LANARK COUNTY

Energy Management Plan

JUNE 18, 2014

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 Background

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

Environmental

Canada's total greenhouse gas (GHG) emissions in 2012 were 699 megatonnes (Mt) of carbon dioxide equivalent (C02eq), or 18% (108 Mt) above the 1990 emissions of 591 Mt. GHGs trap heat in the Earth's atmosphere, just as the glass of a greenhouse keeps warm air inside. Human activity increases the amount of GHGs in the atmosphere, contributing to a warming of the Earth's surface. This is called the enhanced greenhouse effect. Over the past 200 years, humans have released GHGs into the atmosphere primarily from burning fossil fuels. As a result, more heat is being trapped and the temperature of the planet is increasing. Sea levels are rising as Artic ice melts, and there are changes to the climate, such as more severe storms and heat waves. All of this impacts the environment, the economy and human health.[1]

Societal

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

Fiscal

The fossil fuels traditionally used for the generation of energy are becoming no longer financially accessible or environmentally acceptable. This has resulted in the promotion of renewable energy generation which comes with an additional expense. The Province of Ontario's long-term energy plan released in December of 2013 projects a 42 per cent jump in home power bills by 2018, climbing to 68 per cent by 2032. The cost for industrial enterprises will also rise, by 33 per cent in the next five years and 55 per cent in the next 20 years. Natural gas prices are also projected to trend upward in the long-term as stricter US air pollution rules aimed at reducing emissions from utility smoke stacks (mainly at coal plants) will most likely prompt US electricity generators to close as many as 20% of the coal burning facilities in the US.[2]

In 2009, Ontario Regulation 397/11 directed all public agencies in Ontario to prepare, publicly report, and implement energy conservation and demand management plans. Annual reporting of energy consumption and greenhouse gas emissions was required as of July 1, 2013. Energy conservation and demand management reports are required by July 1, 2014 and every fifth anniversary thereafter.

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

[1] Environment Canada website (http://www.ec.gc.ca)
[2] Local Authority Services February 2013 newsflash publication

1.2 Purpose of the Energy Management Plan

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

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

Energy management includes electricity, natural gas and water commodity management. The EMP defines actions in the following key areas:

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

1.3 Key Implemented Actions

1.3.1 Combined Heat & Power (CHP) Units

In 2013, a CHP unit was installed at the Lanark County Housing Corporation (LCHC) building located at 46 Bell Street in Smiths Falls. The CHP unit uses natural gas to produce between 35% and 50% of the buildings total electricity requirements. Heat generated from the CHP unit provides all the domestic hot water required by residents as well as warm air for the building's hallways.

In 2014, a CHP unit will be installed at the LCHC building located at 24 Bourke Street in Smiths Falls.

1.3.2 Natural Gas Furnaces & Boilers

In 2013, thirty seven LCHC units located at Parkland Court in Smiths Falls were converted from electric base board heat to natural gas furnaces and boilers.

Also in 2013, heating lines were run from the County's Administration Building to the Public Works Engineering Building. Both buildings are now heated by the boilers located in the Administration Building.

1.3.3 Air Cooled Condensers for Refrigeration Systems at Lanark Lodge

In 2013, five water cooled condensers at Lanark Lodge were replaced with air cooled units. Since implementation, water consumption at Lanark Lodge has decreased on average 14%.

1.3.4 Energy Management Tool

In 2012, Lanark County implemented an Energy Management Tool (EMT) provided by the Local Authority Services (LAS), Association of Municipalities of Ontario (AMO). It is currently used to track ongoing energy usage based on utility bills and to assess the data needed to identify opportunities for energy conservation improvements, whether operational or capital.

1.3.5. Insulation, Windows and Foundations Waterproofing

Twenty-four LCHC homes located on Jasper, Beech, Carss and Broadview Avenue in Smiths Falls received major renovations in the 2009 to 2011 period. Foundations were waterproofed and exterior walls were insulated and covered with siding.

LCHC's 10 year capital plan includes expenditures for energy efficiency upgrades. Since 2008, significant sums have been invested in improved insulation, new windows, air exchangers and water heating units.

2. LANARK COUNTY'S COMMITMENT

2.1 Declaration of Commitment

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

2.2 Vision

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

2.3 Policy

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

2.4 Goals

Consistent with the vision of this plan, the County of Lanark establishes the following triple bottom line goals:

Environment	To be a leader in the community for energy conservation. We will publicize our successes to generate interest in reducing community GHGs.
Society	Support a vibrant, prosperous community.
Economy	Manage energy costs.

