

The Regional Municipality of York

Committee of the Whole
Environmental Services
June 15, 2023

Report of the Commissioner of Public Works

2022 Corporate Energy Report

1. Recommendation

Council receive this report for information.

2. Summary

This report summarizes progress made toward corporate climate change mitigation targets detailed in the Region's [Energy Conservation and Demand Management Plan](#) (hereafter referred to as "Plan"). It summarizes corporate energy consumption, emissions and costs from York Region's service delivery in 2022, including operational changes and results as the Region emerges from the pandemic.

Key Points:

- Corporate greenhouse gas emissions in 2022 increased to 70,650 tonnes, an annual increase of 4,900 tonnes. Although emissions increased, they remained below 2022 targets set in the Region's Energy Conservation and Demand Management Plan
- In 2022, emissions increased in all categories (buildings, fleet, transit buses, and water and wastewater processes) and were distributed as shown in Figure 1
- Despite consuming less energy in 2022 compared to the period prior to the pandemic, energy costs reached \$57.8 million, an all-time high for York Region driven by increases in diesel fuel consumption, federal carbon and global oil prices resulting from the conflict in Ukraine
- As York Region emerges from the pandemic, energy consumption will increase with rising demand for services. Staff are working to meet this challenge through conservation and investments in energy efficiency made during the pandemic

3. Background

The Region's energy consumption and greenhouse gas emission goals are consistent with Canada's national targets

Bill C-12, the [Canadian Net-Zero Emissions Accountability Act](#), passed in 2021, legislates Canada's 2030 Paris Accord commitment to achieve net-zero carbon emissions by 2050 and limit the global mean-temperature rise to 1.5 degrees Celsius. Canada has set ambitious interim national targets to reduce greenhouse gas emissions by 40% below 2005 levels by 2030, which will require participation from all levels of government, industry and individual Canadians.

Council approved [2019 Energy Conservation and Demand Management Plan](#) and [2022 Climate Change Action Plan](#) are aligned with national mitigation and adaptation strategies. The annual Corporate Energy Report is the primary tool for reporting progress toward achieving the Region's corporate emission targets. Ontario Regulation 25/23 requires municipalities to publish an energy conservation and demand management plan by July 1, 2024. The next iteration of the Plan will be presented to Council in June 2024.

Energy initiatives and results will be reflected in Environmental, Social and Governance reporting

