

**Corporate Energy  
Conservation & Demand  
Management Plan  
(CECDMP) 2014-2019**



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## Our Commitment to Energy Conservation

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### Message from the Mayor,

Council for the Township of West Lincoln is committed to supporting energy management and will continually strive to reduce total energy consumption by implementing processes and efficiencies that will effectively impact the Township's use of energy and resources while still maintaining an efficient use of energy and resources and providing an efficient and effective level of service. West Lincoln Council has demonstrated its commitment to energy conservation by providing staff with a mandate to set in motion the actions required for energy efficiency improvement throughout the municipality. The Energy Management plan will be updated as required under Regulation 397/11 of the Green Energy Act.

Sincerely,

Douglas Joyner  
Mayor of West Lincoln

## 1.0 Introduction

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Ontario Regulation 397/11 of the Green Energy Act requires all municipalities to develop and publish a Corporate Energy Conservation and Demand Management Plan (CECDMP). The Township of West Lincoln has developed a CECDMP (this Plan) to formalize and consolidate its energy management efforts.

Energy management has become increasingly important across Ontario municipalities as energy prices continue to rise and interest in reducing our environmental impact continues to be a priority. Ontario's Long Term Energy Plan predicts that electricity costs will rise an average of 20%, or roughly 4% per year, over the next five years. Natural gas prices, although relatively low compared to historical averages, have begun to rise as illustrated by significant increases in spot market prices through the winter of 2013/2014.

In line with the regulation's requirements, this Plan includes the following key elements:

- 1 A clear corporate vision and policy that includes goals, objectives and strategic priorities for managing energy use.
- 2 Details about the Township's energy baseline and a summary of past successes and present initiatives.
- 3 A specific, actionable and prioritized inventory of energy conservation and demand management measures which includes associated estimated cost and energy savings information.

The Township intends to revisit and update this Plan every five years, as required under the regulation.

## 2.0 Energy Supply in Ontario

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### 2.1 Energy Supply and Pricing Forecasts for Ontario

Acknowledging that energy efficiency is the cheapest source of new energy supply, Ontario's 2013 Long-Term Energy Plan<sup>1</sup> places a strong emphasis on conservation and demand management to avoid adding new generation to the grid. For example:

In 2013, conservation represented 5%, or 8.6 TWh, of Ontario's total electricity supply;

Over the next 20 years, the Province expects to offset almost all growth in electricity demand through energy efficiency programs and improved codes and standards. This represents a conservation forecast of 30 TWh, or 16% of Ontario's total electricity supply mix by 2032.

In 2013, Ontario had a total electricity supply mix of 162.9 terawatt-hours (TWh), including avoided energy use as a result of conservation. Looking forward, supply requirements are expected to increase by approximately 20% over the next two decades.

Ontario municipalities are expected to contribute to this conservation target by developing energy management plans and taking action to improve their energy performance. Electricity costs are expected to increase over 20%, or roughly 4% per year, over the next five years. This further supports the need for Ontario municipalities to carefully manage their electricity use.

Natural gas prices, although relatively low compared to historical averages, have begun to rise as illustrated by significant increases in spot market prices through the winter of 2013/2014. As a result, the Ontario Energy Board has approved an Enbridge rate increase of 28% which came into effect on April 1<sup>st</sup>, 2014.

### 2.2 Green Energy Act and Regulation 397/11

Ontario Regulation 397/11 of the Green Energy Act was developed to help public agencies, including municipalities, understand and better manage their energy consumption. Under the regulation, the Township is required to develop and publish a five-year corporate energy conservation and demand management plan, and update this plan every five years thereafter.

Energy conservation and demand management plans are required to include:

A summary of the Township's energy consumption and emissions,

- A description of previous and current energy conservation measures,
- A description of renewable energy measures,
- Details on the goals, objectives and proposed measures that have been developed,
- A forecast of expected results for current and proposed measures, and
- A commitment from the Township's senior management.

This Plan has been structured to comply with each of the requirements specified in the regulation.

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<sup>1</sup> Ministry of Energy. December 2013. *Achieving Balance: Ontario's Long-Term Energy Plan*.

