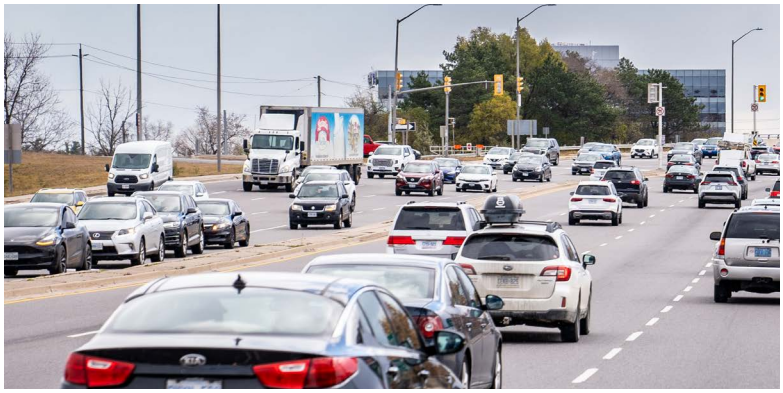
The Regional Municipality of Halton

2024-2028 Energy Conservation and Demand Management Plan



Halton Region

Corporate Services - Energy, Fleet & Facilities

July 1, 2024

Executive Summary

Halton Region is committed to addressing climate change and identifying opportunities to take action. Climate Change and the Environment is identified as one of the four themes in Halton Region's 2023–2026 Strategic Business Plan. Additionally, in September 2019, Halton Regional Council unanimously joined municipalities across Canada in declaring a climate emergency and placing an even greater emphasis on the actions identified in Halton's Strategic Business Plan as well as the Region's Climate Action Plan. Together this deepens Halton's commitment to reducing energy consumption and greenhouse gas emissions from its operations.

The Region's Energy Management Strategy is one of the ways that we are working to protect the environment and reduce our carbon footprint for Regional operations. This includes finding solutions within our organization to:

- **reduce** energy consumption and greenhouse gas emissions,
- **recover** energy from operations,
- **shift away** from fossil fuel-based energy; and
- **identify** further opportunities through targeted empirical studies.

Between 2019 and 2023, the Region implemented various reduction, recovery and shifting solutions across our facilities, water and wastewater process operations and street lighting on Regional roads. The following Energy targets were achieved since the previous CDM 2019-2023:

- Four percent reduction in greenhouse gas emissions related to Corporate Services
- Nine percent reduction in the hydro consumption of streetlights
- Four percent reduction in hydro consumption per MegaLitre of water treated
- One percent reduction in hydro consumption per MegaLitre of Wastewater treated
- 13 percent reduction in hydro and heating consumption across all Corporate buildings

Our 2024 - 2028 Energy Conservation and Demand Management (CDM) Plan will build upon our past successes and introduce new targets and actions to further reduce our carbon footprint. Our organization-wide approach to energy management aligns with the actions and measures set out in the Region's Strategic Business Plan and our Corporate Climate Action Plan including:

- offsetting two percent of the annual electricity consumed by Halton's Water Treatment Plants (WTPs) and Wastewater Treatment Plants (WWTPs) with solar PV;
- offsetting three percent of the annual electricity consumed at the Mid-Halton WWTP with a micro-hydro turbine;
- a four percent reduction in the hydro consumption of Halton Region's streetlights;
- a six percent reduction in the heat and hydro consumption per square foot of corporate facilities; and
- a 25 percent reduction in the Greenhouse Gas emissions of the Halton Community Housing Corporation portfolio.

The potential for future energy and cost savings is significant. The following plan outlines specific actions we will be taking over the next four years to achieve the targets set out above.

This plan also recognizes that the collective actions of various stakeholders and our partner organizations can accelerate progress and make a significant difference in our Corporate and Community reduction efforts. We look forward to continuing the work with our local climate partners to produce results that inspire others to contribute to a sustainable future for all.

The 2024 to 2028 Energy Conservation and Demand Management (CDM) Plan is approved by Management committee.

Contents

Glossary of Terms

CAP
Clean Air Partnership. A network of municipal corporate Energy Managers for networking and knowledge-sharing.

CDM
Energy Conservation and Demand Management.

CMHC
Canada Mortgage & Housing Corporation.

Corporate Portfolio
Corporate buildings; traffic and streetlights; Water and Wastewater Treatment pumps & plants; Fleet & corporate waste.

ECM's
Energy Conservation Measures.

ekWh
Equivalent Kilowatt hour. A unit of electricity combined with natural gas equivalents.

EMS
Emergency Management Services

GHG
Greenhouse Gas. These gases absorb and radiate heat energy easily and help maintain the Earth's temperature. If emitted in excess quantities, they can have negative impacts to the Earth's climate.

GHG Intensity (kg/GJ)
Green House Gases produced as a function of the amount of fuel used.

GigaJoule (GJ)
A GJ is used to measure energy from various types of power, such as electricity, natural gas and oil.

HCHC
Halton Community Housing Corporation. This portfolio includes only housing facilities.

HRPS
Halton Regional Police Services.

kW
Kilowatt. A unit of electrical power.

kWh
Kilowatt hour. A unit of electrical energy.

LED
A semi-conductor light source that emits light when current is passed through it, consuming considerably less energy than most conventional light sources, while achieving similar or better lighting performance.

ML
MegaLitre is a unit of volume equal to a million litres.

NG
Natural gas. A fossil fuel which consists primarily of methane.

PCP
Partners for Climate Protection. A program sponsored by the Canadian Federation of Municipalities that includes a network of 350+ municipalities aimed at reducing greenhouse gas emissions and taking action on climate change.

PW
Public Works.

SL
Street lights.

Sqft
Square Feet is a unit of Area which equals to a square measuring one foot on each side.

tCO2e
Tonnes(t) of Carbon dioxide (CO2) Equivalent (e). GHGs are represented in terms of a single gas, carbon dioxide equivalents, by means of various conversion factors.

TL
Traffic lights.

Waste
This refers to the corporate waste (garbage only) generated at Regional facilities.

WTP
Water Treatment Plant.

WWTP
Wastewater Treatment Plant.

Introduction

Halton Region is dedicated to advocating for communities where urban sprawl is minimized, infrastructure is maximized, natural heritage is protected, and natural spaces and farmland are preserved.

Halton Region encompasses four cities/towns – City of Burlington, Town of Oakville, Town of Milton and Town of Halton Hills. With a population of more than 637,054 residents (as of 2021), it is essential that the Region continues to take an active role in creating a healthy, green and sustainable place to live. We do this by incorporating energy and demand management in our vision to preserve a landscape that is rich, diverse, balanced, productive and sustainable, and a society that is economically strong, equitable and caring for current and future generations. The overall goal is to achieve a sustainable living in Halton both today and in the future. To deliver optimal results, this Energy Conservation and Demand Management (CDM) Plan will guide Halton Region through our:

- managed control of its utility costs, energy use and greenhouse gas (GHG) emissions;
- capture and re-use of available resources; and
- use of green building and green procurement policies.

