2024

Thames Centre Conservation and Demand Management Plan

Municipality of Thames Centre

Environmental Services Department

6/17/2024

Prepared by the Municipality of Thames Centre

Environmental Services Department

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1. Introduction

Energy conservation is directly linked to economic sustainability and environmental preservation. The Thames Centre Energy Conservation and Demand Management Plan is a strategic plan to achieve economic and environmental goals through the reduction of energy consumption.

O.Reg. 379/11 under the *Green Energy Act, 2009* requires all Municipalities, Municipal Services Boards, School Boards, Universities, Colleges, and Hospitals to report on their energy consumption and greenhouse gas emissions annually beginning in 2013. These public agencies are also required to develop and implement a five-year Energy Conservation and Demand Management (CDM) Plan starting in 2014. The CDM Plan must contain "current and proposed measures for conserving and otherwise reducing the amount of energy consumed by the public agency's operations and for managing the public agency's demand for energy, including a forecast of the expected results of current and proposed measures."

This plan acknowledges energy management's long-term importance while satisfying existing municipal needs and future projects.

2. History

Thames Centre was actively managing energy consumption before it was legislated by the Ontario government. Energy benchmarking of most facilities began in 2008. In 2009, Thames Centre installed over $8500 in lighting retrofits at a cost of $750 through the Hydro One Power Saving Blitz program. The success of this program inspired Thames Centre to create a corporate energy policy and pursue other energy saving opportunities (Thames Centre Council Report #ES-003-10):

Municipality of Thames Centre Energy Policy

The Municipality of Thames Centre is committed to energy conservation and environmental accountability. Through public awareness, staff training, and continual improvement, the Municipality of Thames Centre will reduce its environmental footprint through energy, cost, and waste reduction by focusing on three primary goals:

1. Maximize energy efficiency in all new construction,
2. Retrofit existing buildings to incorporate energy-efficient technologies, and
3. Identify and implement demand reduction strategies throughout the community.

Thames Centre has been committed to implementing improvements to facilities and operations that reduce energy consumption, greenhouse gas emissions and their associated costs. The following table is a summary of some of the completed energy upgrade projects:

YEAR	FACILITY	PROJECT
2019	FlightExec Centre	Refrigeration Smart Hub software system installed and designed to run at non-peak hours
2021	Operations Centre	All bay lights upgraded to LED
2022	Dorchester Pavilion	Lights upgraded to LED
2022	Dorchester Library	Lights upgraded to LED

3. Challenges

There are two primary challenges in the municipal environment: time and money. In a small municipality such as Thames Centre, there are limited financial and staff resources for energy efficiency planning and project implementation.

Councillors and upper management receive communications from residents about road conditions, water and wastewater rates, or recreation facilities availability. It is exceptionally rare that a resident would contact the municipality about natural gas usage at the Dorchester Fire Hall. The energy that is used to keep our municipality going is often forgotten in the background, but it is one of Thames Centre's greatest expenditures.

Between 2008 and 2023 Ontario electricity rates for off-peak pricing climbed from 2.7 cents/kWh to 8.7 cents/kWh; an increase of 222%.[1] In the same period, natural gas prices have fluctuated between 9.47 ¢/m3 to 37.83 ¢/m3.[2] An energy project's reduction in energy use does not always translate into an immediate cost savings. Some projects may take three years, five years, or more to benefit in cost from the reduction in energy. The lack of an immediate cost savings can have a negative impact on the decision to proceed with an energy project.

Covid. The Covid-19 pandemic affected every aspect of the Municipality. Cancelled events and sports leagues lowered the usage of many Municipal facilities. Some office staff began working from home and operations departments had limited staff working to maintain the facilities. This worldwide event created an anomaly in energy usage for the Municipality and prevented new energy projects from moving forward.

