Guelph's

Corporate Climate Action Plan

CITY OF Guelph

Making a Difference

Introduction

The City of Guelph's Future Guelph Strategic Plan lays out the priorities for 2024 to 2027 responding to Guelph's changing needs. Environment is one of the four theme areas in the strategic plan and states the local government's role in environmental stewardship to reduce corporate greenhouse gas emissions (GHG) and energy consumption, protect and improve our green spaces, and support community climate action.

This Corporate Climate Action Plan responds to these broader strategic and specific corporate directives, reaffirms the corporate climate targets and lays out areas of focus to build on proven actions that conserve energy and reduce GHG emissions from municipal operations.

Reducing municipal GHG emissions to help mitigate the impacts of climate change will require significant upfront investment. Although there has been considerable progress over the years, there is still much work to do.

As the local government, the City of Guelph plays a vital role in the community and must lead by example in answering Guelph's Community Call to Climate Action. Through the Corporate Climate Action Plan, a roadmap is laid out for the City to be a leader in addressing climate change while optimizing the services it provides to the community.

Cover image: New 164 kW solar panels on the roof of the River Run Centre.

Below: Guelph team checks new energy-efficient equipment that supports the process of treating wastewater.

Key Climate Change Mitigation Objectives and Initiatives in the Corporate Strategic Plan:

- Be a leader in climate action
  - » Reduce energy use and greenhouse gas emissions
  - » Reduce Guelph's carbon footprint by investing in zero emissions vehicles for our fleet
- Empower the community to help create a sustainable city
  - » Encourage community participation in Race To Zero

Climate change impacts on municipal assets and services

Global temperatures are rising, causing more frequent and severe ecological events worldwide such as extreme heat events, wildfires, droughts, severe storms, intense rainfall and flooding, including here in Guelph.

Climate change is impacting the local government in many ways:

Increased damage to municipal assets and infrastructure

Longer and more frequent disruptions to services

Impacts to taxes and rates due to increased operational and capital costs

Higher exposure to health hazards, which elevates risks for both community residents and City staff

Greater community need for municipal resources and services

Why a Corporate Climate Action Plan?

The purpose of the Corporate Climate Action Plan is to set a roadmap that sets a course towards the City's corporate climate objectives and targets and builds on the progress to date. It lays out a set of strategic actions with timelines for implementation that will significantly reduce corporate GHG emissions.

This will also help the City:

- Achieve operational cost savings thereby also reducing impact on municipal tax
  - » Utility cost savings—using energy efficient equipment lowers energy consumption which lowers utility costs and lessens exposure to rising utility rates
  - » Maintenance and replacement cost savings—replacing old equipment with energy efficient equipment that uses less energy reduces overall wear and tear resulting in reduced maintenance and longer equipment service life
- Invest in corporate assets
  - » Getting more use out of assets—municipal assets can recover and repurpose wasted energy or generate clean energy in addition to the main purpose of serving the community
  - » Greater return on investment—operational cost savings resulting from energy efficient upgrades can help pay back the capital investment often supported by energy rebates that improve the business case even more
  - » Future proofing infrastructure—optimizing processes to be more efficient frees up system capacity to take on city growth
- Align with grant requirements—grants often have sustainability requirements to encourage GHG emissions reduction
- Reduce energy waste—wasteful practices in municipal operations cost money and resources

Installing heat pumps with heat recovery at the West End Community Centre.

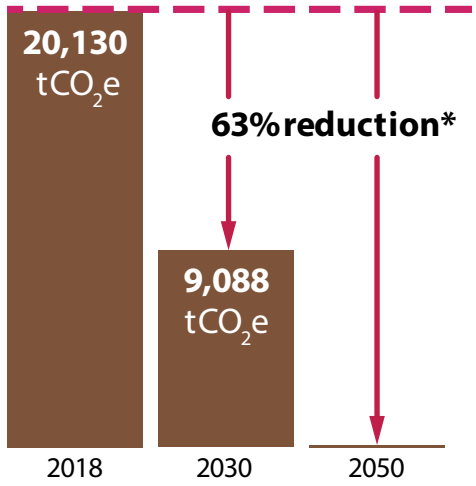
Corporate energy and climate change targets

The City has set the following corporate energy and climate change mitigation targets:

- **100% Renewable Energy (100RE) Target:** Taking an energy conservation and GHG emissions reduction approach to have City facilities and operations using 100 per cent renewable energy sources by 2050.
- **Help reach a net zero carbon community by 2050:** The City of Guelph is committed to the United Nations Race To Zero campaign and has set targets to reduce per capita carbon emissions by 63 per cent against the 2018 baseline by 2030 and work together to become a net zero carbon community by 2050. This target applies to both community-wide and corporate emissions.

