The Corporation of the Town of Collingwood

Energy Conservation and Demand Management Plan

2024-2029

Table of Contents

Executive Summary

The Town of Collingwood is required under the Electricity Act's Ontario Regulation 507/18 Broader Public Sector: Energy Reporting and Conservation Demand Management Plans, to publish an updated five-year Energy Conservation and Demand Management (ECDM) Plan by July 1, 2024.

The Town of Collingwood's 2024-2029 ECDM plan is designed to fulfil regulatory requirements in addition to educate and inform both Town employees and the public about Collingwood's past and future efforts to reduce greenhouse gas emissions (GHG) and energy consumption. The report summarizes and provides analysis of 2023 energy consumption and greenhouse gas emission data, proposes measures for energy conservation and GHG reduction for all Town facilities over the next five (5) years, and identifies future opportunities for the Town to explore including district energy systems, and renewable energy solutions.

The 2019-2024 ECDM plan set a target to reduce the Town of Collingwood's energy consumption by an additional 10% over the life of the plan. The town was successful in reducing electricity use by 7% between 2017 and 2023, however natural gas use increased by 12%. Between 2017 and 2023, an additional 3 facilities were added to the Town's portfolio required to report under Broader Public Sector guidelines.

Between 2017 and 2023, GHG emissions from reporting facilities increased by 21%. This increase in GHG emissions were primarily due to the increase in Ontario's electricity emissions factor, and the 12% increase in natural gas use.

The goals and objectives of the 2024-2029 ECDM Plan have been updated to reflect Council and community climate change priorities of reducing GHG emissions and conserving energy. The new targets identified in this plan are to reduce energy and GHG intensity per square foot, and to reduce building emissions by 50% in 10 years and 80% in 20 years.

Abbreviations and Definitions

GHG (Greenhouse gas) – Compound gases that trap heat and emit longwave radiation in the atmosphere, causing the greenhouse effect.

CO_2 (Carbon dioxide) – A greenhouse gas that absorbs heat radiating from the Earth's surface and re-releases it in all directions, including back towards Earth's surface.

CO_2e (Carbon dioxide equivalents) – A common unit of measurement used to compare emissions from various sources. Carbon dioxide equivalents are calculated using Global Warming Potential factors that represent the impact of each greenhouse gas type (such as methane (CH_4) and nitrous oxide (N_2O) relative to that of carbon dioxide.

Consumption Intensity – An indicator derived to reflect the greenhouse gas emissions intensity of electricity as it is delivered to the consumer.

m^3 (cubic meters) – Used to measure heating fuels (i.e. natural gas) and water.

ft^2 (square feet) – Used to measure the footprint of facilities.

kWh (kilowatt hours) – the unit of measurement for electricity usage.

HVAC (Heating, Ventilation and Air Conditioning) – the primary features required to maintain comfort for building occupants.

Renewable energy - A naturally occurring energy source that is not finite or exhaustible. It includes sources such as sunlight, wind, and geothermal heat.

Emissions Factors

Each greenhouse gas (GHG) has a unique atmospheric lifetime and heat-trapping potential. For simplification and to enable comparisons, gasses are converted to a common unit of measurement for emissions tracking and communication: carbon dioxide equivalent (CO_2e).

GHG's are multiplied by their global warming potential (GWP), which examines each gas' ability to trap heat in the atmosphere compared to carbon dioxide (CO_2). GHGs are measured by mass (e.g. grams, kilograms, or tonnes CO_2e).

Table 1: Intergovernmental Panel on Climate Change (IPCC) Global Warming Potential

Greenhouse Gas	Formula	4th IPCC Assessment 100-year GWP [1]	5th IPCC Assessment 100-year GWP [2]
Carbon dioxide	CO_2	1	1
Methane	CH_4	25	28
Nitrous oxide	N_2O	298	265
Sulphur hexafluoride	SF_6	22,800	23,500
Nitrogen trifluoride	NF_3	17,200	16,100

Emission factors used to calculate greenhouse gas emissions within this report are in alignment with the April 2023 publication of the National Inventory Report 1990 – 2021: Greenhouse Gas Sources and Sinks in Canada by Environment and Climate Change Canada.

[1] https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf
[2] https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

1.0 Introduction

The Town of Collingwood is required under the Electricity Act's Ontario Regulation 507/18 Broader Public Sector: Energy Reporting and Conservation Demand Management Plans, to publish an updated five-year Energy Conservation and Demand Management (ECDM) Plan by July 1, 2024.

The regulation requires public agencies including municipalities, municipal service boards, school boards, universities, colleges, and hospitals, to report on energy and greenhouse gas (GHG) emissions from the operation of publicly owned buildings. As a municipality regulated under the Broader Public Sector Regulation (O.Reg.507/18), the Town of Collingwood has submitted annual energy consumption reporting to the Ministry of Energy in order to comply with the requirements since 2013.

ECDM plans are comprised of two parts intended to help public agencies better understand and manage their energy consumption and needs.

1) Summary of annual energy consumption and operational GHG emissions,
2) Describe and trend previous, current, and future measures for conserving and otherwise reducing the amount of energy consumed through municipal operations, including a forecast of the results of current and proposed measures.

This report is designed to fulfil regulatory requirements in addition to educate and inform both Town employees and the public about Collingwood's past and future efforts to reduce GHG emissions and energy consumption. Many of the recommendations listed in this plan have been influenced by the results of the Town's Greenhouse Gas Reduction Pathway Feasibility Study, completed in the first quarter of 2024, with the goal of reducing GHG emissions from 42 Town owned buildings by 50% in 10 years and 80% in 20 years.

The Fleet and Facilities team under Collingwood's Customer and Corporate Services Department collaborates with numerous department representatives to collect information about previous and future energy efficiency and renewable energy projects throughout Town buildings.

1.1 Scope of Municipal Energy Conservation and Demand Management Plans

The facilities reported within this plan comply with the mandatory list of municipal operation types to report required by O. Reg. 25/23, shown below:

1. Administrative offices and related facilities, including municipal council chambers
2. Public libraries
3. Cultural facilities, indoor recreational facilities, and community centres, including art galleries, performing arts facilities, auditoriums, indoor sports arenas, indoor ice rinks, indoor swimming pools, gyms, and indoor courts
4. Ambulance stations and associated offices and facilities
5. Fire stations and associated offices and facilities
6. Police stations and associated offices and facilities
7. Storage facilities where equipment or vehicles are maintained, repaired, and stored
8. Buildings or facilities related to the treatment of water or sewage
9. Parking garages

The buildings reported in this plan represent a sub-set of the total facilities owned and operated by the Town of Collingwood. Although not required, the Town has historically reported on pumping stations and will continue to do so on a voluntary basis.

2.0 Organizational Approach

The Town of Collingwood's approach to Energy Conservation and Demand Management (ECDM) is continually evolving.

Historically, each department has been responsible for the implementation of energy savings measures throughout their facilities, including the review and approval of utility bills. Since the 2019-2024 ECDM plan, there has been more collaboration and communication between departments and the Fleet and Facilities team to ensure consistency throughout the corporation.

The 2024-2029 ECDM plan places a higher priority on reducing greenhouse gas (GHG) emissions from facility operations following Council's 2019 Climate Crisis declaration.

2.1 Corporate Climate Action

In October 2019, the Town of Collingwood declared a Climate Crisis to name and deepen our commitment to protecting our economy, our community, and our ecosystems, from the climate crisis.

Following the climate crisis declaration, a Climate Change Specialist staff resource was hired in October 2021 and Council passed the Greener Collingwood Corporate Climate Change Action Plan in April 2023.

The Greener Collingwood Plan follows the Federation of Canadian Municipality (FCM) and ICLEI Canada's Partners for Climate Protection (PCP) Program. The PCP program outlines a 5-milestone framework to guide municipalities through acknowledging and reducing emissions produced from corporate operations and community sources. Following the PCP milestones, the Town completed a corporate GHG inventory which estimates that 3,370 tCO2e were produced through operations in 2019.

