Energy Management Plan 2019

JUNE 27 2019

Executive Summary

The County of Lennox & Addington's Energy Management Plan provides a summary of the recommended energy management priorities which will help to conserve energy to create a healthier environment and lower overall energy consumption.

The recommended priorities of the Energy Management Plan include:

- The County's goal is to achieve a 5% reduction in energy consumption over the next 5 years.

- The County should complete the energy management conservation measures as identified in the Energy Management Plan for each building. The County has undertaken significant energy conservation measures over the past ten years. In addition, most of the County's buildings (other than social housing) have been replaced or renovated and energy efficient technology has been incorporated in their design.

- The County will continue to conduct energy audits on a periodic basis to ensure that it is aware of emerging energy conservation technologies and potential funding opportunities.

- The County will continue to review policies/procedures which potentially impact energy consumption and provide information/training to staff and tenants to encourage awareness of energy conservation.

- The County will continue to track monthly energy consumption for all buildings and follow up on any occurrences of unusual consumption.

- The County will incorporate energy reduction projects outlined in this report into the 10 year capital plan.

Introduction

What is Energy Management Planning?

Energy management planning is the process of monitoring, controlling and conserving energy while still being able to meet the County's operational requirements. It typically involves the following steps:

- Metering energy consumption and tracking data
- Identify opportunities to save energy
- Taking action to implement the opportunities to save energy
- Set 5 year energy reduction targets

What is the objective of an Energy Management Plan?

The objective of the Energy Management Plan is to gain a better understanding of the County's energy needs to identify where unnecessary expenses are being incurred and to provide insight about how to reduce energy and lessen environmental impacts.

What buildings are included within the plan?

All County buildings are included within the plan, including social housing buildings.

How was the plan developed and when will it be updated?

The plan was developed in-house by County staff with reference to energy audits and capital needs studies, which have been prepared by independent consultants. The plan will be updated every five years in accordance with the regulations.

Commitment

Energy Vision

We will continue to reduce our total energy consumption and associated carbon footprint through wise and efficient use of energy and resources, while still maintaining an efficient and effective level of service for our clients, staff, and the general public.

Strategic Plan

The County of Lennox and Addington has identified key strategic priorities as they relate to energy and sustainability.

- Maintain Infrastructure Excellence – Pride in Our Fiscal and Environmental Stewardship;
- Review energy efficiency enhancements and seek potential funding opportunities;
- Continue to develop energy tracking tools and ongoing monitoring;
- Provide education to staff and tenants on recommended energy efficiency practices. Consider incentives or change in policy to improve energy efficiency; and
- Update the County's Energy Management Plan in accordance with regulations.

Purchasing Policy

Department Heads shall endeavor to acquire goods and/or services that minimize impacts on the environment and that perform efficiently and effectively. While evaluating potential purchases the following environmental factors shall be considered in addition to the specific requirements of the good and/or service.

- Durable and reusable, as opposed to single use or disposable items;
- Level of greenhouse gas and air pollutant emissions;
- Energy efficiency of the product, preferably ENERGY STAR rated, if available;
- Recyclable, but if not recyclable, may be disposed of safely;
- Made from recycled materials;
- Level of toxicity, preferably compostable or biodegradable;
- Type of packaging, preferably made of reusable, recycled or recyclable materials; and
- Life cycle cost of the item being purchased including acquisition, operational and disposal costs.

Current State

Challenges

The County of Lennox and Addington provides services and infrastructure to a wide variety of facilities that all require a unique set of operational parameters. As such, the County faces a certain number of challenges while maintaining service excellence. These challenges include:

- **Weather**: Extreme weather conditions can be one the largest variables when it comes to energy consumption. Periods of extended heat, cold, and wind will all increase the amount of energy required to maintain acceptable occupancy comfort.

