



# 5 Year Energy Conservation & Demand Management Plan 2024-2029

## Town of Essex



Prepared by: BLUE SKY Energy Engineering & Consulting Inc. with AMO/LAS



## Our Commitment to Energy Conservation



As the Mayor of the Town of Essex, I am pleased to present this research document focused on our commitment to energy conservation within our municipal facilities. This initiative is not just about reducing energy consumption; it reflects our dedication to creating a sustainable future for our community and protecting our environment for generations to come.

In recent years, we have witnessed the increasing importance of energy efficiency in combating climate change and fostering economic resilience. Our municipal facilities serve as a cornerstone of our community, and by implementing effective energy conservation strategies, we can set an example for residents and businesses alike.

This document outlines our current usages, identifies areas for improvement, and proposes actionable strategies that align with our long-term sustainability goals. Our commitment to energy conservation will not only reduce operational costs but also enhance the quality of life for our residents by promoting a cleaner, healthier environment.

We recognize that achieving these goals requires collaboration and innovation. I encourage all stakeholders to engage with us in this critical effort, as your insights and support will be invaluable in driving our initiatives forward.

Thank you for your commitment to making the Town of Essex a leader in sustainability. Together, we can pave the way for a brighter, more sustainable future.

Sincerely,

A handwritten signature in black ink that reads "Sherry Bondy". The signature is written in a cursive, flowing style.

Sherry Bondy, Mayor

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## 1.0 INTRODUCTION

### Background

In pursuit of a greener, more sustainable future, municipal organizations play a pivotal role leading change. As energy prices and carbon emission escalate, the need for strategic energy management becomes increasingly imperative. Recognizing this urgency, and in response to provincial regulations, the Town of Essex has developed a comprehensive plan to reduce energy consumption and the related greenhouse gas (GHG) emissions from the Town's facilities and operations.

Ontario Regulation 25/23 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans) requires broader public sector (BPS) organizations, such as municipalities, to develop an Energy Conservation & Demand Management (ECDM) plan and update it ever five years. This BPS reporting regulation was originally introduced through the Green Energy Act in 2012. The Town of Essex has developed this ECDM plan in compliance with the regulation, which covers the period from 2024 to 2029.

As part of the act, BPS organizations are specifically required to: (1) report annually to the Ministry of Energy, on their energy use and greenhouse gas (GHG) emissions and publish the reports on their websites; (2) develop a five-year conservation and demand management plan and publish the plan on their website. Plans must be updated every five years; the data must include the annual amount of energy used and GHG emitted by BPS organizations.

This CDM plan creates a roadmap for energy conservation while fulfilling the requirements of the O.Reg. 25/23.

### Purpose of Plan

This plan lays out a path towards a more energy-efficient future. The policies, practices, and energy conservation measures outlined in the Action Plan (Section 5.0) illustrate the importance the Town places on acting responsibly towards energy consumption. This will ultimately lead to reduced GHG emissions and a lower impact on our environment. The Town of Essex is committed to following the direction of the Plan and will take the necessary steps to ensure the Plan's success through continual review and development.

Since it's inception, the Town has initiated several substantial energy projects, yielding significant savings including energy efficient boilers, upgrading many lighting systems to LED, and the use of electrical heating/cooling through heat pumps rather than fossil fuels. The successful projects delivered over the last 5 years are highlighted in Section 2.0. To enhance our understanding of energy use and to identify opportunities, this document also contains a thorough review of current and historical energy use dating back to 2011.

## Overview of Town Facilities

The Regulation states that energy use and greenhouse gas emissions must be reported for buildings or facilities the Town owns or leases that:

“(a) the building or facility is heated or cooled and the public agency is issued the invoices and is responsible for making the payments for the building or facility’s energy consumption; or

(b) the operation is related to the treatment of water or sewage, whether the building or facility is heated or cooled, and the public agency e is issued the invoices and is responsible for making the payments for the building or facility’s energy consumption.

(O. Reg. 25/23 s. 6).”

The Town of Essex has twenty (20) main facilities, and an additional nineteen (19) locations related to water and wastewater treatment and pumping. In addition to the mandatory facilities that are required by the regulation, the Town also tracks the energy use of streetlighting due to its large impact on electricity consumption. The facilities are listed below in Table 1.1 with their address, age and size.

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

Facility	Address	Use	Area (ft <sup>2</sup> )
Colchester Harbour	100 Jackson Street	Other	4361
Colchester Lagoons	125 Cornwall	Water/Wastewater Facility	2000
Essex Train Station	87 Station St	Other	2300
Harrow Colchester South Arena	243 McAfee Street	Arena and Community Centre	48947
Harrow Colchester South WTP	405 Clitherow	Water/Wastewater Facility	6000
Harrow Fair Building	206 McAfee	Washrooms	350
Building Department	2610 County Road 12	Office	5700
Carnegie Center	18 Gordon Ave	Historic Library (Museum)	1547
Fieldhouse	100 Fairview Avenue	Community Centre	2268
Fire Station 1 (Essex)	55 Alice Street North	Fire Hall	7729
Fire Station 2 (new 2022)	3575 North Malden Rd	Fire Hall	8817
Fire Station 3 (Harrow)	25 Centre Street East	Fire Hall	4000
Harrow Lagoons	2215 Roseborough Road	Water/Wastewater Facility	1400

