



Corporate Energy Conservation & Demand Management Plan (EMP) 2024-2029

Town of Orangeville

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1.0 Introduction

Overview

In pursuit of a greener, more sustainable future, Municipalities play a pivotal role leading change. As energy prices and carbon emission escalate, the need for strategic energy management becomes increasingly imperative. Recognizing this urgency, and in response to provincial regulations, the Town of Orangeville has developed a comprehensive plan to steer energy conservation efforts towards a more resilient, efficient, and sustainable energy landscape.

Ontario Regulation 25/23 of the Electricity Act (previously O.Reg. 507/18 and O.Reg. 397/11) was first published in August 2011. This regulation requires all municipalities to develop and publish greenhouse gas emissions and energy consumption summary annually on or before July 1st of each year. In addition, a Corporate Energy Conservation and Demand Management Plan (EMP) must be completed once every 5 years, the first plan was published in 2014. In response to this requirement, and building on past work, the Town of Orangeville (the Town) has developed a EMP (this Plan) for the period of 2024 to 2029, to formalize and consolidate its energy management efforts.

This plan is specifically intended to help the Town meet a number of objectives, including lowering energy consumption, improving environmental performance, reducing greenhouse gas (GHG) emissions, improving accountability to taxpayers and reducing operating costs. It also fits within the Town's broader planning context, complementing the Town of Orangeville Corporate Strategic Plan framework and Sustainability Strategy.

This plan is endorsed by the Town of Orangeville's senior management team and includes the following key elements:

- A clear corporate vision and policy that includes goals, objectives and strategic priorities;
- A summary of past successes and present initiatives;
- The Town's energy baseline and a summary of historical energy use over time;
- Our carbon footprint and the existing renewable energy sources;
- A specific, actionable and prioritized inventory of energy conservation and demand management measures to support the energy conservation goals and targets.

Energy management is important to the Town because it results in reduced costs through better equipment maintenance, economic growth, and cost-effective planning. Responsible energy management planning promotes green development and will allow the Town to execute energy reduction strategies within the constraints of existing operating budgets.

Scope and Development of the Plan

The plan was developed by members of the Town's staff with support and direction from Blue Sky Energy Engineering & Consulting Inc. The development involved three primary steps:

1. Assessing the Town's current energy consumption and energy management practices
2. Reviewing and updating the vision and objectives for energy conservation and demand management
3. Defining measurable and specific actions to achieve the objectives

This plan builds on previous energy management planning efforts made by the Town which have been enhanced based on current situation.

Once the vision and strategic priorities of the plan were defined, a detailed list of projects was assembled. The projects were identified by the staff members and the consulting team, and taken from facility energy audits and capital planning documents. The detailed action plan is summarized in the final section of this report and the detailed list of projects can be found in Appendix A.

Overview of Town Facilities

The requirements of O.Reg. 25/23 of the Electricity Act specify that the plan is to cover only the built environment (facilities that are heated) which are currently owned and operated by the Town. The full list of Town facilities included in the plan can be found in Table 1.1 below. Streetlights, as an exception, have also been included in this plan as they are a significant consumer of energy.

Table 1.1 Town Facilities and Infrastructure Within This Plan’s Scope

Name	Address	Use	Area (ft ²)
FACILITIES			
Alder Street Recreation Centre	275 Alder Street	Indoor Recreational Facility	159,478
Tony Rose Memorial Sports Centre	6 Northman Way	Indoor Recreational Facility	77,879
Town Hall	87 Broadway	Administrative Office	26,582
Mill Street Library	1 Mill Street	Public Library	14,208
Fire Hall	10 Dawson Road	Fire Facility	9,973
Operations Centre	500 C Line	Administrative Office	23,374
Town Building	120 Dianne Drive	Administrative Office	3,494
WATER AND SEWAGE			
Dudgeon Reservoir	326 Blind Line	Water Distribution	3,311
South Sector Reservoir	70 Rolling Hills Drive	Water Distribution	2,220
Well/Water Treatment & Pumping Stations (9 accounts) ¹	Various	Pumping and/or Treatment of Water	-
Water Pollution Control Plant	16 Town Line	Treatment of Sewage	20,210
Young Court Sewage Pumping Station	7 Young Court	Sewage Pumping	80
Buena Vista Sewage Pumping Station	3 Buena Vista	Sewage Pumping	388
Sandringham Sewage Pumping Station	65 Sandringham Circle	Sewage Pumping	80
STREETLIGHTS			
Streetlights	Various	Other	-

¹ This includes: Well #2, Well #5/5A, Well #6, Well #7, Well #9A/B, Well #10 – Caledon, Well #10 – Orangeville, Well #11, Well #12

Renewable Energy Sources

The Town of Orangeville does not currently own or operate any significant renewable energy infrastructure. It is our intention to review opportunities to include solar, geothermal and heat pump technologies to further reduce our dependence on energy resources. This will be accomplished through the asset planning process, currently being developed.

2.0 Commitment, Vision and Goals

The following section outlines the Town of Orangeville's commitment to responsible energy stewardship and to this plan.

Our Commitment

Recognizing our responsibility as leaders of the Town of Orangeville, we are committed to being conscientious stewards of our energy and natural resources. This commitment is beneficial to the environment and both the health and economic wellbeing of the community.

The Town of Orangeville is committed to providing the required staff and resources to continuously reduce energy consumption and the related Greenhouse Gas emissions. In addition, we are committed to using energy efficient practices and new technologies throughout our facilities and operations.