"A heating degree day (HDD) is a measurement designed to quantify the demand for energy needed to heat a building. It is the number of degrees that a day's average temperature is below 65^{o} Fahrenheit (18^{o} Celsius), which is the temperature below which buildings need to be heated"

- **Code Requirements**: As our aging portfolio is updated with new high efficiency HVAC equipment we must also operate them as required by today standards. An example of how this can increase our energy intensity is when we replace a make-up air unit in one of our social housing apartment buildings, we are required to operate the units with much greater air flow then previously required by code. Even though we have increased the energy efficiency of the heating unit, we could see an overall increase in energy use due to the longer run times required.

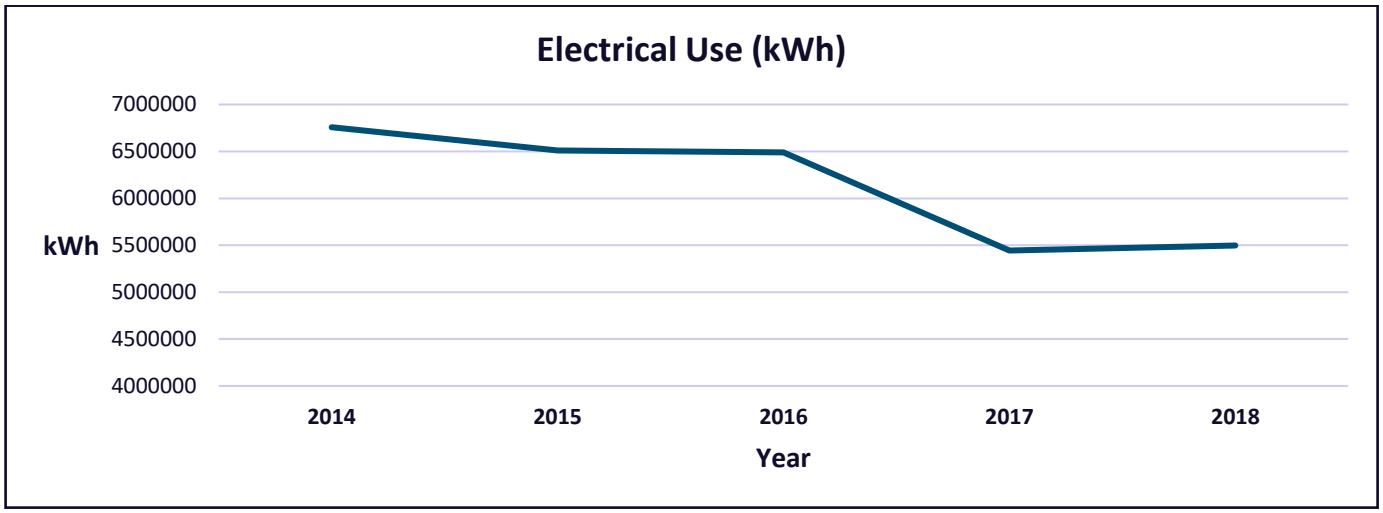
- **Control**: The ability to set temperature and occupancy schedules are a key factor when addressing energy consumption. This is not also obtainable, social housing units have the ability to set their own temperatures, while other County operations can be up to 7 days a week and 24 hours a day in some cases, like EMS.

- **Cost:** Depending on the technology being introduced, higher efficiency equipment can range from 10% to 30% more expensive then traditional technologies. This can put a strain on the budget and make some upgrades not feasible.