[1] Ontario Energy Board, https://www.oeb.ca/consumer-information-and-protection/electricity-rates/historical-electricity-rates

[2] Ontario Energy Board, https://www.oeb.ca/consumer-information-and-protection/natural-gas-rates/historical-natural-gas-rates

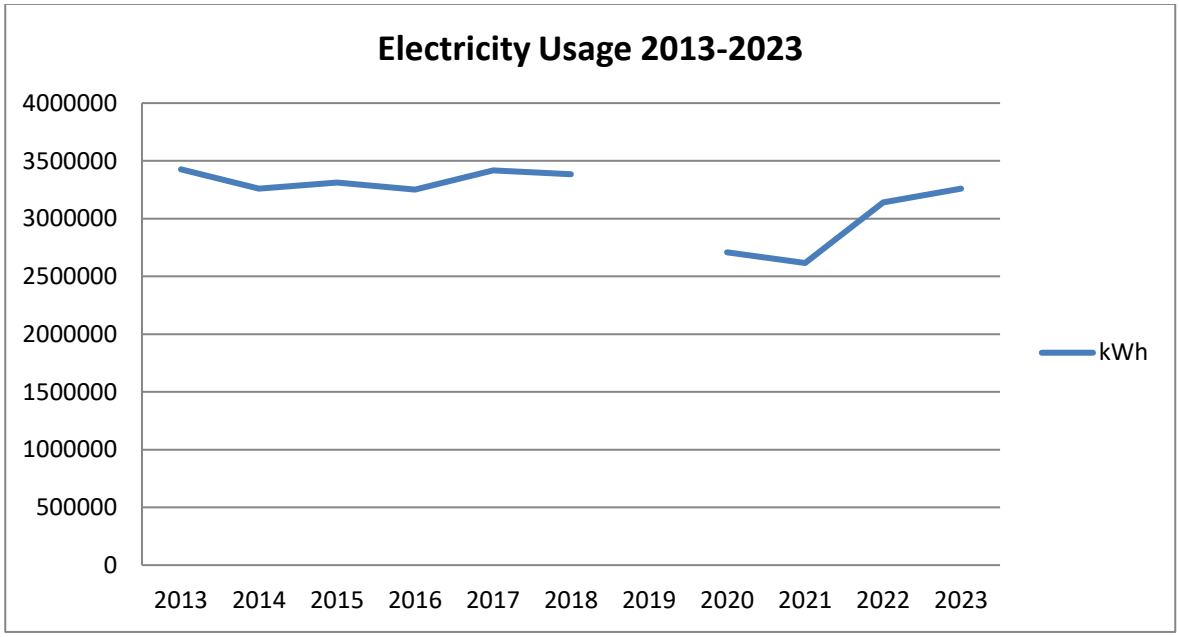
4. The Current State of Affairs

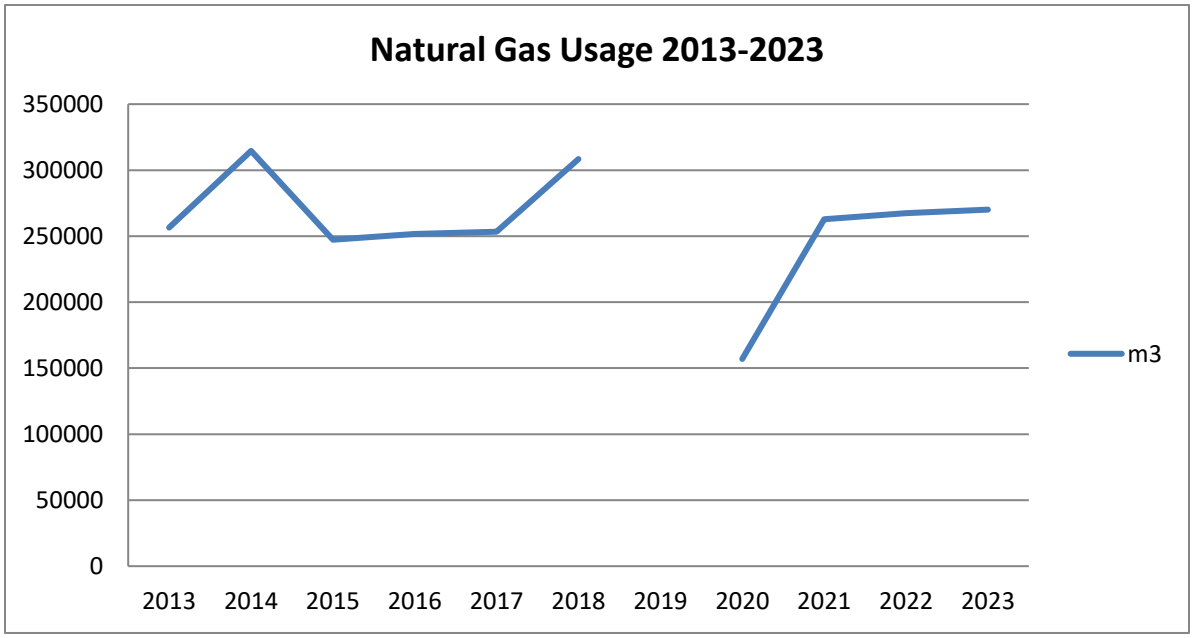
Thames Centre is required to report on 16 facilities for the 2023 reporting year. Energy usage and greenhouse gas (GHG) emissions are listed in Appendix A. A summary of the facilities is provided below:

2023 Reportable Facilities			
Facility	**Address**	**Operation Type**	**Year Constructed**
Thorndale Water Treatment Facility	17163 Thorndale Rd., Thorndale	Facilities related to the treatment of water	1975/2004
FlightExec Recreational Centre	2066 Dorchester Rd., Dorchester	Indoor ice rinks	1976/1991/2011
Catherine St. Sewer System	4182 Catherine St., Dorchester	Facilities related to the pumping of sewage	1983
Dorchester Firehall	2156 Dorchester Rd., Dorchester	Fire stations and associated offices and facilities	1991
Thames Centre Municipal Office	4305 Hamilton Rd., Dorchester	Administrative offices and related facilities, including municipal council chambers	1994
Dorchester Library	2123 Dorchester Rd., Dorchester	Public libraries	2001
Dorchester Wastewater Plant	4835 Hamilton Rd., Dorchester	Facilities related to the treatment of sewage	2001
Dorchester Wastewater Lift Station #1	249 Mitchell Crt., Dorchester	Facilities related to the Pumping of sewage	2001
Thames Centre Landfill	2015 Crampton Dr., Dorchester	Storage facilities where equipment or vehicles are maintained, repaired or stored	2001/2002
Dorchester Water Treatment Facility	2620 Dorchester Rd., Dorchester	Facilities related to the treatment of water	2003
Thorndale Library	21790 Fairview Rd., Thorndale	Public libraries	2006
Thorndale Wastewater Plant	1135 Ideal Dr., Thorndale	Facilities related to the treatment of sewage	2012
Thames Centre Operations Centre	4475 Trafalgar St. Dorchester	Storage facilities where equipment or vehicles are maintained, repaired or stored	2013
Thorndale Firehall	17198 Thorndale Rd., Thorndale	Fire stations and associated offices and facilities	2017
Dorchester Wastewater Lift Station #3	78 Mill Pond Cres., Dorchester	Facilities related to the Pumping of sewage	2019
Thorndale Community Centre	255 Upper Queen St. Thorndale	Community Centre	2020

