Energy Conservation Management Plan

June 2014

Municipality of Port Hope

The Municipality's Energy Conservation Management Plan (ECMP) is the basis for implementation of improvements to our facilities and operations to reduce energy use, associated costs, and environmental impact of Municipal activities. The ECMP will guide priority actions and implementation of energy conservation initiatives over the next five years.

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1.0 Introduction

Climate change is a concern that affects nearly every sector of the Canadian economy, including municipal governments. Municipal governments are either direct or indirect contributors to greenhouse gas (GHG)emissions, through decisions related to facilities energy performance, public transit, waste management and land use planning. Along with the increasing concern of GHG emissions, there are other issues driving the need for a wise use of energy within municipal operations including: energy supply, energy costs and energy security.

This report presents the Energy Conservation Management Plan (ECMP) for the corporate operations of the Municipality of Port Hope for 2014 – 2019.

The ECMP provides the basis for the Municipality to move forward on implementing improvements to its facilities and operations that reduce energy use, its associated costs, as well as the environmental effects of Municipal activities. The ECMP is focused on the core energy consuming operations within the Municipality, which include facilities and buildings operations, street lighting, and vehicle fleet. The ECMP has been developed to serve as guidance for achieving priority actions and implementing energy conservation initiative over the next five years; however staff must be flexible to re-prioritize actions as necessary and take advantage of other opportunities as they arise.

It will also assist the Municipality of Port Hope in complying with the *Energy Conservation and Demand Management Regulation* under the *Green Energy Act (2009)*.

2.0 Background

Energy costs continue to rise for electricity, natural gas and fuels. Effective energy management is imperative in reducing energy consumption to assist the Corporation in an effort to control expenses due rising costs. Successful energy management depends on the integration of energy efficient practices into the “business as usual” operations of the Corporation, is based on a regular assessment of energy performance and implementation of procedures and measures to reduce energy waste and increase efficiency. Regardless of the size of the municipality, the common element of successful energy management is the staff involvement and resources to continually improve energy performance.

The Municipality of Port Hope has a number of plans that provide overall guidance and direction for the Municipality. The ECMP has been developed to align with the goals and principles outlined within the Corporate Strategic Plan and are guided by the Corporate Climate Action Plan 2010.

The Municipality is a participant in the Partners for Climate Protection (PCP) program, where municipalities commit to reducing greenhouse gas emissions. In 2011, Council approved the Corporate Climate Action Plan, a high level document that provides guidance and directions to staff on implementation of the energy initiatives aiming to reduce consumption, achieve cost savings and meet its GHG emission reduction target.

The ECMP will provide strategy for the Municipality to work towards its commitments set forth under the PCP program.

In 2012, Council approved the : *Our Future: Our Priorities Corporate Strategic Plan*, which Goal # 7 directs staff to source and implement technologies that increase efficiency in accordance with industry standards and best practices and enhance the environmental footprint of municipal assets.

In 2009, the Province of Ontario enacted the *Green Energy Act, 2009*. Under the Act, Ontario Regulation 397/11 directed all public agencies in Ontario to prepare and publicly report annual energy consumption and GHG emissions inventory for selected facilities starting on July 1, 2013. It also requires that Municipalities will prepare the energy conservation and demand management plans for a 5-year period starting in 2014.

In June 2013, the Municipality submitted the 2011 energy and GHG emissions inventory to the Ministry of Energy, thus fulfilling the reporting requirements outlined in O. Reg. 397/11. The completion of the ECMP will ensure that the Municipality of Port Hope is compliant with the planning aspect of the Regulation.

3.0 Present State of Corporate Energy Management

The Municipality of Port Hope has managed its energy consumption in the past by implementing energy efficiency measures into their operations and by retrofitting its facilities with energy efficient equipment or fixtures. Appendix A provides a summary of the facilities' retrofits implemented in 2008-2011 as well as information on existing features.

Energy Data Management

The Municipality of Port Hope has managed its energy consumption in the past through an informal approach at departmental level; however the *Green Energy Act* requires an increase in municipal energy management. This results in the need to enhance current practices and develop new approaches. Currently there is a limited energy monitoring and tracking program in place to assist Municipal staff in energy efficiency planning. To meet this need, the Municipality will develop a comprehensive program for collecting and analyzing monthly energy billing information and ensure that staff is informed about energy consumption. This effort will produce an energy costs and consumption database that will be used for monitoring excessive variations, evaluating weather impact on energy consumption, targeting facility follow-up evaluations, and highlighting areas that are candidates for improved efficiency. These monitoring enhancements will improve the Municipality's understanding of the bottom line impact of energy management.

