Agenda – Executive Policy Committee – June 18, 2024

Report – Standing Policy Committee on Water, Waste and Environment – May 31, 2024

Item No. 4 Winnipeg Climate Action Plan – 2023 Annual Report

STANDING COMMITTEE RECOMMENDATION:

On May 31, 2024, the Standing Policy Committee on Water, Waste and Environment concurred in the recommendation of the Winnipeg Public Service and submitted to Council:

1. That the report be received as information.

Report – Standing Policy Committee on Water, Waste and Environment – May 31, 2024

DECISION MAKING HISTORY:

STANDING COMMITTEE RECOMMENDATION:

On May 31, 2024, the Standing Policy Committee on Water, Waste and Environment concurred in the recommendation of the Winnipeg Public Service and submitted to Council:

1. That the report be received as information.

B. Raddatz, Manager, Office of Sustainability, Chief Administrative Office, provided a presentation on the matter.

COUNCIL DECISION:

On July 13, 2023, Council concurred in the recommendation of the Standing Policy Committee on Water, Waste and Environment and adopted the following:

1. That the Winnipeg Climate Action Plan – Annual Report be received each year in June to allow for the data gathering and analysis required for the annual Corporate GHG inventory.

On September 20, 2018, Council concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment that the Winnipeg Public Service report back annually to Council on the Winnipeg Climate Action Plan beginning in 2019.

ADMINISTRATIVE REPORT

Title: Winnipeg Climate Action Plan – 2023 Annual Report

Critical Path: Standing Policy Committee on Water, Waste and Environment – Executive Policy Committee – Council

AUTHORIZATION

Author	Department Head	CFO	CAO
B. Raddatz, RPP, MCIP Manager, Office of Sustainability	T. W. Shanks, M. Eng., P. Eng. Director, Water and Waste Department	N/A	M. Jack

EXECUTIVE SUMMARY

This report provides an outline of climate action and policy development in 2023. This was the first full year of implementation for OurWinnipeg 2045 and the Community Energy Investment Roadmap (CEIR). In alignment with federal and international targets, OurWinnipeg 2045 targets net zero emissions by 2050. This replaces previous climate targets from 2018 identified in the Winnipeg Climate Action Plan (WCAP).

The Community Energy Investment Roadmap (CEIR) is the technical, evidence-based roadmap to achieve this climate action target, and updates both corporate and community greenhouse gas (GHG) inventories. Council directed the Public Service to implement CEIR in July 2022. The modelling results, GHG inventory, and implementation framework of the CEIR will be used to inform a planned update to the WCAP and development of a Climate Resiliency Strategy (Appendix A).

Emissions from City operations in 2023 are 316,626 tonnes of CO_2e. This reflects a decrease of 10,039 tonnes of CO_2e from the year prior. Factors that helped reduce emissions in 2023 include a decrease in waste landfilled, drier weather which reduced volumes treated in wastewater treatment plants, and a reduction in commute time for staff as part of the Flexible Workplace Program. These factors helped offset the emission increases that occurred from buildings and transit.

RECOMMENDATIONS

1. That this report be received as information.

REASON FOR THE REPORT

On July 13, 2023, Council concurred in the recommendation of the Standing Policy Committee on Water, Waste and Environment and adopted the following:

1. That the Winnipeg Climate Action Plan – Annual Report be received each year in June to allow for the data gathering and analysis required for the annual Corporate GHG inventory.

On September 20, 2018, Council concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment that the Winnipeg Public Service report back annually to Council on the Winnipeg Climate Action Plan beginning in 2019.

IMPLICATIONS OF THE RECOMMENDATIONS

There are no implications associated with the recommendations of this report.

HISTORY/DISCUSSION

This report provides an outline of climate action and policy development across the organization in 2023. 2023 was the first full year of implementation for OurWinnipeg 2045 and the Community Energy Investment Roadmap (CEIR).

OurWinnipeg 2045 is Winnipeg's guiding climate policy with an updated climate action target of net zero emissions by 2050. The CEIR is the technical, evidence-based roadmap to achieve this climate action target, and updates both corporate and community greenhouse gas (GHG) inventories. The CEIR uses state-of-the-art modelling to identify City and community-wide systems level actions and investments to achieve net zero emissions. It fulfills Council direction to undertake detailed financial energy and emissions modeling to understand the costs and benefits of implementing climate action. Council directed the Public Service to implement CEIR in July 2022. Through the Corporate Greenhouse Gas Inventory process, the City tracks annual progress towards our climate action targets.

Corporate Greenhouse Gas (GHG) Inventory

The Corporate GHG Inventory relies on departmental reporting of emissions-related data. This data is used by the departments to meet their own reporting requirements.

The Office of Sustainability makes improvements every year to the accounting protocol used to report GHGs. This year's update changed what is reported for Corporate Waste to use measured tonnage of waste streams, as opposed to estimated volume. Additional waste streams were also included: residential curbside pickup, commercial waste, and waste collected from 4R Winnipeg Depots. This better aligns the inventory with the Partners for Climate Protection (PCP) protocol for municipal GHG accounting because it includes measured tonnage and all waste going to the City owned and operated landfill. This means that more waste was included in the 2023 inventory and that increased the GHGs associated with the Corporate Waste sector compared to previous reports. This report incorporates this change for past inventories to facilitate cross-year comparisons.

The Corporate GHG Inventory includes energy use and emissions from buildings, vehicles, equipment, water and waste infrastructure, and streetlights to measure the energy used and CO_2e emitted in providing the services and infrastructure for Winnipeg. In 2023, the City emitted a 316,636 tonnes of CO_2e and used over 2.7 million gigajoules of energy. This energy use is comprised of 238.7 million kWh of electricity, 20.4 million cubic meters of natural gas, 23.9 million litres of diesel fuel, and 5.1 million litres of gasoline.