Facility	Address	Use	Area (ft <sup>2</sup> )
Harrow Pump Station	325 County Road 50	Water/Wastewater Facility	350
Harrow Soccer Complex	2225 Roseborough Road	Recreational Complex	6000
Harrow Water Tower	Sinasac Street	Water/Wastewater Facility	2150
Maedel Community Centre	25 Gosfield Townline West	Community Centre	11414
McGregor Community Centre	9571 County Road 11	Community Centre	4000
Public Works - Harrow Yard	2100 Ferriss Avenue	Public Works Garage	12363
Pumping Station #3	120 Fairview Avenue	Water/Wastewater Facility	430
Pumping Station #4	N/S Maidstone Ave	Water/Wastewater Facility	445
Water Plant Pump	25 Sullivan	Water/Wastewater Facility	2150
Municipal Office	33 Talbot Street South	Office	9900
OPP Station	44 King Street East	Police Facility	5772
Public Works - Essex Yard	4000 North Malden Road	Public Works Garage	4075
Sewage Treatment Plant	3980 North Malden Road	Water/Wastewater Facility	6700
Twin Pad Arena	60 Fairview Avenue East	Arena and Community Centre	85500
Water Department	120 Sinasac West	Water/Wastewater Facility	7000
Colchester PS WW #2, Argyle CC	109 Gloucester Dr.	Water/Wastewater Facility	N/A
Colchester PS WW #3, Crystal Beach	1466 Conc. Lot 20 Crystal Beach Rd	Water/Wastewater Facility	N/A
Colchester PS WW #5, Cooks Beach	117 County Road 50, 196 Cooks Road	Water/Wastewater Facility	N/A
Colchester PS WW #6	Shawondasee Blvd, 280 Wabasso Rd Lot	Water/Wastewater Facility	N/A
Harrow PS WW, Grant St.	Grant/Concession Rd 3	Water/Wastewater Facility	N/A
Essex NE Lagoon	2007 Lakeshore Rd 211	Water/Wastewater Facility	N/A
Essex Water Tower	162 Forest Ave Essex	Water/Wastewater Facility	N/A
Storm Water PS - Maidstone Hwy 3	SE Corner of Maidstone & Hwy 3	Water/Wastewater Facility	N/A
Storm Water PS - 181 Maidstone	181 Maidstone Ave E	Water/Wastewater Facility	N/A
Colchester PS WW #2, Argyle CC	109 Gloucester Dr.	Water/Wastewater Facility	N/A
Street Lighting	Various Locations	Street Lighting	N/A

## Renewable Energy Sources

O. Reg. 25/23 requires the Township to consider renewable energy as a supplement to reducing energy consumption and electricity demand for its buildings/facilities.

The Town leases space to third parties for solar power however, we do not own any of our own panels. These are located at the Harrow and Essex lagoons. Through asset and capital management programs, the Town has also replaced many HVAC units with air source heat pumps and will continue to consider using this technology in the future.

## 2.0 OUR ACCOMPLISHMENTS

### Completed Energy Conservation Measures

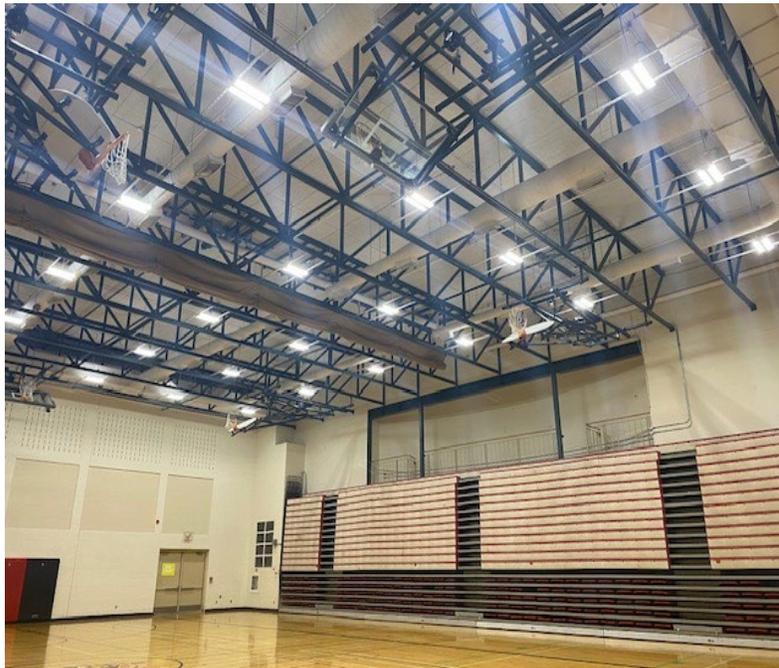
The Town has completed a number of energy conservation projects over the last 5-year period which have contributed significantly to energy savings. The projects range from lighting and HVAC retrofits to new thermostats and building controls. Some of the projects are listed in Table 2.1 below.

**Table 2.1 Completed Energy Conservation Measures**

Facility	Conservation Type	Project Description	Completion Year
Essex Recreational Complex	Lighting	LED Gym Lights	2023
Essex Recreational Complex	Pool Equipment Upgrade	Training Pool Filter w/ Active Glass Filter Media	2023
Essex Recreational Complex	HVAC Upgrade	HVAC RTU-106 Replacement	2019
Essex Recreational Complex	HVAC Upgrade	HVAC RTU-105 Replacement	2022
Essex Recreational Complex	HVAC Upgrade	HVAC Replacement (RTU-101/ RTU-102/ RTU-103 RTU-107) - Pool	2024
Essex Recreational Complex	HVAC Upgrade	MUA 1- & 2-Unit Replacement	2023
Essex Recreational Complex	Building Envelope	Partial Roof Replacement	2023
Harrow arena	Lighting	Re-lamped the LED bulbs from the original retrofit above the rink	2024
Harrow OPP	Building Controls	BAS system for Harrow OPP for 2024	2024
Maedel Community Centre	Building Envelope	Installation of new windows	2023
Maedel Community Centre	Building Envelope	Sealing of building envelope	2023
Maedel Community Centre	Lighting	LED lighting conversion	2022
Maedel Community Centre	HVAC Upgrade	Upgrade of HVAC to 4 Ductless Splits from large inefficient window shaker units	2021
Town Hall	Lighting	LED lighting conversion	2021
Various Parking Lots	Lighting	LED lighting conversions in various parking lots as old lights burn out	Ongoing
Essex Sports Complex	HVAC Upgrade	Switch Shaheen Room to Ductless Splits rather than large HVAC Units	
Colchester Community	HVAC Upgrade	Replaced 2 HVAC units	2019