Using the 2019 data as a baseline, the plan identifies 19 actions to reach the following three visions:

- Integrate climate change and sustainability into the Town of Collingwood's corporate culture,
- Reduce greenhouse gas emissions by a minimum of 30% below 2019 levels by 2030, and
- Become a corporate and municipal leader in sustainability initiatives and GHG reduction measures in the region.

More detail on climate change and sustainability initiatives and to access the full Greener Collingwood Corporate Climate Change Action Plan can be found at: https://collingwood.ca/greener-collingwood.

2.2 Goals and Objectives

The goals and objectives of the 2024-2029 ECDM Plan have been updated to reflect Council and community climate change priorities of reducing greenhouse gas emissions and conserving energy.

Goals

- Provide leadership on minimizing resource use to promote a culture of sustainability.
- Reduce the environmental impact of the municipality's operations.
- Provide a forum to explore new conservation trends, technology, and ideas.
- Maximize fiscal resources and avoid cost increases through energy cost savings.
- Prioritize actions that reduce GHG emissions and support the Town's 2019 Climate Crisis Declaration.

Objectives

- Categorize and quantify past accomplishments in energy conservation and greenhouse gas reduction.
- Identify future opportunities for reducing greenhouse gas emissions, energy consumption, and cost.
- Identify emissions and energy conservation champions throughout the organization.
- Identify and promote promising practices to reduce greenhouse gas emissions and save energy.
- Strengthen partnerships with external stakeholders such as utility providers.
- Explore the potential for renewable energy generation opportunities as they come available.

2.3 Targets

- Prioritize greenhouse gas reduction measures, followed by energy conservation measures.
- Reduce energy and greenhouse gas intensity per square foot as service areas continue to expand to accommodate growth.
- Reduce the corporate greenhouse gas emissions from buildings and facilities by 50% in 10 years and 80% in 20 years below a 2022 baseline.

3.0 Energy Consumption Data and Analysis

As a requirement of Ontario Regulation 507/18, the Town of Collingwood reports on the annual energy use of its facilities to the Ontario Ministry of Energy through the online dashboard, Energy Star Portfolio Manager. Electricity and natural gas make up the daily operational utilities for Town buildings. Energy Star Portfolio Manager uses building use, utility data, and location to calculate various metrics for each facility, including greenhouse gas (GHG) emissions and energy intensity to monitor and compare facilities across Ontario.

3.1 2023 Data and Analysis

In the 2023 reporting year, sixteen (16) municipal facilities met the reporting criteria. The Town also voluntarily reported on the consumption of seven (7) pumping stations and reservoirs for internal tracking purposes. If electricity consumption or annual flow data was not available, pumping stations and reservoirs were not reported.

Table 2 summarizes the energy consumption (electricity and natural gas) of reporting Town of Collingwood facilities, as well as total GHG emissions and site energy use intensity per square foot.

Table 2: 2023 energy consumption totals of reportable Town of Collingwood facilities.

Facility	Electricity (kWh)	Natural Gas (m_3)	GHG Emissions (tCO_2e)	Site Energy Use Intensity ($kBtu/ft^2$)	GHG Intensity ($kgCO2e/ft^2$)
Black Ash Pumping Station	93,853	N/A	2.6	431.0	3.5
Business Development Centre	93,074	2,812	8.0	118.6	2.3
Carmichael Reservoir	161,145	N/A	4.5	109.7	0.9
Centennial Aquatic Centre	543,559	133,649	273.5	355.1	14.4
Central Park Arena	1,008,302	101,014	223.4	192.8	6.1
Cranberry Pumping Station	10,785	388	1.1	454.7	9.4
Curling Club	550,568.35	Not Avail.*	15.4	80.7	0.7
Eddie Bush Memorial Arena	678,562	44,330	104.7	108.9	2.9
Environmental Services Building	217,803	31,648	67.2	90.3	3.2
Fire Hall	215,744	31,861	67.6	105.4	3.8
Library and Municipal Offices	499,161	2,142	18.1	52.3	0.5
Minnesota Pumping Station	93,283	N/A	2.6	404.9	3.3
Parks Building	82,255	22,442	45.7	65.7	2.7
Patterson Street Pumping Station	45,949	N/A	1.3	825.1	6.8
Police Station	218,089	22,192	49.0	66.3	2.1
Public Works Building	135,033	31,690	65.0	88.7	3.6
Raymond A. Barker Water Filtration Plant	4,831,501	N/A	135.3	564.5	4.6
Silver Glen Pumping Station	12,289	N/A	0.3	46.6	0.4
St. Clair Pumping Station	187,797	N/A	5.3	975.3	8.0
Museum	97,186	12,495	26.9	142.6	4.9
Town Hall and Council Chambers	166,332	21,430	46.1	65.4	2.2
Transit Terminal	522	1,414	2.7	91.9	4.7
Wastewater Treatment Plant	2,479,508	186,287	429.4	648.1	18.3
TOTALS	**12,422,300**	**645,794**	**1,595.7**	**264.5****	**4.8*****

*The Town of Collingwood is not responsible for the payment of natural gas use at the Curling Club and therefore costs and usage were not reported.

**Average site energy use intensity ($kBtu/ft^2$) for all facilities.

***Average greenhouse gas intensity ($kgCO_2e/ft^2$) for all facilities.

Overall, offices and operations buildings are more energy efficient by square foot and emit less greenhouse gas emissions than recreation and cultural facilities. Similar to the 2019-2024 ECDM, Centennial Aquatic Centre, Central Park Arena, and Museum, all show higher potentials for conservation based on their Site Energy Use Intensity ($kBtu/ft^2$). The reason for high energy use intensity at the Museum is due to specific temperature and humidity control requirements for the preservation of the collection, this system runs on natural gas and is used year-round.

The seven pumping stations reported show higher site energy use intensities ($kBtu/ft^2$) and GHG intensities ($kgCO_2e/ft^2$) due to their significantly smaller building footprint. For these facilities, more accurate measures are energy intensity and GHG intensity per unit of liquid as shown in Table 3.

Table 3: Flows and intensities for Town of Collingwood water and wastewater facilities.

Facility	2023 Flows (m^3/year)	GHG Emissions (tCO_2e)	Site Energy Use Intensity ($kBtu/m^3$)	GHG Intensity ($kgCO2e/m^3$)
Black Ash Pumping Station	1,061,536	2.6	0.30	0.002
Carmichael Reservoir	59,174	4.5	9.29	0.076
Cranberry Pumping Station	60,518	1.1	0.84	0.018
Minnesota Pumping Station	1,779,191	2.6	0.18	0.001
Patterson Street Pumping Station	300,733	1.3	0.52	0.004
Raymond A. Barker Water Filtration Plant	3,471,284	135.3	4.75	0.039
Silver Glen Pumping Station	58,296	0.3	0.72	0.005
St. Clair Pumping Station	844,569	5.3	0.76	0.006
Wastewater Treatment Plant	6,479,030	429.4	2.35	0.066
TOTALS	**14,114,331**	**636.9**	**19.72***	**0.22****

*Average site energy use intensity ($kBtu/m^3$) for all water/wastewater facilities.
**Average greenhouse gas intensity ($kgCO_2e/m^3$) for all water/wastewater facilities.

Additional charts are available in Appendices A, B, and C visualize the energy and greenhouse gas intensity of facilities in 2023.

Table 4 presents the total cost of the electricity and natural gas that was used in 2023 by Town facilities. The total energy costs for the 23 municipal facilities including pumping stations were **$1,828,449.75** for electricity and **$240,788.19** for natural gas.

Table 4: Total 2023 energy costs for reported Town of Collingwood facilities.

