



Municipality of
Meaford

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN

June 2019

Energy Conservation and Demand Management Plan

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Energy Reporting, Conservation, and Demand Management Plan

Municipality of Meaford

From: July 1, 2019 to June 30, 2024

1. Commitment

1.1 Declaration of Commitment

The Municipality of Meaford will allocate the necessary resources to develop and implement a strategic energy management plan that will reduce our energy consumption and its related environmental impact. We are committed to being conscientious stewards of our energy and natural resources.

1.2 Vision

The Municipality will 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. We value our heritage, natural environment, and small town appeal while embracing the future with a progressive and innovative spirit. To formalize energy management in a strategic manner allowing for the proactive pursuit of optimal energy solutions that will lead to environmental, societal, and economic benefits. To be an energy-conscious organization that continually seeks to conserve energy; and encourages the development and implementation of renewable and other sustainable energy infrastructure. Be a Municipal leader in energy conservation and management of greenhouse gases, spending taxpayer's funds wisely and protecting the environment while delivering outstanding public service to the community.

1.3 Plan Statement

The Municipality will 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. This will be supported with an enhanced focus on energy management.

1.4 Goals

To continuously improve the energy efficiency of our facilities and processes in order to reduce our operating costs, our energy consumption and the concomitant greenhouse gas emissions, while continuing to deliver our approved levels of service through the following goals:

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- Continuously improve the energy efficiency of our facilities and processes in order to reduce operating cost and environmental impact.
- Increase public/staff awareness of current energy management procedures.
- Provide our building operators with the equipment and training they require to reduce their facilities energy consumption.

1.5 Overall Target

We will reduce our consumption of fuels and electricity in all municipal operations by an average of 1.5% per year between January 1, 2019 and December 31st, 2023 for a total 7.5% decrease over this period.

2. Organizational Understanding

2.1 Our Municipal Energy Needs

The Municipality of Meaford needs reliable and sustainable energy sources that efficiently deliver energy to the most crucial facilities ensuring efficiency all throughout the delivery process. The municipality needs to further investigate the implementation of technological practices and devices across municipal facilities to limit energy usage whenever necessary, as well as to alert staff to irregularly high or low periods of energy consumption so the corporation as a whole may have a better understanding of the electrical stressors we are tasked with.

2.2 Stakeholder Needs

Internal stakeholders (Council, CAO, staff) need to be able to clearly communicate the corporate commitment to energy efficiency, and to develop the skills and knowledge required to implement energy management practices and measures. External stakeholders (the Province, community citizens and groups) need the municipality to be accountable for energy performance and to minimize the energy component of the costs of municipal services.

2.3 Municipal Energy Situation

The GHG emissions inventory consists of 39 of the Municipality's main facilities from the departments/divisions of: Recreation, Emergency Services, Library, Administrative, Solid Waste, Water, Wastewater and Storage. The Municipality's 5 major sources of energy usage include: The Meaford & St. Vincent Community

Centre, The Meaford Water Treatment Plant, Meaford Hall, Bighead Pump Station and The Meaford Wastewater Treatment Plant.

The electricity supplied to the municipal buildings are provided by Hydro One, while the natural gas supplied to the buildings are provided by Union Gas, and both services are paid by the Municipality.

2.4 How We Manage Energy Today

The management of energy consumption and the energy performance of our facilities and equipment are the responsibilities of all of the municipal departments.

The municipality has been working to improve our energy usage and tracking by using the Energy Planning Tool. Local Authority Services (LAS) is a preferred provider of competitively-priced and sustainable co-operative business services for Ontario municipalities and the broader public sector. LAS helps its customers “save money, make money, and build capacity”. By tracking our energy consumption we have been able to identify where our energy is going and which facilities generate the most usage, allowing us to create ways of lowering the usage and cost of our energy. Municipality staff have been monitoring the energy usage and are able to quickly identify if there are any errors in the usage or problems in the facility.

Building automation is also used in various facilities in the municipality including: Meaford Hall, the Meaford Museum, the Water Treatment Plant and Wastewater Treatment Plant.