2.5 Objectives

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

1. To create a culture of energy efficiency and sustainability.
2. To promote sustainable use of resources through:
● Energy conservation
● Energy efficiency
● Renewable energy
3. To reduce energy operating costs through implementation of best practices and advanced technologies.
4. To increase the comfort and safety of occupants in County facilities.
5. To increase equipment reliability and reduce maintenance costs.

2.6 Overall Target

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

The County of Lanark's EMP includes comprehensive actions to manage the County's energy use.

Using 2013 as a baseline, the following targets are established with this five year EMP:

1. 7% overall reduction of energy consumption for the Administration & Engineering Buildings.
2. 15% overall reduction of energy consumption for Lanark Lodge.
3. 15% overall reduction of energy consumption for LCHC buildings
4. 15% overall reduction of energy consumption for Public Works Garage & Depot Facilities

2.7 Energy Management Team:

We have appointed the following positions to act as departmental energy efficiency team members:

1. Lanark County Chief Administrative Officer (CAO)
2. Public Works Facilities Coordinator
3. LCHC Maintenance & Asset Services Manager
4. Lanark Lodge Environmental Services Manager
5. Lanark County Senior Financial Analyst

3.0 LANARK COUNTY'S ORGANIZATIONAL UNDERSTANDING

3.1 Our Municipal Energy Needs:

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

3.2 Stakeholder Needs:

Internal stakeholders (Council, committees of council, CAO, staff) need:

a) An up-to-date and relevant energy management plan with clear vision, goals, and targets in order to clearly communicate the corporate commitment to energy efficiency;
b) Timely, regular reports and information to maintain awareness of energy use; and
c) Training and support to develop the skills and knowledge required to implement energy management practices and measures.

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

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

3.3 Current Municipal Energy Situation

Energy Consumption and Demand:

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

Facility Name	Address	Facility Total Area (m2)	Commodity	Energy Consumption in 2013	Total Annual Energy Cost in 2013	Green House Gases Emissions (tonnes CO2e/year)
Administration & Engineering Building	99 Christie Lake Road	1982	Natural Gas	20,593 m3	$7,760	38.93
Administration & Engineering Building	99 Christie Lake Road	1982	Electricity	346,758 kWh	$53,000	34.00
Administration & Engineering Building	99 Christie Lake Road	1982	Water	78,000 Imp. Gallons	$4,710	Not Applicable (N/A)
Almonte Patrol Garage	4752 County Road 29	446	Natural Gas	10,651 m3	$3,625	20.14
Almonte Patrol Garage	4752 County Road 29	446	Electricity	41,635 kWh	$7,120	4.06
Perth Patrol Garage	110 Wilson St West	714	Natural Gas	22,639 m3	$7,925	42.80
Perth Patrol Garage	110 Wilson St West	714	Electricity	69,473 kWh	$7,725	6.81
Perth Patrol Garage	110 Wilson St West	714	Water	37,000 Imp. Gallons	$1,195	N/A
Union Hall Patrol Garage	1982 Wolf Grove Road	262	Propane	7,698 litres	$6,125	11.86
Union Hall Patrol Garage	1982 Wolf Grove Road	262	Electricity	34,993 kWh	$5,100	3.43

Facility Name	Address	Facility Total Area (m2)	Fuel Types	Energy Consumption in 2013	Total Annual Energy Cost in 2013	Green House Gases Emissions (tonnes CO2e/year)
McDonalds Corners Pit	4705 McDonalds Corners Road	44	Electricity	2,086 kWh	$2,700	.21
Social Services Carleton Place Sub-office	43 Lansdowne Ave	166	Natural Gas	1,815 m3	$1,260	3.43
Social Services Carleton Place Sub-office	43 Lansdowne Ave	166	Electricity	23,247 kWh	$3,250	2.28
Lanark Lodge	115 Christie Lake Road	11745	Natural Gas	200,071 m3	$61,025	378.26
Lanark Lodge	115 Christie Lake Road	11745	Electricity	2,148,645 kWh	$250,200	210.65
Lanark Lodge	115 Chrisite Lake Road	11745	Water	5,177,000 Imp. Gallons	$83,600	N/A
LCHC (all properties)	Almonte, Carleton Place, Smiths Falls & Perth	532 units	Natural Gas	380,517 m3	$192,800	719.42
LCHC (all properties)	Almonte, Carleton Place, Smiths Falls & Perth	532 units	Electricity	4,822,000 kWh	$578,800	472.75
LCHC (all properties)	Almonte, Carleton Place, Smiths Falls & Perth	532 units	Water	16,760,783	$269,000	N/A
TOTAL					$1,546,920	1,949.03