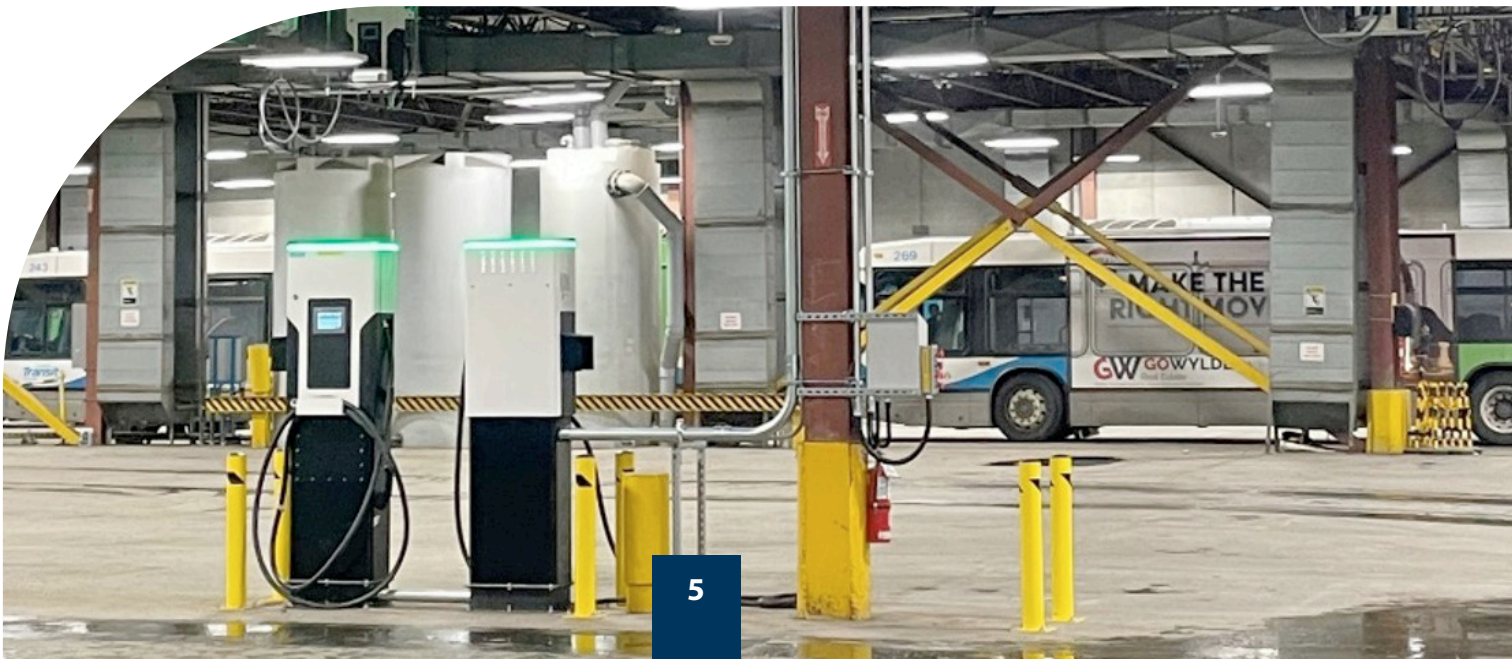
The City is working towards its strategic objectives to be a leader in climate action, help the community progress towards the Race to Zero targets and answer Guelph's Community Call to Climate Action. This report lays out a plan to reduce per capita corporate emissions by 63 per cent and advance efforts, while balancing emerging community and corporate priorities.

Race to Zero Corporate Emissions Target



*The 63% reduction target applies to per capita emissions using projected population data.

Electric bus chargers at the Guelph Transit garage.



Municipal spheres of influence over GHG emissions

Limited/No Control	• Business sector operations • Residential sector energy use • Energy production and distribution (from outside the City)
Indirect Control	• Land use • Transportation • Industrial, commercial and institutional waste • Buildings (residential and commercial)
Direct Control	• Municipal services • Municipal buildings and fleet • Landfill and waste management • Public transportation infrastructure • Local parks and greenspace

Graphic adapted from FCM's Factsheet: Municipal governance for deep decarbonization.

The City recognizes that it has a key role as part of the Guelph community and where it can contribute to reducing GHG emissions. One of the key areas where the City can be a leader in climate action is with GHG emissions from municipal operations where it has direct control.