The CDM Plan:

- aligns with Halton's existing energy, environmental, resource and operational plans;
- will be augmented through Regional policies for green procurement, new construction and renovation, existing building operation and maintenance, and renewable energy utilization;
- outlines opportunities that will help Halton meet its short-term and long-term objectives, which are defined in the Region's Strategic Business Plan and Corporate Climate Action Plan; and
- this Plan compares the 2023 GHG and Energy data to 2019 as the baseline year for the Corporate and HCHC portfolios.

The Region's 2023 Greenhouse Gas Intensity by Energy Source is represented below:

Halton at a glance

969
KM² land area

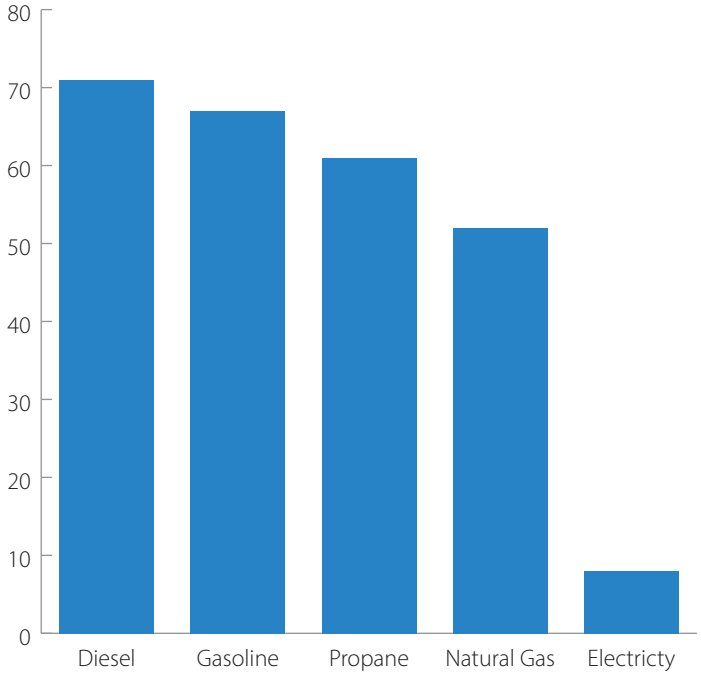
526
KM² of green space

25
KM Lake Ontario shoreline

637,054
Population (2021)

Source: Halton Region 2023-2026 Strategic Business Plan

2023 Corporate GHG intensity by source (KG/GJ)



Regional Assets Energy Profile

- Housing services and the Halton Community Housing Corporation
- Paramedic services
- Public health programs and services
- Regional roads and transportation
- Waste management
- Wastewater treatment and collection
- Water treatment and delivery
- Children's services
- Long-term care facilities
- Halton Regional Police Services
- Operation centres
- Regional fleet

Energy Management Strategy - Guiding Principles

Halton Region has developed an energy management strategy that aligns with existing Federal and Provincial strategies and legislation, as well as Halton's strategic environmental and energy reduction guidelines. Halton's Corporate Energy Management goals include adopting policies and implementing a strategic approach to managing energy and resources that will help guide Halton towards a future where:

- energy is a managed resource;
- there is reduced dependency on fossil fuels in program delivery and facility operations;
- energy consumed comes mainly from renewable sources, complemented by conservation programs;
- energy generation and resource recovery from municipal operations are used to improve system resiliency and sustainability;
- construction of new infrastructure and replacement of existing equipment and processes are aligned with adopted green standards;
- project viability is based on full lifecycle costing that considers economic, environmental, social and cultural sustainability via building condition assessments, feasibility studies, etc.;
- procurement policies are aligned to meet our goals for all future purchases;
- corporate waste does not directly consume energy in the form of electricity or natural gas, however, it contributes to the GHG emissions once deposited into a landfill. The Region has conducted Waste Audits on four buildings and is currently developing a Waste Management Strategy to reduce and divert the waste produced at our corporate sites based on our findings. This will help us develop a Corporate-wide Waste Program that can be implemented across the portfolios;
- the Region's fleet is electrified where possible through a Green Fleet Strategy to meet the objectives of our Net Zero goals and;
- service resilience is enhanced through an Energy and Resource Management Strategy that reduces consumption, increases energy recovery from Region-owned assets and shifts fossil fuel-based energy to renewable energy sources.

To accomplish these goals, the strategy focuses on three key themes to direct the conservation effort:

- **Reduce** costs and resource consumption without reducing our level of service.
- **Recover** energy and resources from available streams to realize a reduction in energy consumption and a reduction in the mass of material landfilled.
- **Shift** away from fossil fuels towards a more renewable energy mix through the integrative design of green buildings and systems, and site-specific opportunities to incorporate solar, wind, geothermal or hydraulic.
- Additionally, **Studies** will help to identify reduce, recover, and shift projects to be included in future Energy Conservation and Demand Management plans.

2019-2023 Conservation and Demand Management (CDM) Plan reporting

In the 2019-2023 Conservation and Demand Management Plan, the Region committed to reducing its impact on the environment and to the principles of conservation and sustainability through the development and implementation of a Corporate Energy Management Plan and a Corporate Sustainability Action Plan.

Common key themes from each plan were adopted into a single approach to provide a guide for effective energy management.

The adoption of the Green Building Policy for New Construction and Renovation, Greening of Existing Facilities Policy, along with the Green Procurement Policy provided a comprehensive roadmap for integrating energy efficiency and sustainable practices into the Region's ongoing operations and projects.

Since the previous reporting period (2019-2023), the Region has made progress towards incorporating energy conservation initiatives and reducing GHG emissions throughout all organizational portfolios.

Did you know?

A 750kW Micro-hydro-turbine was commissioned at the Mid-Halton WWTP in 2019, to generate power from wastewater effluent.

Annual Energy Consumption Reporting

As required under the legislation for Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans (O.Reg. 25/23), Halton Region submits annual energy consumption reporting to the Ministry.

A summary of the annual energy consumption profile of the Region's operations in 2019 vs 2023 is noted on page 10 and 11 with an analysis of the consumption and growth experienced in each sector. This has been done for the Corporate and the HCHC portfolios.

A high-level analysis shows that the Region experienced growth between the two reporting periods, which is reflected by the sector growth numbers in the Total Energy Consumption by Sector table on page 9. During this same time period (2019-2023), the Region realized a reduction in the energy utilized in the WTPs while experiencing an increase at the WWTPs. The energy consumption for Facilities, Streetlights and Fleet, however, remained the same. This does not directly correspond to the pattern of growth experienced in these sectors, indicating that conservation played a role in minimizing the full energy increase impact in these sectors.