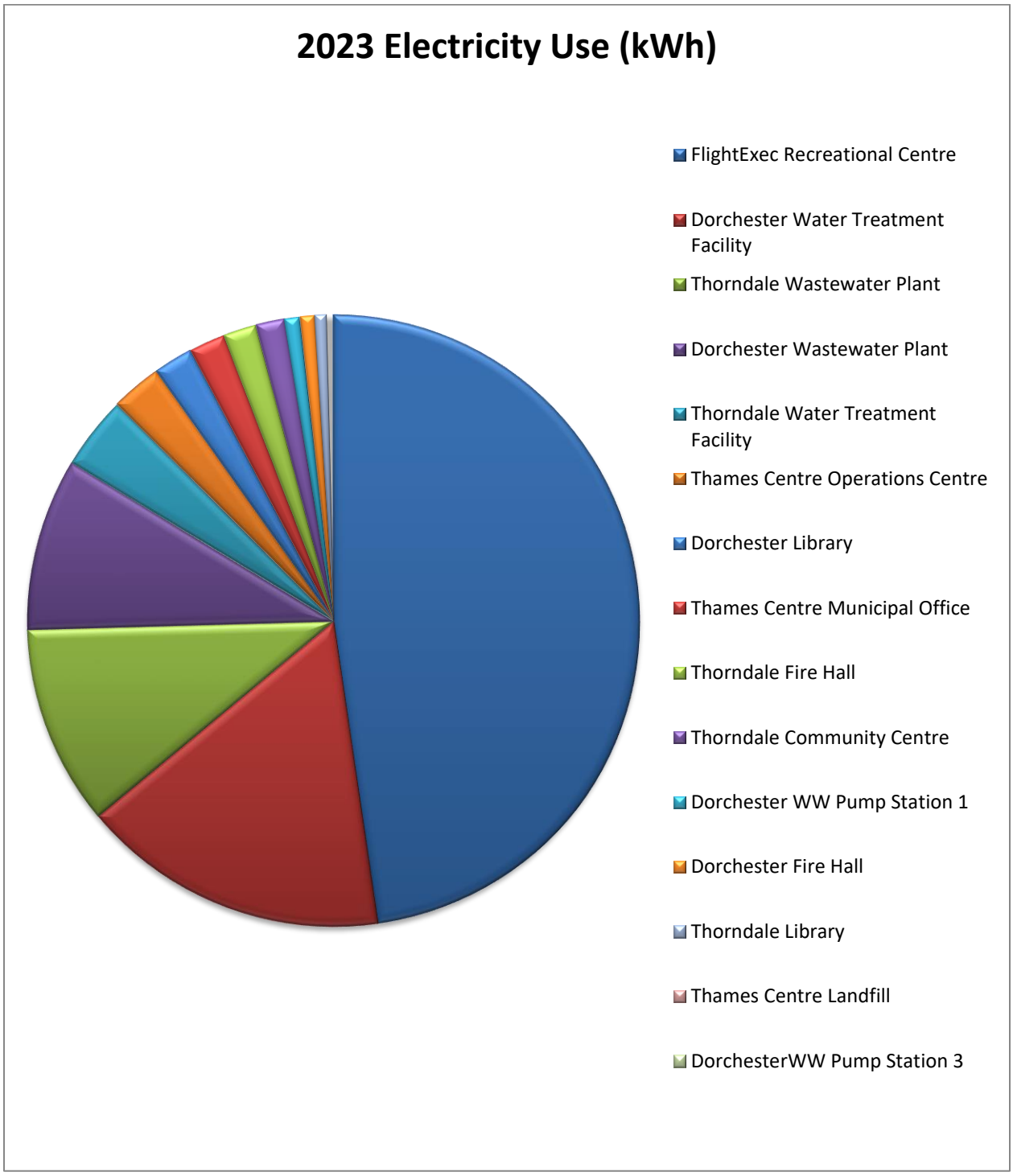
The following graphs show electricity usage and natural gas usage. Thames Centre's electricity usage increased approximately 6% per year, and natural gas approximately 9% per year from 2008 to 2013. From 2013 to 2018 Thames Centre was able to maintain or reduce energy usage in the reportable facilities. These numbers are influenced by annual temperatures, building usage, and the removal or addition of facilities, but the overall trend in both electricity and natural gas usage is evidence that the municipality's energy projects are having a positive effect.

