

# INCORPORATED VILLAGE OF HILTON BEACH

## ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN



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## Introduction

The Incorporated Village of Hilton Beach is a small, rural municipality with a population of 173. Ontario Regulation 397/11 made under the Green Energy Act, 2009, requires that every public agency shall prepare, publish and make available to the public and implement energy conservation and demand management plans. The required elements of the Plan include the following:

- Information on the municipality's annual energy consumption during the last year for which complete information is available for a full year;
- The municipality's goals and objectives for conserving and otherwise reducing energy consumption and managing its demand for energy;
- The municipality's proposed measures under its Plan, the cost and saving estimates for these proposed measures and the estimated length of time these measures will be in place;
- A description of any renewable energy generation facility operated by the municipality and the amount of energy produced on an annual basis by the facility.

Hilton Beach is prescribed as a public agency and therefore is required to record the annual energy consumption of their buildings. The municipality has taken measures to conserve and reduce energy consumption and manage the demand for energy. It is imperative that the energy efficiency of the Village buildings continue to be improved due to the rising fuel costs, energy security and environmental concerns. Energy savings efforts focus on electrical, heating and cooling consumption to create potential savings.

## Goal and Objectives

The Objective is to improve our energy efficiency and lower costs while continuing to meet the needs of the municipality.

The goals are:

- To ensure that employees are more aware of the need for energy conservation and make every effort to reduce energy consumption;
- To explore opportunities that may be available at a reasonable cost vs. benefit to reduce energy consumption;
- To seek funding to increase energy efficiency of Village buildings.

Provided in this report is an overview of each facility as well as a summary of its 2012 and 2017 energy consumption. Also included are the municipality's existing and proposed measures for each facility to reduce energy consumption and greenhouse gas emissions. The Plan is for a period of five years beginning in 2012 and will be reviewed annually.

### **Waterfront Centre Municipal Office**

The Municipal Office is located at 3100 Bowker Street and serves as an office building for Village administration and Council meetings. It consists mostly of administration offices, meeting areas and storage areas. It occupies a floor area of approx. 5,552 sq. ft. The facility operating hours vary week to week but usually follow the typical Monday to Friday office hours for a total of 40 hours per week. The Waterfront Centre was built in 2008. At that time, many energy efficient measures were put in place. This included energy efficient doors, windows and fluorescent lighting as well as propane heating and cooling. Programmable thermostats have been installed to lower the temperature in the winter and raise the temperature in the summer at night and on weekends. Occupancy sensors have been installed throughout the building that turn lights on and off based on whether the room is occupied or not.

In 2012, the Municipal Office had an annual electrical consumption of 13,189 kWh and propane consumption of 9,155 litres resulting in total greenhouse gas emissions of 15,373.95 kg. and a total building energy intensity of 13.968 ekWh/sqft/yr.

In 2017, the Municipal Office had an annual electrical consumption of 14,284.53 resulting in a total of greenhouse gas emissions of 247.09380 kg and a total building energy intensity of 2.57286 ekWh/sqft/yr. Propane usage for the Municipal Office for 2017 was 8472 litres resulting in a reduction of 683 litres from 2012.

Although it is a new building, there are other energy efficient measures that will be put in place. The air conditioner could be set one degree higher in the summer and the furnace one degree lower in the winter to reduce energy costs and consumption. The thermostat has been programmed to lower heating in the evenings and on weekends. The same can also be done in the summer months. The cost to do this is free and could produce even greater energy savings. Computers and lights are to be turned off at the end of each day which will also result in energy savings.

### **Old Municipal Office**

In 2012 the old municipal office located on Hilton Road was used by the Hilton Union Fire Department for its meetings and other purposes. Its floor area is 560 sq. ft. and it is used intermittently.

In 2012, the old municipal office had an annual electrical consumption of 5155.769 kWh resulting in total greenhouse gas emissions of 495.16 kg. and a total building energy intensity of 9.207 ekWh/sqft/yr.

In 2017, the old municipal building used no energy due to the fact the building is no longer in use resulting in total greenhouse gas emissions of 0.00017 kg and a total building energy intensity of 0.00002 ekWh/sqft/yr.

This is an old building and over the next couple of years, consideration will be given to extra insulation to reduce heat loss through the roof. Weather stripping will be checked around doors and windows and

replaced if needed. Weather stripping can be purchased and installed at a reasonable cost and could produce energy savings of 5 to 10 percent.

### **Hilton Beach Community Hall**

The Community Hall is located on Hilton Road and is 10,850 sq. ft. The two original portions were built in 1896 and 1927. In 1990, an extension to the original buildings was made as well as complete renovations to the older portions. The Hall is used regularly for small and large gatherings including meetings, banquets, and other special events. Within the last five years, all of the windows were replaced from single pane to double pane. The majority of the lighting has also been replaced to efficient fluorescents. All lights are turned off and the temperature is adjusted when the building is not in use. In 2010, the two refrigerators were replaced to energy efficient models and a new propane stove was purchased. The 'on-demand' propane hot water tank was also installed which provides up to 50% in energy savings.