Facility	Conservation Type	Project Description	Completion Year
Centre			
Lions Hall	HVAC Upgrade	Replaced Furnace	2019
Essex Train Station	HVAC Upgrade	Replaced Furnace	2024
Harrow Arena	Arena Ice Plant	Harrow Arena compressor control system upgrade	2024
Harrow Daycare	HVAC Upgrade	Replaced HVAC unit with a smaller more efficient unit	2020
Harrow Arena	Building Envelope	Mid Roof replacement and improved insulation level	2020
Essex Sports Complex	HVAC Upgrade	Replace four (4) condensing boilers	2020
Essex Sports Complex	Lighting	Replaced all Shaheen room lighting fixtures to LED	2024
Various	Building Controls	Installed BAS on Town Hall, Maedel Community Center, and McGregor Community Centre to efficiently operate all HVAC units	2021
Kinsman Field House	Building Envelope	Replaced roof	2022
Essex Sports Complex	Arena Ice Plant	Replaced 1 screw compressor and motor	2023
Essex Sports Complex	Arena Ice Plant	Replaced Eco Chill control panel and Cooling Tower in the compressor room to improve efficiency of system	2022
Harrow Arena	HVAC Upgrade	Replaced exhaust fan and motor in Harrow Arena canteen	2023
Harrow Arena	Building Envelope	Repairs to exterior, all caulking replaced, mortar and block repairs, flashing replacement, and water proofing on all walls	2024
Harrow Arena / Community Room	HVAC Upgrade	Replacing Harrow Community Room, office, and lobby HVAC unit PO is awarded	2024
Harrow Arena	HVAC Upgrade	Replaced boiler for back room	2023
All	HVAC Systems	Regular maintenance of HVAC units, boilers, motors, and pumps at all Town Facilities to make sure they are all operation properly and efficiently with contractors and town Staff every day all year	Ongoing

This list demonstrates the Town’s leadership and commitment to actively managing energy consumption. Figures 2.1 to 2.4 below illustrate some of the completed conservation projects.



**Figure 2.1 Retrofit of Gym Lighting Fixtures to LED**



**Figure 2.2 New Training Pool Filters with Active Glass Filter Media**



**Figure 2.3 Colchester New High Efficiency HVAC Units**



**Figure 2.4 Harrow Arena Exhaust Fans**

### 3.0 HISTORICAL ENERGY PERFORMANCE

#### Our Energy Baseline

To track progress, an energy baseline was established previously from which annual energy consumption can be compared. The year 2011 was selected as it is the earliest year in which energy consumption data is available.

The resulting dataset represents the Town’s baseline and current level of energy performance. Table 3.1 below presents the 2023 energy data by fuel type expressed in equivalent kilowatt hours (ekWh), compared to the baseline year of 2011. 2019 was selected as an interim year as it was the start of the last planning period and represents a full year before COVID19 disruptions.

**Table 3.1: Town of Essex Energy Consumption Compared to Baseline**

Account Centre	Energy Type	2011	2019	2023	% Change vs 2019	% Change vs 2011
Facilities	Electricity (kWh)	6,045,437	4,998,715	5,247,888	5.0%	-13.2%
	Natural Gas (m³)	328,331	359,850	343,430	-4.6%	4.6%
	<b>Subtotal (ekWh)</b>	<b>9,437,093</b>	<b>8,715,963</b>	<b>8,795,520</b>	<b>0.9%</b>	<b>-6.8%</b>
Streetlights	kWh	Not Available	1,076,859	881,603	-18.1%	N/A
<b>Total Energy</b>	<b>(ekWh)</b>	<b>-</b>	<b>9,792,822</b>	<b>9,679,199</b>	<b>-1.2%</b>	<b>N/A</b>
<b>Total GHG Emissions</b>	<b>(tCO<sub>2</sub>e)</b>	<b>1,521.1</b>	<b>867.5</b>	<b>844.0</b>	<b>-2.7%</b>	<b>-44.5%</b>

**Note 1:** ekWh (equivalent kWh) is a calculated value using the thermal energy content of natural gas to convert consumption in m³ to units of “equivalent” kWh for comparison.