Figure 3.3 Facilities Energy Cost Break Down by Source for 2013

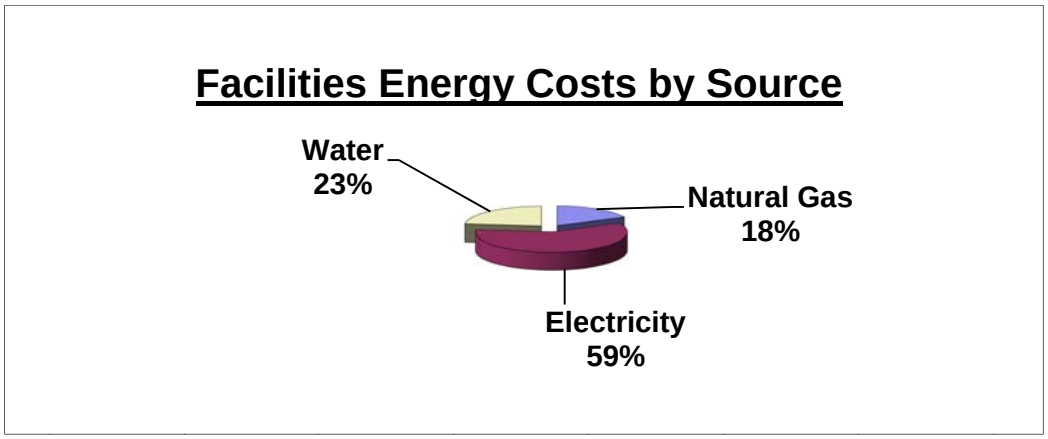


Figure 3.4 Facilities GHGs by Source for 2013

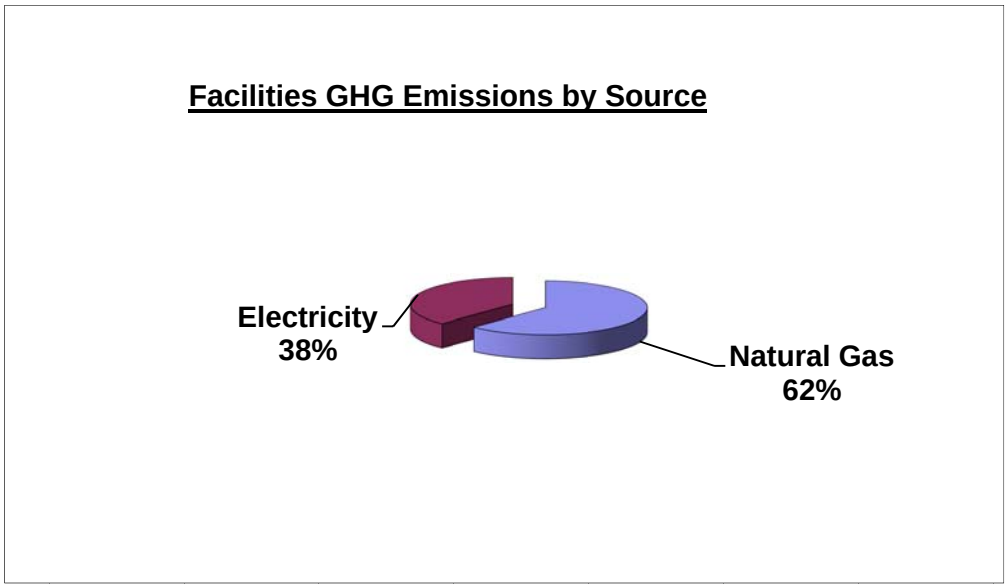
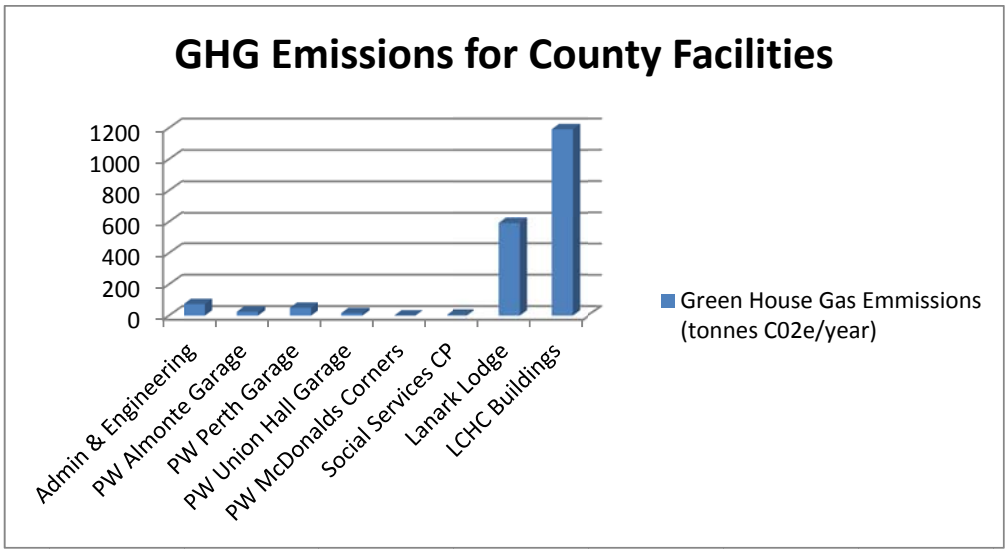


