The Township of Mapleton Energy Conservation and Demand Management (CDM) Plan for 2025 to 2029

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In consultation with Township Staff

INTRODUCTION

In 2014, the Township of Mapleton submitted its first Corporate Energy Conservation and Demand Management (CDM) Plan to the Ontario Ministry of Energy in compliance with the former Ontario Regulation 397/11 Green Energy Act, replaced by the former Ontario Regulation 507/18 Electricity Act, and again replaced by the current Ontario Regulation 25/23 made under the Electricity Act, 1998. This regulation mandates Municipalities to document and report on the results of their CDM plans and update their CDM every five (5) years.

This report meets the regulatory requirements by:

- Documenting energy management initiatives and reporting energy and natural gas statistics throughout the Municipality; and
- Outlining the goals and initiatives to be undertaken by the Municipality over the next five (5) years.

Ontario Regulation 25/23

In February of 2023, the Provincial Government introduced Ontario Regulation 25/23 (O.Reg. 25/23) under the Electricity Act, 1998. This regulation requires certain public agencies – Municipalities, Municipal Service Boards, School Boards, Post-Secondary Educational Institutions, and Hospitals to report on their energy consumption and greenhouse gas (GHG) emissions annually. This also mandates that public agencies develop, and update every five (5) years, an Energy Conservation and Demand Management (CDM) Plan. The intent of this regulation is to help the broader public sector (BPS) organizations better understand and report their energy consumption, help benchmark, encourage energy conservation, and demand management activities within their organizations, and then ultimately make this information available to its public.

To comply with O.Reg. 25/23 the Municipality is required to submit annual energy consumption and GHG emissions for each calendar year for facilities that the Municipality owns or leases, that are:

a) The building or facility is heated or cooled, and the public agency is issued the invoices and is responsible for making the payments for the building or facility's energy consumption; or

b) The operation is related to the treatment of water or sewage, whether the building or facility is heated or cooled, and the public agency is issued the invoices and is responsible for making the payments for the building or facility's energy consumption.

GOALS AND OBJECTIVES FOR CONSERVING ENERGY

Our goal is to position our organization with an energy management strategy that will facilitate change and reduce our GHG emissions. We are committed to creating new partnerships and working with other organizations to better manage energy use across our community.

Our organizational energy goals include:

- Exemplify energy conservation stewardship and leadership.
- To continuously improve the energy efficiency of our facilities and processes to reduce our operating costs, our energy consumption, and the associated greenhouse gas emissions.
- Use this plan to help monitor, evaluate, and measure corporate energy use.

Our energy conservation and demand management objectives include:

- Enhance overall staff understanding of energy and water consumption.
- Consider energy efficiency in the procurement process of equipment upgrades and capital spending.

Our targets towards achieving our goals include:

- We will reduce our consumption in all recreation and corporate municipal buildings by an average of 2% per year between now and 2029.
- We will decrease our consumption levels per Meta litre ratio in our water and wastewater facilities.by an average of 2% per year between now and 2029.

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN RESULTS

In the Energy CDM Plan 2020-2025 we proposed measures to help us meet our targets. Some of these proposed measures have not been completed. The lack of resources has been our main challenge. Our Asset Management Plan has been a competing focus as we need to meet compliance with this legislation. We will be addressing this shortcoming in this Energy CDM Plan.

Here are the results of the work we have done over the past 5 years.

Proposed Measures in CDM Plan 2020-2025	Results
Annual progress reporting to council and regulatory Broader Public Sector (BPS) reporting	Annual reports and updates prepared for council's information. Regulatory reports are submitted to the Province
That year 2012 remains the base year	The base year was amended to 2017 when we built the new Public Works Garage to show comparative data
That ASHRAE Level 2 energy audits completed on the top five energy consuming facilities	Not yet completed
Energy and water efficiency be part of capital budget planning. Fleet and Equipment be considered for energy management.	Exploring and investigating energy efficient products is always a consideration for capital replacement and upgrades. We have not yet added the Fleet and Equipment to our plan
To utilize available incentive funding and financing opportunities to improve energy efficiencies	Charging stations were funded through EPCOR. Drayton Sewage Pumping station funded Disaster Mitigation and Adaption Fund (Construction GHG quantifying helped secure approval)
To work with OCWA to explore and develop opportunities for efficiency improvements	We have seen consumption reductions in our water and wastewater facilities as equipment is being replaced. We are pumping water more efficiently.
Business cases developed for CDM Projects that explore energy efficiencies	Not yet completed
Staff will develop an Annual Energy and Water Conservation Action Plan	Not yet completed

Further to these measures, here are other areas if success we have achieved these 5 years:

- Last year the Environmental Stewardship Advisory Committee was formed, with the purpose of providing advice and recommendations to Council on policies, bylaws, plans, programs, and issues related to climate change mitigation and adaption. This includes but not limited to GHG emissions reduction, carbon sequestration, ecosystem protection and restoration, and community engagement.