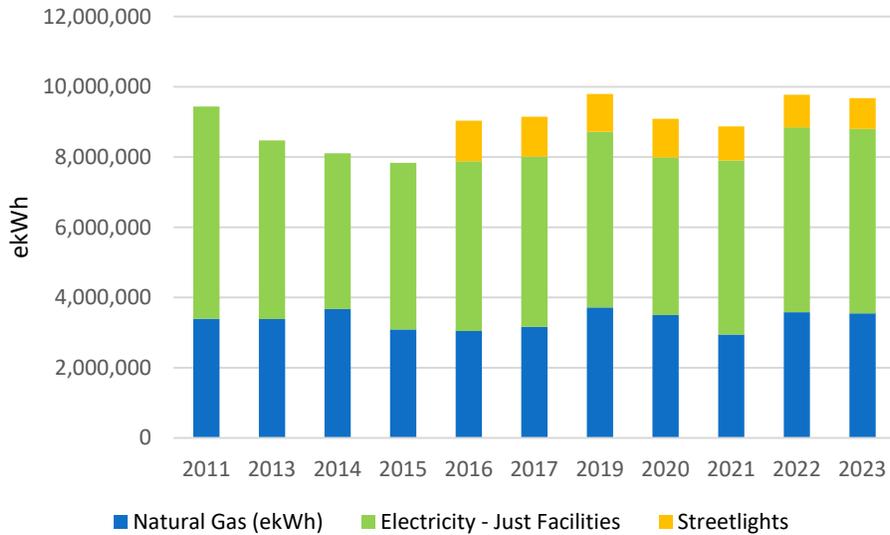
In 2011, the Town’s facilities consumed 9,437 eMWh of energy and were responsible for 1,521 tonnes of greenhouse gas emissions (tCO<sub>2</sub>e). Please note that this number does not include the electricity consumed by streetlighting as it was unavailable for 2011. In 2023 the total energy for the Town facilities was reduced to 8,796 eMWh with an additional 882 MWh for streetlighting.

The Town is proud to have achieved a 13% reduction electricity between 2011 and 2023 (excluding streetlighting), (see Table 3.1 above), however natural gas consumption has risen by 4.6% over the same period. Combining electricity and natural gas, these changes have resulted in an overall energy reduction of close to 7% and a 44.5% reduction in GHG emissions over the twelve-year period.

Please note that the large GHG emissions reduction was due in part to the conservation efforts of Town staff, as well as outside factors including the shutdown of the Ontario coal driven power plants. Ontario’s electricity has become significantly cleaner in the last decade.

Figure 3.1 below illustrates the total energy consumption year to year (2011 to 2023) by energy source.

Streetlighting has been displayed separately from the facility data as it was not available for all the years of data.



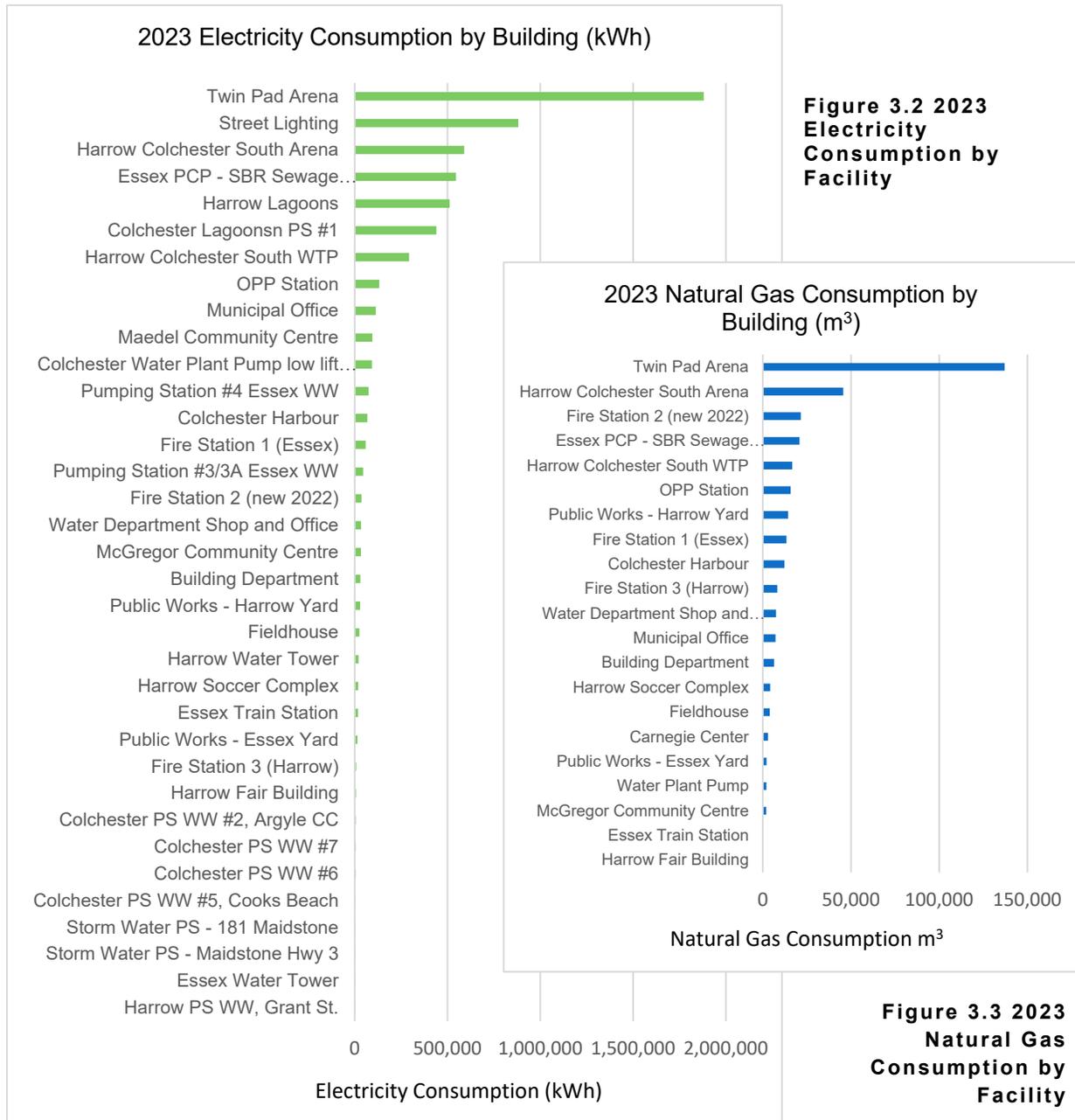
**Figure 3.1 Historical Energy Consumption (ekWh) by Fuel Source**

Please note that in Figure 3.1 above and for other yearly graphs, 2012 and 2018 have been removed. This is because some or all of the energy data was unavailable.