Corporate energy and GHG emissions boundary

Focusing on the GHG emissions the local government has direct control over, the corporate energy and emissions boundary has been set to include the following:

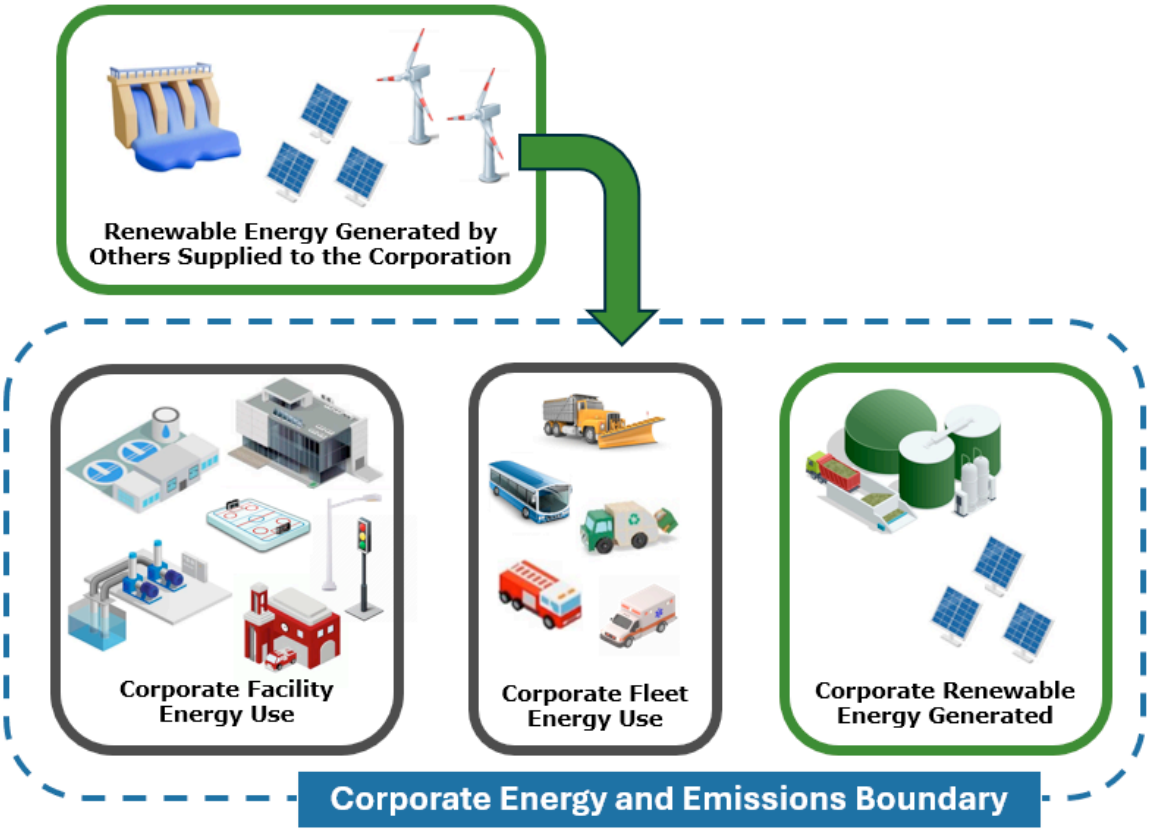
Buildings—consume electricity and natural gas to heat, cool, ventilate and illuminate building spaces

Transit Fleet—comprise of 40ft conventional transit buses and mobility buses with emissions from this category being from diesel, gasoline and electricity consumption

Non-Transit Fleet—include ambulances, fire trucks, waste packers, winter service vehicles, ice resurfacers and other light, medium and heavy-duty City-owned vehicles with emissions being from diesel, gasoline and electricity consumption

Process equipment—electric-driven and natural gas-powered equipment that are used for activities such as wastewater treatment, water distribution, composting organics, and operating recreational pools and ice rinks

Renewable energy systems—solar PV systems and digester gas from wastewater treatment are used to generate renewable energy that offsets energy consumption