Corporate portfolio growth

Treated Water (ML)

2019
61,865

2023
64,942

% growth
5%

Treated Wastewater (ML)

2019
88,912

2023
97,250

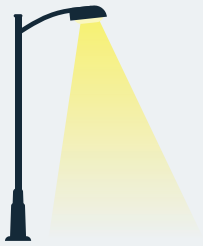
% growth
9%

Facility Floor Area (ft2)

2019
1,359,658

2023
1,509,137

% growth
11%



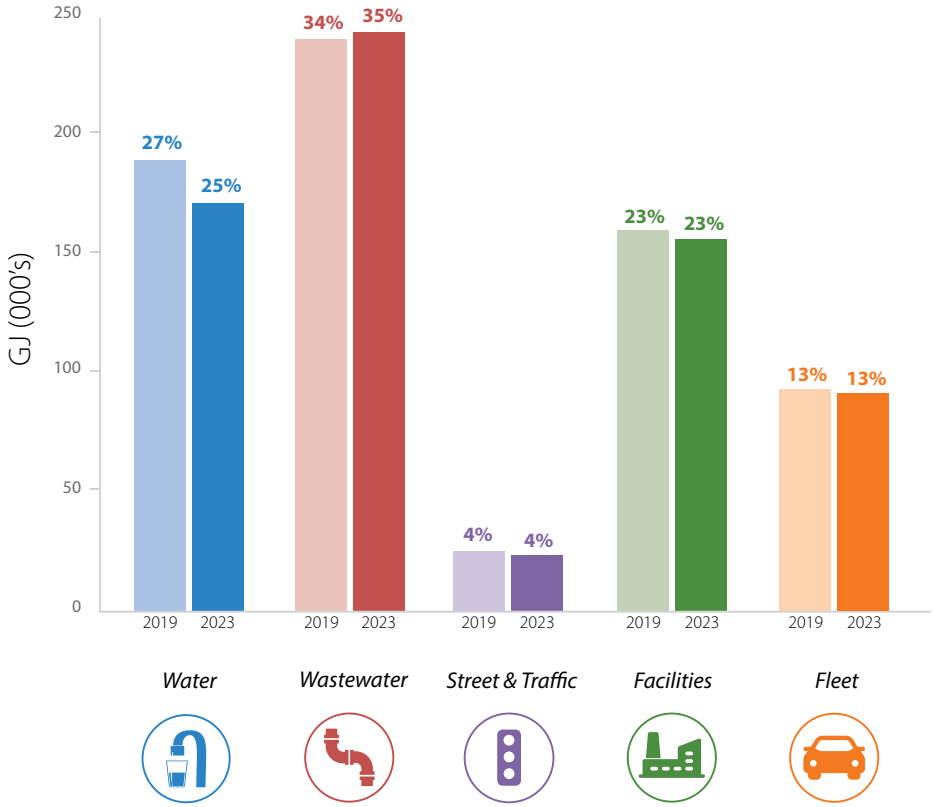
Street Lights

	2019	*2023*	*% growth*
Burlington	1,364	1,423	4%
Halton Hills	592	613	4%
Milton	1,986	2,218	12%
Oakville	2,186	2,647	21%
Total	**6,128**	**6,901**	**13%**

Signalized Traffic Intersections

	2013	*2017*	*% growth*
Burlington	63	24	2%
Halton Hills	28	28	0%
Milton	64	74	16%
Oakville	111	116	5%
Total	**266**	**288**	**6%**

Total Energy Consumption by Sector
2019 (baseline) vs 2023 (normalized)



Energy Consumption (GJ) (normalized)

Energy Consumption (GJ) (Normalized)	2019	2023
Facilities	163,009	159,676
Streetlight & Traffic Lights	26,616	24,309
Water	192,282	169,337
Wastewater	248,742	235,860
Fleet	93,565	91,776
Total	**724,214**	**680,959**
% Decrease	**-6%**	

HCHC portfolio growth

Facility Floor Area (ft2)

2019
1,950,461

2023
1,968,761

% growth
0.94%

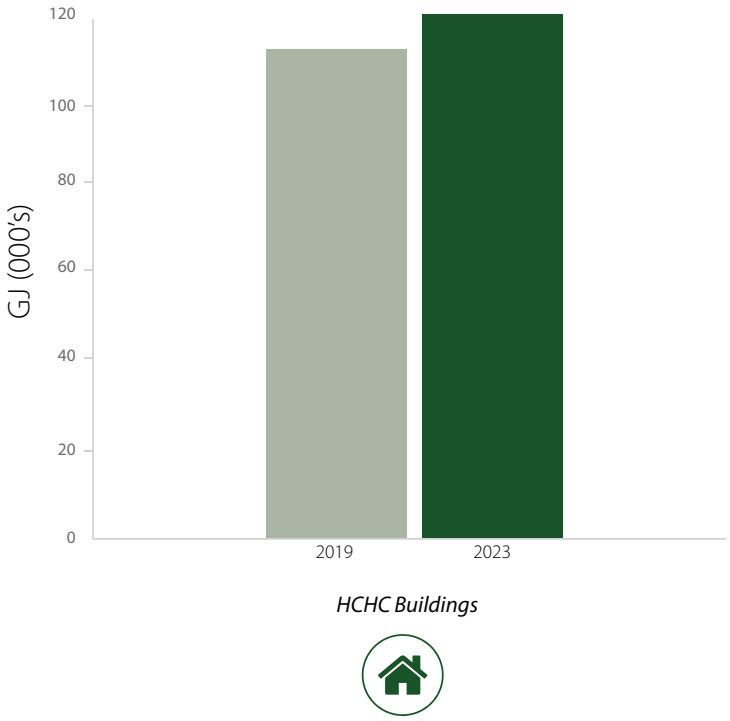
Asset Count

2019
33

2023
34

% growth
3%

HCHC Energy Consumption (GJ) – 2019 (baseline) vs 2023 (normalized)



Energy Consumption (GJ) (normalized)

Energy Consumption (GJ) (Normalized)	2019	2023
HCHC Buildings	110,090	117,902
% Increase	**7%**	

Highlights of 2019-2023

Halton Region completed the Energy Conservation Measures (ECMs) identified in the 2019 to 2023 CDM plan resulting in a 6 percent overall reduction in the energy consumption.

Halton secured over $100,000 in incentives for corporate and housing capital projects from Enbridge and Independent Electricity System Operator (IESO). This equates to an estimated annual savings of approximately 600,000 eKWh. These projects targeted reductions in energy consumption and GHG emissions across the corporate and housing portfolio. The efforts directly align Halton's commitment to sustainability and responsible resource management.

