



City of Kingston Corporate GHG Inventory Report — 2020

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Prepared For:

City of Kingston

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Executive Summary

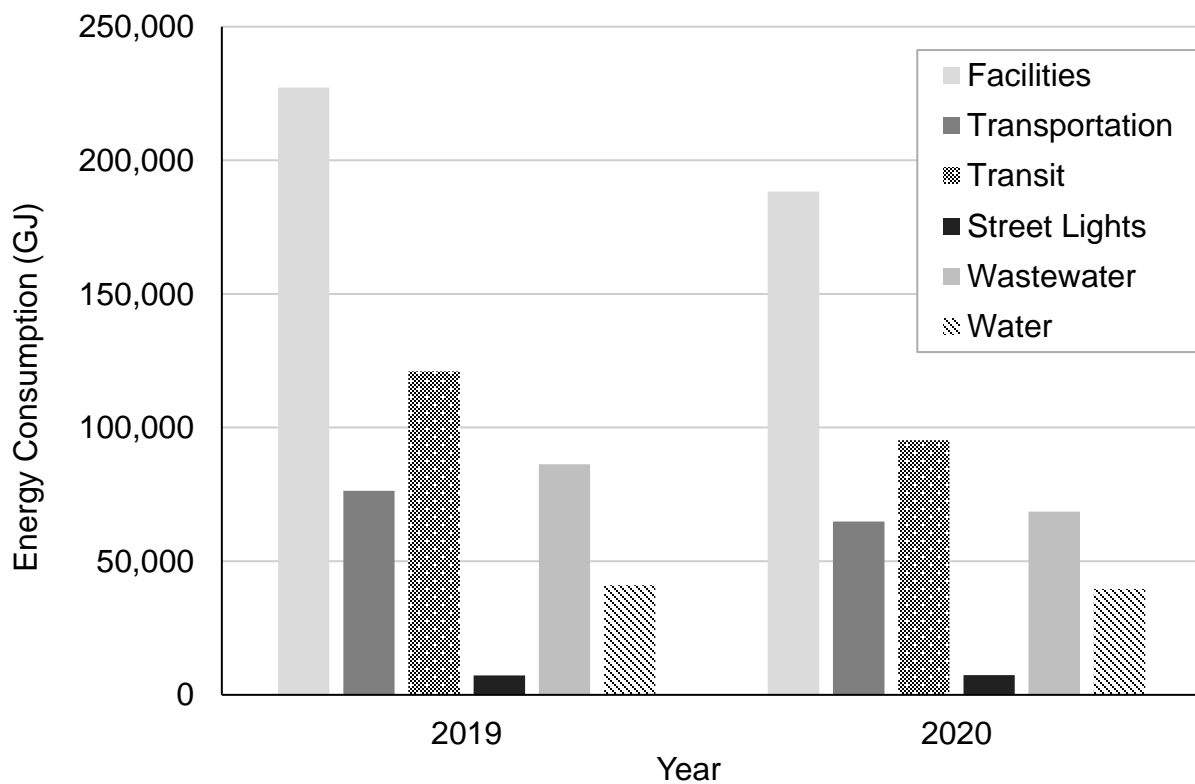
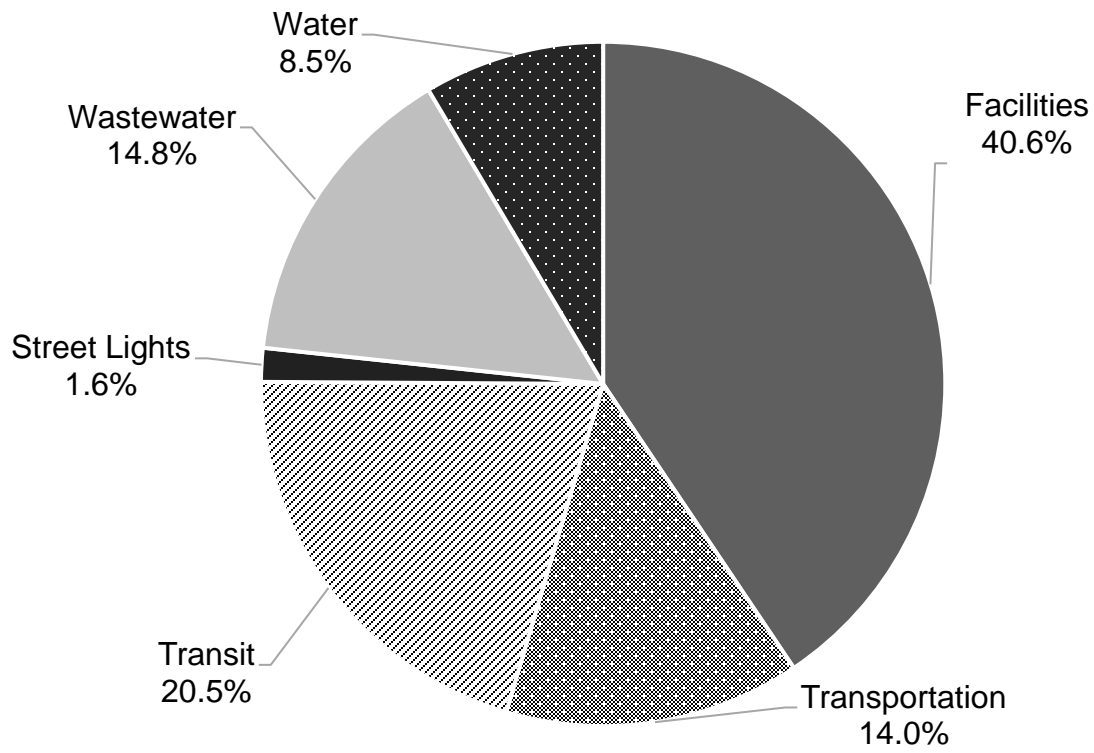
This report provides updated greenhouse gas (GHG) emissions inventory for the Corporation of the City of Kingston for the years 2019 and 2020. The scope of the report includes municipal operations from the Corporation of the City of Kingston (and Utilities Kingston for conducting water and wastewater operations on the City's behalf). Energy and emissions are measured in the report as total energy consumption (GJ), total GHG emissions (tCO_{2e}), and energy expenditures (\$). Data sources for the report were provided by the City of Kingston and Utilities Kingston. All emission factors used were derived using published emission factors from the National Inventory Report 1990-2020 and 1990-2019 (ECCC 2022; ECCC 2021) for 2020 and 2019. Corporate waste emissions were calculated using an emission factor per employee as used in the previous two corporate reports. Energy conversions were derived from the Canada Energy Regulator (2022). A complete description of methods, data, and emission factors used for these results are available in the Supplemental Information Report.