## 3.0 The Corporate Energy Management Policy

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The West Lincoln Corporate Energy Conservation Policy outlines the Township's commitment to energy management, its vision statement, goals, and strategic objectives:

### Our Commitment

*As part of an overall economic strategy, the Township of West Lincoln is committed to proactively improving the energy efficiency of the built environment. As such, we are committed to using energy efficient practices and technologies throughout our facilities, operations and fleet. We will therefore allocate the necessary resources to implement an energy management plan that will reduce energy consumption and positively impact the quality of life and the economic prosperity of the community.*

### Our Vision

*West Lincoln will strive to become a leader in energy conservation, contributing to the enhancement of a healthy, vibrant community, through minimizing carbon emissions and costs, while delivering outstanding public service.*

### Our Goals

*We plan on delivering a 4% reduction in Energy Consumption by 2019 over the base year of 2011.*

### Strategic Pillars

#### 1. Energy Conservation Projects – Identification and Delivery

Deliver energy and cost savings through the identification energy conservation projects from various sources (facility audits and staff training and engagement). Implement processes, projects and programs which reduce energy consumption across the built environment.

#### 2. Energy Monitoring & Tracking

Monitor and track energy use at each facility and make this information visible to all staff. Provide accurate and timely energy consumption information to the organization to support management decision making, troubleshooting and continuous improvement efforts.

#### 3. Communication (External and Internal) and Training:

Increase the energy conservation knowledge, awareness and participation of both the Township staff and community by delivering communication and outreach programs. Develop and execute a training program which ensures key employees have the appropriate knowledge to identify opportunities and improve energy consumption.

## 4.0 Energy Consumption Performance at West Lincoln

### 4.1 West Lincoln Energy Baseline

An energy summary has been compiled to provide a quantitative reference case for comparing the Township’s future energy performance. Energy consumption data for 2011 was collected from utility bills for each of the Township’s facilities, as well as its street lighting accounts.

The table below illustrates the energy use for the base year of 2011. The resulting data set is representative of the Township’s base year level of energy performance; however, it has not been corrected for yearly weather variations. Table 1 presents the Township’s baseline energy data by fuel type and in aggregate, expressed in equivalent kilowatt hours (ekWh). In 2012, the Township consumed 1,851,492 ekWh.

**Table 1– Township Energy Summary Base Year (2012)**

Account Centre	Peak Demand (kW)	Electricity (kWh)	Nat. Gas (m <sup>3</sup> )	Total Energy (ekWh)
All Facilities		850,908	98,725	1,851,492
Streetlights		520,175		
Total by Fuel Source (ekWh)		902,983		
Greenhouse Gas Emissions (tonnes):				

Figure A below shows the breakdown of the Township’s total baseline energy consumption by energy source. Approximately one half of its energy requirements are met by natural gas; the primary heating source for most Township facilities. The remaining half is met by electricity.

**Figure A– Energy Use By Source**

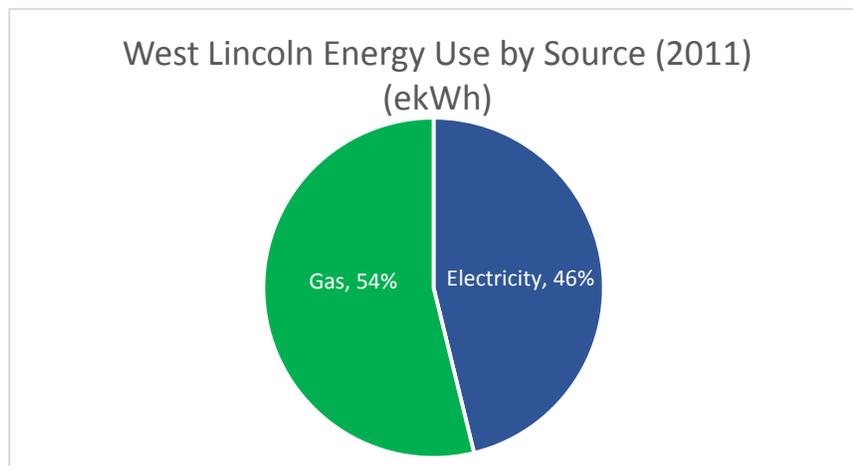


Figure B, below compares energy use for each Township facility by ekWh which combines electrical and natural gas consumption:

