Energy Conservation and Demand Management Plan

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN FRAMEWORK

VISION
- Vision Statement
- Energy Management Team

REVIEW
- Town Needs and Facilities
- Past and Present Energy Conservation Projects
- Current Energy Consumption

PLAN
- Goals and Objectives
- Areas for Improvement

EXECUTE
- Implementation of Measures to Improve Efficiency, Processes and Projects

EVALUATE
- Monitor
- Report

BACKGROUND

Ontario Regulation 507/18 came into effect January 1, 2019 replacing Regulation 397/11 which received Royal Assent in May of 2009 and was intended to attract new investment, create new green economy jobs and better protect the environment.

As part of the protection of the environment, the Province requires that by July 1st of each year all Public Agencies will produce an annual summary of energy consumption and greenhouse gas emissions which is submitted to the Province and available to the public for review.

In addition by July 1st of 2019 an Energy Conservation and Demand Management Plan will be produced to outline how energy usage for all buildings such as Municipal Offices, Fire Hall, Arena, Library, Public Works Buildings and Water and Sewage Treatment Facilities will be

addressed and goals will be identified to reduce and conserve energy at these facilities. The 2016 annual summary is the baseline year to pinpoint the Municipal facilities that would benefit the most from energy saving measures. The subsequent annual summaries will allow Staff to monitor the effectiveness of the measures that are implemented.

Staff has been working with Hydro One and Enbridge Energy Conservation Program representatives to find ways to reduce usage in buildings that stood out in the baseline energy report and to find funding opportunities to help pay a portion of equipment replacement costs.

As the cost of energy and fuel continues climb and the impact of increasing emissions takes a larger toll on the environment and climate change, it becomes ever more important to look to the future and mitigate both the costs and impact on the environment.

VISION

VISION STATEMENT

The vision of the Corporation of the Town of Shelburne is to reduce energy consumption in the areas of electricity, and natural gas for all facilities for an overall reduction in the Municipality's environmental footprint while maintaining the current service levels.

ENERGY MANAGEMENT TEAM

The Energy Management Team consist of:
Denyse Morrissey, CAO
Carey Holmes, Treasurer
Jim Moss, Director of Development and Operations
Patti Hossie, Project Manager

REVIEW

TOWN NEEDS AND FACILITIES

The Town of Shelburne needs reliable, low-cost, sustainable energy to aid in the process of producing energy efficient facilities.

The Municipality owns 14 facilities throughout the Town that vary in size from 200 square feet to 36,700 square feet. These Facilities have different purposes which produce different energy usages and challenges in conservation. Larger facilities such as the Town Hall, Arena, Public Works Building and Fire Hall use more energy to heat and light due to their size. Other facilities

such as the water and wastewater buildings, operate and consume energy on a 24-hour basis. Some of these facilities, the Fire Hall, Library and Arena are Town owned, however are operated by independent boards or in the case of the Arena, the County of Dufferin.
These differences in size and consumption are shown in the following breakdown of the Town's facilities.

Facility Name	Size Square Feet	Electricity kWh	Natural Gas Cubic Meters	Propane Liters	GHG Emissions Kg
Centre Dufferin Recreational	**36,700**	**555,600.00**	**24,584.0**	**0.0**	**66,229.64**
Fiddle Park (Snack Bar, Washroom)	**700**	**34,422.20**	**568.0**	**0.0**	**2,297.52**
Shelburne Fire Department	**5,000**	**67,487.48**	**14,818.0**	**0.0**	**30,414.36**
Garage (Works Yard)	**2,000**	**11,725.81**	**9,411.0**	**0.0**	
Shelburne Public Library	**5,000**	**29,161.88**	**5,194.0**	**0.0**	**10,856.56**
Shelburne Public Works	**6,000**	**28,645.61**	**5,739.0**	**0.0**	**11,868.60**
Sewage Lift Station	**------**	**55,773.60**	**0.0**	**0.0**	**1,982.64**
Shelburne Sewage Treatment	**12,000**	**1,158,000.00**	**6,671.0**	**0.0**	**53,776.96**
Town Hall	**17,550**	**164,202.50**	**13,007.0**	**0.0**	**30,428.46**
Water Tower	**------**	**23,632.50**	**0.0**	**0.0**	**840.09**
Well # 1	**------**	**99,140.00**	**0.0**	**0.0**	**3,524.23**
Well # 3	**------**	**80,760.00**	**0.0**	**0.0**	**2,870.86**
Well # 5 & 6	**------**	**141,000.00**	**0.0**	**0.0**	**5,012.27**
Well # 7 & 8	**------**	**80,880.00**	**551.0**	**0.0**	**3,916.85**

PAST ENERGY CONSERVATION PROJECTS

The Town has implemented energy conservation projects in past years. At Town Hall, in 2017 the exterior windows were upgraded to high efficiency and blinds added in 2018 to greater promote conservation year-round. In 2018 and 2019 the Town participated in a lighting retrofit program through Hydro One at the Public Works building, Town Hall and the Grace Tipling

Concert Hall. This retrofit program is estimated to have saved 18,043.92 kWh of energy or $2,165.27 per year between these facilities. In the Municipal Water system, soft starts have been installed on the larger well pumps to minimize power draw on pump starts. In the Wastewater Treatment Plant, energy efficient motors and pumps are implemented as replacements for older original equipment. In addition, older Fleet vehicles are being replaced on a schedule with new more fuel and emission efficient vehicles.

PRESENT ENERGY CONSERVATION PROJECTS

Other energy saving measures being considered are with the 2019 upgrade to the Water Systems Supervisor Control and Data Acquisition systems (SCADA) that control the operations of the well pumps. The SCADA system could be programed to shift normal well pump run times to off peak hours to fill the water tower and take advantage of cheaper hourly hydro rates.