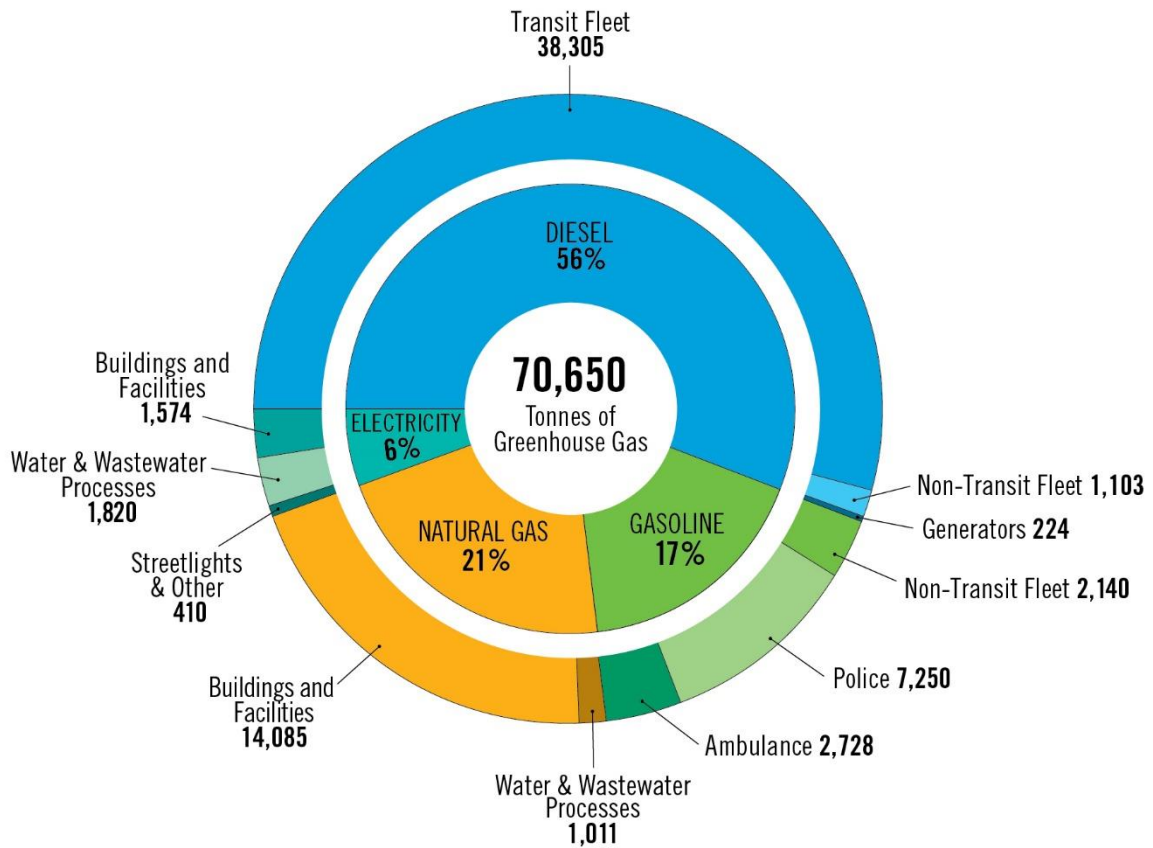
Environmental, Social and Governance (ESG) factors have a major impact on the long-term sustainability of a community and quality of life. Reporting on ESG, using a consistent framework, will inform residents, investors and others about how the Region is addressing environmental and social challenges while ensuring good governance through its strategic, financial and operational plans. Corporate Finance and Public Works continue to collaborate to ensure initiatives and measures from future Corporate Energy Reports are incorporated into the Region's future ESG reporting.

Corporate efforts to meet Energy Conservation and Demand Management Plan targets have been tracked since 2015

Staff continue to track emissions generated by lines of business and monitor multi-year impacts resulting from conservation initiatives. Appendix A illustrates 2022 per capita emissions by department. Appendix B illustrates changes in emissions compared to the Plan's 2014 baseline. Monitoring enables staff to focus efforts on targeted opportunities to optimize results.

Figure 1 illustrates the 2022 distribution of greenhouse gas emissions by fuel type under corresponding categories.

