Energy Conservation and Demand Management Plan

2024-2029

May 31, 2024

Municipality of Kincardine

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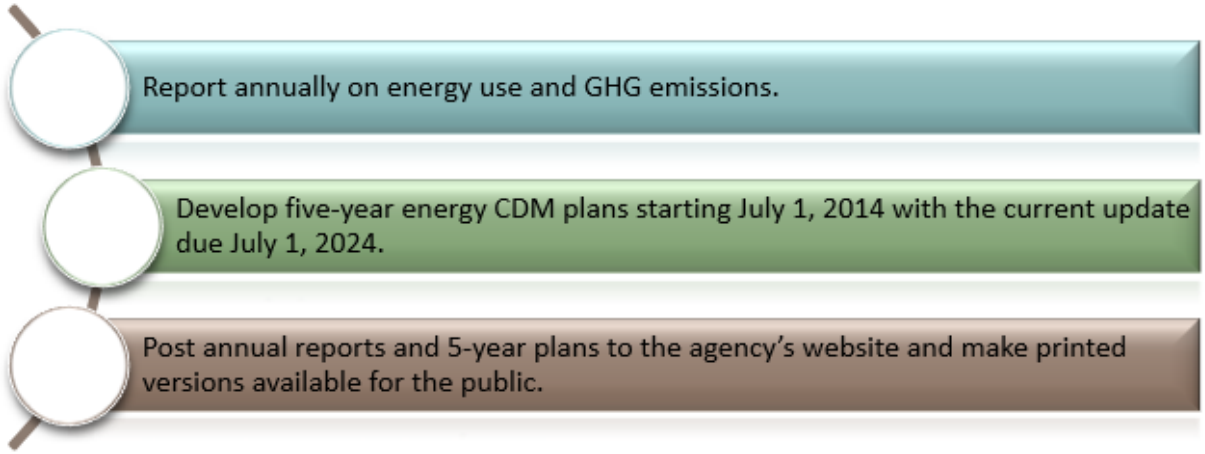
1.0 Overview

In 2014, the Municipality of Kincardine (Municipality) developed a 5-year Conservation and Demand Management (CDM) Plan in compliance with the requirements of *Ontario Regulation 397/11* under the *Green Energy Act, 2009*. This regulation was replaced with *Ontario Regulation 507/18* in 2018, and recently with *Ontario Regulation 25/23* in 2023 under the *Electricity Act, 1998*. The CDM plan was updated in 2019, under regulation 507/18, by the Municipality with the support and direction from Blue Sky Engineering & Consulting Inc. (Blue Sky) and the Local Authority Services (LAS).

Under *Ontario Regulation 25/23*, the requirements for broader public sector energy planning and reporting are identical to those under the former Ontario *Regulation 397/11* and *507/18*.

Under *Ontario Regulation 25/23*, all BPS organizations, including municipalities and townships, are required to report annually on energy use and greenhouse gas (GHG) emissions. The organizations are also required to develop a CDM plan and update it every five years, with this first update posted July 1, 2019. This document is the second update, which is required by July 1st 2024.

Ontario Regulation 25/23 requires public agencies to:



The Municipality of Kincardine retained OCWA to build on the existing CDM Plan, incorporating the experiences gained and results in energy conservation over the last five years. This updated CDM plan was developed as per the regulation and guidelines provided by Ministry of Energy and covers the period of 2019 to 2024. The plan was presented to the council and approved on June 26, 2024.

There are significant advantages to developing and implementing a CDM Plan. The lowest cost options for meeting energy demands could be to implement simple energy efficiency measures. Simple actions of turning off lights and appliances, shutting off heaters in the summer and establishing efficient usage times, efficient production requirement, and many other ***actions can result in energy savings, while providing many other environmental, economic and social benefits, including reducing GHG emissions***. Reducing energy consumption translates to reducing costs incurred by municipalities and the savings could be directed to more important works in the municipalities.

The Municipality seeks to incorporate energy efficiency throughout all of its activities to minimize the fiscal impact of energy on operating costs and its related environmental impacts. This will include organizational and human resources management procedures, procurement practices, financial management and investment decisions, and facility operations and maintenance. All of the Municipality's departments have clear links to some, or all, of the goals and objectives of the CDM plan.

The requirements of Regulation 25/23 of the Electricity Act specify that the plan is to cover only municipal owned heated/ cooled facilities and facilities related to treatment of water or sewage. The full list of the Municipality's facilities included in the CDM plan can be found in Table 1 below.

Table 1: Kincardine Facilities and Infrastructure within the Boundaries of this Plan

Name	Address	Use	Area (m^2)
FACILITIES			
Municipal Administration Centre	1475 Concession 5	Administrative office	1,337
Kincardine Fire Hall	127 Mahood-	Fire Facility	894
Tiverton Fire Hall	15 McLaren St	Fire Facility	492
Underwood Municipal Office	1240 Con 6	Administrative Office	304
Armow Women's Institute	810 Con 7	Community Centre	144
Kincardine Library	727 Queen Street	Public Library	1,567
Tiverton Library	56 King St	Public Library	114
Davidson Centre	601 Durham St	Indoor Recreational facility	534
Tiverton arena	20 McLaren St	Indoor Sports Arena	266
Arts Centre	707 Queen St	Performing Arts Facility	254
Armow Garage	796 Con 7	Facility where equipment or vehicles are maintained or stored	1,022
Public Works 4 Bay Garage	140 Valentine Ave	Facility where equipment or vehicles are maintained or stored	626
Tiverton Equipment Garage	115 King St	Facility where equipment or vehicles are maintained or stored	204
Underwood Garage	1240 Con 6	Facility where equipment or vehicles are maintained or stored	1,394

Name	Address	Use	Area (m^2)
WATER AND SEWAGE FACILITIES			
Water and Sewage Pumping Stations (9 accounts)	Various	Pumping and/or Treatment of Water	-
Connaught Park L.S	135 Broadway	Treatment of Sewage	-
Durham Street L.S	867 Olde Victoria	Treatment of Sewage	-
Effluent Station	169 Mahood	Treatment of Sewage	-
Briarhill Pumphouse	36 Conquergood	Treatment of Water	-
KWWTP	520 Bruce Ave	Treatment of Water	-
Scotts Point Water Works	26 Zepfs Dr	Treatment of Water	-
Underwood Water Works	7 Concession Lot PT	Treatment of Water	-
Village of Tiverton Dent	6 Smith St	Treatment of Water	-
Water Treatment Plant	155 Durham St	Treatment of Water	-

The intent of the CDM Plan is to provide a basis for the Municipality to implement improvements to its infrastructure and operations that reduce energy use, their associated costs, as well as environmental effects of the Municipality's activities. It is a living document that will evolve with the Municipality's energy needs. The CDM Plan should be consistent with other existing planning documents that relate to energy conservation. The updated CDM Plan will outline the following:

2.0 The Current Municipal Energy Overview

How we Manage Energy Today

The management of our energy is a combination of energy data management, energy supply management, and energy use management.

Energy Data Management: Municipal energy data is managed through the Finance Department. The supplier invoices are received and summarized on a spreadsheet according to location. Senior management reviews the variances in comparison to the prior 3-month period to identify and monitor any unusual fluctuations in spending.

Energy Supply Management: Our municipal energy is supplied via a number of providers. Electricity is supplied by Hydro One and Westario Power on an as needed basis and is priced at the standard rates offered by the provider. Propane and fuel is obtained from local providers where appropriate and the commodity price fluctuates according to the market. Natural gas is now available in areas of Kincardine (supplied by EPCOR) and is currently used at the Davidson Centre since 2021, Kincardine Fire Hall starting on December 2023 and Tiverton Fire Hall starting on January 2024.