Energy Management Practices

Day-to-day management of energy is primarily a responsibility of department staff responsible for their respective facilities. They oversee the day-to-day operations and

are responsible for the upkeep and maintenance of the equipment and infrastructure of their respective facility. Utility bills are typically reviewed by the facility managers and they generally serve as the project lead on capital equipment replacement and upgrading. The attention to energy management varies from department to department. Currently the budgeting process and the implementation of capital improvement projects serve as the primary opportunity for staff to consider energy performance within their respective departments. When planning a capital budget project staff are required to assess the operational impact, which include considerations for energy performance and possible energy efficiency improvements. There are no formal energy efficiency project evaluation and verification protocols being utilized when planning the capital project. Increasing budget constrains create a barrier to allocate money to energy projects.

Municipal staff has retained a great deal of knowledge with regard to their facility's operations and energy use. Through the deployment of energy management database staff will be equipped with the information to help make effective energy management decisions. The Environmental Compliance Technician has provided assistance with energy conservation programs and projects, however due to limited staff resources there is no staff solely dedicated for energy efficiency planning and development.

The Municipality has pursued many measures to improve the energy efficiency of municipal equipment. Some of these measures include interior lighting upgrades, upgrades of heating and cooling equipment for more efficient one, retrofitting the street lighting. As the understanding of corporate energy consumption improves, staff will have knowledge necessary to make informed decisions. This improved understanding will also reveal how simple actions like re-commissioning and maintenance can improve existing equipment efficiency.

Energy Supply Management

The energy for municipal operations is supplied by a number of providers as follows:

- Electricity is supplied by Veridian Connections to the urban area and by Hydro One to the rural area on an as-needed basis and is priced at the standard rates offered by the provider;
- Natural gas is supplied by Union Gas on an as-needed basis and is priced at the standard rates offered by the provider;
- Fuel (gasoline/diesel) is supplied by various providers such as Cooks Fuels, Sunderland and Petro Canada in bulk or as single purchases, and is priced at the standard rates offered by the provider.

Nonetheless, rising energy costs, environmental awareness and long term planning needs have begun to raise the importance of energy use within the Corporation, as evident by the following initiatives:

- Successful implementation of some energy efficiency projects in existing facilities (Town Hall HVAC system and windows insulation - 2011);
- Retrofitting street lighting with more energy efficient fixtures (2014);

- Conducting a corporate and community greenhouse gas emission inventory (2010);
- Tracking electricity and natural gas consumption for the Corporation (2011);
- The completion of the annual energy and greenhouse gas emissions inventory for corporate facilities (2013).

These actions are moving the Municipality in the right direction, however, when examining the best energy management practices, there are deficiencies in the Municipality's approach as follows:

- Lack of formal Corporate commitment or policy regarding energy management;
- Insufficient awareness of energy management practices among staff and Council;
- Minimal access to the energy consumption and usage data;
- Lack of financial and staff resources for energy efficiency planning and implementation;
- Limited collaboration among departments regarding energy conservation.

Moving forward there are opportunities to improve the Municipality's energy management practices that will, in turn, improve the energy performance of the Municipality of Port Hope.

4.0 Municipal Infrastructure & Operations

Energy is utilized in all aspects of municipal operations, in the form of electricity, natural gas, fuel oil and vehicle fuel. The major consumers of energy are grouped into the following categories:

- Building and facility operations;
- Street lighting;
- Vehicle fleet.

4.1 Building and Facility Operations

The Municipality has a diverse inventory of facilities that serve the various departments within the Corporation. This report will focus on 23 facilities which operations are reportable under the Ontario Regulation 397/11. Table 1 lists the major energy consuming facilities within the Municipality.

