Town of Fort Erie

Energy Conservation and Demand Management Plan

2024-2029

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SECTION I - Introduction

Introduction

This report represents the Town of Fort Erie's Energy Conservation and Demand Management Plan (CDM) for 2024-2029.

The report is a strategic plan which provides the basis for the Town to move forward on identifying and implementing improvements to our facilities and operations. The goal of reducing energy consumption and mitigating the environmental effects associated with energy usage.

The plan will assist the Town of Fort Erie in meeting its legislative requirements under the Green Energy Act (2009), which came into effect on January 1, 2012. Under the new regulation, public agencies are required to report annually on energy use and greenhouse gas (GHG) emissions, develop and implement energy management plans and report on the results.

A number of progressive and attainable goals are identified within the plan aimed at improving the environmental performance of the Town of Fort Erie over a 5-year term.

Each year, the municipality incurs over $1.2 million in utility costs throughout our facilities and operations. Previous and future studies focusing on the management of utility expenditures are in the best financial interest of the Town of Fort Erie.

SECTION II – Understanding and Context

Vision and Goals

Although energy conservation isn't specifically identified in the Town's **2023-2026** Corporate Strategic Plan, senior staff and members of Council have been supportive of numerous energy initiatives.

The Green Energy Act (2009)

On January 1, 2012 the Green Energy Act (GEA) came into effect. Under the act, public agencies were required to report annually on their energy use and GHG emissions beginning on July 1, 2013. In addition to reporting total energy consumed and GHG emissions, municipalities report on GHG intensity (per square foot) and energy intensity (per square foot), by facility and by operation type. "Operation type" includes;

- Administrative offices
- Public libraries
- Cultural and recreation facilities
- Ambulance stations and facilities
- Fire stations and facilities
- Police stations and facilities
- Storage facilities
- Water and sewage treatment/pumping
- Parking garages

Starting July 1, 2014, public agencies were required to develop and implement 5-year energy conservation and demand management plans. Plans included;

→ Goals and objectives for conserving energy, reducing energy and managing energy demand

→ Proposed measures and the associated costs and savings estimates

→ Timeframes associated with the energy conservation and demand management measures

→ Confirmation that the plan has been approved by the Town's senior management (Council)

SECTION III – Current State, Baseline & Opportunity

Energy Opportunity Assessment

Staff has undertaken an energy opportunity assessment to confirm the current state of operations, develop an energy consumption, demand and greenhouse gas baseline, and identify and quantify opportunities for improved performance for Town facilities.

The energy opportunity assessment comprised of a brief evaluation of utility consumption history, a walk-through of each Town-owned facility. Energy conservation measures (ECMs) have been identified and evaluated for possible application at each Town facility to reduce energy consumption.

Portfolio Description

The Town has a diverse inventory of buildings, the following portfolio description provides context for the energy opportunity assessment and is consistent with the GEA reporting requirements:

Administrative Offices

Town Hall
1 Municipal Centre Drive, Fort Erie

The Fort Erie Town Hall was constructed in 1995 in order to provide to the Town with greater administrative space. The 3-floor facility consists primarily of office and meeting space. The space within the building is conditioned by a boiler/chilled water system which is controlled by a Building Automation System (BAS).

Public Libraries

Centennial Branch
136 Gilmore Road, Fort Erie

The centennial library was originally constructed in 1967, with an addition in 1979. The single floor structure is home to the Libraries administrative staff and is the largest circulation site as well. The facility also includes 2 community rooms which are used extensively throughout the year. The space is conditioned by 3 rooftop HVAC units.

Crystal Ridge Branch
89 Ridge Road South, Ridgeway

This branch of the Libraries opened in 1988. The main floor houses public space and a community room. The site also has a large, unfinished basement which is used as storage for excess materials. The facility is conditioned by 2 rooftop HVAC units.

Stevensville Branch
2508 Stevensville Road, Stevensville

A renovation to the Stevensville Memorial Hall in 2001 made room for the smallest branch of the Libraries. The space is conditioned by a single rooftop HVAC unit.

