



THE CORPORATION OF THE TOWNSHIP OF ADJALA – TOSORONTIO

Energy Management Plan

BACKGROUND

The Green Energy Act Regulation 397/11 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 required that by July 1st 2013 all Public Agencies will produce an annual summary of energy consumption and greenhouse gas emissions which is submitted to the Province and is to be available to the public for review.

In addition by July of 2014 an Energy Management Plan will be produced to outline how energy usage for all buildings such as Municipal Offices, Fire Halls, 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 2011 annual summary will become 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 Association of Municipalities Ontario (AMO) and Local Authority Services (LAS) representatives through a provincially funded program 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 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.

ENERGY MANAGEMENT PLAN FRAMEWORK

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VISION

VISION STATEMENT

The vision of the Corporation of the Township of Adjala-Tosorontio is to reduce energy consumption in the areas of electricity, natural gas and propane 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:

Janet Sherwood, Treasurer
Jim Moss, Public Works Superintendent
Gail Greer, Public Works Administrative Assistant
Lisa Keenan, Public Works Administrative Assistant
Wayne Hartwell, Energy Efficiency Service Provider

REVIEW

TOWNSHIP NEEDS, FACILITIES & CURRENT ENERGY CONSUMPTION

The Township of Adjala-Tosorontio needs reliable, low-cost, sustainable energy to aid in the process of producing highly energy efficient facilities.

Our current total energy consumption and greenhouse gas emissions for facilities as of 2011 that has been compiled and reported to the Province is listed below.

18 Facilities	2011
Total Annual Electricity Consumption	625,418 kWh
Total Annual Natural Gas Consumption	22,196 m ³
Total Annual Propane Consumption	36,691 Litre
Total Greenhouse Gas Emissions	148,648.11 Kg

The Municipality owns and operates 18 facilities spread throughout the Municipality that vary in size from 12 square metres to 1575 square metres and have different purposes which produce different energy usages and challenges in conservation. Larger facilities such as the Municipal office, Public Works' and Fire Halls use more energy to heat and light due to their size. Other smaller facilities such as the water and wastewater buildings, operate and consume energy on a 24 hour basis.

These differences in size and consumption are shown in the following breakdown of the Township facilities.

Operation Name	Size	Electricity	Natural Gas	Propane	GHG Emissions
Adjala-Tosorontio Municipal Center	1,575.00 m ²	127,289.00 kWh		16,574.00 Litre	35,773.11 kg
Station #1 Everett Fire Hall	958.00 m ²	24,056.00 kWh	8,088.00 m ³		17,215.87 kg
Station #2 Loretto Fire Hall	1,332.00 m ²	30,428.00 kWh	5,372.50 m ³		12,591.63 kg
Station #2 Loretto Fire Hall	1,332.00 m ²	30,428.00 kWh	5,372.50 m ³		12,591.63 kg
North Public Works Depot	464.00 m ²	20,610.00 kWh	3,363.00 m ³		8,006.98 kg
South Public Works Depot	1,362.00 m ²	32,765.00 kWh		20,117.00 Litre	33,681.53 kg
New Horizons Sewage Treatment Plant	300.00 m ²	14,696.00 kWh			1,175.68 kg
Lisle Pumphouse	42.00 m ²	21,890.00 kWh			1,751.20 kg
Grohal Pumphouse	80.00 m ²	78,000.00 kWh			6,240.00 kg
Ball Park Pumphouse	85.00 m ²	39,780.00 kWh			3,182.40 kg
Rosemont #1 Pumphouse	24.00 m ²	32,218.00 kWh			2,577.44 kg
Rosemont #3 Pumphouse	49.00 m ²	25,342.00 kWh			2,027.36 kg
Hockley Pumphouse	20.00 m ²	14,868.00 kWh			1,189.44 kg
Loretto Heights Pumphouse	20.00 m ²	17,453.00 kWh			1,396.24 kg
WECA #1 Pumphouse	12.00 m ²	8,292.00 kWh			663.36 kg
WECA #2 Pumphouse	35.00 m ²	31,079.00 kWh			2,486.32 kg
Colgan Reservoir	36.00 m ²	25,475.00 kWh			2,038.00 kg
Colgan Pumphouse	130.00 m ²	50,749.00 kWh			4,059.92 kg

PAST ENERGY CONSERVATION PROJECTS

The Municipality has implemented energy conservation projects in past years. These projects include installing lighting retrofits through Hydro One in 2011 at both the North and South Public Works buildings and the North Fire hall (Station #1 Everett). This retrofit program is estimated to have saved 4619 kWh of energy between these facilities'. In the Municipal Water systems, soft starts have been installed on the larger well pumps at the WECA #2, Grohal and Ball Park Pumphouses beginning in 2007 to minimize power draw on pump starts. In the New Horizons Wastewater Treatment Plant, energy efficient motors on drives were implemented with the 2011 RBC shaft replacement. In addition, older Fleet vehicles are being replaced on a schedule with new more fuel and emission efficient vehicles.

PRESENT ENERGY CONSERVATION PROJECTS

Currently, Staff is looking at installing further lighting retrofits at facilities and possibly streetlights for the largest savings.

Water systems like Everett and Rosemont, with Supervisor Control and Data Acquisition systems (SCADA) that control the operations of the systems, would be programmed to shift well pump run times to off peak hours to fill the reservoirs and take advantage of cheaper hourly hydro rates.

Another measure to conserve being considered is the insulation of hydro-pneumatic tanks in pumphouses to keep the cold water in the tanks from radiating into the building and acting as a heatsink, adding to heating costs.