Figure 3.5 GHG Emissions for County Facilities for 2013



Energy Supply:

The types of energy used in the operation of the County of Lanark's facilities and delivery of services include:

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

3.4 How Energy is Currently Managed

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

Energy Data Management: Our municipal energy data is managed through the Finance department. The data is received via the LAS Energy Management Tool (EMT), then tracked and/or monitored using the trend analysis reports generated by the EMT.

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

● Electricity: Lanark County has adopted a hedging strategy by purchasing our electricity through Local Authority Services electricity purchasing program.

● Natural Gas: Lanark County has adopted a hedging strategy by purchasing our natural gas through Local Authority Services bulk gas purchasing program.

Energy Use Management: Day to day management of energy has been primarily the responsibility of facility managers. The tools available to the facility managers to aid in their efforts to reduce energy use include: LAS' Energy Management Tool (EMT) and Energy Planning Tool (EPT).

3.5 Renewable Energy Utilized or Planned

The County of Lanark aspires to show leadership in the promotion and development of renewable energy systems that are compatible with our asset management and land use planning objectives. As a result, we will investigate the potential to develop solar photovoltaic systems on the rooftops of all corporate facilities with sound, south-facing roofs.

4.0 STRATEGIC PLANNING

4.1 Long-term strategic issues

We will develop and implement energy policies, organize for energy management, develop the required skills and knowledge, manage energy information, communicate with our stakeholders, and invest in energy management measures.

4.2 Links with other municipal plans and management processes:

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

4.3 Departmental responsibilities

We will incorporate energy budget accountability into departmental responsibilities.

4.4 Consideration of energy efficiency for all projects

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

4.5 Resources Planning

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

4.6 Staff Training and Communication

● Communication programs: We will develop a communication strategy that creates and sustains awareness of energy efficiency as a corporate priority among all employees and conveys our commitment and progress to our stakeholders.

● Energy Awareness Training: We will develop and deliver training focused on the energy implications of employees' job functions and the day-to-day opportunities for conserving energy found in the workplace and at home.

● Energy Skills Training: We will develop and deliver skills training for operators, maintainers and other employees that have "hands-on" involvement with energy consuming systems in order to improve the team's ability to achieve energy efficiency improvements.

● Business Procedures: We will carry out a comprehensive review of all business processes and modify them as necessary in order to incorporate any energy efficiency considerations.

4.7 Development of Energy Projects

● Internal assessments: We will develop a methodology for the internal assessment of energy performance of County facilities and their energy loads. In addition, a process will be developed for identifying and cataloguing energy efficiency improvements.

● Staff suggestions: We will implement a dynamic process for submitting and processing staff suggestions for energy efficiency improvements.

● Energy audits: We will establish the criteria for energy audits for the requirement and frequency of municipal facility energy audits. The energy audits will be carried out based on the developed policy.

4.8 Investment in Energy Projects

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

● Consideration of energy efficiency for all projects: Life cycle cost analysis will be incorporated into the design procedures for all energy projects.

● Budgetary resources for energy projects: Energy projects will be integrated into our capital planning and budget development procedures.