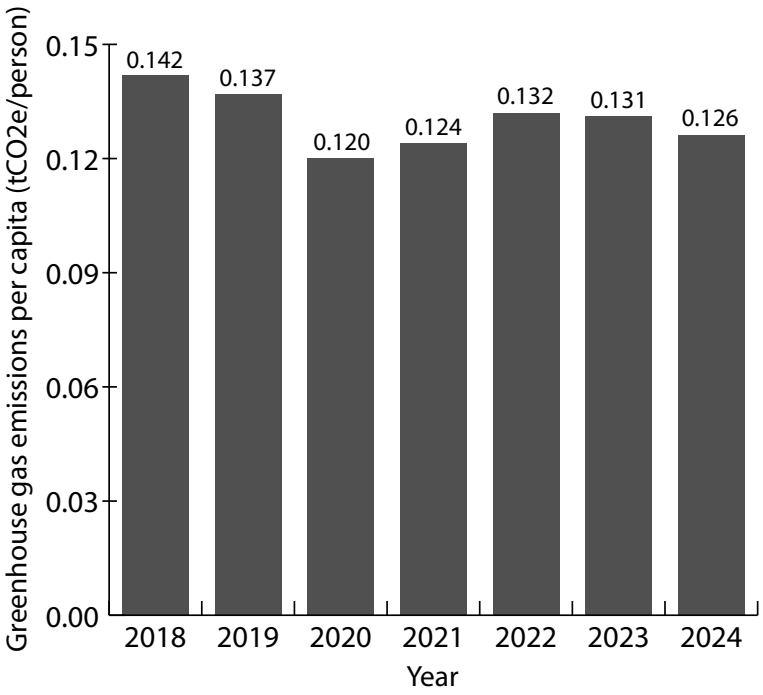
Progress towards energy and climate change targets

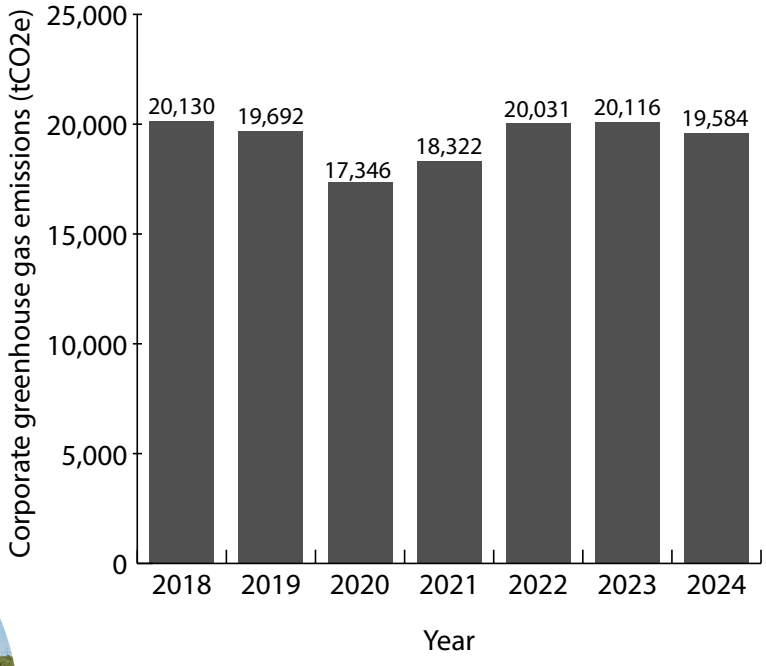
The graphs on pages 8 and 9 show annual data for total and per capita greenhouse gas emissions, corporate energy consumption, and progress towards the 100% renewable energy target since the baseline year in 2018. Data and analysis are based on information available when this report was prepared. This information is subject to update from time to time.

Decrease in annual greenhouse gas emissions since 2018

The gray bar graphs to the right track the annual GHG emissions on a total and per capita basis.. There has been an increase following closures during the COVID-19 pandemic, but recent years have shown a measurable decrease.

Despite the Ontario electricity grid using more natural gas for power generation and the increase in municipal services due to Guelph's significant population growth, overall annual GHG emissions have reduced by 550 tCO_2e (a 3% reduction) compared to the 2018 baseline year. This is equivalent to taking 170 cars off the road.



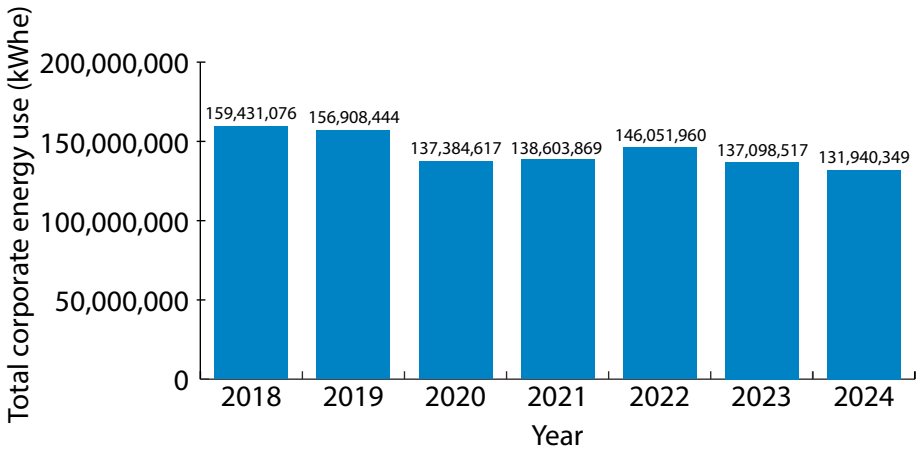


Wastewater treatment at the Water Resource Recovery Centre.