Emissions have decreased by 3.1 percent since 2022, with energy use also decreasing by 2.8 percent. This comes from a reduction in gasoline, natural gas, aviation fuels, and electricity usage. These decreases offset the increase in diesel usage. The additional decrease of 8,045 tonnes CO_2e comes from less landfilled waste.

	2023 Energy		2023 CO_2e		
	Total Energy (GJ)	**Change from 2022 (%)**	**Total CO_2e (tonnes)**	**Change from 2022 (%)**	**Change from 2022 (tonnes CO_2e)**
Buildings	952,162	2.9%	28,925	4.7%	1,290
Vehicle Fleet	1,092,792	-0.9%	73,484	-0.3%	-242
Streetlights	110,042	0.0%	37	0.0%	0
Water and Wastewater	580,614	-14.3%	10,039	-23.3%	-3,042
Corporate Waste	-	-	204,152	-3.8%	-8,045
Total	**2,735,610**	**-2.8%**	**316,636**	**-3.1%**	**-10,039**

The largest areas of emissions change were due to:

- Total amount of waste landfilled at the Brady Road Resource Management Facility was down from 2022 with projected emissions down by 3.8 percent (8,045 CO_2e).
- Total wastewater treated was down by 43 percent due to 50 percent less precipitation than in 2022.
- The Flexible Workplace Program reduced staff commuting trips and related emissions by 1,156 CO_2e.
- Transit use continues to recover from the pandemic with an increase in fuel use emissions of 2.6 percent (1,099 tonnes CO_2e) from 2022, but still below 2019 levels.

A Whole City Approach

Our climate action goals require a city-wide approach to climate considerations for all policy and spending decisions. This section outlines the corporate actions taken in 2023 to embed climate action into internal decision-making processes.

Council's Strategic Priorities Action Plan identifies five key priority themes and 42 priority actions for strategic focus and investment. The Green and Growing City with Sustainable Renewal of Infrastructure theme includes 10 actions that focus on climate resiliency, renewable energy, waste diversion, protecting and growing the urban forest, road and pedestrian safety, and public and active transportation. The measurement and reporting framework identifies the Community Energy Investment Roadmap as one of the key performance indicators.

Council approved six citizen members to sit on the Climate Action and Resilience Committee(CARC) through the Boards and Commissions process. CARC's function is to advise Council on climate change issues, support the update of the Winnipeg Climate Action Plan and development of the Climate Resilience Strategy, and support community climate action.

The Office of Sustainability added three full-time equivalent positions. The Senior Sustainability Planner, Green Buildings Specialist and Sustainability Planner positions will lead high level strategies and projects, including the Winnipeg Climate Action Plan update and development of

the Climate Resilience Strategy, green building policy and program development, and support the Climate Action and Resilience Committee.

2023 marked the first full year of implementation for the Sustainable Procurement Action Plan. An Environmental Procurement Questionnaire was designed for the formal request process (including bids, information, proposals, quotations and tenders) to ask for information about business practices that can contribute to the environmental goals of the City and community. Environmental clauses and specifications were also included as part of the design of the Social Value Menu, a mechanism that can be used to drive measurable environmental outcomes from the City's procurement.

The first phase of the Zoning By-law Review was completed. This initial review identified ways the City's current zoning by-laws work well, challenges surrounding their use, and ways to make future revised zoning by-laws more user-friendly. Climate resilience and sustainability were considered throughout the review. Making climate-resilient development a part of the "core DNA" of the by-law through strategic development approaches and zoning tools was identified as a key recommendation to be carried into the next phase of the review process.

The Government of Canada and the City of Winnipeg announced an agreement under the Housing Accelerator Fund to fast-track housing development. Funding from this program will support the development of more affordable, diverse, and climate-resilient buildings through seven local initiatives and help to increase the supply of housing in Winnipeg.

Municipal Accommodations hosted internal presentations on building energy and carbon related topics. These presentations highlighted impacts of climate change and available City sustainability resources. Through this peer learning group, information surrounding sustainable design, building and energy codes, energy demand, life cycle costing analysis and City policies and programs was shared and discussed.

Green Buildings

Buildings are the second largest source of GHG emissions in Winnipeg, accounting for 42.5 percent of community-wide emissions in 2023. City facilities accounted for 34.8 percent of overall energy use and 9.1 percent of emissions at the corporate level. The use of natural gas for heating purposes is a significant driver of building emissions.

The CEIR includes actions related to new buildings that are energy efficient and electric, retrofitting existing buildings and the installation of heat pumps to increase overall efficiency. These actions can be measured through improvements to energy performance metrics for new buildings and total number of buildings and total floor area retrofit for existing buildings.

The Green Building Policy has been directing sustainability requirements for new City-owned buildings and major additions since 2010. An update to the Green Building Policy was initiated to align with the OurWinnipeg 2045 emissions targets and buildings related actions outlined in the CEIR. While the update is in progress, the City has applied actions from the CEIR to multiple facilities, including energy efficiency targets and carbon reduction requirements in requests for proposals. These incremental targets support a higher tier of energy efficiency in the 2020 version of the National Energy Code for Buildings than what was adopted by the Province. Sustainability workshops for the South Winnipeg Recreation Campus were held in 2023 and examined net zero carbon ready design, passive strategies, active systems and LEED requirements.

Energy efficient upgrades for existing City buildings, including those for lighting, building envelope, HVAC and related operations controls, and custom energy solutions received over $280,000 in financial support through Efficiency Manitoba programs.

Council approved the development of a Building Emissions Reduction Strategy (BEDP) for existing buildings in September. The strategy is expected to be reported back to Council in Q3 2024. The energy and emissions performance of these buildings is tracked through the City's Building Energy Disclosure Project. The BEDP helps commercial and institutional buildings owners in Winnipeg better understand the energy performance of their buildings while supporting overall reductions in greenhouse gas emissions and energy consumption.