Table 1: Facility Listing by Department/Division

Department/Division	Facility
Parks, Recreation & Culture	Jack Burger Sports Complex Town Park Recreation Centre

Department/Division	Facility
	Ruth Clarke Activity Centre Canton Municipal Office
Emergency Services	Port Hope Police Services Fire Hall #1 Ontario Street Fire Hall # 2 Welcome Fire Hall # 3 Garden Hill
Library	Mary J. Benson Library Main Branch Garden Hill Library Branch
Administrative	Town Hall Municipal Development Team Office Port Hope Archives Fire Fighters Museum
Roads	Joint Operations Centre Canton Works - Garage
Water	Port Hope Water Treatment Plant Victoria St. Booster Station Jocelyn St. PS & Reservoir
Wastewater	Port Hope Sewage Treatment Plant Mill St. Pumping Station AON Pumping Station Hope St. North Pumping Station

The top six energy consuming facilities: Water Treatment Plant, Sewage Treatment Plant, Jack Burger Sports Complex, Town Park Recreation Centre, Library and Joint Operations Centre account for approximately 83% of the total energy consumed by facilities within the Municipality.

4.2 Street Lighting

The Municipality owns and operates 1613 street lights in urban area and 63 in rural area consisting of high pressure sodium (HPS), Mercury Vapour (MV) and incandescent lights. In 2014, the Municipality completed the street lighting retrofit project which will provide 44% of energy reduction used for street lighting.

4.3 Vehicle Fleet

The Municipality owns and operates a variety of vehicles to perform daily operations. These include light and heavy duty trucks, off-road equipment, police vehicles, fire tracks and public transit buses, which utilize either gasoline or diesel fuel. The ice

resurfacing machine at JBSC is powered by natural gas. Corporate fuel usage is influenced by the size of the vehicle fleet, the vehicle operators and the efficiency of the individual vehicles. Fleet renewal and vehicle replacement is performed by each department on the end of life cycle basis with newer models which are more fuel efficient. This report will not focus on energy savings measures related to fleet vehicle. They will be evaluated and implemented in next revision of the ECMP.

4.4 Renewable Energy Generation Facility

There is no renewable energy generation facility currently installed and operated by the Municipality of Port Hope. Staff investigated the deployment of renewable energy at Jack Burger Sports Complex JBSC. Rooftop photo voltaic (PV) solar panels were considered however it was recommended that it should proceed at the time of the roof replacement.

5.0 Baseline Energy Consumption

To effectively manage energy and establish attainable conservation targets an accurate baseline of energy use for the Municipality must be established. An energy baseline provides a foundation for energy management as it is used to monitor progress. The Municipality has completed an energy inventory for its facilities and street lights. For the purpose of the ECMP, the energy use data from 2012 has been selected. The annual energy consumption data for selected facilities and streetlights from 2012, as summarized in Table 2, will serve as the baseline to measure the progress of implementation of the ECMP.

Table 2: 2012 Annual Energy Consumption

Operations	Electricity (kWh)	Natural Gas (cu.m)
Facilities	6,675,823	447,153
Street Lighting	1,126,387	n/a
Total usage:	7,802,210	447,153

All energy conservation efforts completed through the implementation of the ECMP will be quantified and compared against the 2012 baseline data to assess if the overall corporate reduction targets are being met.

6.0 Vision

The Municipality of Port Hope will strive to continually reduce energy consumption in all areas of our activity through wise and efficient use of energy and resources, while still maintaining an efficient and effective level of service for the general public. Our goal is to improve the energy efficiency of our facilities and processes in order to reduce the energy consumption and our operating cost.

7.0 Goals and Objectives

The Municipality of Port Hope ECMP was completed to help achieve the following goals:

- Improve the energy efficiency of all facilities and operations by utilizing best practices to reduce energy consumption
- Maximize fiscal resources through direct and indirect energy cost savings
- Optimize use of energy related funding opportunities (grants, incentives)
- Reduce the environmental impact of the Municipality's operations
- Create awareness and culture for energy conservation within the Municipal staff
- Create the Energy Management Team/Committee
- Increase the comfort and safety of staff and patrons of the Municipal facilities
- Improve efficiency of Municipal equipment and reduce maintenance

The primary objective of this plan is to improve the management of the Municipality's energy consumption. Part of this objective is setting an energy conservation target that is anticipated to see the Municipality of Port Hope reduce its 2012 energy consumption by 12% over the duration of this plan.