Figure 1
2022 Greenhouse Gas Emissions (in Tonnes) by Fuel and Category

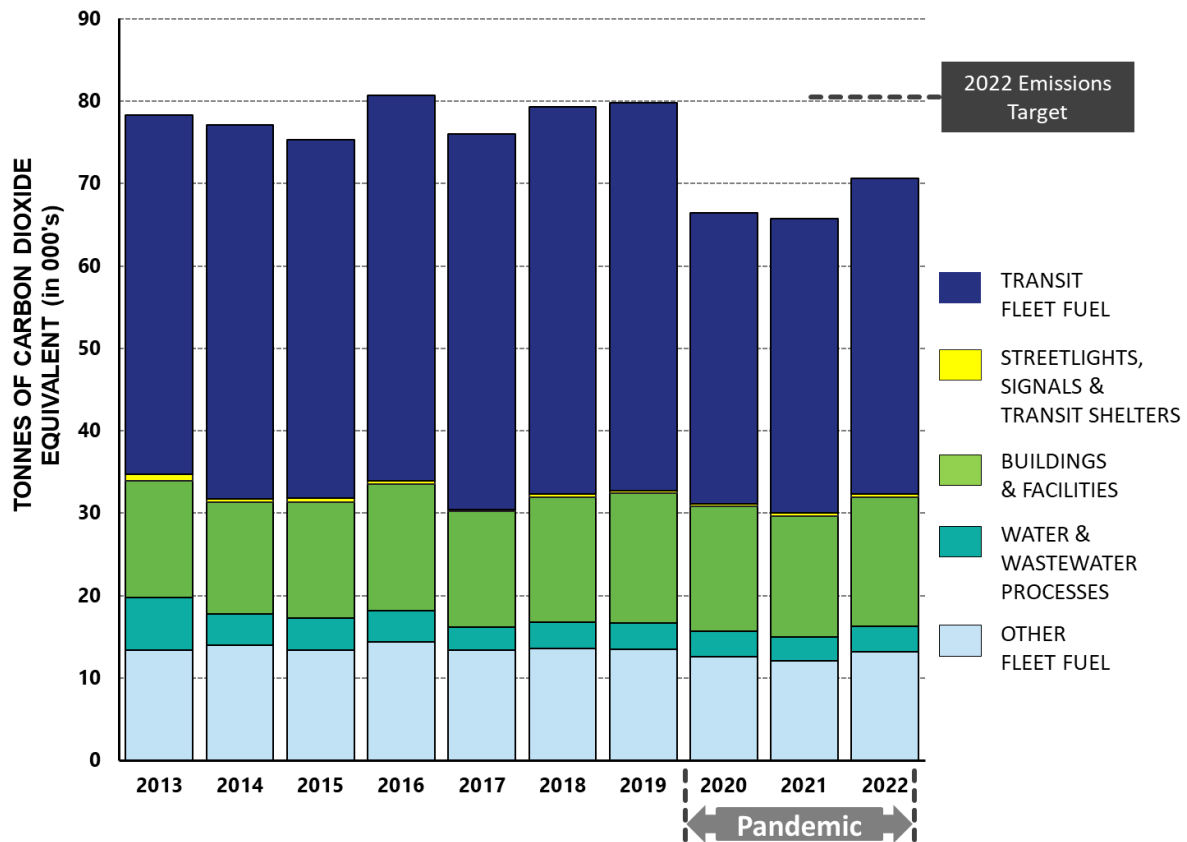


4. Analysis

Compared to 2021, corporate emissions increased by 8% but remain below Energy Conservation and Demand Management Plan targets for 2022

York Region’s corporate emissions increased by 8% (4,900 tonnes) in 2022, driven by increases in demand for York Region’s services. Total corporate emissions were below 2022 targets previously set in the Plan. Figure 2 illustrates the ten-year corporate emissions trend by operational category.

Figure 2
Ten-Year Corporate Emissions Trend



Fleet emissions increased by 3,750 tonnes as ridership rebounded

Transit bus emissions rose by 7% (2,650 tonnes) as a response to an increase in ridership. However, overall ridership remains below pre-pandemic levels. Increased transit bus emissions are largely offset by a proportional reduction in community emissions, which benefit from fewer single-occupant vehicles operating on local roads. Efforts to accelerate the Region’s fleet electrification plans will further lower emissions as ridership continues to increase and return to pre-pandemic levels.

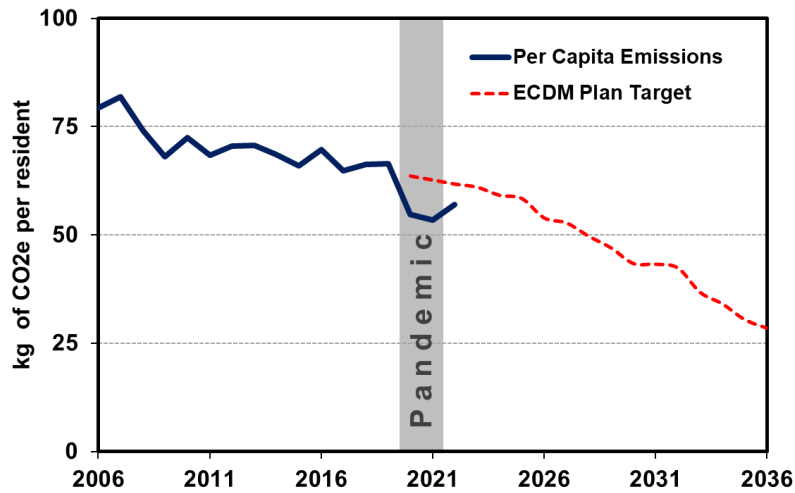
Non-transit fleet vehicle emissions increased by 1,100 tonnes and remained 2% below pre-pandemic levels. The Region’s fleet electrification plan and installation of electric vehicle charging infrastructure are aimed at reducing these emissions.