Zero-Emissions Transportation

Transportation is the largest source of GHG emissions in Winnipeg, accounting for 49.4 percent of community-wide emissions. It includes personal vehicle use, commercial operations, transit, heavy transportation and off-road vehicle use. Fuel use for City operations, including fleet, equipment and waste hauling contractors accounted for 39.9 percent of overall energy use and 23.2 percent of emissions.

Transit electrification, increased transit use, active transportation, flexible workplaces and the electrification of vehicle transportation (personal, commercial, city fleet) are identified in the CEIR as actions to be undertaken towards zero-emissions transportation. These actions can be measured through percentage shares of total personal vehicles and energy used for transit which is electric, and mode share targets.

The City of Winnipeg Flexible Workplace Program (FWP) underwent its first-year review in May. Flexible work locations reduce the number of vehicle kilometres traveled by City employees for commuting and for attending meetings and training. For the program's first year, about 22,803 trips per month were saved just for commuting, with a total of 1,153 tonnes of CO2e avoided.

The Transition to Zero Emissions Bus Program progressed, including issuing tenders for the construction of charging and hydrogen infrastructure, and facility modifications to service and repair battery electric and hydrogen fuel cell buses at the Fort Rouge Garage. The Standing Policy Committee on Public Works also approved the recommendation that all future reports regarding the replacement of transit buses consider the purchase of zero-emission buses, unless there are extenuating circumstances.

The Winnipeg Fleet Management Agency began work on a study of the City's infrastructure compatibility for electric vehicles. This project will determine the electrical capacity of sites to serve future fleet electrification, and the necessary charging infrastructure required.

The EV Public Charger Pilot Program continued through 2023. There were 2,956 charging sessions and 24.7 gigawatt-hours of electricity dispensed throughout the year, resulting in 25.2 tonnes of CO2e avoided.

The Winnipeg Parking Authority worked with Peg City Car Co-op (PCCC) to expand the carshare parking permit program to include a free-floating zone-based option. These free-floating cars will be exempt from on-street parking time limits within a designed zone that extends around downtown. Launched in June 2023, PCCC currently has 38 of these permits in their free-floating (FLO) program.

Active transportation programs continued to advance. Council approved the permanent conversion of nine bicycle routes to neighbourhood greenways in March. An additional five

bicycle routes were designated as seasonal routes for 2023 and beyond through the Enhanced Summer Bike Route Program.

Local Renewable Energy

CEIR identifies that after reducing the need for energy and increasing energy efficiency, electrification of heating and transportation is key to reaching net zero emissions. Hydroelectricity can be supplemented by local production, including solar generation which can reduce the need to build new grid-scale generating capacity. Clean energy actions included in the CEIR focus on the installation of solar photovoltaics (PV) on new and existing buildings, and use of renewable natural gas (RNG) as a zero emissions fuel during the decarbonization transition. These actions can be measured through megawatts of solar PV installed and percentage of natural gas displaced with RNG.

Five possible location types were identified as part of an administrative report for solar power generation on City property, including new buildings, deep energy retrofits, major additions, renovations and special use cases. Consideration of these location types and futureproofing for solar power generation were referred to the update process for the Green Building Policy.

Winnipeg Transit awarded the contract for the development of a preliminary design and a Class 3 cost estimate for a grid-tied microgrid as part of the Transition to Zero-Emissions Bus Program. The microgrid is expected to consist of energy generation from a rooftop solar photovoltaic installation and an existing diesel genset, supported by an integrated battery storage system and microgrid controller.

Sustainable Waste Management

Community GHG emissions from waste come from both City-owned and private landfills. Organic matter in landfills decays over time and can continue to release GHGs long after it is buried. The CEIR includes actions for sustainable waste management related to waste diversion, reduction of water consumption and increase of wastewater efficiency. These actions can be measured through an established waste diversion rate, waste generation target and incremental increase of the efficiency of water pumps. Waste accounted for 6.9 percent of community-wide emissions, and 64.5 percent of corporate emissions in 2023.

The first phase of engagement for the Comprehensive Integrated Waste Management Strategy (CIWMS) Review took place. As part of this phase of engagement, an online survey and ideas wall were publicly available for input and stakeholder meetings and interviews were conducted. Waste audits were completed in the summer and autumn to understand the waste composition of residential (single- and multi-family dwellings) and industrial, commercial and industrial, and construction, renovation and demolition sectors.

The Multi-Family Waste Diversion and Management Strategy was approved by Council. The goals and objectives of the strategy are to reduce GHGs and increase diversion of waste from multi-family dwellings (MFD). The strategy includes enhanced or new diversion programs, implementing a sustainable MFD waste management program that balances social, environmental and financial considerations, and developing design standards for storage and collection of waste.

An options analysis and high-level cost estimate was completed for an organic waste processing facility to support a city-wide green cart program for single-family residential dwelling units. The concept and development of this program was approved by Council. Progress on the development of the program is expected to be reported back to Council in June 2024.

Council approved a compost support grant which awarded $65,000 to Compost Winnipeg to improve affordability, efficiency and reliability of their organic waste collection service. As part of program development for the green cart program, Council also approved continued administration of the grant annually until the program is operational.

For the third consecutive year, 100 percent of biosolids were beneficially used through soil fabrication and land application. In total, 59,976 tonnes were diverted from landfill, equivalent to 13,879 tonnes of CO2e avoided, a 10 percent increase from 2022.

Resilience

The Winnipeg Climate Action Plan update will include the development of a Climate Resilience Strategy. Resilience refers to actions taken to address the impacts of climate change and to respond to the local risks and opportunities climate change may bring. Projected climate impacts include extreme heat days, intense summer precipitation events, drought, and increased freeze-thaw events. Overall, the climate will continue to become more unstable as more carbon pollution is released into the atmosphere. In 2023, the City contributed $450,000 towards various community-based initiatives that are building climate resilience. This section outlines these initiatives and actions that the City is already taking to increase climate resilience.