On November 2, 2022, Halton Community Housing Corporation (HCHC) was offered $7 million in capital funding under the Canada Mortgage and Housing Corporation's (CMHC) National Housing Co-Investment Fund Renewal and Repair program, aimed at supporting capital repairs, energy efficiency upgrades, greenhouse gas reduction, and accessibility upgrades. The CMHC investment will enhance HCHC's capital program, focusing on energy efficiency improvements, reducing greenhouse gas emissions, and improving accessibility, thereby reducing energy consumption and operating costs while supporting Halton Region's Climate Change priority.

The 2019 to 2023 CDM Plan also committed to undertaking several initiatives to improve energy efficiency in Public Works operations, including improvements in water and wastewater plant and pumping and energy conservation in operations through improvements to street and traffic lighting.

Summary of Completed Energy Conservation Measures (ECM's) - 2019 - 2023

Corporate Facility Measures

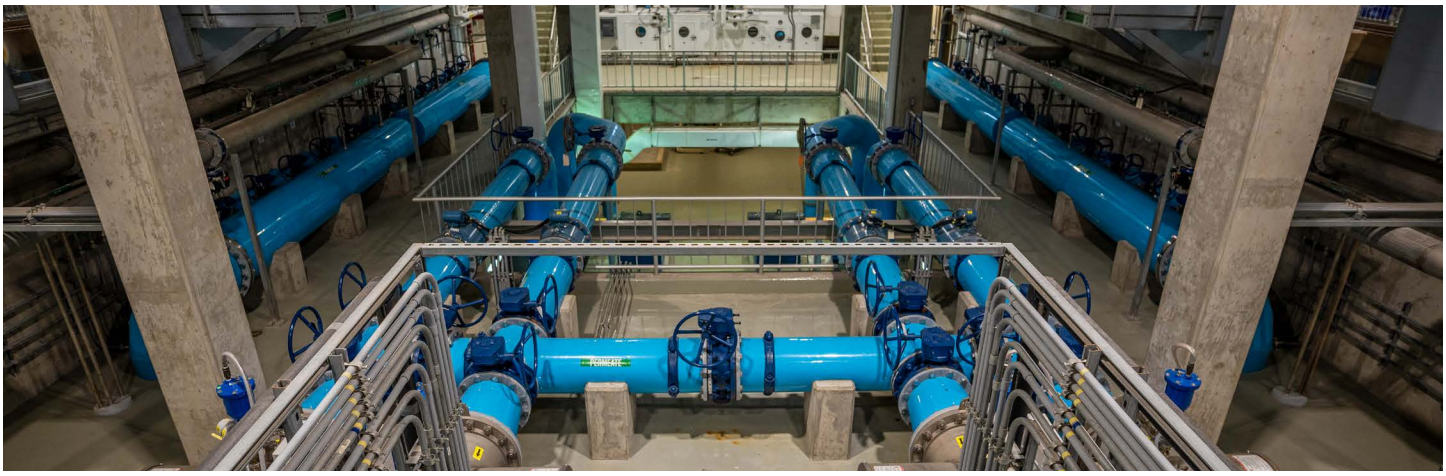
Year	ECM's Implemented	Demand Reduction (kW)	Electricity Reduction (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
2019	Lighting, control and Mechanical retrofits- various locations	39	131,269	4,640	$18,899	10	645
2020	Lighting, control and Mechanical retrofits- various locations	117	662,503		$99,180	19	2,385
2021	Lighting, control and Mechanical retrofits- various locations		19,655	2,475	$3,661	5	163
2022	Lighting, control and Mechanical retrofits- various locations		541	153,467	$53,055	291	5,726
2023	Lighting, control and Mechanical retrofits- various locations	18	392,380		$57,754	10	1,413
	Total	**173**	**1,206,348**	**160,582**	**$232,549**	**335**	**10,332**

Did you know?

Regional Facilities incorporate LED lighting, occupancy and daylight sensors to reduce electricity consumption during peak times.

Water and Wastewater Measures

Year	ECM's Implemented	Demand Reduction (kW)	Electricity Reduction (kW)	Electricity Produced (kWh)	Gas Reduction (m3)	Savings (Dollars)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
2019	Biosolids Management Centre Wastewater Servicing Project ; Micro-Hydro Turbine at Mid Halton Wastewater Treatment Plant; Switching to Seasonal Ultraviolet Disinfection at Georgetown Wastewater Treatment Plant		40,000	346,535		$40,929	119	1,392
2020	Micro-Hydro Turbine at Mid Halton Wastewater Treatment Plant			290,087		$43,513	8	1,044
2021	New High Lift Pumps at Burlington WTP Micro-Hydro Turbine at Mid Halton Wastewater Treatment Plant;		468,250	146,185		$86,021	18	2,212
2023	Micro-Hydro Turbine at Mid Halton Wastewater Treatment Plant;			653,115		$91,436	19	2,351
Total			**508,250**	**1,435,922**		**$261,899**	**164**	**6,999**



Did you know?

Over the course of four years, 1.43 million kWh of electricity was generated at the Mid-Halton Wastewater Treatment Plant, which is sufficient to provide electricity to 125 Ontario households for one year.

HCHC Facility Measures

Year	ECM's Implemented	Demand Reduction (kW)	Electricity Reduction (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
2019	Lighting, control and Mechanical retrofits- various locations			1,502	$358	3	56
2020	Lighting, control and Mechanical retrofits- various locations	12	14,972		$2,232	1	54
2022	Lighting, control and Mechanical retrofits- various locations	2	296,500	123,871	$89,745	244	5,688
2023	Lighting, control and Mechanical retrofits- various locations			47,389	$19,368	90	1,293
	Total	**14**	**311,472**	**172,762**	**$111,703**	**338**	**7,090**

Total GHG Emissions Reductions, Energy Consumption Reduction and Cost Reduction

Completed Projects By Sector	Demand Reduction (kW)	Electricity Reduction (kWh)	Electricity Produced (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
Corporate Facilities	173	1,206,348		160,582	$232,549	335	10,332
Water & Wastewater		508,250	1,435,922		$261,899	164	6,999
HCHC	14	311,472		172,762	$111,703	338	7,090
Total	**187**	**2,026,070**	**1,435,922**	**333,344**	**$606,151**	**837**	**24,421**

Did you know?

An annual savings of 24,421 GJ is the equivalent amount of energy used by 240 typical Ontario households in a year.

