The Corporation of the Town of Collingwood

Energy Conservation & Demand Management Plan

2019-2024

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Executive Summary

The Town of Collingwood has met the challenges of monitoring and reporting of its energy consumption, as required by Ontario Regulation 507/18, and is driven to improve the energy efficiency of our operations due to rising energy costs, energy security, and environmental concerns. The Town's current Energy Conservation and Demand Management (ECDM) Plan was submitted in 2014, and the first update is due by July 1, 2019.

In 2014 the Town of Collingwood set a target, "To reduce the Town of Collingwood's overall municipal energy intensity by 5% over the life of the Energy Conservation & Demand Management (ECDM) Plan where energy consumption may be quantified without the influence of growth." In 2014 Collingwood Public Utilities set a target, "To show a total energy reduction of 5%." Based on the same facilities that were reported on in 2014, we are pleased to report that we have achieved a 16% decrease in overall electricity consumption, and a 9.5% decrease in overall natural gas consumption from 2011 to 2017. This decrease is a result of the energy savings measures implemented as well as a change in operations/function of some of these buildings. It is also important to note that 20 facilities are being reported on in 2019, and only 15 facilities were reported on in 2014. When you consider the additional facilities, there are increases in total electricity and natural gas consumptions.

The following report summarizes the energy consumption data, provides analysis of the data, compares the results to average municipal data, and sets out goals and objectives for energy conservation for the next five (5) years. Through previous energy audits and investigations, several energy saving measures have been identified. Some of these measures have been implemented, some are still under consideration, and others have been identified and added through this update.

Going forward, our goals will be achieved by furthering investigating, prioritizing, and implementing the energy savings measures identified in this Plan, but also re-visiting and updating this list of measures more regularly, on a bi-annual basis. We believe this approach will help us ensure progress is made in meeting our energy use reduction goals, will encourage us to stay informed on all incentive programs that we may qualify for, and encourage us to share resources within the organization.

The new target for energy conservation is to further reduce the Town of Collingwood's energy consumption by an additional 10% over the life of this Plan. This is a more aggressive target than identified in the last plan because there is already a significant energy savings measure being implemented at our Wastewater Treatment Plant.

1.0 Introduction & Background

As required by Ontario Regulation 507/18, this Energy Conservation and Demand Management (ECDM) Plan is a five year update to the 2014-2019 ECDM Plan. The regulation includes reporting requirements that intend to help public agencies better understand and manage their energy consumption and needs. Public agencies include municipalities, municipal service boards, school boards, universities, colleges and hospitals. As a municipality, the Town of Collingwood was required to report their annual energy consumption and greenhouse gas (GHG) emissions beginning in 2013.

ECDM plans are comprised of two parts. First, municipalities are required to summarize their annual energy consumption and GHG emissions for its operations. Second, municipalities need to describe previous, current, and proposed measures for conserving and otherwise reducing the amount of energy consumed by the municipality's operations and for managing the municipality's demand for energy, including a forecast of the expected results of current and proposed energy savings measures.

In 2014, Collingwood Public Utilities and The Corporation of the Town of Collingwood each submitted separate ECDM Plans. As part of this update, these separate plans are being combined into a single plan that will report on all qualifying facilities. The data in this Plan are based on 2011 consumption benchmarks as reported in the 2014 plans, and 2017 consumption data as required by Ontario Regulation 507/18.

2.0 Organizational Approach

The Town of Collingwood's approach to Energy Conservation and Demand Management is continually evolving. Each department implements their own energy savings measures, and reviews and approves their own energy bills. Through this update, the Town discussed and recognized the need to centralize the analysis of energy bills as well as support for energy conservation related projects. The analysis of energy bills and energy related project support will become one of the functions of a new Department created in 2019; detail on this are available in section *7.0 Looking Forward* of this Plan.

The goals and objectives of this ECDM Plan update remain consistent with the previous plan. The target we identified in this Plan update is twice as aggressive as the target identified in the last plan. Our goals, objectives, and target are summarized below:

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.

Objectives

- Categorize and quantify past accomplishments in energy conservation.
- Identify future opportunities for reducing energy consumption and cost.
- Establish energy conservation champions throughout the organization.
- Identify and promote best practices to save energy.

- Strengthen partnerships with external stakeholders such as electric and gas utilities.
- Identify and implement renewable energy generation opportunities as they come available.

Overall Target

- Further reduce the Town of Collingwood's energy consumption by an additional 10% over the life of the ECDM Plan, from 2019 to 2024. It is estimated that the UV System Upgrade at the Wastewater Treatment Plant will reduce electrical consumption at that facility by as much as 34%. This measure alone may result in an 8.8% reduction of the Town's total electrical consumption; the Wastewater Treatment Plant and Water Filtration Plant consume approximately 60% of the Town's total electricity. This measure, along with the other measures identified in this Plan, should allow us to meet or exceed this target.

New to this Plan is an explanation of some of the policies and/or contracts which are helping staff meet the goals, objectives, and overall target identified above. The sections below discuss some of these policies and/or contracts that have led to a reduction in energy consumed or GHG emissions, but are not located in facilities where we report on energy consumption.

2.1 Vehicle Purchase Policy

The Town's vehicle procurement policy, which has been approved by Council, allows for a 30% reduction in the base price of the vehicle for evaluation purposes. This policy has resulted in the purchase of four Hybrid CUVs this year to be used as Fleet vehicles. It is expected that the usage of these CUVs will result in a decrease of GHG emissions, therefore reducing the impact of municipal operations.

2.2 LED Streetlighting

In 2015, the Town solicited proposals for the supply and installation of Light Emitting Diode (LED) street lighting, in order to upgrade lighting throughout the community while reducing energy consumption. RealTerm Energy was procured to manage the replacement of approximately 2,400 High Pressure Sodium (HPS) and Metal Halide (MH) streetlights with LED streetlight luminaires.