Cultural and Recreation Facilities

Crystal Ridge Arena
109 Ridge Road South, Ridgeway

The seasonal, single-pad arena was constructed in 1974. The building has been extensively renovated, most recently in 1999, when dressing rooms and lobby space were expanded. Space is heated by an indirect HV system and radiant unit heaters.

Leisureplex Arena
3 Municipal Centre Drive, Fort Erie

The Leisureplex opened to the public in 1996. The building consists of 2 ice surfaces, one which operates year round, and a second which operates with ice for 9 months and hosts dry floor activities for the other 3 months of the year. The building boasts a large, bright atrium, an arcade, concession stand, pub and a sports shop. The facility is also home to numerous tenants. The space is conditioned by multiple rooftop HVAC units and radiant unit heaters controlled by a central BAS.

Lion's Community Hall
3 Municipal Centre Drive, Fort Erie

The community hall is situated within the Leisureplex arena; however, many of its events are hosted independent of arena operations. The 500 seat hall includes a full service kitchen, bar, separate meeting room and generous washrooms. The space is conditioned by 2 rooftop HVAC units.

Stevensville Community Hall
2508 Stevensville Road, Stevensville

Rebuilt in 1981 following a fire to the original structure, the site was further renovated in 2001 to include the Stevensville Branch of the public library system. The community hall can host events of up to 150 people. It includes a full service kitchen, bar and washrooms. The space is conditioned by a rooftop HVAC system.

Central Station Community Hall
444 Central Avenue, Fort Erie

The new community hall within the Central Fire Station opened in 2013. The community hall and training room have a combined capacity of 100 people. The hall includes a full service kitchen, bar and washrooms. The community hall operates independent from the fire response services. The space is conditioned by indirect heat, split HVAC systems.

Railroad Museum
411 Central Avenue, Fort Erie

The railroad museum site includes 2 former railway stations and one locomotive. The GTR B1 Station was originally constructed in 1873 and was moved to the current site in 1982. The Ridgeway Station was built circa 1900 and moved to the current site in 1975. The seasonal site operates daily from Victoria Day through to Labour Day annually.

Historical Museum
402 Ridge Road North, Ridgeway

The limestone structure was originally constructed in 1874 and operated as Bertie Town Hall for almost 100 years. The building eventually became a museum in 1976 and was designated as a building of architectural and historical interest in 1988. The site still operates as a year round museum and also is the main office site for the 3 full-time museum staff. Additionally several part-time staff and numerous volunteers work at the site throughout the year. The space is conditioned by a rooftop HVAC unit.

Fire Stations and Facilities

Fire Station #3
1015 Dominion Road, Fort Erie

The privately owned 2 floor fire station was constructed in 1955. The Town leases the majority of the site for fire response equipment. The site houses up to 5 response vehicles and one additional wash bay. The second floor includes a training room,

kitchen and private office space. The space is conditioned by 3 rooftop HVAC units and gas fired unit heaters in the truck bays.

Fire Station #4
398 Ridge Road North, Ridgeway

Originally constructed in 1955, the 2-floor building has served as a fire station for Ridgeway/Bertie Township for over 60 years. Housing 4 fire response vehicles, the station also has two cold storage bays in the rear of the site and a training room, kitchen and bar on the second floor. The space is conditioned by a furnace and radiant unit heaters in the truck bays.

Fire Station #5
2654 Stevensville Road, Stevensville

The station was originally constructed in 1955, then renovated and expanded in 2002. The one story structure houses up to 4 response trucks, and also has a small meeting room with commercial kitchen facilities. The space is conditioned by a furnace with split AC and radiant unit heaters in the truck bays.

Fire Training Centre
525 Industrial Drive, Fort Erie

The fire training tower was constructed in the 1980's. The classroom is capable of hosting training session of up to 24 people. A small addition in 2011 added updated washrooms and serving space to the classroom portion of the site. The space is conditioned by furnace and split AC system.