The measurement of success will be based on variety of indicators such as reaching the ECMP energy conservation target, reaching the GHG reduction target as set in the Corporate Climate Action Plan, and creating an energy conscious work environment.

8.0 Measures

Measures are the actions that are taken to save energy and to help achieve goals and objectives of the ECMP. The proposed measures are to be implemented during the duration of the Plan. However, if some measures were initiated before July 1, 2014, information on the results of those measures may be included in the first Energy Conservation Management Plan. The energy savings measures are often considered to be technological in nature however, there are also organizational and behavioural measures that can also result in real energy savings and help to enable the proposed technological measures.

To identify those energy saving measures staff reviewed current state of energy management within the Corporation, reviewed measures recommended in Corporate Climate Action Plan 2010, researched initiatives undertaken by other local governments and partnered with Local Authorities Services (LAS) to conduct facility high level energy audits.

The ECMP has been developed to serve as guidance for achieving the priority actions and implementing energy conservation initiatives over the next five years. However, Municipal staff must be flexible to re-prioritize actions as necessary and take advantage opportunities as they arise.

8.1 Organizational and Behavioural Measures

The following organizational and behavioural measures are proposed for implementation:

- Establish a Corporate Energy Management Team of applicable staff to ensure implementation of the ECMP, to provide input and integrate energy policies and initiatives into all departments operations, and to enhance collaboration between departments and knowledge sharing in regards to energy conservation;
- Endorsement of the ECMP and the conservation target will provide direction to staff and Council over the next five years. Future budgeting decisions regarding energy conservation projects or operating programs will be examined with consideration of energy management;
- Provide energy awareness training to all staff, focused on the energy use and conservation opportunities associated with staff job functions;
- Incorporate energy management/conservation training into employee orientation and future training opportunities offered through Human Resources;
- Create centralized energy consumption database for all operations within the Municipality; the database will be updated on a monthly basis and will be accessible to all staff;
- Establish energy monitoring and reporting program to enhance access to energy consumption data for facilities operators and managers to assist in planning efficiency and conservation initiatives;
- Report annually to Council on the progress of the ECMP implementation and the energy performance of the Corporation;
- Communicate energy conservation successes regularly to both internal and external stakeholders, including public;
- Establish staff energy efficiency program by promoting and coaching staff on simple conservation actions combined with and incentive program. Recognizing the efforts of staff enhances the awareness of energy management, encourages staff to pursue energy efficiency and can build collaboration among departments;
- Investigate Collaborative Procurement of Natural Gas and Fuels with other local government to achieve discounted prices for those commodities;
- Investigate options for the implementation of energy projects that utilize public-private partnerships;
- Undertake pilot projects to determine benefits/weaknesses of any new emerging technology as applicable for the corporate use;
- Consider the LEED (Leadership in Energy and Environmental Design) standards as guidelines in design, construction and renovation of buildings.

The above mentioned measures will be implemented during duration of the ECMP, starting in fourth quarter of 2014 (i.e. establish the Energy Management Team, establish centralized energy reporting database). Some of them will be implemented on on-going basis such as awareness training, energy monitoring and reporting. For organizational measures, estimating a cost, savings and lifespan of the measures is difficult and can be based on case studies. For example, adopting a LEED standards building policy can result in energy savings of 25-30% over a building built to code. For behavioural

measures, cost can be very low and behavioural programs can result in 5-10% reduction in energy use.

8.2 Technological Measures

The Municipality owns and operates a variety of facilities that utilize different equipment in their operations. Upgrading equipment and modifying processes presents an excellent opportunity to improve the energy performance of the Municipality. To identify these opportunities, staff reviewed and analysed initiatives employed by other civil institutions and utilized the energy auditing service provided by LAS. Staff identified the largest energy consuming facilities within the Municipality and provided energy consumption data to the LAS auditor for analysis. Smaller facilities that consumed relatively limited quantities of energy were not considered for the auditing at that time. Based on this screening process, the Water Treatment Plant and the Sewage Treatment Plant were audited. Jack Burger Sport Complex was also identified for an audit however due to the upcoming revitalization project the audit was not recommended at this time. The auditing process included the analysis of facility energy consumption information, walk-through facility energy audit and identifying energy savings opportunities for capital, operational and maintenance changes. The auditor conducted the walk-through audits with support from each facility manager. The following opportunities for energy conservation were identified for those facilities:

<u>Water Treatment Plant:</u>

- Replace existing ”high bay” lighting at the plant with LED – it may provide up to 50% reduction on energy used for lighting;
- Eliminate heat sink at the wastewater treatment room by installing a cover or applying the air curtain;
- Insulate pipes – not viable option from the maintenance perspective;
- Consider replacing existing heat system with heat pumps (air to air or utilizing process heat);
- Install occupancy sensors in the washrooms and lunch room – estimated cost $200.