Council approved the second phase of implementation (2024-2027) for the Poverty Reduction Strategy. The Poverty Reduction Strategy aims to increase community resilience and provide increased support to residents experiencing poverty-related effects of climate change, such as during increased extreme weather events.

The City of Winnipeg approved becoming a signatory to the Montreal Pledge. The Montreal Pledge challenges municipalities to take 15 tangible actions towards pursuing and accelerating efforts to preserve their ecosystems. These actions are well aligned with the City of Winnipeg's established policies and operating procedures, including OurWinnipeg 2045. The Pledge further supports forthcoming City strategies on greenspace and climate resilience.

The Winnipeg Comprehensive Urban Forestry Strategy was approved by Council. The strategy includes City-wide and public tree targets and policy priority actions. These actions focus on planning, planting, management, protection and partnerships. Alongside enhanced tree protection, the strategy encourages Winnipeg to embrace the ecological role of the urban forest in providing valuable climate adaptation and mitigation, habitat, and other ecosystem services.

Project scoping for the Master Greenspace and Natural Corridors Plan was completed. Preliminary design work was also advanced for two green infrastructure projects in the Armstrong combined sewer district. These projects aim to improve sewer system performance by slowing down rainwater. They will also boost the number of trees in the area and provide opportunities for an urban garden for community-led local food production.

City staff planted approximately 16,180 trees in parks and on boulevards, greenspaces and naturalized areas as part of the second year of the Home Grown Winnipeg Tree Planting Program. Grants were established as part of this program to support tree planting projects on public land. Projects planned for geographic areas of higher poverty and underserved communities were given priority in the evaluation process. Through the first intake cycle of the program, $180,000 was awarded to 13 not-for-profits and incorporated community groups, with approximately 280 trees planted.

The Land Dedication Reserve Fund provided over $260,000 for community projects that support the creation or continuation of a physical legacy of parks and recreation facilities for the City of Winnipeg. Several projects implemented tree planting and naturalization, community gardens and nature education programs, nature play and outdoor learning spaces, and education on food security.

For the second consecutive year, the Winnipeg Food Council offered small grants to support community gardens and urban agriculture initiatives. Thirteen organizations were selected, with $10,000 awarded in grant money to new projects, garden renovations and upgrades, engaging over 500 participants.

The first phase of the Winnipeg Clean Air Spaces project was completed, and a facility assessment tool was developed to identify clean air spaces in existing community facilities for possible use during wildfire smoke events. An additional $100,000 in funding from Health Canada was also approved to advance the second phase of the project. This phase will include the coordination of a clean air space exercise in April 2024 at a facility identified through the assessment tool in the previous phase. Community consultation and workshops are also expected to take place in the second phase to identify risk perceptions, expectations and concerns to help develop communication tools and increase awareness surrounding air quality events.

FINANCIAL IMPACT

Financial Impact Statement **Date:** May 8, 2024

Project Name:

Winnipeg Climate Action Plan - 2023 Annual report

COMMENTS:

There is no Financial Impact associated with the recommendation of this report.

Lucy Szkwarek, CPA, CGA

Lucy Szkwarek, CPA, CGA
Manager of Finance and Administration

CONSULTATION

This Report has been prepared in consultation with:

- Assets and Project Management
- Community Services Department
- Planning, Property and Development
- Public Works Department
- Winnipeg Fire Paramedic Services
- Winnipeg Fleet Management Agency
- Winnipeg Parking Authority
- Winnipeg Transit

OURWINNIPEG POLICY ALIGNMENT

OurWinnipeg Goal: Leadership and Good Governance
Objective 1. **Establish and implement priority actions through evidence-informed decision-making processes.** Evidence-informed actions require transparent and accountable decision-making to determine the long-term public interest and the appropriate trade-offs in levels of service, taxation, and budget priorities.

WINNIPEG CLIMATE ACTION PLAN ALIGNMENT

Strategic Opportunity #1: Corporate Leadership
Key Direction #1.1 Cultivate a Corporate Culture That Values Climate Action

Strategic Opportunity #7 Community Climate Resiliency
Key Direction #7.1 Implement Opportunities to Improve Winnipeg's Resilience and Adaptability to the Effects of a Changing Climate

WINNIPEG POVERTY REDUCTION STRATEGY ALIGNMENT

The Winnipeg Climate Action Plan aligns with the Winnipeg Poverty Reduction Strategy as both place focus on building a more resilient, sustainable, and equitable city for all residents. The Plan and the Winnipeg Poverty Reduction Strategy both represent the intention for increased resiliency of our communities, municipalities, and the city as a whole, while also placing emphasis on providing increased support to residents experiencing poverty related to the effects of climate change.

SUBMITTED BY

Department: Water and Waste Department
Division: Office of Sustainability
Prepared by: J. Harper / A. Brinton
Date: May 15, 2024
File No: O-005
Attachment:
Appendix A: City of Winnipeg Corporate Greenhouse Gas Emissions 2023

City of Winnipeg Corporate Greenhouse Gas Emissions

2023

INTRODUCTION

This report provides an update on the City's Corporate Greenhouse Gas (GHG) Inventory for 2023. The tracking and measurement of greenhouse gas (GHG) emissions is called for in OurWinnipeg 2045:

- Good Governance Objective 1: Establish and implement priority actions through evidence-informed decision-making processes.
- Environmental Objective 1: Prioritize the transition to a resilient, low-carbon future through demonstrated organizational and community leadership, and collaborative actions that mitigate and adapt to a changing climate.

The Corporate GHG Inventory follows the Partners for Climate Protection (PCP) protocol for municipal GHG accounting. The PCP Inventory protocol focuses on municipal operations and is consistent with Corporate GHG inventories produced to date. The scope of data collected has increased since the first inventory in 1998. The collection process has been refined over the years to improve the accuracy and completeness of the inventory.