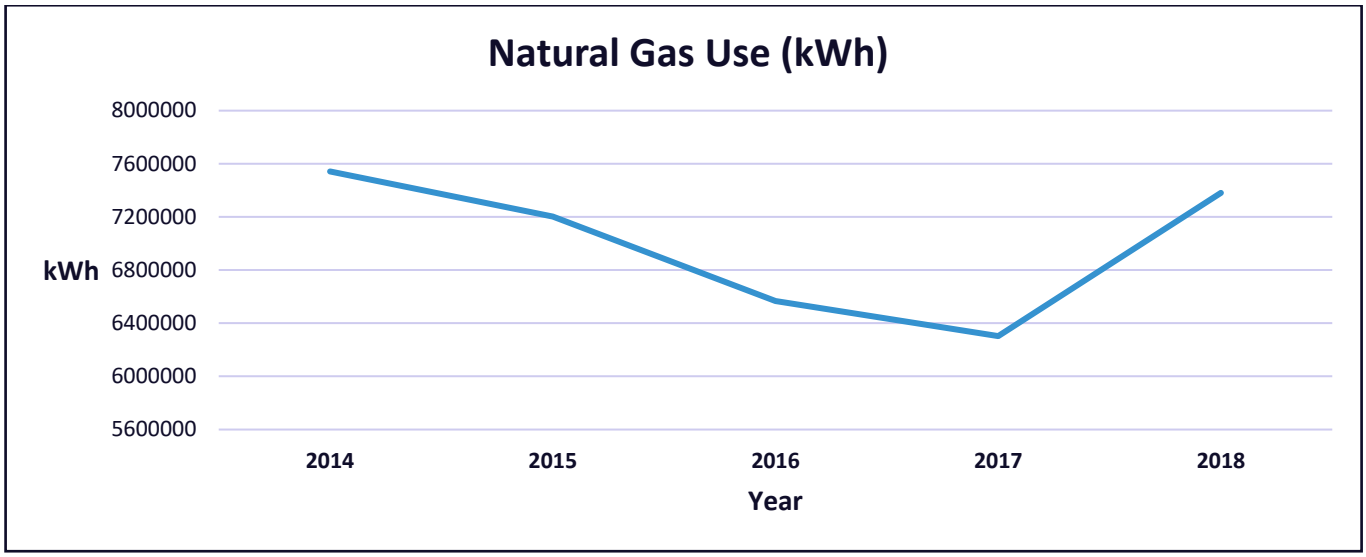
- **Aging Infrastructure:** Most of the County's buildings (other than social housing) have been replaced or renovated and energy efficient technology has been incorporated in their design. The social housing portfolio is largely made of buildings constructed between 1960's - 1970's. These buildings were designed to have low construction cost with little consideration given to energy performance.