2.5 Summary of Current Energy Consumption, Cost and GHGs

The total annual average energy consumption in municipal operations across the time period of 2015-2018 is 5,859,786 kWh, at a cost of \$658,641 per year and Greenhouse gas emissions of 551,128 tonnes/year CO₂.

2.6 Trends in Energy Consumption

The Municipality’s energy consumption has decreased by 1.5% over the period 2015 to 2018 while our energy costs have increased by 21% in this same period. The total Greenhouse Gas emissions have decreased by 5%.

The majority of the reduction in energy consumption has been a result of capital projects, including the replacement of equipment within municipal facilities, such as lighting, furnaces, compressor, dehumidification, and pump replacement projects. The Municipality will continue to experience consumption reductions associated with

similar projects over the period of 2019 to 2023, but must enhance its programs related to operations and internal controls in order to experience the greatest reduction in consumption.

2.7 Summary of Current Technical Practices

Our assessment of operations and maintenance practices, facility and equipment condition, and energy performance indicators establishes the following priorities (list; e.g. development of standard operating procedures incorporating energy efficiency optimization, enhancement of preventative maintenance procedures, retrofit of lighting system in recreation complex, etc.).

Energy Audits were performed by Virta Group in 2016 on twenty of the Municipalities facilities. The audits included the many energy saving features that the Municipality has incorporated into the municipal buildings in efforts to lower the Municipalities energy consumption by using more efficient technologies.

2.8 Renewable Energy Utilized or Planned

The Municipality of Meaford recognizes the importance of the development of renewable energy systems within our asset management and land use planning objectives. We will continue to analyze the financial and functional properties of renewable energy initiatives present within any future municipal projects.

3. Strategic Planning

3.1 Links with other municipal plans

As an integral component of the delivery of services, the energy management plan is coordinated with the municipality's budget planning process, preventative maintenance plans, environmental management plan, and the overall asset management plan.

The Municipality's Community Improvement Plan has a section focused specifically on energy efficiency. This section is aimed towards providing a grant or loan to eligible property owners and assessed owners, to improve energy efficiency of existing commercial, mixed-use, agricultural and industrial buildings, and to facilitate the installation of renewable energy systems, where applicable. This grant helps support the viability of these buildings, which may have older, inefficient energy systems, while supporting the Municipality's overall environmental sustainability objectives.

The Municipality of Meaford's Official Plan also incorporates energy efficiency as an important feature in the plan. In section A2.9.2. Strategic Objectives:

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Objective #1: To minimize Meaford's ecological footprint and the impacts of growth by ensuring that all new development is based on the principles of sustainable development.

Objective #2: To promote the use of leading edge sustainable development and energy conservation policies designed to reduce greenhouse gas emissions.

Objective # 4: To reduce the per-capita consumption of energy, water, land and other non-renewable resources.

Objective #6: To promote a compact urban form and develop an energy-efficient mix of land uses, where appropriate, to provide livable, healthy communities.

Objective #8: To encourage efficient site design, and building design and construction techniques that minimize space heating and cooling energy consumption, and encourage the upgrading/retrofitting of existing buildings and facilities.

Energy conservation and efficiency is an important component to achieve sustainability goals and objectives. Energy conservation and efficiency not only reduces environmental footprints, it helps to reduce energy costs for individuals, businesses and organizations. It is a policy of the Municipality to:

- a) support initiatives and educational programs that promote energy conservation and efficiency measures;
- b) promote the reduction in energy consumption in all Municipally-owned, maintained and operated facilities and equipment in a cost-effective manner, including upgrading and retrofitting of existing buildings where practical;
- c) ensure that all new Municipal facilities are designed to incorporate energy conservation measures;
- d) require, where appropriate, new commercial and industrial development to use light coloured roofing material;
- e) seek to minimize energy consumption by:
 - i. promoting mixed use development, compact urban form and complete communities;
 - ii. maximizing existing infrastructure;
 - iii. encouraging the adaptive reuse of existing buildings;
 - iv. promoting building designs and orientations that incorporate energy conservation features; and,
 - v. promoting walking and cycling, and providing for bicycle parking and secure bicycle storage facilities;

