Incorporation ~ 1973

The Municipality of Val Rita - Harty

Energy Conservation and Demand Management Plan

July 2014

Prepared by

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Preface

This Energy Conservation and Demand Management (CDM) Plan was developed by the Engineering Services group of the Ontario Clean Water Agency with the assistance from the staff of the Municipality of Val Rita - Harty (Municipality).

The objective of the CDM Plan is to develop strategic plans and set goals such that the Municipality may have a guideline to manage its energy consumption effectively and efficiently.

This Plan will also assist the Municipality in complying with the Green Energy Act, O.Reg. 397/11 - Conservation and Demand Management Regulation.

1. Introduction & Background

The Ontario Regulation 397/11 under the *Green Energy Act 2009* requires public agencies (municipalities, municipal service boards, school boards, universities, colleges and hospitals) to report on their energy consumption and greenhouse gas (GHG) emissions annually beginning in 2013 and updated annually, and to develop and implement a 5-year Energy Conservation and Demand Management (CDM) Plan starting in 2014 and updated every 5 years.

There are significant advantages to developing and implementing a CDM Plan. Reducing energy consumption translates to reducing costs to a municipality and the savings could be directed to other important works in the municipality.

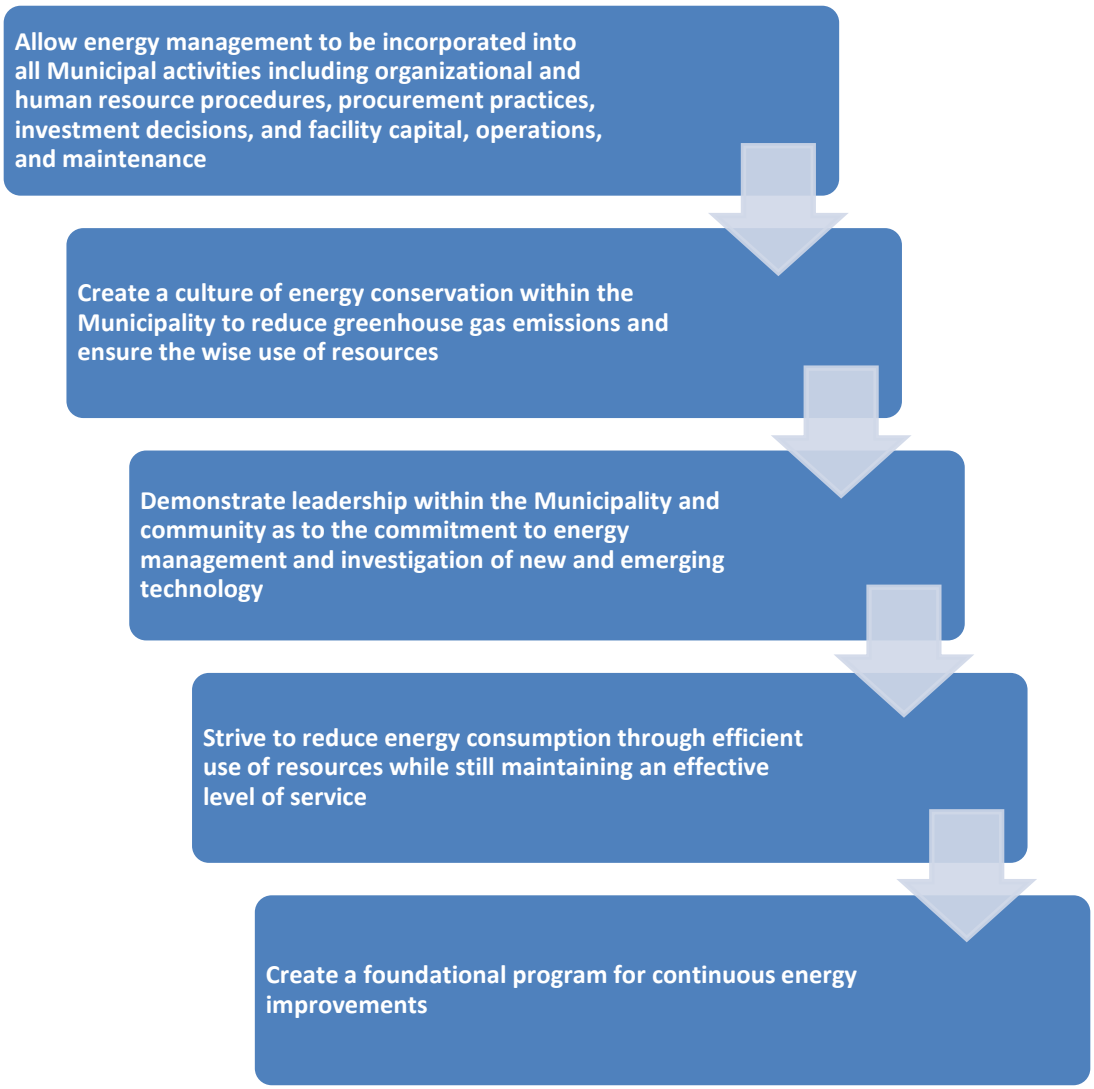
The CDM Plan should be consistent with other existing planning documents that relate to energy conservation. This Plan should also document all energy conservation initiates that the Municipality currently have and plan to implement.

1.1 Overview

The intent of the CDM Plan is to guide the Municipality of Val Rita - Harty in the development of an energy management foundation. It is a living document that will evolve as the Municipality's energy needs are revealed and better understood. This Plan is designed to meet the current energy needs of the Municipality. An improved understanding of corporate energy consumption will require improvements in energy management and awareness. Energy awareness campaigns along with the integration of energy efficiency into capital and operational decision making will be incorporated in the Municipality's plan.