Greenhouse gas emissions from Regional buildings increased by 7% (1,050 tonnes) due to a colder winter in 2022.

Emissions increased 7% to 57 kilograms per capita

Per capita emissions in 2022 rose to 57 kilograms but remained within Plan targets (see Figure 3). While per capita emissions have largely trended downward since 2006, this trend reversed in 2022 in part due to a rebound in transit ridership.

Figure 3
Per Capita Emissions Trend and Target



Initiatives are being implemented to balance greenhouse gas emission increases as demand for programs and services returns

York Region’s response to the pandemic resulted in a cumulative 18% reduction (below 2021 targets) in corporate greenhouse gas emissions. The largest emission reduction came from temporary changes to transit services in response to a drop in ridership.

Previous Energy Conservation and Demand Management Plans laid the foundation for a Plan update in 2024

Staff have started work to meet the legislated requirement to update the Region’s Energy Conservation and Demand Management Plan. The updated 2024 Plan will continue to propose initiatives and targets based on a framework of conservation, higher efficiency, renewable alternatives and low emission energy sources, with an aspirational goal of net-zero greenhouse gas emissions by 2050.

Each update to the Plan is an opportunity to refine internal data gathering and reporting processes to refine modelling of York Region’s greenhouse gas emissions. In 2024, the scope of emissions will be expanded to include operations such as Waste and Forestry. The Plan will consider available technologies, best practices, fiscal prudence and data driven decision-making to propose future initiatives to curb energy demand and seek conservation opportunities. Groundwork completed in previous Plans (2016 and 2019) laid the foundation for the updated 2024 Plan to pursue ambitious near-term targets for 2025 to 2029. Priorities will leverage available funding and the latest proven technologies, such as electric vehicles, to accelerate progress toward achieving net-zero greenhouse gas emissions by 2050. Accomplishments toward reducing greenhouse gas emissions in 2022 are listed in Table 1.

Table 1

2022 Greenhouse Gas and Cost Reduction Accomplishments

Initiatives (Service Area)

Climate Change Action Planning - Existing Buildings (Public Works / Housing York Inc. / Corporate Services)

Climate Change Action Plans identify mitigation and adaptation measures for existing buildings through selecting alternatives based on cost benefit and effectiveness to drive future building upgrades aligned with state of good repair capital plans. In 2022, staff advanced procurement to prequalify service providers and accelerate upcoming studies at 25 of the highest energy consuming buildings within York Region's portfolio.

Social Housing Energy Audits and Retrofits (Housing York Inc.)

Completed energy audits on over 1,300 social housing units across 18 buildings. Installed Central Heating Management Systems at the Richmond Hill Hub that optimizes heating and cooling to ensure maximum efficiency and occupant comfort. Completed LED lighting retrofit at Mackenzie Green and Blue Willow Terrace (social housing) reducing electricity consumption and operational costs while improving lighting quality. Electricity and natural gas savings from these retrofits are estimated to be \$30,000 in annual operating costs and 210 tonnes of greenhouse gas emissions per year.

LED Lighting Retrofit (Public Works)

Installed LED lighting systems at the West Operations Transit Garage (8300 Keele St., Vaughan) and six water and wastewater facilities which reduced annual electricity consumption by an estimated 334,000 kilowatt-hours, saving the Region \$54,000 per year.

Next Generation Energy Management System (Public Works)

Selected a qualified bidder to deliver York Region's Next Generation Energy Management System that analyzes, reports and stores utility billing data. Through measurement and verification, this system is designed to track and enable staff to reduce the Region's electricity, natural gas and water consumption at buildings and facilities.