Our Municipal Energy Needs

The Municipality requires reliable, low-cost, sustainable energy sources delivering energy to the most efficient facilities and energy-consuming technologies feasible. A natural gas pipeline was recently constructed by EPCOR, providing access to natural gas to residents and businesses in Kincardine, including the MUSH sector. This will primarily replace propane and electricity as the primary heating source at several facilities. Natural Gas is both less expensive and produces close to 20% less carbon dioxide (GHG gases) per BTU than Propane when combusted.

The Municipality anticipates significant growth in the upcoming years and expects energy consumption to grow with the population. As such, additional infrastructure will need to be available, and energy conservation will therefore need to be woven into all improvement to ensure energy use and costs are optimized.

Stakeholder Needs:

In order to implement a successful Energy CDM Plan and achieve the conservation targets set forth in this plan, there must be adequate resources allocated towards energy planning initiatives. This will require both a financial commitment from Council through the annual budget process, as well as adequate staff resources and training. The overall conservation vision and

energy consumption reduction targets cannot be achieved without the support of key stakeholders.

Strategic Energy Conservation Planning

The Municipality will develop and implement energy policies, organize for energy management, develop the required skills and knowledge, manage energy information, communicate with stakeholders, and invest in energy management measures. As an integral component of the management structure, the CDM plan is to be coordinated with the Municipality's asset management plan, budgeting process purchasing policy, preventative maintenance plans, and the policy development process.

The availability of natural gas in parts of the community in the near future will also impact energy use at the Municipality. Natural gas is more cost effective than propane and electricity for heating spaces and, compared to propane, natural gas is generally a cleaner and more efficient energy source.

3.0 Kincardine's Corporate Energy Conservation Commitment

The following section outlines the Municipality's commitment to, and vision for, energy conservation. Delivery of this vision will involve a collaborative effort to increase education, awareness, and understanding of energy management within the Municipality. While commitment from Council and Senior Management is required, all staff have a role in energy usage, and to display appropriate leadership within corporate facilities and operation.

Declaration of Commitment

The Municipality of Kincardine will allocate the necessary resources to implement the Energy Conservation and Demand Management (CDM) Plan as required under *Ontario Regulation 25/23* of the *Electricity Act*.

Council is committed to energy conservation and planning and will allocate resources to update the plan as required. Staff and council will strive to achieve the objectives presented in this plan and monitor progress on an ongoing basis. Staff and council will update the plan as required under *Regulation 25/23* of the *Electricity Act* or any subsequent legislation.

Our Conservation Vision

The Municipality of Kincardine will strive to continually reduce energy consumption and the associated greenhouse gases while maintaining a high level of service to our community.

This aligns with the Municipality's new Integrated Strategy, which was developed in 2023. The Municipality's vision aspires for **Energy, Opportunity, and Balanced Lifestyle** across the organization.

Our Goals

1. Maximize fiscal resources and mitigate future energy cost increases through direct and indirect energy savings.
2. Reduce the environmental impact of the Municipality's operations.
3. Increase the comfort and safety of staff and patrons of the Municipality's facilities
4. Create a culture of conservation within the Municipality.

Our Objectives

In order to meet the strategic goals of the CDM plan, there are several objectives that align with its development and implementation:

A. **Energy Efficiency Standards:** Ensure energy efficiency measures are incorporated consistently across all municipal facilities, and standards are incorporated into purchasing practices.

B. **Energy Monitoring and Tracking:** Monitor and report on energy consumption annually. Staff have implemented a review process of utility bills related to energy on a monthly basis. Staff will also measure and verify the actual savings and return on investment of delivered energy.

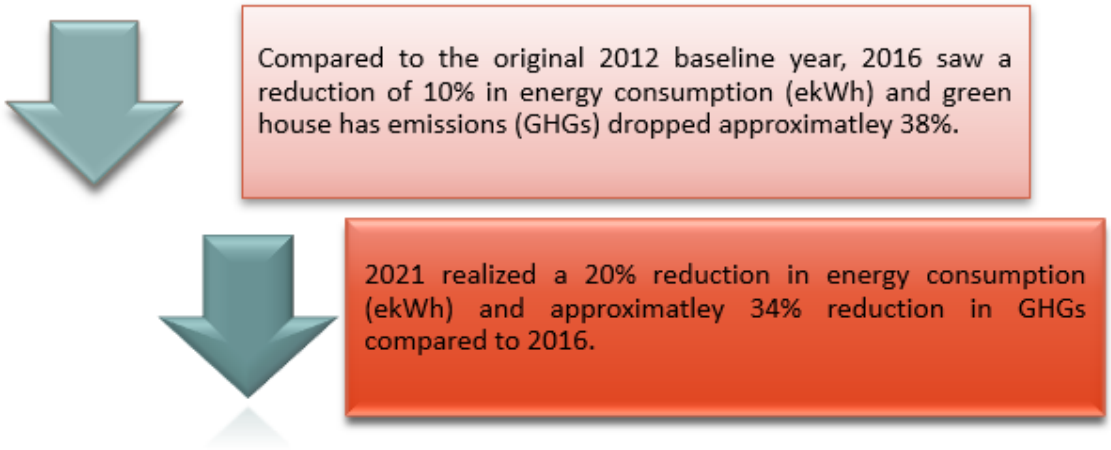
C. **Training and Capacity Development:** Raise staff and Council awareness around energy efficiency. This will include communicating successes to both internal and external stakeholders and providing energy training to key staff members.

Our Energy Conservation Target

It is anticipated that Kincardine will experience significant growth over the next 5-10 years. Municipal infrastructure and community buildings will be utilized more leading to higher energy consumption. The Municipality will continue to seek reductions in energy consumption in light of anticipated population increases.

Reduce energy consumption by 5% compared to 2021 over a 5-year period for all those facilities reported under Regulation 25/23 of the Electricity Act.

The Municipality's target to achieve 5% energy savings over 5-year periods starting from 2012 has been achieved consistently and targets have been exceeded. The on-going efforts to implement energy conservation measure by the Municipality has proven to be effective.



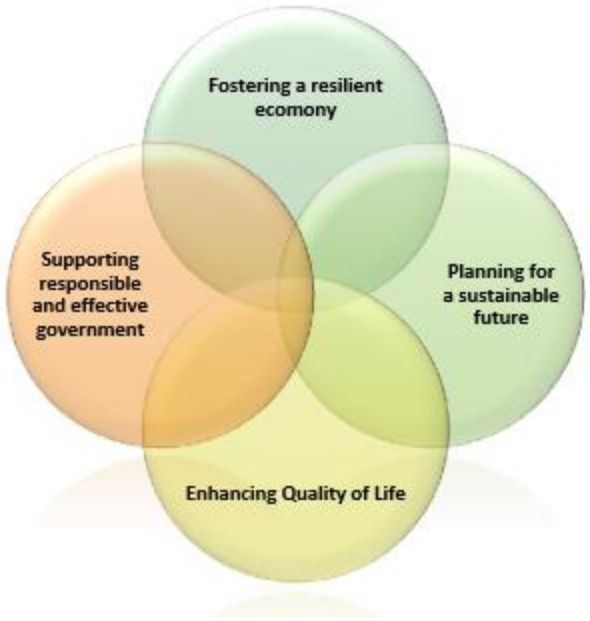
With the replacement of propane with natural gas at the Davidson Centre, and the Kincardine and Tiverton Fire Halls, it is anticipated that GHG emissions will continue on its downward trend. The future 2029 CDM update will compare the recent 5-year energy usage (2021 vs. 2026) to determine if the 5% energy reduction target was achieved. The energy reduction target is approximately 350 eMWh.