- The township has added FLO electrical charging stations in the community which will allow residents and visitors more flexibility using their electric powered vehicles.

- Water and wastewater stations have been programmed to utilize higher consumption tasks during low peak times to take advantage of lower hydro rates.

- An agreement was made with Local Authority Service LAS for stabilized natural gas pricing.

ENERGY USE AND BENCHMARK PERFORMANCE OF OPERATIONS

This table outlines a comparison of the total electricity consumption between the base year of 2017 and the years addressed in our last CDM Plan, as well as the percentage change from our base year. We have had an increase in consumption in recreational facilities, water and wastewater stations and street lighting. In these areas we have seen growth adding the ABC splash park, the new water tower and additional street lighting. We have shown a 11.2% decrease at in our corporate facilities.

Electrical Consumption

Electricity Usage	2017	2021	2022	2023	% Change
Recreational Facilities	629,782	483,793	704,502	805,807	28.0%
Corporate Facilities	409,107	356,279	381,385	363,482	-11.2%
Water & Wastewater Stations	486,526	460,582	476,913	544,788	12.0%
Street Lighting	202,380	212,672	229,724	233,807	15.5%
Total Electricity Consumption:	1,727,795	1,513,326	1,792,524	1,947,884	12.7%

kWh = kilowatt-hours

The table below outlines the comparison of the total natural gas consumption with the percentage change. Natural gas showed a reduction of 12.7%. In the area of natural gas consumption, we have met our 2 percent per year goal.

Natural Gas Usage ekWh	2017	2021	2022	2023	% Change
Total Natural Gas Use:	1,509,389	1,059,083	1,491,460	1,317,791	-12.7%

ekWh = equivalent kilowatt-hours

Overall, the data shows an increase of 0.9%. This figure does not address the growth we have experienced. Growth has had an impact on these overall figures.

Combined Electrical and Natural Gas Consumption

Natural Gas Usage ekWh	2017	2021	2022	2023	% Change
Recreational Facilities	1,252,583	873,878	1,247,869	1,379,431	10.1%
Corporate Facilities	1,295,695	1,025,277	1,329,478	1,107,650	-14.5%
Water & Wastewater Stations	486,526	460,582	476,913	544,788	12.0%
Street Lighting	202,380	212,672	229,724	233,807	15.5%
Total ekWh	3,237,184	2,572,409	3,283,984	3,265,676	0.9%

ekWh = equivalent kilowatt-hours

In addition to our energy consumption, we have added the reporting of our Municipal water usage. This is the information OCWA has provided us on Municipal Water usage.

OCWA Water Report Data

Water usage in Meta Litres	2017	2022	2023
Sewage lagoon - Drayton	247	239	275
Sewage Pumping Station - Drayton	218	206	221
Sewage Pumping Station - Moorefield	29	17	25
Water Pump House - Drayton	112	174	167
Water Pump House - Moorefield	67	42	46

Looking at the data by facility is a way to pinpoint where we should be focusing our efforts. The table below shows yearly consumption with the percentage change. Only non-covid years have been used in this comparison. Here, we see where we have been successful and where we need to improve. To reach our goals, we will need to make changes to some of the equipment or energy management at our PMD Arena facility. This is the area where most of our consumption usage falls.