The LED streetlight retrofit project was a recommendation outlined in the Town of Collingwood Public Works and Engineering Services Review Report (August 14, 2015). The retrofit initiative was also considered a complimentary program in line with the spirit of the Green Energy Act, regulation 397/11, even though street lighting does not fall under a "facilities" category.

The Town has benefitted from improved light levels and 62% energy savings through this program; the streetlight system electrical demand has been reduced to 117.5 kW from 311 kW.

2.3 Idling Control By-law

The Town continues to enforce an Idling Control By-Law. This is another measure the Town has taken to reduce GHG emissions, but staff are unable to provide an estimate as to how much of a reduction this has had.

2.4 LED Lighting Retrofit

With the improvement of LED technology and the reduction in price, the Town's Facility Managers have adopted a practice of replacing existing lights with new LED fixtures rather than re-lamping or replacing ballasts when they fail. These are often done as small repairs and are not tracked as individual projects. Through this update, the Town has discussed and is considering a more formal and streamlined approach to LED Lighting Retrofits; details about this can be found in section *7.0 Looking Forward* of this Plan.

2.5 IT Energy Awareness

The Town of Collingwood recognizes there are energy savings opportunities related to its Information Technology (IT) energy footprint. These types of measures are typically implemented corporately and effect all facilities. In 2018, the Town implemented scale computing hyper converged infrastructure.

This resulted in the physical footprint of the server and server storage being cut in half. The Town now runs production workload from 3, 1U rack mount servers; there were originally 7 Servers plus a separate storage subsystem. Running fewer servers means less energy used for IT operations, as well as less heat generated and reducing the need for cooling. Additional measures are being explored and are expanded upon in section *7.0 Looking Forward* of this Plan.

3.0 Energy Consumption Data & Analysis

As a requirement of Ontario Regulation 507/18, the Town of Collingwood reports on the annual energy use of its facilities to the Ministry of Energy, Northern Development and Mines. 2017 energy consumption data was submitted prior to July 1, 2019, and is shown in Table 1. The Ministry then consistently calculates GHG emissions and energy intensity. The GHG emissions are calculated for each facility by multiplying energy consumption totals by their respective GHG coefficient, and then adding them up. Energy intensity is calculated by converting all energy totals for a facility to an equivalent kilowatt hour, and then dividing that total by either the indoor floor area or mega litres processed annually. Town of Collingwood facilities only consume electricity and natural gas for energy, so only these energy types are reported.

In the 2017 reporting year, there were fifteen (15) municipal facilities that met the reporting criteria. The Town also reported on the consumption of five (5) pumping stations and reservoirs. If electricity consumption or annual flows data were not available then pumping station stations and reservoirs were not reported. Although reporting on pumping stations and reservoirs is not required under the regulation, we feel there may be significant opportunities for energy savings at these location and have chosen to include them for our tracking purposes.

Charts in Appendix A, B, and C illustrate the how various types of facilities utilized energy in 2017. Offices and operations buildings are typically more efficient on a square foot basis than recreation and cultural facilities. Various forms of energy have a different impact on GHG emissions.

Table 1: 2017 energy consumption totals of reportable Town of Collingwood facilities

Facility	Electricity (kWh)	Natural Gas (m^3)	GHG Emissions (kg)	Energy Intensity (ekWh/sqft)
Annex Building	90,203	4,615	10,286	42
Centennial Aquatic Centre	810,158	117,657	236,460	109
Central Park Arena	1,057,206	89,027	186,604	54
Curling Club	637,716	*N/A*	11,031	28
Eddie Bush Arena	535,169	62,222	126,896	38
Environmental Services Building	225,882	37,018	73,895	28
Fire Hall	190,645	30,674	61,291	25
Library & Municipal Offices	441,101	2,049	11,504	14
Parks Building	84,546	16,258	32,200	15
Police Complex	248,122	25,719	52,917	22
Public Works & Recreation Shop	185,269	26,366	53,053	26
Raymond A Barker Water Filtration Plant	4,681,555	*N/A*	80,982	726*
Station Museum	81,205	8,962	18,348	37
Town Hall with Council Chambers	202,548	19,523	40,414	27
Waste Water Treatment Plant	3,427,067	136,187	316,760	710*
St. Clair Pumping Station	144,782	*N/A*	2,504	146*
Black Ash Pumping Station	73,981	*N/A*	1,280	84*
Paterson Pumping Station	45,036	*N/A*	779	126*
Cranberry Pumping Station	10,292	679	1,462	290*
Carmichael West End Reservoir	177,729	*N/A*	3,074	887*
Totals	**13,350,212**	**576,956**	**1,321,740**	

**Unit of energy intensity is measured in eKWh/Mega Litre*

Table 2 presents the total cost of the electricity and natural gas that was consumed in 2017 by Town facilities that were reported in the 2017 reporting year. The total energy costs for these 20 municipal facilities, pumping stations, and reservoirs was **$2,088,626.28** for electricity and **$163,792.55** for natural gas.