In addition to the Municipality benefitting from reducing its energy use, residents and local businesses also benefit from more efficient use of taxpayer dollars and better

maintained/operated public buildings and facilities. These efforts aligns with Kincardine's organizational vision and mission to plan for a sustainable future and enhancing quality of life.

Integrated Strategy Focus Areas

The Municipality is committed to the promotion of responsible energy management through the implementation of economically viable energy efficiencies and environmental care throughout all facilities, plants and equipment. The Municipality will take reasonable efforts to minimize impacts to the environment when allocating resources, while recognizing the needs of our community.



4.0 Our Successes and Completed Energy Projects

The Municipality has competed a number of energy conservation projects from 2019 - 2024 which have contributed significantly to the control of energy consumption and costs. The Municipality has reduced its energy consumption by approximately 28% compared to the 2012 base year. This is an excellent example of how dedicated staff, with a commitment to efficiency and a structured plan, can make a difference.

A list of 34 completed energy conservation measures from 2019 – 2024 can be found in Table 2 below. These are energy conservation projects that were identified in the 2019 CDM update which were completed. The list illustrates the Municipality's leadership and commitment to actively managing energy consumption.

Table 2: Completed Energy Conservation Projects (2019 – 2024)

Facility	Project Type	Description	Details
Arts Centre	Heating	Controls	Installed programmable thermostats for space heating and program setbacks for unoccupied periods.
Arts Centre	Lighting	Interior Upgrade	Upgraded existing T12 fluorescent lighting to T8 lamps with electronic ballasts. Include replacement of all GU10 and MR16 lamps with LED.
Municipal Administration Centre	Heating/Cooling	Program temperature setbacks	Program temperature setbacks during unoccupied periods both in the summer to reduce A/C load and winter to reduce heating load.
Municipal Administration Centre	Lighting	Upgrade remaining fluorescent lights to LED	Changed T8 lighting to LED on upper level of building.
Davidson Centre	Chillers	Replace existing ice plant with new ammonia system	Replaced existing Freon ice plant with new ammonia system. Investigate incorporating premium efficiency motors, enabling floating head pressure, VFDs on brine pumps.
Davidson Centre	Lighting	Replace MH rink lighting with LED	Upgraded arena rink lighting from MH to LED technology.
Davidson Centre	Lighting	Replace Pool area lighting with LED	Upgraded high bay lighting around perimeter of pool from MH to LED technology.
Davidson Centre	Lighting	Upgrade Exterior Lighting	Upgraded exterior HID wall packs to LED technology.
Fire Hall, Tiverton	Heating	Install Line-Voltage Programmable Thermostats on Electric Baseboard Heaters	Installed programmable digital wall thermostats for all wall mounted electric baseboard heaters.
Fire Hall, Tiverton	Heating	Upgrade plug in heaters	Replaced plug in electric space heaters with panel radiant heaters.

Facility	Project Type	Description	Details
Fire Hall, Tiverton	Lighting	Upgrade Exterior Lighting	Upgraded wall pack lights on exterior above doors HPS to LED fixtures.
Garage, All	Heating	Programmable Set-Back Thermostats for Propane Unit Heaters	Installed Programmable Set-Back Thermostats on the Propane Unit Heaters in Bays. Reduced evening temperatures by about 4 degrees during unoccupied times, returning temperature in the morning as required
Garage, Armow	Building Envelope	Bay Doors	Replaced 3 large bay doors with high R-value insulated material.
Garage, Armow	Lighting	Interior Lighting Upgrade	Upgraded T12 fluorescent lighting to LED.
Garage, Kincardine	A/C	Upgrade Window A/C Unit to Energy Star Rated A/C Unit	Replaced the existing window Air Conditioning Unit with an Energy Star Rated unit.
Garage, Kincardine	Lighting	Interior Lighting Upgrade	Upgraded T8 fluorescent lighting to LED with motion sensors.
Garage, Underwood	Building Envelope	Windows	Replaced four (4) older aluminum frame windows with energy efficient low -3 thermal windows.
Garage, Underwood	Lighting	Exterior Lighting Upgrade	Upgraded exterior HID lighting to LED wall packs.
Garage, Underwood	Lighting	Interior Lighting Upgrade	Upgraded T8 fluorescent lighting to LED with motion sensors.
Garage, Underwood	Lighting	Interior Lighting Upgrade	Upgraded highbay lighting with LED with motion sensors.
Garage, Underwood	Building Envelope	Insulation	Added insulation in office walls and around exhaust fans to reduce heat losses
Garages: Armow, Underwood	DHW	Electric DHW Heater - Efficiency Upgrade	Replaced the existing Electric Element (4.5 kW's) domestic hot water tank heater with high efficiency electric.
Garages: Kincardine, Tiverton	DHW	Electric DHW Heater - Efficiency Upgrade	Replaced the existing Electric Element (4.5 kW's) domestic hot water tank heater with high efficiency electric.
Library, Kincardine	Lighting	Interior Upgrade	Updated upper level lighting to LED.

Facility	Project Type	Description	Details
Library, Tiverton	Heating	Controls	Installed programmable wall thermostats on electric baseboard heaters.
Medical Clinic	Heating	Controls	Programmed temperature setbacks during unoccupied periods both in the summer to reduce A/C load and winter to reduce heating load.
Medical Clinic	Lighting	Interior Upgrade	Replaced T12 and T8 Fluorescent lighting with LED.
Tiverton arena	Lighting	Upgrade Rink Lighting	Upgraded (21) 1000W MH fixtures over ice surface to LED technology (option to T5).
Underwood Community Centre	Heating	Upgrade Heat Pump	Replaced existing heat pump with new energy efficient air-to-air heat pump.
Kincardine WWTP	Process Equipment	Aeration Upgrade	Upgraded mechanical mixers with diffused air system and positive displacement blowers in 2023.
Kincardine WWTP	Lighting	Upgrade	Supplier has completed a walkthrough and upgrades are to begin in 2019 and run for several
Kincardine WTP and BEC WWTP	Lighting	Upgrade	Plant lighting will be changed to T5 high output in office and garage as well as BEC. Supplier report to follow. Upgrades to begin in 2019 and run for several years as budget permits.
Kincardine WTP	Lighting	Upgrade	Supplier has completed a walkthrough and upgrades are to begin in 2019 and run for several
Various Well and Sewage Pumping Stations	Lighting	Upgrade	Supplier has completed a walkthrough and upgrades are to begin in 2019 and run for several years as budget permits.

5.0 The Energy Conservation Team

The Municipality's team described below will continue to be responsible for delivering the plan's vision, objectives and goals as well as maintaining the Municipality's focus on energy efficiency in the years to come.

Energy Leader:

The Chief Administrative Officer (CAO) is assigned overall responsibility for corporate energy management.

Energy Conservation Champion – CAO:

The role of the Energy Conservation Champion is to provide clear guidance, assistance and support to the conservation team on internal and external funding mechanisms and to include the team in relevant decision-making and budget discussions. Community Services, Corporate Services, and Infrastructure and Development will provide key support to the CAO.

This role will also be responsible for providing the energy consumption data on a monthly basis to the facilities staff, and on an annual basis to council for review and tracking.

The Energy Conservation Champion will support the use of life cycle costing and discounted cash flow-based assessments for capital projects and will include energy efficiency in procurement criteria where relevant. In addition, the Energy Conservation Champion will ensure that suppliers offer energy efficient alternatives/options where available and include energy criteria/performance in service contracts. This will be supported by Finance as required.