Central Fire Station
444 Central Avenue, Fort Erie

Opening in 2013, the new fire station amalgamated the operations of 2 existing stations (#1 and #2) under one roof. The site includes truck bays for up to 8 pieces of equipment and training facilities. As well, the Fire Department administrative offices are housed here along with an independent community hall. The space is conditioned by indirect heat, split HVAC systems.

Fire Station#4 -New
148 Ridge Road south

The new fire station #4 constructed in 2022, The new Fire Station is a post-disaster rated structure that includes 4 drive-through vehicle bays, with the support services of male and female washrooms/ changerooms, a meeting room, offices, public restrooms,

a large training room, a small “commercial” kitchen, fitness room, tank filling/storage, laundry and decontamination room, bunker gear storage and general storage and utilities rooms.

Storage Facilities

Public Works Facility
1818 Petit Road, Fort Erie

The John L. Gibson Centre public works building was constructed in 1993. The facility hosts the Town’s public works operations, including; roads and drainage services, water/wastewater services, parks and cemetery services and fleet services. The building contains administrative offices, staff facilities, vehicle storage and repair and general storage space. The space is conditioned by 5 rooftop HVAC and gas fired unit heaters.

Summary of Current Energy Consumption

Energy consumption baselines have been established in conformance with the GEA using historical data. All Town facilities have been grouped by type for reporting purposes and energy consumption profiles for each facility type have been developed; these include:

- Administrative Buildings
- Public Libraries
- Cultural and Recreation Facilities
- Fire Stations and Facilities
- Storage Facilities

Additional details, including energy usage and GHG emissions, by facility, are included in Appendix A.

Figure 1 - Historical Electricity Usage (kWh)

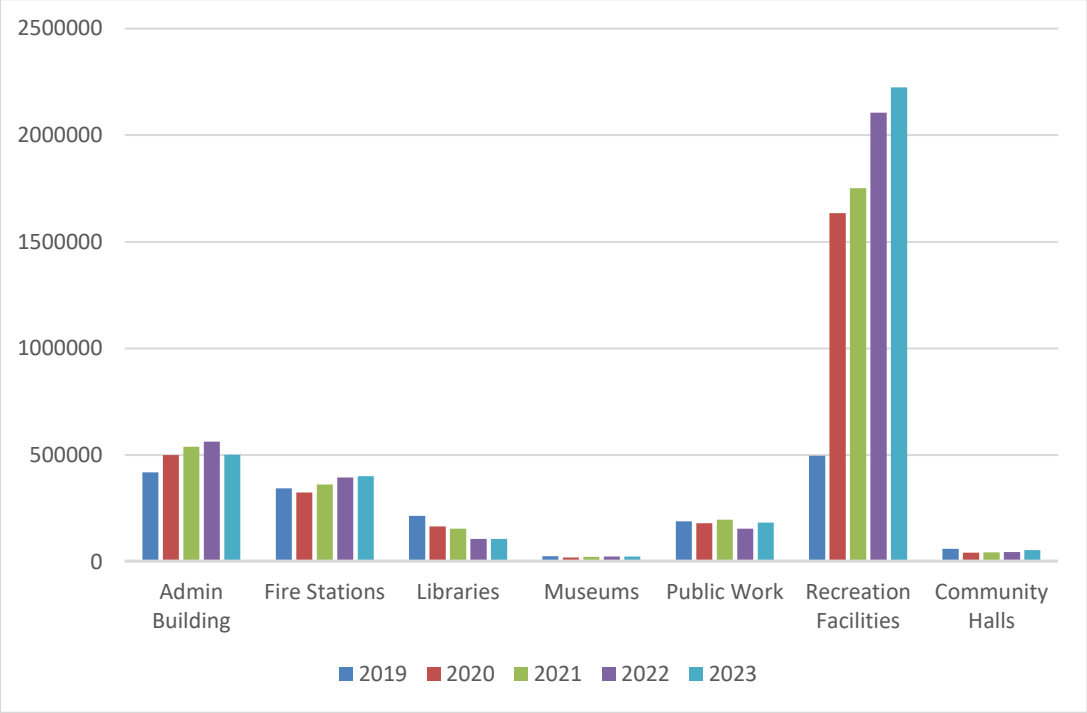


Figure 2 - Historical Natural Gas Usage (Cubic Meters)

