



Embracing the Future
while Remembering our Past

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Energy Conservation and Demand Management Plan Update

Township of Stirling-Rawdon

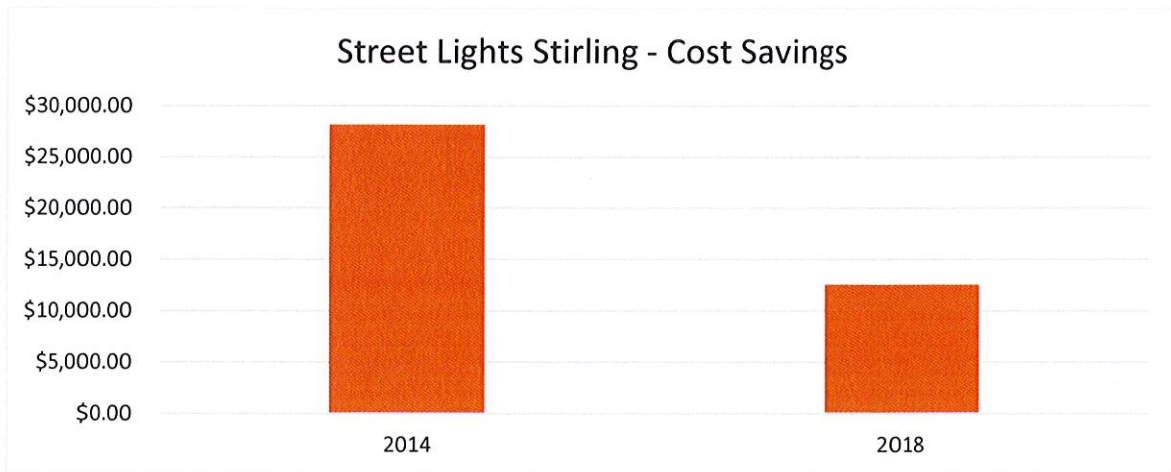
Dated: June 2019

Energy Conservation and Demand Management Plan Update

The Township of Stirling-Rawdon originally established a 5-year plan in 2014 and is committed to finding ways to conserve and/or better manage our resources. Since 2014 we have updated a number a resource to provide more efficiencies but using less resources.

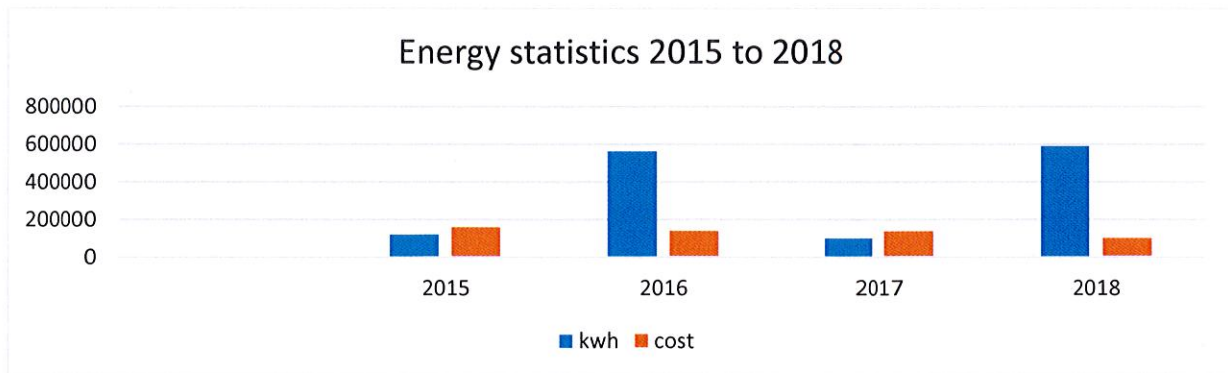
HYDRO

In 2015/2016 we updated our Street Lights to LED to assist with conserving energy and savings to the Township.



In 2017 we updated the lighting in our Springbrook Roads Garage and we have received some savings in our hydro costs in 2018 and have started to see a reduction in usage. It is anticipated to continue to see savings and reduced energy consumption for 2019.

Below is a chart that reflects our energy costs in 2015 compare to 2018 which reflects a reduction not only in usage but in overall costs.