1.2 Objectives

The following objectives will be adopted to create a foundation for the Energy Conservation and Demand Management Plan.



1.3 Official Plan of the Municipality of Val Rita - Harty

Energy conservation and management is part of the “Official Plan of the Municipality of Val Rita - Harty, July 2006”. The Official Plan encourages the implementation of energy conservation practices for new developments and existing facilities in the Municipality.

Some of the energy conservation strategies from the Official Plan are listed below:

“The Council shall support development proposals which incorporate energy conservation measures such as the solar orientation of streets, lots, and buildings and landscape buffering to reduce space heating/cooling loads, and encourage innovative structural designs"

“In order to encourage more efficient proposal designs for new buildings, or for the retrofitting of existing buildings, Council shall support site specific zoning amendments or minor variances in order to accommodate energy conservation measures”

“Development will only occur where careful examination of environmental issues and servicing arrangments, which includes water, sewage disposal and storm drainage, is undertaken”

This CDM Plan complements the Official Plan in defining practical objectives in order to realize the goal to create an energy efficient and comfortable environment in the Municipality of Val Rita - Harty. Energy conservation and management does not only deal with electricity but rather it covers a broad area that spans to water/wastewater, solid waste and environmental management for instance, as the efficient management in those areas can also lead to reduction in energy consumption.

1.4 Energy Demand and Cost

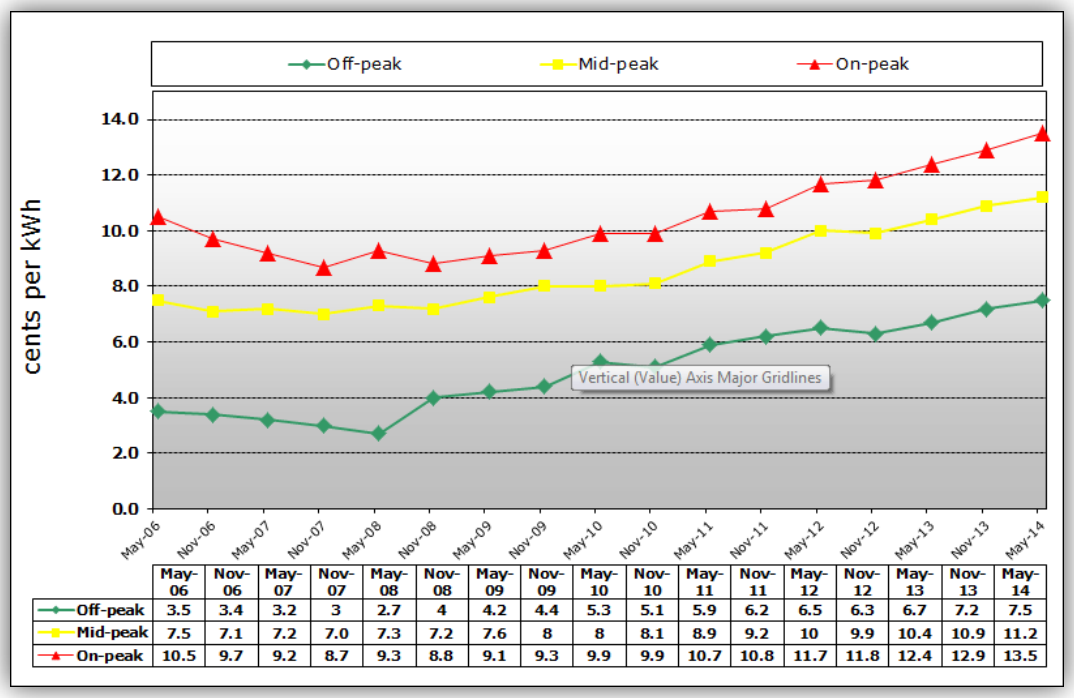
Population

The Municipality of Val Rita - Harty has experienced an overall decreasing population size over the last decade. The Official Plan of the Municipality of Val Rita – Harty predicts an estimated population of 1066 by 2016. Should population continue to decrease instead of increase as projected by the Official Plan, facilities would be required to be optimized to match the reduced amount of demand for public energy and services. Reduced population means there would be less contribution to municipal fees. It is imperative that measures be taken to replace/optimize aging and inefficient equipment under these circumstances.

Cost of Energy

The cost of energy in Ontario has been rising steadily since 2007 as shown in the chart below from the Ontario Energy Board.