Our Vision

Be a Municipal leader in energy conservation and management of greenhouse gases, spending taxpayer's funds wisely and protecting the environment while delivering outstanding public service to the community.

Our Goal

4% reduction in total energy consumption (828 MWh) by 2029, measured against the total energy used in 2019 (20,708 MWh).

Our Strategic Focus

- ✓ Energy Efficient Asset Management & Capital Planning
- ✓ Energy Training and Capacity Development
- ✓ HVAC System Recommissioning

Details of our Strategic Focus

The following section describes the strategic priorities for the energy conservation plan.

Priority 1: Energy Efficient Capital Planning

Develop guidelines for Energy Efficient Capital Planning and Purchasing to ensure the acquisition of energy efficient equipment and systems. This will be incorporated into the larger asset management and purchasing process through the use of specific guidelines and the use of life cycle costing. Among many key areas, the following are the topics which will be a primary focus:

- HVAC Systems Guidelines (Efficiency Standards, HRV/ERVs, Heat Pumps, Electric Heating etc.)
- Building Controls (Standardized approach for all buildings)

Priority 2: Training and Capacity Development

Develop a training program which ensures employees have the appropriate knowledge of energy use and conservation. Improving the skills of the Orangeville team will help empower employees to support the development of a culture of conservation. The training will focus in two key areas:

- Energy Skills Training (technical training for specific employees)
- Energy Awareness Training (general training for all staff including knowledge of building controls (BAS))

Priority 3: Recommissioning Existing Building Systems

In order to improve the efficiency of existing HVAC systems, the Town will focus on recommissioning large rooftop units and building control systems back to their original energy efficient operation.

3.0 Our Successes

The Town of Orangeville has delivered many improvements to its facilities over the last decade resulting in the energy reductions shown in Figure 3.1 below. Please note that a significant portion of energy reductions from 2020 to 2023 were due to the shutdown of the Alder Street Pool which was reopened in 2024 and the impact of COVID-19. Conversely, 2022 and 2023 include a significant natural gas account from the Water Pollution Control Plant which was not previously reported.

Removing the impact of the Alder Street Pool shutdown, COVID19 and WPCP additional accounts, the Town is proud to have delivered over a 13% energy savings from 2012 to 2019.

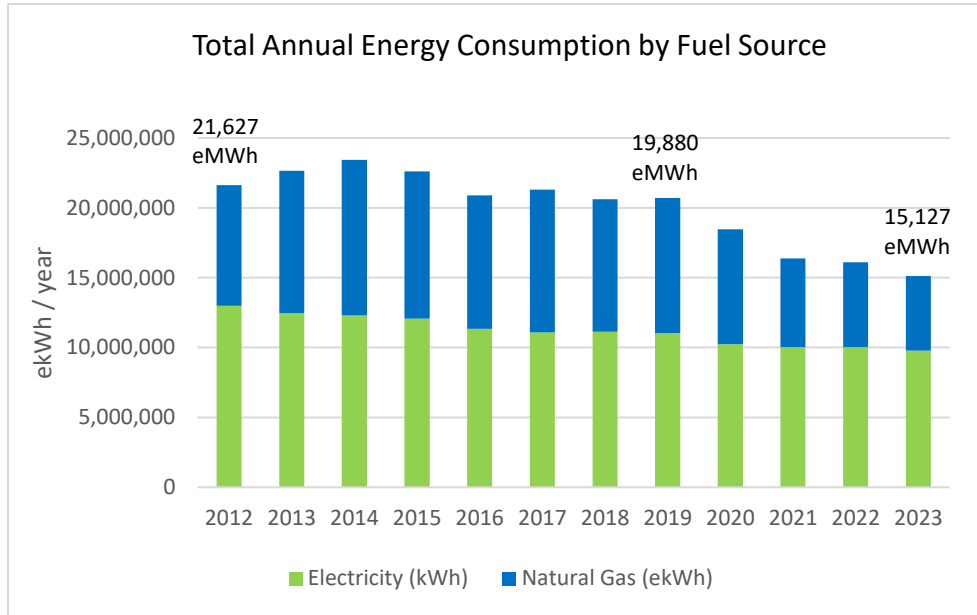


Figure 3.1: Total Annual Energy Consumption (ekWh) by Fuel Type 2012 - 2023

Completed Energy Conservation Measures

The Town has completed a number of energy conservation projects over the last ten years which have contributed significantly to energy savings. The projects range from lighting and HVAC retrofits to new thermostats and building controls. Some of the projects delivered in the last 5 years are listed in Table 3.1 below.

This demonstrates the Town’s leadership and commitment to actively managing energy consumption.