Non-Transit Fleet Electrification Plan (York Regional Police / Public Works)

York Region ordered 48 hybrid-electric police pursuit vehicles, ten battery electric light-duty pick-up trucks and five battery electric cargo vans to integrate into its non-transit fleets which will reduce gasoline consumption and associated greenhouse gas emissions. Orders for electric and hybrid-electric vehicles have been delayed by semi-conductor shortages which has impacted the global supply-chain, including vehicle manufacturers. Staff anticipate vehicle availability in late 2023.

Initiatives (Service Area)

Transit Fleet Electrification Plan (Public Works)

Twelve battery electric buses integrated into York Region's transit fleet have travelled almost 600,000 kilometres, reducing greenhouse gas emissions by 500 tonnes. Maintenance savings are realized due to battery electric technology requiring different preventative maintenance activities and less powertrain maintenance. Through the Zero Emissions Transit Fund, York Region will purchase up to 180 battery electric buses and infrastructure to replace its existing fleet of diesel buses, which will reduce diesel fuel emissions. Driver monitoring systems installed on Regional buses provide drivers with real-time operating feedback resulting in higher fuel efficiency and lower greenhouse gas emissions.

Wastewater Energy Exchange Project (Corporate Services / Public Works)

Staff have started to advance an initiative to develop a wastewater energy exchange project with Markham District Energy that uses energy within wastewater to offset natural gas consumption for heating and electricity for cooling. If viable, this project could offset 30,000 tonnes of community-based greenhouse gas emissions each year, equivalent to sequestration from a mature forest 75% of the size of Newmarket.

Efficient and Safe Driver Training (Public Works)

Staff driver training includes techniques for efficient driving that reduce operating costs and greenhouse gas emissions associated with gasoline and diesel consumption. Full program rollout will begin in Q3 2023.

Water Pumping Optimization Project (Public Works)

Achieved a 5% reduction in electricity consumption by optimizing pump sequences at South Maple Water Pumping Station (Pressure District 8).

Sustainable Buildings Projects (Public Works/Housing York Inc.)

Application of York Region's draft Sustainable Buildings Policy was advanced on new construction projects including Southeast Works Yard and 62 Bayview Parkway, which are seeking to achieve high performance building certifications toward net-zero carbon operations and high resilience against extreme weather. York Region received \$7.4 million from the Canada Mortgage and Housing Corporation for a project which advances its Sustainable Buildings Policy goals.

Ontario is moving forward with plans for natural gas generated electricity against recommendations from 32 Ontario municipalities including York Region

Advocacy by Ontario municipalities, including the [July 12, 2021](#) letter from York Region's Chairman and CEO Wayne Emmerson, to eliminate greenhouse gas emitting electricity

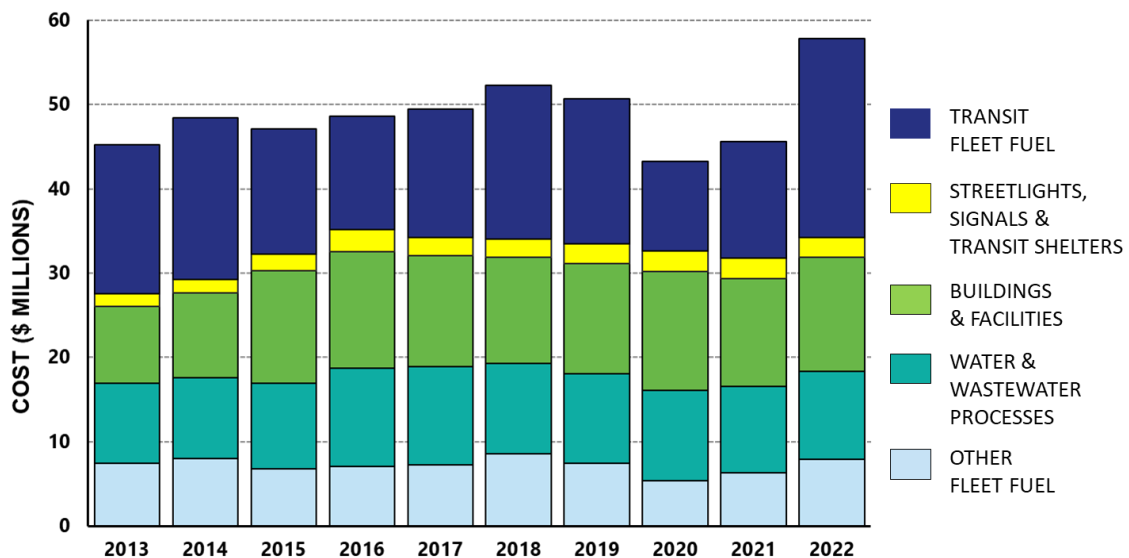
generation from Ontario’s grid resulted in a temporary moratorium on new natural gas generation. However, the Minister’s October 7, 2022 directive based on the Independent Electricity System Operator’s recommendations provided in its [Resource Eligibility Interim Report](#) allows for procurement of up to an additional 1,500 megawatts of natural gas generation and 2,500 megawatts of storage and non-emitting resources. Consequently, an increase in grid-supplied electricity greenhouse gas emissions is expected.