Cost of Energy (kWh) in Ontario

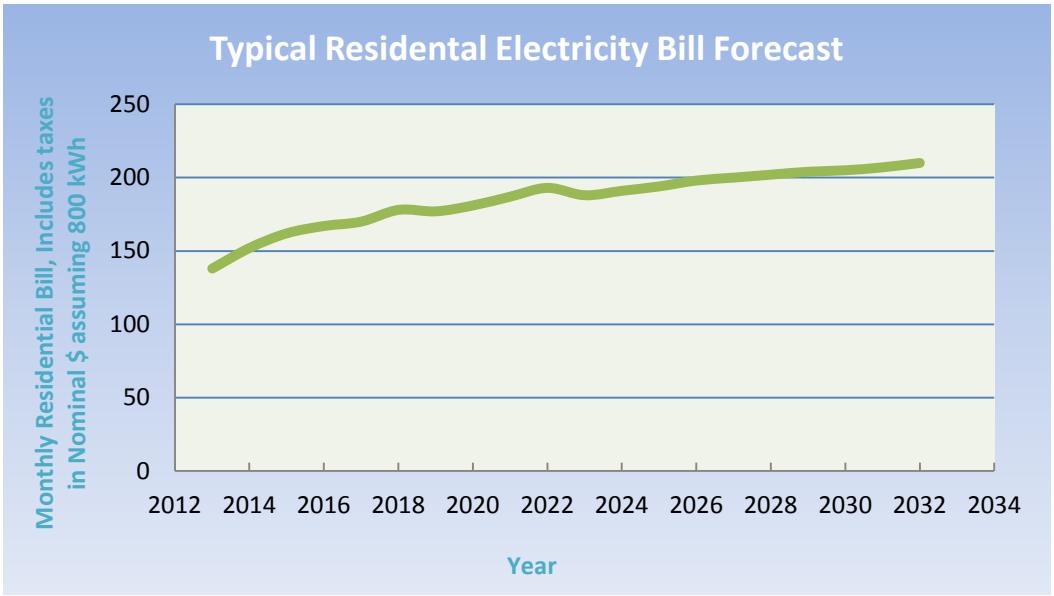


	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09	May-10	Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14
Off-peak	3.5	3.4	3.2	3	2.7	4	4.2	4.4	5.3	5.1	5.9	6.2	6.5	6.3	6.7	7.2	7.5
Mid-peak	7.5	7.1	7.2	7.0	7.3	7.2	7.6	8	8	8.1	8.9	9.2	10	9.9	10.4	10.9	11.2
On-peak	10.5	9.7	9.2	8.7	9.3	8.8	9.1	9.3	9.9	9.9	10.7	10.8	11.7	11.8	12.4	12.9	13.5

Source: Ontario Energy Board, www.ontarioenergyboard.ca

Using the Mid-peak cost line as an average, the cost of energy increased approximately 60% from November 2007 to May 2014.

According to *Ontario's Long Term Energy Plan* published by the Ministry of Energy in 2013, the cost of energy will continue to rise. The chart below shows the electricity bill forecast for a typical residential household.



Source: Ontario's Long Term Energy Plan, 2013, www.energy.gov.on.ca

It is forecasted that the major increases would be from 2013 to 2018 - an approximated 29% increase. The year-to-year increase would then be smaller from 2018 to 2032.

With the cost of energy continuing to rise at a rapid pace, energy conservation and management should be made a priority in every municipality.

This is the very reason that the Ministry of Energy created the O.Reg. 397/11 requiring public agencies to develop an Energy Conservation and Demand Management Plan.

2. Baseline

The establishment of an energy consumption baseline is essential for energy management and to monitor the effectiveness of energy efficiency projects.

It can also assist with target setting, bill verification, energy awareness and the selection and assessment of potential energy projects.

The Municipality of Val Rita - Harty uses its electricity utility bills to establish its energy consumption baseline for the reportable municipal buildings.

The Municipality began collecting energy consumption data in 2011, and to date there are three full years (2011 to 2013) of data for comparison. 2011 and 2012 energy data were collected as a requirement of the Part 1 of the Regulation 397/11 under the *Green Energy Act* in which energy consumption and greenhouse gas (GHG) emissions data have to be reported annually.

The 2013 energy consumption data is used as the baseline for this CDM Plan.

The table below summarizes energy consumption data from 2011 to 2013 for the reportable facilities.

	Electrical Energy (kWh) Consumption					Natural Gas (m3) Consumption				
Facility	2011	Difference From 2011 to 2012	2012	Difference From 2012 to 2013	2013	2011	Difference From 2011 to 2012	2012	Difference From 2012 to 2013	2013
Municipal Building	29,999	-975	29,024	2,924	31,948	7,314	-505	6,810	1,421	8,231
Public Works	17,501	-1,065	16,436	264	16,701	10,580	-1,978	8,601	3,471	12,073
Water Treatment Plant	41,883	225	42,108	20	42,128	23,331	-2,866	20,464	1,437	21,901
Ste-Rita Centre	12,978	23,402	36,380	15,534	51,914	1,218	6,048	7,266	-1,186	6,080
Total	**102,361**	**21,587**	**123,948**	**18,742**	**142,690**	**42,443**	**698**	**43,141**	**5,143**	**48,284**

2.1 Trends in Energy Consumption

It is important to examine the trends of energy consumption for each facility. It could provide an overall picture of the behaviour of the facilities and a forecast of future consumption. Actions could be planned accordingly should there be distinctive trends that need attention.