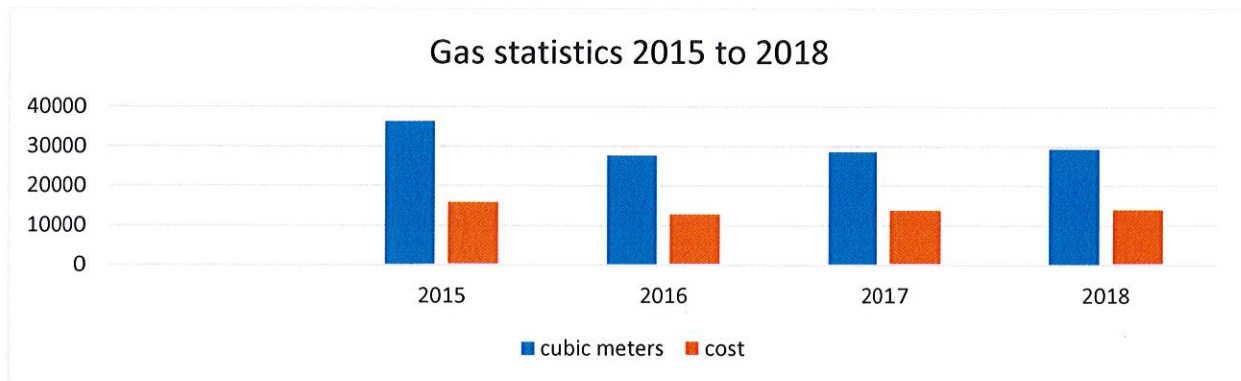
Stirling-Rawdon is part of the LAS program through AMO to assist with further reductions in hydro costs and have been on this program for a number of years now.

At the present time our Municipality facility has T5's for lighting and we are researching to change these lights to LED, which will assist Stirling-Rawdon to become more efficient by using 5 watts instead of 15 or 16 watts.

NATURAL GAS

Most of our facilities use natural gas for heat and hot water tanks. The Township has been a part of the LAS Program through AMO to assist with reduction in costs for several years. We have a third party that helps with the maintenance of our systems to ensure efficiencies and helping us to receive the maximum potential.

Below is a chart that reflect our gas costs in 2015 compare to 2018 which reflects our Township's overall usage and costs.



I have attached as an appendix the Stirling-Rawdon District Recreation Centre Energy Conservation and Demand Management Plan as our Stirling-Rawdon District Recreation Centre Board and Staff should commended for working together to achieve results of reduced usage and costs.

ENERGY MANAGEMENT FORECASTING

Stirling-Rawdon will continue to monitor and obtain the energy saving measures where possible and are currently researching net metering solar options.

Future projects will be reviewed not only on cost savings analysis but on the overall energy saving measures which will assist with our management of energy for now and the future. Our goal is to still provide the best service but using reduced energy which will provide cost savings and the ability to run the municipality in the most economically way with less resources.

5Year Energy Conservation and Demand Management Plan

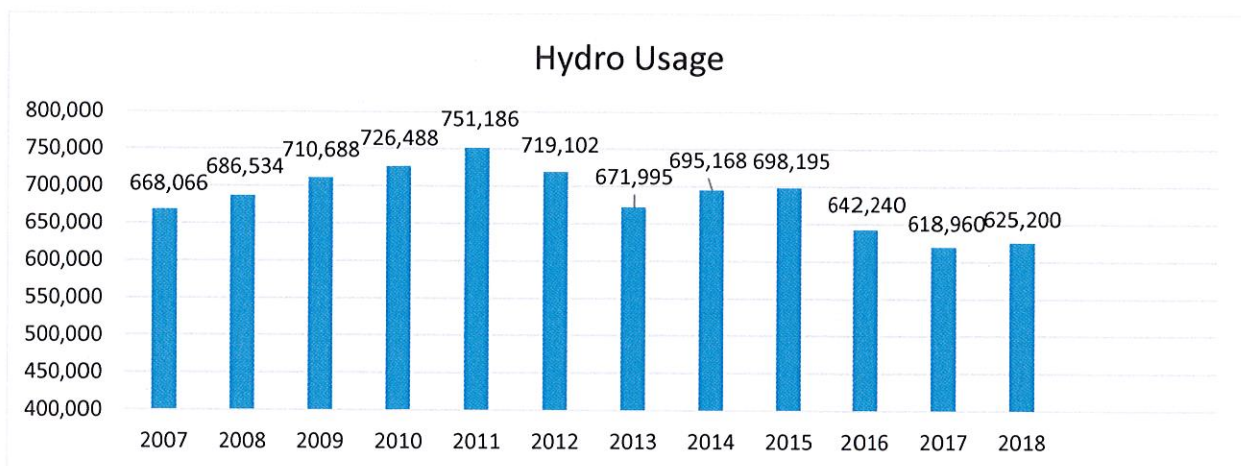
The Stirling-Rawdon and District Recreation Centre along with the arena board is committed to working towards an energy efficient facility. Our initial undertaking was to compile as much data on previous years of energy use. Followed by an analysis of where and how it was being used. Finally looking at ways to conserve or find ways to better manage our resources.

