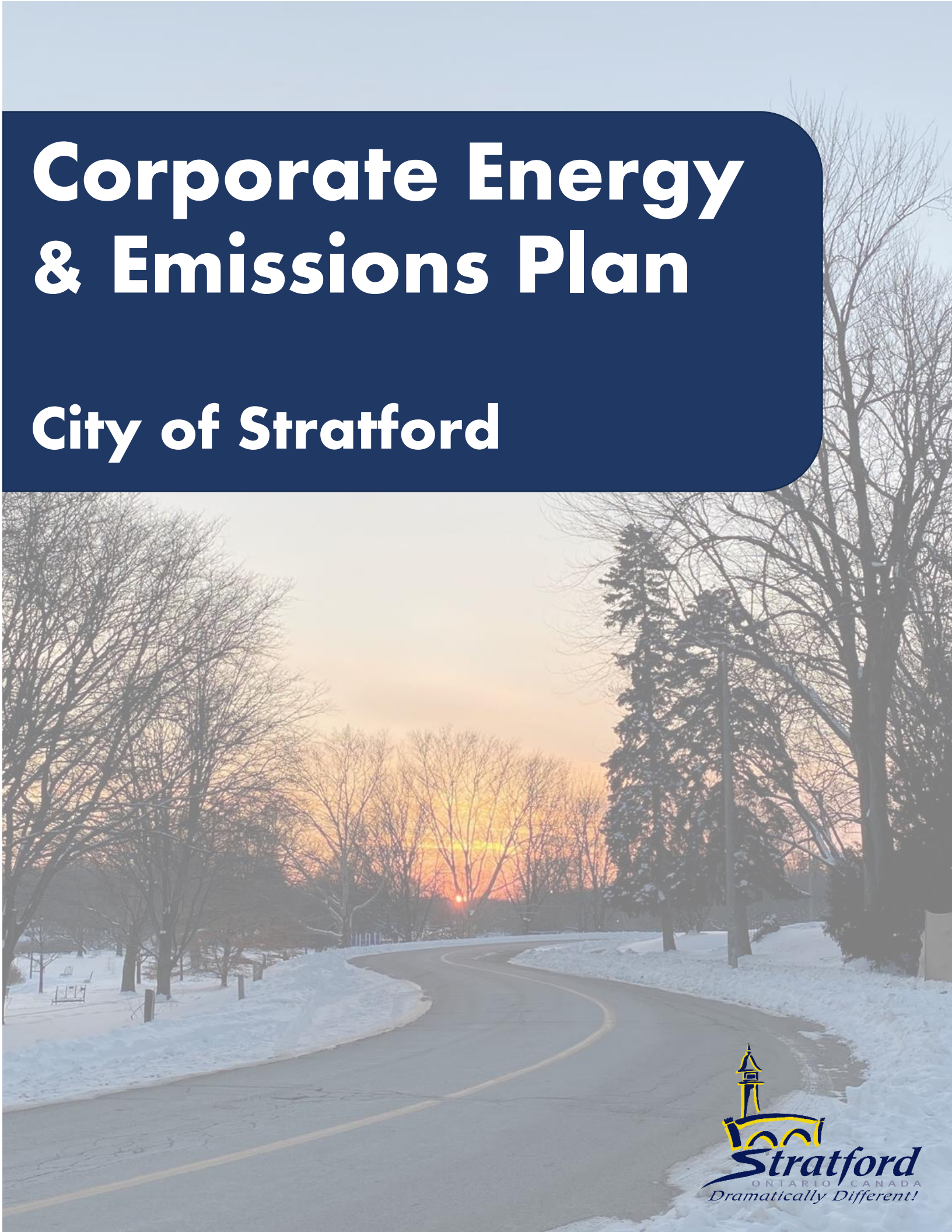
Corporate Energy & Emissions Plan

City of Stratford



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Executive Summary

The City of Stratford's Corporate Energy Conservation and Demand Management Plan (CECDMP) from 2014 set out five-year energy conservation goals for the corporation and aimed to achieve a 6% reduction in energy consumption by 2024. Recognizing the urgency to accelerate climate action, the City is committed to demonstrate leadership and strengthen climate action in all operations.

This renewed plan builds on and supports the advancement of strategic objectives identified within the CECDMP and takes a comprehensive approach towards energy management and monitoring, proactively identifying emissions reduction opportunities, capacity development and staff awareness. This plan also includes more recent data sets from 2017 onward focusing on 6 Asset Classes: Buildings, Fleet, Outdoor Lighting, Solid Waste, Municipal Airport, Water and Wastewater, which represent 42%, 35.5%, 14%, 3%, 1% and 1% of the quantified 5,114.41 tCO_2e[1]. These categories provide a more current and detailed picture of the City's assets' emissions.

Following the declaration of a Climate Emergency in 2020, City Council committed to the following city-wide greenhouse gas (GHG) reduction targets below 2017 emission levels.

- 30% by 2030, a reduction of 1534.32 tCO_2e
- 60% by 2040, a reduction of 3068.64 tCO_2e
- 100% or "net zero" by 2050, a reduction 5114.41 tCO_2e

The Corporate Energy and Emissions Plan (CEEP) will primarily support the City advance towards its emissions reduction goals. It will provide a long-term direction with a 2050 horizon as well as outline short to medium-term targets and actionable strategies for the corporation to implement throughout its operations.

The CEEP ('the Plan') is aligned with the reporting structure defined by the Corporate Energy Conservation and Demand Management Plan (2014) and proposed amendments to Ontario Regulation 507/18 Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans under the Electricity Act, 1998. In addition to energy reporting, the Plan encompasses additional elements within Scope 1 and Scope 2[2]

[1] tCO_2e, or carbon dioxide equivalent is a metric measure used to compare emissions from various greenhouse gases in terms of CO_2 that would create the same amount of global warming.
[2] Scope 1 emissions are direct greenhouse gas (GHG) emissions that occur from sources that are controlled or owned by an organization, for example emissions associated with fuel consumption in boilers furnaces and vehicles.
Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although scope 2 emissions physically occur at the facility where they are generated, they are accounted for in an organization's GHG inventory because they are a result of the organization's energy use.

emissions that are in the purview of the corporation to ensure an accurate representation of GHG emissions generated by all city operations. This Plan provides recommendations to strengthen climate action throughout the Corporation. It also recognizes the dynamic public policy environment in which the City operates, including the costs of inaction and the urgency for prompt concerted response at the provincial and local levels of jurisdiction.

Asset classes have been selected based on requirements for corporate emissions reporting as stipulated in the Federation of Canadian Municipalities (FCM) corporate inventory.

Introduction

Climate Emergency

In 2020, following a community call for action to address the impacts of climate change, City Council declared a climate emergency and committed to reducing greenhouse gas emission across the community by 30% from 2017 levels by 2030 and 100% by 2050. With this climate emergency declaration, the City of Stratford joined a number of cities in Canada and around the world in acknowledging the scale of the climate crisis, and to necessitate more aggressive action towards achieving a low carbon future.

Current Climate and Greenhouse Gas Emissions Projections

Global climate models project temperatures will continue to increase over the course of the century. By the 2050s, we can expect the number of summer days over 25 degrees Celsius to increase at twice the rate than what it was in the past, and the annual hottest day temperature to reach beyond 35 degrees Celsius by the 2050s. Together with these temperature increases Southwestern Ontario can also expect to see a significant decrease in average yearly frost days with more frequent storms and intense precipitation. Such seasonal variations will result in extreme weather events like flooding, heat waves that can lead to health implications for the community and impact local food sustainability through reduced agricultural yields.

For local governments increasingly variable temperatures and weather conditions may impact demands on municipal infrastructure, implementation of emergency measures, and potentially affect energy and utility loads associated with operating public works and facilities.

Corporate Emissions Trajectory

As the population of a community grows, so do the City's services to meet the needs of all residents. In support of expected population growth and resultant higher service needs, the City of Stratford's asset inventory and level of service will continue to expand over the coming years. The anticipated asset acquisitions along with service delivery expansion are incorporated into a "business-as-usual" (BAU) scenario which projects the City's corporate emissions without any substantial corrective action taken. In order to meet the City's Climate Emergency targets, it needs to take strong measures to reduce corporate emissions.