Two small adjustments to the 2019 inventory were also made with updated data from UK and facilities. Streetlight data was updated to reflect measurement of streetlights only, and that approach was applied to the new 2020 inventory. Facility energy use was also updated for 2019 with updated data that now includes explicit accounting for EV chargers. Both adjustments to previous inventories improved accuracy and inventory methods, but were small changes and did not impact overall results or trends.

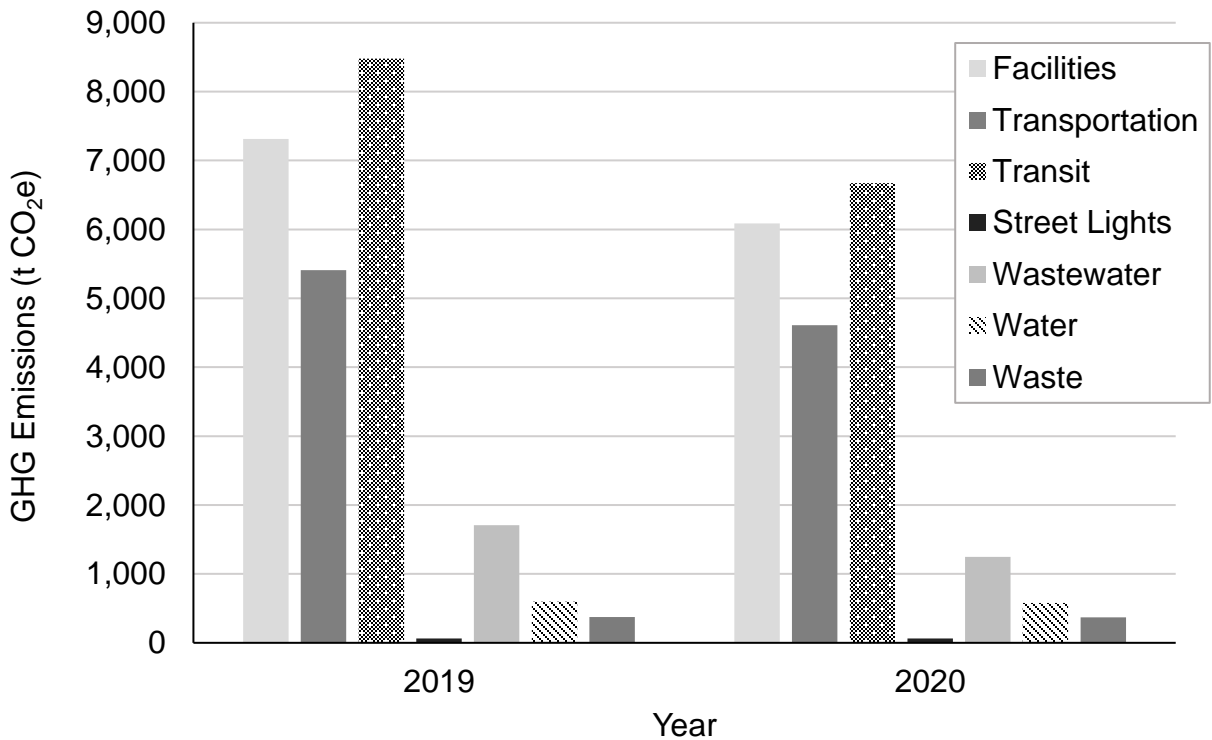
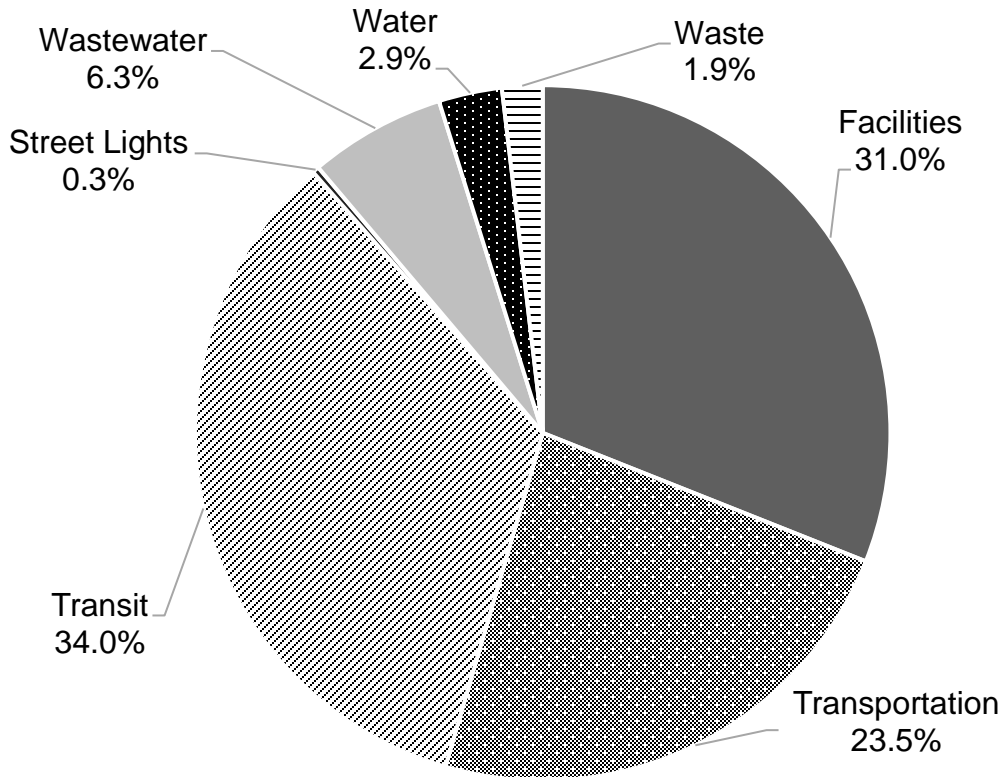
Summary of Results