Past 5 years.

The initial data has been completed and we now have several years of reported energy usage with which to make our future decisions on. From this baseline of information we are now setting goals to achieve using an average mean percentage. Changes in weather is one of our major factors to deal with however we still do our best to determine if we have met or exceeded those set bookmarks.

Hydro

This is our most used resource and thus one of our most monitored and focused on. Over the previous years we have seen a steady rise in hydro use and have taken the data collected to determine where savings could be made. The chart below summarizes the usage over the past 11 years. Since 2013 you can see where we began to work towards better energy conservation and the results have a positive showing.



Stating in 2013 we replaced our main 60hp compressor motor with a more energy efficient NEMA certified unit.

In 2015 we replaced the main electrical panel in the compressor room that had been in service since the arena was built in 1977. Not only did this allow us to better monitor and control electrical devices but gave us several other energy use advantages. Those included the following –

- 1) Soft start on both compressor motors
- 2) Upgraded the old 1000E Controller panel with the newer more efficient 6000E
- 3) VFD motors on both Arena and Curling Club condensers with an additional benefit of being high efficiency at 91.7% and 89.5% respectively.

Half way through the year of 2016 we undertook a complete facility overhaul of all lighting converting everything to LED. This included the following –

- 1) All main lighting over Arena and Curling Club pads.
- 2) Separating those light on the arena side to be controlled in 6 separate banks, so they did not all have to be on at the same time
- 3) Separating the Curling Club pad lights in to 2 separate banks and allowing them to be dimmable.
- 4) All emergency lighting and exit lights
- 5) All general lighting throughout the building including, lobbies, hallways, dressing room and so on.
- 6) All outdoor lighting.
- 7) Installed automatic light sensors

Since this project was done half way through the year the full results would not be seen until 2017. However you can see by the above chart that substantial hydro savings began to be recognized in 2016 and continued forward.

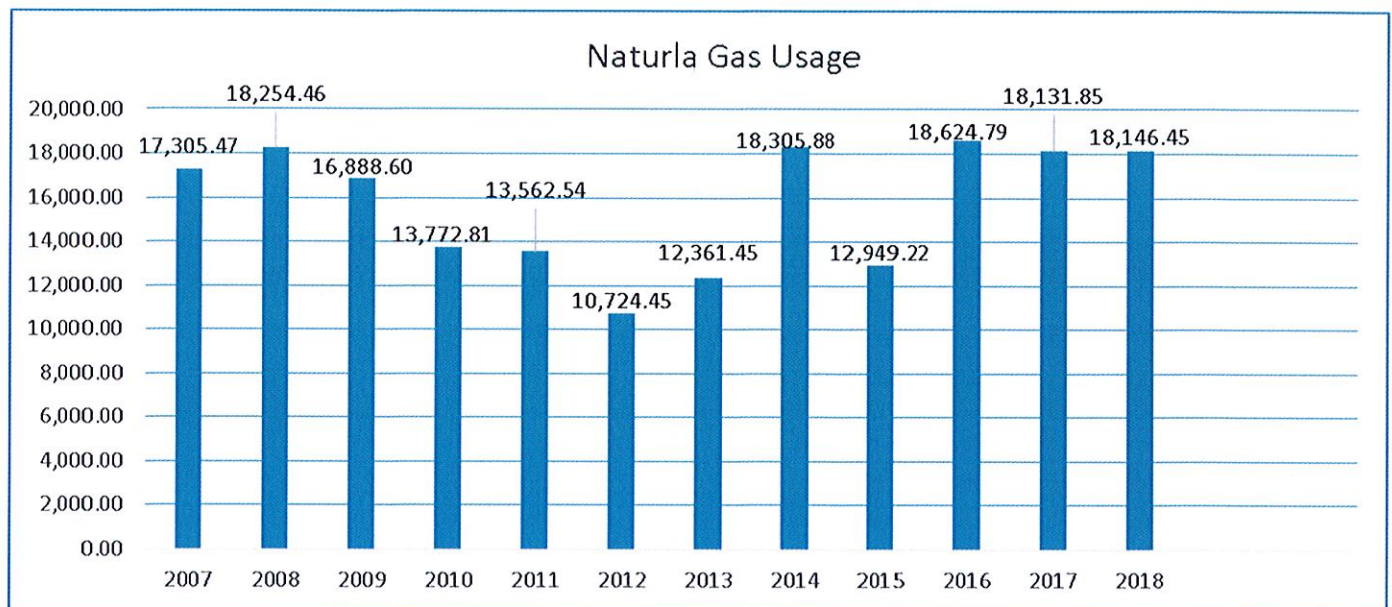
In 2016 we also needed to change out an electrical bine motor. In keeping with our policy on energy efficiency we chose to go with another NEMA certified model.