Energy Conservation Team – Senior Leadership Team (SLT), Community Services Team and Infrastructure and Development Team:

The Energy Management Champions will have direct knowledge of the Municipality's major energy-using facilities and assets and are responsible for developing and maintaining the focus on energy conservation. The conservation team will ensure the delivery of energy conservation measures in each of the facilities and will be responsible for the consumption of energy within their respective departments. As such, they will be tasked with reviewing facility energy consumption data on a monthly basis, managing energy issues as required.

6.0 Current and Historical Energy Results

This section reviews the current and historical Kincardine building energy usage. Electricity, propane and fuel consumption was obtained from annual Energy Consumption and Greenhouse Gas Emissions Reporting spreadsheets, and summarized energy data provided by the Municipality. A summary of the annual energy consumption starting from the baseline year of 2012 is displayed in Table 3. The annual fuel, propane and natural gas consumption was converted to equivalent energy (ekWh) to determine the total energy usage. It should be noted that the reported annual propane consumption for the 2012 baseline year and 2016 reporting year were significantly understated (for the Davidson Centre) in the previous CDM plan. This has been corrected in this 2024 CDM update and the correct values are shown below. In 2012, the Municipality consumed approximately 9,000 eMWh and was responsible for approximately 1,085 tonnes of GHG emissions. This was significantly reduced in 2016 and further in 2021 (CDM baseline and reporting years bolded in Table 3).

Table 3: Historical Energy and GHG Emissions for Kincardine Facilities and Water & Sewage

Year	Electricity (kWh)	Fuel Oil (L)	Propane (L)	Natural Gas (m^3)	Total Energy (ekWh)	Approx. GHG Emissions (tonnes)
2012	**6,687,325**	**2,519**	**329,731**	**-**	**9,035,252**	**1,085**
2013	5,798,899	8,907	344,718	-	8,327,598	1,000
2014	5,781,157	16,378	342,969	-	8,385,767	811
2015	5,952,457	13,474	365,696	-	8,682,570	847
2016	**6,035,231**	**564**	**294,365**	**-**	**8,111,439**	**670**
2017	5,709,525	564	304,575	-	7,857,516	642
2018	5,649,011	3,318	361,530	-	8,229,929	737
2019	5,315,870	3,922	362,680	-	7,912,003	731
2020	4,697,996	2,621	291,025	-	6,775,004	598
2021	**4,962,488**	**1,370**	**69,448**	**95,696**	**6,458,518**	**444**

As indicated in Table 3, Kincardine has achieved an impressive 20% reduction in energy consumption over the 5-year period of 2016 to 2021. In addition, the associated GHG emissions were reduced by approximately 59% since 2012. Figure 1 displays the recently reported annual energy consumption by all Kincardine buildings for this CDM plan. The graph shows a steady decline in energy consumption.

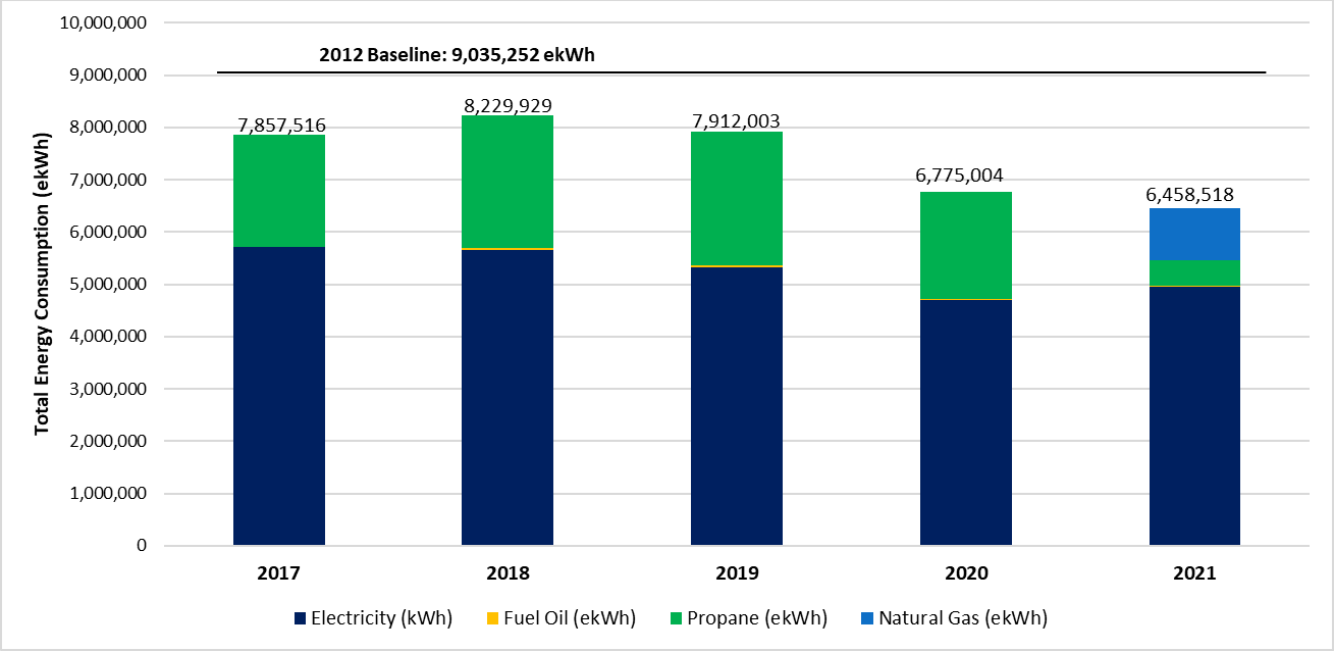


Figure 1: Total Annual Energy Consumption (ekWh) for all Reported Kincardine Facilities (2017 – 2021)

Figure 2 illustrates that the Municipality facilities rely primarily on electricity for energy and heating, with natural gas and propane used as the primary heating energy in some facilities (non-water/wastewater). Fuel oil is only used in minor quantities. Kincardine looks to implement natural gas for heating at more facilities for overall cost savings and GHG emissions reduction.

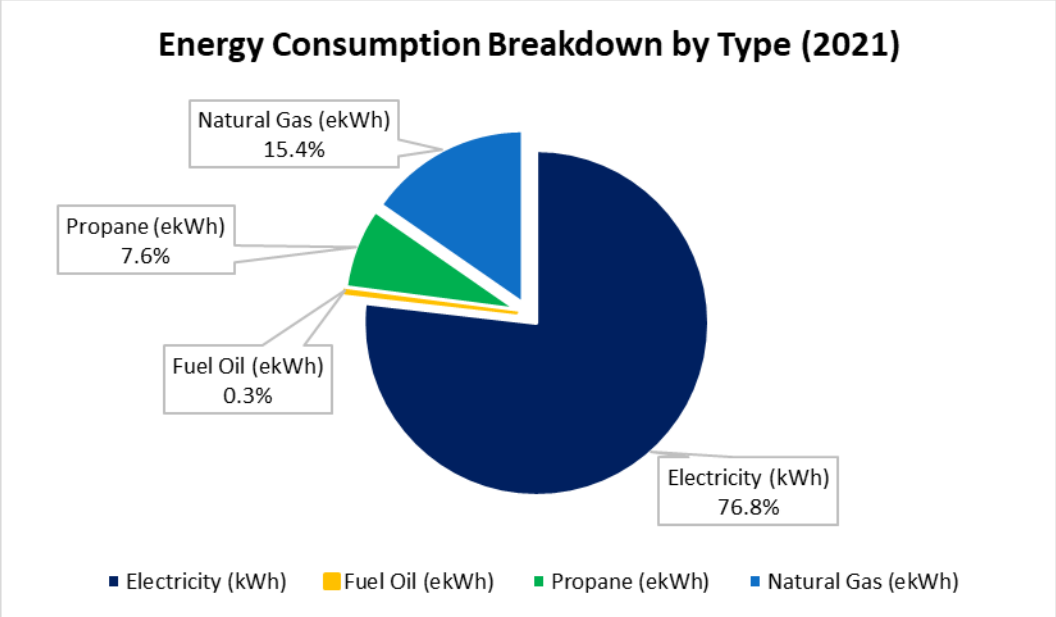


Figure 2: Energy Consumption Breakdown by Fuel Type (2021)

Figure 3 shows the energy consumption in 2021 by building type. Indoor recreation facilities consumes the most energy (ekWh) primarily due to propane being consumed. This is evident when reviewing Figure 4. In terms of electricity consumption (kWh) alone, water and wastewater treatment facilities are the highest consumers.