Industrial Conservation Initiative (ICI)

The Industrial Conservation Initiative (ICI) is a demand response program that enables participants to lower their global adjustment (GA) costs by decreasing electricity use during peak periods. Customers in the ICI, known as Class A, pay GA fees based on their contribution to the top five peak demand hours in Ontario over a 12-month period. Class B customers are those who do not participate in the ICI program. They pay GA fees based on their overall electricity consumption, without the specific incentives or responsibilities tied to peak demand reduction. Ontario's electricity system is designed to handle the highest demand times of the year. By cutting back on electricity use during these peak periods, ICI participants can reduce their GA costs and contribute to delaying the need for new electricity infrastructure investments. Through analysis of previous and current usage and demand trends, the Region annually opts into Class A. The Region has been participating in the ICI program for many years now and has achieved electricity cost avoidance of over $14.9M dollars for several of our Water and Wastewater facilities as noted in the table below.

Total avoided electricity cost

Adjustment Year	Class A Costs ($)	Class B Costs ($)	Cost/(Savings) ($)
July 2018 - June 2019	$4,403,168	$6,495,640	($2,092,472)
July 2019 - June 2020	$4,381,392	$7,975,120	($3,593,728)
July 2020 - June 2021	$4,267,012	$7,791,192	($3,524,180)
July 2021 - June 2022	$2,612,846	$4,608,316	($1,995,470)
July 2022 - June 2023	$2,611,477	$4,248,941	($1,637,464)
July 2023 - June 2024	$3,130,707	$5,168,218	($2,037,511)
Total			**($14,880,825)**

Energy Conservation & Demand Management Plan 2024-2028
Proposed Projects

Current and Proposed Measures

Multiple Energy Audits, Building Condition Assessments and Feasibility Studies were conducted across all of the Regional portfolios. The goals of the studies are to reduce energy consumption and greenhouse gas emissions, with the intent of minimizing cost risk and maximizing service delivery to the Region.

The recommendations identified under each of the completed studies were reviewed, analyzed, and compiled into a comprehensive listing of various Energy Conservation Measures (ECMs) and make up the work plan with a multi-stakeholder team for the 2024 to 2028 Energy Conservation and Demand Management (CDM) Plan period. Where possible, Halton Region aligns capital equipment lifecycle replacement with proposed measures to maximize value from existing assets.

A summary of all the ECMs identified and those to be implemented during the CDM plan period are identified in the following tables.

The 2019 to 2023 Conservation and Demand Management (CDM) Plan focused on energy conservation in Regional facilities, water and wastewater process operations and Halton Community Housing Corporation. The Plan did not address energy used from fleet vehicles or traffic and street lights. Energy used in these sectors will be addressed by specific plans within each of their respective program areas or by the next version of our CDM Plan.

Corporate Facility Measures

Energy Management Strategy	ECM's to be Implemented	Demand Reduction (kW)	Electricity Reduction (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
Reduce	Lighting Retrofit and Re-design	17	1,547,349	-76,665	$185,698	-99	2,696
Reduce & Shift	HVAC (Heating, Ventilation, and Air Conditioning) Upgrades		-97,671	29,632	-$469	51	754
Reduce	Building Automation System		65,128	25,925	$20,847	52	1,201
Reduce	Water Heating upgrades		-101,336	7,714	-$10,838	12	-77
Reduce	Window and Building Envelope Upgrades		24,539	15,282	$10,404	30	658
Recovery	Heat Recovery and Energy Efficiency		-51,369	19,641	$1,577	36	548
Shift	Fuel Switching and Renewable Energy		-9,024	86,394	$42,419	163	3,190
	Total	**17**	**1,377,616**	**107,923**	**$249,639**	**245**	**8,970**

Street and Traffic Lighting Measures

Energy Management Strategy	ECM's to be Implemented	Demand Reduction (kW)	Electricity Reduction (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
Reduce	SL LED retrofit	41	180,433		$25,261	5	650

Water and Wastewater Measures

Energy Management Strategy	ECM's to be Implemented	Demand Reduction (kW)	Electricity Reduction (kW)	Electricity Produced (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
Shift	Solar Photovoltaic Deployment on Multiple Water & Wastewater Facilities			1,790,900		$268,635	54	6447
Shift	Battery Energy Storage System at Oakville Water Treatment Plant						30	
Recover	Micro-Hydro Turbine at Mid Halton Wastewater Treatment Plant;			2,372,500		$355,875	71	8541
Total				**4,163,400**		**$624,510**	**155**	**14,988**

HCHC Facility Measures

Energy Management Strategy	ECM's to be Implemented	Demand Reduction (kW)	Electricity Reduction (kWh)	Gas Reduction (m3)	Savings ($)	GHG Reduction (tCO2e)	Energy Reduction (GJ's)
Reduce	Lighting Retrofit and Re-design		241,850		$32,604	7	871
Reduce & Shift	HVAC (Heating, Ventilation, and Air Conditioning) Upgrades		12,033	10,101	$5,397	20	420
Reduce	Water Heating upgrades		-292,900	98,310	-$322	178	2,613
Reduce	Window and Building Envelope Upgrades		142,419	29,569	$30,249	77	1,616
Shift	Fuel Switching		-1,750,560	369,428	-$79,729	653	7,478
	Total		**-1,647,158**	**507,408**	**-$11,801**	**934**	**12,997**

Studies

A number of studies were identified that will support further assessment of additional Reduce, Recover and Shift projects to be included in future Energy Conservation and Demand Management plans. These include:

Energy Management Strategy	Project Type	Capital Cost
Shift	Wastewater Treatment Plant Renewable Energy Technology Project	Engineering investigation required
Reduce & Shift	PIV & CCC Net Zero Study	~$60,000
Shift	HCHC facilities (Electricity capacity study)	Feasibility Study required (~$20,000)
Shift	Green Fleet study	Feasibility Study required (~$100,000)
Reduce & Shift	Net Zero Study- various sites	~$150,000
Shift	EV Chargers Implementation study	~$65,000
Reduce	Artificial Intelligence Software for Distribution System	~ $2,000,000

Alignment with External Partners and Agencies

Partners for Climate Protection (PCP) Program

The Partners for Climate Protection (PCP) Program is an initiative from the Federation of Canadian municipalities (FCM) and Local Governments for Sustainability (ICLEI Canada) that looks to help municipalities take action on climate change. This is done by guiding municipalities through a five-step Milestone Framework:

- Milestone one: Creating a Baseline Greenhouse Gas Emissions Inventory
- Milestone two: Set Emission Reduction Targets
- Milestone three: Developing the Local Action Plan
- Milestone four: Implementing the Plan
- Milestone five: Monitoring and Reporting Results

In 2014, Halton Region joined the PCP program and in the same year submitted, applied for, and received credit for completion of Milestone 1 – Corporate Baseline Emissions Inventory, which set 2007 as the baseline year. Since 2006, the Region has been tracking the energy consumption and carbon footprint of its energy consuming assets and operations. This work is integral to development and continual improvement to the Region's greenhouse gas emissions inventory. In 2023, the Region updated Milestone 1 for the corporation, and set 2019 as a new emissions baseline year to align reporting to the climate emergency declaration and to take advantage of improved data availability.