1. Overall, corporate annual GHG emissions were reduced by 4,308 tonnes from 2019 to 2020. This represents an 18% reduction from 2018, which is lower than the 15% reduction target set for 2022.
2. The most significant sources of municipal emissions were due to natural gas heating of municipal facilities, and diesel consumption by transit and fleet vehicles which were the source of 79% of all emissions.
3. The most significant reductions in emissions occurred in the two highest emitting sectors – natural gas from facilities and diesel consumption from transit and transportation – which accounted for 91% of all the reductions from 2019 values
4. Both the total energy consumption (GJ) and total expenditures (\$) decreased from 2019.

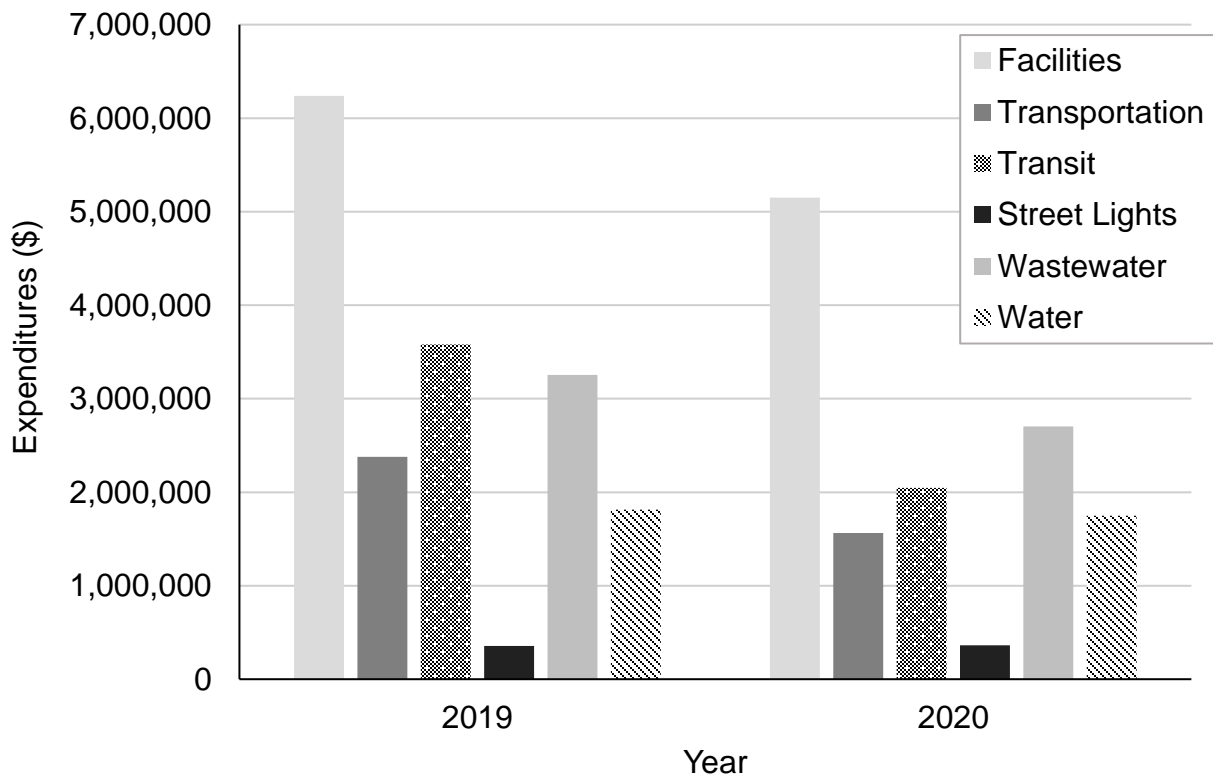
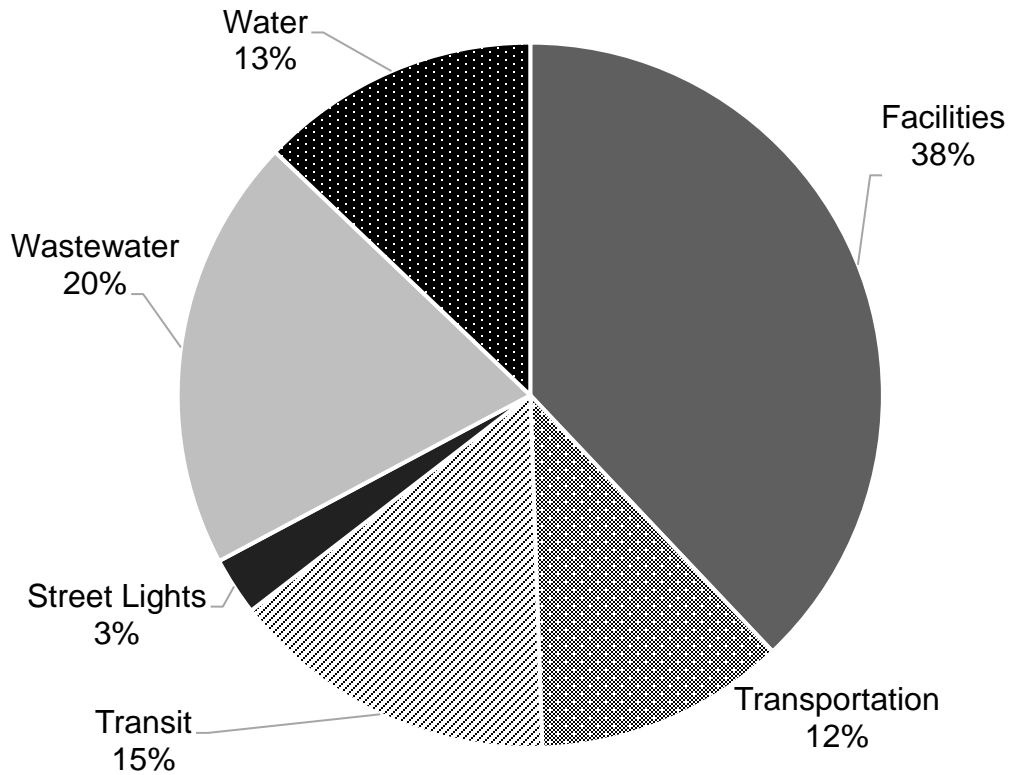
2020 Energy Consumption by sector (total: 464,000 GJ) and historical trend