● Capital: Savings and incentives from previous energy efficiency projects will be incorporated into our annual capital planning procedures as a separate envelope.

● Other sources of funds for energy projects: The Energy Management Team will be mandated to investigate, document, and communicate funding sources for energy projects, including government and utility grant incentives.

4.9 Procurement

● Energy purchasing: The County uses Local Authority Services which is a division of the Association of Municipalities of Ontario to negotiate energy purchase contracts that appropriately address our cost considerations, available energy services, energy quality and reliability, and other performance factors.

● Consideration of energy efficiency of acquired equipment: Our purchasing procedures will be modified as required to incorporate energy efficiency into the criteria for selection and evaluation of materials and equipment.

● Standards for new buildings: We will develop criteria for the design and/or acquisition of new buildings that include energy performance factors and that use as appropriate the principles embedded in performance standards such as Leadership in Energy and Environmental Design (LEED) and the Model National Energy Code for Buildings.

5.0 EXECUTION OF ENERGY MANAGEMENT PLAN

Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner	Target Completion Date
Program	Awareness	Add energy awareness to management meetings.		CAO	Q2-2014
Program	Awareness	Make use of visual displays to demonstrate the implications of current behaviors.	Cost: $1,500	Energy Management Team	Q4-2014
Process	Awareness	Energy reports to be distributed to building managers on a monthly basis.		Senior Financial Analyst	Q3-2014
Process	Procurement	Incorporate life-cycle costing into procurement process.		Senior Financial Analyst	Q3-2014

Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner	Target Completion Date
Project	Energy Efficiency	LED lighting retrofit for County Administration & Engineering Buildings.	Cost net of $12,000 grant is $55,000. Estimated payback of 5 years.	Public Works Facilities Coordinator	Q4-2015
Project	Energy Efficiency	Construct one new energy efficient Public Works Garage to replace three garages that are not energy efficient and have exceeded their economic life.	The new Public Works Facility has been budgeted at $4 million, however actual costs may be significantly lower.	Public Works Facilities Coordinator	Q4-2015
Project	Energy Efficiency	Instantaneous water heater for Public Works Engineering Building.	Cost $2,300. Expected to be 30% more efficient than previous unit.	Public Works Facilities Coordinator	Q4-2014
Project	Energy Efficiency	Installation of Energy Efficient Windows in the County's Administration Building (7 year program to be completed in 2020).	Cost $42,000. Estimate savings on gas heat of 3% to 4%.	Public Works Facilities Coordinator	Q4-2020
Project	Energy Efficiency	Installation of Combined Heat & Power Unit at LCHC property located at 24 Bourke Street in Smiths Falls.	Cost net of $30,000 grant is $43,000. Estimated payback of 4 years.	LCHC Maintenance & Asset Services Manager	Q4-2014

Type	Objective	Action	Cost/Savings Estimate (if applicable)	Owner	Target Completion Date
Project	Energy Efficiency	Installation of energy efficient boiler & tanks at 252 Moffat Street in Carleton Place.	Cost of $60,000	LCHC Maintenance & Asset Services Manager	Q4-2014
Project	Energy Efficiency	Installation of energy efficient windows at 3 Anne Street Smiths Falls, 46 Empress Avenue Smiths Falls & 72 Thurber Street Smiths Falls.	Cost of $80,000	LCHC Maintenance & Asset Services Manager	Q4-2014
Project	Energy Efficiency	Insulation upgrade at 195 Carss Ave Smiths Falls.	Cost of $35,000	LCHC Maintenance & Asset Services Manager	Q4-2014
Project	Energy Efficiency	Installation of energy efficient lighting at 24 Bourke Street Smiths Falls .	Cost of $10,000	LCHC Maintenance & Asset Services Manager	Q4-2014
Project	Energy Efficiency	Installation of Two Combined Heat & Power Units at Lanark Lodge.	Cost net of $60,000 grant is $140,000.	Lanark Lodge Environmental Services Manager	Q4-2015
Project	Energy Efficiency	Installation of Building Automation System at Lanark Lodge.	Cost of $83,000	Lanark Lodge Environmental Services Manager	Q4-2015

6.0 EVALUATION OF ENERGY MANAGEMENT PLAN

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

Monitoring Progress

Measurement and verification of energy projects: Standard methods for savings verification will be adopted and a measurement and verification (M&V) plan will be incorporated into all energy projects.

Review & Reporting

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

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

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