Facility	2023 Electricity	2023 Natural Gas
Black Ash Pumping Station	$12,723.63	N/A
Business Development Centre	$13,578.00	$1,962.98
Carmichael Reservoir	$28,612.17	N/A
Centennial Aquatic Centre	$92,047.50	$36,700.96
Central Park Arena	$166,365.74	$29,829.36
Cranberry Pumping Station	$2,557.12	$1,089.57
Curling Club	$94,902.32	Not Available*
Eddie Bush Memorial Arena	$107,871.40	$15,334.83
Environmental Services Building	$31,130.13	$15,386.20
Fire Hall	$32,702.12	$15,231.78
Library and Municipal Offices	$70,670.83	$1,584.87
Minnesota Pumping Station	$12,669.96	N/A
Parks Building	$13,950.47	$10,984.11
Patterson Street Pumping Station	$7,119.05	N/A
Police Station	$32,620.76	$9,536.41
Public Works Building	$21,556.22	$12,306.92
Raymond A. Barker Water Filtration Plant	$661,197.48	N/A
Silver Glen Pumping Station	$1,914.54	N/A
St. Clair Pumping Station	$26,919.57	N/A
Museum	$15,982.41	$6,060.94
Town Hall and Council Chambers	$25,049.05	$10,517.51
Transit Terminal	$1,225.61	$1,595.34
Wastewater Treatment Plant	$355,083.67	$72,666.41
TOTALS	**$1,828,449.75**	**$240,788.19**

*The Town of Collingwood is not responsible for the payment of natural gas use at the Curling Club and therefore costs and usage were not reported in this plan.

3.2 Comparison with past ECDM Plans

In addition to reporting 2023 usage, comparisons between the 2017 baseline identified in the 2019-2024 Energy Conservation and Demand Management (ECDM) Plan were gathered to highlight where energy changes have been observed throughout Collingwood's facilities. Table 5 provides a comparison of 2017 and 2023 natural gas and electricity use.

Table 5: Comparison of electricity and natural gas consumed in 2017 and 2023.

Facility	2017 Electricity (kWh)	2023 Electricity (kWh)	Change (%)	2017 Natural Gas (m^3)	2023 Natural Gas (m^3)	Change (%)
Black Ash Pumping Station	73,981	93,853	27%	N/A	N/A	N/A
Business Development Centre	90,203	93,074	3%	4,615	2,812	-39%
Carmichael Reservoir	177,729	161,145	-9%	N/A	N/A	N/A
Centennial Aquatic Centre	810,158	543,559	-33%	117,657	133,649	14%
Central Park Arena	1,057,206	1,008,302	-5%	89,027	101,014	13%
Cranberry Pumping Station	10,292	10,785	5%	679	388	-43%
Curling Club	637,716	550,568.35	-14%	Not Avail.	Not Avail.	
Eddie Bush Memorial Arena	535,168	678,562	27%	62,222	44,330	-29%
Environmental Services Building	225,882	217,803	-4%	37,018	31,648	-15%
Fire Hall	190,645	215,744	13%	30,674	31,861	4%
Library and Municipal Offices	441,101	499,161	13%	2,049	2,142	5%
Minnesota Pumping Station	N/A	93,283		N/A	N/A	N/A
Parks Building	84,546	82,255	-3%	16,258	22,442	38%
Patterson Street Pumping Station	45,036	45,949	2%	N/A	N/A	N/A
Police Station	248,122	218,089	-12%	25,719	22,192	-14%
Public Works Building	185,269	135,033	-27%	26,366	31,690	20%

Raymond A. Barker Water Filtration Plant	4,681,555	4,831,501	3%	N/A	N/A	N/A
Silver Glen Pumping Station	N/A	12,289		N/A	N/A	N/A
St. Clair Pumping Station	144,782	187,797	30%	N/A	N/A	N/A
Museum	81,205	97,186	20%	8,962	12,495	39%
Town Hall and Council Chambers	202,547	166,332	-18%	19,523	21,430	10%
Transit Terminal	N/A	522		N/A	1,414	
Wastewater Treatment Plant	3,427,067	2,479,508	-28%	136,187	186,287	37%
TOTALS	**13,350,210**	**12,422,300**	**-7%**	**576,956**	**645,794**	**12%**

When comparing electricity and natural gas usage between 2017 and 2023, the data shows a 7% decrease in overall electricity consumption, and a 12% increase in overall natural gas consumption. This data has not been normalized to account for varying weather conditions between years. Table 5 provides a good summary of changes over a 6-year period, however trends are more closely reviewed on an annual basis to monitor and evaluate fluctuations related to service delivery, energy conservation projects, and equipment use.

Energy Consumption Decreases:

Some notable electricity consumption decreases (>20% decrease) were observed at Centennial Aquatic Centre (-33%), Public Works Building (-27%), and the Wastewater Treatment Plant (-28%). An ultraviolet system upgrade is likely a major component of the 28% electricity decrease observed at the Wastewater Treatment Plant.

Significant natural gas consumption decreases (>20% decrease) were observed at the Business Development Centre (-39%), Cranberry Pumping Station (-43%), and Eddie Bush Memorial Arena (-29%). Decreases in energy consumption are typically the result of energy savings measures and/or a change in the operation/function of the facility.

Two facilities in this time period experienced decreases in both electrical and natural gas consumption, the Environmental Services Building and the Police Station. At the Environmental Services Building, LED lights were installed throughout the facility which would contribute to the 4% decrease in electrical consumption. The 15% decrease in natural gas use cannot be attributed to specific retrofits, however the building is no longer open to the public and more staff have hybrid or remote work agreements, which may have led to less heating, ventilation, and air conditioning (HVAC) usage. Similarly,

LED lights were installed throughout the Police Station, contributing to a 12% decrease in electrical consumption. Additional retrofits since 2017 include a new roof, new main entrance and garage door replacements which all contribute to less HVAC usage.

Energy Consumption Increases:

Increases in electricity consumption (>20% increase) were observed at Black Ash Pumping Station (27%), Eddie Bush Memorial Arena (27%), St. Clair Pumping Station (30%), and the Museum (20%). The increase in electricity consumption observed at Black Ash Pumping Station comes from a large renovation at the site to increase capacity.

Locations at which there was a notable increase in natural gas consumption (>20% increase) include the Parks Building (38%), Public Works Building (20%), Museum (39%) and Wastewater Treatment Plant (37%). On an annual basis, when unexpected increases are observed, further investigations are conducted to identify the reasoning and determine if any additional conservation measures are required.

Greenhouse Gas Emissions:

A comparison of 2017 greenhouse gas (GHG) emissions from reported facilities with 2023 GHG emissions is presented in Table 6.

Table 6: Comparison of 2017 and 2023 GHG emissions.

Facility	2017 GHG Emissions (tCO_2e)	2023 GHG Emissions (tCO_2e)	% Change
Black Ash Pumping Station	1.3	2.6	100%
Business Development Centre	10.3	8.0	-22%
Carmichael Reservoir	3.1	4.5	45%
Centennial Aquatic Centre	236.5	273.5	16%
Central Park Arena	186.6	223.4	20%
Cranberry Pumping Station	1.5	1.1	-27%
Curling Club	11.0	15.4	40%
Eddie Bush Memorial Arena	126.9	104.7	-17%
Environmental Services Building	73.9	67.2	-9%
Fire Hall	61.3	67.6	10%
Library and Municipal Offices	11.5	18.1	57%
Minnesota Pumping Station	N/A	2.6	
Parks Building	32.2	45.7	42%
Patterson Street Pumping Station	0.8	1.3	63%
Police Station	52.9	49.0	-7%
Public Works Building	53.1	65.0	22%
Raymond A. Barker Water Filtration Plant	81.0	135.3	67%
Silver Glen Pumping Station	N/A	0.3	
St. Clair Pumping Station	2.5	5.3	112%
Museum	18.3	26.9	47%
Town Hall and Council Chambers	40.4	46.1	14%
Transit Terminal	N/A	2.7	
Wastewater Treatment Plant	316.8	429.4	36%
TOTALS	**1,321.9**	**1,595.7**	**21%**

Between 2017 and 2023, there was a 21% increase in GHG emissions from Town facilities. GHG emissions of facilities are a function of the amount of energy consumed, the type of energy consumed, and the emission factor associated with the source of energy.