Implementation of those measures, estimated cost and projected savings will be evaluated by the Energy Management Team in consultation with the Water Operations Manager in 2015.

<u>Sewage Treatment Plant:</u>

- Replace existing exterior wallpack lighting with LED – cost varies from $200-600 depending on a wattage of the lamp; up to 50% energy use reduction for lighting;
- Replace existing interior Metal Halide lighting with LED – up to 50% energy use reduction for lighting;
- Automation and optimization of building and processes - temperature controls and process optimization – estimated 5-10% energy use reduction;
- Blower optimization – install variable frequency drivers on the aeration blowers;
- Install heat pumps to utilize process heat or air to air heat pump.

Implementation of those measures, estimated cost and projected savings will be evaluated by the Energy Management Team in consultation with the Sewage Treatment Supervisor in 2015.

Energy Conservation – Capital Projects

The Jack Burger Sports Complex Revitalization

This project will include reasonable approaches to energy efficiency. The project is primary focused on the restructuring of existing spaces to enhance the recreational experience and satisfaction of users, and extend a life expectancy of the building. However, the project includes the installation of upgraded, energy efficient HVAC systems including dehumidification system for the pool areas, replacement of interior lighting with more energy efficient fixtures and optimizing usage of natural lighting with windows throughout the building. The project completion is anticipated for June 2015. The energy consumption will be monitored closely after the completion of the project for at least one year and this information will be used as a baseline for future energy conservation initiatives for this facility.

Police and Fire Facilities

In 2013, Council approved the construction of a joint Police and Fire Services facility to be located on Fox Road. A new building will host Police Services and Fire and Emergency Services. The Fire Services portion of the building will be primarily a response only station housing existing vehicles and equipment currently in use at Stations 1 and 2. Construction is anticipated to take more than a year to complete with occupancy near the end of 2015/ early 2016. Combining the new station with the Police facility aligns with Council's Corporate Strategic Plan strategy goal of developing innovative and cost-effective Municipal services as we continue to provide current levels of response and service to our residents and business owners. A design of the new facility is to include all reasonable approaches to energy efficiency as per LEED standards. The energy consumption will be monitored closely after a completion of the project for at least one year and this information will be used as a baseline for future energy conservation initiatives for this facility.

Other Municipal Facilities

The following energy reduction initiatives are recommended for consideration and implementation in all Municipal facilities, where applicable:

- Reduce energy usage by continually upgrading facilities with energy conservation in mind;
- Conduct walk-through self-audits to collect information on facility energy usage characteristics;
- Replace old hot water tanks with newer more efficient models or on-demand models, based on a life cycle plan;
- Implement conversion to low flow, low-e windows, etc. over time at each facility,

as applicable;

- Replace windows and doors with products which meet Energy Star rating; tinting of south and west facing windows – estimated 10% energy use reduction;
- Continually upgrade interior lighting with more efficient fixtures, where applicable;
- Replace Exit, exterior and parking lighting with high efficiency LED lighting – estimated up to 50% reduction on energy used for lighting;
- Implement building automation systems wherever possible, i.e. overhead door interlock for garage and fire hall doors, HVAC, etc.;
- Replace existing lights with new T8, T5 and CFF at various facilities;
- Install programmable thermostats in all buildings;
- Replace HVAC systems with new efficient models, where applicable –estimated up to 30% energy use reduction;
- Install occupancy sensors in offices, lunchrooms and washrooms – estimated 5% energy reduction; cost will vary depending on how many to be installed, occupancy, and usage of the area;
- Upgrade insulation to buildings as determined to be required;
- Investigate additional energy conservation opportunities by scheduling the energy audits to be conducted by LAS or other agency;
- Investigate energy conservation grants and incentives applicable to above listed measures.