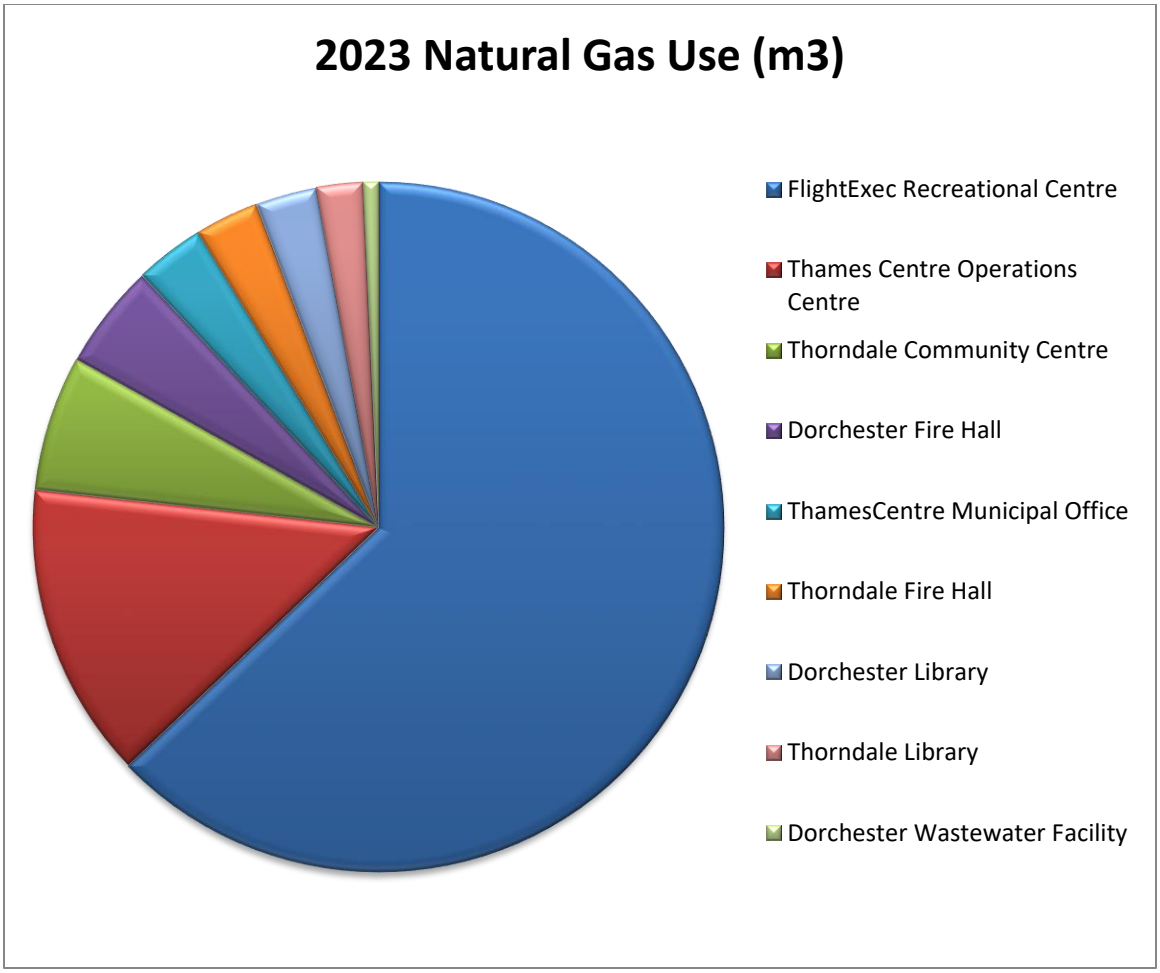
As previously stated, the Covid-19 pandemic resulted in anomalous readings from 2019-2021. The municipality did not report energy usage for 2019 and the effects of closed or lower usage facilities can be seen in the 2020 and 2021 numbers.