The CEEP is intended to measure, monitor, and track corporate emissions toward our collective targets for 2030 and beyond. Emissions generated outside of the purview of the corporation including but not limited to community buildings (residential,

commercial, institutional, industrial), community transportation and waste, agriculture are not in the scope of this strategy.

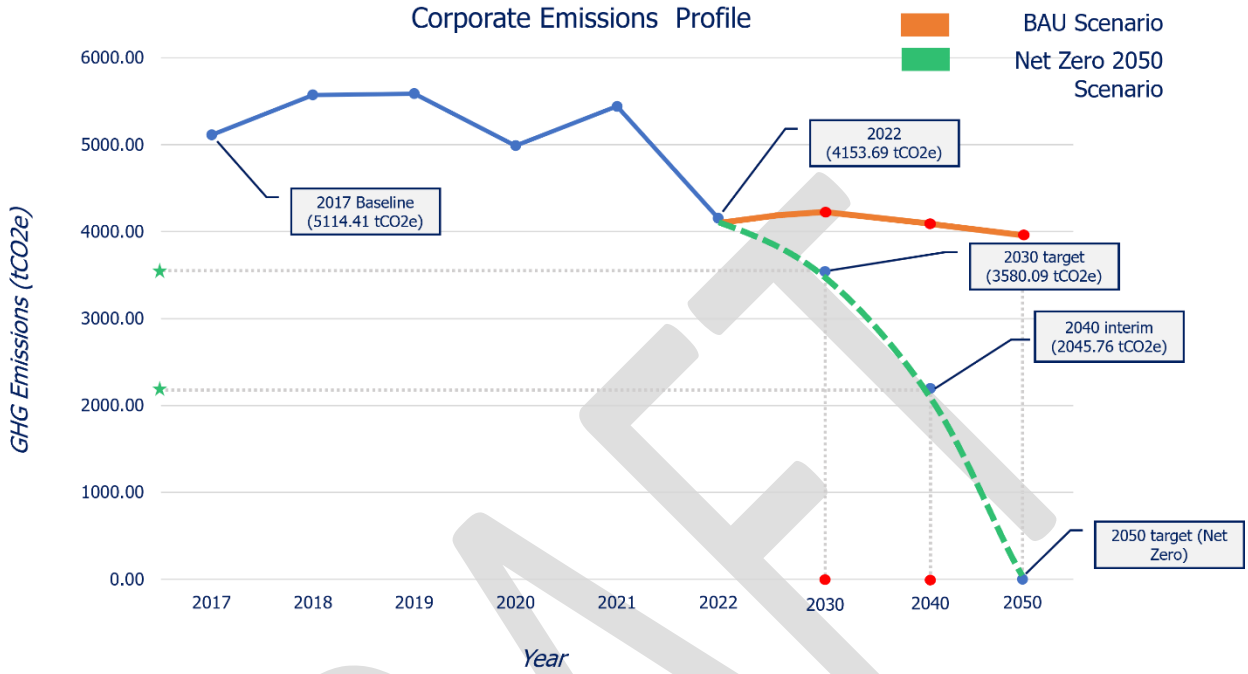

Figure 1 Corporate Emissions Profile and Trajectory

Under the BAU scenario, the City will inevitably see emissions levels increase or plateau from 2022 to at least 2030. If the City were to follow the energy conservation strategies outlined within this plan, it has the opportunity to not only prevent a natural increase but reduce emissions below 2017 levels.

National Policy and Provincial Context

In 2015, the Government of Canada adopted the Paris Agreement, a legally binding international treaty on climate change ratified by 196 national governments. Under this agreement, governments commit to accelerate and intensify the actions and investments needed to limit global average temperature rise and pursue efforts to limit the temperature increase to 1.5 degree Celsius globally.

To build on the momentum of the Paris Agreement, the federal government developed a comprehensive climate action plan, the Pan-Canadian Framework on Clean Growth and Climate Change (2016) in collaboration with provinces and territories, and in consultation with Indigenous peoples. This Framework is a guiding document for Canada to meet its emissions reduction targets, grow the economy, adapt to, and build resilience to a changing climate. The Framework has four main pillars:

- **Pricing carbon pollution** to encourage transition from fossil fuels to low-carbon solutions, drive innovation and energy efficiency to reduce GHGs;
- **Complementary climate actions** such as tightening energy efficiency standards and codes for vehicles and buildings;
- **Adaptation and resilience** to ensure communities are adequately prepared for climate risks like extreme weather events;
- **Investments** in clean technology, innovation and jobs to support a strong economy.

Carbon pricing is one of the key elements for municipalities to consider as a means of accelerating the transition away from fossil fuels. Under the Greenhouse Gas Pollution Pricing Act (GGPPA), the price of carbon pollution is expected to rise by $15 per year, from $65 per tonne of CO_2e in 2023 to $170 per tonne of CO_2e in 2030. Considering this additional cost to maintain assets, municipalities need to phase out the use of fossil fuels and accelerate their transition toward cleaner energy sources.

The Province of Ontario has implemented the Made-in-Ontario Environment Plan and is taking significant steps to protect natural resources and lower greenhouse gas emissions, while helping communities adapt to a changing climate. Investments in clean energy systems and renewable technologies are at the forefront as the province takes meaningful action to progressively transition from fossil fuels and boost the local economy. As a part of this plan, and consistent with the federal approach, the province has also deployed an Emissions Performance Standards program to regulate GHG emissions from large polluters such as industries, requiring them to either reduce their emissions, or pay for exceeding the limits established.

Corporate Energy & Emissions – Vision and Goals

The City of Stratford is committed to advancing strategies and energy efficient practices that reduce greenhouse gas emissions for all corporate operations including facilities, fleet, and equipment, in a fiscally responsible manner.

Transforming the way we use energy is key to reducing our corporate emissions. Ontario's energy mix includes low carbon sources including nuclear energy (55%), hydro power (23%), wind power (9%) and solar power (2.5%) all of which emit relatively lower GHGs. As depicted in Figure 2, natural gas, a fossil fuel, powers approximately 8% of Ontario's energy needs.

As several areas of municipal operations are still powered by fossil fuels, this plan will set out a pathway toward decarbonization, enabling the City to seek opportunities for

reducing energy consumption, emissions reduction and shifting to low carbon sources of energy as feasible to improve long term environmental performance.

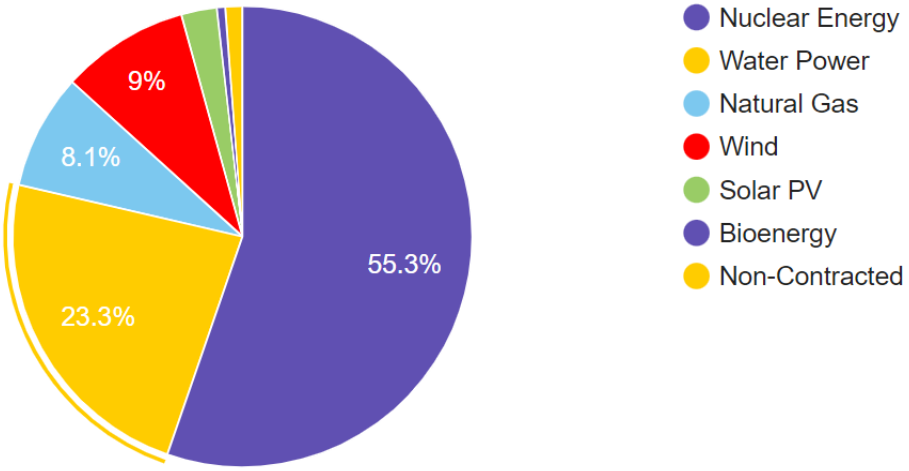

Figure 2 Ontario-Wide Electricity Supply Mix: 2021 Data

Source: Ontario Energy Board – Overview of Energy Sector

As noted in Table 1, electricity derived from hydropower has a significantly lower carbon intensity, or amount of GHG emitted per unit of electricity produced. In comparison, natural gas has a much larger carbon footprint per unit and resultant GHG emissions.