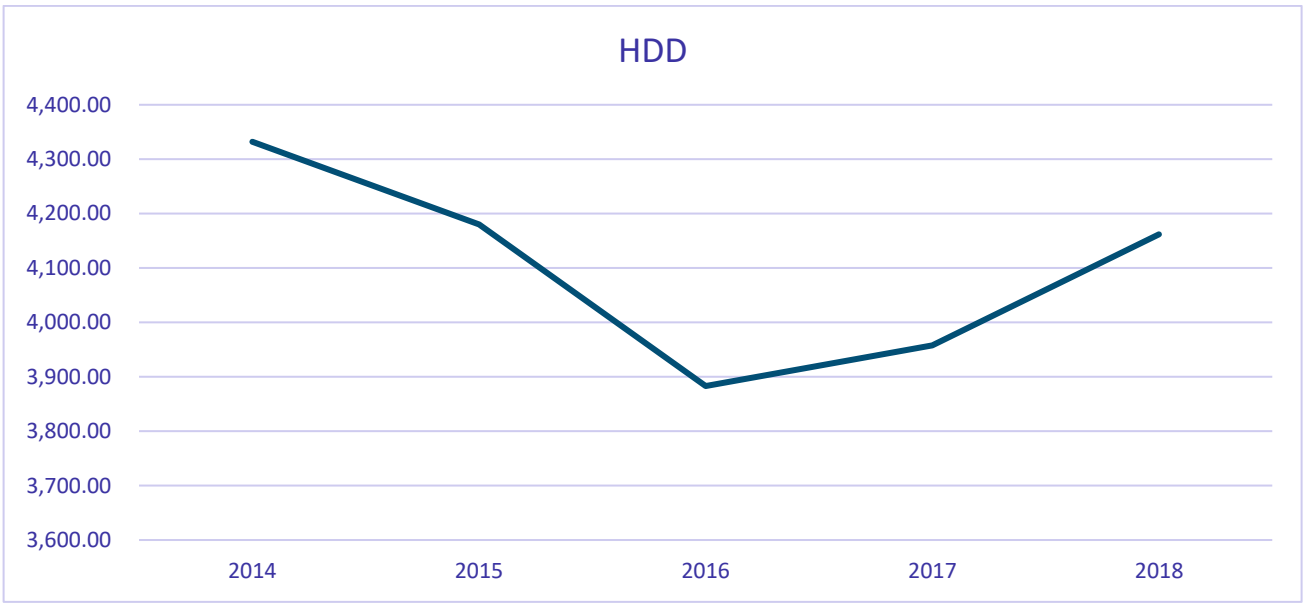
Energy Snap Shot

YEAR	ELECTRICAL USE (KWH)	ELECTRICAL USE (MWH)	ELECTRICAL USE DIFFERENCE	PERCENT CHANGE	PER SQUARE FOOT
2013	6,390,674.13	6,390.67			11.53
2014	6,757,704.26	6,757.70	367,030.14	0.06	12.19
2015	6,508,779.87	6,508.78	-248,924.40	-3.68	11.74
2016	6,490,565.48	6,490.57	-18,214.39	-0.28	11.71
2017	5,443,706.16	5,443.71	-1,046,859.32	-16.13	9.82
2018	5,496,217.62	5,496.22	52,511.45	0.96	9.91



Year	*Natural Gas Use (m3)*	*Natural Gas Use Difference*	*Percent Change*	*Per Square Foot (kWh)*
2013	644,742.57			12.27
2014	714,893.92	70,151.36	10.88	13.60
2015	682,791.45	-32,102.47	-4.49	12.99
2016	622,361.55	-60,429.90	-8.85	11.84
2017	597,458.21	-24,903.34	-4.00	11.37
2018	699,600.87	102,142.66	17.10	13.31


Natural Gas Use (kWh)
8000000
7600000
7200000
kWh
6800000
6400000
6000000
5600000
2014
2015
2016
2017
2018
Year


HDD
4,400.00
4,300.00
4,200.00
4,100.00
4,000.00
3,900.00
3,800.00
3,700.00
3,600.00
2014
2015
2016
2017
2018

Explanation

Electrical consumption over the past five years have shown a consistent reduction with a noticeable drop in 2017. The drop is in line with LED retrofits that were undertaken at that time.

The Natural Gas consumption shows a fairly steep decrease from 2014 - 2016/17 with an equal increase in 2017/18. This type of consumption pattern is not uncommon for gas consumption for a portfolio that is as diverse as the County of Lennox and Addington's. The largest factor affecting gas consumption is the weather. The weather demand is illustrated as Heating Degree Days (HDD). The above graph demonstrates as the HDDs increase and decrease the gas consumption will tend to follow the same magnitude of increases and decreases. Compounding the increases in consumption can also be related to building specific contributions; increased in-house services at the JMPC, meeting code requirements for fresh air at two social housing apartment buildings, and mechanical failures at the Court House have had the largest impact for the consumption increase.

The Plan

Target

The County of Lennox and Addington will aim to reduce our overall energy consumption by 5% over the next 5 years.

Strategy

In addition to our Commitment and Energy Vision previously, The County of Lennox and Addington will also be incorporating energy efficient measures into its 5 and 10 year capital budget. Key projects will include;

- LED retrofits will target building with large electrical lighting loads. This will include parking lots at various locations and social housing apartment

buildings. Parking lot lights use high-wattage fixtures while apartment buildings have high hours of operation, both lending well to retrofit applications.

- Increasing the level of control of our HVAC systems will be a key factor for addressing current challenges. Enable remote viewing and smart controls will help offset increased heating and fresh demands while limiting excessive use due to mechanical failures.
- Utilizing internal and external resources, an energy usage and conservation campaign will educate and incentivize building occupants to reduce energy usage and greenhouse gas.
- Utilize third party engineering service to perform detailed building and energy audits to identify and analyze energy saving measure.

All projects will be incorporated into our long term capital budget, reducing the financial impact for energy efficiency upgrades. Special funding for Green/Energy Projects will be monitored and pursued above and beyond set project budgets.