Some of the variables to consider when analyzing the 21% increase in GHG emissions between 2017 and 2023 include the additions and renovations of facilities, changes to the Ontario electricity grid, and increased natural gas usage in Town facilities.

Three facilities were added to the portfolio – Minnesota Pumping Station, Silver Glen Pumping Station, and the Transit Terminal. However, the added facilities only account for 5.6 tCO_2e or 0.4% of total emissions. Black Ash Pumping Station also underwent a large renovation during this time period to increase servicing capacity.

A main driver of the increase of GHG emissions from Town facilities between 2017 and 2023 is that the increase in Ontario's electricity emissions factor, measured in gCO_2e/kWh, which has increased by 58% or 11 gCO_2e/kWh. In 2017, Ontario's electricity emissions factor was 19 gCO_2e/kWh [3], whereas in 2023, the emissions factor has increased to 30 gCO_2e/kWh [4]. Although electricity consumption from Town facility decreased by 7% over the reporting period, emissions associated with electricity use increased by 47%. Emission intensity from electricity use is not within the Town of Collingwood's control.

An additional driver for the increase in GHG emissions between 2017 and 2023 was the 12% increase in natural gas consumption by Town facilities. Unlike electricity, the emission factor for natural gas remained relatively stable between 2017 and 2023, only increasing by 0.3% from 1,916 gCO_2/m^3 [5] in 2017 to 1,921 gCO_2/m^3 [4] in 2023. Table 5, shows that there were significant increases (over 20%) in natural gas consumption at the Parks Building, Public Works, Museum, and Wastewater Treatment Plant.

The burning of natural gas has a significantly higher emissions factor than the Ontario electricity grid, which is why buildings that reduced natural gas consumption between 2017 and 2023 had a correlated reduction in associated GHG emissions. These buildings include the Business Development Centre, Cranberry Pumping Station, Eddie Bush Memorial Arena, Environmental Services Building, and the Police Station

---

[3] National Inventory Report 1990-2021: Greenhouse Gas Sources and Sinks in Canada – Part 3 (Table A13-7): https://publications.gc.ca/collections/collection_2023/eccc/En81-4-2021-3-eng.pdf

[4] Government of Canda Emission Factors and Reference Vaues (Table 5.1): https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system/emission-factors-reference-values.html

[5] National Inventory Report 1990-2021: Greenhouse Gas Sources and Sinks in Canada – Part 2 (Table A6.1-1): https://publications.gc.ca/collections/collection_2023/eccc/En81-4-2021-2-eng.pdf

A good example to demonstrate the higher emissions factor associated with natural gas is the Eddie Bush Memorial Area. Between 2017 and 2023, the arena increased electricity use by 27% and decreased natural gas use by 29%, resulting in an overall decrease of GHG emissions by 17% despite the increase in Ontario's electricity emissions factor during the same period.

To visualize annual building emission trends, Figure 1 was created using emissions reported in past ECDM Plans.

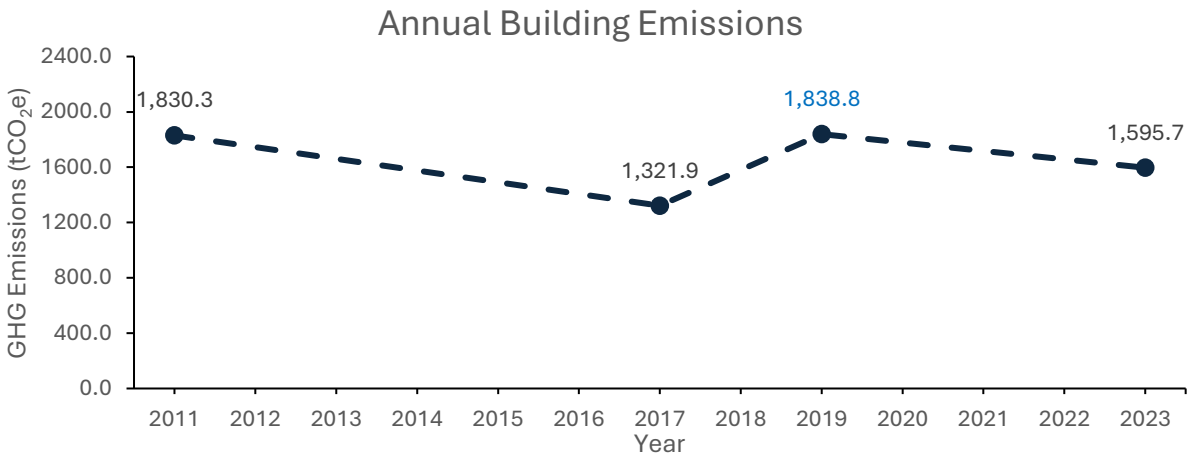


Figure 1: Town of Collingwood annual building emissions as per historical greenhouse gas inventories.

The purpose of Figure 1 is to begin comparing building emission trends, however, the comparison between the 4 data points (inventories) are not all equal as shown in Table 7.

Table 7: Comparison between past greenhouse gas inventories.

Inventory Year	Number of Facilities	Reporting Agency	Other Comments
2011	15	2014-2019 ECDM Plan	Did not report on natural gas use (and associated emissions) from Curling Club.
2017	20	2019-2024 ECDM Plan	Did not report on natural gas use (and associated emissions) from Curling Club.
2019	23	Partners for Climate Protection (PCP) Emissions Calculator	Highlighted in blue to signify that the 1,839 tCO2e represents a subset of the full 2019 GHG inventory of all Town operations.
2023	23	2024-2029 ECDM Plan	Does not report on natural gas use (and associated emissions) from Curling Club.

As shown in Table 7, with each iteration of the ECDM plan, the Town increases the number of buildings reported to the Ministry of Energy.

In addition, natural gas use at the Curling Club and its associated emissions are only included in the 2019 GHG inventory prepared following the Partners for Climate Protection (PCP) Program. The Curling Club's natural gas use and its associated emissions have not historically been included in the ECDM reporting since they are not received by or paid for by the Town of Collingwood.

Finally, the large drop between 2011 and 2017 inventories accounts for a significant drop in the electricity emissions factor during this time period as explained in Section 3 of Collingwood's previous 2019-2024 Energy Conservation and Demand Management Plan.

4.0 Implemented Energy Conservation and Demand Management Measures

The following table summarizes the energy conservation and demand management measures that have been implemented between 2019 and 2024.