On November 22nd, 2023, Halton Region achieved Milestones 2 and 3 through the endorsement of the Corporate Climate Action Plan and the Region's corporate emissions reduction target of net zero by 2045 by Regional Council. The Corporate Climate Action Plan allows the Region to adapt to the changing climate, establish a pathway for greenhouse gas (GHG) emission reduction efforts, and will further support Regional partners and partnerships.

The Region is currently advancing Milestones 4 and 5 through the implementation of the Corporate Climate Action Plan and progress reports to Regional Council.

Clean Air Partnership (CAP) – Corporate Energy Managers Community of Practice (CEM COP)

The Clean Air Partnership's (CAP) Corporate Energy Managers Community of Practice (CEM COP) is a network of municipal corporate energy managers where municipal staff can share expertise, resources, lessons learned, and research to advance energy efficiency and greenhouse gas emission reduction efforts.

Regional staff are members of the Corporate Energy Managers Community of Practice (CEM COP) and have attended webinars, workshops and in person events over the past few years. As members, Regional staff also have access to the Corporate Energy Managers Community of Practice (CEM COP) website where all resources, recordings, presentations, and resources are stored.

Project Implementation

Implementation of specific conservation and recovery projects and studies will be completed across the Corporate and HCHC portfolios over the multi-year term of the Plan. When completed, the projects could realize a maximum potential energy reduction and cost savings of five to ten percent and over $900,000 per year.

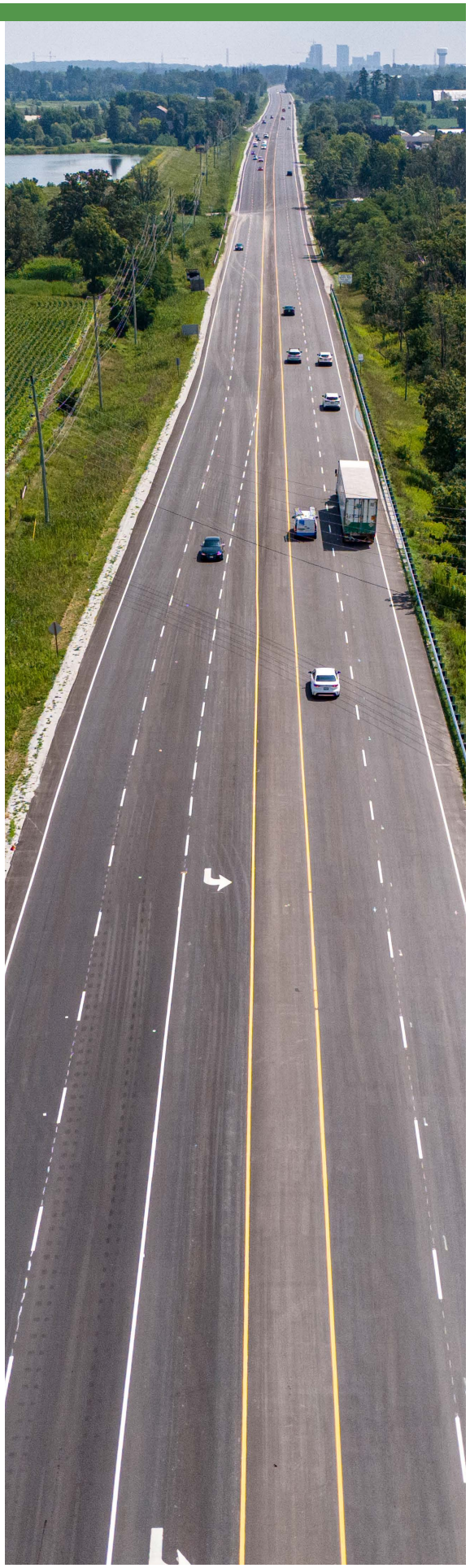
Energy and greenhouse gas reduction targets

- 3% of the annual electricity consumed at the Mid-Halton WWTP will be offset by the micro-hydro turbine
- 2% of the annual electricity consumed by the WTPs and WWTPs will be offset by solar PV
- 4% reduction in the hydro consumption of Halton Region's Streetlights
- 6% reduction in the heat and hydro consumption per square foot of Corporate facilities
- 25% reduction in the heat and hydro consumption of the Halton Community Housing Corporation

Net Zero Target

On November 22, 2023, Halton Regional Council endorsed the Region's proposed corporate emissions reduction target of net zero by 2045. The target was determined through thorough consultation, discussion and review of possible pathways. The Region's corporate emission reduction target is also in alignment with the Canada's national target, International commitments and scientific consensus.

This target acts as the goal for the Region's climate change mitigation journey and can be achieved through the implementation of actions within the Corporate Climate Action Plan, the Strategic Business Plan, the CDM Plan, and other climate change initiatives. The Halton Region is committed to developing a detailed plan to achieve the Net Zero target and has developed several internal committees that continue to investigate the best path forward. Once more information becomes available and additional projects are identified through these working committees, the CDM Plan will be updated on halton.ca.



Conclusion

By pursuing opportunities for energy conservation in all areas, and incorporating green building design, alternate energy production, energy management and sustainable operations, the Region will be able to make the best possible decisions regarding its energy conservation measures.

Halton Region will continue to make great strides towards establishing a Corporate Energy Management approach that achieves the goals of:

- conserving and reducing energy use;
- treating energy as a managed resource;
- reducing dependency on fossil fuels;
- redirecting energy consumed to come mainly from renewable sources;
- investigating energy generation and recovery projects in municipal operations;
- constructing new infrastructure and replacing existing equipment and processes to meet green standards;
- reassessing project viability to be based on full life cycle costing and a triple bottom line approach; and
- engaging external partners and agencies in our community.