CURRENT ENERGY CONSUMPTION

Our total energy consumption and greenhouse gas emissions for facilities as of 2016 that has been compiled and reported to the Province is listed below.

14 Facilities	**2016**
Total Annual Electricity Consumption	2,530,431.58 kWh
Total Annual Natural Gas Consumption	80,543 m^3
Total Greenhouse Gas Emissions	224,019.04 Kg

PLAN

The Town of Shelburne's Energy Conservation and Demand Management Plan will use information compiled from the 2016 usage report for hydro and natural gas usage for all facilities as a baseline measurement. This will help Staff understand which buildings standout as high consumers of energy and where the greatest improvement in conservation can be made in the next 5 years. This data will be reviewed each year to analyze improvements and areas that require focus to reduce consumption.
It is important to note that the calculation conversion for greenhouse gases from hydro, natural gas and propane does change from year to year which can change the total greenhouse gas emission total for the Town. Therefore, attention to usage in kWh and cubic meters or litres is important to track consumption.

GOALS

To improve the energy efficiency of Town facilities using energy efficient products and best practices to reduce operating costs and energy consumption resulting in an overall reduction in greenhouse gas emissions.

OBJECTIVES

- Improve the Towns understanding of energy consumption through annual monitoring and facility usage reviews with focus on the least efficient consumers.
- Isolate the source of the high consumption at the facilities and identify measures to reduce the consumption.
- Improve efficiency through low cost opportunities like sound operating and maintenance practices and improving staff awareness of energy consumption.
- Track energy consumption changes and improvements on an annual basis.
- A consistent reduction in the Towns overall greenhouse gas emissions.

AREAS FOR IMPROVEMENT

In the 2016 report to the Province there were 4 facilities that stand out in regards consumption.

The Arena, Sewage Treatment Plant, Town Hall and the Fire Hall stood out from the 14 facilities as the largest producers of greenhouse gases at 66,229.64 kg, 53,776.95 kg, 30,428.45 kg and 30,414.35kg, respectively.

The Arena at a size of 36,700 square feet was built in 1976 and renovated in 2010 and is a Town owner facility that is operated by County of Dufferin. The Arena is highly reliant on hydro to produce the ice surface in the winter and the operation of the pool in the summer months. Since the operation of the facility is not under the control of the Town, a joint evaluation of opportunities to reduce consumption with have to be undertaken by County and Town Staff.

The Sewage Treatment plant at approximately 12,000 square feet was built in 1981 and expanded in 1999, 2006 and again in 2010. The plant is responsible for treatment of the Town's sanitary sewage and is a 24 hour a day, 7 days a week operation that leads to the higher consumption. The plant is heavily reliant on hydro for the operation of the pumps and treatment systems. The upgrades to the plant over the years have improved energy consumption with the use of more efficient motors and systems. Even with new technology to achieve a high-quality product returning to the receiving water course, energy consumption is still a challenge. Further plant expansion is planned in the coming years and again the Town is looking forward to incorporating the most efficient process systems into the plant.

The Town Hall at 17,550 square feet was built in 1884 and had extensive renovations and an expansion in 1994. Town Hall is used extensively through the week from early morning to afterhours and weekends with facility rentals and use of the Grace Tipling Concert Hall. The building also houses the Shelburne Police Services which operates 24 hours a day contributing to the consumption. A number of efficiency programs were completed for this building after the 2016 baseline assessment that should show reductions in upcoming annual Provincial reporting.

The Fire Hall at 5000 square feet and was built in 1976 with an expansion in 2012. This building is another Town owner facility that is operated by a Fire Board made up of 5 Municipalities. The Fire Hall does have set office hours of 8:30 to 4:30, 5 days a week, however the emergency calls are unpredictable and can vary depending on weather and road conditions. In winter when fire calls come in the large roll up doors are opened so the firetrucks can leave the building. This is a large heat loss that is inevitable. The Hall has upgraded the heating system in the office portion from electric to natural gas and some of the burners for the radiant heat system in the bay areas. Further burner upgrades could further improve natural gas usage. Like the Arena, Town Staff will work with the Fire Department to see if there are possible usage reduction opportunities.

EXECUTE

All work on the Energy Plan (preparing the baseline usages and pinpointing areas for improvement) leads to the execution of actions to reduce consumption of energy.
When a facility is identified through the annual review as a high consumer of energy, an evaluation of the facility will be conducted to isolate the source of the consumption. Once the source of consumption has been identified, a plan will be produced to implement actions that will improve the performance of the facility and reduce consumption. An action can be classified as a program, process or project. These actions support the plan objectives and the Town goal, which will ultimately move closer to its vision.

EVALUATE

MONITOR

Each facility will be individually monitored annually for changes in its consumption and greenhouse gas emissions. Facilities that have been previously identified as high consumers and that have taken actions to reduce consumption will be noted. This will be an ongoing process to establish the success of actions and processes put in place to conserve energy and will be essential in planning future actions for an overall Town reduction in consumption and emissions.

REPORT

As part of the evaluation, a report will be produced each year for the consumption and greenhouse gas emissions for each facility for submission to the Province and will posted on the Township website for compliance with regulation 507/18.

The Energy Conservation and Demand Management Plan will be reviewed, updated and revised as necessary with information taken from the annual report to the Province for facility energy usage. Ongoing monitoring of the Town facilities will evaluate progress towards the objective of a reduction in consumption and greenhouse gases emissions. The annual review will bring new opportunities and actions forward to improve the Town's efficiency towards energy consumption.