Facility	Measure	Completion	Description	Assumed Demand Savings (kW)	Assumed Annual Energy Savings (kWh)
Eddie Bush Memorial Arena	Dehumidification	September 2019	Replacement of dehumidifiers with more efficient models	Unknown	65,374
Eddie Bush Memorial Arena	Replace Ice Lights	May 2020	Replacement of 36, 450 watt metal halide fixtures with 240 watt LED high bay fixtures	7.56	37,422
Eddie Bush Memorial Arena	Hot Water Heating	2020	Replacement of ice resurfacer hot water heater with hot water on demand unit (gas powered)	Unknown	Unknown
Central Park Arena	De-Aerator	April 2022	By removing air from cold water through cyclonic action rather than heating water to remove air from ice, we are able to run the refrigeration plant at a higher temperature, therefore saving energy	Unknown	Unknown
Central Park Arena	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	11.5	41,917
Centennial Aquatic Centre	Upgrade Lighting	February 2020	Replace the on deck mercury vapor lights with LED equivalents	1.46	8,851
Centennial Aquatic Centre	Large Pool Cover	August 2023	Added a cover to the large pool	Unknown	Unknown
Environmental Services	Upgrade Lighting	May 2019	Replace high bay lighting in the garage with LED fixtures	1.59	4,121
Environmental Services	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	7.95	37,396

Town Hall	Upgrade Uninterruptable Power Supply (UPS)	2019	Install a new UPS for critical loads. A single UPS replaces a number of smaller UPSs. Expected energy savings as a result of operating a single, more efficient unit. New UPS will allow monitoring of power quality and consumption for critical loads more accurately	Unknown	Unknown
Town Hall	Upgrade Lighting	August 2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	6.38	23,053
Business Development Centre	Upgrade Lighting	July 2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	1.2	3,110
Business Development Centre	Additional Measures	2023	Completed air balance assessment and a GHG Reduction Pathway Feasibility study to highlight opportunities for energy and GHG savings	N/A	N/A
Business Development Centre	HVAC	2024	Replace gas fired HVAC rooftop unit with heat pump	In Progress	In Progress
Police Station	Garage Door Replacement	2019 and 2020	One set of garage doors replaced in 2019. Second set replaced in 2020	Unknown	Unknown
Police Station	HVAC		Incorporated into BAS	N/A	N/A
Police Station	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	4.8	50,957
Police Station	Water Heating	2023	Replace gas fired domestic hot water heating system with electric domestic hot water system	Unknown	Unknown
Fire Station	Upgrade Lighting	August 2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	6.9	47,323
Public Works	Upgrade Lighting	December 2019	Upgrade of existing fluorescent fixtures to LED fixtures in shop	2.1	9,173
Public Works	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures in office to LED fixtures with electronic ballasts	2.9	8,372
Museum	Humidification	2023	Upgraded existing electric humidifier	Unknown	Unknown

Library	Geothermal System	2022/2023	Recommission system	Unknown	Unknown
Library	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	18.8	73,980
Wastewater Treatment Plant	Water & Energy Conservation and Public Awareness Strategy	Ongoing	Promotion of energy and water conservation strategies to increase public awareness. Campaign included promotion of the Town's Quench Buggy, annual farmers market booth, and the sale of rain barrels to residents	N/A	N/A
Wastewater Treatment Plant	UV System Upgrade	June 2019	Upgrade wastewater treatment plant UV system	16	1,180,000
Wastewater Treatment Plant	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	15.1	59,370
Black Ash Creek Pumping Station	New Station	2020/2021	Construction of a new, more efficient pumping station	N/A	N/A
Water Filtration Plant	Filter Membranes	2023	Life-cycle replacement of remaining ½ train of water filtration membranes	Unknown	Unknown
Carmichael Reservoir	Station Upgrades	Ongoing. Expected completion in 2025	Upgrades to include the introduction of smaller pumps that will be more appropriate for low flow rates. Large pumps to be fitted with VFDs	In Progress	In Progress
Parks Building	Upgrade Lighting	2023	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts	9.2	23,949
Multiple Facilities	Occupancy Sensors	2019/2020	Installed occupancy sensors in multiple facilities including but not limited to Eddie Bush Memorial Arena, Curling Club, Townhall, Police Station	Unknown	Unknown

Operational

In addition to the physical energy conservation and demand management measures within facilities, a number of operational measures were identified in the 2019-2024 plan under the Looking Forward section that have been implemented including:

- Hiring of an **Executive Director of Customer and Corporate Services** – hired in August 2019. Part of this role manages special projects, and champion an environmental sustainability (“green”) function to look at ways to reduce the organization’s carbon footprint.
- **Centralized Analysis of Energy Consumption** – Two detailed excel documents have been created to track natural gas and electricity utility bills to better manage and visualize trends from 2018 to present. In addition, the Broader Public Sector Reporting has modified their reporting process to utilize Energy Star Portfolio Manager, an interactive browser tool that enables building benchmarking based on energy and resource use of any type of building.
- **Energy Conservation and Demand Management Team** – A number of operational and technical staff members have been identified as important contributors to energy conservation and greenhouse gas (GHG) reduction projects. A more formalized group with consistent meetings throughout the year will be included in the proposed energy conservation and demand management measures section.
- **Greener Collingwood Staff Team** – The green team is an internal staff group comprised of members who promote environmentally sustainable practices within the organization. This organization is comprised of volunteers from multiple departments.
- **Electric Vehicle Charging Stations** – The Town currently operates 10 electric vehicle (EV) charging stations for public use in the Pine Street and Ste Marie Street parking lots. Usage is being tracked to identify if and when the Town should invest in additional public charging infrastructure. Privately provided public EV charging stations are also available throughout the Town.

In addition to the operational energy conservation and demand management measures that were identified in the 2019-2024 plan, the Town hired a Climate Change Specialist on contract from October 2021- October 2024. The primary mandate for this contract was to develop and implement corporate and community climate change action plans for Collingwood. Through this position, the Town has achieved Corporate Milestone 3 of the Partners for Climate Protection Program following the adoption of the Greener Collingwood Corporate Climate Change Action Plan in April 2023. The position has also influenced decision-making to prioritize greenhouse gas emission reduction when

considering energy conservation measures. The position has been transitioned from a contract to a permanent position as of 2024.

Although these measures do not directly result in measurable energy or greenhouse gas emissions savings, they assist in a culture shift towards a more sustainable corporate mindset.

5.0 Proposed Energy Conservation and Demand Management Measures

The proposed energy conservation and demand management measures included in this plan align with the organizational approach of placing a higher priority on reducing greenhouse gas (GHG) emissions from operations following Council's 2019 Climate Crisis declaration.

5.1 Greenhouse Gas (GHG) Reduction Pathway Feasibility Study

As identified in the Greener Collingwood Corporate Climate Change Action Plan, the Town of Collingwood completed a GHG Reduction Pathway Feasibility Study in 2023. The study followed the Federation of Canadian Municipalities' (FCM) Green Municipal Fund (GMF) Community Building Retrofit (CBR) Initiative, which aims to extend building lifecycle and reduce building emissions by 50% in 10 years and 80% in 20 years.

The GHG Reduction Pathway Feasibility Study resulted in 28 reports analyzing 42 Town facilities to identify all opportunities for emission reduction. Over 600 potential opportunities for emission reduction were identified by the consultant, however not all recommendations are required to meet the Town's committed GHG reduction target.

Common recommendations that the Town may consider included more energy efficient equipment, fuel switching, district energy solutions, installation of renewable energy sources, and carbon offsets.

A list of 87 recommendations for all Town facilities which could be considered by 2029 are listed in Table 8. Projects identified in Table 8 are for all Town facilities, not only those required to be reported under the ECDM plan.

Table 8: Proposed Energy Conservation and Demand Management Measures by 2029.