Appendices

Data Normalization

Normalization: for the purposes of this CDM Plan, all utility data from 2019 was used as baseline for the calculations of GHG Emissions as well as Energy Consumption. The actual 2023 data was then normalized to 2019 based on certain applicable metrics as noted below:

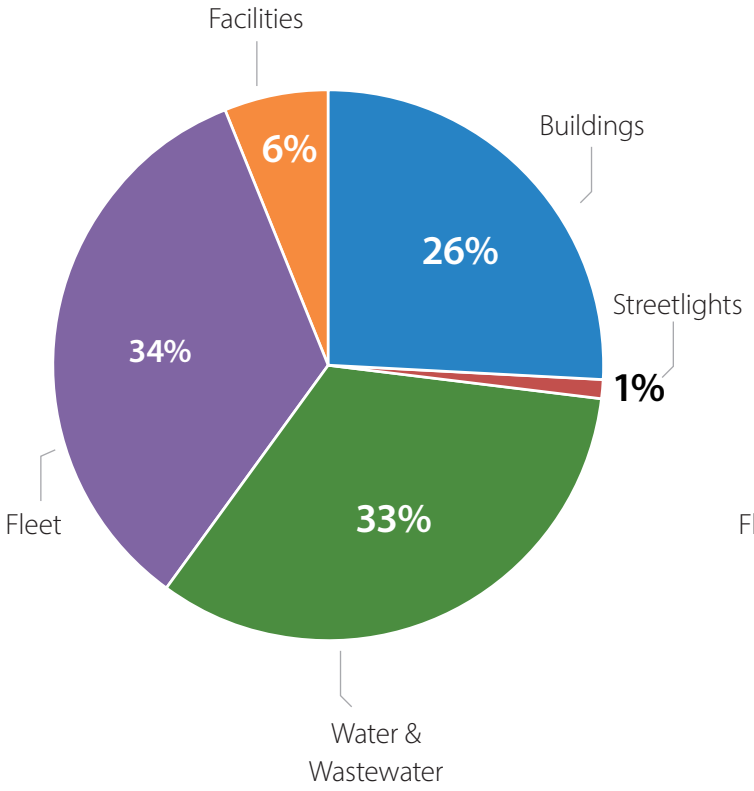
Corporate Portfolio	Normalization Metrics
Buildings	Building Area; Weather
Streetlights & Traffic Lights	Asset count
Water & Wastewater	Population growth
Fleet	Mileage
Waste	N/A

HCHC Portfolio	Normalization Metrics
Buildings	Building Area; Weather

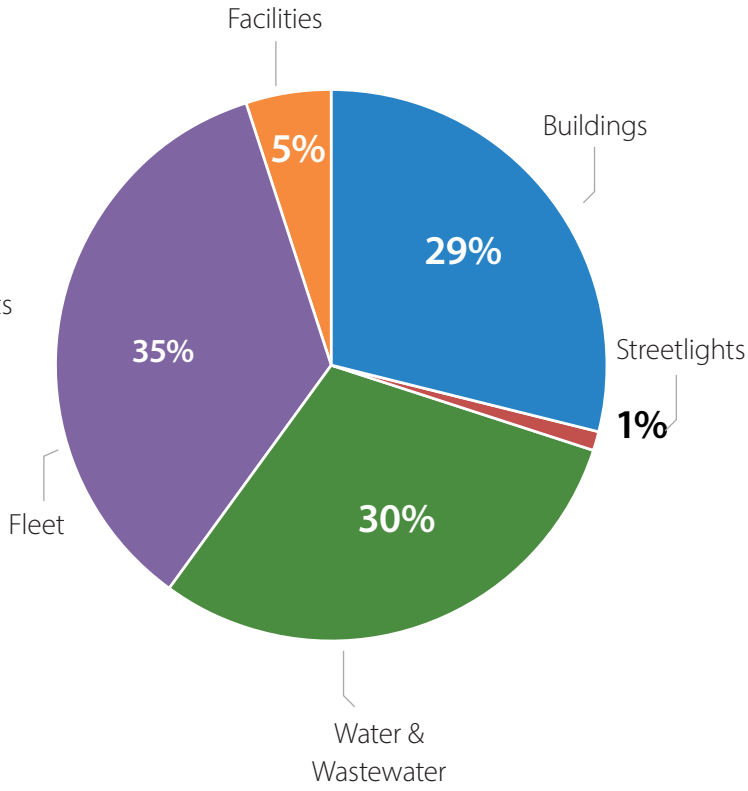
Corporate GHG Emissions

The GHG Emissions for the Corporate Portfolio for 2019 and 2023 are represented below:

GHG Emissions Corporate 2019 (baseline)

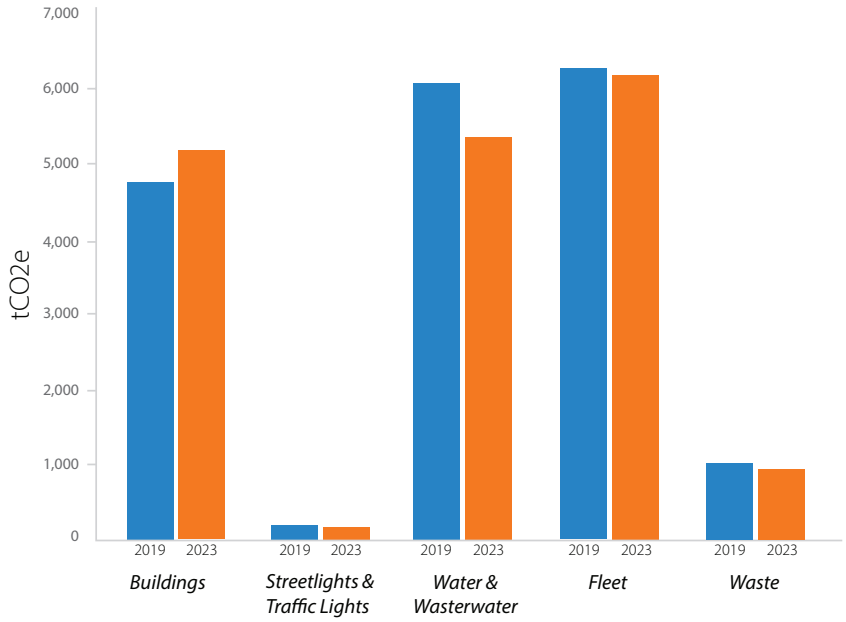


GHG Emissions Corporate 2023 (normalized)



The GHG Emissions in tCO2e for the Corporate Portfolio for 2019 vs 2023 is represented below:

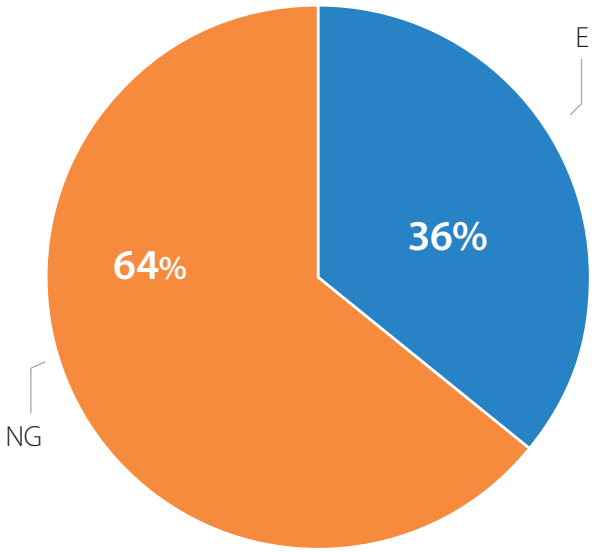
GHG emissions Corporate – 2019 (baseline) vs 2023 (normalized)