5. Financial

York Region incurred its highest cost of energy to date in 2022, driven largely by volatility in global oil prices and annual increases in carbon tax

Total energy consumption in 2022 was below pre-pandemic levels, yet the Region’s total energy cost recorded an all-time high of \$57.8 million, representing an annual increase of \$12.2 million. Going forward, increasing energy consumption, fuel prices and a federal carbon tax will combine to account for what is expected to be a continuing budgetary pressure. Figure 4 summarizes the ten-year trend in Regional energy costs.

Figure 4
Ten-Year Corporate Energy Cost Trend



Volatile oil prices and increasing carbon price strengthen business cases for electrification and energy efficiency initiatives

Increasing energy and fuel costs are a growing financial risk to the Region as global events and inflation result in budget pressures and challenge services dependant on fossil fuel consumption. Compared to 2021, oil prices increased by an average 39% to \$95 per barrel, which impacted all services including police, transit, ambulance, road maintenance and raw material costs for capital projects. Federal carbon taxes increased by 25% to \$50 per tonne and will continue to increase up to \$170 per tonne in 2030. In 2022, carbon taxes cost York

Region \$3.25 million. By 2030, carbon taxes will cost York Region an estimated \$9.7 million annually in addition to the cost of underlying fossil fuels.

In the coming years, some price relief may result from fluctuations in oil prices due to supply and demand. However, carbon taxes are expected to rise year-over-year and a global shift away from fossil fuels is certain.

6. Local Impact

York Region's corporate emissions are small at 4% of total community emissions

York Region's corporate contribution compared to overall community emissions is small at approximately 4%. Staff recognize the importance of York Region's corporate role in leading emission reduction initiatives with the goal of achieving a sustainable future and to bolster replication of similar initiatives within the community. Staff continue to collaborate with local municipalities to exchange information, share best practices and initiatives towards reducing energy consumption and greenhouse gas emissions.

7. Conclusion

Emissions across all departments have increased as the Region emerges from the pandemic. Staff are pursuing opportunities to integrate efficiencies and operational changes gained over the past two years into post-pandemic service delivery to curb emission growth. Additionally, staff are working to expand the scope of the 2024 Energy Conservation and Demand Management Plan to include emissions associated with wastewater, solid waste and contracted services.

In 2022, corporate greenhouse gas emissions increased to 70,650 tonnes but remained below Energy Conservation and Demand Management Plan targets. Corporate energy costs reached an all-time high for the Region at \$57.8 million in 2022 despite consumption being below pre-pandemic levels. Increases in energy consumption, higher fuel prices and the federal carbon price combined to inflate energy costs. Increased energy costs improve business cases in support of conservation and energy efficiency projects.

For more information on this report, please contact David Szeptycki at 1-877-464-9675 ext. 75723. Accessible formats or communication supports are available upon request.