Table 1 Comparison of carbon intensity for energy sources in Ontario[3]

Energy type	Energy source	Estimated GHG emissions (tCO_2e) per 1000 units
Electricity	Renewable hydropower	0.028 tCO_2e per 1000 kW
Natural Gas	Non-renewable fossil fuel	1.921 tCO_2e per 1000 cu. m.

Objectives of Corporate Energy and Emissions Plan

The purpose of this Plan is to demonstrate continued leadership in taking actions on climate mitigation and define the best path forward using technological advancement and knowledge. The climate action targets set the level of actions needed over the near term and longer term. The Plan provides a framework consisting of a set of measures for implementation. Given the complexity and uncertainty of projecting future emissions

[3] Carbon intensity per unit of energy produced by electricity in Ontario (year 2020) is 25g CO_2e/kWh
Carbon intensity per unit of energy produced by natural gas in Ontario (year 2020) is 1921g CO_2e/m^3

and technological changes, this document should be considered a living document and the actions should be regularly reviewed and revised by Staff based on current technologies, new conditions (e.g., new asset acquisition) or changes to provincial government policies and presented to Council.

Energy and Emissions Inventories

The Corporate Energy Conservation and Demand Management Plan of 2014 considered a baseline year of 2011 and measured energy usage from city facilities and infrastructure including parks, outdoor lighting and water and wastewater.

This renewed Corporate Energy and Emissions Plan (CEEP) will track emissions from city-owned and operated asset classes that are consistent with the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) recommendations. The asset classes include civic buildings, fleet, outdoor lighting, solid waste, municipal airport and water and wastewater infrastructure.

Emissions data for CEEP is gathered and estimated from the year 2017 and is consistent with Stratford's community emissions baseline in order to have a current and accurate representation of city-wide emission levels to date. Not all data is readily available, however, considering the need to align with Intergovernmental Panel on Climate Change (IPCC) recommendations to measure Scope 1 and Scope 2 emissions (at a minimum) from baseline year of 2010, some corporate emissions data has been *estimated* based on the regression analysis technique and the 2011 inventory.

For an accurate representation and analysis of all corporate wide emissions moving forward, a comprehensive inventory has been established with the 2017 baseline for all six asset classes identified.

The total corporate emissions for 2010 are *estimated* to be 7,593.32 tCO_2e and for 2017 are *quantified* as 5,114.41 tCO_2e.

2017 Corporate Emissions

The corporate emissions inventory from 2017 indicated that the total GHG emissions from all asset classes of corporate operations was 5,114.41 tCO_2e. Civic buildings, including airport buildings generated the largest quantity of GHGs (2,529 tCO_2e) followed by fleet which emitted 1,902.25 tCO_2e (Table 2). Reductions in observed emissions are largely attributed to the updated conversion factors for gasoline, diesel, and electricity as set by the Province annually.

Table 2 GHG Emissions Inventory

Asset Class	2011 GHG Emissions (tCO_2e)[1]	2017 GHG Emissions (tCO_2e)	% City Assets GHGs (2017)
Buildings	4,270.311	2,251.82	42%
Fleet	2,050	1,902.25	36%
Outdoor Lighting	810	719.75	14%
Solid Waste	157	145[2]	3%
Water and Wastewater	125	57.18	~1%
Municipal Airport	38.4[2]	50.5	~1%
Total	**7,693.32**	**5,114.41**	-

Note 1. 2011 Data provided for information purposes. Using 2017 as baseline year is based on quality and quantity of data available.

Note 2. Estimated emissions

Buildings

Civic buildings used for service delivery of approved City services include 18 facilities which are powered by a mix of hydropower and natural gas (Table 3). The corporate GHG inventory includes all city-owned facilities (Table 4). Facilities leased to third parties were excluded from this analysis.

Figure 3 William Allman Arena

Building emissions resulting from electricity and natural gas consumption account for approximately 42% of the City's total GHG emissions. A majority of these emissions result from on-site combustion of natural gas for space heating followed by electricity consumption.

Although electricity consumption is not responsible for the majority of emissions, it is imperative that the City recognize the importance of energy efficiency as a way to reduce operational and equipment maintenance costs. Savings through energy efficiency retrofits can further fund fuel switching efforts, which in turn will continue to reduce the City's emissions.

Table 3 Buildings Total Energy Consumption and Emissions, 2017

Asset Class-Buildings	Natural Gas Consumption (cu. m.)	Electricity Consumption (kWh)	GHG Emissions (tCO2e)
Total Energy Consumption	560,125	58,930,865	2,252

Table 4 Buildings – 2017 Breakdown of Energy Consumption and Emissions

Asset Class	Natural Gas Consumption (cu. m.)	Electricity Consumption (kWh)	GHG Emissions (tCO_2e)	Area (sq. ft.)	% of Total Building Emissions
Avondale Cemetery	8,118.98	25,523.54	15.8	5,535	1.24
Boathouse Information Centre	3,612.24	16,643.84	7.12	335	0.56
City of Stratford Annex Building	22,339.61	342,240.00	48.16	26,054	3.8
City of Stratford City Hall	**45,561.82**	**384,160.00**	**92.79**	**23,400**	**7.31**
Community Services	11,017.40	20,927.10	21.20	3,064	1.67
Dufferin Arena	**39,973.43**	**405,840.00**	**82.60**	**35,000**	**6.5**
Fire Station #1	10,677.40	55,786.86	21.16	7,292	1.6
Fire Station #2	7,438.82	28,331.75	14.56	4,832	1.14
Police Station	**28,929.65**	**376,560.00**	**61.21**	**28,800**	**4.82**
Public Library	21,562.74	205,306.12	44.32	17,202	3.49
Queens Park Snack Bar	-	19,866.30	41.65	7,275	0.02
Rotary Complex	**225,479.35**	**1,906,039.20**	**459.27**	**155,600**	**36.1**
Tourism Alliance	8,898.10	31,900.00	17.38	5,610	1.3
Transit Garage	26,009.16	131,722.97	51.45	12,640	4.05
Wastewater	1,371.43	3,278,434.00	59.30	-	4.67
Water	-	1,831,445.00	31.68	-	2.5

Asset Class	Natural Gas Consumption (cu. m.)	Electricity Consumption (kWh)	GHG Emissions (tCO_2e)	Area (sq. ft.)	% of Total Building Emissions
William Allman Arena	**92,675.43**	**715,140.69**	**187.59**	**38,610**	**14.77**
Youth Focus Centre	6,459.20	24,362.27	12.64	3,500	1

* Note: Facilities in **bold** are the largest GHG emitters. Fun fact cost of hydro 14c/ and water wastewater is $\$3/m^3$

Vehicle and Equipment Fleet

Vehicle and equipment fleet (termed collectively as "fleet") includes all motorized vehicles and equipment operated by the City. Corporate fleet is predominantly comprised of light, medium and heavy-duty vehicles. Emissions from fleet are the second largest source of GHG emissions after buildings, representing approximately 36% of the City's total emissions. In 2017, the City's vehicles emitted 1,902 tCO_2e (Table 5). These emissions were primarily from the use of diesel and gasoline. Currently, ethanol that is purchased has a 10% blend and diesel has a 0% blend.

Figure 4 Public Works' hybrid truck

Table 5 Fleet – Energy Consumption and Emissions, 2017

Fleet – by Sector	Gasoline Consumption (L)	Diesel Consumption (L)	GHG Emissions (tCO_2e)	% of Total Fleet Emissions
Community Services, Water	250,000	420,000	1,703.1	89%

Engineering, Public Works				
Police	86,211.37	-	199.15	11%
Total	336,211.4	420,000	1,902.25	-

Notes: GHG emissions from fleet controlled by the City's external partners are not counted toward the 2017 corporate inventory as these emissions are not in direct sphere of influence of the City.

Emissions from fleet use (along with facility energy use, equipment use and outdoor lighting) at the municipal airport have been accounted for within the Airport section.

Off-Road Equipment

Off-road equipment includes some medium-duty vehicles (MDV), heavy-duty vehicles (HDV) and equipment not used on streets. It may range from snowplows, mowers, trucks, tractors, and chippers to hand-held devices such as those used for landscaping and maintenance. Some of this equipment is electric powered.