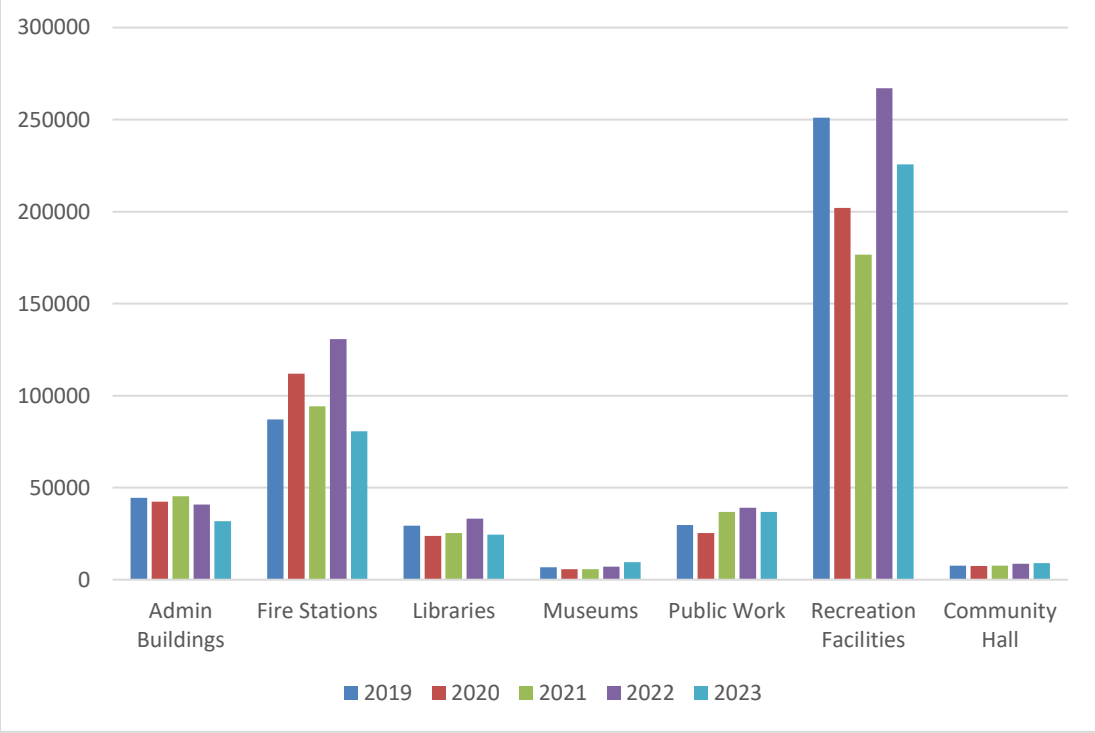


Figure 3 - Utility Distribution Across Fire Stations (2023 data)