Consumption Comparisons (Base Year to last year)

Facility	2017	2022	2023	% Change
ABC Park and Splash Pad(Washroom, Mechnical)	New	361	478	
Alma Community Centre	126,700	108,171	149,144	17.7%
Drayton Ball Park	4,523	1,087	1,566	-65.4%
Drayton Cemetery - Chapel	30	39	10	-66.7%
Drayton Fire Station	93,094	103,334	99,343	6.7%
Drayton Water Tower	New	4,429	81,071	
Kinsmen Park (new connection)	New	583	232	
Mapleton Health Centre	229,915	214,794	186,573	-18.9%
Mapleton Township Office	84,685	91,631	101,948	20.4%
Maryborough Fire Hall	71,903	78,316	72,388	0.7%
Moorefield Community Centre	264,207	163,863	156,859	-40.6%
Pavilion - Drayton	2	1	1	-58.7%
PMD Arena	847,373	973,803	1,071,151	26.4%
Roads Shop - 58 Wood	38,409	53,295	48,773	27.0%
Roads Shop - Sideroad 16	737,999	788,070	598,615	-18.9%
Sewage lagoon - Drayton	151,827	153,615	150,632	-0.8%
Sewage Pumping Station - Drayton	75,362	73,814	80,703	7.1%
Sewage Pumping Station - Moorefield	26,938	17,367	19,476	-27.7%
Streetlights	202,380	229,724	233,807	15.5%
Water Pump House - Drayton	150,483	159,374	142,700	-5.2%
Water Pump House - Moorefield	81,914	68,314	70,206	-14.3%
Road Shop Maryborough	39,660	Sold		
Moorefield Optimist Hall	9,779	Sold		
Grand Total in ekWh	3,237,184	3,283,984	3,265,675	0.9%
ekWh = equivalent kilowatt hours				

Water and Wastewater Energy Intensity

Presenting the data in various ways also gives us a picture of our energy intensity. While looking at water facilities, we need to also consider the amount of water pumped, as this is the building's purpose. The table shows the consumption rate per meta litre of billed water, with the hydro consumption to pump this water. There are many factors for consideration, such as equipment processes, elevations and water used for lawns that does not reach the sewers. For this reason, comparisons should not be made with each facility, however year to year comparisons are appropriate.

2017 Consumption (ekWh) per Meta litre of water

Facility	Metered Utility consumption Meta L	Hydro Consumption ekWh	ekWh/ML
Sewage lagoon - Drayton	157.6	151,827	963.12
Sewage Pumping Station - Drayton	128.3	75,362	587.40
Sewage Pumping Station - Moorefield	29.3	26,938	918.04
Water Pump House - Moorefield	29.3	81,914	2,791.60
Water Pump House - Drayton	128.3	150,483	1,172.92

Taking this one more step, shows the consumption in ekWh per meta litre for different years with the percentage change. This way of looking at our data, factors in growth and gives us very different results. Here we show we are close to reaching our 2% per year goal while adding the service level of our water tower.

Base year to last year Consumption (ekWh) per Meta litre of water

Facility	2017 ekWh/ML	2022 ekWh/ML	2023 ekWh/ML	% Change
Sewage lagoon - Drayton	963.12	870.82	840.49	-12.7%
Sewage Pumping Station - Drayton	587.40	506.74	548.01	-6.7%
Sewage Pumping Station - Moorefield	918.04	565.00	609.50	-33.6%
Drayton Water (Pumphouse and Tower)	1,172.92	1,094.12	1,483.44	26.5%
Water Pump House - Moorefield	2,791.60	2,222.46	2,197.10	-21.3%
Total	6,433.08	5,259.15	5,678.54	-11.7%

Facilities Energy Intensity

The table below shows the energy usage in comparison to building square footage. When interpreting the data we also need to consider the usage of the building. For example, an arena with an ice pad cannot be compared to a hall. We can however compare the two firehalls to determine why one is more efficient.

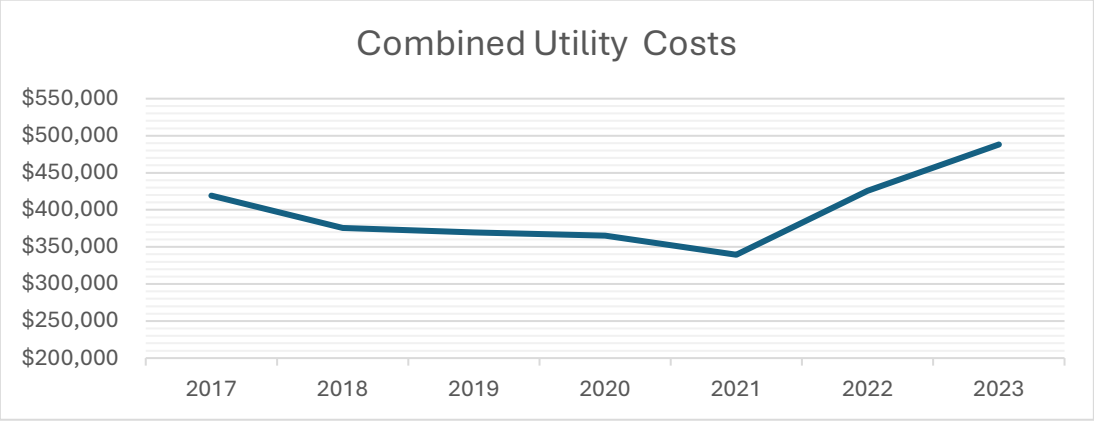
Energy Intensity (ekWh /m3)