Figure 5 Electric ice resurfacer in use

This asset sub-class is anticipated to be challenging to transition in comparison to light-duty vehicles (LDV), including their high initial capital cost and current technology constraints.

The City recognizes that this is a dynamic area and will follow provincial and federal direction and regulation.

Outdoor Lighting

The majority of energy consumed in this asset class is related to streetlights and traffic lights. Other lighting assets include ornamental lighting, lighting used for parks, arenas, and sports fields. The emissions inventory for this asset class in 2017 amounted to 719.75 tCO_2e (Table 6). Most lighting accounts are metered which provide actual electrical consumption. For those assets billed under flat-rates, consumption is estimated (e.g., overhead street lighting, traffic signals).

The lighting asset class has been greatly influenced by changes in carbon intensity from Ontario's electrical power generation, and GHG emissions conversion factor. As a result,

the asset class experienced a decrease in emissions by approximately 91 tCO_2e between 2011 and 2017 and consumption was reduced by 25%.

All traffic signals and streetlights are well into the process of being converted to LED lights from high pressure sodium (HPS) and metal halide. Upgrades to outdoor lighting within the municipal airport are also planned.

Table 6 Outdoor Lighting – Energy Consumption and Emissions, 2017

Energy type	Consumption (kWh)	GHG Emissions (tCO_2e)
Electricity	2,879,039	719.75

Solid Waste

The City of Stratford owns and operates the City's Landfill under the Ministry of Environment (MOE) Certificate of Approval No. A150101. The landfill receives non-hazardous waste generated within the city from residential, industrial, commercial, and institutional (ICI) sectors. The site has provisions for composting (leaf and yard waste), processing construction waste (concrete crushing and recycling) and accommodates a recycling depot for plastic, glass, cardboard, textiles, electronic waste and batteries. Most recyclables received are segregated and transported off-site for processing.

In 2017, the city generated 81,812.09 tonnes of solid waste materials; this amount includes waste from all waste streams including but not limited to: general waste, recyclable material (concrete asphalt, cardboard, metal), organic (food scraps, leaf and yard waste), electronic waste and hazardous waste (contaminated soil, asbestos). Out of this overall tonnage, 21,697.92 tonnes were considered Municipal Solid Waste (MSW) and sent to landfill. 305 tonnes of the MSW were produced by the City's corporate facilities; waste generated by the City corporate buildings will be further referred to as corporate waste. Resultant emissions from corporate waste in 2017 equaled 145 tCO_2e.

Waste generated at public buildings such as Rotary Complex, William Allman Arena and Agriplex Facilities are considered Scope 3 emissions and were excluded from this analysis.

Table 7 Solid Waste – Comparison of GHG Emissions Generation from Corporate Waste

Year	Waste Generation (tonnes)	GHG Emissions (tCO_2e)
2011*	325	157
2017	305	145

*Emissions from 2011 have been estimated from a study conducted by Consultant in 2005.

Emissions from Landfill

The City reports landfill gas collection (LFG) to the Ontario Ministry of the Environment, Conservation and Parks on an annual basis. LFG is collected and managed in compliance with all applicable regulations and combusted in-site via the installed enclosed flare.

GHG emissions reductions from the landfill are fairly consistent since the past 5 years. Aligning with federal direction to reduce global methane emissions by 30% below 2020 levels by 2030, the Stratford landfill will aim to capture more of the methane that is generated on-site. Actions to reduce generation and increase diversion of biodegradable waste (the source of landfill methane) are also needed to achieve longer-term landfill methane emission reductions. In a circular economy, biodegradable wastes and waste emissions are processed to increase their value as they are transformed to raw material for products such as fertilizers, soil supplements, and renewable energy.

Water and Wastewater

The majority of the energy consumed in the asset class of water and wastewater is a result of motors that drive water sanitary and storm sewer pumps. City assets include 11 sanitary pumping station, 1 stormwater pumping station, 11 water production wells and 1 water pollution control plant. Energy is primarily derived from hydropower, or electricity and is therefore relatively low in emissions. Overall, for the water and wastewater asset class, 3,091,339 kWh (11,129 GJ) of electricity was consumed in 2017 which resulted in the generation of 57.2 tCO_2e (Table 8).

Table 8 Water and Wastewater – Energy Consumption and Emissions, 2017

Energy type	Consumption (kWh)	Energy Costs ($)	GHG Emissions (tCO_2e)
Electricity	3,091,339	504,922.20	57.20

Municipal Airport

The emissions generated as a result of airport operations (Scope 1 and Scope 2) including building energy usage, maintenance equipment, lighting and fleet usage have been considered. Emissions from fuel usage, which comprise Scope 3 emissions[4] that the City has no jurisdiction over, are not being considered in the CEEP. Data from fuel usage and resultant emissions has been captured (2012 to present) and will be available for analysis should there be direction to include Scope 3 emissions in future inventories.

[4] Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects in its value chain. Scope 3 emissions include all sources not within an organization's Scope 1 and Scope 2 boundary.

Figure 6 Stratford Municipal Airport

The Airport utilizes a mix of fuel sources. Diesel is used primarily for fleet and equipment use, electricity consumption accounts for the airfield lighting and power needs of the airport buildings, fuel pumping system, etc. Natural gas consumption is limited to the heating of airport buildings.

GHG emissions are generated through the operation of the mobile equipment fleet, natural gas consumption from the terminal building and maintenance garage, and electricity required provide power to the terminal building, fuel system, airfield lighting, and other draws.

As shown in Table 9, in 2017, the operation of the Airport's mobile equipment fleet generated between 5 and 7 metric tons of CO_2 emissions; electricity consumption generated approximately 2 metric tons of CO_2 emissions; and natural gas usage generated between 31 and 42 metric tons of emissions. Cumulatively, it is estimated that the operation of the mobile equipment fleet and buildings at the Airport generated between 38 and 50 metric tons of CO_2 emissions. In comparison, 2021 saw a slight increase in operational emissions generated from the municipal airport and equaled approximately 50.5 tCO_2e.

Table 9 Municipal Airport Operations –Energy Consumption and Emissions

Year	Category	Input Metric	GHG Emissions (tCO_2e)
2017	Diesel Fuel Consumption	1,930 L	5.2
2017	Electrical Consumption	74,830 kWh	2.1
2017	Natural Gas Consumption	16,182 m^3	31.1
-	-	Total for 2017 (*estimated*)	38.4

2021	Diesel Fuel Consumption	2,512 L	6.7
2021	Electrical Consumption	77,101 kWh	2.2
2021	Natural Gas Consumption	21,626 m^3	41.5
-	-	Total for 2021 (*quantified*)	50.5

*Emissions from 2017 have been estimated based on 2020 and 2021 data derived from a study conducted by Consultant in 2022.

Greenhouse Gas Emissions Profile 2017 – 2022

Data collated and analyzed from 2017 to 2022 suggests a consistent trend in energy use throughout all asset classes, with an overall decrease of 9% over this period.

As depicted in Fig. 7, buildings account for the most energy use and resultant GHG emissions, followed closely by fleet. The profile also indicates a consistent trend in solid waste generation and resultant emissions. Energy use by outdoor lighting depicts a gradual decrease with ongoing city-wide lighting replacement to LEDs. Emissions generated from the municipal airport operations also follow a consistent trend. Energy consumption in the water and wastewater sectors is primarily from electricity – therefore even though consumption is the relatively higher (in terms of kWh), resultant emissions are the lowest for this asset class.