Facility	Energy Conservation Measure	Anticipated Electricity Reduction (%)	Anticipated Natural Gas Reduction (%)	Anticipated GHG Reduction (%)	Anticipated Utility Cost Reduction (%)	Anticipated Project Cost	Anticipated Timeline
Black Ash Pumping Station	LED lighting upgrade and occupancy controls	0	N/A	0	0	$5,771	2024
Business Development Centre	Window Envelope Upgrade	1.4	8.3	6.4	1.9	$493,442	TBD
Business Development Centre	Roof Renewal Upgrade	1.0	6.0	4.3	1.4	$213,305	TBD
Business Development Centre	HVAC scheduling and temperature setback	18.7	35.6	30.0	13.7	$2,500	2024
Business Development Centre	Low-flow washroom hand faucets	2.9	0	0.7	5.6	$250	2028
Business Development Centre	RTU to air source heat pump with natural gas backup	-0.3	67.9	45.0	8.0	$211,613	2024
Business Development Centre	Washroom exhaust fan energy recovery ventilation	2.4	11.2	8.6	2.7	$8,125	2028
Carmichael Reservoir	LED lighting upgrade and occupancy controls	0.1	N/A	0	0	$34,628	2024
Centennial Aquatic Centre	Building envelope – Air Sealing	16	0	1.5	7.6	$2,562	2029
Centennial Aquatic Centre	Install low flow aerators	0	1	0.7	1.4	$375	2029
Centennial Aquatic Centre	Therapy pool cover	2.7	2.7	2.6	1.8	$50,000	Q3 2024

Central Park Arena	Adjust RTU-Z1 fan setting from ON to AUTO	0.6	2.9	2.8	0.9	$0	2025
Central Park Arena	Install low-flow shower fixtures	0.1	3.8	2.8	3.4	$10,000	2027
Cranberry Pumping Station	LED lighting upgrade and occupancy controls	0.2	-0.5	0	0.2	$1,924	2024
Cranberry Pumping Station	Unit heater replacement	-32.6	89.4	43.2	-20.5	$7,695	2028
Curling Club	Building level electricity metering	0	0	0	0	$75,000	2025
Curling Club	F-01 - F-04 replacement with air source heat pump	-6.0	27.3	15.9	-1.3	$132,354	TBD
Curling Club	F-05 & F-06 replacement with air source heat pump	-10.5	53.0	30.5	-2.1	$49,248	TBD
Curling Club	Implement an outdoor rink covered structure	11.6	0	4.9	15.3	$1,150,000	2027
Curling Club	Solar PV over outdoor rink	65.4	0	23.2	39.1	$925,201	2027
Curling Club	Windows and doors to high performance	0	2.7	2.4	0.3	$269,325	TBD
Central Park Washroom	Baseball diamond fixture replacement	3.5	0	1.2	4.0	$60,000	2026
Central Park Washroom	Fix timer controls for baseball diamond lighting	2.7	0	1.2	2.6	$1,750	2026
Central Park Washroom	Interior lighting retrofit	0.6	-0.7	0	0.4	$6,250	2025
Davey Reservoir	LED lighting upgrade and occupancy controls	0.1	0	0	0.1	$19,238	2024
Eddie Bush Memorial Arena	Cold Water Flooding	5.4	17.9	14.2	6.4	$96,188	TBD

Eddie Bush Memorial Arena	Roof Upgrade	0.3	4.2	2.5	0.8	$5,317,341	2025
Eddie Bush Memorial Arena	Envelope upgrade – Walls	0.2	3.7	2.5	0.7	$6,053,464	TBD
Eddie Bush Memorial Arena	Permanent vent sealing	0.4	6.6	5.0	1.2	$0	2026
Eddie Bush Memorial Arena	Solar PV	14.3	0	4.2	8.0	$280,868	TBD
Environmental Services	AC to air source heat pump with natural gas backup	-23.3	44.6	36.7	2.6	$144,281	2031
Environmental Services	Roof Upgrade	0.5	1.9	1.1	0.8	$1,110,389	2028
Environmental Services	Envelope upgrade – Walls	0.2	0.7	0	0.3	$846,450	TBD
Environmental Services	Envelope upgrade – Windows and Doors	0.7	5.3	4.4	1.9	$1,229,276	2026
Environmental Services	Furnace to air source heat pump with electric backup	-44.5	58.4	46.7	-8.8	$334,733	TBD
Environmental Services	Lighting sensors in storage shed	0.5	-0.2	-1.1	0.2	$1,250	2026
Environmental Services	Low-flow washroom hand faucets	1.6	0	0	2.3	$750	2031
Fischer Field Clubhouse	Field lighting to LED	35.0	0	31.2	28.1	$277,020	2024
Library	Optimize geothermal loop control	2.4	0	2.2	1.8	$36,250	2028
Library	Reduce summer solar gain	3.3	0	3.0	3.2	$0	2026
Minnesota Street Pumping Station	LED lighting upgrade and occupancy controls	0	N/A	0	0	$5,771	2024
Museum	Dehumidification upgrade	-13.7	20.1	16.1	-4.9	$137,500	2026

Museum	Domestic hot water upgrade to air source heat pump	-0.4	0.8	0	0	$11,542	2028
Museum	Low-flow washroom hand faucets	0	0.4	0	0.8	$375	2028
Museum	Seal exhaust vent in office	3.9	5.0	5.3	4.1	$2,500	2028
Police Station	Air handling unit-1 replacement with air source heat pump with natural gas backup	-18.7	33.2	24.2	-3.8	$144,281	2030
Police Station	Air handling unit-2 replacement with air source heat pump with natural gas backup	-8.2	15.6	11.3	-1.3	$69,255	2030
Police Station	Air balancing and general recommissioning	1.0	0.8	0	0.7	$18,750	2025
Police Station	Envelope air sealing	0.8	4.4	3.2	1.3	$67,331	2025
Police Station	Low-flow fixtures	0	11.7	9.7	9.7	$7,695	2030
Osler Booster Station	Pump VFDs	8.4	0	12.7	8.4	$38,475	2025
Parks Building	Infiltration reduction	5.7	1.2	1.9	3.2	$13,125	2026
Parks Building	Replace natural gas furnaces with air source heat pump	-17.1	15.7	12.7	-1.7	$204,687	2026
Parks Building	Replace natural gas boiler with air-to-water heat pump	-12.3	13.4	11.3	-0.9	$208,727	2027
Parks Building	Replace natural gas pressure washers with electric models	-108.8	56.0	41.6	-31.6	$86,569	2030
Parks Building	Replace natural gas unit heaters (4) with electric models	-34.0	14.9	10.6	-10.6	$76,950	2030

Public Works	Air handling unit to air source heat pump	-8.2	17.8	13.9	0.7	$227,003	2025
Public Works	Domestic hot water to air source heat pump	6.4	0	0.4	3.6	$26,740	2027
Public Works	Infiltration reduction	20.1	39.3	36.2	25.9	$13,125	2026
Public Works	Thermostat schedules	3.0	3.2	2.6	2.3	$0	2025
Public Works	Washroom exhaust fan recovery ventilation	0.1	3.4	2.8	1.0	$48,094	2026
Sunset Point Park	Lighting upgrade to LED – Canteen	3.3	0	0	2.2	$8,750	2024
Sunset Point Park	Lighting upgrade to LED – Washroom	2.5	0	0	1.6	$3,750	2024
Town Hall	Demand control ventilation	2.2	3.9	3.8	2.3	$40,000	2026
Town Hall	Roof Upgrade	1.1	3.1	2.9	1.4	$76,758	2041
Town Hall	Envelope Upgrade – Windows	2.1	5.7	5.4	2.6	$1,918,941	TBD
Town Hall	HVAC equipment scheduling	7.9	16.4	14.9	7.5	$12,500	2026
Town Hall	Low-flow washroom hand faucets	1.9	0	0.2	3.3	$1,000	2028
Transit Terminal	Air Curtain	2.8	5.8	5.3	1.5	$10,581	TBD
Transit Terminal	HVAC temperature setpoint optimization	6.3	12.5	11.5	3.2	$1,250	2025
Wastewater Treatment Plant	Admin air source heat pump	-4.0	15.6	10.8	-1.2	$57,713	TBD
Wastewater Treatment Plant	Control room ground level air source heat pump	-0.2	1.0	0.6	0	$25,009	TBD
Wastewater Treatment Plant	Digestor gas recovery boiler	0	37.7	28.5	7.4		TBD