Electrical Energy Consumption Trend

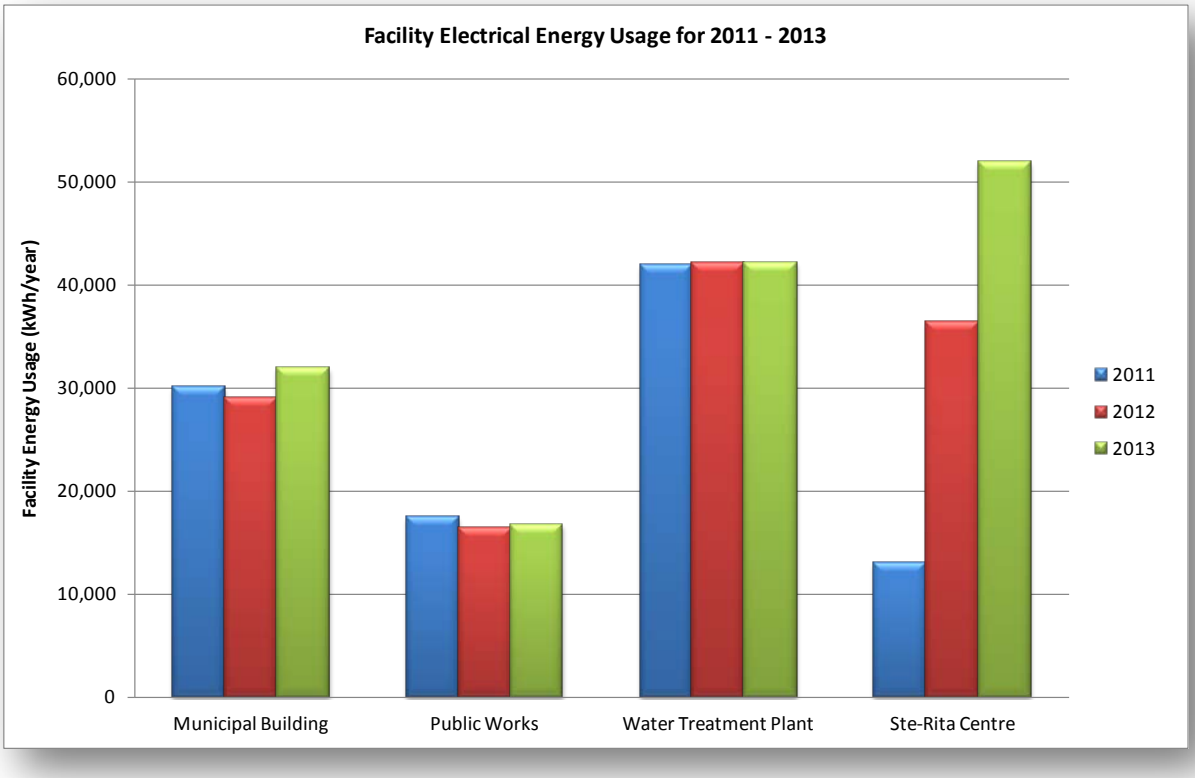
There is an increasing trend in the total electrical energy consumption of the facilities in the table above. There was a yearly increase of 21,587 kWh (21%) and 18,742 kWh (15%) from 2011 to 2012 and from 2012 to 2013, respectively.

The main contributor to the increase in energy consumption was the Ste-Rita Centre that consumed 12,978 kWh in 2011, 36,380 kWh in 2012, and 51,914 kWh in 2013. An increase of 23,402 kWh and 15,534 kWh was seen between the two consecutive years. The reason for this drastic increase is due to the Ste-Rita

Centre, which was a church facility up until 2011, was repurposed in 2012 to accommodate community centre activities and functions. As a result, the space is used more frequently and consumes more energy. The Municipality has plans to reduce the amount of energy used at the Ste-Rita Centre that are described in more detail in Section 5.5.

The energy consumption in the other three facilities has been fairly consistent from 2011 to 2013. They are considered to be small energy consumers and it is more difficult to reduce energy consumption in smaller facilities as there is a minimum requirement for essential energy usage. However, there are still opportunities for improvement. There have been various initiatives in the Municipality to reduce energy usage. Energy conservation and demand management has been and will continue to be an on-going process in the Municipality.

The chart below provides a perspective of the amount of energy usage from 2011 to 2013 for each municipal facility.



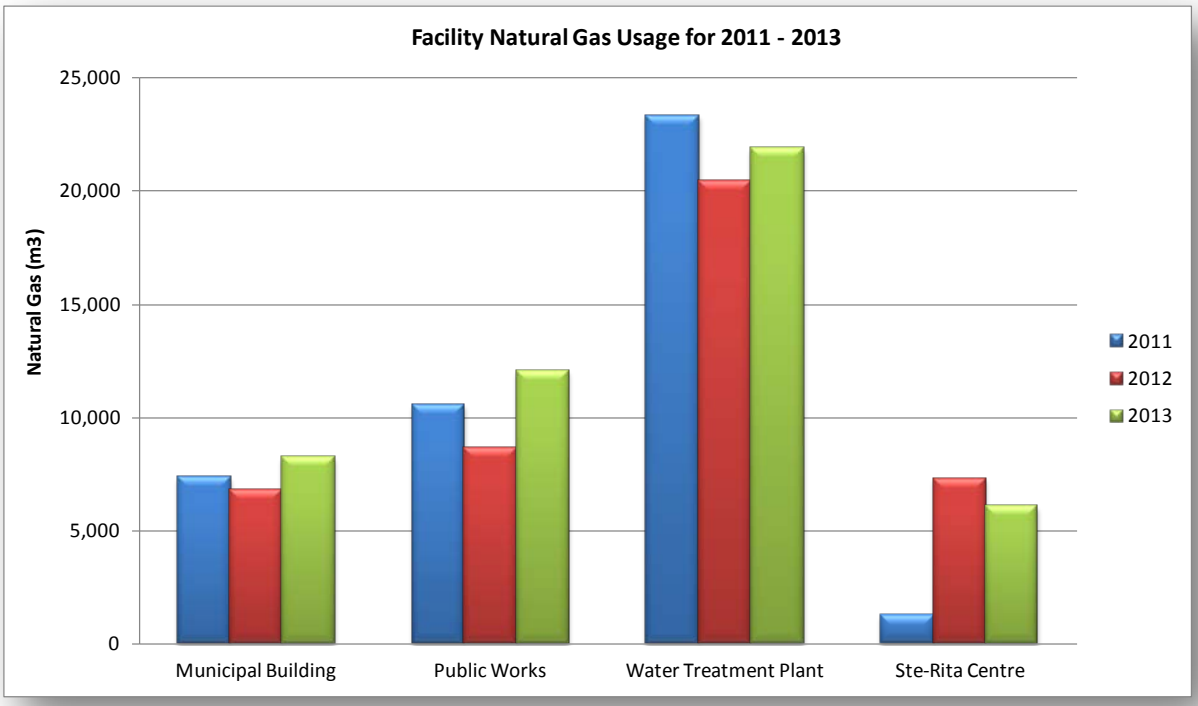
Natural Gas Consumption Trend

There is also an increasing trend in the total natural gas consumption of the municipal facilities. There was a yearly increase of 698 m^3 (2%) and 5,143 m^3 (12%) from 2011 to 2012 and from 2012 to 2013, respectively.