Energy used for operations comes in different forms; including litres of vehicle fuel, kilowatt hours of electricity, and cubic meters of natural gas. To allow comparisons between these energy sources, the volume of each is converted to the amount of work each unit of fuel does. This translates these different fuel types into gigajoules (GJ) of energy. With this, 30 litres of gasoline, 26 litres of diesel, 26 m^3 of natural gas, and 278 kilowatt hours (kWh) of electricity all contain the same amount of energy: 1 GJ.

Similarly, there are the three most significant GHGs related to climate change, with different strengths of impacts. These include carbon dioxide (CO_2), nitrous oxide (NO_2), and methane (CH_4). The impacts of the latter two GHGs are expressed in equivalent CO_2 levels, and the sum of the three is expressed in "CO_2 equivalent", or CO_2e.

Updates to Accounting Practice

The Office of Sustainability makes improvements every year to the accounting protocol used to report GHGs. This year's update changed what is reported for Corporate Waste to use measured tonnage of waste streams, as opposed to estimated volume. Additional waste streams were included: residential curbside pickup, commercial waste, and waste collected from 4R depots. This better aligns the inventory with the Partners for Climate Protection (PCP) protocol for municipal GHG accounting because it includes measured tonnage and all waste going to the City owned and operated landfill. This means that more waste was included in the 2023 inventory and that increased the GHGs associated with the Corporate Waste sector compared to previous reports. This report incorporates this change for past inventories to facilitate cross-year comparisons.

2023 Inventory

In 2023, total energy use decreased 2.8% and total emissions decreased 3.1% compared to the previous year. Energy use and emissions increased within the Buildings and Transportation sectors in 2023. Use of natural gas and electricity decreased 4%, gasoline decreased 29%, and diesel fuel use increased 13%. The Corporate Waste sector emitted 3.8% less GHGs compared to 2022 and constituted 64.5% of total emissions.

CORPORATE GHG INVENTORY (2023)

Source	2023			
	Energy (GJ)	% change from 2022	Total CO_2e (tonnes)	% change from 2022
Buildings	952,162	2.9%	28,925	4.7%
Vehicle Fleet	1,092,792	-0.9%	73,484	-0.3%
Streetlights	110,042	0.0%	37	0.0%
Water & Wastewater	580,614	-14.3%	10,039	-23.3%
Corporate Waste	-	-	204,152	-3.8%
TOTAL	2,735,610	-2.8%	316,636	-3.1%

Figure 1 - Energy Use and GHG Emissions for City Operations

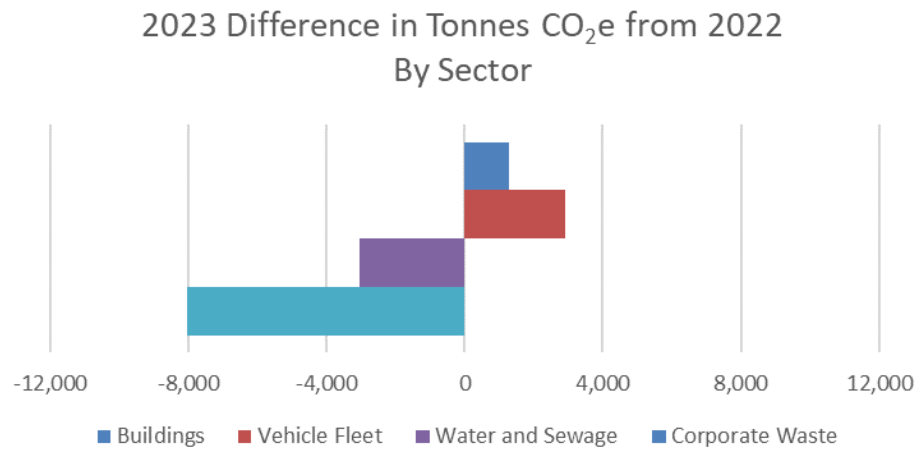

Figure 2 – Difference in GHG emissions tonnages from 2022 to 2023

ENERGY USE AND GHG EMISSIONS IN 2023

Energy use and emissions decreased between 2022 and 2023. Energy use decreased 2.8% over this time, with increases in the Buildings sector (2.9%) offset by a significant decrease in the Water & Wastewater sector (14.3%) and a smaller decrease in the Vehicle Fleet sector (0.9%). Emissions decreased 3.1% overall, with offsetting increases in the Buildings sector (4.7%), a significant decrease in the Water & Wastewater sector (23.3%), as well as a smaller decrease in the Vehicle Fleet sector (0.3%). The relatively large impact of the Corporate Waste sector (64.5% of emissions in 2023) meant that its decrease in emissions has a significant impact on the year-to-year change of total emissions.

Energy Use by Source

The Corporate Waste sector emissions are excluded from this section. Waste emissions do not come from the consumption of energy but from the decomposition of waste in landfills.

In 2023, diesel was the largest energy source at 33.4% of energy used and, owing to its high carbon content, was 55.4% of energy-related emissions, or 19.7% of total emissions. This is despite increases in ethanol content for diesel and gasoline which decreases the emissions per litre of fuel.

Electricity was the second largest energy source at 31.4% of total use, 0.3% of energy use related GHGs, or 0.1% of total emissions. This is due to the low-carbon profile of Manitoba's electrical grid.

Natural gas use accounted for 28.6% of total energy use and 34.4% of energy use related GHGs, or 12.2% of total emissions.

Gasoline (in an ethanol blend) accounted for 6.4% of energy use and 9.7% of energy use related emissions, or 3.4% of total emissions.

Aviation fuel's impacts were negligible.