Table 2: Total 2017 energy costs for reported Town of Collingwood facility

Facility	2017 Electricity	2017 Natural Gas
Annex Building	$14,787.03	$2,197.84
Centennial Aquatic Centre	$129,916.99	$30,818.11
Central Park Arena	$173,749.04	$23,768.04
Curling Club	$113,596.56	N/A
Eddie Bush Arena	$88,087.99	$17,587.65
Environmental Services Building	$38,682.66	$10,454.97
Fire Hall	$26,447.12	$8,789.52
Library & Municipal Offices	$64,914.89	$1,459.41
Parks Building	$12,860.53	$5,137.50
Police Complex	$34,249.69	$8,083.58
Public Works & Recreation Shop	$26,893.47	$8,062.42
Raymond A Barker Water Filtration Plant	$721,928.80	*N/A*

Station Museum	$11,331.83	$3,469.56
Town Hall with Council Chambers	$30,089.00	$6,077.87
Waste Water Treatment Plant	$530,333.65	$36,840.52
St. Clair Pumping Station	$20,272.01	*N/A*
Black Ash Pumping Station	$10,377.30	*N/A*
Paterson Pumping Station	$6,568.46	*N/A*
Cranberry Pumping Station	$1,695.68	$1,045.56
Carmichael West End Reservoir	$31,843.58	*N/A*
Totals	**$2,088,626.28**	**$163,792.55**

The Ministry provided 2016 energy benchmark data, which can been seen in Table 3. This data is shown as equivalent kilowatt hours per square foot, meaning all the energy types have been converted into an equivalent kilowatt hour of electricity and added up. This data has been further normalized by adjusting the energy intensity per square foot on the basis of the annual Heating Degree Days (HDD), which reflects how cold or warm a winter was that year. Table 3 also reveals the median scores, provided by the Ministry, which represents the middle value for the weather normalized energy benchmarks. This allows for direct comparison of the various types of facilities from municipality to municipality, and can provide a way to assess changes in energy performance of buildings over time. Similar operations with an energy benchmark greater than the median value have a greater potential for conservation than the buildings whose median value is lower than the median. Water and wastewater treatment facilities have not been included in this comparison because median values for these operation types were not provided by the Ministry. Eight (8) out of the thirteen (13) facilities assessed had energy benchmarks greater than the median value, indicating potential for conservation in these facilities.

Table 3: Comparison of facilities' adjusted energy benchmarks for weather with median scores of facilities with similar operation types

Facility Name	eWh/sqft/HDD	eWh/sqft/HDD (Median)
Annex Building	12.16	6.2
Centennial Aquatic Centre	27.86	19.1
Central Park Arena	14.93	7.8
Curling Club	7.79	7.4/7.8
Eddie Bush Arena	9.66	7.8
Environmental Services Building	8.64	5.8
Fire Hall	7.87	5.4
Library & Municipal Offices	4.37	6.4
Parks Building	4.81	5.8
Police Complex	5.98	7.9
Public Works & Recreation Shop	7.83	5.8
Station Museum	14.74	5.1
Town Hall with Council Chambers	5.19	6.2

The Station Museum, Annex Building, Centennial Aquatic Centre, and Central Park Arena showed significantly higher potential for conservation. The Station Museum is controlled to specific parameters of temperature and humidity for the preservation of the collection utilizing

natural gas on a year-round basis, and the electricity consumption associated with the surrounding park is included in the totals. One of the planned energy savings measures for the Museum is a conversion from electric to gas humidifier. The Centennial Aquatic Centre and Central Park area operate year round, which could be an explanation for the higher energy intensity. The energy intensity for the Annex Building is higher than expected, and as a result, investigation into the energy consumption has been identified as a proposed measure in this Plan.

Table 4 provides a comparison of 2011 and 2017 natural gas and electricity use. Energy data from 2011 is the baseline year for this report because it was the year reported in the 2014-2019 ECDM Plan. Therefore, 2017 facility energy data is being compared with only the facilities that were reported in 2014-2019 ECDM Plan.

Table 4: Comparison of electricity and natural gas consumed in 2011 and 2017

Facility	2011 Electricity (kWh)	2017 Electricity (kWh)	2011 Natural Gas (m^3)	2017 Natural Gas (m^3)
Town Hall/Council Chambers	175,096	202,547	13,368	19,523
Annex Municipal Office	60,533	90,203	6,363	4,615
Station Museum	97,911	81,205	13,837	8,962
Curling Club	584,112	637,716	N/A	N/A
Eddie Bush Arena	974,773	535,168	53,953	62,222
Public Works & Recreation	182,590	185,269	31,970	26,366
Police Complex	368,682	248,122	22,173	25,719
Library & Municipal Office	508,080	441,101	6,935	2,049
Waste Water Treatment Plant	3,543,999	3,427,067	167,551	136,187
St. Clair Pumping Station	209,754	144,782	*N/A*	*N/A*
Black Ash Pumping Station	78,905	73,981	*N/A*	*N/A*
Paterson Pumping Station	33,675	45,036	*N/A*	*N/A*
Cranberry Pumping Station	11,182	10,292	477	679
Raymond A Barker Filtration Plant	6,028,896	4,681,555	*N/A*	*N/A*
Carmichael West End Reservoir	247,645	177,729	*N/A*	*N/A*
Totals	**13,105,833**	**10,981,773**	**316,627**	**286,322**

This data has not yet been normalized to account for varying weather conditions, yet shows a 16% decrease in overall electricity consumption, and a 9.5% decrease in overall natural gas consumption from 2011 to 2017. Some notable electricity consumption decreases (>20% decrease) can been seen at the Eddie Bush Arena, Police Complex, St. Clair Pumping Station, Raymond A Barker Filtration Plant, and the Carmichael West End Reservoir. The significant reduction of 1,347,341 kWh at the Raymond A Barker Filtration Plant, is due to the lifecycle replacement of the water filtration membranes and a reduction in flow. Some notable natural gas consumption decreases (>20% decrease) can be seen at the Annex Building, Station Museum, and the Library & Municipal Office. Some notable increases (>20% increase in energy consumption) include the Annex Building and Paterson Pumping Station for electricity, and the Town Hall/Council Chambers and Cranberry Pumping Station for natural gas. Decreases will be the result of implemented energy savings measures and/or a change in the operation/function of the facility. When unexpected increases are seen, this prompts the Energy Conservation and

Demand Management Team to further investigate and potentially identify measures that could be implemented.

A comparison of 2011 GHG emissions from reported facilities with 2017 GHG emissions is presented in Table 5.