The following graphs show the largest users of energy on an annual basis. The FlightExec Recreational Centre uses almost half of the electricity and 63% of the natural gas of reportable Thames Centre facilities. Environmental Services facilities (water and wastewater) are the next largest consumers. Savings and improvements can be found in every facility, but targeting the largest consumers for energy reduction projects will give the municipality the best results in lowering energy costs and GHG emissions.





5. Current Energy Management Practices and Future Needs

Organizational Structure

Without the proper infrastructure in place no plan can be successful. Currently, the Finance department completes the energy benchmarking and annual reporting of energy usage. This benchmarking is done only once a year which allows inconsistencies in billing and metering to go unnoticed for long periods of time. Each department has their own energy projects, and there is a lack of communication between departments about these projects. A lack of coordination can result in missed opportunities or overlapping grant applications.

An individual or team should be assigned to communicate potential energy projects to directors and coordinate these projects between departments. The individual or team would coordinate and investigate partnerships with the province or service providers in the form of refunds, incentives, and/or grants. Monthly benchmarking would identify errors in billing and metering before they become a serious problem. They would investigate energy reduction opportunities for new and existing buildings,

and assist directors in applying for grant funding and aid. Clearly defined roles and responsibilities will allow Thames Centre to take advantage of all available resources and funding options to successfully undertake energy projects. This responsibility would amount to a few hours of work per week, but could result in thousands of dollars in savings and GHG emissions reduction.

Energy Benchmarking, Audits, and Reporting

Benchmarking and energy audits are tools the municipality uses to get a better sense of where we need to focus our resources. Currently, the minimum number of required facilities are benchmarked for the legislated annual reporting to the Ministry of Energy. The data is entered on an annual basis which, as previously stated, has resulted in missed billing and metering errors. Accurate energy data will also aid in a more accurate budget process and forecasting.

It is recommended to go beyond the scope of the reportable facilities. Thames Centre would benefit from expanding the benchmarking to all facilities, streetlights, and outdoor recreational sites. This will allow the municipality to capture energy reductions through other projects. Eventually water and fuel usage may also be benchmarked to capture other areas where potential savings could be found.

As an ongoing commitment to energy conservation it is recommended to communicate energy success regularly to council and upper management. An annual energy report containing information on upcoming projects and the success of past projects would keep council and staff informed on energy management in the municipality.

Training

Currently there is minimal energy conservation awareness among the Municipal staff. Staff focuses on municipal operations rather than improving energy efficiency. Conservation improves when operations and awareness are combined. An energy plan will not succeed without staff and council commitment. Training for staff and council is needed to facilitate energy efficiency awareness and create a culture of conservation. A screen saver is not an energy saver, but turning off a computer and monitor at the end of each work day can save over $50 per computer per year. Habits like turning off electronics and lights in offices can result in thousands of dollars in savings and GHG emission reduction, but these initiatives will only be effective if staff are dedicated to energy conservation. Staff suggestions can also be a great resource for new and innovative ideas. The people who work in the facilities every day know them best. Staff that have ‘hands-on’ involvement with energy conservation are more likely to achieve efficiency goals.

Current Projects

Covid-19 limited the grants available for energy reduction projects. In the past couple of years, with a return to normalcy, the lighting has been upgraded at the Operations Centre, Dorchester Pavilion, and Dorchester Library. Currently, projects are underway at the Dorchester Water Treatment Facility to replace the old plant high lift pumps and UV system. Staff are exploring options to replace the old equipment with more energy efficient ones.

Old Buildings and New Builds

In the past 10 years, Thames Centre has disposed of several older and low use buildings. Below is a summary of these facilities. This has saved the municipality almost $55,000 per year in energy costs and reduced GHG by over 70,000 kg per year. Continued analysis through benchmarking and energy audits should be applied to existing buildings in consideration for their continued use or replacement.