A majority of the increase from 2011 to 2012 was contributed by the Ste-Rita Centre for the reasons described above.

Natural gas is used for heating purposes and the amount of heating required could vary significantly and is highly dependent on winter temperatures. Should there be many cold days in a winter, the gas usage would be higher. However, there are energy conservation measures that can reduce heating requirement, including lowering the thermostat temperature while maintaining a comfortable environment, and using less hot water.

The chart below provides a perspective on the amount of natural gas usage by the facilities.



3. Current State of Energy Usage

The Municipality of Val Rita – Harty is aware that energy conservation and management is imperative to creating a sustainable environment and reducing on-going operations/energy costs. There have been various works in the Municipality in recent years that contributed to energy conservation and management.

Energy conservation and management does not include only electricity usage reduction in buildings. Water conservation and solid waste management also play a direct role in the overall target for efficient energy management. The lower the amount of water and waste produced the less energy required for treatment and disposal.

3.1 Energy Conservation in Buildings

Energy conservation has been an on-going process and priority in the Municipality as per the Official Plan. Under this goal, the focus is to lead by example through energy consumption reduction at municipal facilities. New developments and redevelopments including replacement/retrofit works are encouraged to be built and sustained in a manner that minimizes energy consumption. Electrical equipment replacement works over the years have been evaluated against energy efficiencies criteria, and the most cost-effective option at that time was chosen.

3.2 Street Lights & Festival Lights Retrofit

Street Lights

In April 2014 the Municipality retained RealTerm Energy Corp. to perform an Investment Grade Audit of the Municipality's street lights. RealTerm examined the existing street lights in the Municipality and the energy savings that could be achieved with the replacement to more efficient LED street lights. It was determined that an estimated **5.87 kW** in demand savings and **25,702 kWh** in energy usage savings could be realized on an annual basis, and the payback period is estimated to be 4.5 years.

The Municipality of Val Rita – Harty is moving forward to implementation of this project in August 2014. This initiative has a significant positive effect on the amount of energy consumption in the Municipality.

Festival Lights

The Municipality has been continuously changing the existing festival lights along the highway to LED lights. LED lights are more energy efficient and would reduce the overall energy consumption in the Municipality. This retrofit would likely be on-going for a few more years.

3.3 Water Conservation

The Municipality of Val Rita – Harty has made effort in recent years to reduce water usage. The Municipality is considering the installation of water meters in the Municipality in order to continue the water conservation process and benefit by consuming less energy in the process.

Installation of water meters has multiple benefits:

Immediate water usage reduction

Historical statistics have shown that buildings reduce water consumption immediately following the installation of water meters.

Ability to detect water loss/leaks

The summation of all water meter readings over a period of time can be compared to the amount of water output at the water wells over the same period of time to see how much of the wells output actually gets consumed. This verification check could provide an indication of water loss or watermain leaks should the consumption be much lower than the water output.

These two parameters should be compared on an annual basis for a meaningful analysis. Should the gap between them increases, it is likely that watermain leaks are worsening and an investigation may be warranted.

Increase capacity of Water and Wastewater Systems

All water and wastewater systems have a rated capacity or maximum output that they can produce. Should output be near the rated capacity (~80% of rated capacity) as demand increases, studies should be initiated to increase the capacity which would typically involve major upgrades to these systems.

Reducing water consumption has a direct effect on reducing output of the water and wastewater systems and could avoid costly capital upgrades.

The amount of wastewater produced is also directly related to the amount of water consumed as a majority of the water consumed is released to the sewer system, hence, reducing water consumption has the effect of “increasing capacity of both water and wastewater systems” in the community. This is in turn beneficial from the municipal planning perspective as there would be capacity to accommodate new housing or commercial developments.

Decrease energy consumption of Water and Wastewater Systems

Water and Wastewater systems are costly to operate, in fact, combined they are the single largest energy consumer in the Municipality. The treatment and pumping of water and wastewater are very energy and chemically intensive. Reducing output from these systems directly decreases energy and chemical cost.

The chart below shows the yearly amount of water treated at the Val Rita Water Treatment Plant, as well as the decreasing trend of water use in the Municipality.

Val Rita Water Treatment Plant - Water Data

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Water Output (m3)	61,402	60,011	56,103	50,013	47,946	47,128	46,594	46,541	46,377
Difference in Water Output from Previous Year (m3)	-	-1,391	-3,908	-6,090	-2,067	-818	-534	-53	-164
Decrease (%)	-	2.3%	6.5%	10.9%	4.1%	1.7%	1.1%	0.1%	0.4%

From 2005 to 2013, the water usage in the Municipality has decreased year over year. There is a steady and pronounced trend towards less water use. With decreasing water consumption, wastewater produced would also decrease. This decreasing trend could continue as consumers further adjust their water use habits and replace old appliances with new and more water efficient appliances.

3.4 Solid Waste Management

Solid waste management services including collection and disposal of waste are provided by the Municipality. Solid waste is disposed to municipal landfills.

A “Solid Waste Disposal” section is provided in the Official Plan of the Municipality to regulate the operations and effectiveness of the program.

In general, the amount of solid waste generated by the Municipality has decreased over the years.