Table 5: Comparison of 2011 and 2017 GHG Emissions

Facility	2011 GHG Emissions (kg)	2017 GHG Emissions (kg)
Town Hall/Council Chambers	39,281	40,414
Annex Municipal Office	16,872	10,286
Station Museum	33,993	18,348
Curling Club	46,728	11,031
Eddie Bush Arena	179,986	126,896
Public Works & Recreation	75,050	53,035
Police Complex	71,415	52,917
Library & Municipal Office	53,757	11,504
Waste Water Treatment Plant	664,230	316,760
St. Clair Pumping Station	20,564	2,504
Black Ash Pumping Station	7,736	1,280
Paterson Pumping Station	3,302	779
Cranberry Pumping Station	1,998	11,031
Raymond A Barker Filtration Plant	591,073	80,982
Carmichael West End Reservoir	24,279	3,074
Totals	**1,830,264**	**740,841**

In comparing the total GHG emissions of only those facilities that were reported in the 2014-2019 ECDM Plan (baseline year), it can be seen that there is an almost 60% decrease in GHG emissions from these facilities from 2011 to 2017. As the GHG emissions of a facility are a function of both the GHG coefficient and total energy consumed for a type of energy, it is important to note that the GHG coefficient, or emission factor, for electricity was 0.098040 in 2011 and 0.017298 in 2017.This notable drop in the emission factor for electricity would account for why most facilities had a decrease in GHG emissions from 2011 to 2017. For example, the curling club increased electricity consumption by 9% from 2011 to 2017, but its GHG emissions decreased by over 75% because of the drop in the emission factor for electricity, and due to the fact that it does not consume any other form of energy like natural gas. The emission factor for natural gas is 1.8906270 and this has not changed since 2011; emission factors for fossil fuels, like natural gas, have not been updated as they do not change. Therefore, Town of Collingwood facilities that consume more natural gas will contribute more to the amount of greenhouse gases emitted. The Ministry derives GHG coefficients from *National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada (2019)*.

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 2014 and 2019.

Measure	Year Completed	Description	Assumed Demand Savings (kW)	Assumed Annual Energy Savings (kWh)
Eddie Bush Memorial Arena				
Washroom Lighting	2017	Upgraded 10, T12 two lamp 34 watt fluorescent fixtures to 17 watt LED fixtures with electronic ballasts and occupancy sensors. Assumed occupied 6 hours per day.	0.34	745
Hall of Fame Lighting	2017	Upgraded 54, T12two lamp 34 watt fluorescent fixtures to 17 watt LED fixtures with electronic ballasts. Assumed occupied 3 hours per day.	1.84	2,010
Upgrade Lighting	2017	Upgraded remaining T12 fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per T12 replaced	Quantity Unknown
Upgrade Lighting	2017	Replaced 75 watt pot lights in entrance lobby with LED technology.	.064 kW per pot light replaced	Quantity Unknown
Electric Ice Resurfacer	2019	Replaced propane fueled Ice Resurfacer with electric Ice Resurfacer. (GHG emission reduction.)	N/A	N/A
Occupancy Sensors	2019	Install occupancy sensors for offices, utility and storage areas	N/A	N/A
Station Museum				
Upgrade Lighting	2018	Upgraded existing T12 fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per T12	Quantity Unknown
Upgrade Lighting	2018	Upgraded existing T12 fluorescent washroom lighting to LED fixtures with electronic ballasts.	.017 kW per T12	Quantity Unknown
Occupancy Sensors	2017	Install occupancy sensors for offices, storage areas and washrooms.	Unknown	Quantity Unknown
Water Heating	2017	Replaced existing gas fired water heater with gas fired on demand	N/A	N/A

		system. Expected to reduce gas consumption.		
HVAC	2017	Upgraded existing HVAC system and DX condenser with high efficiency system.	Unknown	Unknown
Central Park Arena				
Electric Ice Resurfacer	2019	Replaced propane fueled Ice Resurfacer with electric Ice Resurfacer. (GHG emission reduction.)	N/A	N/A
Upgrade Lighting	2018	Upgraded existing T12 fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per T12	Quantity Unknown
Town Hall				
Upgrade Lighting	Ongoing	Upgraded existing T12 fluorescent fixtures to T8 fixtures with electronic ballasts. This has been done on an as required basis based on repairs. Going forward, the upgrade will be from fluorescent to LED.	Unknown	Unknown
Exterior Lighting	2019	Replaced all exterior lights with LED lights.	3.1	13,508
Annex				
Upgrade Lighting	Ongoing	Upgraded existing T12 fluorescent fixtures to T8 fixtures with electronic ballasts. This has been done on an as required basis based on repairs. Going forward, the upgrade will be from fluorescent to LED.	.01 kW per T12	Quantity Unknown
Police Station				
Upgrade Lighting	Ongoing	Upgraded existing T12 fluorescent fixtures to T8 fixtures with electronic ballasts. This has been done on an as required basis based on repairs. Going forward, the upgrade will be from fluorescent to LED.	.01 kW per T12	Quantity Unknown
Occupancy Sensors	Ongoing	Some occupancy sensors have been installed in utility areas, corridors, and washrooms.	Unknown	Quantity Unknown