**Figure B– Facility Energy Use (ekWh)**

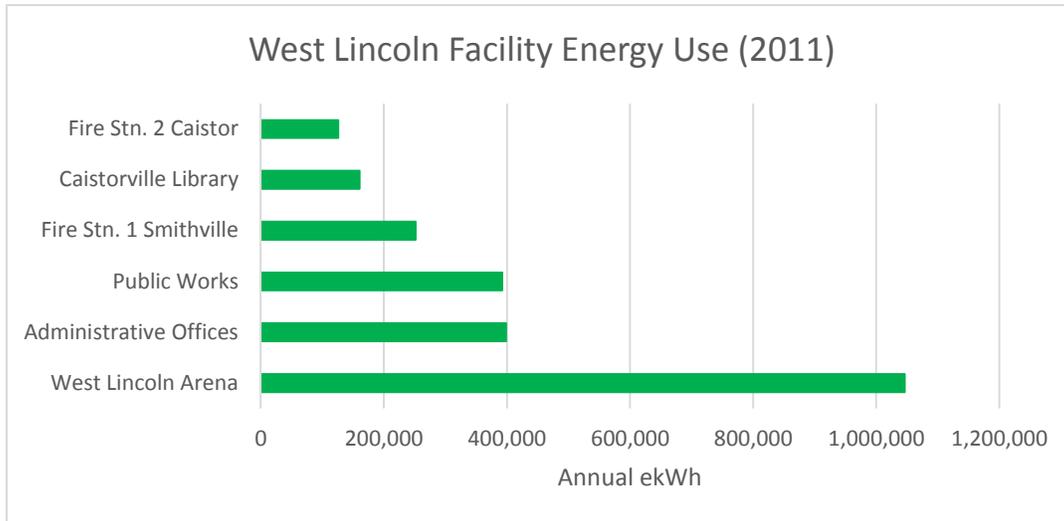


Table 2 lists the Township spending of over \$250,000 a year on energy across its six account centres.

**Table 2– Annual Energy Expenses (Pre-Tax)**

Account Centre	2012	2013
Facilities	\$199,245	\$187,497
Streetlights	\$54,013	\$67,192
<b>Total Cost</b>	<b>\$253,258</b>	<b>\$254,689</b>

## 4.2 Current (2014) Energy Costs and Pricing

### Electricity:

While electricity is delivered by Niagara Peninsula Energy Inc. (NPEI), the Township’s accounts all fall within the <50 kW category but are charged time of use or for blocks of usage (tiered) depending on the facility:

#### Time of Use:

- On Peak = \$0.140 / kWh Winter, \$0.135 / kWh Summer
- Mid Peak = \$0.114 / kWh Winter, \$0.112 / kWh Summer
- Off Peak = \$0.077 / kWh Winter, \$0.075 / kWh Summer
- Debit Retirement Charge = \$0.007/ kWh
- Delivery and Regulator Charges = a fixed monthly charge + variable charge per kWh

**Tiered Use:**

- Tier 1 = \$0.088/kWh
- Tier 2 = \$1.03/kWh
- Debit Retirement Charge = \$0.007/ kWh
- Delivery and Regulatory Charges = a fixed monthly charge + variable charge per kWh

One account (at the arena) falls into the >50 kW category and is charged market pricing with global adjustment fees for consumption. The delivery and regulatory charges are similar to above with the consumption charges as follows:

**> 50kW Service:**

- Market Price = \$0.033184 / kWh (February 2014)
- Global Adjustment = \$0.07607 / kWh

**Natural Gas:**

The Township's natural gas is supplied by Enbridge Gas Distribution and the current charges are shown below:

- Customer Charge = \$ 70 / month
- Delivery and Transportation Charge = 10.0¢/m<sup>3</sup> to 12.5¢/m<sup>3</sup>
- Gas Supply Charge = 12.7159¢/m<sup>3</sup>

## 5.0 The Energy Conservation Team

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The facility staff at the Township of West Lincoln has provided the leadership required to achieve energy conservation savings across the built environment. The team, described below, will be responsible for delivering this plans objectives and goals as well as maintaining the Township's focus on energy management vision in the years to come.

### **Energy Conservation Sponsor: (Director of Public Works)**

The Energy Conservation Sponsor is responsible for legitimizing the Plan's high-level goals and objectives, keeping abreast of major project activities, and approving resources and funding for the team and its approved projects. This position is ultimately responsible for securing spending authority and resources for the Plan and is therefore the highest ranking management person on the Energy Conservation Team.

### **Finance Champion: (Treasurer)**

The role of the Finance Champion is to provide clear guidance, assistance and support to the Energy Conservation Team on internal and external funding mechanisms and to include the team in relevant decision-making and budget discussions. The Finance Champion will support the use of life cycle costing and discounted cash flow-based assessments for capital projects and will include energy efficiency in procurement criteria where relevant. In addition the Finance Champion will ensure that suppliers offer energy efficient alternatives/options where available and include energy criteria/performance in service contracts.

### **Energy Management Champion: (Arena/Parks Supervisor)**

The Energy Management Champion has direct knowledge of the Township's major energy-using facilities and assets and is responsible for developing and maintaining the focus for the Energy Conservation Team. Their role is to coordinate meetings, set agendas, and delegate and manage tasks related to the Energy Conservation Team. This person also helps create and own the vision for the Plan and will help the Plan to maintain momentum, particularly if barriers arise.