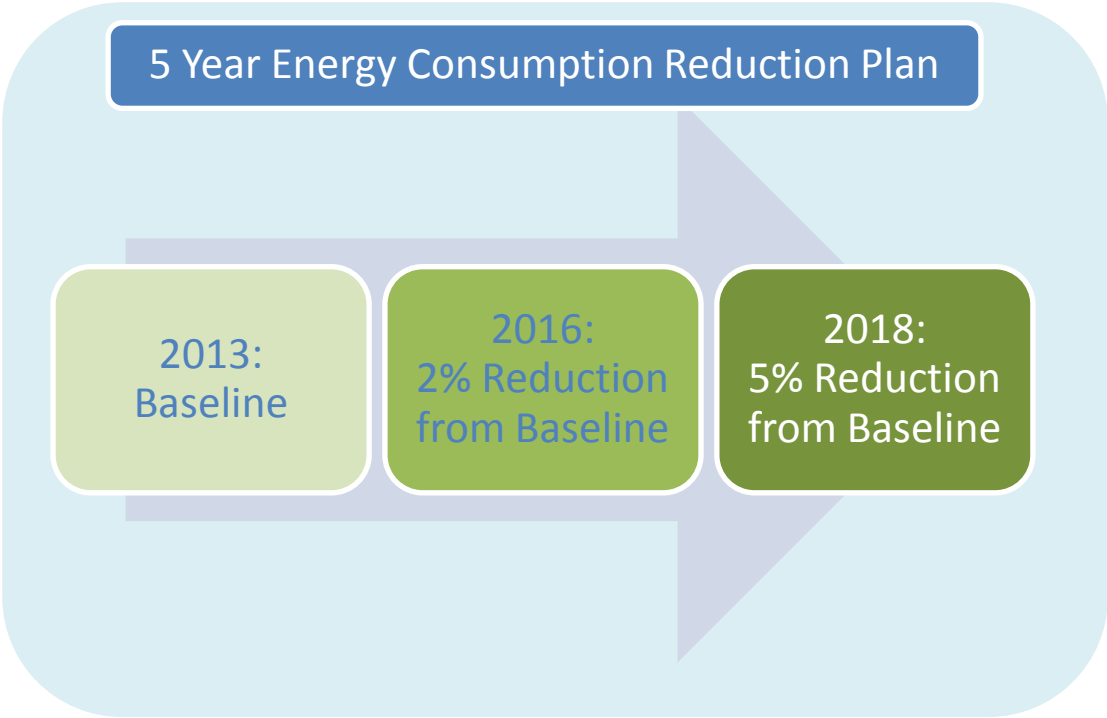
The Municipality will continue to monitor the program and make improvement where applicable.

4. Preferred State of Energy Usage

The municipal buildings of the Municipality of Val Rita – Harty have gone through continuous upgrades and improvements over the years.

However, there are more opportunities for improvement and the Municipality is committed to continuously monitoring energy consumption and implementing energy efficient practices where applicable.

As a target for this 5 year Energy Conservation and Demand Management (CDM) Plan, the Municipality will strive to reduce energy (electricity and natural gas) consumption in each building by 5% by the end of 2018 from the 2013 baseline.



As a short term target, a 2% reduction by the end of 2016 in energy consumption from the 2013 baseline is established. This will provide a target to strive for.

The preferred state of energy usage in the Municipality of Val Rita – Harty is to continue to comply with the guidelines as set out in its Official Plan and to always seek improvement to its energy conservation and management practices where applicable.

5. Energy Conservation Measures & Implementation

In order to reach the preferred state of energy usage as identified in Section 4, energy conservation measures and an implementation plan are required to be developed.

5.1 Energy Conservation Planning Measures

A planning framework acts as an overall guideline to ensuring energy conservation will be realized. Three planning measures are identified: structure planning, resource planning, and procurement planning.

Structure Planning

Consideration of Energy Efficiency for All Projects: incorporate life cycle cost analysis into the design procedures for all capital projects as well as procurement decisions for equipment and other municipal assets. Life cycle cost analysis is a technique to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave. It can avoid a narrow outlook on environmental concerns by: 1) compiling an inventory of relevant energy and material inputs and environmental releases; 2) evaluating the potential impacts associated with identified inputs and releases; 3) interpreting the results to help make a more informed decision.

Resource Planning

Energy Team: all municipal staff have a responsibility to contribute to overall municipal energy management objectives. Technology alone will not achieve energy conservation and demand management objectives. The Municipality will benefit when staff realizes how everyday actions can reduce energy waste and decrease operating costs. Simple actions such as turning off lights, computers and printers, ensuring that filters on heating and cooling coils are clean and dust-free, etc., all contribute to reduced energy use and energy costs in municipal buildings.

Energy Skills Training: provide skills training for operators and employees that have hands-on involvement with energy consuming systems to enhance their capacity to achieve energy efficiency improvements. Training will help lower operating costs, reduce greenhouse gas emissions, increase operational efficiency, and create a better work environment.

Procurement Planning

Energy Purchasing: investigate utilizing purchasing groups and/or cooperatives to procure natural gas, and electricity. The investigation will include the analysis of cost considerations, available energy services, energy quality, and other performance factors. The goal is to obtain the optimal rates while achieving an appropriate level of cost certainty.

Consideration of Energy Efficiency of Acquired Equipment: incorporate energy efficiency and life cycle costing into the criteria for selection and evaluation of materials and equipment.

5.2 Best Practices

Nearly all buildings have lighting and heating, ventilation and air conditioning (HVAC) components, and they typically account for nearly all of the energy consumption in non-industrial buildings. Lighting and HVAC along with the building envelope upgrades are the major works that could lead to energy savings. Best practice measures of the three components are provided below; however, this does not mean all buildings should implement the measures below as each project is different and various factors (i.e. life cycle cost, long term use of the equipment/building, etc.) need to be considered.

Lighting Retrofits

There have been significant improvements in the area of lighting technology in recent years. Energy savings can be achieved by replacing older incandescent, T12 fluorescent, and metal halide lamps with T8 fluorescent, T5 fluorescent, compact fluorescent (CFL), and LED (light-emitting diode) lamps. Newer technology can produce the same amount of light for half or less of the input power, thereby reducing half or more energy consumption. At the same time, lighting levels should be optimized to meet needs - if a 100W and a 80W light bulb both can produce sufficient lighting level for the location, consider installing the 80W light bulb.