Table 3.1 Completed Energy Conservation Measures

Facility	Conservation Type	Project Description	Completion Year
Lion's Sport Park	Generator Upgrade	Installed a 60kW back up generator as this became the temporary location of the Town's EOC	2018
Alder Recreation Centre	HVAC Retrofit	Replaced Roof Top unit 13 - Carrier 4 ton unit with economizer.	2018
Town Hall	Building Envelope	Flat roof replacement, new insulation installed as part of the project.	2018
Alder Recreation Centre	Building Envelope	New flat roof installed with insulation.	2018
Town Hall, Diane Drive, Alder Rec. Centre	Lighting	LED lighting retrofit	2019
Town Hall	Building Envelope	Heritage side of the building new windows and doors installed.	2019
Alder Recreation Centre	HVAC Upgrade	RTU 5 Replaced - 25 ton unit with economizer.	2019
Alder Recreation Centre	HVAC Upgrade	RTU 16 Replaced - York	2020
Tony Rose Sport Centre	Lighting	Installed LED lighting.	2020
Diane Drive	Building Envelope	Window replacement.	2020
Fire Hall	HVAC Upgrade	RTU 3 ton cooling unit.	2021
Alder Recreation Centre	Building Envelope	exterior doors and frames, plus weather stripping replaced.	2021
Operations Centre	Lighting	LED lighting replaced.	2021
Town Hall	HVAC Upgrade	2021 replaced 6 fan coil units.	2021
Alder Street	HVAC Upgrade	2021 Replaced RTU 7 and RTU 12 no other information.	2021
Alder Street	HVAC Upgrade	2021 Spectator seating in red rink removed 8 tube heaters and replaced with 67 Schwank eco-shwank 26 model heaters. Also, replaced 2 tube heaters in green rink.	2021
Tony Rose	HVAC Upgrade	New Camus boiler installed. Dyna flame/DFX series Modu Flame 780020.	2022
Town Hall	HVAC Upgrade	new make up air unit. Engineered Air Unit model DJ-40-0 2700 cfm, input of 35,000 BTU and an output of 210,000 BTU.	2022
Alder Recreation Centre	Building Envelope	Replaced an additional 6 exterior doors, frames and weather stripping at Alder.	2022
Alder Recreation Centre	HVAC Upgrade	Replaced RTU 2 2 stage heat/cool unit with 144,000 BTU heat and 79,000 BTU cool with economizer. RTU 4- 2 stage heat/cool with 144,000BTU heat and 80,800 BTU cool with economizer.	2022
Alder Recreation Centre	HVAC Upgrade	Make Up Air Unit, heat only (400,000 BTU heat) with economizer.	2022

Facility	Conservation Type	Project Description	Completion Year
WPCP	Lighting	Replaced the T-12 in office area with LED. 43 HID fixtures to 41 LED fixtures. Upgrades in chemical building, maintenance shop, inlet building and office.	2023 / 2024
WPCP	Operational Improvement	Reduced large effluent pump (75hp) continuous usage to 2-3 day/months by adding an auto-gate allowing gravity feed.	2022/2023
Alder Recreation Centre	DHW	Replaced the 2 hot water tanks for flooding room, each tank is 100 gallons 275,000BYU/h natural gas.	2023
Alder Recreation Centre	Pool Upgrade	Replaced RTU 8 pool dehumidification system/heat.	2024
Alder Recreation Centre	HVAC Upgrade	Replaced RTU 11, 14 and make up air (MUA) unit 2.	2024

4.0 Orangeville’s Energy and Carbon Performance

Energy and Carbon Baseline

An energy baseline was established to provide a quantitative reference case for comparing the Town’s energy performance. The Town has chosen 2012 as the baseline year and data has been collected and tracked from this year forward to 2023.

The following data set is representative of the Town’s current level of energy performance, however, it has not been corrected for yearly weather variations. Table 4.1 below, presents the Town’s energy baseline by fuel type, expressed in equivalent kilowatt hours (ekWh). Streetlighting has been separated from the facilities as it is fundamentally different from other energy consuming systems, and it is not required to be reported by the O.Reg. 25/23.

Table 4.1: Town Energy Consumption Compared to Baseline

Account Centre	Energy Type	2012	2019	2023	% Change vs 2019	% Change vs 2012
Facilities	Electricity (MWh)	11,395	10,274	9,051	-11.9%	-20.6%
	Natural Gas (m ³)	835,854	934,976	516,976	-44.7%	-38.1%
	Subtotal (eMWh)	20,029	19,932	14,391	-27.8%	-28.1%
Streetlights	Electricity (MWh)	1,593	776	736	-5.1%	-53.8%
Total Energy	(eMWh)	21,622	20,708	15,127	-26.9%	-30.0%
Total GHG Emissions	(tCO₂e)	3,526.2	2,116.5	1,286.7	-39.2%	-63.5%

Note: ekWh (equivalent kWh) is a calculated value using the thermal energy content of Natural Gas to convert consumption of Natural Gas in m³ to units of “equivalent” kWh for comparison.

In 2012, the Town’s facilities included in this plan consumed 21,622 eMWh and were responsible for 3,526 tonnes of associated greenhouse gas (GHG) emissions.

The Town is pleased to report that the total energy consumed by the Town facilities in 2023 decreased by 30% and emissions were reduced by almost 64% compared to 2012. Please note that in energy consumption was due to the conservation improvements (streetlighting to LED, HVAC upgrades, see Table 3.1) made by the town staff and, in part by the following changes in facility operation:

- The COVID-19 pandemic impacted community facility use significantly in 2020 and 2021
- The Alder Street Pool was shut down in 2021 for renovations and has just been reopened. This significantly impacts both electricity and natural gas use. It is anticipated that the fuel consumption at Alder Street will increase when this facility reopens in mid 2024.

Although the baseline year for ultimate comparison is 2012, for the purposes of this report, 2029 targets will be set against 2019 consumption levels for consistency as 2020-2023 data was impacted by the factors listed above.

The following section outlines the specific energy used by the Town both historically and currently (2023).