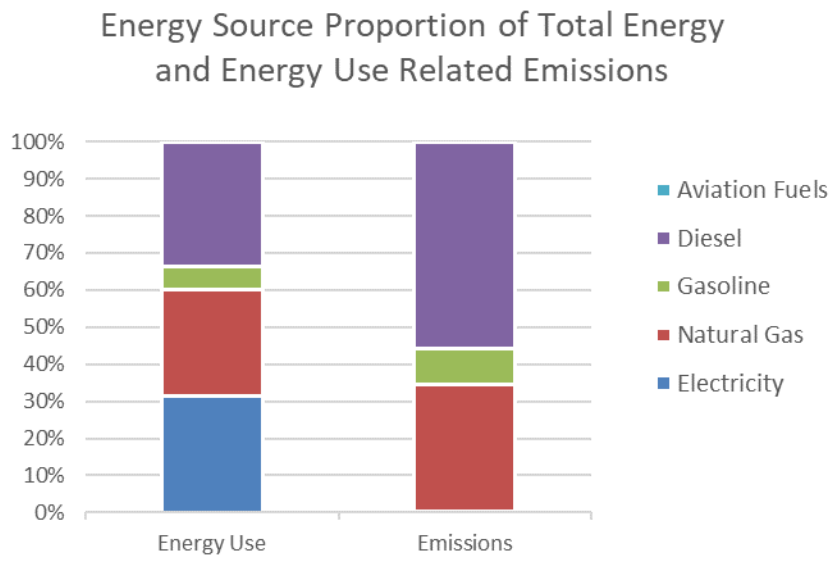

Figure 3 – Energy sources proportion of total energy use and total emissions – excludes Corporate Waste emissions

Emissions and Energy Use by Sector

The Corporate Waste sector impacts 64.5% of total emissions. GHGs from waste are calculated from the tonnage of waste landfilled at Brady Road Resource Management Facility. 2023 is the first year the Corporate GHG Inventory has included this measured waste tonnage; previous years accounted for an estimated waste volume produced at City facilities. This new process accounts for all waste under the control of the City at its landfills.

In general, the graphs below show an increase in energy use with no corresponding increase in emissions. This indicates that the City operations energy mix is lower carbon than in previous years.

Vehicle & equipment fuel use was the largest energy user and second largest CO_2e emitter in 2023 at 39.9% of total energy use and 23.2% of emissions.

Buildings (excluding those involved in providing water & wastewater services) were the second largest user of energy, using 34.8% of all energy, and producing 9.1% of emissions.

Water & Wastewater infrastructure was the third largest user of energy. In 2023 it used 21.2% of total energy and had the fourth highest GHG emissions at 3.2% of total.

Streetlights & Traffic Signals used the least energy at 4% and were 0.01% of total emissions.

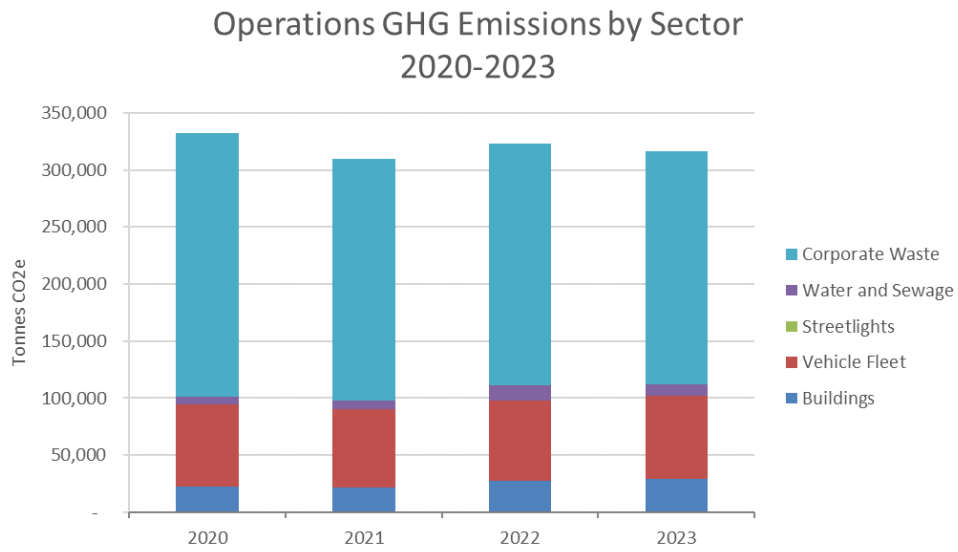

Figure 4 - Emissions Use for Corporate Operations 2020 – 2023

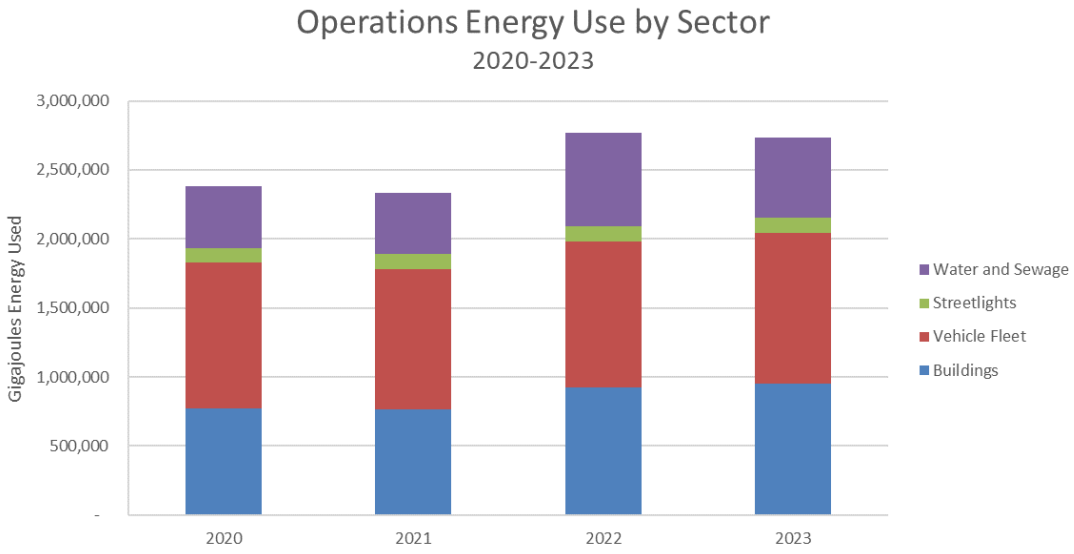

Figure 5 – Energy Use for Corporate Operations 2020 – 2023

Buildings

The effects of the pandemic on building energy use were apparent across most of the City's building portfolio from 2020 to 2022. Energy use in the Buildings sector dropped 21% from 2019 to 2020 and declined again in 2021 by 1%. Energy use in the 2023 Buildings portfolio increased 2.9%.