Reduction in corporate energy consumption

The blue bar graph to the right tracks total annual energy used from all the different energy sources. The graph is showing a steady decline over the years.

Overall annual energy consumption has dropped by nearly 28 million kilowatt-hour equivalent (kWhe). This is a 17% reduction compared to the 2018 baseline year. Cumulative energy savings over the years is almost 109 million kWhe, which is enough energy to power more than 4,300 Ontario households for a year.

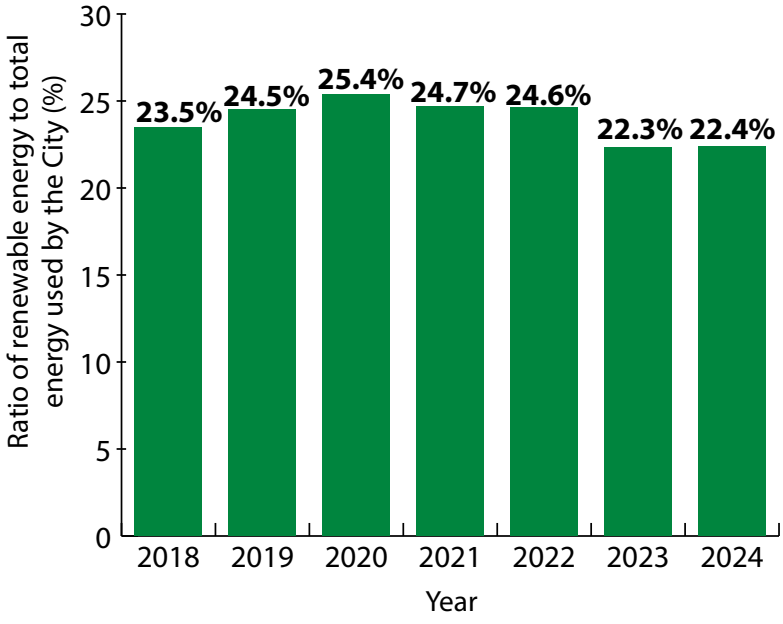


100RE progress status

The green bar graph to the right tracks the 100RE indicator. The 100RE indicator is shown as a percentage and is the ratio of renewable energy used and generated by the City to the amount of energy consumed. About 20-25% of the energy used by the City is from renewable energy sources.

Total solar PV capacity owned and maintained by the City was 78 kW in 2018 and has since increased to 500 kW. This will generate more than 500,000 kWh per year, enough electricity to power the Guelph Civic Museum and Firehall Headquarters combined.

While our renewable solar energy capacity has grown, our digester gas production has gone down. This has led to an overall decline in the proportion of renewable energy use in recent years, despite increased solar and energy conservation efforts.



Although there's good progress, much more work is needed to keep moving towards the corporate energy and climate change targets.

Areas of focus for climate action

To build on the progress so far, there are key focus areas and strategic opportunities to effectively reduce energy consumption and GHG emissions.

Race To Zero Target

100% Renewable Energy Target

Policies and standards

- Training
- Corporate policies
- Performance tracking

High performance buildings

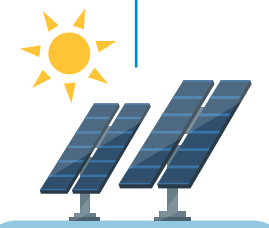
- Heat pumps
- Retro-commissioning
- Zero Carbon Building (ZCB) standard

Energy efficient process equipment

- Process equipment upgrades and optimization
- Energy waste reduction and waste heat recovery

Low emission fleet vehicles

- Right-size fleet
- Fleet chargers
- Fleet electric vehicles



Renewable energy generation

- Solar photovoltaics (solar PV)
- Renewable natural gas (RNG)

Strategic Climate Actions

Based on the areas of focus for climate action, strategic energy conservation and GHG emissions reduction actions have been identified on page 12. Recognizing the competing demands on City budget and considering community priorities that have emerged, this plan lays out the strategic actions needed to meet the targeted 63% reduction levels.

The plan balances technical limitations, budget constraints and the significant investment needed for the City's climate actions.

To hit our target of 63% emissions reduction, corporate GHG emissions must be reduced by more than 10,000 tCO_2e.

Guelph Transit long-range electric bus.