Natural Gas

Throughout this facility we use natural gas for general heating with 6 gas furnaces. Public heating in the bleachers with 2 Infar-red tube heaters. General hot water heating with a 60 gallon hot water tank for bathrooms, showers, dish washing etc. and hot water for ice resurfacing using a condensing water heater.

Along with our own general maintenance program the town itself has taken on an annual maintenance program with a third party to make sure that all of these units are running at their peak efficiency. Lowering operating costs and using gas to its maximum potential.

The chart below shows the gas usage for previous years. There is little change here overall and much of the variable lies with how cold or warm a winter is. Using all the data from 2007 through 2018 or average usage per year is 15,752.33. This amount gives us a fairly accurate amount to strive for as our benchmark set point.



In 2013 we did a heat loss study before doing a major front addition. From that study we made sure to update all new insulation to meet new codes coming in to effect. As well we changed out the 4 main gas furnaces with high efficiency ones.

Water

Water was a resource that was not previously monitored throughout the years so it is harder to determine a solid baseline for its true savings. However from the middle of 2013 to the middle of 2014 we installed a water meter to try and determine an approximate annual usage. From this we calculated a base amount of 8501 m³ per year. This was likely a best case scenario as we had begun to implement water saving measures and would have been considerably higher.

At this point the town had installed their own metering system and we were now able to monitor quarterly our usage going forward. Our average use for the years 2016-2018 was 4357 m³. Showing an overall reduction in water use by 49%. Again this is likely a conservative estimate over previous years when water consumption was not being monitored and we were not trying to conserve.

The following measures have since been put in place to conserve water-

Between 2013 and 2014 we installed automatic flush systems on all toilets and urinals. As well as water saving heads on all showers.

In 2015 when doing upgrades to the compressor room we also went ahead and did a glycol loop for cooling the compressors down. This was originally a water cooled system as was determined to be one of the largest wastes of water we had. This project had the largest impact on water conservation.

In connection with the glycol loop we installed a water recirculation system for melting snow in the pit. This was further enhanced by adding a water mixer and melting pit sprinkler system. Now we are using a lot less hot water and thus natural gas as well as water in entirety.

Current and Future Energy Management Forecasting

Going forward with the same direction as we have in the past means that all future projects will be looked at with an emphasis to energy savings measures. What this means is that we will not always choose our future projects based upon immediate cost savings but rather take in to account how such projects could save us resources as well.

Currently we are undertaking a full building roof restoration project. This project is not only to refurbish an old and weathered roof deck but the product we chose has energy savings attached to it. The coating reduces under roof temperatures by as much as 15 degrees or more. In this situation it has the potential to significantly reduce electrical cost by keeping the building colder and reducing run time hours on the compressors.

Through an engineering study we are also looking at ways to better improve overall refrigeration performance and benefits associated with doing so. Over the next few years we hope to update the mechanical room and implement in to that upgrade as many resource saving ideas as we can.

Overall our direction will continue to be that of resource monitoring along with maintaining top performance and the use of cost saving management tools. Including energy reduction ideas to be able to operate this facility economically and with the least amount of resources possible.