The estimated energy reductions for above mentioned initiatives may vary from 2-30% depending on type of the initiative and new evolving technologies being available for implementation. The Energy Management Team in consultation with staff responsible for facilities management will review all past energy conservation projects and identify new possibilities. The review will take place in 2015.

Street Lighting

Street lighting operations account for approx. 8% of the energy consumption of the Municipality (Corporate Climate Action Plan 2010). In February 2014, the Municipality through a partnership with Langley Utilities completed a retrofit of the 1572 street lights in an urban area of the Municipality. The existing High Pressure Sodium (HPS) with magnetic ballast were replaced with new HPS lights and digital ballast thus reducing the energy use for street lighting by 44%. It is estimated that this initiative alone will provide approx. 4% energy reduction in total energy consumption by the Municipality. The total cost of the project was $665,461.66 (including net HST) to be repaid over 5 years by installments from savings realize from lower energy cost (estimated at $59,268 annually) and lower maintenance cost since those lights have 5-year warranty. The implementation of the proposed streetlight retrofit project through a partnership with Langley Utilities will allow the Municipality to achieve significant long term savings in the operating budget with no initial capital cost.

Renewable Energy

Energy conservation is an effective approach to reduce energy consumption and improve efficiency; however consideration must also be given to energy supply and

generation. There are opportunities to generate energy using renewable sources as part of the corporate energy management program.

There is no renewable energy generation facility currently installed and operated by the Municipality of Port Hope. Staff investigated the deployment of renewable energy at Jack Burger Sports Complex JBSC). Rooftop photo voltaic (PV) solar panels were considered however it was recommended that it should proceed at the time of the roof replacement.

There are opportunities to install small scale renewable equipment or infrastructure within the Municipality. These systems can be strategically incorporated into current systems, such as solar hot-water heaters or employed to provide energy for non-serviced locations such as off-grid solar voltaic traffic lighting or signs. These systems would serve as demonstration projects for the public while reducing electrical grid consumption. As part of the ECMP implementation staff will investigate and identify opportunities to install renewable energy generation infrastructures.

9.0 Corporate Energy Management Team

For the Municipality of Port Hope to achieve its ECMP goals energy conservation has to become a higher priority for all Municipal staff and energy conservation must be integrated across the organization.

It is recommended that the Municipality will establish a corporate Energy Management Team (EMT) to oversee implementation of the ECMP, provide input and integrate energy policies and initiatives into departments operations and to enhance collaboration between departments and knowledge sharing in regards to energy conservation.

The Energy Management Team shall be comprised of the staff that have responsibility for planning and authorizing corporate capital and operating expenditures as following, but is not limited to:

- Environmental Compliance Technician;
- Financial/Purchasing representative;
- Appropriate Department representatives;
- Facilities representatives;
- Roads representatives; and
- Other staff as appropriate.

The EMT would monitor the implementation of the Energy Conservation Management Plan; review Plan periodically to ensure that there is progress in achieving a target, and advise staff on issues related to energy or energy conservation. Meetings of the EMT will also provide an opportunity for discussion on energy management strategies that may benefit all departments. The EMT members will share their knowledge on energy consumption and conservation with staff in their respective departments. The representatives from local utilities may be invited to the EMT meetings to provide update on available energy conservation programs/incentives.

The EMT will be established in fourth quarter of 2014 and will meet semi-annually.

10.0 Plan Implementation

The ECMP would provide guidance to the Municipality for energy conservation for period of five years, from 2014 – 2019. The EMT would be responsible for the ECMP implementation and monitoring.

Successful implementation of the ECMP requires effective financial planning and budgeting. Implementing energy efficiency and conservation initiatives generally makes sound financial sense when considering the long term operational costs savings. Identifying and allocating funding sources for these projects will help to ensure these initiatives are implemented.

Individual departments will be responsible for the project management for the implementation of the specific energy conservation initiatives, with support from the EMT. Projects will be implemented on a case-by-case basis and brought forth for Council's consideration and approval as necessary. It is recommended that through annual budget process, an energy compliance component will be incorporated as a rationale for budget requests. In addition every capital project, if applicable, should be reviewed by the EMT and recommendation made in regards to energy impact.