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- f) support the use of renewable energy systems, such as geothermal systems (provided such systems do not negatively impact natural heritage features and areas, and hydrologic features and their functions) and solar photovoltaic, solar hot water, and solar air heating systems, in locations where they can operate in full sun year-round;
- g) require new development to be designed to maximize solar gains and encourage building design that allows for future solar installations;
- h) encourage innovative development that incorporates energy conserving principles into building design;
- i) encourage the application of energy conservation measures in the rehabilitation and upgrading of existing buildings; and,
- j) promote increased use of solar energy systems to heat water, air and/or generate electricity;

Outdoor lighting, air quality (including promoting tree planting for natural shade), water conservation, and subdivision development policies in the Municipality's Official Plan all incorporate energy efficient policies/recommendations to help lower energy usage.

Energy efficiency is an important feature that is included in many of the Municipality's plans and processes and will continue to be updated and implemented in upcoming plans as well.

4. Structure Planning

4.1 Staffing requirements and duties

The Municipality will endeavour to incorporate energy efficiency into standard operating procedures and for staff development programs.

4.2 Consideration of energy efficiency for all projects

We will incorporate life cycle cost analysis into the design procedures for all capital projects. This life cycle cost analysis will incorporate rising energy costs and the risks associated with increasing energy consumption. This will in turn lead to a greater sense of importance when the municipality's capital projects are being designed.

5. Resources Planning

5.1 Energy Leader

The Municipality has designated the leadership and overall responsibility for corporate energy management to the Chief

Administrative Officer, who will be responsible for championing municipal initiatives directed towards energy conservation.

5.2 Energy Team

The Management Team will act as the Energy Team and will promote and implement the Municipality's plan within their respective Divisions.

5.3 Key Individuals

We will identify staff members and personnel from our critical service providers who carry significant responsibility for energy performance or who can make essential input to energy management processes.

5.4 Internal Resources

We will develop criteria for determining whether internal resources can be utilized for the implementation of energy conservation initiatives.

5.5 External Consultants and Suppliers

We will establish criteria based on our energy goals and objectives for the selection of external consultants and energy suppliers. These increased standards in energy efficiency will have a significant positive effect on the attitude towards efficiency within the municipality's consultants and suppliers due to the large market share the municipality has over local development.

5.6 Energy Training

We will develop and deliver energy training for relevant staff and Council members. This training will not be limited to operators and maintainers with "hands-on" involvement with energy consuming equipment but will also include others since they also make energy consumption decision in their daily work. Training focused on the energy use and conservation opportunities associated with employee's job functions will be utilized whenever possible. Training will focus on low/no cost measures staff can conduct easily throughout their day to day work. This widespread training and resultant large quantity of smaller energy reduction measures will lead to ongoing savings across the municipality.

6. Procurement Planning

6.1 Energy Purchasing

The Municipality participates in the LAS Natural Gas Procurement to help manage and reduce our natural gas usage and are now looking into participating in the Electricity Procurement to help manage and reduce the municipality's electricity usage.

The LAS Electricity Program provides an easy way for Ontario municipalities to ensure predictable electricity commodity costs through a professionally administered program that leverages both aggregated purchasing and spot market exposure. As a licensed electricity retailer in Ontario, LAS is able to remove municipal accounts, including streetlights, from high-cost RPP and time-of-use rates, and enter them into a hedge/spot market billing scenario under the LAS Electricity Program.

6.2 Consideration of energy efficiency for all projects

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

6.3 Consideration of energy efficiency of acquired equipment

The development of the requirements and specifications for equipment related purchases will incorporate energy efficiency into the selection criteria.

7. Implementation Planning

7.1 Building Standards

The Municipality will consider the development of 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 LEED and the Model National Energy Code for Buildings.

7.2 Communication Programs

We will develop an internal communication plan that creates and sustains awareness of energy efficiency as a corporate priority among all employees, and conveys our commitment and progress to our stakeholders.