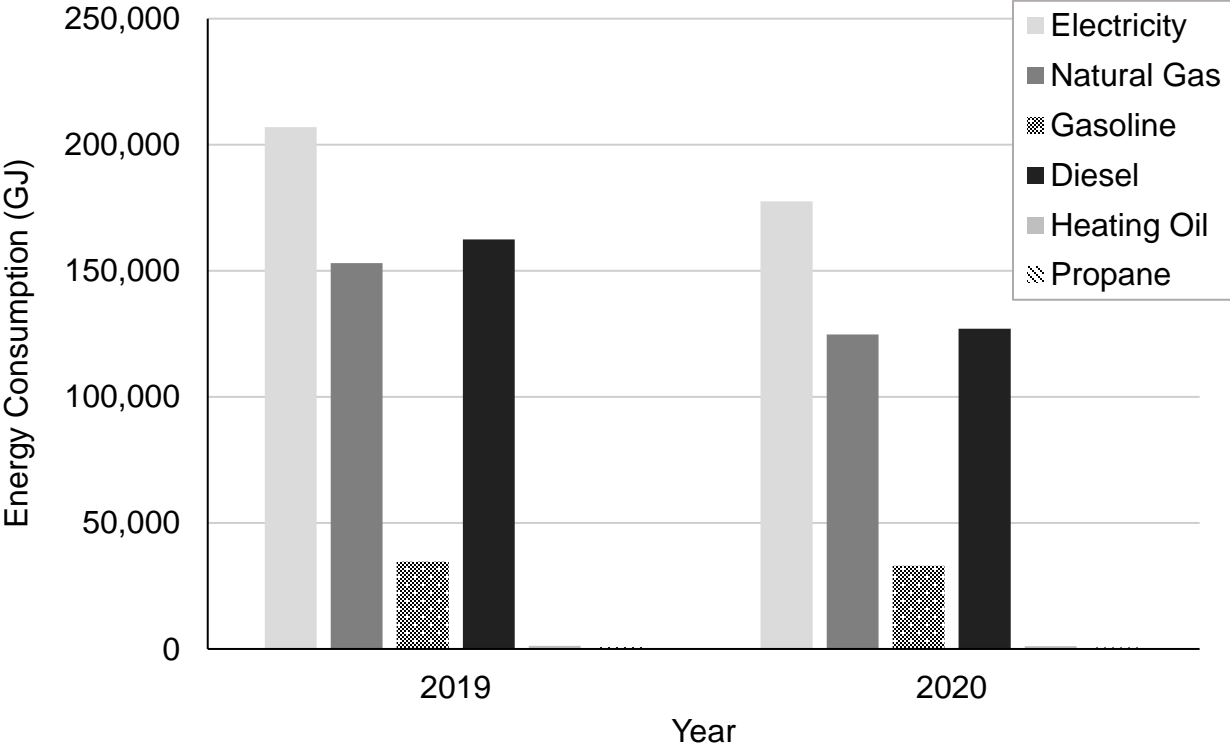
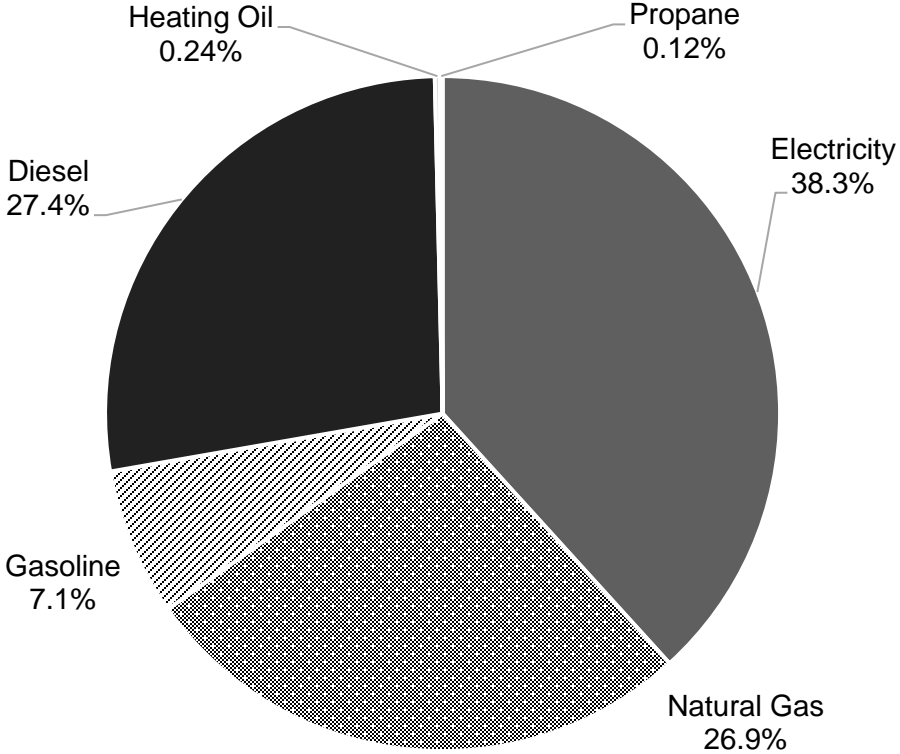
2020 GHG Emissions by sector (total: 19,627 tonnes CO₂e) and historical trend