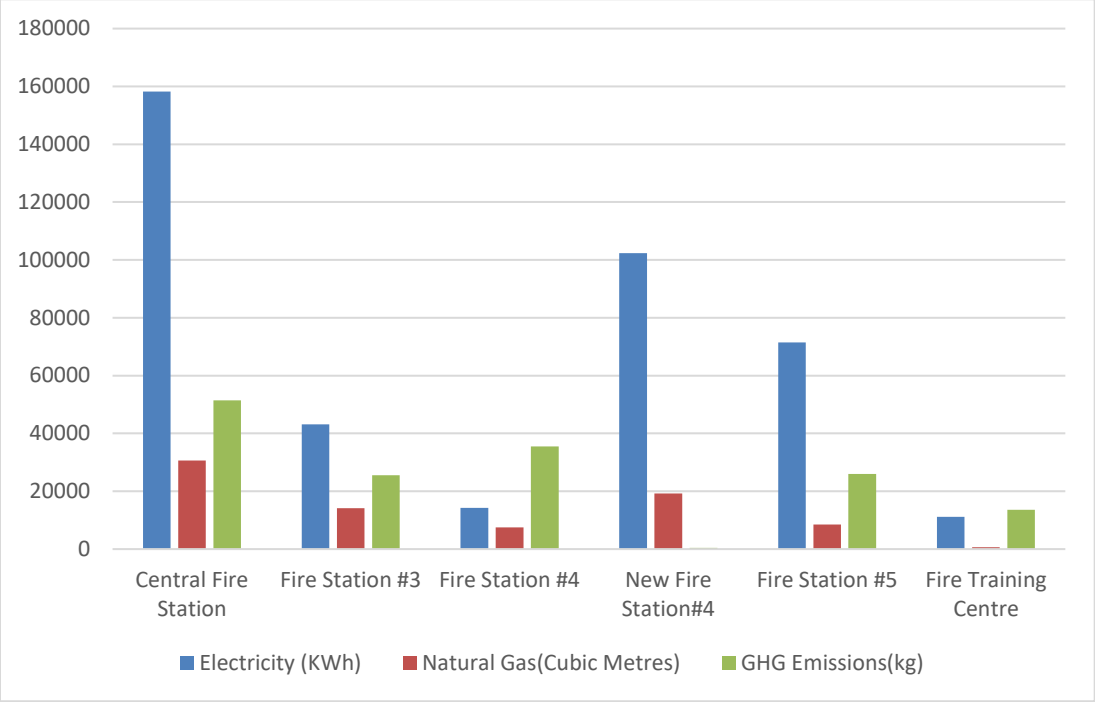
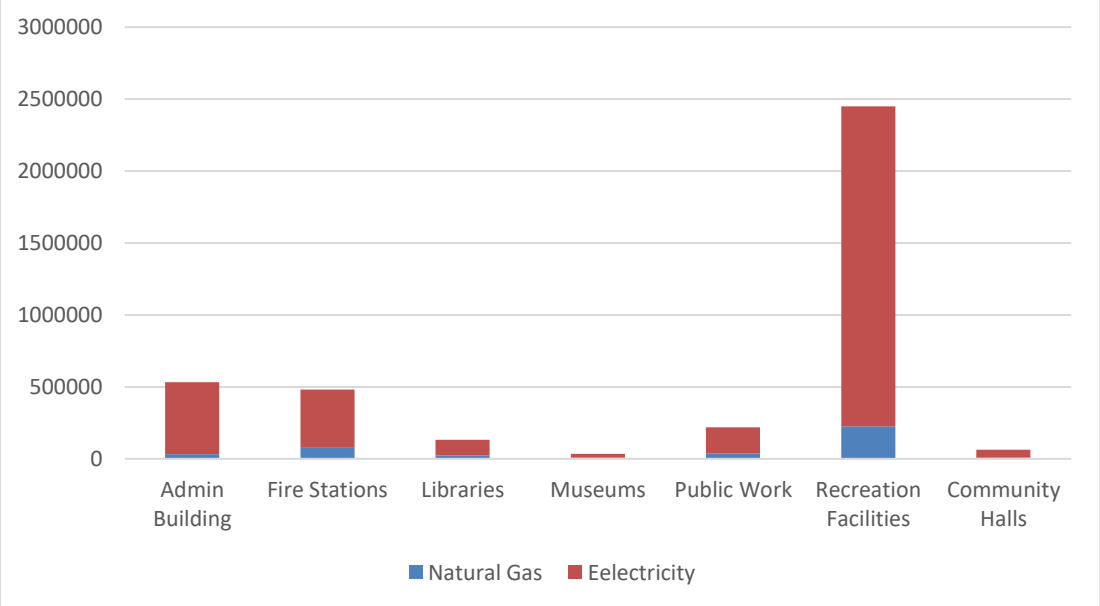