### **Corporate Energy Conservation Team:**

The Energy Conservation Team, on a strategic level will be responsible to set expectations for each of the facilities; to develop metrics for tracking overall energy improvement, and to build accountability for energy management activities. In addition, this cross-functional team has direct responsibility for the consumption of energy within their respective departments. As a group, the team supports and monitors energy management initiatives (processes, programs, and projects) at the various facilities and across the corporation.

## 6.0 Our Successes

### 6.1 Completed Energy Conservation Measures

The Township has completed a number of energy conservation projects over the last few years which have contributed significantly to energy savings. These projects demonstrate that the Township has already established itself as a corporation that actively manages energy, and provide a strong base of energy management experience upon which to build. Table 3 below summarized the details of the completed projects.

**Table 3 – Completed Energy Conservation Measures**

Facility	Measure Type	Project	Implementation Date
Arena	Controls	New chilling plant operating system and Ice Temperature measurement	2010
Arena	Lighting	Changed all fluorescent lamps to T5 with electronic ballasts	2011
Public Works	Lighting	Lighting upgraded (except Metal Halide)	2011
Town Hall	Lighting	All lighting (except Metal Halide) upgraded to T5 Fluorescent lamps with electric ballasts.	2011
Public Works	Lighting	Change out all metal halide lamps to T5 with electronic ballasts	2014
Wellandport Hall	Lighting	Changed all fluorescent lamps to T5 with electronic ballasts	2014

## 7.0 Energy Conservation Action Plan

### 7.1 Action Plan List

A critical part of any plan is the detailed list of specific actions needed to achieve the desired goals and objectives. The Township of West Lincoln has developed a key project list which will help ensure the Township meets the energy reduction goals.

The plan includes projects that will support the following pillars of the Energy Management Policy:

**Pillar 1:** Energy Conservation Project Identification and Delivery

**Pillar 2:** Energy Monitoring & Tracking

**Pillar 3:** Communication, Outreach and Training

The detailed list of project included in the plan, which covers a period from July 2014 to June 2019, can be found in Appendix A.

### 7.2 Schedule and Forecast

The specific projects from the Action Plan (Appendix A) have been summarized in a delivery schedule which can be found in Appendix B. Using the schedule as a baseline, a cumulative savings graph has been generated to show forecasted annual savings from the conservation measures over time. Please see Figure C below.

It is estimated that over 4% of annual avoided energy cost will be saved once the projects have been completed. It should be noted that the projections have been calculated in 2014 dollars and do not include expected rises in energy costs. For this reason, the estimate is most likely conservative.

**Table 4 – Total Energy Savings by Account Centre**

Account Centre	Baseline (ekWh)	Energy Savings (ekWh)	% of Baseline
Facilities	1,851,492	74,060	4
Street/Traffic Lights	520,175	20,807	4
<b>Total</b>	<b>2,371,667</b>	<b>94,867</b>	<b>4</b>

Table 4 above shows the energy savings as a function of building/account type. A percent savings of over 4% could be achieved if all of the projects are completed as scheduled. The energy baseline and savings are shown in ekWh or *equivalent* kWh which is a combination of all energy sources (electricity and natural gas) measured. The baseline year is 2012.

## **Appendix A:**

# **Corporate Energy Conservation Action Plan**



## Corporate Energy Conservation Action Plan

Project Type	Measure	Description	Projected Annual Savings	Cost Estimate	Gov't Incentives	Completion Date <sup>2</sup>
			\$	\$	\$	
<b>Monitoring &amp; Tracking</b>	Energy Consumption Tracking	Install, populate and maintain RET screen + software to track electricity and gas usage for each building. Distribute reports regularly for review.	Indirect Savings <sup>3</sup>	Free Software	N/A	June 2015
<b>Training/Awareness</b>	Capacity Building	Delivery in house energy efficiency training. Consider NRCan Dollars to Sense, Spot the Energy Savings Workshops	Indirect Savings <sup>4</sup>	TBD	50 – 95% Rebates	Q4, 2015
	Communication	Visual displays, example screen savers or posters as reminders to staff and the public of our energy conservation goals.	Indirect Savings <sup>3</sup>	Approximately \$500.00 Internal Resource	N/A	Q4, 2015
<b>Project Identification</b>	Energy Audit	Arena – Please note this may change due to new Arena project.	TBD: Savings based on Identified Opportunities	\$5,000 - \$8,000	Up To 50%	Q4, 2016
	Energy Audit	Administrative Offices	TBD: Savings based on Identified Opportunities	\$3,000 - \$5,000	Up To 50%	Q4, 2017
	Energy Audit	Public Works	TBD: Savings based on Identified Opportunities	\$3,000 - \$5,000	Up To 50%	Q4, 2018
<b>Administrative</b>	Policy Update	Update purchase policy to include energy consumption and efficiency parameters in decision making. Use life cycle costing calculations to determine energy impact.	Indirect Savings	Internal Resources	N/A	2015
	Policy Update	Introduce new standards to ensure the use of LED street lighting for all new construction or installations.	Indirect Savings	Internal Resources	N/A	2015 - 2018