Wastewater Treatment Plant	Domestic hot water heat pump	-0.1	0.3	0	0	$17,314	2030
Wastewater Treatment Plant	Effluent heat recovery and process water source heat pump	-9.9	40.4	28.0	1.0	$923,400	2025
Wastewater Treatment Plant	Enable cogeneration unit	22.9	33.3	30.7	24.7		2024
Wastewater Treatment Plant	Headworks Heat Recovery Bioscrubber	0	7.5	5.7	1.5	$702,169	2030
Wastewater Treatment Plant	Headworks Heat Recovery EF-3	0	2.5	1.8	0.5	$336,656	2030
Wastewater Treatment Plant	Low-flow water fixtures	0	0.1	0	0.1		2025
Wastewater Treatment Plant	Makeup air unit replacement with electric backup	-5.8	23.2	15.9	-1.2	$1,708,290	2027
Wastewater Treatment Plant	N_2O Monitor	0	0	0	0	$150,000	2025
Wastewater Treatment Plant	Process Optimization	0	0	0	0	$37,500	2025
Water Tower	Lighting upgrade to LED	0.3	N/A	0	1.3	$3,750	2024
Water Tower	Reduce temperature setpoint for heating	20.0	N/A	20.3	18.5	$0.00	2025
Yacht Club	Boiler to water source heat pump	-395.6	N/A	86.6	48.1	$55,789	TBD
Yacht Club	HVAC scheduling and temperature setback	0	N/A	12.1	9.3	$2,125	2026
Yacht Club	Lighting upgrade to LED	6.5	N/A	-0.1	0.2	$13,938	2025
All Projects						**$26,974,494**	

5.2 Operational Energy Conservation Measures

In addition to the building upgrades suggested in section 5.1: Greenhouse Gas (GHG) Reduction Pathway Feasibility Study, additional operational recommendations to be considered by 2029 are described below. Similar to the operational recommendations included in the 2019-2024 ECDM, these initiatives do not directly result in measurable energy or GHG emissions savings in Town facilities but will assist in a culture shift towards a more sustainable corporate mindset.

Continue to renew the corporate fleet with electric vehicles to reduce GHG emissions associated with internal combustion engines.

As of July 1, 2024, the Town of Collingwood owns 7 hybrid SUVs and 3 electric pickup trucks. In addition to on-road vehicles, the Town has also invested in 3 electric ice resurfacers, and 1 electric riding lawn mower. The Town should continue to prioritize the purchase of electric vehicles, where feasible, to support the Town's goal of reducing overall greenhouse gas emissions by a minimum of 30% by 2030.

We acknowledge that expanding the electric fleet will increase the amount of electricity consumed at some facilities. However, electric vehicles play a significant role in reducing the Town's overall corporate GHG emission reduction targets.

Expand the availability of corporate fleet charging stations.

To support the anticipated increase in electric vehicles in the next five years, the Town will need to install electric vehicle (EV) charging stations reserved for the corporate fleet. Based on anticipated usage, the Town is currently anticipating the need for 1 level-2 charging station for each fully electric vehicle. In addition, 1 level-2 charging station should be available for every 2 hybrid electric vehicles. Over the next 5-years, we will continue to refine EV charging placement and our understanding of energy needs to optimize the ratio of EV chargers required for fully electric and hybrid vehicles.

Energy Conservation and Demand Management (ECDM) Team

Through the greenhouse gas reduction pathway feasibility study workshops, a number of employees from various departments were identified as technical experts who should be included in the ECDM team. These team members are responsible for managing and implementing facility projects and are important stakeholders in ensuring energy conservation and GHG reduction measures are successful. It would be beneficial for this team to continue meeting on a regular basis to discuss projects, share resources, and discuss lessons learned.

Fleet and Facilities Service Review

Through the fleet and facilities team's service review, consideration should be given to the scope and responsibility of the team to identify and implement energy conservation and GHG reduction measures within municipal facilities and the corporate fleet. This review is scheduled to be completed in 2025.

5.3 District Energy

District Energy systems have the potential to maximize energy efficiency and further reduce GHG emissions throughout the Town by allowing facilities to share energy. The GHG Reduction Pathway Feasibility study identified the following locations to explore the possibility of district energy systems:

- Downtown Buildings – Business Development Centre, Eddie Bush Memorial Arena, and Town Hall
- Central Park – Arena and Curling Club
- Collingwood Museum
- Fire Station
- OPP Station
- Tenth Line Facilities – Parks Building and Public Works Building
- Transit Terminal
- Wastewater Treatment Plant

In addition to the recommended Town owned facilities, the Town could consider extending district energy connections to local businesses and buildings in the vicinity of a proposed system to assist in reducing community GHG emissions.

Collingwood's Terminals Point project may consider the opportunity for district energy and has identified the potential of expanding the system to Collingwood's downtown core. The completion of a district energy feasibility study for Collingwood is recommended to determine the scope and size of district energy solutions in the Town.

6.0 Renewable Energy

As the Town moves towards electrification of equipment to decrease greenhouse gas (GHG) emissions from operations, renewable energy can play a role in reducing utility costs and increasing the amount of available electricity in the community. This section lists opportunities that the Town can explore to support renewable energy generation.

6.1 Cogeneration Plant

Collingwood's Wastwater Treatment Plant (WWTP) installed a 65 kW cogeneration plant in 2017. Cogeneration plants generate electricity by using waste by-products, reducing the need for the WWTP to purchase electricity. Additionally, the waste heat created from the electricity generation can be used to supplement heating the facility.

Early energy monitoring results were positive with monthly productions ranging from 30,000 and 40,000 kWh; however the system has not run consistently since installation. Plans to recommission the unit are underway and hope to be completed in 2024.

6.2 Geothermal Systems

The Town of Collingwood's Library and Municipal Office building was built to a LEED Gold standard in 2010 and utilizes a geothermal system for heating and cooling. The system uses 26 deep wells that extend over 100 feet below the parking lot on the East side of the building which maintains 65 independent water-to-air heat pumps located throughout the building.

The Library and Municipal Office building produces significantly less GHG emissions than comparable facilities due to the geothermal system. Geothermal systems should be considered in the design of future buildings that the Town undertakes.

6.3 Solar Photovoltaic (PV)

The most common renewable energy solution identified in the GHG Reduction Pathway Feasibility Study Reports was the installation of solar photovoltaic (PV) panels on the roofs of Town facilities to offset annual electricity use.

Net metering arrangements are the preferred approach to utilize on-site renewable energy, while maintaining the benefits of being connected to the electricity grid. To realize the highest benefits of solar PV installations, electrification of equipment should be considered prior to installation to ensure right-sizing of the solar system based on the facility's annual electricity consumption load. While solar PV was recommended at most facilities, highest priority will be given to facilities with the largest real estate to support larger installations.