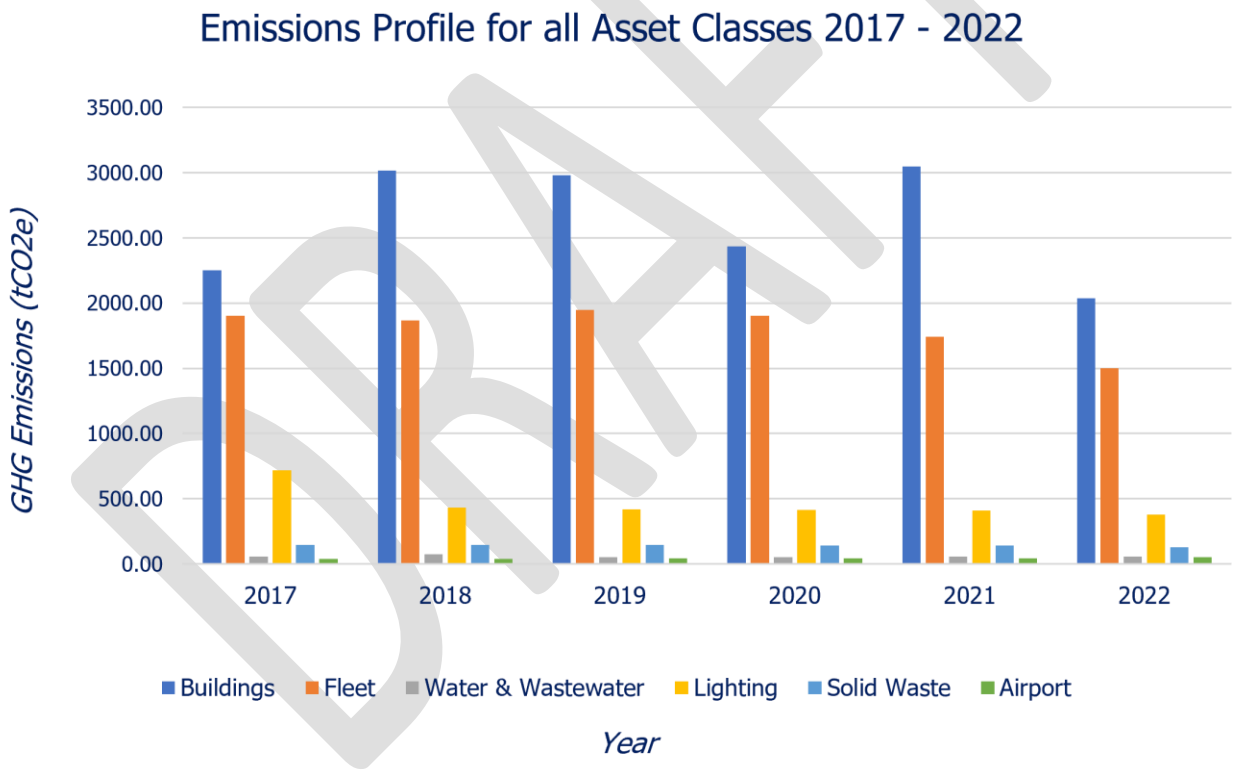

Figure 7 Corporate Emissions Profile 2017 to 2022

Setting the Target and Forecasting

The City's climate emergency declaration stipulates a corporate GHG reduction target of 30% below 2017 emission levels of 5,114.41 tCO_2e by 2050, which sets 3,580.09 tCO_2e as the maximum allowable emissions in 2030 from all corporate asset classes. This goal

will be made more challenging as reductions in GHG emissions will need to include those emissions associated with anticipated growth (Table 10).

A *business as usual* (BAU) scenario forecasts the rising level of emissions from expanding City services and infrastructure to meet population growth demands, without aggressive corrective action taken. Forecasting the quantity of corporate GHG emissions that will need to be reduced by 2030 and 2040 needs to account for those emissions associated with projected growth of City assets and services. An emission trend line can be extrapolated from 2017 data to 2030 assuming an annual growth rate of 3-5% in services for fleet, inclusion of contracted services emissions and forecasted growth of other asset classes.

In a BAU scenario, when no measures are taken to reduce energy consumption or emissions, the City's corporate emissions inventory in 2030 would rise to approximately 5,574.70 tCO_2e. This value represents the quantity of emissions in 2017 (5,114.41 tCO_2e) plus the growth in the BAU scenario of approximately 9% over all sectors annually (460.29 tCO_2e).

To reach the target of 30% reduction in GHG emissions below 2017 levels (3,580.09 tCO_2e) by 2030, the City will need to implement energy measures or initiatives that reduce GHG emissions by at least 1,534.32 tCO_2e. Similarly, it is recommended that the City establish interim targets of 60% reduction by 2040, leading up to the net-zero target of 2050. This translates to reduction of 3,068.64 tCO_2e and sets 2,045.76 tCO_2e as maximum allowable emissions for the year 2040.

Recognizing that some industries are challenging to decarbonize and best emissions reduction estimates rely on evolving technologies, there may be opportunity to lessen this gap and adopt new mechanisms including but not limited to carbon offsets and carbon capture to achieve near-zero emissions.

Table 10 Milestones for corporate emissions reduction

Milestone Year	Targets (2017 baseline)	GHG Emissions Required Savings (tCO_2e)	Maximum/ Allowable GHG Emissions (tCO_2e)
2030	30% reduction	1,534.32	3,580.09
2040	60% reduction	3,068.64	2,045.76
2050	100% reduction, or net zero	5,114.41	0

Other Emissions (Scope 3 emissions)

Due to the lack of accurate data for emissions related to activities such as those from employee commuting, business travel and leased assets, Scope 3 emissions have been

omitted from the current BAU projections. While local governments are not currently accountable for emissions in these areas, specifically Scope 3 emissions, including them in monitoring frameworks, inventories and reduction strategies demonstrates leadership and accountability.

In the future, should federal and provincial reporting requirements change to incorporate a larger scope of emissions, local governments that have systems in place to track emissions in these areas will be in a position to provide accurate data and reporting. Some data within Scope 3 (e.g. estimated emissions from employee commuting, fuel usage at the airport, energy usage at leased assets) is readily available and can be tracked annually.

The City will initiate the development of monitoring and reporting procedures to expand the scope of emissions included in the corporate emissions profile. Continuous review and adjustments to the BAU scenario will result from these activities.

Looking Ahead

It is critical for both City Council and Staff to understand that many of the decisions we make now will have a direct and/or indirect impact on corporate emissions. This impact may influence our ability to achieve our stipulated climate goals for 2030 and beyond. It is therefore imperative that all decisions made for City projects, initiatives, procurement, policies, and plans be examined through a stringent climate lens, and identified solutions be low carbon or zero-carbon as feasible.

Recognizing technology-related and feasibility constraints, some of these decisions may also not directly support a 100% transition to zero-carbon fuel. It is important to account for such a scenario within the decision-making process, and a realization that alternatives (including future technologies) may need to be considered to achieve such goals. For example, exploring purchase of carbon credits, carbon capture, initiatives that offset credits such as renewable energy certificates (RECs), any GHG emissions produced are offset by renewable energy (either generated onsite or purchased) etc.

The City's Procurement Policy update that is currently under review will support and inform such decision making.

Energy and Emissions Reduction Opportunities

Emissions reduction measures presented in this section will help the City meet its adopted corporate climate emergency GHG emissions target of 3747.10 tCO_2e (30% reduction below 2017 levels) by 2030, advance toward interim targets leading up to carbon neutrality by 2050, and support CEEP vision and goals.

Refer to Appendix A for a summary of recommendations to advance decarbonization in all asset classes.

Buildings

New Buildings

Aim for green building certification for all new buildings constructed. In cases where certification is not attainable due to financial implications, integrate energy efficiency measures from leading green building rating systems, and/or industry best practice for energy efficient, high-performance buildings including but not limited to Energy Star, Building Owners and Managers Association's Building Environmental Standards (BOMA BEST), Leadership in Energy and Environmental Design (LEED), Passive House as relevant, in all new construction commissioned by the City.

Following are some strategies to consider in building design and construction –

- When starting a new project, project teams to reach out to the respective Facilities Manager and/or Climate Change Program Manager for guidance and support. For larger projects retaining a Consultant for support is recommended.
- Integrate passive design strategies appropriate for the facility, with a focus on energy efficiency and load reduction.
- Use an air-tight building envelope to prevent energy loss through gaps or cracks.
- Install efficient mechanical systems. Where possible, consider electric heating and cooling systems including heat pumps.
- Install energy efficient appliances such as those Energy Star rated.
- Consider installing renewable energy components e.g., photovoltaic panels.