A distinction must be made between an energy conservation initiative and a regular capital replacement or upgrade. Generally, as old equipment or infrastructure is replaced there will be an improvement in energy performance as the new equipment will be more efficient due to design and technological improvements. In these cases of planned replacement of capital assets, the projects should be funded through the regular budgeting process. However, improvements can be implemented outside of the regular capital replacement program where changes to processes or deploying new technologies can be funded through the available grants, Federal Gas Tax or incentives programs.

11.0 Monitoring and Verification

The ECMP establishes energy conservation targets and identifies energy efficiency measures to be implemented. Continuous monitoring, verification and reporting are an essential tool to track consumption and savings as a result of implemented initiatives.

Monitoring the overall energy performance of the Municipality is a process which involves quantifying the total energy consumed year-over-year and comparing the consumption to the conservation target. This will be conducted annually and reported to Council.

Staff will evaluate benefits of using the LAS online Energy Management Tool (EMT) to assess the effectiveness of implemented measures. The tool allows for analysis and comparison of energy consumption metrics for a specific facility over a variety timeframes.

12.0 Project and Program Implementation Timelines

Table 3 provides a summary of the recommended programs outlined in section 8.1 to improve the best management practices of the Municipality.

Staff must be flexible in the ECMP implementation to re-prioritize actions to take advantage of opportunities as they arise.

Table 3: Summary of Recommended Programs

Program / Process	Description	Objective	Year of Implementation
Endorse Energy Management Plan and Conservation Targets	Establishes conservation targets for the Municipality	To establish a formal corporate commitment to energy management	2014 – Q2
Establish corporate Energy Management Team		Energy Management Team will overlook Plan implementation	2014 – Q4
Energy Monitoring and Reporting Program	Establishes a reporting framework for energy management for Staff and Council	Improve awareness among Staff and Council and improve access to usage data for facility managers and staff	2014 – Q4
Staff Energy Efficiency Training	Training on energy use and conservation	Promote behavioural change to embrace energy conservation at work	2015
Staff Energy Efficiency Program	A program that engages and celebrates energy conservation action within the workplace		2015-2016
Investigate Bulk / Collaborative Procurement of Natural Gas	Determine benefit of natural gas bulk purchasing	Reduce cost of natural gas	2015

13.0 Summary and Recommendations

The Municipality of Port Hope ECMP establishes a strategic framework that ensures that the wise use of energy and commitment to environmental sustainability are part of the shared values and actions that reflect all corporate services. By providing a basis for the Municipality to move forward with energy conservation, the plan offers a co-ordinated approach to reducing energy consumption and maintaining achieved improvements. The ECMP has been developed to serve as guidance to identify specific energy efficiency actions, to manage energy data and to help monitor effectiveness of implemented energy conservation initiatives.

Appendix A

Port Hope Municipal Facilities Energy Retrofits 2008-2011

Facility Name	Retrofit/Changes 2008-2011	Existing energy efficient features/ building information
Port Hope Town Hall	2009 - 29 light fixtures (2-lamp 4ft) were changed from T12 to T8 as part of Power Savings Blitz program for a cost of $647. All incandescent light bulbs were changed to CFL. 2011 – Installation of energy efficient windows (double glazed); 2011 – Installation of new heating system; New York LX gas furnaces can reduce energy costs by nearly 40% compared to old furnaces; 6 furnaces (AFUE of 96%and total 620,000BTU) and 6 air conditioners (total of 25 Ton) installed.	- New roof installed in 2000 (probably R20 insulation used); - Window treatments (blinds) installed in all windows; - Hot water tanks are insulated; - Motion light sensors and timers are used to control lights usage;
Municipal Development Team office **5 Mill St. South**	2009 - seventeen (17) light fixtures (2-lamp 4ft and 4-lamp 4ft) replaced with T8 and four 60 W incandescent with 13W CFL bulbs for total of $239.40; 2009 - Electric water heater insulation installed 2009 - New roof installed with R35 insulation (total cost $71,873)	- Double pane windows - All windows have blinds - New heating and air conditioning installed in 2005 - Programmable thermostats are used and set for on/off hours - Existing lights are all T8 or CFL
Fire Hall #1 - Port Hope	- Installed new high-efficiency gas heat pump and air conditioner (replaced old electric one); - Replaced majority of the fluorescent lighting with smaller fluorescent lighting (T12 replaced with T8). (Approx.66 light fixtures in the building)	
Mary J. Benson Library	Replacement of a large single pane window with new low E coating and argon filled unit on a north-west side of the building; 2012 – upgrades to HVAC system software to improve performance and efficiency	New roof installed in 2002 (assume sufficient attic insulation R35+)