7.0 Looking Forward

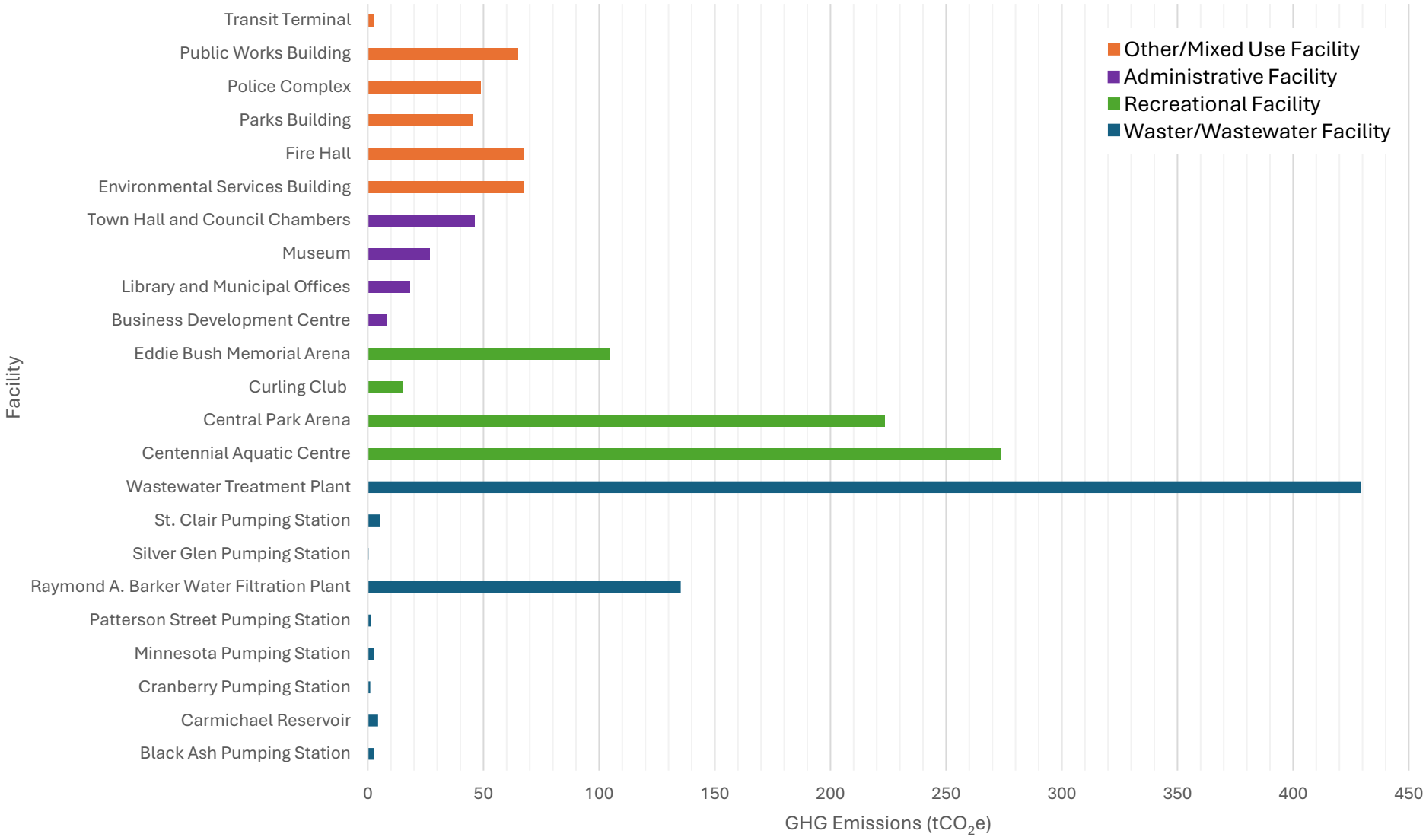
In preparing the 2024-2029 Energy Conservation and Demand Management (ECDM) Plan, it was identified that the goals from previous ECDM plans were not consistent, making it difficult to compare and track progress. Beginning with the 2024-2029 ECDM plan, with the increased prioritization on greenhouse gas reduction (GHG), the Town of Collingwood will compare building emissions based on GHG intensity per square foot ($kgCO2e/ft^2$). For facilities servicing water and wastewater, the Town will also track GHG intensity per cubic meter of water serviced ($kgCO2e/m^3$).

The measures identified in Section 5.0 are under consideration and shall be quantified, prioritized, and assigned to project and facility managers for implementation. Many of the measures will require considerations for funding and will be included in operational and capital budgets over the next 5 years. Additional measures may be identified and will be prioritized based on GHG reduction potential and energy savings. Incentives and grant funding, when available, will be leveraged to support the implementation of energy conservation and greenhouse gas reduction projects.

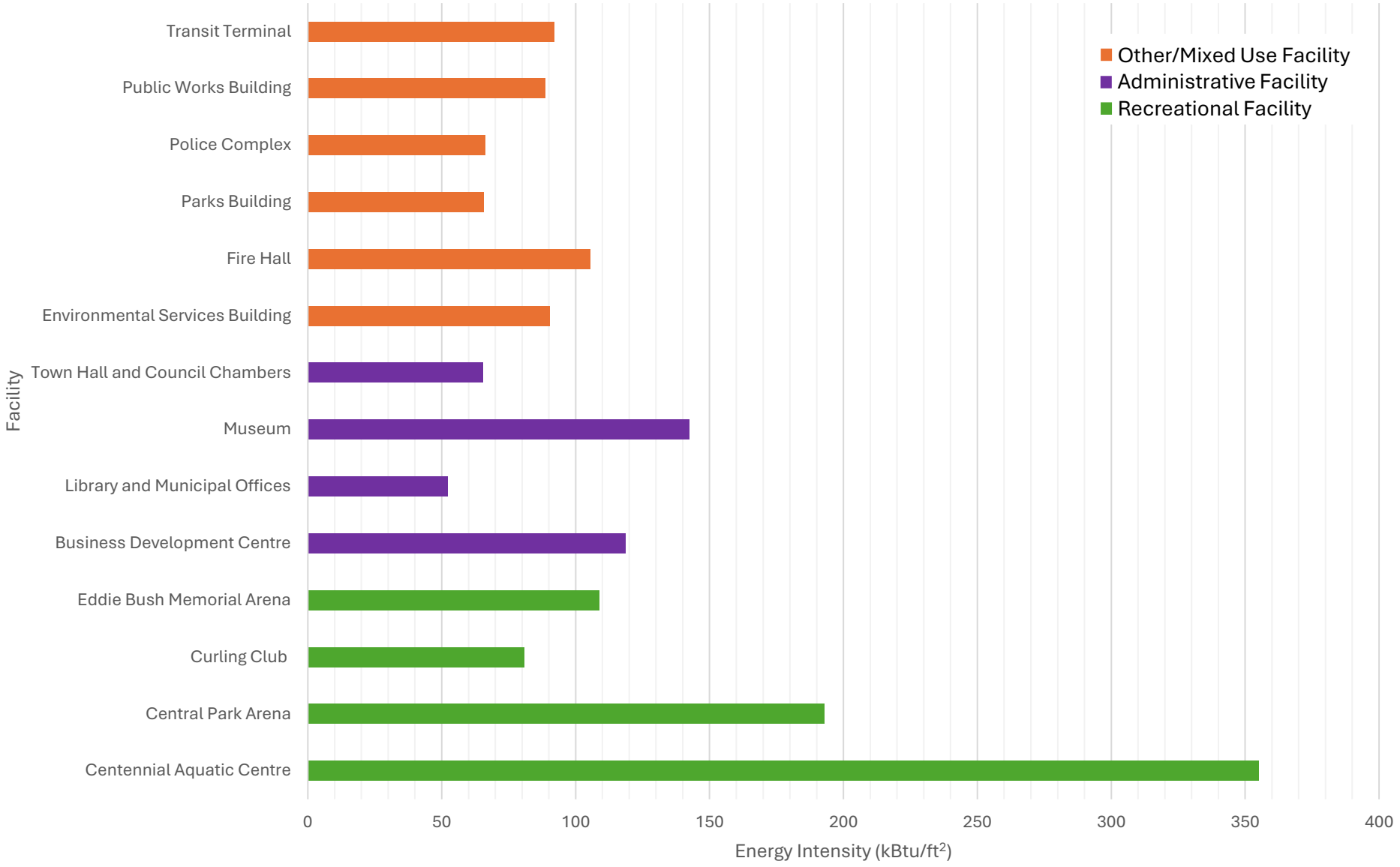
8.0 Approval Process and Publication

This 2024-2029 Energy Conservation and Demand Management Plan was reviewed by the Executive Director of Customer and Corporate Services and incorporates input from multiple departments at the management level. In addition to the ECDM plan being publicly available on the Town of Collingwood's website (www.collingwood.ca), it will also be available in print for at Town Hall, located at 97 Hurontario Street, Collingwood, Ontario.

Appendix A – 2023 Town of Collingwood Greenhouse Gas Emissions by Facility



Appendix B – 2023 Town of Collingwood Energy Intensity by Facility



Appendix C – 2023 Town of Collingwood Energy Intensity for Water/Wastewater Facilities