Figure 4 - 2023 Utility Costs by Operation Type



Trends in Energy Consumption

Utility consumption varies based on many factors; facility usage, ambient temperature, human behavior, mechanical maintenance and upgrades, most of which can be mitigated through conservation efforts. Since forming in 2005, the Facilities Management division has been to analyzing and benchmarking utility consumption, initiating capital renewal programs aimed at improving energy efficiency and formalizing maintenance programs to optimize equipment operation. These efforts have led to electricity consumption reductions roughly equal to the annual utility rate increases. Natural gas rates have remained quite stable for the past 10 years requiring more modest conservation efforts to balance budget potential increases. The value of these past efforts continues to be realized today, however, the future of the utility markets is far more uncertain.

Summary of Current Technical Practices

The Town of Fort Erie currently employs a number of routine technical practices which enhance energy conservation measures. The following list outlines a few guidelines staff uses when maintaining or upgrading our facilities.

Building Envelope

→ Current facilities are regularly inspected an air gaps sealed to reduce air loss.

→ Building roofs are inspected, visually or with a thermal scan, prior to replacement. Any deficiencies are addressed during replacement, including; replacing damaged insulation or addition of insulation to improve heat retention/reflection.

Building Automation Systems

→ Existing BAS have been maintained and/or upgraded to ensure the optimal operation of the facility.

→ New or replacement equipment is integrated into the existing BAS where applicable.

HVAC Replacement

→ Specification for replacement units include; energy star rating, R-410A refrigerant, variable speed drive motors (when applicable) and economizers.

Appliances and Office Equipment

→ Only energy star appliances and equipment are purchased (when available).

→ All monitors and screens have been replaced with energy star LCD/LED/Plasma where applicable.

Lighting

→ Replacement of all fixtures considers upgrades to the most efficient models suitable for the application.

→ The most efficient lamps are sourced for each fixture when replacing.

→ 98% of the facility light fixtures have been upgraded to LED.

→ Available OPA programs are applied for prior to all lighting upgrades.

→ Lighting controls are being analyzed and integrated during all lighting replacements. This method can often derive more energy savings than the actual fixture replacement.

Heated Water

→ On-demand water heaters have been implemented in several applications and are considered during all replacements.

→ Replacement boilers are specified as high efficiency, modulating, direct vent models.

Summary of Energy Conservation Measures

A walk-through assessment was completed at each of the facilities listed in the portfolio. A number of common and categorized energy conservation measures have been identified through these walk-throughs. The following table indicates what measures have been identified for each facility.

	Exterior lighting upgrade	Interior lighting upgrade	Interior lighting controls	Heated water upgrade	HVAC upgrades	Staff/ Tennant Education
Town Hall	✓	✓	✓	✓	✓	✓
Centennial Library						✓
Crystal Ridge Library		✓			✓	✓
Stevensville Library	✓	✓	✓	✓	✓	✓
Crystal Ridge Arena	✓	✓	✓	✓	✓	✓
Leisureplex Arena				✓	✓	✓
Lion's Banquet Hall					✓	✓
Stevensville Hall					✓	✓

	Exterior lighting upgrade	Interior lighting upgrade	Interior lighting controls	Heated water upgrade	HVAC upgrades	Staff/ Tennant Education
Central Station Hall						✓
Railroad Museum						✓
Historical Museum				✓	✓	✓
Fire Station #3						✓
Fire Station #4						✓
Fire Station #4 New						✓
Fire Station #5	✓			✓	✓	✓
Training Tower						✓
Central Station	✓					✓
EJ Freeland	✓	✓	✓	✓	✓	✓
Public Works Facility	✓	✓	✓	✓	✓	✓

SECTION IV – Action Plan

The focus of the CDM is on short term, feasible actions that are achievable with minimal budgetary impact, timelines and responsibilities will be address during implementation phase. Actions that require funding will be considered as part of future budget processes. In addition, a 5-year facility action plan is presented at the end of this section with a distinct focus on energy conservation.