Although the baseline year has been chosen to be 2011, for the purposes of this report, 2029 reduction targets will be set against 2023 consumption levels for clarity and consistency. The following sections outline the specific energy and GHG emissions used/created by the Town both currently (2023) and historically.

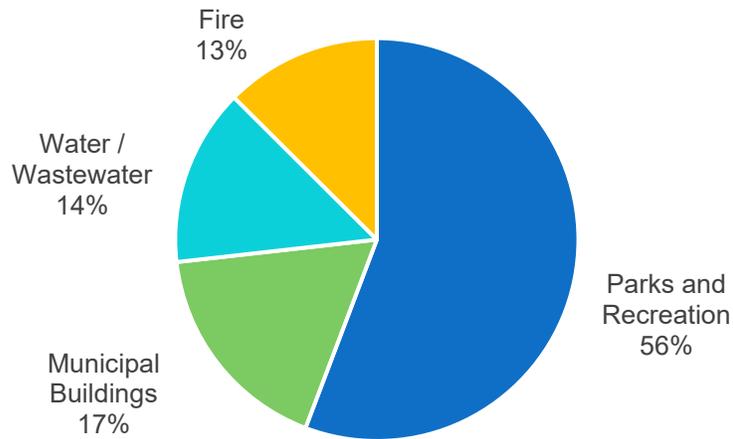
### Breakdown of Corporate Energy Consumption

In order to track progress, it is important to review past performance. The following are a series of figures that illustrate the consumption of electricity and natural gas at individual facilities. Figures 3.2 and 3.3 below show the electricity and natural gas consumption by buildings in 2023.



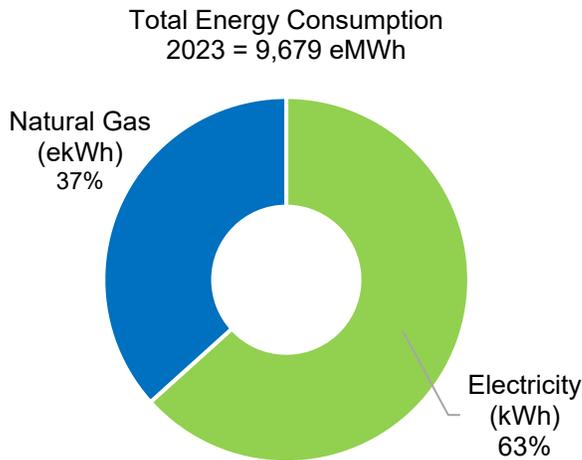
The primary consumers of electricity and natural gas at the Town of Essex are the Twin Pad Arena and the Harrow Colchester South Arena followed by Streetlighting and the Sewage Treatment Plant.

Natural gas is a significant contributor to GHG emissions and therefore it is helpful to understand the division of this resource between departments. 56% of the natural gas used at the Town was used by Parks and Recreation, the rest was divided between the Municipal Buildings (17%), Water / Wastewater Division (14%) and the Fire Department (13%), (see Figure 3.4 below).



**Figure 3.4 2023 Natural Gas Consumption by Department**

To compare different energy sources, the natural gas consumption was converted to equivalent kWh (ekWh) using standard conversion rates. This allows all fuel types to be combined and compared. Figure 3.5 below shows the total municipal energy consumption broken down by fuel source for 2023.



**Figure 3.5 2023 Total Energy Consumption by Fuel Source**

In 2023, the Town energy consumption was led by electricity (63%) followed by natural gas (37%). This information is also shown historically from 2011 to 2023 in Figure 3.1. As mentioned previously, the Town is proud to have achieved an overall reduction in energy use from 2011 to 2023 of over 6% which is conservative as it doesn't include the more recent savings from Streetlighting improvements.

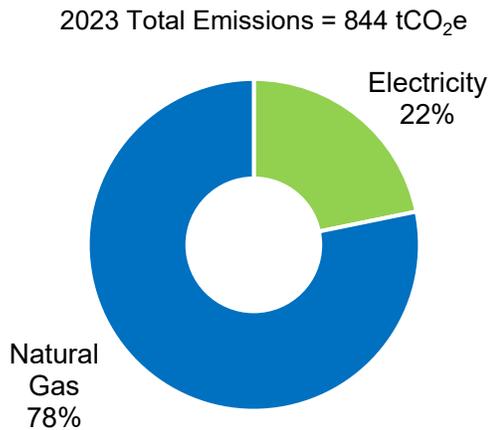
The following facilities consumed over 90% of the Town's total energy (all fuel types combined) in 2023. Table 3.2 shows their energy consumption, percentage of total, along with the facility energy intensity.