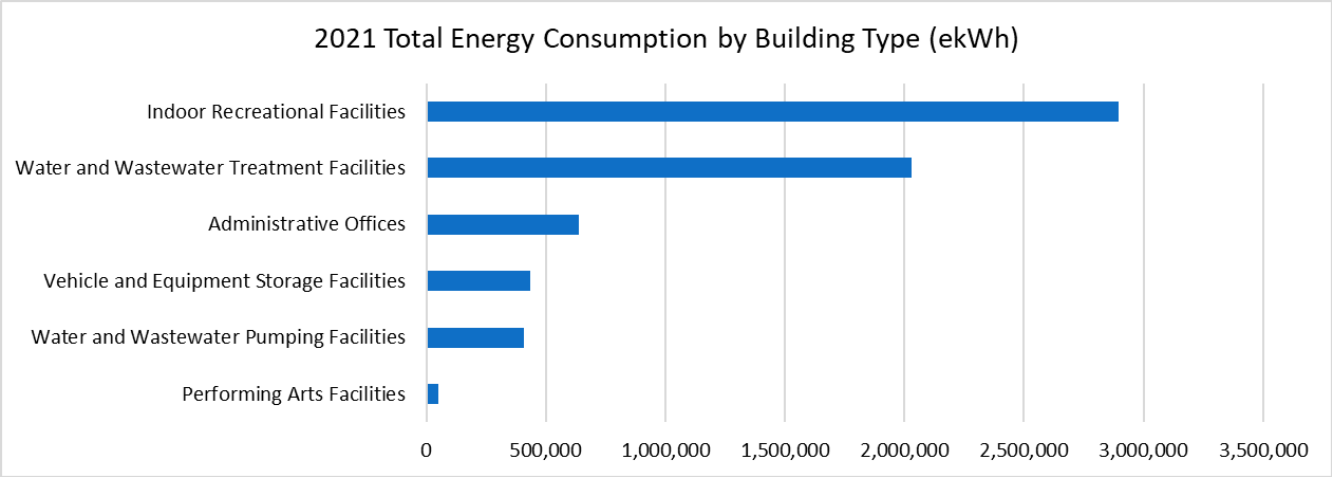


Figure 3: 2021 Total Energy Consumption (ekWh) by Building Type

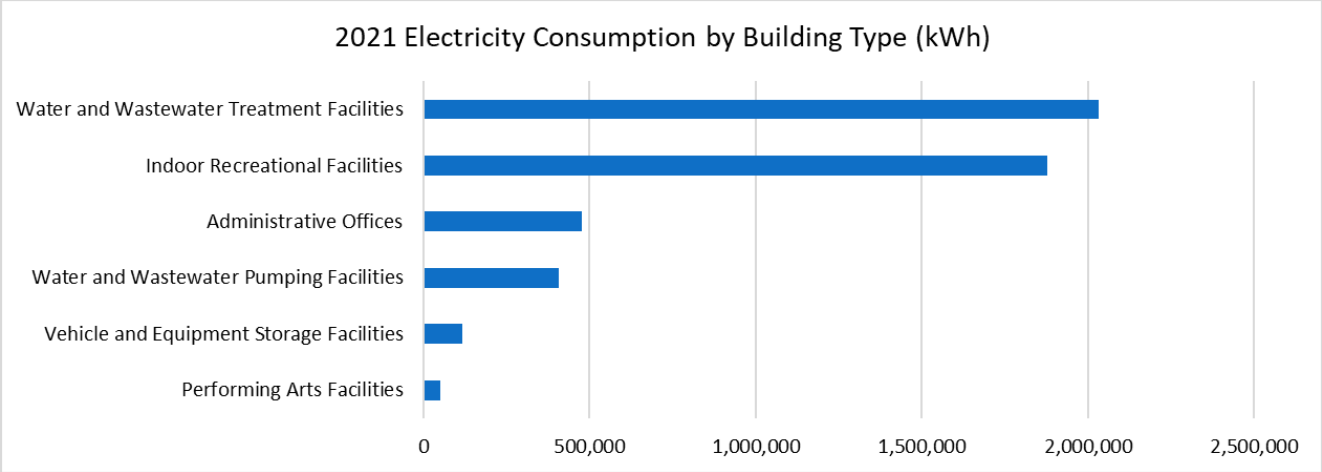


Figure 4: 2021 Electricity Consumption (kWh) by Building Type

Figure 5 breaks down the annual energy consumption for all Kincardine facilities (non-water/wastewater) from 2017 to 2021. The highest energy consumer, by a significant amount, is the Davidson Centre. This facility is a sports recreation facility that houses swimming pools, ice rink, gym, courts etc. The upgrades to the ice system, rink/pool lights and exterior lights have proven to save a significant amount of energy. The Davidson Centre has realized electricity savings of about 435 eMWh from 2016 to 2021 (25% reduction). The switch over from propane to natural gas occurred in 2021 for this facility.

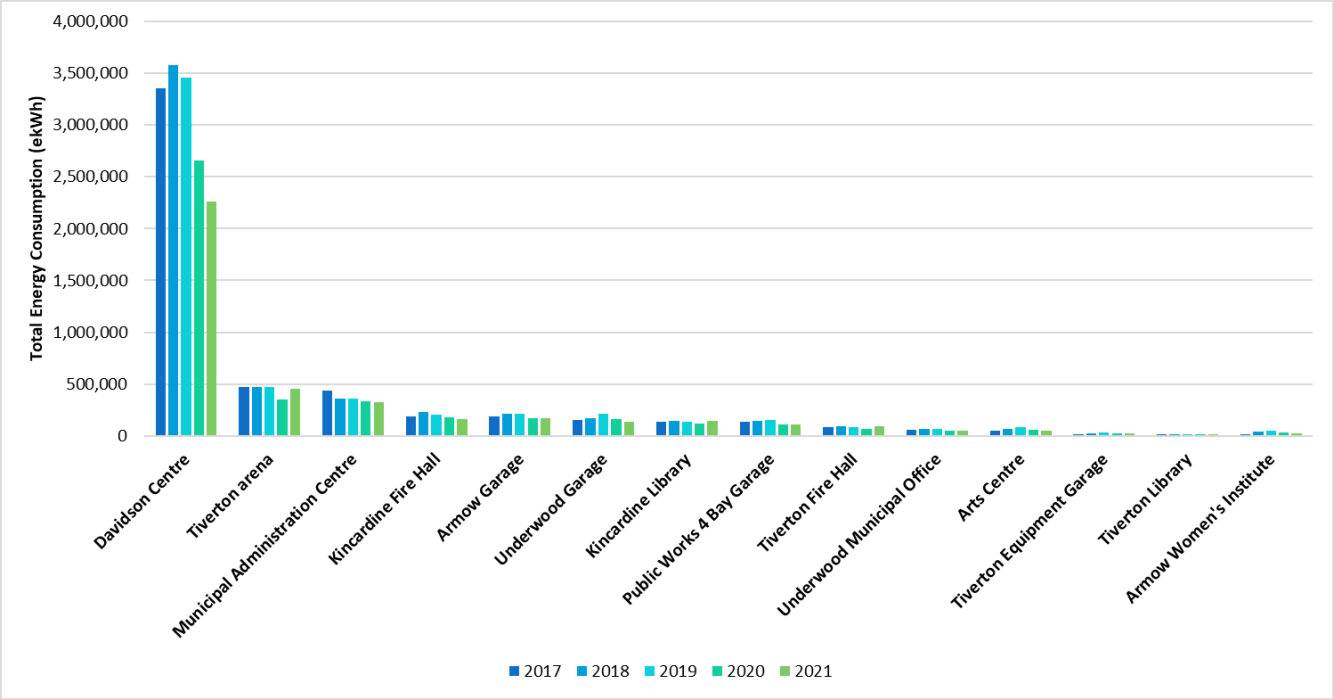


Figure 5: Annual Energy Consumption for Kincardine Facilities (2017 – 2021)