Disposed Facilities			
Facility	**Address**	**Disposal Type**	**Year Constructed**
Thorndale Firehall	160 King St., Thorndale	Sold	1924/1987
Dorchester Roads Garage	5130 Hamilton Rd., Dorchester	Sold	1963
Thorndale Roads Garage	17198 Thorndale Rd., Thorndale	Demolished, built new fire hall and water tower on site	1966
Thames Centre Landfill	2015 Crampton Dr., Dorchester	Demolished	1985
Former MTO Building	78 Cromarty, Dr., London	Rental agreement ended	1960's
Environmental Services Shop	130 Thames St., Dorchester	Sold	1948
Thorndale Community Centre	255 Upper Queen St. Thorndale	Structure fire	1952
Thorndale Progress Building	255 Upper Queen St. Thorndale	Demolished	1990

Thames Centre has implemented a design standard that requires all new subdivisions to install LED street lights. This requirement has put the cost of LED lighting on the subdivision developer instead of the Municipality paying to upgrade the streetlights in the future.

The Leadership in Energy and Environmental Design (LEED) standard for new buildings should be considered when designing new facilities. Many municipalities have adopted this standard which has resulted in lower energy costs, lower GHG emissions for the new buildings, and a higher return on government and energy partner rebates. LEEDs design and renewable resources such as solar, wind, or geothermal energy should be investigated when building new facilities or retrofitting older facilities.

6. Planned Energy Management System: Goals and Targets

Recommendations and Future Initiatives		
Initiative	**Description**	**Operational Benefit**
Organizational	An individual or team should be assigned to the manage and coordinate the Municipality's energy systems.	Increased communication between departments, increased frequency of benchmarking, aid directors in funding applications
Audits	Conduct energy audits on all facilities.	Identifies inefficiencies and potential projects
Benchmarking	Maintain benchmarking data on a more frequent schedule expand benchmarking to all facilities and street lighting, expand benchmarking to water and fuel.	Identifies inefficiencies and potential projects, identifies billing and metering errors, required by O.Reg.397/11
Reporting	Prepare an annual energy report for staff and council.	Increased communication and energy awareness between staff and council, summary of data for directors
Training	Create a training program for staff to communicate energy awareness and promote conservation programs	Raise staff involvement, increase energy awareness, unknown reduction in annual cost and GHG emissions
Energy Reduction	Through continuous improvement, staff involvement, and project commitment the Municipality of Thames Centre is committed to cost and GHG emission reduction through energy conservation.	Thames Centre will reduce its energy consumption by 1% per year over the next five years for a total of 5% by 2029

7. Conclusion

The Thames Centre Conservation and Demand Management Plan establishes a starting point for energy management in the municipality. A 1% reduction in energy usage saves 35,000 kWh in electricity and 2,500 m3 of gas per year. This creates a savings of over $10,000 per year for Thames Centre. This plan's recommendations outline achievable goals in organization, administration, supports current energy reduction initiatives, and begins the groundwork for more ambitious future projects.

Appendix A: 2023 Energy Reporting

Facility	Average Hours per Week	Floor Area (ft2)	Annual Flow (Mega Litres)	Electricity Consumption (kWh)	Gas Consumption (m3)
Thames Centre Municipal Office	65	5,404		61,750	8,862
Dorchester Library	49	3,853		68,103	7,712
Thorndale Library	30	3,692		20,101	5,913
FlightExec Recreational Centre	126	53,303		1,553,960	169,746
Dorchester Fire Hall	30	6,932		24,866	13,267
Thames Centre Operations Centre	54	26,230		87,509	37,404
Thorndale Community Centre	45	16,512		49,703	17,146
Thorndale Fire Hall	30	12,978		56,885	8,068
Thames Centre Landfill	20	565		5,652	
Dorchester WW Pump Station 3	168		18.275	4,901	
Catherine St. Sewer System	168		3.259	1,550	
Dorchester Water Treatment Facility	168	1,873	502.209	530,822	
Thorndale Water Treatment Facility	168	1,292	137.942	125,181	
Dorchester Wastewater Plant	168	1,851	124.333	296,596	1,854
Dorchester WW Pump Station 1	168		124.333	26,320	
Thorndale Wastewater Plant	168	1963	124.514	344,960	