Figure 8 Britannia Street Housing Project

Britannia Street Housing Project is one of the City's new builds that are being commissioned to integrate elements of energy efficient design, as stipulated by the Passive House standard.

Existing Buildings

It is recommended that ASHRAE energy audits (Level 1[5] at a minimum) be conducted for all major facilities to identify deficiencies in the building envelope, heating systems and a detailed energy assessment. The criteria for selection of facilities for energy audits and upgrades can be a) align with the City's 5-year capital upgrade plan and b) those with largest carbon footprint. Planned upgrades can include the following strategies –

- When starting a new project, project teams to reach out to the respective Facilities Manager and/or Climate Change Programs Manager for guidance and support. For larger projects, retaining a Consultant for support is recommended.
- Address drafts and air infiltration through insulation upgrades and weatherstripping gaps and cracks in the building envelope to reduce heating (and cooling) loads.
- Installing building automation system (BAS) controls such as occupancy sensors and thermostats.
- Lighting upgrades to LEDs.

[5] ASHRAE Level 1 is a basic evaluation performed to identify glaring energy problems. It comprises a basic walk-through assessment, review of utility bills and other applicable operating data, and interviews with operations staff.

- Mechanical system upgrades to energy efficient options and electric options where viable.

In order to realize deeper retrofit opportunities, an ASHRAE Level 2 or 3 audit[6] or study should be conducted on those facilities with the largest carbon footprint, as identified in preliminary energy studies and review of utility charges.

The City undertakes several maintenance and facility upgrade projects each year to address operational needs and deferred maintenance. As part of these activities, Staff will need to evaluate whether proposed equipment or systems upgrade would contribute to an enhanced corporate carbon footprint or would alternatively improve energy and emissions reduction performance. A protocol will need to be developed to ensure this evaluation is captured before the project commences.

Fleet

The growth of corporate fleet in response to increased service levels is anticipated to be a continual challenge to reduce the City's overall corporate emissions. The City continues to work towards eliminating the dependence on fossil fuels and will monitor the progress of new technologies that allow it to do so.

The City has been monitoring fossil fuel consumption and reduced resultant GHG emissions through implementation of several initiatives such as installation of telematics global positioning system (GPS) in fleet, advancing investments in hybrid vehicles[7] and future proofing infrastructure with phased installation of EV chargers.

[6] ASHRAE Level 2 audit builds on the Level 1 analysis with more detailed energy calculations and added financial analysis of proposed energy measures. This level of audit uses utility data over a longer period of time so that the auditor can better understand the building's energy use.

ASHRAE Level 3 audit builds on the Level 2 audit by doing a more in-depth analysis of energy use in the building. This can include sub-metering of major energy systems.

[7] Hybrid-electric vehicles, or hybrids, use both a conventional internal combustion engine and an electric motor, which is more energy efficient than a conventional powertrain, especially in city driving. Hybrids have battery packs that are charged with electricity generated by the vehicle, and need no charging equipment like electric vehicles do.

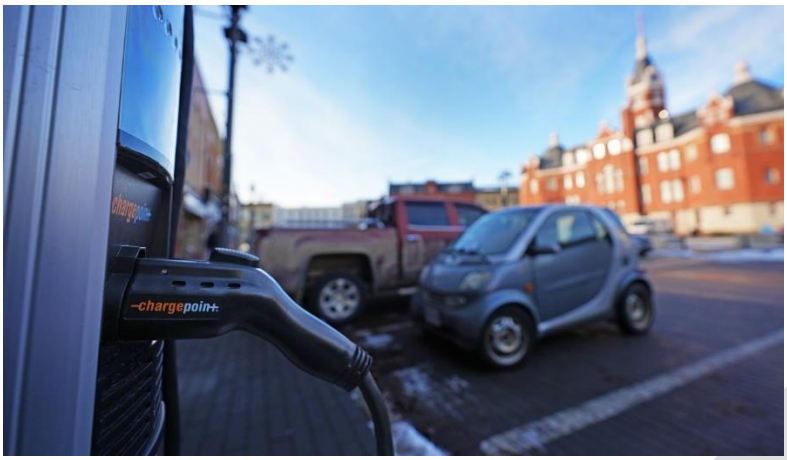

Figure 9 Electric charging station at Market Square

A suite of measures has been identified for the fleet asset class to help reduce GHG emissions. These measures will improve the efficiency and utilization of its fleet assets and encourage travel by non-auto modes. Although the City's fleet is projected to increase by 3-5% over the next 10 years, the most prominent action to counterbalance this increase will be the switch from fossil fuels to electric power. Even with recent advancements in electric vehicle (EV) technology, there is uncertainty associated with availability and delivery timeline of EV models for medium and heavy-duty applications for reliable City operations. Some of the biggest challenges to electrify the fleet are related to electrical capacity and high costs of installing charging infrastructure.

The Green Fleet Roadmap in Appendix B illustrates measures that should be implemented over a 10-year period. These measures will be reviewed and updated periodically to consider new technological advancements and ensure the roadmap is relevant for the City and its requirements. Ongoing actions are outlined below.

- Procurement of vehicles in the future to be hybrids, plug-in hybrids, and electric vehicles subject to availability.
- Install EV charging infrastructure and associated upgrades, projects may be included as part of facilities.
- Monitor the potential use of non-fossil/renewable fuels (e.g., EV) for the City's heavy-duty fleet and purchase vehicles, as applicable.
- Phase out the use of fossil fuels in hand-held equipment (e.g., landscaping).
- 100% of fleet renewal after 2035 must be electric or other low carbon fuel such as hydrogen (subject to technological improvements).

Water and Wastewater

The amount of energy consumed in this asset class relative to the total amount consumed by the City is considerably low (approximately 1.07%) with the majority consumed by drainage and liquid waste pump stations. There are minimal options to reduce consumption in this asset class, and it is expected that future annual usage will be consistent with growth. As this asset class is powered through hydroelectricity and not fossil fuels, resultant emissions are lower than other asset classes (with a similar energy use profile that may be a mix of fossil fuels and hydro). Actions are outlined below.

- Upgrade Pumps to Higher Efficiency Pump Systems as part of lifecycle replacement.
  As wastewater flow increases or pump stations age, pumping equipment will need to be replaced. Replacements will include higher efficiency units that are equipped with self-monitoring features and variable frequency drives. These features prevent overheating motors and minimize energy consumption.
- Ongoing installation of variable frequency drives (VFDs) in most sites, with funding from IESO. Planned installation of VFDs on future pump station upgrades. With consideration being given to any future pump station upgrades to ensure VFDs are installed at any sites that do not currently have them.
- Promote user reduction.

Outdoor Lighting

The majority of energy consumption in this asset class is from streetlights and traffic signals. Streetlights have been converted to LED (light emitting diode) technology on an opportunistic basis. LED technology is evolving and has advanced to a stage where LED installations can translate to significant energy savings through reduction of approximately 30 – 40% in electricity consumption compared to conventional lighting such as high pressure sodium (HPS) and metal halide lights. LED luminaries also have a longer service life than counterparts, and result in lower maintenance and replacement costs.

Since 2014, the City has collaborated with Festival Hydro to switch streetlights city-wide. This Plan will provide clear direction and consistency for the use of LED lighting, including overhead lighting at facilities under the purview of the City, such as the Municipal Airport.

Solid Waste

The City of Stratford owns and operates the City's Landfill under the Ministry of Environment (MOE) Certificate of Approval No. A150101. The landfill receives residential waste, industrial, commercial and institutional waste (ICI) nonhazardous wastes generated within the city including demolition materials, recyclable waste, electronic waste and yard waste.

In addition to introducing and implementing community-wide programs (e.g., Blue Box program for residential and commercial recycling, green bin program, textile diversion program etc.) for residents, the City has also implemented initiatives for corporate facilities with the goal to track, reduce waste generation and increase waste diversion. Efforts have been directed toward waste segregation into three streams including general waste, mixed recyclables, and organic waste. While general waste is disposed of in the landfill, mixed recyclables are processed by a waste contractor off site. Leaf and yard waste is composted on-site, and other segregated organics (from the Green Bin program) are anaerobically digested through a third-party processing facility.