Recommended by:



Erin Mahoney, M. Eng.
Commissioner of Public Works



Approved for Submission:

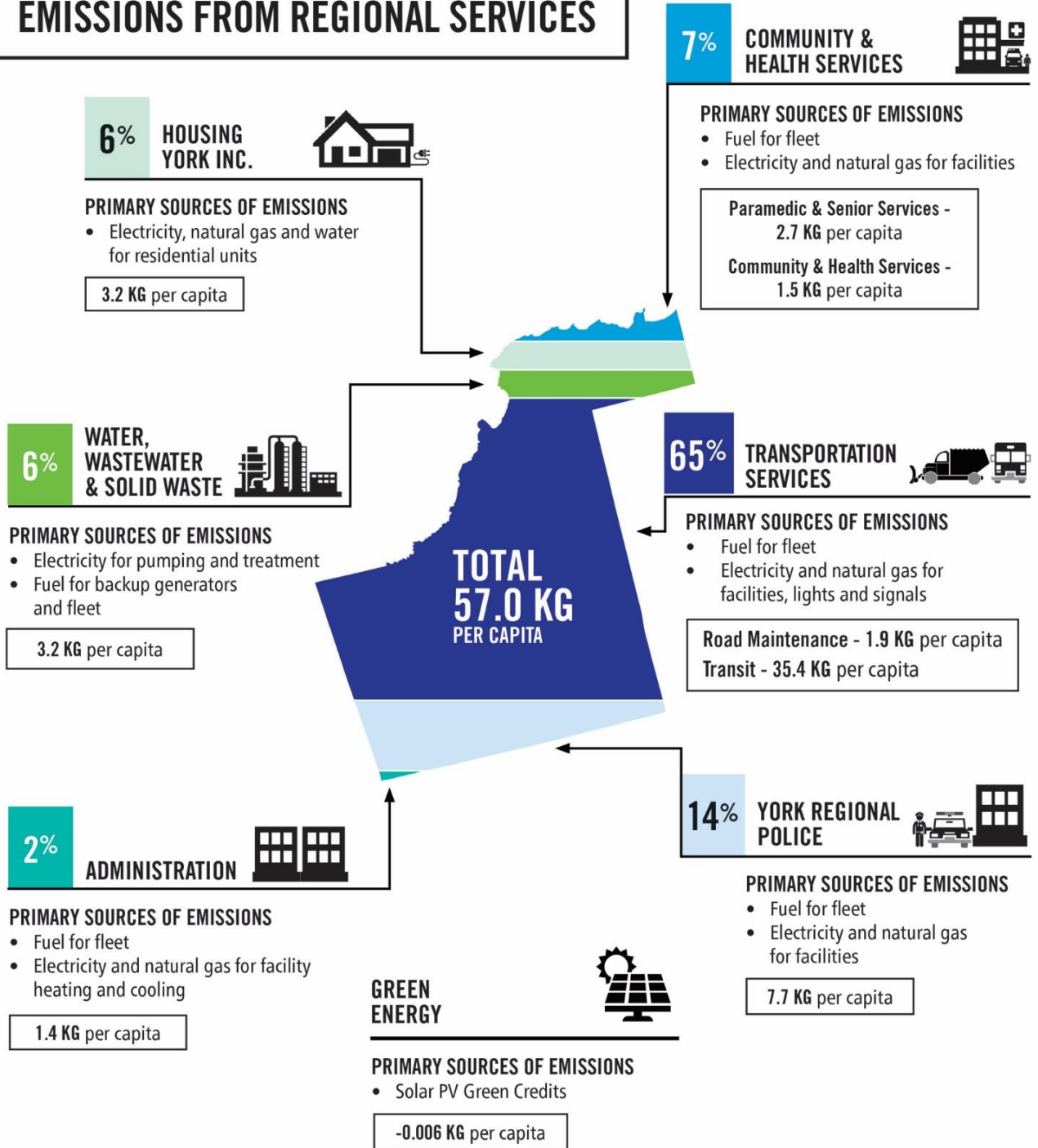
Bruce Macgregor
Chief Administrative Officer

June 2, 2023

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Appendix A – 2022 Per Capita Emissions
Appendix B – Departmental Emissions Changes