Goals

The following list summarizes objectives that have been identified as a priority in attaining our goal of becoming a more environmentally responsible community partner. Where possible, estimated annual savings have been included.

→ Mechanical system re-commissioning to ensure optimal performance of systems.

→ Mechanical upgrades to reduce energy consumption.

→ Maximizing funding opportunities related to energy improvements.

5-Year Facility Action Plan

1. **Renewable Energy Generation** – Integrating renewable energy into a 5-year facility action plan offers numerous benefits. It reduces the facility's carbon footprint, aligning with sustainability goals, and cuts long-term costs by minimizing operational

expenses compared to traditional. This integration drives innovation in renewable energy systems, boosts employee morale, and strengthens community relations. Ultimately, it aligns environmental, economic, and social goals, paving the way for a sustainable future.

2. **Re-Commissioning of Mechanical Systems** – This includes the process of assessing, adjusting, and optimizing existing mechanical systems within the Town of Fort Erie's buildings. This practice helps ensure that all mechanical systems continue to operate efficiently and effectively over time. It is recommended to re-commission or upgrade mechanical systems every 15 to 20 years to maintain optimal performance, address any wear and tear, and incorporate advancements in technology for improved energy efficiency and functionality.

3. **Mechanical Unit Upgrades** - Various mechanical systems will be upgraded through future capital projects. These upgrades typically aim to improve system efficiency, reliability, and performance. By investing in mechanical upgrades, Town of Fort Erie can ensure that their mechanical systems remain up-to-date with technological advancements, leading to better energy efficiency, reduced maintenance costs, and enhanced occupant comfort.
   The capital forecast outlines several equipment upgrades across various facilities, including Town Hall, Leisureplex, Fire stations, the Gibson Centre, Museum, FJ Freeland, Library, and Crestal Ridge Arena.

4. **Lighting Upgrades** – Over the past 5 years, extensive lighting upgrades have been carried out across multiple facilities, encompassing advancements in indoor and outdoor lighting systems. These improvements have been motivated by technological advancements, focusing on enhancing energy efficiency, extending fixture lifespan, and improving lighting quality. Future upgrades are planned to stay current with evolving lighting technology, ensuring the infrastructure remains efficient and cost-effective as fixtures age. Benefits include reduced energy consumption, decreased maintenance expenses due to longer-lasting fixtures, and potentially enhanced lighting conditions for occupants or users of the space.

5. **Whole Building Improvements** – The 2023-2024 capital program includes funding for Gibson Centre Office Building and Vehicles bay Expansion. This new addition will design and build with most recent energy efficient systems and technologies. The roof replacements projects, exterior metal replacement, door and windows at the multiple facilities will also improve the building envelope and heat retention.

6. **Demand Management** – Investigate opportunities to participate in demand management programs for a possible fit within our operations. Annual savings will be based on the surplus demand that can be shaved during peak call times and the current electricity rates.

SECTION V – Implementation

Oversight

A multidisciplinary staff-based steering committee was established to oversee the development of this plan. It is recommended that this committee continue to meet on an annual basis to continue to manage the development and execution of the action plans. This committee is comprised of representatives from:

- Infrastructure Services
- Corporate Services
- Fire Services
- Museum Services
- Library Services

Renewal Cycle and Reporting

This is the second version of the CDM, it is recommended that the GEA portion of the plan be updated annually to comply with reporting requirements. The CDM has to be update on or before July 1st, of every fifth anniversary or as required by the GEA. Facilities Management will continue to provide updated reports as required by the Green Energy Act, posting each on the municipal website for public availability.

Monitoring and Measurement

As the 5-year CDM is implemented, accurate accounting of energy demand and consumption will be required to sustainably satisfy the annual GEA reporting requirements. In addition, monitoring and measuring consumption will allow the Town to communicate successes to stakeholders.

Resource Implications

The actions in the plan are staggered for implementation over a 5-year timeframe. They have been developed to mirror the capital budget forecast of the various Town departments to ensure an allocation of funding for each action is identified. Facilities Management will administer the actions of the plan in collaboration with staff from various other Town departments.