**Table 3.2: Facilities with Highest Energy Consumption**

Facility Name	Energy Consumption 2023 (ekWh)	Percentage of Total Energy (%)	Energy Intensity 2023 (ekWh/ft <sup>2</sup> )
Twin Pad Arena	3,297,022	34%	38.6
Harrow Colchester South Arena	1,061,067	11%	21.7
Street Lighting	881,603	9%	N/A
Essex PCP - Sewage Treatment Plant	759,862	8%	N/A
Harrow Lagoons	510,934	5%	N/A
Harrow Colchester South WTP	464,457	5%	N/A
Colchester Lagoons	440,007	5%	N/A
OPP Station	294,097	3%	51.0
Fire Station 2	259,119	3%	29.4
Fire Station 1 (Essex)	197,174	2%	25.5
Colchester Harbour	194,499	2%	44.6
Municipal Office	187,881	2%	19.0
Public Works – Harrow Yard	177,176	2%	14.3

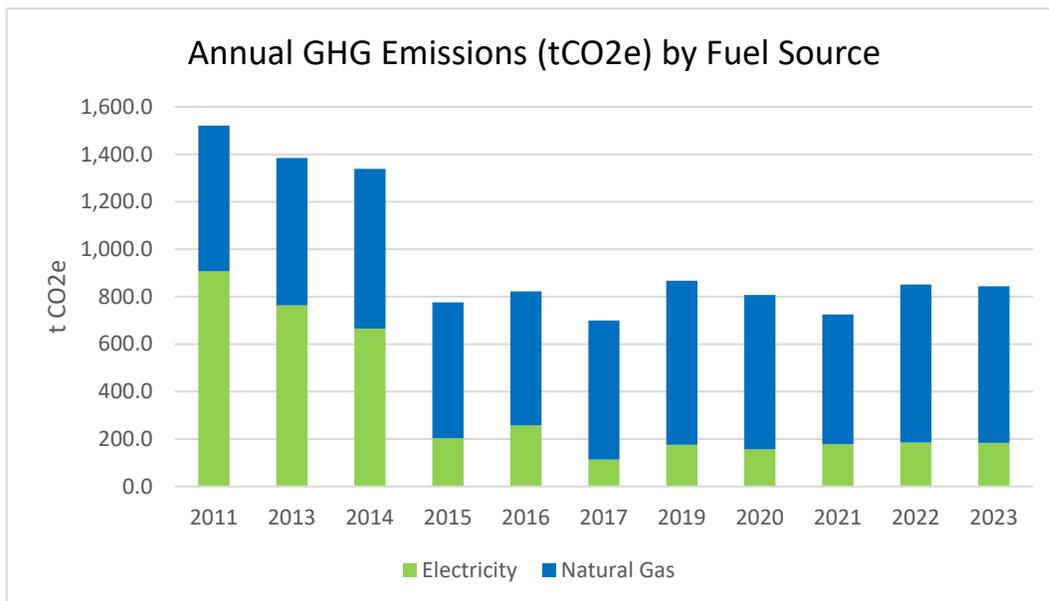
## Carbon Emissions

The carbon footprint is a measure of the impact of GHG emissions related to the energy use. The rate of GHG production varies by energy source and is directly affected by the emissions conversion factors and the Town’s energy consumption. Emission conversion factors used in this report were published values for Ontario and can vary year to year based on how clean energy generation is. The GHG emissions were calculated for the Town and are broken down by fuel source in Figure 3.6 below.



**Figure 3.6 Total 2023 GHG Emissions by Energy Source**

Note that although natural gas provides 37% of the total energy needs for the Town, it is responsible for 78% of the GHG emissions. It is for this reason that GHG emissions reduction plans must include a strategy for the reduction of consumption of fossil fuels.