Facility	Area (m3)	2023 Consumption (ekWh)	2023 ekWh/m3
ABC Park and Splash Pad (Partial Year)	19	478	25
Alma Community Centre	970	149,144	154
Drayton Ball Park (Partial Year)	46	1,798	39
Drayton Fire Station	604	99,343	164
Mapleton Health Centre	1,003	186,573	186
Mapleton Township Office	944	101,948	108
Maryborough Fire Hall	697	72,388	104
Moorefield Community Centre	688	156,859	228
PMD Arena	4,120	1,071,151	260
Roads Shop - 58 Wood	279	48,773	175
Roads Shop - Sideroad 16	2,806	598,615	213

Here we see the Alma Community Centre (ACC) uses 154 kWh/m3 while Moorefield Community Centre uses 228 kWh/m3. An energy audit may be able to pinpoint where the energy loss is occurring. Perhaps frequency of use is also a contributor, so further investigation is needed.

COSTS

The graph below shows the increased costs we have experienced since 2017. The dip shows the effect of energy pricing and covid shutdowns. Overall costs are up 16.5 percent since 2017. The additional service levels (new water tower, splash pad) should also be considered when comparing this data.



CURRENT AND PROPOSED ENERGY CONSERVATION AND DEMAND MANAGEMENT MEASURES

The purpose of this section is to outline and define the changes that will help us reach our goal.

- This year Mapleton Township made an agreement with Centre Wellington to share a position dedicated to energy management. We trust that this resource will provide us with the information and expertise to both identify efficiencies and make better choices around energy management.

- That an energy audit for the Township's top five energy consuming facilities be undertaken within the next two years.

- Township staff continue to be responsible for providing council with annual energy progress reports. This report will show consumption and cost data from previous years and the base year to highlight areas for improvement. This is a critical tool in helping us reduce consumption and GHG emissions. Using 2023 as our next base year will give us better comparable data as the water tower was in use most of this year. Measuring water and wastewater consumption against the amount of water pumped, will give us a better measure of comparison.

- That energy and water efficiency be specifically incorporated into the annual capital budgeting process.

- The township will work with the Ontario Clean Water Agency to explore and develop opportunities for energy and water efficiency improvements. All capital requests must explore option for energy efficiency improvements.

- The township will utilize available incentive funding and favourable financing opportunities to improve energy and water efficiency.

- The following are some of the budgeted capital projects which are scheduled for the next five years which we believe will translate into reduced consumption and savings.

Project	Implementation year	Approved Budget
Ice Rink Compressor	2024	$ 125,750
PMD New skate floor and Refridgeration Station	2028	$ 1,072,230
PMD Condensor Replacement	2025	$ 53,500
PMD Roof and Insulation	2026	$ 63,250
PMD Electical	2026	$ 340,000
PMD Water Heaters	2029	$ 22,000
PMD Heating Water Distrbution	2029	$ 22,000
Wastewater Pumping Station Electrical Upgrades	2028	$ 400,000
Drayton Water HVAC Improvements	2027	$ 80,800
Drayton Water Electrical Upgrades	2026	$ 27,500
Moorefield Water System Renewal	2024	$ 2,744,280
Moorefield SPS Flow Meter Chamber	2026	$ 232,760

The consumption savings these projects will realize will be dependent on the choices that are made throughout the project. There is also the Wastewater Renewal Project that is currently underway. Energy efficient equipment and electrical upgrades would translate into reduced consumption and savings.

CONCLUSION

The 2025-2029 Energy Conservation and Demand Management Plan for the Township of Mapleton will assist the Municipality in meeting energy related goals, reporting requirements as per O.Reg. 25/23, and striving for continuous improvement related to both industry best practices and internal practice improvements.