8. Investment Planning

8.1 Internal Funding Sources

We will develop criteria for determining whether internal resources can be utilized for the implementation of energy projects.

8.2 Creative Approaches

We will investigate and document options for the implementation of energy projects that utilize public-private partnerships, creative financing arrangements including energy performance contracting, and other creative approaches.

9. Implementation Planning

9.1 Business Procedures

We will carry out a comprehensive review of all business processes and modify them as necessary in order to incorporate energy efficiency considerations. This review will be considered in the development of the larger Asset Management plan and affect it in a manner that may alter the useful life or suitable performance guidelines outlined within it with respect to energy conservation on the asset level.

10. Project Execution

10.1 Municipal Level

We will carry out the required development of business procedures and communication programs and implement them methodically according to the planned time lines within the resources constraints that apply.

10.2 Asset Level

We use department and facility operational staff representatives to facilitate the implementation of facility level business procedures and communication initiatives, including energy performance reporting.

11. Review

11.1 Energy Plan Review

We will review and evaluate our energy plan, revising and updating it as necessary, on an annual basis within our internal work plans and as part of the development of annual operating and capital budgets.

11.2 Discussion of Progress

We will correlate our progress towards corporate goals and objectives, and update those goals and objectives accordingly. Providing regular updates to council regarding the progress of the plan implementation and recurring data reports to facility managers will build awareness within the corporation. Furthermore, the reporting will serve to assess the effectiveness of any energy conservation measures implemented.

12. Evaluation Progress

12.1 Energy Consumption

Our energy consumption in 2018 was reduced to 6,669,582 kWh from our 2015 levels of 6,768,623 kWh. A decrease of 1.5% over the four (4) year period or an average annual decrease of 0.375%.

12.2 Green House Gas Emission

In 2015 the municipality was responsible for polluting the earth with 694,191 tonnes of CO₂. By 2018 the municipality was responsible for polluting the earth with 659,452 tonnes of CO₂. A 5 year decrease over the four (4) year period or an average annual reduction of 1.25%. This decrease is mostly attributed to greener processing of the Ontario power grid (see figures 8 and 9) and temperature fluctuations leading to less degree days of heating and cooling.

12.3 Cost

We have increased our energy costs by a sum of \$129,395 from \$616,543 in 2015 to \$745,938 in 2018 or 21% in absolute terms (see figure 10). In the face of marginal increases in energy prices. This number truly illustrates the inflation of energy prices and importance of reducing energy usage as the municipality reduced both electricity usage and greenhouse gas emissions yet was still faced with a large price increase.

13. Action Plan

In order to attempt to reduce the Municipality's energy consumption by 7.5% over the period of this plan, a series of actions, divided into people, processes, and technology, have been established to meet this target.

13.1 People

- Develop and implement an Employee Energy Awareness Program
- Develop and implement an "Unplug" program that determines which equipment can be unplugged or operate on programmable power bars.

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- Included professional association training for energy efficiency use for facility operations staff.

13.2 Processes

- Add energy awareness to Management Team meeting agendas, including the review of energy consumption on a quarterly basis.
- Develop and implement a demand management program to determine the appropriate use of energy and connection to operation of all facilities.
- Develop and Implement building operating procedures including, start-up and shut-down schedules, digitalization of operating manuals, and preventative maintenance activities to maintain equipment efficiencies.

13.3 Technology

- Investigate the expansion and coordination of the Municipality's Building Automation System network.
- Include utility data analysis and high-level energy end-use breakdown in the evaluation of the lifecycle costs for equipment replacement planning and implementation, as identified in the Integrated Facility Condition Assessment Report and associated Energy Audits.*
- Investigate the financial and functional properties of renewable energy initiatives present within any future municipal projects.

*Due to the recent variations and cancellation of energy rebate programs, the planned projects included in this project are updated annually and have not been identified within this Plan to prevent the misrepresentation of annual savings and project payback. Individual projects will be updated in the annual operating and capital budgets to reflect current usage and eligible third-party funding programs.