT	Documented training records	Cost: Low	2019-2024	(3)
Utilize the Energy Planning Tool to better analyze energy use and costs within City facilities and operations	Process	Update the energy consumption data for all City facilities on an annual basis	Updated EPT	Cost: Low	2019-2024	(3)
Develop a commitment to manage load demands and to shift and reduce energy demand during peak periods, when possible	Program	Evaluate current energy demand and consumption and determine opportunities for improvement in each facility	Completed assessment of load demand for each facility uploaded into the EPT	Cost: Low	2019-2024	(1&3)
	Program	Develop a commitment target to reduce energy demand during peak hours	Manage load demand and energy consumption through lighting and plug load reduction	Cost: Low	2019-2020	(3)
		Carry out energy demand management initiatives	Shifted consumption to off peak hours and reduced demand			(3)

Focus Area: Procurement

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Develop and implement an Energy Efficiency Procurement Policy, which ensures that new equipment purchases (computers, HVAC etc.) undergo an energy efficiency assessment before purchase	Process	In cooperation with the Chief Administrative Officer's office, create an Energy Efficiency Procurement Policy to be implemented	Policy created and implemented	Cost: Low	2024	(1)
			New purchases will have undergone energy efficiency assessment before purchase			(1)
Develop and implement a policy that states tenants who lease City facilities are required to use energy star, or equivalent appliances	Process	In cooperation with our facility directors, create an Energy Efficiency Appliance Policy to be implemented	Policy created and implemented	Cost: Low	2024	(1)

Focus Area: Renewable Energy

Objective	Type (Process, Program, Project)	Action	Measure of Success	Estimated Costs/Savings (if applicable)	Timeline	Goal No.
Develop a Renewable Energy Plan to guide the research and possible implementation of renewable energy initiatives within the City	Program	Establish a City-wide commitment to renewable energy	Developed Renewable Energy Plan	Cost: Low	2019-2024	(1)
	Process	Monitor available renewable energy technologies and market conditions to make recommendations to the ECC and ultimately to Council	Evolving list of recommended projects including financial considerations	Cost: Low	2019-2024	(1)