Figure 6 displays the annual energy consumption for all water & wastewater facilities in Kincardine from 2017 to 2021. The WTP, BEC and Kincardine WWTP are the highest energy consumers. The fluctuations in the electricity consumption at these facilities are directly related to the flow experienced at each plant. Increase in population/seasonal population, and increases in significant climate events (i.e. droughts, heavy rain events etc.) typically cause changes in energy consumption. It should be noted that BEC saw a significant decrease in annual flow, which resulted in over 60% of electricity usage reduction.

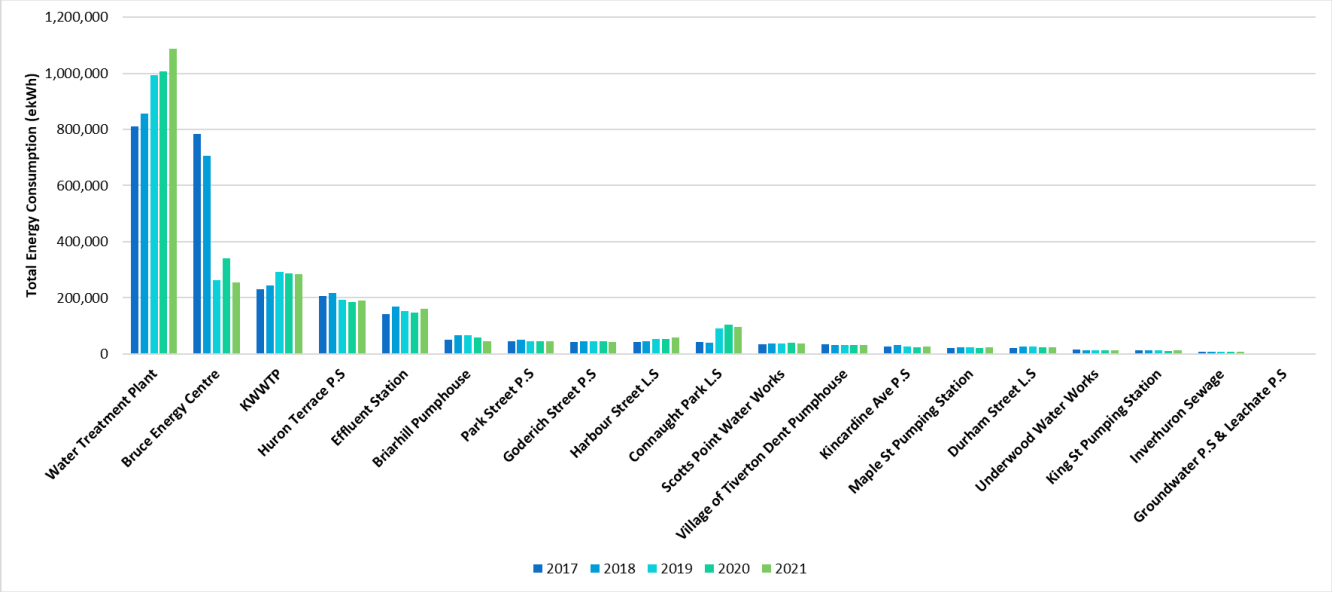


Figure 6: Annual Energy Consumption for Kincardine Water & Wastewater Facilities (2017 – 2021)

The Davidson Centre, Water Treatment Plant, Tiverton Arena, Municipal Administration Centre and Kincardine WWTP are the five largest energy consumers of Kincardine in 2021, responsible for 68% of the total energy consumption.

7.0 Renewable Energy

Renewable Energy Utilized or Planned:

Renewable energy is generated from natural sources such as sunlight, wind, and geothermal heat. Currently the Municipality has geothermal heat pumps used to regulate building temperatures at the Municipal Administration Centre and the Underwood Community Centre. In addition to these systems, the Municipality is also home to wind generation facilities.

The Municipality does not currently have any plans for new renewable energy generation.

8.0 Plan Implementation

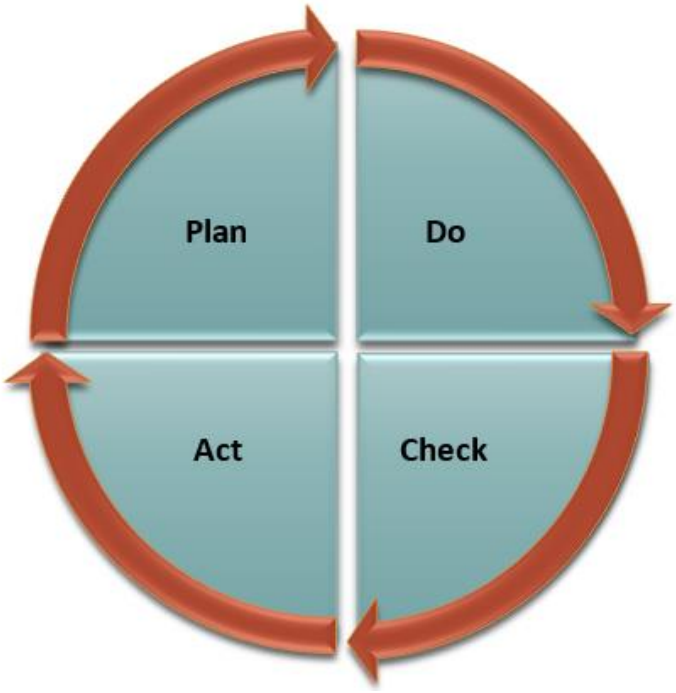
Ontario Regulation 25/23 promotes increased municipal energy management and engagement. The main driver for municipalities to change the way energy is used relates to fiscal benefits and financial incentives. Energy is a manageable input to the business process, much like any other resource cost. Kincardine is maintaining and developing current and planned services that continue to be affordable to taxpayers.

This CDM Plan provides the "big picture" view as an ongoing framework for optimizing overall energy use and achieving success.

Current practices must be enhanced and new approaches must be developed. In order to enhance the current practices, both human and financial resources for systems will be required. To meet these needs, the Municipality will consider designing a comprehensive program for collecting and analyzing monthly energy billing information, and ensuring that staff is informed about energy consumption. The resulting energy costs and consumption database will be used to monitor excessive variations, target facility follow-up assessments, and determine areas that could be candidates for improved conservation. These monitoring enhancements will improve Kincardine's understanding of the bottom line impact of energy management.

In order to establish a baseline for managing energy costs, the Municipality has captured information critical to energy management planning. This formalizes the process involved in understanding the relative magnitude of energy costs, the possible ways to reduce energy use, energy targets that are likely to be achievable, and other associated activities that need to occur.