Focus area	Strategic Climate Action	Estimated capital investment 2025-2034**	Level of Funding	Estimated GHG reduction potential [tCO_2e/yr] 2025-2029	Estimated GHG reduction potential [tCO_2e/yr] 2030-2034**
Policies and standards	Maintain ISO 50001 EnMS certification	Staff time	N/A	-	-
Policies and standards	Building temperature standards	Staff time	N/A	35	-
High performance buildings	High performance new construction buildings standard	Staff time	N/A	-	-
High performance buildings	Building energy retrofits	$12M	Funding's outside 10-year plan	350	500
Energy efficient process equipment	Organic waste processing using anaerobic digestion*	$60M	Funding's outside 10-year plan	-	3,000
Energy efficient process equipment	Wastewater heat recovery and anaerobic digestion*	$15M	Funding's outside 10-year plan	-	2,000
Low emission fleet vehicles	Transit bus electrification	$96M	Funded	1,350	3,150
Low emission fleet vehicles	Transit mobility services electrification	$11M	Funded	20	50
Low emission fleet vehicles	Light duty fleet electrification	$8M	Funded	177	150
Low emission fleet vehicles	Low emissions waste packer vehicles	$12M	Partially funded	-	330
Renewable energy generation	Facilities solar PV	$3M	Funding's outside 10-year plan	30	50
Renewable energy generation	Eastview landfill solar PV*	$30M	Funding's outside 10-year plan	-	1,200
Total	-	**$247M**		**1,962**	**10,490**

*Capital investment estimate is listed. Optimal project delivery models are to be determined for large scale projects and may include investments by stakeholders other than the City.
**Inclusive of full year (January 1 to December 31).

Strategic Climate Actions—
Polices and Standards

Maintain ISO 50001 EnMS Certification

The City's corporate-wide energy management system is ISO 50001 certified. The ISO 50001 standard is an internationally recognized standard that provides a framework for managing energy and improving energy performance. Maintaining certification needs ongoing energy policy maintenance, data management, measuring results, staff resources and training, continual improvement of energy performance and annual third-party audits. These regular audits ensure the framework is followed and energy and emissions management across municipal operations keeps improving.

Building Temperature Standard

The City operates many facilities that are used for different purposes. Heating and cooling these facility spaces use a lot of energy, and some areas may be over-conditioned. Natural gas is the main energy source for heating and electricity is the main energy source for cooling. A review of building temperature standards will be conducted and a corporate standard developed and adopted to optimize thermal conditions and save energy and utility costs.

Did you know?

In 2023, the City of Guelph became the first Canadian municipality to get certified to this global best practice standard at the corporate-wide level.

Strategic Climate Actions—
High Performance Buildings

High Performance Corporate Building Standard

There are a number of building standards that define low-carbon building design and operational performance exceeding the Ontario Building Code requirements to result in significantly lower energy consumption and GHG emissions. All new corporate facilities must be designed to achieve zero carbon. There is currently no formal corporate policy in place requiring new corporate buildings to meet zero carbon building standards. A review of building standards will be conducted and a standard developed and adopted, supported by policy enactment, to achieve better energy performance and lower carbon emissions.

Building Energy Retrofits

Energy retrofits and upgrades for existing buildings follow the asset management plan to align with lifecycle renewal timing and investment in assets. Planning, design, and construction will continue to future-proof these buildings. Retrofit projects include building envelope upgrades such as improving insulation and air tightness or windows and roof replacement, updating inefficient heating and cooling systems such as with heat pumps, optimizing control systems, installing heat recovery and energy-efficient electrical equipment.

Did you know?

The new Guelph Central Library is the first standalone library building in Canada to achieve the CAGBC's Zero-Carbon Building–Design Standard certification.

Corporate facilities use significant amounts of natural gas for heating. Through energy conservation measures and energy efficiency retrofits across facilities, 930,000 m^3 less natural gas is being consumed which results in 1,800 tCO_2e GHG emissions reduction.

By reducing energy waste, overall annual energy costs went up by only 1.7% while energy rates rose substantially higher since the 2018 baseline (electricity +6.4%, natural gas +57%, fuel +16%). Had energy consumption remained as high as 2018 levels, annual energy cost would have been higher by more than $1.5 million in 2024 alone.

Strategic Climate Actions—
Process Equipment

Organic Waste Processing using Anaerobic Digestion

Residential organic waste is sent to the Organic Waste Processing Facility, which can compost 30,000 tonnes of material per year. Composting breaks down organic materials to produce compost, which is used to enrich soils. Preliminary reviews suggest the existing facility is approaching renewal and so should be reviewed to determine if the site can be modified to use anaerobic digestion. Anaerobic digestion processing produces soil nutrients and biomethane, a renewable energy source. Detailed investigations, engineering design work, and project planning are needed to implement this change. Optimal project delivery models are to be determined for large scale projects like this and may include investments by stakeholders other than the City.