2022 PER CAPITA GREENHOUSE GAS EMISSIONS FROM REGIONAL SERVICES

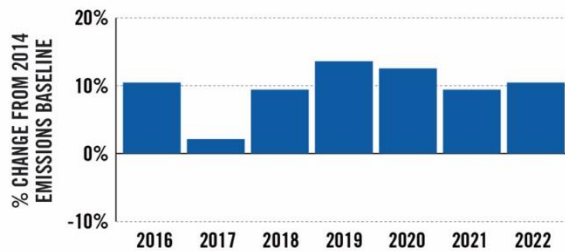


IN 2022, EMISSIONS TO DELIVER YORK REGION SERVICES TOTALLED 57.0 KG/PERSON
 2022 TOTAL EMISSIONS: 70,650 TONNES | 2022 POPULATION: 1,239,424

ANNUAL DEPARTMENTAL CHANGES IN PER CAPITA GREENHOUSE GAS EMISSIONS

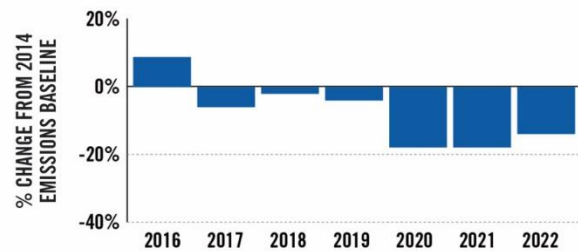
HOUSING YORK INC.

2014 Baseline: **2.9 KG** per capita



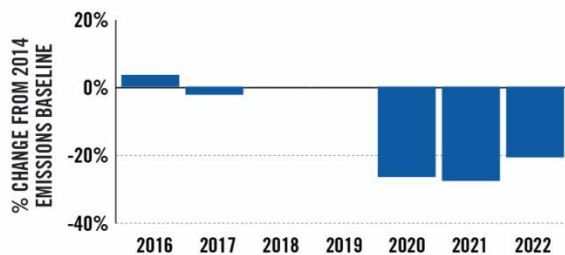
COMMUNITY & HEALTH SERVICES

2014 Baseline: **4.9 KG** per capita



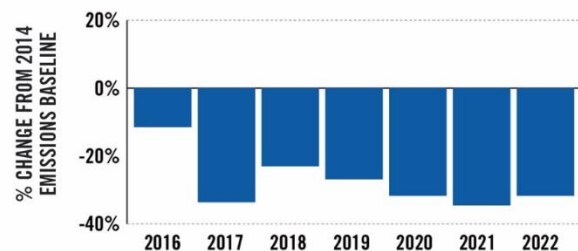
TRANSPORTATION SERVICES

2014 Baseline: **45.5 KG** per capita



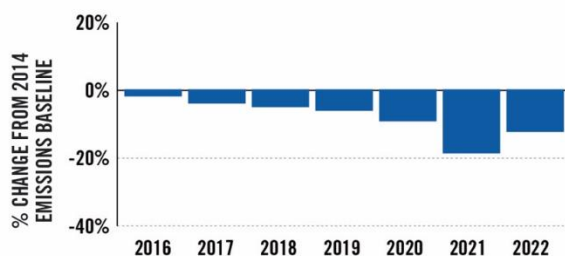
WATER, WASTEWATER & SOLID WASTE

2014 Baseline: **4.8 KG** per capita



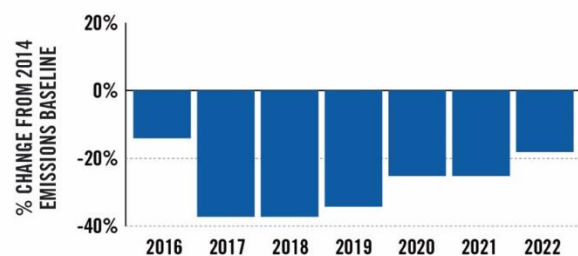
YORK REGIONAL POLICE

2014 Baseline: **8.8 KG** per capita



ADMINISTRATION

2014 Baseline: **1.7 KG** per capita



**THE 2019 ITERATION OF THE ENERGY CONSERVATION DEMAND MANAGEMENT PLAN TARGETS
A 60% REDUCTION FROM 2014 BASELINE GHG EMISSIONS BY 2051**