Facility Name	Retrofit/Changes 2008-2011	Existing energy efficient features/ building information
Jack Burger Sports Complex	June 2008 – 40 metal halide light fixtures (400W) were replaced with T5 fluorescent lights in pool enclosure (approx. annual hydro savings of $5,000); 2009 - installed oversized cooling tower for refrigeration system thus reducing the run time of the refrigeration plant. Installed glycol loop to cool compressor heads thus allowing them to operate more efficiently; Summer 2009 – installed new Honeywell ice temperature controllers which allow to program temperature of the ice during different times of the day. It will reduce run time of refrigeration plant; Summer 2009 – installed new electrical panel for refrigeration plant which includes soft starts for compressor motors reducing peak loads on system (use less hydro); Winter 2010 – installed expandable insulation and new light coloured siding on exterior of east wall of the arena. Energy consumption on refrigeration plant and the dehumidifiers will be reduced as less heat penetrates through the block wall into the arena; Summer 2010 – installed T5 fluorescent lights in pool filter room	
Victoria Street Works - Garage & Office (now Joint Operations Centre - JOC)	Major renovation in 2010 – there were many energy-efficient features implemented including using T8 and T5 light fixtures, R35 insulation throughout the building and a roof, light coloured roof to reflect heat, hot and cold piping insulation, low water consumption toilets and showers, high efficiency water heaters (insulated), high efficiency gas heaters, high efficiency air conditioning unit, pumps equipped with variable frequency drivers, occupancy sensors and others; Water Distribution and Parks Operations has moved from other locations; 3 dept. operations consolidated in one location	

Facility Name	Retrofit/Changes 2008-2011	Existing energy efficient features/ building information
Ruth Clarke Activity Centre	Replaced older window AC units with central air conditioning unit 2008 - High efficiency furnace installed 2012 – new roof installed	
Ganaraska Region Archives (now Port Hope Archives)	2009 - 29 light fixtures were changed from T12 to T8 as part of Power Savings Blitz program for a cost of $647.	- Metal roof (insulation type unknown -likely R20); - windows have metal shutters installed; - baseboard electric heating is used (limited by construction type) in conjunction with programmable thermostat; - window air conditioning unit (2 years old);
Port Hope Police Services	2009, all light fixtures were changed from T12 to T8; Started using roof top HVAC units to heat a building in fall 2010, therefore did not use the boiler all winter. Three (3) small electric heaters are in use in the basement since roof top units are not vented there;	Programmable thermostats are in use
Town Park Recreation Centre	Upgraded gymnasium lighting controls	
Canton Works - Garage	Switched from oil heating to electrical; The electrical service was changed from 200 amps to 400 amps. One 15 kW heater installed in the building	
Fire Hall #2 - Welcome	Replaced majority of the fluorescent lighting (T12) with smaller fluorescent lighting (T8)	
Garden Hill Library Branch(Library Portion Only)	Replaced majority of the fluorescent lighting (T12) with smaller fluorescent lighting (T8). Installed programmable thermostats	
Canton Municipal Office	2010 - 6 windows replaced with new energy efficient 2010 - installed heat pump to replace baseboard heaters	

Facility Name	Retrofit/Changes 2008-2011	Existing energy efficient features/ building information
Garden Hill Park	New efficient lights installed at the Ball Park	

Prepared by Environmental Compliance Technician based on information provided by various Municipal Departments

MUNICIPALITY OF PORT HOPE
RESOLUTION

Date: 24 Jun 2014

78/2014

MOVED BY: _____

SECONDED BY: _____

WHEREAS Committee of the Whole at their meeting held on June 17, 2014 considered a Staff Report regarding Energy Conservation Management Plan;

NOW THEREFORE BE IT RESOLVED THAT Council endorse the Energy Conservation Management Plan for the Municipality of Port Hope as attached to the Staff Report dated June 16, 2014 to be utilized as a guide for achieving greater Municipal energy conservation.

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Mayor Linda Thompson