In 2012, the community centre had an annual electrical consumption of 79,476.91 kWh and propane consumption of 956.5 litres resulting in total greenhouse gas emissions of 9106.914 kg. and a total building energy intensity of 7.945 eKWh/sqft/yr.

In 2017, the community centre had an annual electrical consumption of 65,796.80 resulting in a reduction of 13,680.11 kWh used. The hall also used 951.6 litres of propane, a reduction of a mere 4.9 litres. The community hall had a total greenhouse gas emission of 2,604.55342 kg and an total building energy intensity of 6.68084 ekWh/sqft/yr. The huge savings in electrical is due to the fact that the Village has taken the initiative to close the hall from January to May and set the thermostats low to save energy. Propane did not reduce to the amount that we were hoping due to the fact that there were faulty nozzles on the stove in the kitchen that we had to replace. We have resorted to shutting off the propane at the source when not in use. This should in time show a reduction in the amount of propane used. We have installed more insulation in the basement of the hall under the kitchen to help with our heating costs. We have also recently purchased a new energy efficient upright freezer and have been unplugging the refrigerator when the hall is not in use.

Over the next couple of years, more insulation will be added in the attic of the older parts of the building. Consideration is being given to the replacement of the heating and cooling from forced-air electric to propane which is expected to provide energy savings. However, with the recent increase in propane costs, further investigation is required to ensure that it will be the best approach. The municipality is hopeful that grants will become available over the next couple of years to cover part or all of the conversion.

In 2013, solar panels were installed on the roof of the Community Hall. The Village has since connected to the grid and we are now able to sell power back to the power company. The solar modules are made using only the highest efficiency mono-crystalline solar cells. The textured PV glass and 3 bus bar design provide world class power output. The projected annual output is 12.07 megawatt hours. As of 2017, the annual output is 5.79 megawatt hours due to a failure with the fuses in the unit resulting in no power generation being recorded.

### **Workshop**

The workshop is situated on Ringham Street and is used regularly during the day and occasionally on weekends. It has 1,344 sq. ft. Over the last couple of years, the building has been retrofitted with new energy efficient fluorescent lighting.

In 2012, the Workshop had an annual electrical consumption of 7836.481 kWh resulting in total greenhouse gas emissions of 752.616 kg. and a total building energy intensity of 5.831 ekWh/gsf/yr. In 2017 the workshop had used 9463.76 kWh, up from 2012, due to the fact that the Village has had to use the fridge and freezers in the workshop to accommodate the overflow of food for the community events. The energy usage at the workshop should reduce now that there is a new energy efficient freezer in the hall and the fridge and freezer units in the workshop are now not needed. The workshop had a total greenhouse gas emissions of 163.70412 and a total building energy intensity of 7.0149 ekWh/sqft/yr.

Weather stripping will be checked around doors and windows and replaced if needed. Weather stripping can be purchased and installed at a reasonable cost and could produce energy savings of 5 to 10 percent. The thermostat is also being turned down during the winter months to reduce usage.

### **Waterfront Centre House and Units**

The Waterfront Centre house and rental units are connected to the Municipal Office and are in use by Canada Post as well as other small businesses. The floor area totals 4,828 sq. ft. The facility operating hours vary week to week but usually follow the typical Monday to Friday office hours for a total of 40 hours per week. Energy efficient lighting has been installed in each unit.

In 2012, the units had an annual electrical consumption of 27,491.47 kWh resulting in total greenhouse gas emissions of 2,640.28 kg. and a total building energy intensity of 23.148 ekWh/gsf/yr.

The energy usage for the units in 2017 totalled 17,893.72 kWh. A savings of 9597.75 kWh. Total greenhouse gas emissions were 13,364.74201 kg and total building energy intensity was 42.55 ekWh/sqft/yr. This is partly the result of unit seven not having a tenant after October 2017, however, units three and four started to be occupied in May of 2017.

The cooling system is set higher and the heating system is set lower to reduce energy costs. The doors and windows are in good shape but will be checked to determine if weather stripping is required.

In 2012, solar panels were installed on the roof of the Post Office and it has been connected to the grid. The solar modules are made using only the highest efficiency mono-crystalline solar cells. The textured PV glass and 3 bus bar design provide world class power output. The projected annual output is 11.89 megawatt hours.

The annual output from the solar panels for 2017 was 10.64 megawatt hours. Which was very close to our projected goal.

### **Marina Office**

The Marina Office is situated at 3130 Marks Street and was originally constructed in 1989. It is 1,229 sq. ft. and has an office area as well as washrooms and showers for use by the boaters. There are also separate washrooms that are open to the public. The building is used for approx. six months of the year during the boating season.

In 2012, the Marina Office had an annual electrical consumption of 31,778.04 kWh resulting in total greenhouse gas emissions of 3051.963 kg. and a total building energy intensity of 25.861 ekWh/gsf/yr.