Historical Energy Breakdown

This section outlines the energy consumption picture at the Town both currently (2023) and over the last decade. Figure 4.1 below illustrates the total energy consumed by the Town broken down by fuel type for 2023. As previously indicated, the Town consumes two main fuel types, electricity and natural gas.

**Total Energy Consumption (Electricity & Natural Gas)
2023 = 15,127 eMWh**

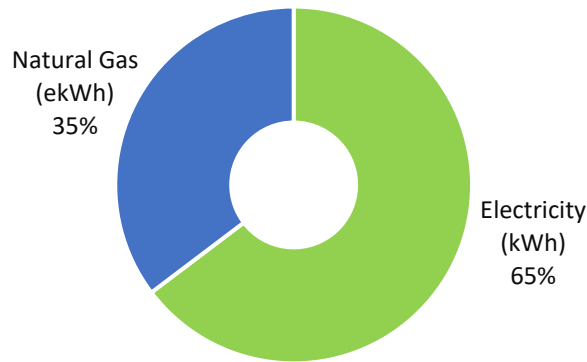


Figure 4.1: Total Energy Consumption by Fuel Source 2023

Figure 4.2 below illustrates the total energy consumed (ekWh) at the Town each year between 2012 and 2023 by business division.

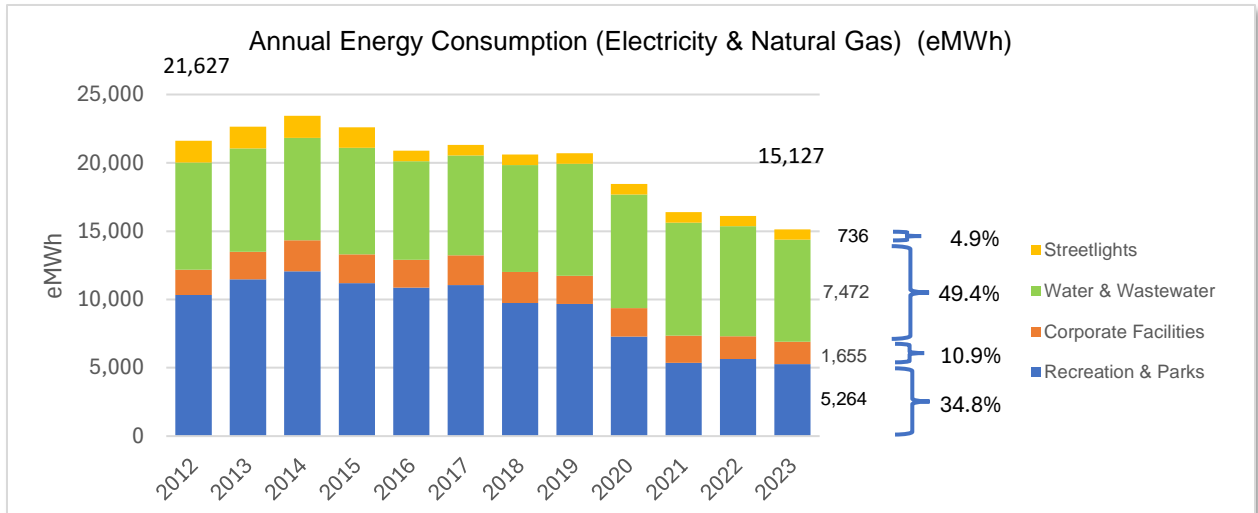


Figure 4.2: Total Annual Energy Consumption (ekWh) 2012 - 2023

The graph shows a significant reduction (30%) in energy consumption over the period from 2012 to 2023. The energy

savings was primarily due to the following factors:

- Shut down of the Alder Street Recreation Centre pool for maintenance
- Significant savings from streetlighting upgrade to LED
- Energy savings measures delivered at the Town facilities

It is anticipated that the energy consumption will rise to near pre-COVID19 levels beginning in 2024 because of the reopening of the Alder Street pool. As such, as mentioned previously, this energy plan will use 2019 as a baseline year to measure energy savings goals and targets.