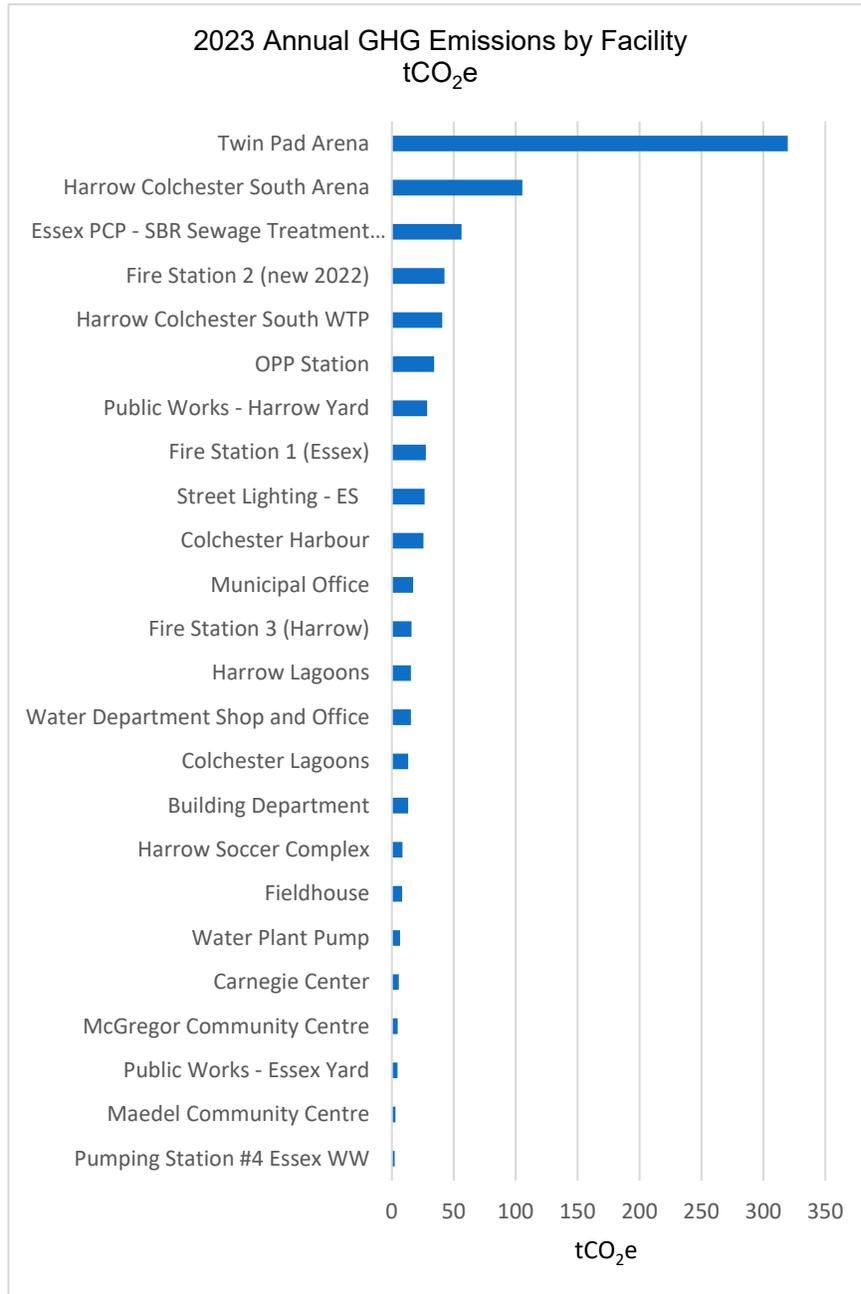


**Figure 3.7 Total Annual GHG Emissions from 2011 to 2023 by Energy Source**

Please note that, as in previous figures, the years 2012 and 2018 have been omitted as the data was not complete.

Emissions conversion factors have changed significantly for electricity production in Ontario. Specifically in 2014 electricity became significantly cleaner when the last of the coal fired electricity generation plants were shut down. This is why a significant reduction in emissions from electricity is evident in Figure 3.7 in 2015. Emissions from Town facilities have remained at a consistent level for a number of years and it therefore will require the execution of energy savings measures to make improvements in the future.

Figure 3.8 below illustrates the relative GHG emissions generated from energy consumption in 2023 by facility.



**Figure 3.8 Total Annual GHG Emissions in 2023 by Facility**

## 4.0 VISION, GOALS AND TARGETS

The Federal Government declared a National Climate Emergency in 2019 to support the country's commitment to meeting the targets outlined in the Paris Agreement. The City of Windsor and the County of Essex declared climate emergencies in 2019 as well, recognizing that future climate performance must be a high priority in all regional decision-making.

The following are the Town's energy management vision, goals and targets for the 2024 to 2029 Energy Conservation and Demand Management Plan.

### Energy Conservation Vision

The Town of Essex will strive to reduce energy consumption and mitigate energy costs through the wise use of electricity, fuels and resources. By embracing new energy efficient opportunities, the Town will reduce our impact on the environment and build a more resilient, efficient, and sustainable community.

### Objectives and Goals

The Town of Essex has the following strategic objectives to ensure that our energy management vision is realized:

- Create a culture of conservation across Town operations
- Ensure the necessary resources are allocated to enable implementation of the action plan
- Increase the visibility of facility energy consumption data to the senior management team through enhanced monitoring and tracking
- Embrace energy efficient asset management best practices to build, maintain and continuously improve our municipally owned infrastructure.

### Energy Conservation Targets

Our energy reduction target is to reduce our consumption of fuels and electricity across all Town facilities and operations by 3% (290 eMWh) by 2029 measured against the total 2023 annual energy consumption of 9,679 eMWh.

## 5.0 STRATEGIC PRIORITIES

The Town of Essex will deliver the goals, objectives and targets set out in Section 4.0 by focusing on the following four priorities. These priorities will also support the goals set out in the Town's climate action plan, (see 'Climate Ready-A Climate Change Adaptation Plan for the Town of Essex 2021-2026' located on the Essex Website).

### Priority: Funding for Energy Conservation

The Town of Essex is making a positive impact on climate change by managing our assets for long term sustainability. We are committed to investing in projects now that will reduce our carbon footprint through sound asset management and renewals.

To assist and possibly accelerate this process, the Town will seek out provincial and federal government grant and incentive programs, as well as energy conservation incentives offered by Utility companies. Staff time will be allocated to research and submit applications for these grants and incentives, which can be substantial, and often require additional energy monitoring and tracking.

### Priority: Asset Management and Capital Planning

The Town will develop energy efficient guidelines and standards for future capital purchases covering various topics including:

- Heating systems - boilers, packaged rooftop units,
- Refrigeration and cooling systems – space cooling, refrigerators, freezer chests
- Ice Plant equipment for Arenas
- Air Handling
- Lighting
- Domestic Hot Water
- Building Controls
- Alternatives to Natural Gas fueled equipment

In addition, life cycle costing will be incorporated into capital planning processes to ensure that the long-term cost of energy is incorporated into technology decision making when replacing assets.

Given that the majority of GHG emissions from the Town's facilities are caused by the use of natural gas, the Town of Essex will develop guidelines to help find viable alternative energy sources for any new natural gas equipment and determine whether the phase out of existing natural gas equipment/appliances is possible.

## Priority: Identification of Energy Savings Opportunities

Ensure that the ongoing effort to reduce energy consumption is a priority in departmental planning and operations, and corporate programs are coordinated throughout the organization to support energy related actions. Town staff will continue to seek efficiency opportunities and deliver operational changes to reduce energy consumption in all areas of the organization including ongoing building operation and control refinement, the purchase of energy efficient equipment, continued fleet greenings and facility maintenance opportunities.

The Town of Essex will deliver energy cost savings through the identification and implementation of processes, programs and projects which reduce energy consumption. In addition, staff will take recommendations from audits or NetZero studies into consideration and implementation wherever possible.

## Priority: Communication, Training and Outreach

The Town will maximize long term energy savings investments through ongoing staff training and the development of communication and awareness programs. The Town's Management Team is committed to ensuring that energy conservation and consumption are a priority for all staff throughout the organization. Improved understanding of building controls, and how energy can be wasted can significantly improve everyone's contribution to conservation and the overall goals of the corporation.

The Town has participated actively and enthusiastically in the annual Earth Hour initiative and each year encourages all Town residents and businesses to come together to conserve energy and to increase awareness.