<sup>2</sup> All project completion dates are subject to final annual budget approvals by Council

<sup>3</sup> Actions identified through monitoring and tracking can result in 5-10% reduction in HVAC energy consumption at a given facility

<sup>4</sup> Behaviour changes caused by training have been shown to result in a 3-5% reduction in energy consumption at a particular facility, for a given building system (e.g. refrigeration plant in Arena)

Project Type	Measure	Description	Projected Annual Savings	Cost Estimate	Gov't Incentives	Completion Date <sup>2</sup>
			\$	\$	\$	
Building Envelope	Infiltration	Door weather stripping and door replacement Public Works Garage	Decreases heat loss and protects structural integrity	\$8,000.00 Man and bay doors	N/A	Q4 2015
	Building Insulation	Insulate Public Works Garage Roof	Will depend on final design	TBD	N/A	Q1 2018
	Building Insulation	Replace and reinsulate Caistor Fire Station #2 Roof.	Modest	\$38,000 (total roof replace)	N/A	April 2015
	Windows	Review window coverings in Caistorville Library to reduce heat gain in summer	Modest	TBD	N/A	Q1 2106
Street lighting	Upgrade	Convert existing street lights to LED.	50% of KWH plus Maintenance costs for significant savings	TBD	\$69.00 to \$180 per unit	TBD
Building Lighting	Upgrade	Replace all exterior wall packs for outdoor lighting at the Caistorville Library, Town hall, Caistor Fire hall, Arena and Public Work with LED wall packs with light sensors.	55% of annual KWH used currently	\$5500.00 less incentives	Yes, \$88.00 per unit times 22 units = \$1936.00	Q3 2016
	Upgrade	Arena: Install circuits on ice pad lights to allow better flexibility	20% of annual KWH used currently	\$500.00	N/A	TBD
	Controls	Install occupancy sensors in washrooms for lighting and exhaust fan: Arena, Fire Station #1, Administration Building	50% reduction of annual KWH currently used	\$200/sensor times 12 sensors = \$2400.00	TBD	Q2 2016
	Controls	Install occupancy sensors in all other appropriate locations (meeting rooms, offices etc.)	50% reduction of annual KWH currently used	\$200/sensor	TBD	Q2 2016
	Upgrade	Public Works Garage: Change MH lights in high bay to T5s, high efficiency T8s or LED.	25% or \$533.52 per year	\$4662.30 less incentive	\$1575.00	Completed Q4 2014
HVAC Systems	Controls	Install programmable HVAC thermostats	3-4% savings for every 1°C setback	\$150/sensor less incentives	\$30.00 per sensor	Q3 2016
	Controls	Program night time temperature setbacks or shutoff (electric heat): Fire Station #1 and #2, Administration Building, Caistorville Library	3-4% savings for every 1°C setback	\$0	N/A	Q4 2015
	Upgrade	Arena: Investigate radiant heaters for some spaces	TBD	TBD	Possible - TBD	TBD

Project Type	Measure	Description	Projected Annual Savings	Cost Estimate	Gov't Incentives	Completion Date <sup>2</sup>
			\$	\$	\$	
	Upgrade	Investigate installing ceiling fans in Fire Station #2 loading bay	Modest	\$2000.00	Possible - TBD	Q3 2016
	Upgrade	Review and Optimize HVAC system for server room in Administration Building	TBD	TBD	Possible - TBD	Q1 2015
	Controls	Fire Station #1: Change large bay door control such that only one opens not six.	TBD	TBD	N/A	Q4 2105
Miscellaneous	Plug Load	Arena: Install Vending Machine Misors and Unscrew Lighting on Machines	\$50	\$200	N/A	Q1 2016
	DHW	Caistorville Library: Consider reducing size of hot water tanks	75% of annual KWH used currently	\$450.00	N/A	Q2 2015