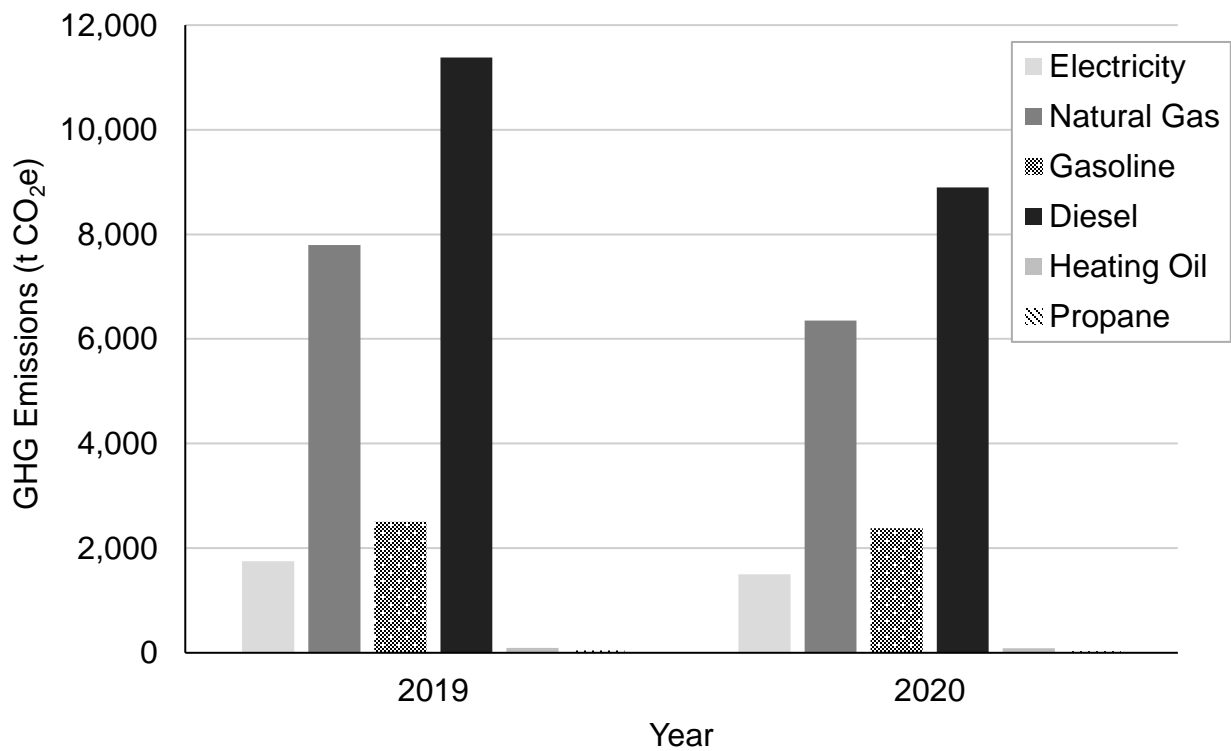
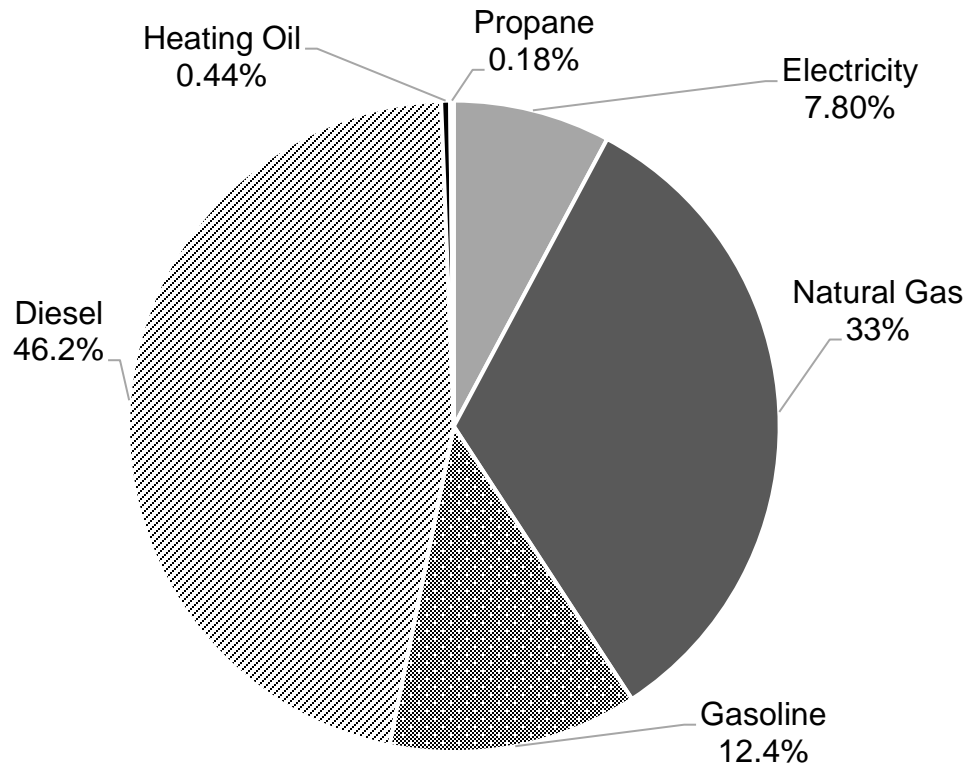
2020 Expenditures by sector (total: \$13,576,565) and historical trend