CDM Planning is intended to be a process of "continuous improvement." The Municipality follows *NRCAN, ISO 50001*'s four step plan–do–check–act management methodology, used in business for the control and continuous improvement of processes.



PLAN

Establish the energy conservation objectives and processes necessary to deliver results in accordance with the expected outputs: the energy conservation targets or goals. Start on a small scale to test possible effects and financial feasibility. Develop an Energy Conservation Demand Management Plan prioritizing budgets, resources, and timelines.

DO

Implement the plan and collect data for analysis in the following "CHECK" and "ACT" steps. Develop projects' design and execution, preparing status reports, and implementing the communication strategy.

CHECK

Study the actual results (measured and collected in "DO" above) and compare against the expected results (targets or goals from the "PLAN") to ascertain any differences. Evaluate any deviations in implementation from the plan and evaluate the appropriateness and completeness of the plan to enable the execution, i.e., "Do".

ACT

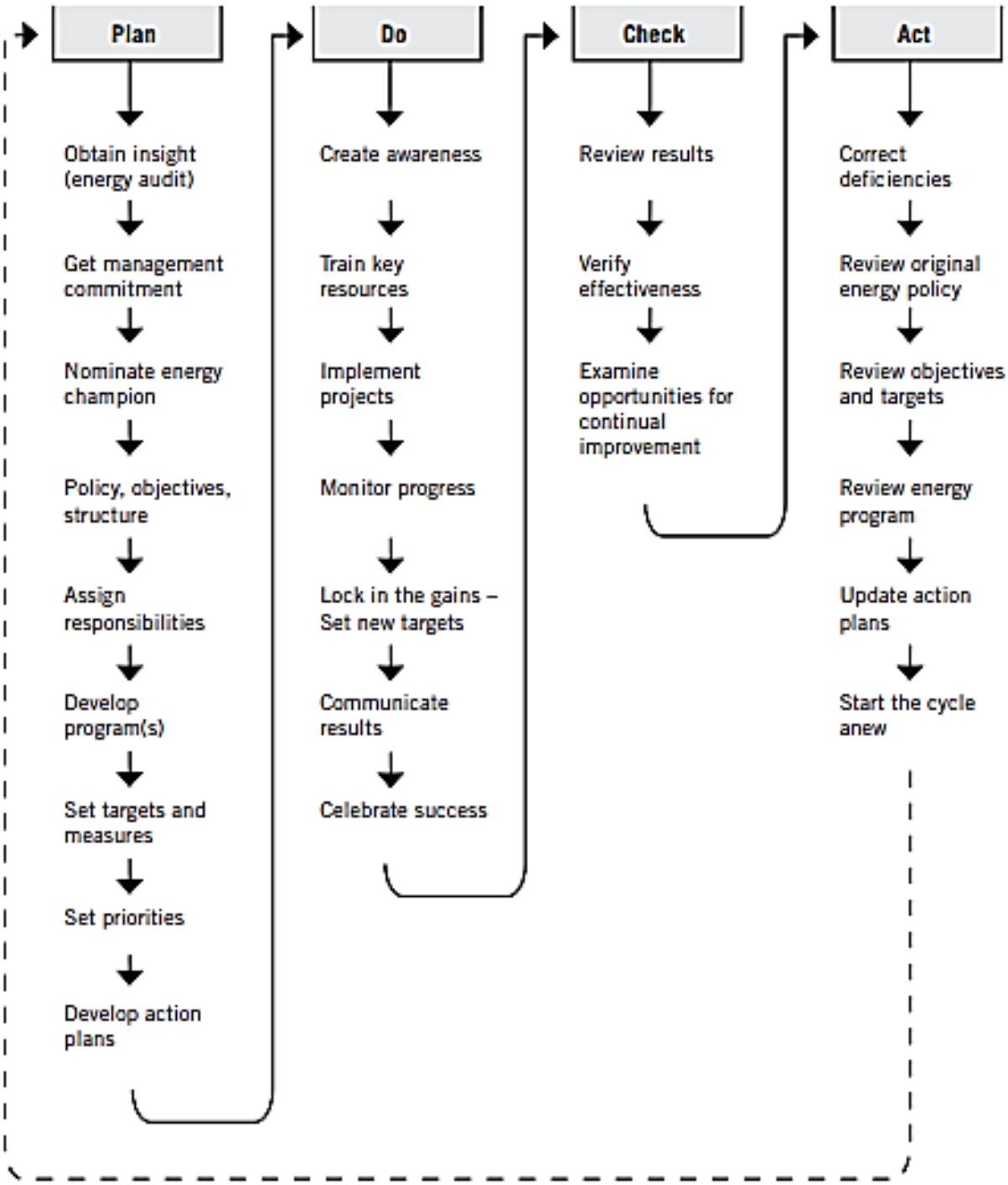
Recommend improvements and adjustments to the initial plan; determine the course of corrections and modifications to the plan.

The Municipality implements tools to maintain and continually improve energy conservation and demand management. Benchmarking is the process that the Municipality has implemented for collecting, analyzing and relating energy performance data of comparable activities to evaluate and compare performance between or within entities.

The detailed energy conservation project planning process is visually illustrated below.

Energy Conservation Project Planning Process[1]

[1] Energy Efficiency Planning and Management Guide, CIPEC, 2002



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9.0 Update and Review Process

Energy Plan Review:

As part of any energy management strategy, continuous monitoring, verification, and reporting is an essential tool to track consumption and cost savings/avoidance as a result of implemented initiatives. The Municipality will endeavor to create a useful energy reporting mechanism for key facility staff to ensure opportunities are managed appropriately.

As part of the Energy Plan, the implemented process improvements and projects will continue to be documented and reviewed annually to update consumption savings. By regularly monitoring consumption and cost savings/avoidance to its departments, the outcomes of the Municipality's participation in energy management initiatives can be demonstrated, and feedback can be obtained for any new ideas.

This monitoring will also align with the requirements of Regulation 25/23 of the Electricity Act and/or any subsequent legislation related to energy management.

10.0 Energy Conservation Action Plan

A critical part of any plan is the detailed list of specific actions needed to achieve the desired goals and objectives. The Municipality of Kincardine has developed a list of key projects that will help ensure the Municipality meets the energy reduction goals and targets set out in the Corporate Energy Conservation Commitment (see Section 3.0).

The plan has been divided into the following sections:

A. **Creating a Culture of Conservation**
B. **Energy Efficiency Standards and Policies**
C. **Energy Monitoring and Tracking**
D. **Energy Conservation Action Plan**

Creating a Culture of Conservation

Energy Training: The Municipality will develop and deliver energy training for relevant staff members. This training will not be limited to operators and maintainers with "hands-on" involvement in energy consuming equipment but will also include others since they also make energy consumption decisions in their daily work. Training focused on energy use, energy costing and conservation opportunities associated with employee job functions will be provided. (The Municipality of Kincardine will utilize both internal and external resources to provide this training as appropriate). Energy training will be a new cost that has budgetary implications.

Energy Efficiency Standards

Procurement Planning

The intent is to make Life Cycle Cost Analysis part of the normal course of business for all facility and operational retrofits, including capital renewal and life cycle replacements projects. Success means incorporating energy efficient options at the initial stages of a project design. This ensures that options for improving energy efficiency are considered, evaluated and quantified in terms of life cycle analysis, including cost, maintenance and emission levels. As energy is a major component of the operating costs of municipal facilities, energy costs will be considered in the lifecycle costing and procurement policies of the Municipality.

Consideration of energy efficiency of acquired equipment: Purchasing procedures will be modified as required to incorporate energy efficiency into the criteria for appropriate materials and equipment.