Lighting motion sensors could be a beneficial add-on for areas of infrequent occupancy, as most people do not turn off lights when they leave the area. This would ensure the light is automatically turned off when the area is not occupied.

Heating, Ventilation and Air Conditioning (HVAC) System Upgrades

HVAC system improvements offer the greatest potential for energy savings in most buildings. The first step for reducing HVAC operating costs in large buildings is to reduce HVAC loads. "Greening" an existing building may also include replacing equipment with more efficient models, improving controls and operating procedures, and retrofitting existing equipment to operate more efficiently. It must be realized, however, that HVAC systems contain many interrelated components, and upgrading them takes careful planning, professional engineering design, and careful implementation. Properly designed, installed and maintained HVAC systems are efficient, provide comfort to the occupants, and inhibit the growth of moulds and fungi.

Buildings usually operate under less than full-load heating and cooling conditions. Therefore, the greatest overall efficiency improvements will result from giving special consideration to part-load conditions and selecting equipment accordingly. Chiller manufacturers now provide a standard rating for part-load efficiency, reflecting the fact that chillers operate at less than full load 99% of the time. Staging multiple chillers or boilers to meet varying demand also greatly improves efficiencies at low and moderate building loads. Pairing different-sized chillers or boilers in parallel offers greater flexibility. Units should be staged with microprocessor controls to optimize system performance.

The fan motors in packaged units typically run at constant speeds. Variable frequency drives (VFDs) can be installed on the motors to match the fan output to the required airflow. Energy savings vary depending on the specific system characteristics, but in certain cases can be 50% or higher.

Programmable thermostats should be utilized where possible. It can be used to specify an automatic reduction in temperature overnight. Typical savings are 2% of the heating bill for every 1°C that the temperature is reduced overnight.

Building Envelope Upgrades

Reducing a building's energy consumption often revolves around changes to its mechanical and electrical operations or system. However, a building's roof and walls may also provide significant energy savings.

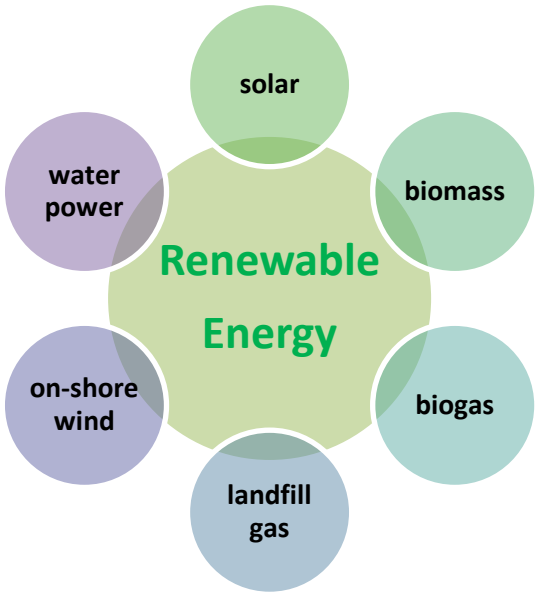
Adding/improving insulation to the roof and walls reduces the amount of heat lost to the environment in the winter and also reduces the heat coming into the building in the summer.

By implementing this measure, studies have shown a building could reduce the heating and cooling load substantially. This is generally a high cost measure for existing buildings since the roof and walls essentially need to be rebuilt. The most effective strategy is to coordinate the work with a roof or wall replacement.

5.3 Renewable Energy

The Ontario Power Authority (OPA) has developed the Feed-In Tariff (FIT) Program for the Province to encourage and promote greater use of renewable energy sources. The fundamental objective of the FIT Program, in conjunction with the *Green Energy and Green Economy Act, 2009* and *Ontario's Long Term Energy Plan, 2010* is to facilitate the increased development of renewable generating facilities of varying sizes, technologies and configurations.

A feed-in tariff is a straightforward way to contract for renewable energy generation. It provides standardized program rules, prices and contracts. It offers stable prices under long-term contracts for energy generated from renewable sources, including:



The Municipality currently has six OPA FIT solar projects installed. Over the last couple of years, these projects generated an average yearly energy output of approximately **82,031 kWh** and produced an average yearly payment from Hydro One of approximately **$64,226**. The energy generation and payment averages for each project is presented in the chart below.

Facility of Solar Panel Installation	Average Yearly Energy Generation (kWh)	Average Yearly Hydro One Payment ($)
1 Couture Ave.	13,504	9,797
3E Cargill Rd.	14,997	10,880
150 Williamson Rd.	12,192	8,845
134 Government Rd.	15,256	11,068
Water Treatment Plant	11,640	10,549
Municipal Garage	14,442	13,088
Total	**82,031**	**64,227**

5.4 New Construction / Redevelopment of Existing Buildings

Energy efficiency measures should be implemented during the construction phase for maximum potential benefit when the measures have been evaluated, planned and designed.

The Municipality of Val Rita – Harty will consider employing sustainable/energy efficient building principles for new or redevelopment of municipal buildings through the pursuit of LEED (Leadership In Energy and Environmental Design) certification where applicable.

LEED is a set of rating systems for the design, construction, operation, and maintenance of green buildings. Developed by the United States Green Building Council (USGBC) and adopted by Canada Green Building Council (CaGBC), LEED is intended to help building owners and operators be environmentally responsible and use resources efficiently.

Under LEED (2009), there are 100 possible base points distributed across six credit categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design. Up to 10 additional points may be earned: 4 additional points may be received for Regional Priority Credits, and 6 additional points for Innovation in Design.