Wastewater Heat Recovery and Anaerobic Digestion

Sewage from the city is treated at the Water Resource Recovery Centre, separating liquids and solids. Solids are processed using anaerobic digestion to produce nutrient-rich material and biomethane. Biomethane, mixed with natural gas, fuels a cogeneration engine that generates electricity and recovers waste heat for the digestors. Due to varying biomethane production, there are times where additional natural gas is used to supplement low production, and other times where there is excess biomethane and it is flared. As the cogeneration equipment nears end of life, process and equipment enhancements can recover heat from incoming wastewater using an industrial heat pump, eliminating natural gas reliance and collecting all biomethane for renewable natural gas. Planning and detailed design are needed to implement this initiative.

Did you know?

In 2024, the City's organic waste processing facility diverted 30,505 tonnes of organics from landfill, which was converted into 5,652 tonnes of finished compost.

In 2024, 1.5 million m^3 of reused digester gas powered the Water Resource Recovery Center. That's enough to power 1,123 houses.

Strategic Climate Actions—
Low Emission Fleet Vehicles

Transit Bus and Mobility Services Electrification

The initial phase of transitioning to electric 40ft conventional buses is complete with pilot charging installed at the existing 170 Watson bus garage and 19 electric buses in service. Design and construction work is underway to expand the bus charging infrastructure. Lifecycle replacement and expansion of the conventional bus fleet will continue with electric buses.

There are currently 14 mobility buses that are powered using gasoline. When these are due for replacement or expanded, these are to be converted to electric vehicle equivalents. Procurement strategies for these vehicles need to be developed to ensure the electric alternatives meet operational and mobility requirements.

Light Duty Fleet Electrification

The electric vehicle market in the light duty category is relatively more established and has enabled electrification of the light duty fleet vehicles to progress well. Electric vehicles are to replace gasoline powered light-duty vehicles (passenger vehicles, pickup trucks, vans) and right-size the associated charging infrastructure to meet the operational needs.

Low emissions waste packer vehicles

Diesel fueled solid waste packers are the second largest GHG emitters among the types of City fleet vehicles. The market for electric and low emissions solid waste packers is maturing with municipalities and private companies running pilots. Review of the waste packer usage should be completed to determine the viability of low emissions vehicle alternatives and what infrastructure is required ahead of when lifecycle replacement is due.

Did you know?

Currently, 11.6% of the City's fleet are electric or hybrid. Fleet emissions have remained flat despite an increase in kilometers travelled to meet growing service levels.

Strategic Climate Actions—
Renewable Energy Generation

Facilities Solar PV

The City has been expanding solar PV generation at corporate sites by utilizing facility roof space to install solar PV systems where appropriate. The facility solar PV systems generate renewable energy and reduce facility utility costs. Current systems range from 10kW to nearly 200kW in size.

Eastview Landfill Solar PV

The closed Eastview Landfill can be transformed into a 'bright-field', or a large solar PV system. The system would get further utilization out of otherwise unusable land, be a potential revenue stream, and have a renewable generation capacity in the order of 10 to 15 megawatts. Design considerations would need to be made for ground settling and existing landfill gas management. Optimal project delivery models are to be determined for large scale projects like this and may include investments by stakeholders other than the City.

Did you know?

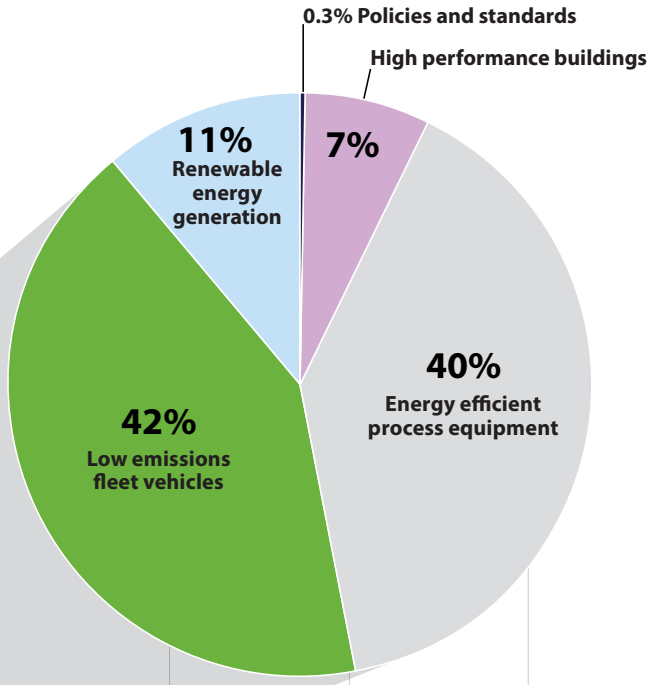
In 2025, a 164 kW rooftop solar PV system was installed on the River Run Centre and is the largest solar PV system at a City facility to date.