Outdoor Lighting	2017	Replaced 10, 175 W mercury vapor wall packs with 10, 70 W LED wall packs.	1.05	4,599
Garage Door Replacement	2018	Replaced three uninsulated garage doors, (South Side), with three R-16.22 rated doors. Expected to offset gas consumption. (Cost and GHG emission reduction.)	N/A	N/A
Public Works and Recreation				
Upgrade Lighting	Unknown	Replaced remaining T12, 38 W fluorescent lighting in the offices, utility areas, corridors and washrooms with T8, 28 W fixtures with electronic ballasts.	.01 kW per T12	Quantity Unknown
Library and Municipal Offices (Note: this is a LEED Gold Building)				
Upgrade Lighting	2016	Replaced approximately eighteen 50 W GU-10 with 6.5 W LED GU-10	.78	3,430
Wastewater Treatment Plant				
Cogeneration Project	2015	Install 65 kilowatt (kW) gas turbine cogeneration plant.	65	237,700
Variable Frequency Drive (VFD) on Aeration Blower Motors	2016	As recommended by CHEC Energy Savings Group Report, retrofit the existing multi-stage blower with VFDs and a control panel.	25	150,000
Water & Energy Conservation & Public Awareness Strategy	2015	Work with a local non-profit on a water and energy conservation strategy that focuses on increasing public awareness, highlighting the interconnection between water and energy, the importance of sustainable resource management and actions which may be taken to support water and energy conservation in homes, businesses and the community.	Unknown	Unknown

5.0 Proposed Energy Conservation and Demand Management Measures

The Town of Collingwood has participated in various energy audits and has accumulated a substantial list of recommendations for various facilities. The list of proposed measures is based on recommendations from these energy audits as well as recommendations from staff.

The following table lists the proposed energy savings measures that the Town plans to implement between 2019 and 2024. This list includes some of the measures that were identified in the last plan but are still under consideration, as well as new measures that have been added through this update process.

Measure	Year	Description	Assumed Demand Savings (kW)	Assumed Annual Energy Savings (kWh)
Eddie Bush Memorial Arena				
Replace Ice Lights	2020	Replacement of 36 metal halide 750 watt fixtures with 200 watt LED fixtures. Assumed occupied 8 hours per day.	19.8	57,816
Occupancy Sensors	2020	Install occupancy sensors for offices, utility and storage areas.	Unknown	Quantity Unknown
Transformer	Future	Replace existing 150 kVA transformer with high efficiency model. Further information is required to determine payback time. This may be addressed when the existing transformer has reached the end of its useful life if the evaluation finds that the payback time is too long to justify immediate replacement.	TBD	TBD
Hot Water Heating	2020	Replace ice resurfacer hot water heater with high efficiency condensing unit.	Unknown	Unknown
Dehumidification	2019	Replace existing ice surface dehumidifiers with gas fired regenerative units.	Unknown	Unknown

Space Heating	2021	Upgrade space heating for dressing rooms and lobby area in conjunction with ventilation improvements. To be done in conjunction with Change Rooms upgrade project.	TBD	TBD
Curling Club				
Occupancy Sensors	2019	Install occupancy sensors for change rooms, washrooms, storage and utility areas.	Unknown	Quantity Unknown
Centennial Aquatic Centre				
Upgrade Lighting	2020	Replace the on deck mercury vapor lights with LED equivalents. Estimating a 280 W reduction per lamp and 6 hours per day of operation.	.28 per lamp	613 per lamp
Transformers	Future	Replace existing 150 kVA and 45 kVA transformers with high efficiency models. Further information is required to determine payback time. This may be addressed when the existing transformer has reached the end of its useful life if the evaluation finds that the payback time is too long to justify immediate replacement.	TBD	TBD
Station Museum				
Humidification	2019	Replace existing electric humidifier with gas fired high efficiency unit.	TBD	TBD
Town Hall				

Upgrade Uninterruptable Power Supply	2019	Install a new UPS for critical loads. A single UPS replaces a number of smaller UPSs. In addition to the energy savings as a result of operating a single, more efficient unit, the new UPS will allow us to monitor power quality and consumption for our critical loads more accurately.	Unknown	Unknown
Upgrade Lighting	2020	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per unit	Quantity Unknown
Occupancy Sensors	2020	Install occupancy sensors in offices, storage and utility areas and washrooms.	Unknown	Quantity Unknown
HVAC	Future	Recommission rooftop units and electric baseboard heaters to improve setback scheduling opportunities.	TBD	TBD
Annex				
Occupancy Sensors	2020	Install occupancy sensors in utility areas and washrooms.	Unknown	Quantity Unknown
HVAC	Future	Recommission HVAC controls and rooftop unit to improve economizer operation and setback scheduling.	TBD	TBD
Upgrade Lighting	2020	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per unit	Quantity Unknown
Seek Additional Measures	Future	The energy intensity for this building was significantly higher than average. Need to seek additional measures for energy savings at this facility.	N/A	N/A
Police Station				
Upgrade Lighting	2020	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per unit	Quantity Unknown

Occupancy Sensors	2020	Install occupancy sensors in utility areas, corridors and washrooms.	Unknown	Quantity Unknown
HVAC	Future	Replace rooftop HVAC unit to improve efficiency and reliability – incorporate into BAS. This will be done at the end of the existing unit's useful life.	TBD	TBD
Water Heating	Future	Replace existing domestic hot water heating system with a high efficiency unit.	TBD	TBD
Garage Door Replacement	2019	Replace three older garage doors, (North side), with three R-16.22 rated doors. Expected to offset gas consumption. (Cost and GHG emission reduction.)	N/A	N/A
Public Works and Recreation				
Upgrade Lighting	2020	Upgrade of existing fluorescent fixtures to LED fixtures with electronic ballasts.	.017 kW per unit	Quantity Unknown
Occupancy Sensors	Future	Install occupancy sensors in the offices, utility areas, corridors and washrooms	Unknown	Quantity Unknown
HVAC	Future	Upgrade DX cooling condensers to high efficiency units. This project is ready to proceed, but depends on accommodation project details as the building may change.	TBD	TBD
HVAC	Future	Install HRV's on office area ventilation systems to improve efficiency. This will be done in conjunction with the HVAC project above.	TBD	TBD
Water Heating	Future	Replace existing domestic hot water heating systems with gas fired high efficiency units. This will be done at the end of the existing unit's useful life.	TBD	TBD