Municipal Airport

The City owns and supports the operations of two buildings at the Airport: the terminal building and maintenance garage. Based on a review of a Consultant study (April 2023) and a site visit conducted by the CCPM and Manager of Airport Operations, the following recommendations will tie into the CEEP over a medium to long term (approximately 5-10 years) time period.

Recommended building envelope improvements include window replacements to high-performance assemblies, indoor lighting upgrades to light emitting diodes (LEDs), replacement of outdoor lighting, or floodlights to LEDs, installation of occupancy sensors in common areas, and washroom upgrades to water saving fixtures and faucets. It is recommended that an energy audit be conducted for this building and related costs to upgrade airport facilities be considered in upcoming annual operating budget.

Additionally, four units of mobile equipment fleet are owned by the City. These are expected to reach the end of their useful service lives, the procurement of new or used/surplus units will be required to ensure that all maintenance and operational tasks can continue to be performed appropriately. It is recommended that all equipment be replaced with low-carbon options such as those powered by electricity, at the end of their service life.

The following buildings are excluded from this Plan: private hangars on leasehold lands and the sprung structure erected by Stratford Air Services adjacent to the maintenance garage.

Stakeholder Engagement Process

This Plan has been developed in ongoing collaboration with a corporate, interdepartmental internal working group (Climate Change Working Group- CCWG) that was established in 2022 to identify and oversee energy efficiency improvements for the City. The CCWG members are identified as key internal stakeholders and periodically report status of ongoing projects to the Corporate Leadership Team (CLT). The group meets every three weeks to discuss progress on climate action planning and implementation of identified strategies within the corporate realm. Staff members also share relevant funding opportunities, opportunities to enhance knowledge, and recent technological advances.

The CCWG consists of key staff from different departments, including Infrastructure and Development Services, Transit and Fleet, Facilities, Clerks Office, Fire Department, and the local distribution company (LDC), Festival Hydro Inc. The corporate energy and emission management governance structure is shown in Figure 10.

Figure 10 Corporate Governance Structure and CCWG

Project Prioritization and Decision-Making Tools

A systemic view of climate action will enable project teams to consider a three-pronged approach during the decision-making process, relating to:

a. Emissions reduction potential: Does the investment or action measurably reduce corporate and/or community emissions, and help advance carbon reduction goals?
b. Financial implications: Does the investment or action objective speak to life cycle costing and provide expected return of investment over the service life of the project?
c. Co-benefits: Does the investment or action advance community sustainability goals (related to One Planet Principles) such as health, equity, biodiversity and economic savings and development?

This approach demonstrates that adaptation and mitigation are two sides of the same coin; both are proactive responses that aim to minimize the risks of climate change and build resilience into the future.

Staff should ensure that a climate lens is embedded in all interdepartmental work, such as projects and programs, and quantified within budgets, for example climate impacts for capital and operating expenses. The implementation of the recommended actions and their effectiveness in achieving the vision and targets of the plan will be monitored and evaluated through the monitoring, evaluation, and reporting system (e.g., key performance indicators, measured annually).

Mechanisms for Change

It is anticipated that there will be three mechanisms that drive change; funding, project synergies and necessary accomplishments. It is *critical* that necessary accomplishments be identified early to allow flexibility on how change is made, which can be determined in three main steps.

1. Identifying where emissions are being generated.
2. Conducting an audit to determine what assets create emissions and by how much.
3. Listing recommendations reduce or eliminate emissions altogether.

To illustrate this as an example we can use civic buildings. Through our analysis it has been established that buildings are the largest emitters by generating 2,251 tCO_2e in 2017. An audit was conducted on all facilities (See Table 4) resulting in an analysis of the annual consumption of hydro and natural gas, and the corresponding emissions generated. The next step in this process would be conducting an ASHRAE Level 2 audit

for all facilities. This study will outline what specific assets are generating emissions, and mitigation options. The list of potential projects created can be used in the 10-year capital budget forecast, which can be adjusted based on other ongoing projects within the City and adjustments made on potential funding streams.

Sustainable Procurement

The City's Procurement Policy and procedures are currently being updated and will integrate a sustainability lens in all purchasing decisions. It is expected to clearly articulate goals and set expectations for contractors and suppliers around environmental sustainability and include consideration of environmental elements such as energy and emissions, end of life considerations when purchasing goods and services.

Monitoring and Reporting (KPIs)

Ongoing monitoring and reporting are integral components of organization-wide energy management. Tracking consumption and emissions can help assess the City's progress, better understand how energy is consumed and demonstrate the value of projects. The City is currently monitoring and reporting corporate energy consumption and emissions annually to the Province, and streamlined monitoring is anticipated to be done internally as well.

A more comprehensive review of the CEEP will be conducted every 3-5 years to ensure that the City is on track to meet its targets. The review may include changing and adding reduction strategies as necessary and ensure resources needed to reach the goals are included in the next 5-year capital planning process. A more comprehensive analysis of cost savings and GHG emissions reduction related to projects implemented should also be considered.

Key priorities identified through a staff survey, interviews with department leads and an internal working group have helped inform this Plan and relevant Key Performance Indicators (KPIs). The following proposed KPIs (Table 11) will enable staff to measure and quantify progress toward our emissions reduction targets and may need to be revisited based on progress of initiatives.

Table 11 Proposed KPIs for tracking corporate emissions.

Sector	Key Performance Indicator (KPI)	Proposed Measure
Energy	For Buildings: Energy consumption and GHG impact of	• Number of new facilities built to a green building standard or

Sector	Key Performance Indicator (KPI)	Proposed Measure
	retrofits and new buildings as applicable	similar; energy audits and building upgrades (mechanical system, building envelope, lighting)
Energy	For Fleet: Fleet conversion to using low carbon fuel (HEV, PHEV, EVs)	• Number of corporate vehicles transitioned to low carbon fuel • Number of new EV chargers installed for corporate use (L2 and L3)
Water	Water use in City facilities	• Facility water usage, expressed in liters, annually per capita • Facility improvements to include water saving mechanisms • Quantity of water reclaimed and reused in City facilities
Waste	Percentage of corporate waste diverted from landfill annually through reuse, repurpose, recycling or composting	• Annual waste generated by buildings or facility within scope • Percentage of waste diverted from landfill a. Transferred to recycling facilities (tonnes) b. Food waste/leaf and yard waste generated and composted (tonnes) • For new builds, total quantity (tonnage) and percentage of construction and demolition (C&D) waste diverted from landfill
Materials	Estimated embodied carbon of buildings (Kg CO_2e/m^2) annualized over the anticipated lifespan of the buildings (e.g., 60 years)	• Embodied carbon reductions of 10% for all new Part 3 buildings, and 20% for new Part 9 buildings (low-rise) • Consider achieving the following in new builds and major renovation projects: Design for disassembly Sustainable sourcing of wood, concrete, or steel Higher recycled content (%) in concrete mix, steel, asphalt as compared to generic material Disclosure of chemical ingredients of building products;

Sector	Key Performance Indicator (KPI)	Proposed Measure
		At least 70% diversion of construction & demolition waste diversion

Appendix A: Summary of Strategies and Implementation Elements

Building Assets

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium/ Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
For existing facilities: Reduce Energy Demand – Any planned upgrades to include air-tight building envelopes, added insulation, weatherproofing measures. Improve Efficiency – Replacement of mechanical systems (HVAC) to energy efficient counterparts at the end of service life. Fuel Source – Explore opportunities to switch fuel source from carbon intensive fossil fuels to low carbon source, e.g., from natural gas-powered furnaces to electric heat pumps.	Buildings, Climate	> $ 500,000	>100 tonnes	Medium to Long term Ongoing	Yes	Explore funding opportunities through provincial and federal grants with municipal support

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium/ Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
For new developments: Apply the Ontario Building Code requirements and Passive/Net Zero principles without certification. Buildings to be designed utilizing the principles and energy efficiency considerations of leading green building rating systems including but not limited to Passive House, LEED, etc. Certification	Buildings, Climate	> $ 500,000	>100 tonnes	Long term Ongoing	Yes	Explore options to be funded through grants with municipal support
Conduct Level 1 Energy Study for all civic buildings to determine emissions reduction opportunities for existing buildings, and budget for Level 2 and 3 in Capital Plans.	All	~ $100,000 - 400,000	>100 tonnes	Ongoing	No	Municipal funding with support from grants e.g., Mayors' Megawatt Challenge