Staff is also investigating the possibility of introducing the use of heat pumps that would cycle the effluent from the wastewater treatment process through heating coils to aid in heating of the plant, would reduce hydro consumption at the Wastewater Treatment Plant.

Saving from these initiatives should be placed in an energy reserve account which could be used for future projects like furnace replacements or energy efficient window replacements, when the need arises.

PLAN

The Township of Adjala-Tosorontio Energy Management Plan is to use the baseline information compiled from the 2011 usage report for hydro, natural gas and propane usage for all facilities to understand which stand out as high consumers of energy and where the greatest improvement in conservation can be made. This 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 does change the total greenhouse gas emission total for the Township. Therefore, attention to usage in kWh, cubic metres and litres is important to track consumption and conservation measures that will be implemented.

GOALS

The Township's overall goal is to improve the energy efficiency of Municipal facilities by the use of energy efficient products and best practices to reduce operating costs and energy consumption, and result in an overall reduction in greenhouse gas emissions. This can be accomplished by the following objectives.

OBJECTIVES

- Improve the Township's understanding of energy consumption through annual monitoring and facility usage reviews with focus on the highest 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.
- Report energy consumption changes and improvements on an annual basis.
- Create an energy management reserve with the savings generated by the plan to be used for future projects.
- A consistent reduction in the Township's overall greenhouse gas emissions.

AREAS FOR IMPROVEMENT

In the 2011 report to the Province there were 4 facilities that stand out in regards to consumption.

The Municipal Office, Station 1 and 2 Fire Halls and the South Public Works yard stand out from the 18 facilities as the largest producers of greenhouse gases at 35,773 kg, 17,216 kg, 25,182 kg and 33,681 kg, respectively.

The Municipal office was built in 2003 at a size of 1575 square metres. Being relatively new, it has been constructed to be energy efficient. The Municipal office is used extensively through the week from early morning to afterhours and weekend facility rentals, making a larger consumption not surprising. One thing that does stand out for improvement is the outside lighting and wall packs that are currently high pressure sodium lights. These could be removed under lighting programs and replaced with LED lighting which could save as much as 65% to 70% of the operating cost of the lights.

Station 1 Fire Hall in Everett at a size of 958 square metres, houses the Fire vehicles, equipment and offices. A large portion of this buildings consumption is electricity. In 2011 all light fixtures at this facility were changed out with energy efficient fluorescent fixtures.

Station 2 Fire Hall in Loretto is approximately 1,332 square metres and has had extensive renovations over the past two years to change office space to vehicle storage area. This has meant the removal of more than half of the second floor to accommodate the new insulated roll up doors. There have been furnace repairs and maintenance done to the building and the building is being considered for lighting fixture replacement similar to the Everett Hall. Both Fire Hall's should show improvements in following annual reports from the 2011 baseline report.

The South Public Works yard is 1362 square metres in size and houses more than half of the works' fleet as well as an office and lunch room and vehicle maintenance area. In winter when trucks leave the shop the large roll up doors are opened so the trucks can leave the building. This is a large heat loss that is inevitable. The shop has an electricity usage of 32,765 kWh and 20,117 litres of propane to heat the facility by the 2011 baseline information. In 2011, lighting fixtures at this facility were all upgraded similar to the other buildings. The ceiling fans were also replaced in the shop area this year to help the propane radiant heat system improve circulation and recover quicker from this heat loss when the equipment doors are opened. In addition, the North Public Works yard was included in the lighting retrofit program in 2011.

There are other buildings that do not stand out as one of the highest consumers, but that could benefit from some minor changes.

The Everett Water System has two pumphouses and a reservoir that is controlled by a Supervisory Control and Data Acquisition system (SCADA). This system controls the water system's two 40hp 600 volt main production well pumps by reading the depth of water in the reservoir and starting well pumps to fill the reservoir. The current SCADA system has been scheduled to be replaced in 2014 and Staff plans to program the system to run the well pumps during off peak hours to take advantage of the price savings during this timeframe. Many of the water systems could benefit by insulating the large hydro-pneumatic tanks used to regulate pressure to prevent heaters from running during the summer.

The Everett Sewage Treatment Plant has been identified by LAS Staff as a possible candidate for a heat pump system that would recirculate warm treated effluent through coils to heat the treatment area of the building to conserve hydro. This would depend on the continued use of this plant as it is currently anticipated that in the future, it may be possible to incorporate this system into a new plant be planned for construction in the north end of Everett.

One area that is not captured by the baseline reporting is the Township's streetlight hydro consumption. Recently through LAS, a program has been presented to Staff that would allow the all of the current streetlight heads to be changed out with new LED heads. The proposal suggests that a 66% energy savings could be attained by this lighting change and increased savings from lower maintenance costs. Staff intends to bring a report to Council in future to present this proposal that a number of other Municipalities are taking advantage of. The savings produced by this program would be put into an energy management reserve which could be drawn on in the future for projects that are identified through the annual review and reporting process.

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 Municipality's goal, which will ultimately move the Township 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 had actions taken 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 Township 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 Council, which will include any potential budget implications. This report will also be posted on the Township website for compliance with regulation 397/11.

The energy management plan will be reviewed, updated and revised as necessary each year with the Annual Energy Report on Ongoing Monitoring of the Townships facilities. This 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 Township's efficiency towards energy consumption.

The formulation and implementation of the Township of Adjala-Tosorontio's Energy Management Plan, will ensure our compliance with regulation 397/11.