Implementation Planning

Building Standards: Municipality staff will develop criteria for the design and/or acquisition of new buildings that include energy performance factors and that use as appropriate the principles embedded in performance standards such as the Model National Energy Code for Buildings.

The Municipality of Kincardine will investigate adopting such a standard for new buildings.

Energy Monitoring and Tracking

Energy Consumption: Municipality staff will review and evaluate our energy plan, revising and updating it as necessary, based on the Energy Consumption Reports that are submitted to the Ontario Government on an annual basis as required under *Regulation 25/23*. Monthly billing review will provide an opportunity to identify and recover any billing errors, or usage that requires further investigation.

Green House Gas Emissions: Governments at all levels are moving to address emissions of GHGs, in light of scientific evidence on how human activities are affecting the world's climate. For more information on the science, see http://www.ipcc.ch/. The combustion of fossil fuels in buildings is a major source of GHG emissions that fall under local government influence. Municipalities can lower emissions by improving energy efficiency of buildings and using more renewable energy. The Municipality is committed to both objectives through the development and implementation of this CDM plan. We will continue to track and report on GHGs as part of our regular reporting on energy consumption and will evaluate progress in this area against our overall reduction target.

Energy Conservation Action Plan

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

The projects fall under the following broad categories; organizational improvements, lighting, heating, building envelope, chillers, domestic hot water (DHW), and general equipment improvements and process optimization.

Appendix A:
Kincardine Energy Conservation Action Plan

Kincardine Energy Conservation Work Plan 2024-2029

No	Facility	Project Type	Description	Details
1	Across Organization	Standard or Program	Energy Training	Arrange training for key staff on energy staff that covers energy sources, financing, technology and conservation. Consider LAS/AMO's Energy Efficient Building Operations 101 that is 50% subsidized by the ISO (with a potential additional 25% from natural gas suppliers) and can be customized.
2	Across Organization	Standard or Program	Procurement Practices - Incorporate Energy	Incorporate Life Cycle Costing (LCC) into procurement processes as appropriate. Specifically include a requirement to specify power, energy consumption levels, and energy efficiency ratings in requests for proposal and quotation from suppliers as deemed fit.
3	Across Organization	Standard or Program	Monitoring and Tracking Energy Use	Investigate options for online energy tracking service to review and track electricity consumption at each facility.
4	Municipal Administration Centre	Heating	Upgrade plug in heaters	Replace plug in space heaters with radiant panel heaters with timers and/or motion sensors
5	Davidson Centre	Lighting	Interior Upgrade	Upgrade interior T12 fluorescent lighting to T8 technology with electronic ballasts. Retrofit hall lighting to T5 technology. Relamp entire building using
6	Fire Hall, Kincardine	Heating	Install New Programmable Set-Back Thermostats for	Install programmable digital wall thermostats for all wall mounted electric baseboard heaters.
7	Fire Hall, Kincardine	Heating	Upgrade plug in heaters	Replacement of plug in electric space heaters with panel radiant heaters
8	Fire Hall, Kincardine	Lighting	Interior Lighting Upgrade	Upgrade all interior lighting from T12 fluorescent to T8 lamps with electronic ballasts. Include in project to upgrade all exit signage bulbs from incandescent to LED. Investigate Small Business Lighting Program for incentives, if not already being used.
9	Fire Hall, Kincardine	Lighting	Upgrade Exterior Lighting to LED	Upgrade exterior wall packs and pole lighting from HID to LED technology.
10	Garage, All	Heating	Install Line-Voltage Programmable Thermostats	Install Programmable Setback Thermostats on all office Electric Baseboard Heaters. Setback night time space temperatures. The Mechanics Room and Lunch Room have these electric baseboard heaters.
11	Garage, Armow	Building Envelope	Bay Doors	Replace 3 large bay doors with high R-value insulated material.
12	Tiverton arena	Chillers	Install Refrigeration Plant Controller for Floating Head Pressure Control and Scheduling	It is recommended to install a refrigeration plant controller such as a CIMCO 6000E system which will provide floating head pressure control, brine pump speed control, ice surface temperature control and other features. The system will provide accurate control of ice temperature, brine pump energy savings, compressor energy savings and will adjust with outdoor temperature and thermal loading on the ice pad. It can be programmed and scheduled according to occupant requirements and settings are easily changed.

No	Facility	Project Type	Description	Details
13	Tiverton arena	DHW	Replace Kitchen Electric Water Heater with Propane Instantaneous Domestic Hot Water Heater	The Kitchen Area uses a small electric domestic hot water heater. It is recommended to replace this unit with propane fired, instantaneous domestic hot water heater. This w ill reduce standby heating losses from the hot water tank. Savings are estimated for electric heat standby losses only, additional savings are available from fuel switching to propane. The water lines should have insulation added to them to reduce radiant heat losses.
14	Tiverton arena	DHW	Replace Electric Domestic Hot Water Tank Heater with Propane Fired Heater	There is currently one large (100 Gallon, 8 kWs each approximately) electric Domestic Hot Water Tank Heater used to supply hot water to the dressing room that has not been updated. This unit has a large electrical demand (kW) and is an older model, with scaling which reduces heating efficiency. By replacing these units with high efficiency propane- fueled DHW tank heaters, electrical consumption and demand charges will be saved. An alternative is to use Instantaneous Domestic Hot Water Tank Heaters to reduce stand-by losses. At a minimum, the existing tanks should be insulated with blanket insulation to reduce stand-by losses. Savings is based on reduced stand-by losses only. Additional savings from fuel switch and efficiency increase will also be achieved.
15	Tiverton arena	Heating	Programmable Set-Back Thermostats on Change Room Electric Heaters	Install Programmable Set-Back Thermostats on electric space heating in all Change Rooms. The existing electric heating units within all Change Rooms are manually controlled and can remain on during unoccupied periods. It is recommended to install programmable units on all electric heaters to shut them off when not required.
16	Tiverton arena	Lighting	Interior Lighting Upgrade	Upgrade all interior lighting from T12 fluorescent to T8 lamps with electronic ballasts. Include in project to upgrade all exit signage bulbs from incandescent to LED. 50% Complete.
17	Tiverton arena	Lighting	Install occupancy sensors in various rooms	Install occupancy sensors in washrooms and dressing rooms to automatically shut off lights when unoccupied. Tie in exhaust fans w here possible. 70% Complete.
18	Tiverton arena	Lighting	Upgrade Rink Lighting	Upgrade (21) 1000W MH fixtures over ice surface to LED technology (option to T5).
19	Tiverton arena	Lighting	Upgrade Exterior Lighting	Upgrade exterior wall packs to LED technology.
20	Tiverton arena	Transformer	Install High Efficiency 4 kVA Electrical Transformer in Storage Room (Lighting Equipment)	It is recommended to replace the existing 4 kVA electrical transformer in the Storage Room area of the Arena to reduce electrical stand-by losses. The existing transformer uses power even when not loaded by lighting loads, which is greatly reduced by installing a high efficiency transformer. All similar transformers should be replaced as well as this equipment operates 8760 hours per year.
21	Underwood Community Centre	Heating	Controls	Program temperature setbacks during unoccupied periods both in the summer to reduce A/C load and w inter to reduce heating load.
22	Underwood Community Centre	Lighting	Interior Upgrade	Upgrade T12 Fluorescent lighting to LED.

No	Facility	Project Type	Description	Details
23	Kincardine WTP	Process Equipment	Optimization	Evaluate possibility of modifying production schedule to transfer burden of energy intensive processes to off-peak times.
24	Scott Point Well	Process Equipment	Upgrade	The duty pump's high lift motor has been upgraded while the stand-by will be upgraded prior to the duty's expected end-of-life. Upgrade to one pump is complete; looking at the other in 2024.