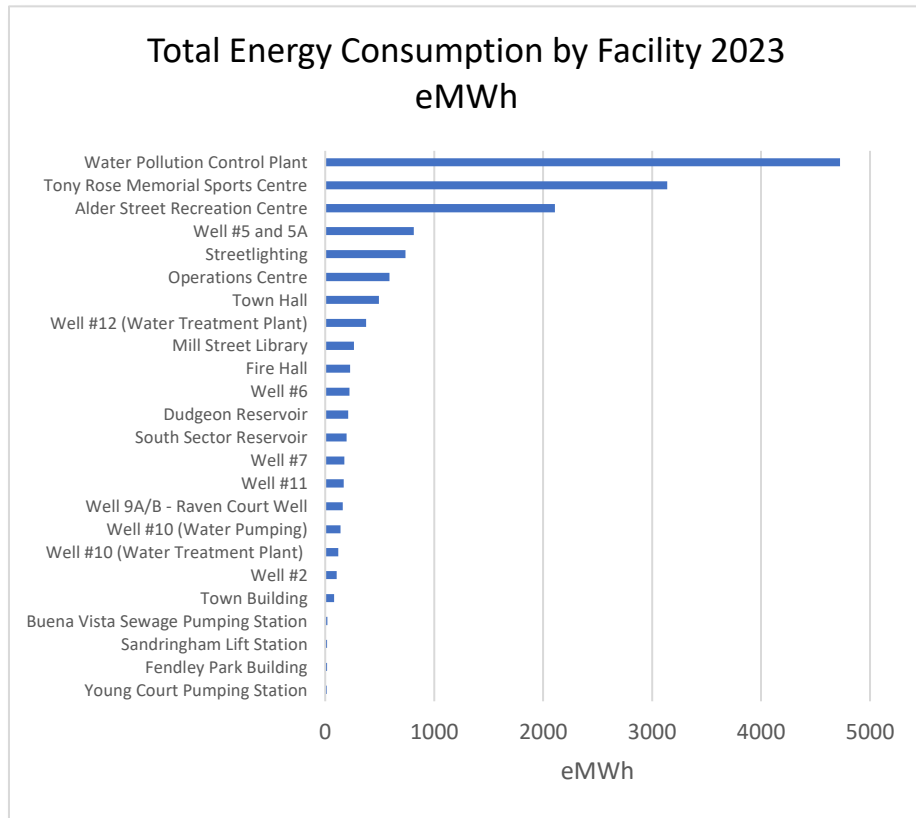


Figure 4.3: Total Energy Consumption Breakdown by Facility 2023

As illustrated in Figure 4.3 above the majority of the energy consumed in Orangeville is by the Water Pollution Control Plant (WPCP), and the two sports and recreational centres; Tony Rose Memorial Sports Centre and Alder Street Recreation Centre. The three facilities are responsible for over 65% of the total energy consumed at the Town.

- The Water Pollution Control Plant (WPCP) is the largest consumer, (4,726 eMWh per year representing 31% of the total consumption),
- The Tony Rose Memorial Sports Centre is second, (3,139 eMWh per year, representing over 20% of total energy consumed),
- The Alder Street Recreational Centre is next with 2,109 eMWh of energy consumption, (14% of the total).

The following sections break down energy use further by electricity and natural gas.

Electricity:

The figure 4.4 below show electricity use in 2023 by facility, with WPCP, Alder Street and Tony Rose Memorial Recreation Centres, Well #5 and 5A and streetlighting responsible for 75% of the consumption picture.