The Buildings sector is heavily influenced by the weather; colder weather requires more energy for heating needs. This sector has also shown efficiency gains over the last five years. From 2018 onwards, emissions dropped relative to heating needs, until 2021, when the difference began to decrease. 2023 showed that these efficiency gains seem to decrease still further, as energy use increased while heating needs decreased.

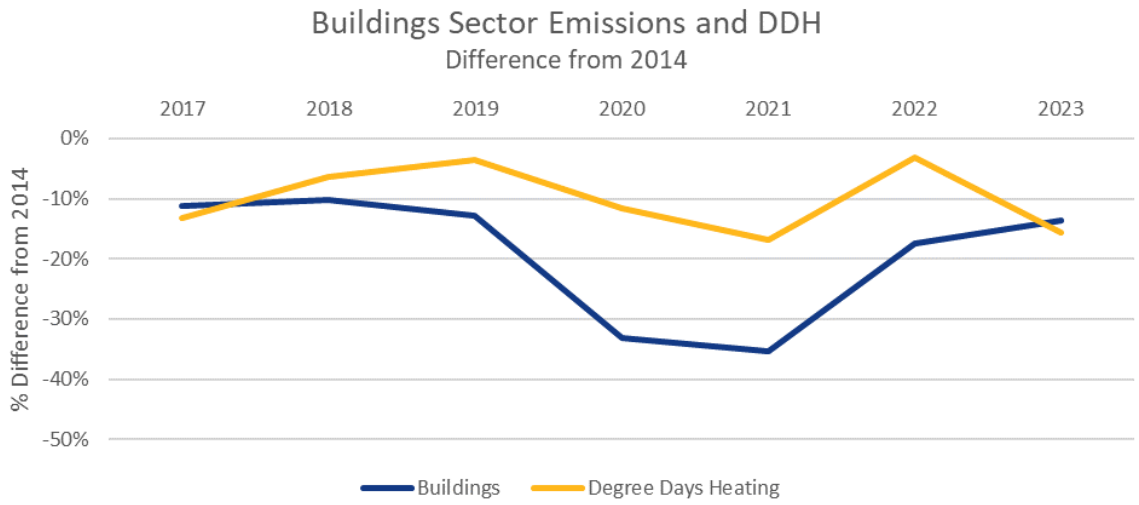

Figure 6 - Influence of Climate on Buildings Sector Emissions

Vehicle Fleet

The Vehicle Fleet sector includes energy and emissions from vehicles and heavy equipment used in City operations.

2023 reported a negligible decrease in emissions, dropping 0.3% compared to 2022. This was not the result of a lack of change, but rather the counterbalancing of two large changes related to transit and staff commuting. Transit increased fuel use and emissions by a small amount (2.6%, 1,099 tonnes), while commuting for City workers decreased emissions (14.7%, 1,153 tonnes) because of the Flexible Workplace program. Corporate vehicle use (City owned and operated vehicles not used by Transit, and not helicopters) increased by 0.8% (113 tonnes) and use of Air1 by WPS increased by 1.7% (4 tonnes) while there were decreases in waste hauling vehicles (2.3%, 175 tonnes), insect control (51.6%, 90 tonnes), leachate hauling (21.6%, 31 tonnes), and Personal Vehicles for City Business (PVCB) (2.5%, 9 tonnes).