The energy usage for the Marina Office for 2017 was 14,552.00 kWh, which is down an astonishing 17,226.04 kWh hours. The total greenhouse gas emissions were 251.72050 kg and the total building energy intensity was 11.84245 ekWh/sqft/yr.

This building is in excellent condition. To increase energy efficiency, the heat is reduced substantially in the winter. The windows and doors have been checked to determine if any weather stripping is required. We plan to replace one of the windows in the building in the spring of 2019.

In 2012, solar panels were installed on the roof of the Marina and they are operational. The solar modules are made using only the highest efficiency mono-crystalline solar cells. The textured PV glass and 3 bus bar design provide world class power output. The projected annual output is 12.15 megawatt hours.

The annual output calculated for 2017 was 10.60 megawatts.

### **Marina – Power Building**

The Marina – Power Building is 120 sq. ft. and is used every day and night during the boating season.

In 2012, the Marina - Power Building had an annual electrical consumption of 10,703.83 kWh resulting in total greenhouse gas emissions of 1,027.99 kg. and a total building energy intensity of 89.199 ekWh/gsf/yr.

In 2017, the energy consumption for the Marina Power Building was 12, 002.40 kWh. The total greenhouse gas emissions were 207.61752 kg and the total building energy intensity was 100.02 ekWh/sqft/yr.

Weather stripping will be used for the door, if required.

### **Hilton Union Public Library**

The Library is an older building which occupies 875 sq. ft. and is used approx. eight hours per week. Efforts have been made to reduce energy consumption, particularly during the winter months. The foundation has been wrapped to reduce the amount of cold air entering the crawl space.

In 2012, the Library had an annual electrical consumption of 2,711.482 kWh resulting in total greenhouse gas emissions of 260.411 kg. and a total building energy intensity of 3.099 ekWh/gsf/yr.

A gauge is being purchased to establish the humidity level in order that the de-humidifier may not be required to run as often. The crawl space perimeter has numerous damaged openings which are a major source of heat loss. In 2014, the crawl space access will be improved, debris removed and 6 ml. poly ground moisture barrier will be installed and the joints will be sealed. The outside of the crawl space will then be insulated and wrapped. The exterior grading will be altered to ensure that the finished grade slopes away from the building. As well, the chimney will be repaired. Over the next couple of years, new exterior siding will be installed.

The energy consumption for the Library for 2017 was 1,771.419 kWh, a savings of over 1000 kWh. The total greenhouse gas emissions were 30.64200 kg and the total building energy intensity was 2.02448 ekWh/sqft/yr.

### **Water Pumping Station, Reservoir, Sewage Pumping Station and Treatment Plant**

There are 4 buildings relating to the treatment or pumping of water and sewage. There is one well pumping station, reservoir, sewage pumping station and sewage treatment plant. The waterworks were completed in 1994 and the sewage in 1995. All buildings are in use 24 hours per day and 7 days a week. An adjustment has been made so that the water is pumped into the reservoir during the night to take advantage of the off-peak savings.

In 2012, the water and sewage facilities had an annual electrical consumption of 137,402.5 kWh resulting in total greenhouse gas emissions of 13,196.136 Mega Litres and a total building energy intensity of 8036.983 ekWh/Mega Litre/yr. The annual electrical consumption for 2017 was 157,871.3 kWh. The Village had been in the process of finding a water leak and this leakage has added to the increase in energy consumption. Now that the leakage has been repaired, we are confident that the energy consumption will reduce. OCWA staff are in the process at looking at how to reduce consumption more. The total greenhouse gas emissions were 2,731.72 kg and the total building energy intensity was 3,583.96025 ekWh/sqft/yr.

The buildings are in excellent condition and were built with every effort made to ensure they were designed to reduce energy and consumption in every aspect. In 2013, solar panels were installed on the roof of the Sewage Treatment Plant and the Village is in the process of having them connected to the grid. The solar modules are made using only the highest efficiency mono-crystalline solar cells. The textured PV glass and 3 bus bar design provide world class power output. The projected annual output is 11.84 megawatt hours. The annual output for 2017 was 7.30 megawatt hours. During the winter we do not have the means to clear the snow off the panels or the output would have been higher.

### **Streetlights**

There were 20 – 175W MV (mercury vapour), 3 – 250W HPS (high pressure sodium) and 12 – 150W HPS streetlights in the Village. The lights were not energy efficient and some of them were not working at all.

In 2012, the Streetlights had an annual electrical consumption of 28,492.14 kW resulting in total greenhouse gas emissions of 2,279.37 kg.

In 2013, all streetlights were replaced with LED lighting which are much more energy efficient. This has resulted in a 60% reduction in electrical consumption based on a six month comparison.

In 2017, the annual energy consumption was 21,880.3 kWh, showing a reduction of 6,611.84 kWh from 2012.