Each year the Town of Essex does a 'legacy tree planting day' at local schools where a ceremony is held, and a tree is planted on their property. The Town also has a yearly spring clean-up day where each ward has volunteers, staff and Council that take a couple hours to clean up garbage throughout our communities.

Other similar activities and events can be considered to further ingrain the need for continuous daily conservation efforts by all citizens and staff.

## 6.0 ACTION PLAN

A critical part of any plan is the detailed list of specific actions needed to achieve the desired goals and objectives. The Town of Essex has developed a key project list which will help ensure the Town meets the energy reduction goals set out in Section 4.0 of this report (see Table 6.1 below).

**Table 6.1: Town of Essex Energy Conservation Action Plan**

No.	Facility	Project Type	Description	Forecasted Timing
1	All	Standards	Develop energy efficient purchasing standards and guidelines for key infrastructure: Heating systems, pumping, cooling system, ice plant equipment, equipment controls, building envelope.	2025
2	All	Standards	Develop natural gas reduction strategy which would be integrated into capital/asset management processes	2025
3	All	Standards	Develop energy efficient standard for new buildings	2025
4	Various	Building Envelope	Take infrared images of external walls to help identify infiltration, thermal bridging and insulation issues.	2026
5	Essex Recreation Complex	HVAC Upgrade	Dehumidifier Replacement - Pool	2026
6	Essex Recreation Complex	Building Envelope	Partial Roof Replacement - Pool	2024/2026
7	Harrow Daycare	DHW	Remove the hot water tanks and utilize the dressing room hot water tanks.	2025
8	Harrow & Colchester South Arena	Lighting	Upgrade all remaining lighting fixtures to LED	2025
9	Harrow & Colchester South Arena	Equipment	Replace ice resurfacer with an electric Olympia	2026
10	Harrow & Colchester South Arena	Controls	Upgrade BAS system	2025
11	Harrow & Colchester South Arena	Lighting	Harrow Tennis court lighting and Ball diamond switch to LED	2025
12	Harrow & Colchester South Arena	Lighting	Parking Lot lighting to be upgraded after parking lot paving is complete	2024
13	Colchester Community Centre	Controls	Upgrade BAS system	2025
14	Colchester Community Centre	Building Envelope	New Windows and doors as per capital budget renovations	2024
15	Harrow Soccer Complex	Controls	Install internet service and then upgrade BAS	2026
16	Harrow Lions Hall	Controls	Install internet service and then upgrade BAS	2026
17	Essex Sports Complex	Lighting	Replace all Walking Track lighting fixtures to LED	2024/2025
18	Essex Sports Complex	Arena	Adding magnetic water system for cold water ice resurfacing	2026
19	Essex Sports Complex	Arena	Replace rink lighting	2026
20	Ball Diamonds	Lighting	LED light conversion on ball diamonds	2025
21	Tennis Courts	Lighting	LED light conversion on tennis courts	2025
22	Water Department Office	Lighting	Upgrade remaining lighting fixtures to LED	2025
23	Water Department Office	Building Envelope	Inspect and maintain/replace weatherstripping, seals and window caulking as necessary	2026
24	Water Department Office	HVAC Upgrade	Investigate installing interlocks to shut off shop heaters when overhead doors are open.	2025

No.	Facility	Project Type	Description	Forecasted Timing
25	Water Plant and Pumping Stns	Lighting	Replace any remaining fixtures with LED	2026
26	Water Plant and Pumping Stns	HVAC Controls	Upgrade thermostats and heating controls as necessary to digital, programable units. Review and optimize setpoints for unoccupied spaces.	2025
27	Water Plant and Pumping Stns	Process Equipment	- High Lift pump upgrades (WTP)	2028
28	Water Plant and Pumping Stns	Process Equipment	- Backwash pump upgrade	2025
29	Water Plant and Pumping Stns	Process Equipment	- Alum pump replacement	2025
30	Water Plant and Pumping Stns	Process Equipment	- 3 high lift pumps and 2 low lift pump replacements	2028
31	Essex WWTP	HVAC Controls	Review and optimize setpoints on heating systems and minimizing heating loads during unoccupied periods.	2028
32	Essex WWTP	Process Equipment	Replace bulbs on UV system. Consider installing UV system controls to adjust output based on plant conditions (flow, quality)	2026
33	Essex WWTP	Controls	Investigate updating SCADA system to include energy consumption trending and tracking from all installed VFDs.	2025
34	Harrow Lagoon	Equipment	Replace blower for aeration system	2025
35	WWTP and Pumping Stns	Lighting	Replace any remaining fixtures with LED	2025
36	Harrow Pumping Stn	Equipment	Pumps to be upgraded	2025/2026
37	Streetlights	Lighting	Upgrade of remaining fixtures to LED	Ongoing
38	Various	Training	Arrange energy conservation training for general staff. Consider subsidized programs offered by CIET.	2025

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## 7.0 CONCLUSION

In conclusion, this Energy Conservation and Demand Management Plan serves as a strategic blueprint for optimizing energy use, reducing costs, and minimizing environmental impact. By implementing targeted measures, leveraging technology, and fostering a culture of sustainability, this plan aims to achieve significant reductions in energy consumption and greenhouse gas emissions.

Continuous monitoring, regular updates, and engagement with stakeholders will ensure the plan's success and adaptability to evolving energy needs. Ultimately, this approach not only contributes to organizational resilience and financial efficiency but also supports broader goals of sustainability and climate responsibility.

The CDM Plan is the driver of energy conservation for the Town of Essex and it will continue to evolve over time, providing additional opportunities to significantly reduce overall energy use and greenhouse gas emissions