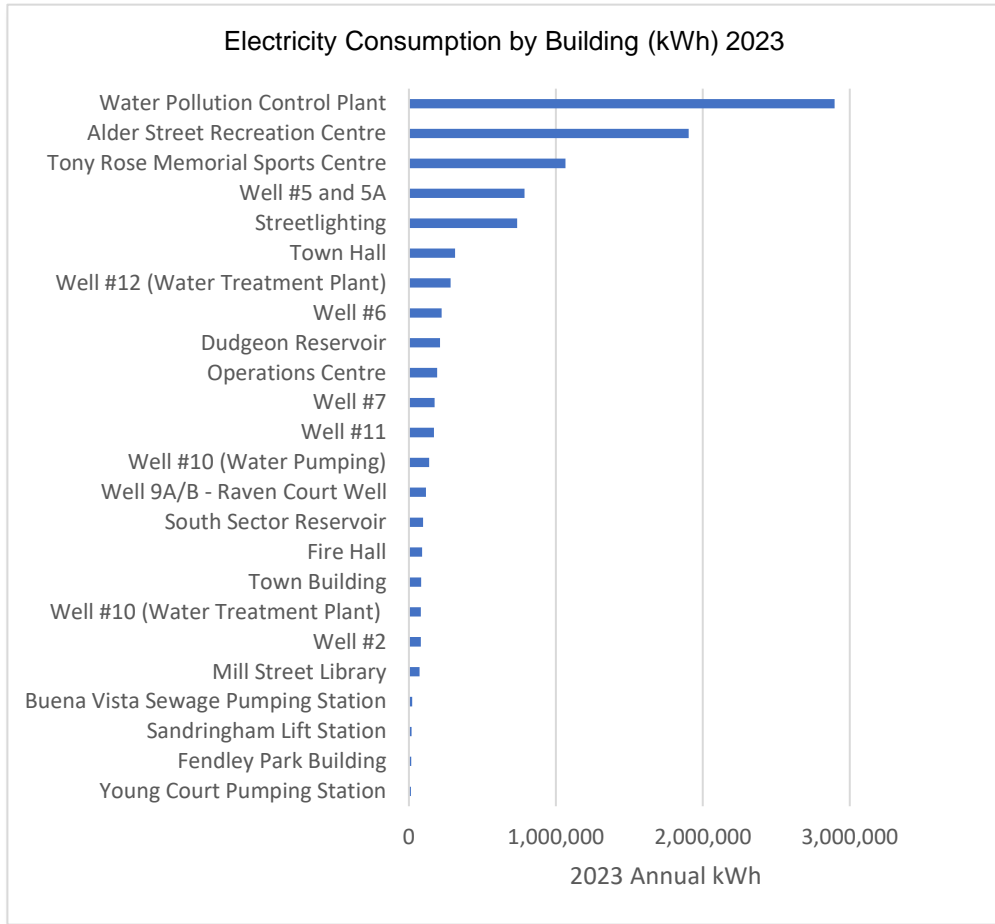


Figure 4.4 2023 Electricity Consumption by Facility

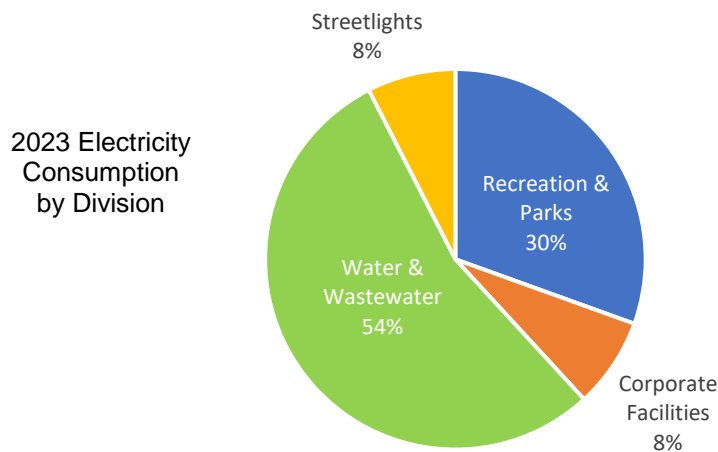


Figure 4.5 2023 Annual Electricity Consumption by Division

Figure 4.5 above illustrates electricity consumption by division with Water and Wastewater processing and pumping responsible for 54% of the consumption.

Natural Gas:

Figure 4.6 below shows the consumption of natural gas by Town facilities with Tony Rose and the WPCP leading consumption. As previously mentioned, Alder Street natural gas use is low because the pool was not in operation in 2023. Figure 4.7 below, illustrates the breakdown of natural gas consumption by division.

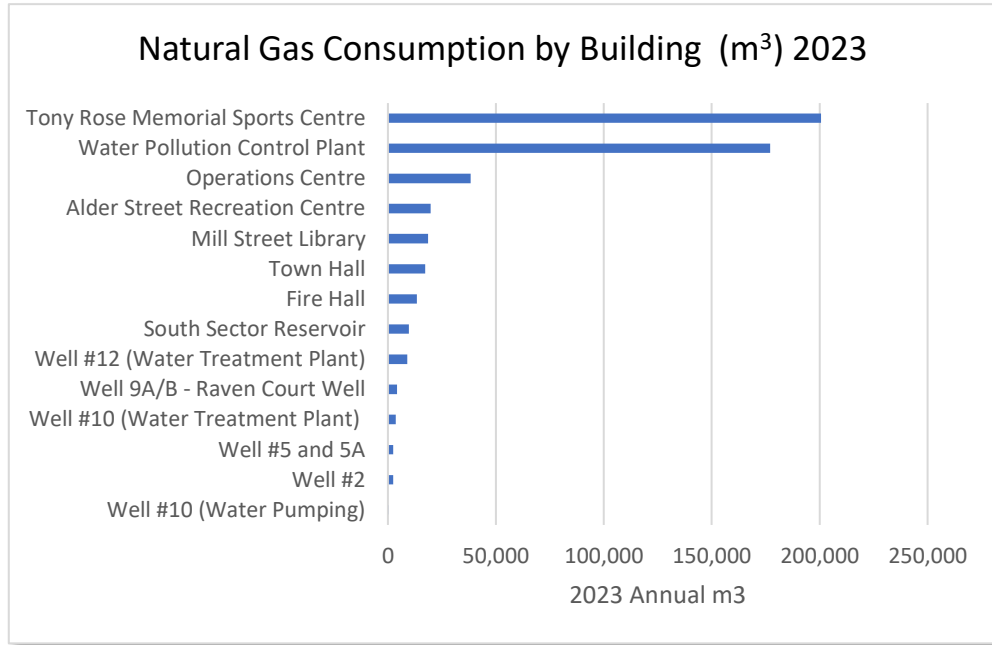


Figure 4.6 2023 Natural Gas Consumption by Facility

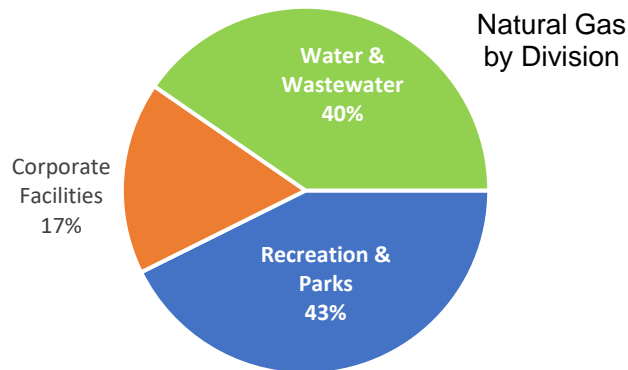


Figure 4.7 2023 Annual Natural Gas Consumption by Division

Carbon Emissions

The carbon footprint related to the energy used by the Town is tracked and monitored. The rate of greenhouse gas production varies by energy source and is directly affected by the emissions conversion factors and the Town consumption. Emission conversion factors used in this report were published values for Ontario and can vary year to year based on the how clean is the energy generation.

The GHG emissions resulting from Town energy use are broken down by fuel source in Figure 4.8.

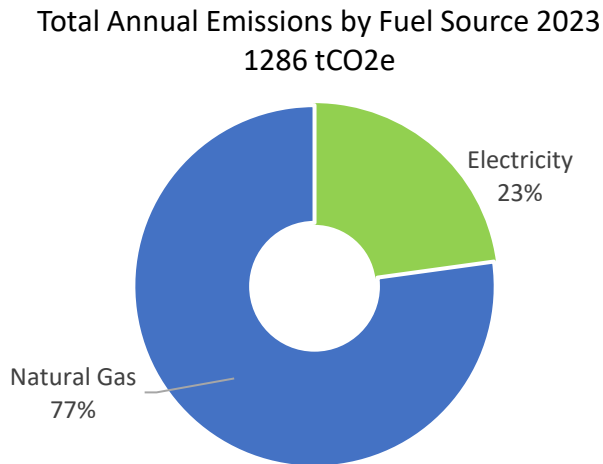


Figure 4.8 Total Annual GHG Emissions for 2023 by Energy Source

Note that although natural gas provides 37% of the total energy needs for the Town, it is responsible for 79% of the GHG emissions. It is for this reason that GHG emissions reduction plans must include a strategy for the reduction of consumption of fossil fuels.