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium/ Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
Explore initiating a pilot project in collaboration with Community Services building/s to build to green building standards such as R-2000 energy efficiency, Energy Star for New Homes, EnerGuide Rating System, LEED, Passive House, or similar; with or without certification.	Varies	> $ 500,000	>100 tonnes	Ongoing	Yes	Municipally funded, funded through grants, financed
Consider developing parking spaces within all facilities (phased approach) to be EV-ready, for minimum L2 port operating at 208-240 V to future proof infrastructure.	Transit	~ $100,000 - 400,000	Not Applicable	Medium to Long term	Yes	Municipally funded with support from senior levels of government (e.g., NRCan)

Fleet Asset Class

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/Not Applicable	Funding Sources/ Mechanisms
Install EV charging infrastructure and associated upgrades for City fleet	Transit	> $ 500,000	>100 tonnes	Medium term	Yes	Funded through federal grants (NRCan) and municipal support
Purchase light duty EVs and equipment, as applicable to replace end of service life fleet	Transit, Public Works, Engineering, Water	> $ 500,000	>100 tonnes	Medium to Long term	Yes	Municipally funded, funded through grants
Transit fleet decarbonization	Transit	> $ 500,000	>100 tonnes	Medium to Long term	Yes	Municipally funded, funded through grants
Monitor the potential use of non-fossil fuel (low carbon, renewable) with lower carbon intensity options for the City's heavy-duty fleet, as applicable	Transit, Public Works, Engineering, Water	~ $100,000 - 400,000	>100 tonnes	Long term	Yes	Financed

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/Not Applicable	Funding Sources/ Mechanisms
Continue GPS tracking for fleet to identify fuel savings	Transit	Not Applicable	under 50 tonnes	Ongoing	Not Applicable	Not Applicable
Phase out fossil fuel vehicles at the end of their service life, as feasible. Consider replacement options to be electrically powered or low carbon fuel – EVs, plug-hybrids, hybrids.	All	~ $100,000 - 400,000	50-100 tonnes	Ongoing	Yes	Municipally funded, funded through federal grants

Water and Wastewater Asset Class

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
Upgrade pumps to higher efficiency pump systems as part of lifecycle replacement	IDS	~ $100,000 - 400,000	under 50 tonnes	Ongoing	No	IESO, other sources of funds, municipal top-up

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
Ongoing installation of Variable Frequency Drives in most sites Future pump station upgrades to install VFDs	IDS, Corporate Services	~ $100,000 - 400,000	under 50 tonnes	Ongoing	No	IESO, other sources of funds, municipal top-up

Outdoor Lighting Asset Class

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium/ Long term or Ongoing	Roadmap or Task Force required? Yes/No/NA	Funding Sources/ Mechanisms
Include LED lighting as part of upgrades to City-owned assets including sports arenas	Buildings, Festival Hydro	~ $100,000 - 400,000	50-100 tonnes	Ongoing	No	Municipally funded
Ongoing replacement of streetlights to efficient LED lights	Festival Hydro	~ $100,000 - 400,000	50-100 tonnes	Ongoing	No	Municipally funded

Solid Waste Asset Class

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/Not Applicable	Funding Sources/ Mechanisms
Phase-in of institutional, commercial and industrial (ICI) buildings under the purview of the City, as applicable to the Green Bin Program	Public Works	< $100,000	50-100 tonnes	Short (anticipated Q4 2023)	No	Municipally funded
Green bin services available for special events hosted within the city	Public Works	< $100,000	50-100 tonnes	Medium (planned 2024)	No	Municipally funded
Mattress diversion at the Landfill	Public Works	Not estimated at this time	under 50 tonnes	Long (planned 2028)	Not Applicable	Municipally funded
Wood diversion at the Landfill	Public Works	Not estimated at this time	under 50 tonnes	Long (planned 2028)	Not Applicable	Municipally funded

Implementation Strategies

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/Not Applicable	Funding Sources/ Mechanisms
Empower the Climate Change Working Group in implementing CEEP	All associated departments	Not Applicable	Not Applicable	Ongoing	No	Not Applicable
Institute sub-groups for identified asset classes. Develop an outreach strategy focused on energy conservation and climate change awareness	Climate, Communications	< $100,000	under 50 tonnes	Short to medium	Possibly	Not Applicable
Establish a process or tool to ensure energy and emissions considerations are included as a part of the design process for facility upgrades and new construction projects	Building, Climate	Not Applicable	Project dependent	Short to Medium	No	Explore funding opportunities offered by FCM/PCP
Adopt a corporate-wide procurement policy that considers energy and GHG emissions	Climate, Corporate Services	Not Applicable	Not Applicable	Short to medium	No	Not Applicable

Strategies	Lead Department	Estimated Expense	GHG Reduction Estimate	Timeline: Short/Medium /Long term or Ongoing	Roadmap or Task Force required? Yes/No/Not Applicable	Funding Sources/ Mechanisms
Apply a climate lens to all Plan and Policy development, upgrades. E.g., Official Plan, Transportation Master Plan	All	Not Applicable	>100 tonnes	Ongoing	No	Not Applicable
Develop an annual report for indicators of success (KPIs) and monitor CEEP objectives	Lead- Climate Support- IDS, Public Works, Community Services	< $100,000	Not Applicable	Medium	No	Municipally funded

Appendix B: Green Fleet Roadmap

Fuel-Based and Technical Initiatives

Fleet type/All Departments	Strategies and Initiatives	Net Emissions Reduction 2030	Initiative Leads
Light Duty Fleet (e.g. Police Patrol)	- Purchase Electric Vehicles in place of conventional fossil fuel vehicles - Prepare L2 infrastructure for electric vehicles – e.g., dedicated and load share L2 chargers for corporate light duty fleet - Mapping charger locations in corporate facilities - Infrastructure enhancement and maintenance	380-400 tonnes	Fleet Supervisor Managing Staff
Medium Duty Fleet	- BAU fuel use (gasoline) for the short term until - Study of charging infrastructure needs - Purchase low-carbon options as technology matures in this sector - Provide infrastructure for electric medium duty fleet including L3 DCFC	60-80 tonnes	Fleet Supervisor Managing Staff
Heavy Duty Fleet (e.g. Public Works, Fire)	- BAU fuel use (diesel) until medium term until low-carbon options are available - Research use of R100 or other low carbon fuel - Implement R100 or other low carbon fuel use - Prepare infrastructure for electric/low carbon fuel heavy-duty fleet - Procure low-carbon heavy duty fleet as feasible	Unknown	Fleet Supervisor Managing Staff
Transit (fleet including buses): Note: This will be addressed in detail within	- Explore funding opportunities to decarbonize fleet, Investing in Canada Infrastructure Program -Retained a Consultant to perform the feasibility study for Transit fleet electrification	1,200-1,250 tonnes	Transit Manager and Fleet Supervisor Managing Staff

Fleet type/All Departments	Strategies and Initiatives	Net Emissions Reduction 2030	Initiative Leads
the Community Climate Action Plan (CCAP)	- 10-year Capital plan in effect starting 2026- Replacement of fossil fuel powered buses with Battery Electric Buses (BEB's) starting 2026 and every 2 years after that.		
Other (Pool vehicles/Employee commute)	- Investigate enhanced pool vehicle program, including e-bikes, car share (hybrids) - Explore installation of employee charging stations	50-100 tonnes	Fleet Supervisor, CLT, Managing Staff

Policy-Based Initiative

Initiative	Procedure
Sustainable Procurement Guidelines (e.g., low carbon fleet)	- Update City's Procurement Policy to include sustainability measures for fleet procurement - Implement updates to Procurement Policy - Present to CLT for consideration, and Council for approval - Staff awareness and education
Hybrid Work Policy	Explore a remote work policy for staff, so Scope 3 GHG emissions are measured and monitored.