Library and Municipal Offices				
Upgrade Lighting	2020	Replace approximately twenty 100 W Par 38 incandescent bulbs with 20 W LED Par 38. Assuming 12 hours per day of operation.	1.6	7,008
Upgrade Lighting	2020	Replace approximately eighteen 50 W GU-10 with 6.5 W LED GU-10. Assuming 12 hours per day of operation.	.78	3,430
Geothermal System	Future	Recommission system. Expected to offset gas consumption. (Cost and GHG emission reduction.)	N/A	N/A
Environmental Services Building				
Upgrade Lighting	2019	Replace high bay lighting in the Garage with LED fixtures. Estimating a 280 W reduction per lamp and 12 hours per day of operation.	.28 per lamp	1,226 per lamp
Wastewater Treatment Plant				
Water & Energy Conservation & Public Awareness Strategy	Reoccurring Measure	Work with a local non-profit on a water and energy conservation strategy that focuses on increasing public awareness, highlighting the interconnection between water and energy, the importance of sustainable resource management and actions which may be taken to support water and energy conservation in homes, businesses and the community.	Unknown	Unknown
UV System Upgrade	2019	Project in progress. Part of a Save on Energy Program. Funding will depend on results of energy monitoring results. Expected to receive between $235k & $635k.	134.7	1,180,000
Blower Upgrade	Future	Currently investigating the replacement of the centrifugal blowers with turbine blowers.	TBD	TBD

Black Ash Creek Pumping Station				
New Station	2019	A new, more efficient station is being constructed.	Unknown	Unknown
R.A.B Water Filtration Plant				
Upgrade Lighting	Future	Replace high bay lighting in the Filter Room with LED fixtures. Estimating a 280 W reduction per lamp and 12 hours per day of operation.	.28 per lamp	1,226 per lamp
Filter Membranes	2019	Life-cycle replacement of remaining ½ train of water filtration membranes. (Others have already been replaced.) Life-cycle requirement have driven this project, but previous replacements have resulted in a significant reduction in energy required to operate the plant.	Unknown	Unknown
Carmichael Reservoir				
Station Upgrades	2020	Upgrades to include the introduction of smaller pumps that will be more appropriate for low flow rates. Large pumps to be fitted with VFDs.	Unknown	Unknown

6.0 Renewable Energy

Collingwood's Wastewater Treatment Plant installed a 65 kW cogeneration plant in 2017. The cogeneration plant generates electricity by using what was previously a waste by-product, reducing the plant's purchased electricity requirements while the waste heat created from the electricity generation is used to supplement heating the facility. Early energy monitoring results have been positive with monthly production ranging between 30,000 and 40,000 kWh. The electricity generated depends on the amount of downtime required for maintenance/repairs, but staff attempt to operate it as much as possible.

The Town of Collingwood built a new Library and Municipal Office facility which opened to the public in 2010. The building was built to a LEED Gold standard and utilizes a geothermal system for heating and cooling. The geothermal system for the library utilizes 26 deep wells that extend over 100' below the parking lot on the East side of the building. Each well is connected to one of four supply and return manifolds. A series of circulating pumps in the penthouse circulate a 20% ethanol solution throughout the ground source heat exchanger. A portion of the solution is circulated through sixty-five (65) separate water to air heat pumps located throughout the building

for both heating and cooling service. Each of these heat pumps operates independently based on the heating or cooling needs in their respective zones. A separate circuit carries the fluid to a sixty-sixth (66th) water to water heat pump, also located in the penthouse, to provide 106 degree Fahrenheit treated water to radiant heaters around the perimeter of the building and the in-floor heating system for the lower level.

For renewable energy projects, the Town recognizes there are operational, maintenance, and cost impacts to operate these systems. Now that the geothermal system for the Library and Municipal Office facility is approximately 10 years old, it will benefit from re-commissioning in order to maximize the effectiveness of the system. This has been identified as one of the measures to be completed for the Library and Municipal Office facility over the term of this Plan.

7.0 Looking Forward

The measures that have been identified in Section 5.0 and are under consideration shall be quantified, prioritized and assigned to individual project and facility managers for implementation. Many of the measures will require consideration for funding and will be included in operations and capital budget programs in the coming years. Some of the measures will require input from engineering firms or utility providers to quantify potential savings and recommend specific actions. Incentives, when available, will be leveraged to support the implementation of energy conservation projects.

The expectation will be to implement the listed measures over the five (5) year life of this ECDM Plan. Additional measures may be identified and will be prioritized against the known opportunities.

As the organization looks forward, there are a number of initiatives already underway that are designed to help us reach the goals, objectives, and targets identified in this Plan. From the creation of a new position/department that is designed to provide leadership in energy management to the introduction of a new type of contract that will help deliver LED retrofits more effectively, the organization will continue to look for improvements. The following sections summarize the current initiatives that are expected to support our approach to energy conservation and demand management.

7.1 Executive Director, Customer and Corporate Service

This is a new position for the Town of Collingwood and part of the duties of this new position will be to manage special projects, and champion an environmental sustainability (“green”) function to look at ways to reduce the organization’s carbon footprint. This position is scheduled to be filled early in the summer of 2019.

7.2 Centralized Analysis of Energy Consumption

One of recommendations from this Plan is to centralize the analysis of energy bills, as a Corporate Service. Although we currently report on energy consumption annually, as required by the Province, we recognize the need for more detailed analysis of energy bills so we can:

- Verify the effect of the energy savings measures we implement and calculate actual payback times;

- Identify trends that could be in either direction. An increase in consumption may trigger us to investigate a facility more closely and find that a change to equipment or operations has caused an unexpected increase in consumption. A decrease in consumption could be from the implementation of an energy savings measure and/or a staff/public awareness campaign;
- Maintain near real-time energy consumption data for our facilities;
- Make the next update to this Plan in 5 years much easier.