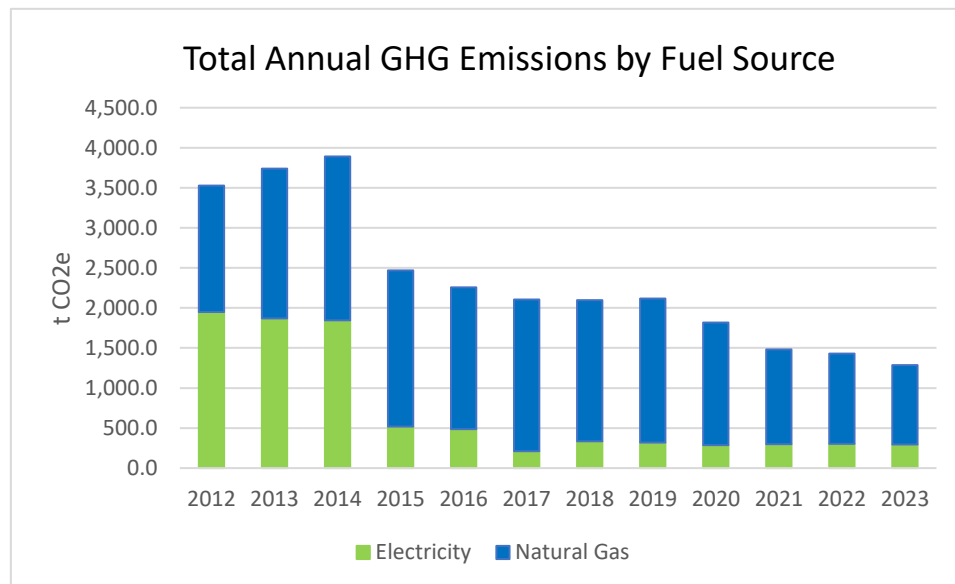


Figure 4.9 Total Annual GHG Emissions from 2012 to 2023 by Fuel Source

Emissions conversion factors have changed significantly for electricity production in Ontario. Specifically in 2014 electricity became significantly cleaner when the last of the coal fired electricity generation plants were shut down. This is why a significant reduction in emissions from electricity is evident in Figure 4.9 in 2015.

Figure 4.10 below lists the GHG emissions by facility for 2023. The four largest emitters are the WPCP, Tony Rose Memorial Sports Centre and Alder Street Recreation Centre. As indicated by the previous figures, the larger GHG emission levels are due to the consumption of natural gas in these facilities.