Pathway to 63% GHG Emissions Reduction

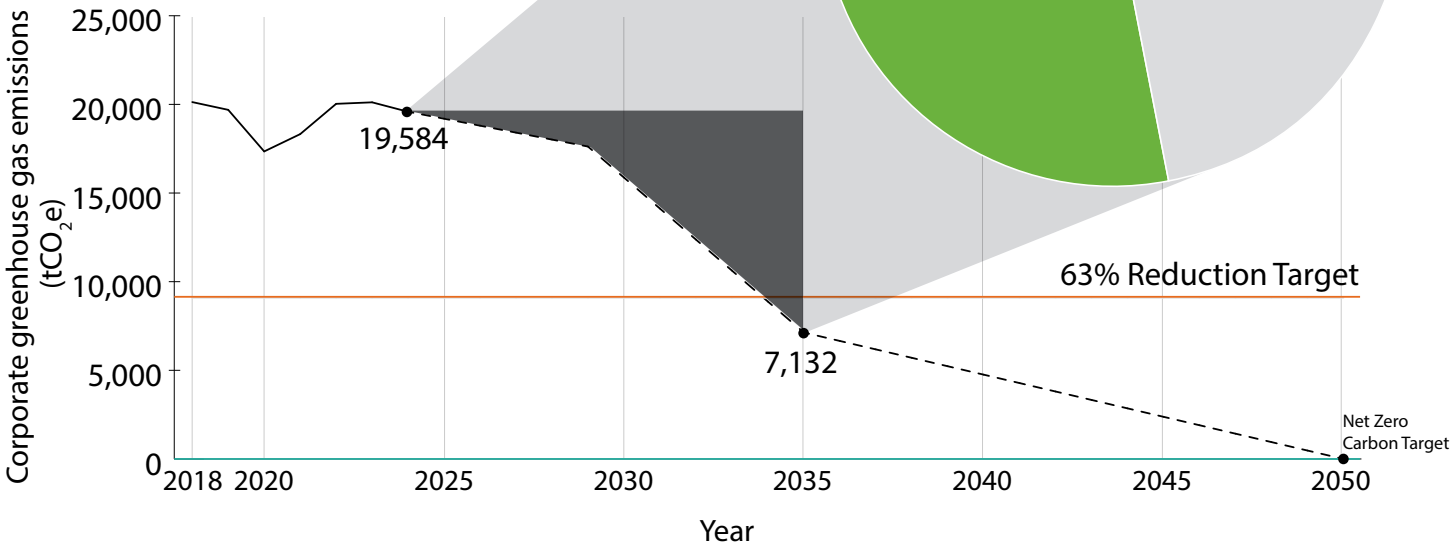
The Corporate Climate Action Plan strategically aims to achieve a 63% reduction in corporate GHG emissions by the revised timeframe of 2035, thereby also paving the way for continued energy conservation and emissions reductions towards the 100RE and net zero carbon by 2050 corporate targets.

Significant emissions reduction can be achieved, but current timelines extend beyond 2030. To reach the 63 per cent per capita reduction target, we will need sustained action and adequate resourcing. Acting now will help maintain momentum and prevent further delays.

Percentage of total emissions reduction by climate action, to the end of 2034



City's greenhouse gas emissions and projections to 2050 with climate actions



Pathway to Net Zero GHG Emissions Reduction by 2050

To ensure sustained progress toward the 100RE and net zero GHG emissions by 2050 corporate targets, further investments through to 2050 will also be needed to continue with energy efficiency efforts that focus on fleet and facility electrification and expanding renewable energy generation capacity. These long-range climate actions will need to be factored into the applicable future budget frameworks to ensure these actions are integrated into the City's operational and financial planning processes.

Next steps

The Corporate Climate Action Plan sets out corporate strategic actions for the City to be a leader in climate action. By moving forward with this plan and implementing these actions, it sends a strong signal to others in the community and beyond to also take up the climate change fight.

The strategic actions build upon proven measures to reduce energy waste and lower GHG emissions from how the City provides public services everyday. The Corporate Climate Action Plan is a meaningful way to make real progress towards the corporate climate targets and make our fair share contribution to the community's collective climate action.

The Corporate Climate Action Plan shows that real progress on emissions reduction is possible, and has been made. Continued investment is required to reach the 2030 interim targets. Ongoing focus, commitment and investment into the Corporate Climate Action Plan will lead to greater reductions and savings as time progresses.

CITY OF Guelph
Making a Difference

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