7.3 Energy Conservation and Demand Management Team

Through this update, it was recognized that there is a need for technical expertise from the Town departments who manage the projects and implement measures at the facilities included in this Plan. It was decided that it would be beneficial to meet more regularly, on a bi-annual basis, to discuss the status of the planned measures, share resources, and discuss lessons learned. This Team will be comprised of representatives from Fleet & Facilities, Recreation Facilities, Water Filtration Operations, and Wastewater Operations. These representatives have provided the update to the completed and proposed energy savings or GHG reduction measures in this Plan.

7.4 Greener Collingwood

While the Energy Conservation and Demand Management Team will look at the implementation of energy saving measures from a technical perspective, the Town of Collingwood has also developed an internal organization that promotes environmentally sustainable practices and behaviors within the organization. This organization is comprised of volunteers from all Departments. Any energy or GHG reducing measures brought forward by this team will be evaluated for implementation by the Energy Conservation and Demand Management Team.

7.5 Electric Vehicle Charging Stations

The Town is currently planning for the implementation of Electric Vehicle Charging Stations. At the time of this update, the Town is considering the type of chargers required, locations to be installed, and investigating all available incentives. The Town expects to begin the install of the first units in 2019.

7.6 LED Lighting Retrofit Contract

While updating this Plan, the Energy Conservation and Demand Management Team discussed the need for a contract designed to deliver LED Lighting Retrofit Contracts more effectively. Practically all energy audits made recommendations for LED conversions. With limited engineering requirements and a payback time that can sometimes be as little as one year, the Town plans to actively look for LED retrofit opportunities as resources permit.

The current approach is to retrofit small areas when repairs to existing lighting is required, and is organized by department. While this approach is cost effective and minimally impactful to operations, it presents challenges in tracking the investments being made and savings realized. Another challenge with this approach is that the conversion to LED technology may not be happening as fast as it should for certain areas. One option discussed was the implementation of a Standing Offer Agreement based on competitive unit prices, obtained through an open procurement method, for the replacement of our most common types of lighting. For this type of

contract, we could set the level of investment we are willing to make. For example, a $200,000 total contract value with a $25,000 limit per call-up. As needed, any facility could request quotations for work based on the lowest unit rates. This type of contract could help staff track investments more effectively through a single contract, while also allowing staff to deliver larger value retrofit projects more quickly.

7.7 IT Energy Awareness

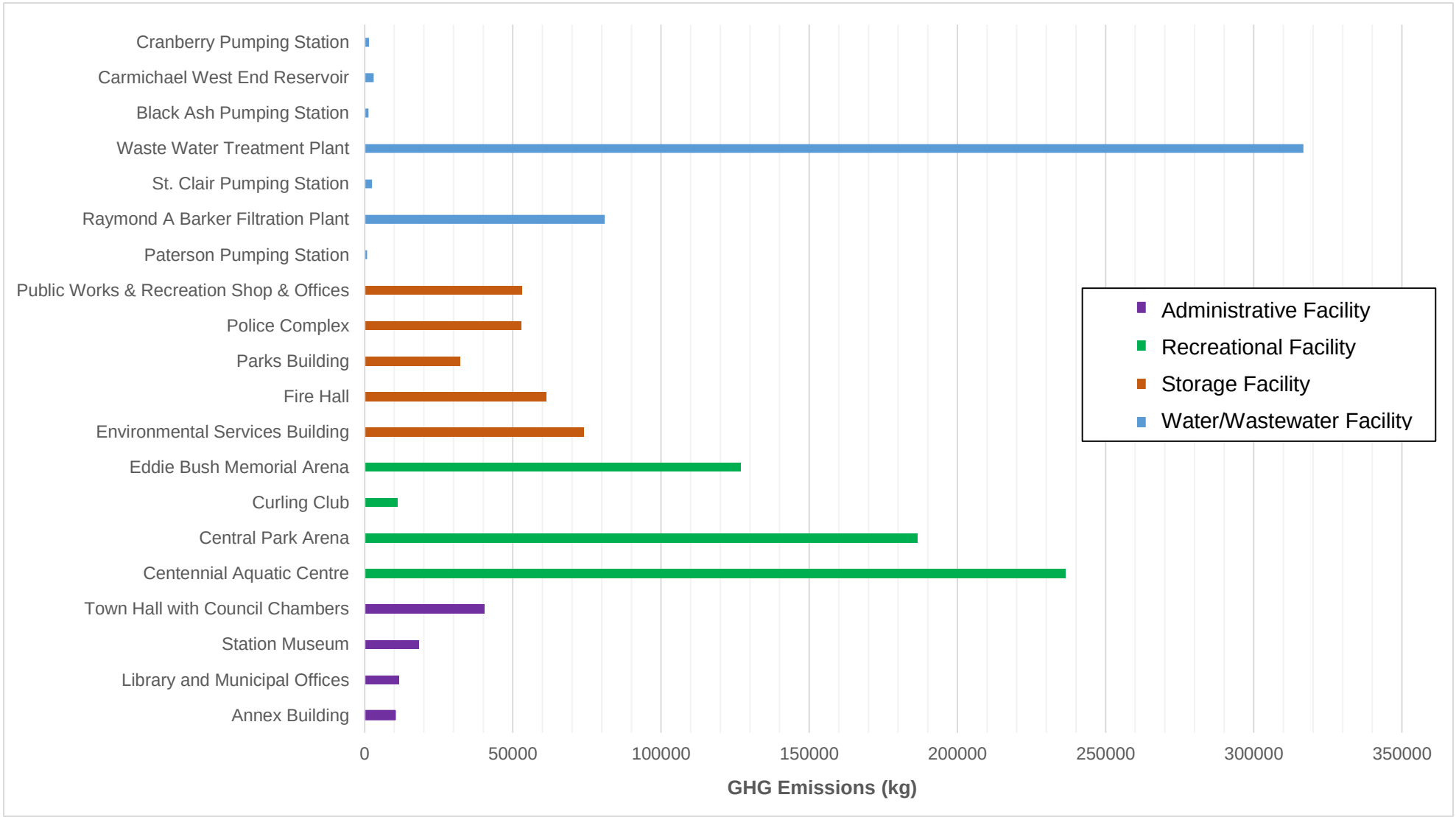
Since IT related measures are implemented corporately, the energy savings are not always linked to a single facility, but still represent an opportunity for energy savings. The following initiatives are either being implemented and/or are under consideration for implementation between 2019 and 2024:

- In 2019, the Town replaced 32 printers/copiers. The old units, some of which were over 10 years old, have been replaced with modern energy efficient units. All printers have a sleep mode when not in use and use a more efficient toner;
- In 2019, the Town is planning to replace 90 workstations/laptops. The latest generation technology is Energy Star compliant. Therefore it is expected there will be a decrease in consumption;
- In 2019, the Town plans to implement a computer locking policy that will force workstations to lock and go into standby mode after a period of inactivity;
- In 2020, the Town is planning on replacing 3 UPS at its main Data Centre at the Fire Hall with a single, more efficient unit.

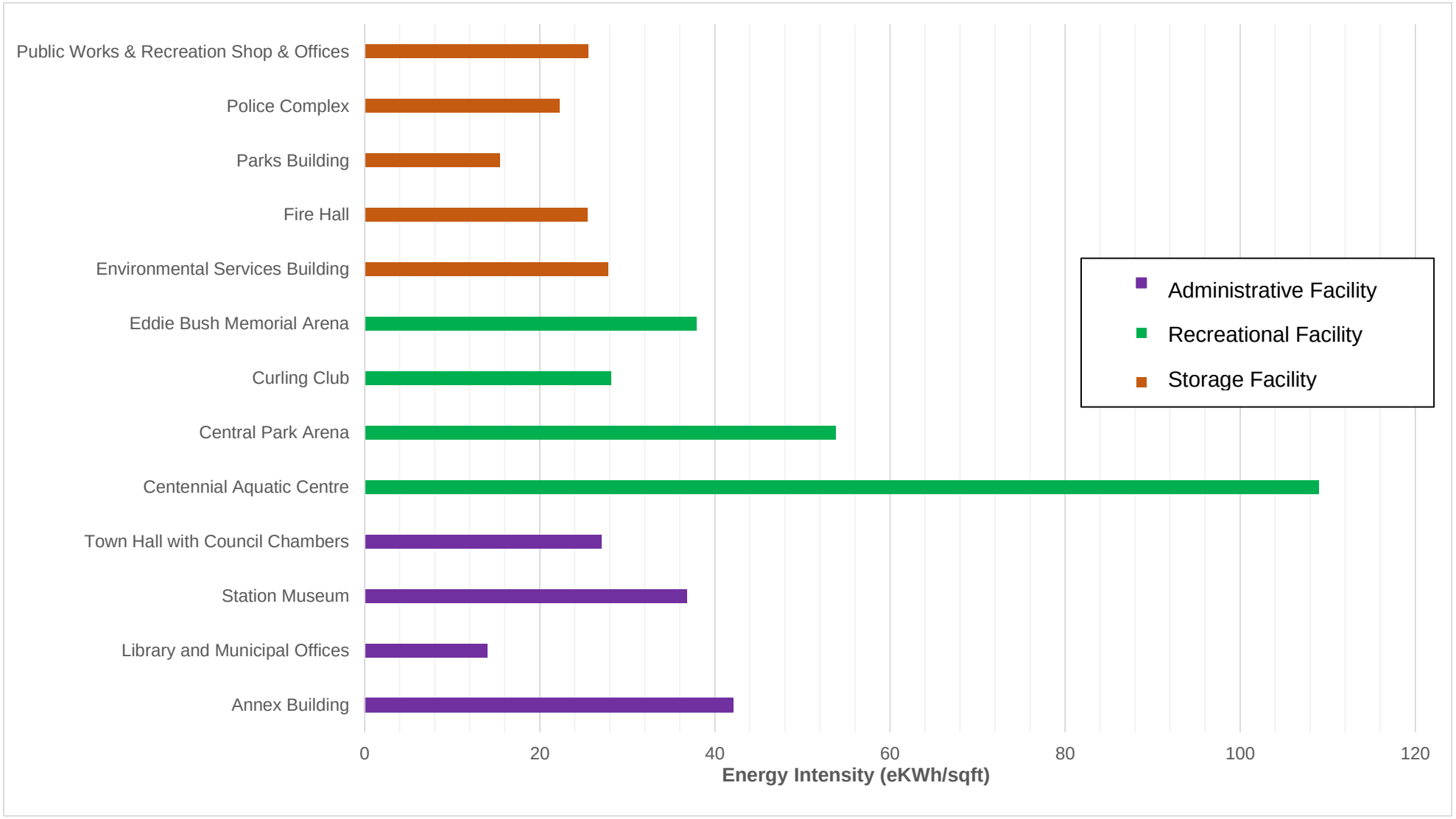
8.0 Approval Process and Publication

This Plan was reviewed and discussed with all Department Heads during the update process. After receiving Department Head approval, this Plan received approval from Council. In addition to the ECDM Plan being publicly available in print form at the Town Hall, located at 97 Hurontario Street, it will also be posted on the Town of Collingwood website (www.collingwood.ca).

Appendix A – 2017 Town of Collingwood Facilities' Greenhouse Gas Emissions



Appendix B – 2017 Town of Collingwood Facilities' Energy Intensity



Appendix C – 2017 Town of Collingwood Water/Wastewater Facilities' Energy Intensity