Buildings can qualify for four levels of certification:

Certified: 40 - 49 points

Silver: 50 - 59 points

Gold: 60 - 79 points

Platinum: >80 points

Buildings with LEED certification implies they have employed sustainable and energy efficient practices into their design and construction.

Canada stands as the largest international market for LEED green buildings and boasts more area of LEED-certified space than any other nation outside the United States, according to a report released by the USGBC in June 2014.

LEED certification is becoming more popular in Canada as its benefits are becoming more apparent. It also serves as a reminder to occupants that energy conservation and management is a priority and everyone's responsibility.

5.5 Energy Conservation Implementation - Buildings

Building equipment tend to lose their efficiency as they approach the end of their useful life. A plan should be developed to replace the equipment by evaluating the life cycle cost of the replacement options. The chart below presents the energy conservation measures and implementation plan for each municipal building.

As discussed previously, the Municipality has been continuously improving equipment and their energy efficiency. Many energy conservation measures have already been implemented. The chart below shows proposed measures for the next 5 years.

Municipal Building	2011 Electrical Energy Usage (kWh)	2011 Natural Gas Usage (m3)	2012 Electrical Energy Usage (kWh)	2012 Natural Gas Usage (m3)	2013 Electrical Energy Usage (kWh) / Baseline	2013 Natural Gas Usage (m3) / Baseline	Proposed Measures - Description of Energy Efficiency Work for next 5 years if any	Year of Implementation	Estimated Cost ($)	Estimated Energy Savings (kWh/year)	Estimated Greenhouse Gas (GHG) Emission Reduction (kg)	Champion
Municipal Building	29,999	7,314	29,024	6,810	31,948	8,231	Installation of two rooftop furnaces.	2015 - 2018	To be determined	1,597 kWh (5%)	906	Public Works
Public Works	17,501	10,580	16,436	8,601	16,701	12,073	Installation of new and more energy efficient furnace.	2015	$4,000	835 kWh (5%)	1,208	Public Works
Water Treatment Plant	41,883	23,331	42,108	20,464	42,128	21,901	Implementation of energy conservation measures recommended in the Energy Efficiency Walkthrough Assessment conducted by OCWA Engineering Services.	2015 - 2018	To be determined	2,106 kWh (5%)	2,239	Public Works
Ste-Rita Centre	12,978	1,218	36,380	7,266	51,914	6,080	Modification on two (2) existing furnaces, and remove electric radiators in the basement.	2015	$5,000	2,596 kWh (5%)	782	Public Works

5.6 Energy Conservation Implementation - Behavioural

Currently, Ontario's electricity system has a capacity of approximately 33,000 megawatt (MW) of power and the Ontario Power Authority forecasts that more than 15,000 MW will need to be renewed, replaced or added by 2030. To help meet the increasing demand for energy, as outlined with *Ontario's Long Term Energy Plan*, conservation has become an integral part of the future to help meet the ever increasing demand for energy.

Studies have stressed the importance of engaging the people working within the facility along with technological changes to achieve meaningful and lasting energy consumption savings. This has been shown to result in much higher energy savings than just implementing energy technology or engaging people alone.

The chart below presents some behavioural measures that the Municipality could implement without major cost or effort. There is no cost to adjusting behaviours on day-to-day activities so the payback is immediate.

Behavioural Measures	Year of Implementation
Place poster near kitchen/bathroom sinks reminding users to limit water usage where appropriate	2014 - 2015
Place poster/sticker near light switch in rooms reminding users to turn off lights when no one is in the room	
Place poster in office rooms with computers reminding users to turn off computers at the end of the day	
Continue to ensure the temperature of facilities/rooms meets the needs of the users	On-going
Install programmable thermostats and implement programmed setback temperatures where appropriate	
Harvest day light where possible by opening blinds instead of using electric lighting	

6. Monitoring & Evaluation

To ensure the Municipality of Val Rita – Harty meets its goals in energy consumption reduction, it is critical that there is regular monitoring and evaluation of its progress.

6.1 Short Term Goal

As a minimum, there will be an evaluation at the end of 2016. As stated in Section 4, a short term target of 2% energy reduction by the end of 2016 from the 2013 baseline is established. Energy usage of each facility for the year 2016 will be compiled and compared to the baseline energy usage in 2013. The comparison would provide the Municipality an idea where it stands in meeting the short term goal and the long term goal (5% energy reduction by the end of 2018 from the baseline).

This also provides an opportunity to examine measures implemented and their effectiveness in reducing energy consumption. A plan could be developed to further implement the successful measures for other facilities.

6.2 Long Term Goal & CDM Plan Update

The Municipality will strive to reduce 5% in energy consumption by the end of 2018 from the 2013 baseline.

The Energy Consumption and Greenhouse Gas (GHG) Emission template that is required to be submitted in 2019 will document the 2018 energy usage results. This template will show if the 5% energy reduction was achieved or not. At the same time, this CDM Plan is required to be updated.

The updated CDM Plan in 2019 will include the following items:

- The Energy Consumption and Greenhouse Gas Emissions Template for 2018 data
- A description of current and proposed measures for conserving and otherwise reducing energy consumption and managing demand for energy
- A revised forecast of the expected results of the current and proposed measures
- A report of the actual results achieved
- A description of any proposed changes to be made to assist the public agency in reaching any targets it has established or forecasts it has made

6.3 2014 & Beyond

The Energy Conservation and Demand Management Plan is intended to be a living document and flexible roadmap that will provide guidance and encourage the Municipality of Val Rita – Harty to incorporate energy management into their daily and future decisions. As capacity building and development of the foundation for successful energy management practices will be the primary focus for the initial implementation of the CDM Plan, future years will allow staff to apply their knowledge to investigate energy efficiency initiatives that will emerge as the energy management field continues to thrive and evolve.

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