APPENDIX A – 2022-2023 Summary of Energy Usage and GHG Emissions

2022 Summary of Energy Usage and GHG Emissions							
No#	**Property Name**	**Property Use Type**	**Building Size (m2)**	**Electricity (kWh)**	**Natural Gas (Cubic meters)**	**GHG Emissions (Metric Tons CO2e)**	**GHG Emissions Intensity ($kgCO2e/m^2$)**
1	Crystal Ridge Branch	Library	519	61,125	8,314	17.8	34.3
2	Fire Station #3	Fire Station	1,115	44,528	15,092	30.4	27.3
3	Fire Station #4	Fire Station	418	27,175	11,970	23.9	57.2
4	Fort Erie Town Hall	Office	4,246	563,469	40,861	94.7	22.3
5	Works Facility	Other - Public Services	2,123	155,149	39,109	79.9	37.6
6	Historical Museum	Entertainment/Public	441	16,242	7,065	14.1	32
7	Centennial Branch	Library	1,317	45,602	24,862	49.3	37.4
8	Central Fire Station	Fire Station	1,239	151,191	41,979	85.3	68.9
9	Crystal Ridge Arena	Ice/Curling Rink	2,601	268,266	55,549	114.8	44.2
10	Fire Station #5	Fire Station	710	62,813	9,167	19.5	27.4
11	Fire Station #6	Fire Station	511	10,691	0	19.8	38.7
12	Fire Training Centre	Fire Station	113	12,735	731	1.8	15.7
13	Leisureplex Arena	Ice/Curling Rink	11,892	1,837,883	211,426	460	38.7
14	Railroad Museum	Entertainment/Public	171	7,289	0	0.2	1.2
15	Community Hall	Social/Meeting Hall	883	45,807	8,599	17.9	20.3
16	New Fire Station#4	Fire Station	1,119	86,058	51,754	102.4	0.9
	Total=		**29,417**	**3,396,023**	**526,478**	**1,132**	**504**

2023 Summary of Enegy Usage and GHG Emissions							
No#	**Property Name**	**Property Use Type**	**Building Size (m2)**	**Electricity (kWh)**	**Natural Gas (Cubic meters)**	**GHG Emissions (Metric Tons CO2e)**	**GHG Emissions Intensity ($kgCO2e/m^2$)**
1	Crystal Ridge Branch	Library	519	55,649	8,241	17.5	33.7
2	Fire Station #3	Fire Station	1,115	43,104	14,152	28.6	25.6
3	Fire Station #4	Fire Station	418	14,258	7,477	14.8	35.5
4	Fort Erie Town Hall	Office	4,246	500,796	31,868	75.6	17.8
5	Works Facility	Other - Public Services	2,123	182,813	36,826	76.3	35.9
6	Historical Museum	Entertainment/Public	441	16,881	5,571	11.2	25.5
7	Centennial Branch	Library	1,317	51,705	16,170	32.7	24.8
8	Central Fire Station	Fire Station	1,239	158,269	30,639	63.6	51.4
9	Crystal Ridge Arena	Ice/Curling Rink	2,601	305,251	59,788	124.1	47.7
10	Fire Station #5	Fire Station	710	71,437	8,528	18.5	26
11	Fire Station #6	Fire Station	511	0	0	0	0
12	Fire Training Centre	Fire Station	113	11,181	631	1.5	13.6
13	Leisureplex Arena	Ice/Curling Rink	11,892	1,919,253	165,893	374.3	31.5
14	Railroad Museum	Entertainment/Public	171	7,412	3,895	7.7	45.2
15	Community Hall	Social/Meeting Hall	883	53,594	8,929	18.8	21.2
16	New Fire Station#4	Fire Station	1,119	102,347	19,245	40.1	0.4
	Total=		**29,418**	**3,493,950**	**417,853**	**905**	**436**

*Note, this data represents the most recent data confirmed by the Ministry at the time of publishing this plan.