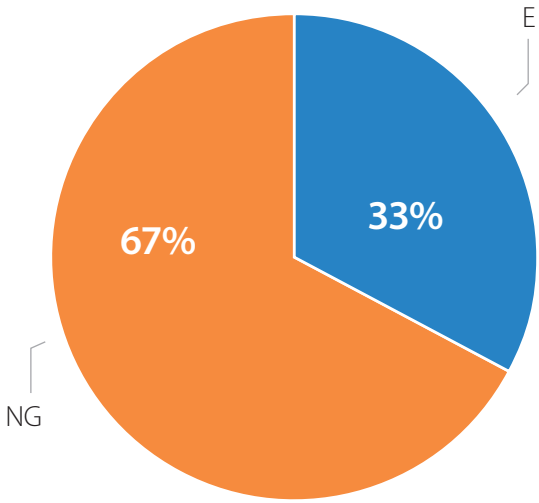
Corporate GHG Emissions

The GHG Emissions for the Corporate Portfolio contributed by Electricity and Natural Gas for 2019 and 2023 are represented below:

GHG Emissions Corporate 2019 (baseline)

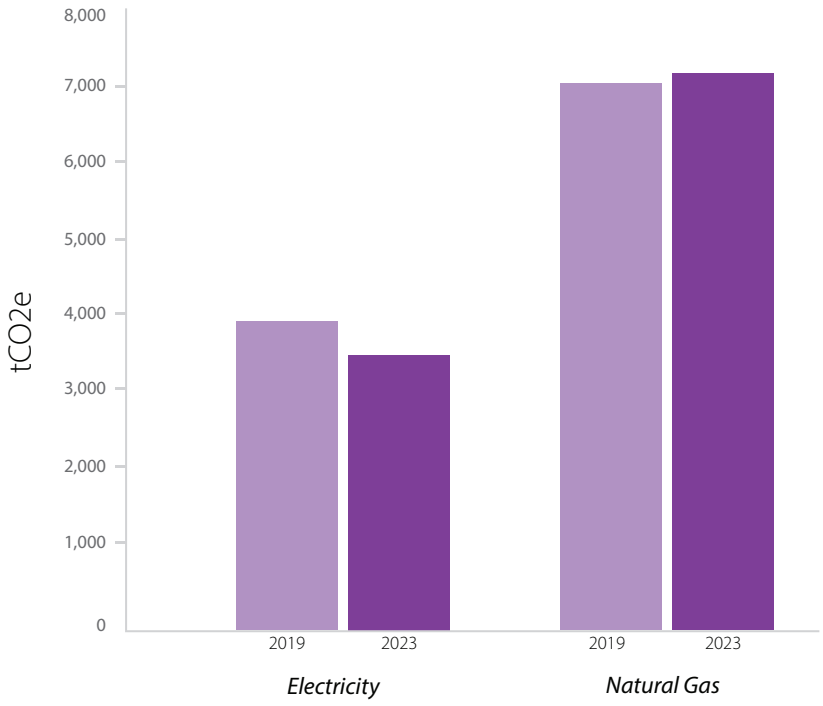


GHG Emissions Corporate 2023 (normalized)



The GHG Emissions in tCO2e for the Corporate Portfolio contributed by Electricity and Natural Gas for 2019 vs 2023 are represented below:

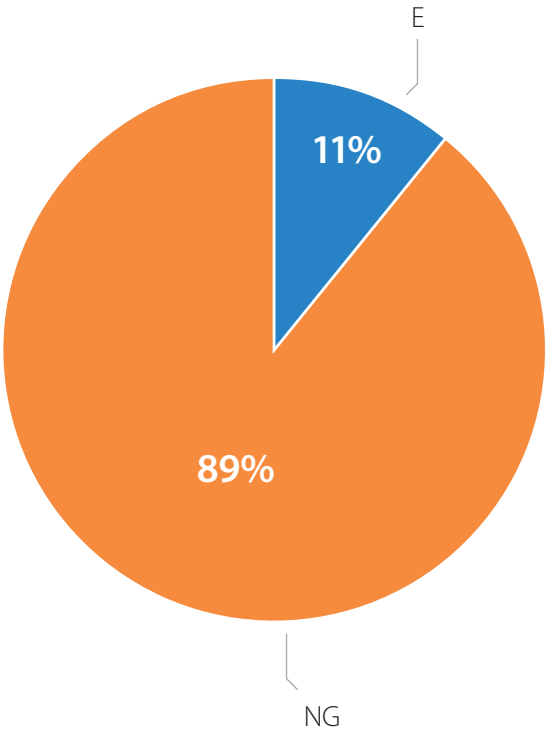
GHG Emissions – 2019 (baseline) vs 2023 (normalized)



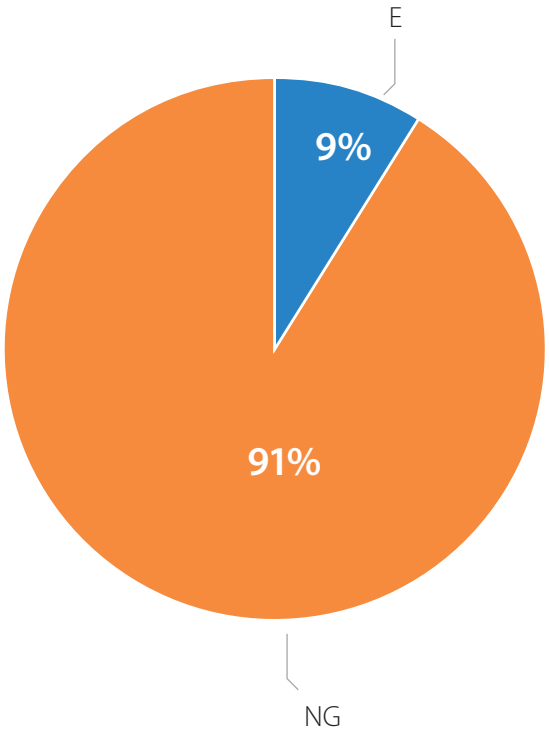
HCHC GHG Emissions

The GHG Emissions for the HCHC Portfolio contributed by Electricity and Natural Gas for 2019 and 2023 are represented below:

GHG (tCO2e) 2019 (baseline)



GHG (tCO2e) 2023 (normalized)



The GHG Emissions in tCO2e for the HCHC Portfolio contributed by Electricity and Natural Gas for 2019 vs 2023 are represented below:

GHG Emissions HCHC – 2019 (baseline) vs 2023 (normalized)