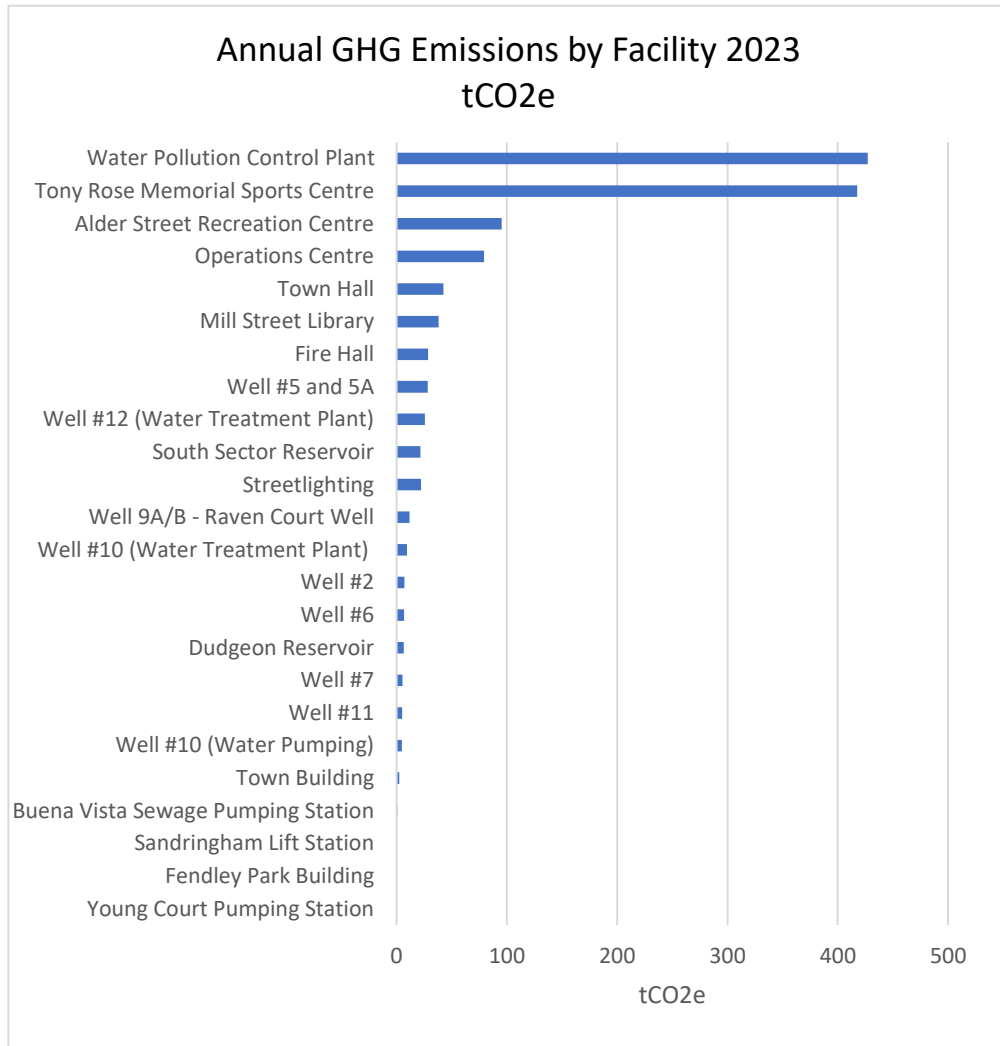


Figure 4.10 Annual GHG Emissions by Facility 2023

5.0 Our Energy Conservation Action Plan

Action Plan List

A critical part of any plan is the detailed list of specific actions needed to achieve the targeted goals and objectives. The Town of Orangeville has developed a key project list which will help ensure the Town meets the energy reduction goals set out in Section 2.0.

The plan will be focused on the following three conservation strategies:

- ✓ Energy Efficient Asset Management and Capital Planning
- ✓ Training and Capacity Development
- ✓ HVAC Recommissioning

The detailed list of projects included in the plan, which covers a period from July 2024 to June 2029, can be found in Appendix A.

Appendix A:

Corporate Energy Conservation Action Plan



CORPORATE ENERGY CONSERVATION & DEMAND MANAGEMENT ACTION PLAN

VISION: Be a municipal leader in energy conservation and management of greenhouse gases, spending taxpayer’s funds wisely and protecting the environment while delivering outstanding public service to the community.

5 YEAR GOAL: 4% Reduction in Energy Consumption (828 MWh) by 2029 compared to 2019 (20,708 MWh)

Projects and Programs				
Facility	Measure Type	Action	Responsible	Completion Date
All	Standards	Develop energy efficient capital planning standards and guidelines for key infrastructure: Heating systems, pumping, cooling system, ice plant equipment, equipment controls, building envelope.	Community Services	2029
All	Standards	Develop energy measurement / monitoring policy for Municipal Facilities.	Community Services	2029
Various	Training	Energy Awareness Training: Deliver general and energy conservation and awareness training to staff and facilities personal.	Community Services	2027
Various	Training	Energy Skills Training: Deliver specific technical energy conservation training to facility and operations staff.	Community Services	2027
Various	Study	Facility energy audits completed for targeted buildings	Community Services	2025
Various	Program	Recommission HVAC systems at all targeted facilities	Facilities	2029
Alder Recreation Centre	Ice Plant	Replace evaporative condenser for the refrigeration plant.	Facilities	Aug 2024
Town Hall	HVAC	Replace condenser unit	Facilities	July 2024
Town Hall	HVAC	Replace 9 fan coil units	Facilities	2024
Alder Recreation Centre	HVAC	Replace three more aging roof top units.	Facilities	April 2024
Pump Houses (Wells)	Lighting	Upgrade lighting fixtures to LED	Facilities	2024
Town Hall	HVAC	Replacement of fan coil units 6 to 8	Facilities	2025
Pump Houses (Wells)	Lighting	Continue with the LED lighting	Facilities	2025
Alder Recreation Centre	HVAC	Replace the Lars boiler.	Facilities	2025

Projects and Programs				
Facility	Measure Type	Action	Responsible	Completion Date
Alder Recreation Centre	HVAC	Replace heating pumps.	Facilities	2026
Tony Rose	Lighting	Change pool lighting to LED.	Facilities	2026
OPP Building	Building Envelope	Replace outside steel doors and new weather stripping.	Facilities	2026
Alder Recreation Centre	HVAC	Replace the Camus boiler	Facilities	2029
Tony Rose	HVAC	Replace/Upgrade RTU units	Facilities	2030
Tourism Building	Building Envelope	Replace fenestrations with higher efficiency windows	Facilities	2030
Various	Lighting	Finish converting all remaining Town lighting assets to LED	Facilities	2029
WPCP	Digester Heating System	Replace and upgrade digester heat exchangers and the affiliated pumps and valves.	Operations	2025
WPCP	Renewable Energy	Review the viability of using biogas produced in the digesters once the heat exchanger upgrade has been completed. This would greatly reduce natural gas use at the facility.	Manager Facilities + Operations	2026
WPCP	Process Equipment	Fix air leak around flange on aeration plenum – reducing energy load on blowers	Operations	2025
WPCP	HVAC	Replace older space heater thermostats with programmable digital units. Longer term, add control of space heating through a BAS system which can be viewed on SCADA. Setback heating setpoints wherever possible in building which are not regularly used.	Operations	2024-2029
WPCP	Building Envelope	Replace rollup door with insulated sealed unit in Maintenance Shop	Manager Facilities	2025
WPCP	Building Envelope	Complete review and maintenance of door and window seals	Manager Facilities	2024
WPCP	Building Envelope	Take Infrared (IR) images of outer walls for all buildings to identify opportunities to reduce infiltration and improve insulation.	Manager Facilities	2025

Notes: All capital projects are subject to funding availability and council approval.