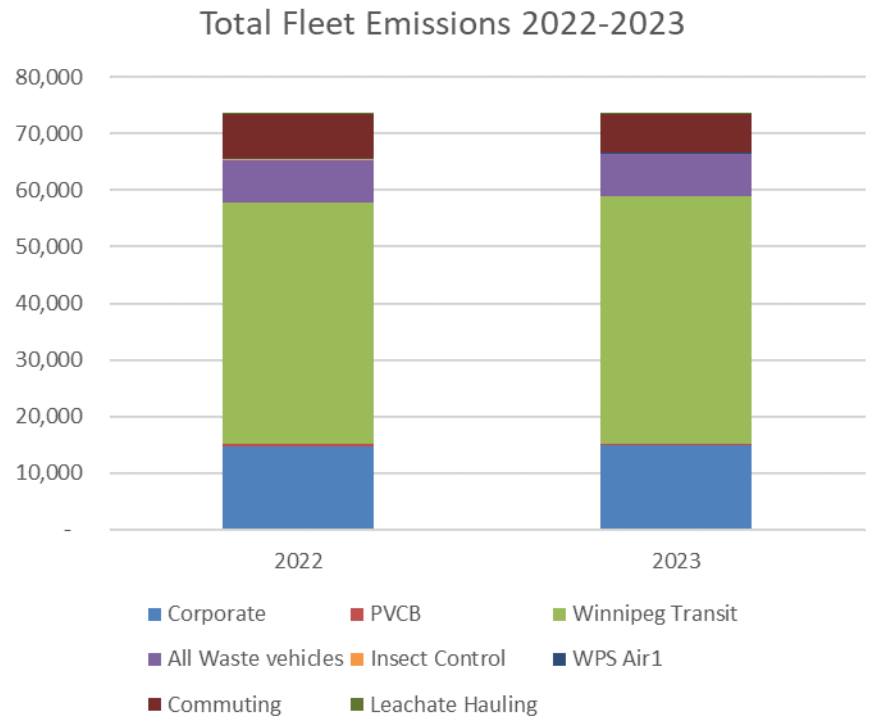

Figure 7 - Fleet Emissions Profile, 2022 and 2023

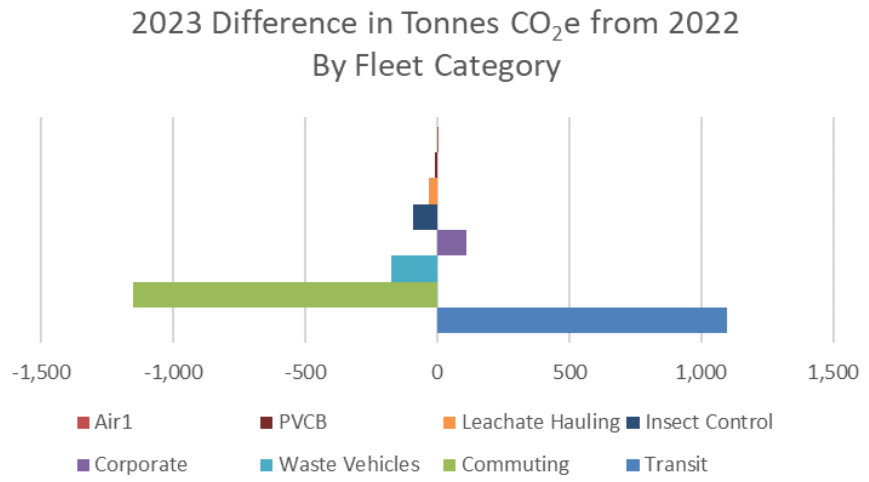

Figure 8 - Tonnage Difference from 2022 by Fleet Category

Commuting impacts have been included in Winnipeg's inventories since 2018. 2023 saw the first reported impacts of the Flexible Workplace Program. This program has reduced commuting kilometres (km) by 531,875 km monthly, or 6,382,496 km annually. This represents emissions reductions from commuting by 14.7%, or 1,153 tonnes CO_2e.

Transit associated emissions have increased 3% from 2022, though they are still 7% below pre-Covid levels.

Leachate hauling and aviation fuel use were down, by 21.6% and 52% respectively. These are both operations significantly affected by rainfall and benefited in a particularly dry year. Leachate hauling was also impacted by improved leachate management practices at Brady Road Resource Management Facility.

Streetlights

Streetlights only use electricity. In Manitoba this is a relatively clean energy source, so this sector produces negligible emissions. Most Winnipeg streetlights have been switched to LED lights. This has decreased energy use substantially.

Water and Wastewater

Water & Wastewater infrastructure energy use decreased in 2023 by 14.3%. In comparison, this was 1% higher than the levels reported in 2019. The Wastewater sector is significantly impacted by precipitation entering the sewer system and needing to be processed by the wastewater treatment plants. The chart below shows the link between precipitation, treated wastewater, and energy use by wastewater infrastructure from 2020 to 2023.

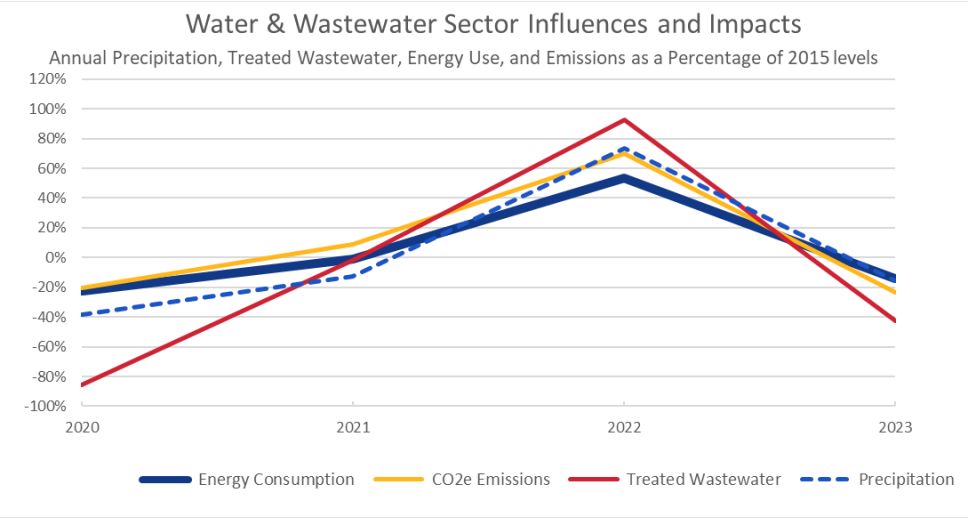

Figure 9 - Change in Water & Wastewater Energy Use, Emissions

Corporate Waste

Waste emissions are based on weighed tonnage of waste delivered to the Brady Road Resource Management Facility. Emissions from this sector are a result of methane generation from landfilled refuse, as opposed to the combustion of fossil fuels, as in other sectors of this inventory. Methane generation from decomposition of waste can peak several years after landfilling and can continue for more than 50 years.

For the 2023 inventory, a new process for calculating waste has been used. This has increased the reported impacts of waste emissions by between 17 and 18 times compared to the previous process, at a total of 379,569 tonnes CO2e. This new process will also allow for a more accurate reflection of the methane emissions from the actual landfilled waste mix in future reports.

Biosolids diversion has saved the City from landfilling 221,219 tonnes of biosolids, producing 51,191 tonnes of CO_2e since 2020. In 2023, it accounted for 13,879 tonnes of CO_2e avoided, or 12.3% of the total Corporate Waste stream.

There has been a gradual decline in waste landfilled over the last three years. A peak in the amount of waste landfilled was last seen in 2020, with 344,087 tonnes of waste generating approximately 230,657 tonnes of CO_2e. The amount of waste landfilled in 2023 dropped by 26,505 tonnes of waste, or 11.5%, accounting for 17,767 tonnes CO_2e.



Figure 10 - Change in Corporate Waste Emissions, 2020-2023