2020 Energy Consumption by source (total: 464,000 GJ) and historical trend



2020 GHG Emissions by source (total: 19,258 tonnes CO₂e) and historical trend



2020 Expenditures by source (total: \$13,576,565) and historical trend

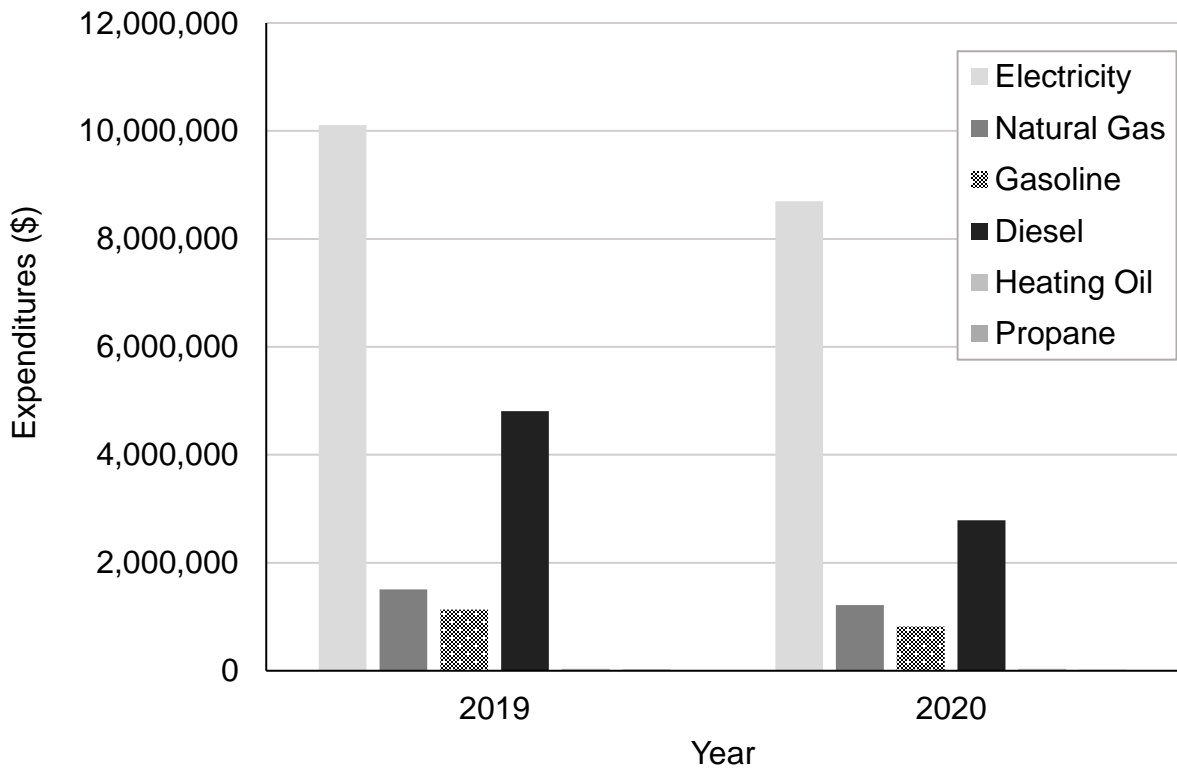
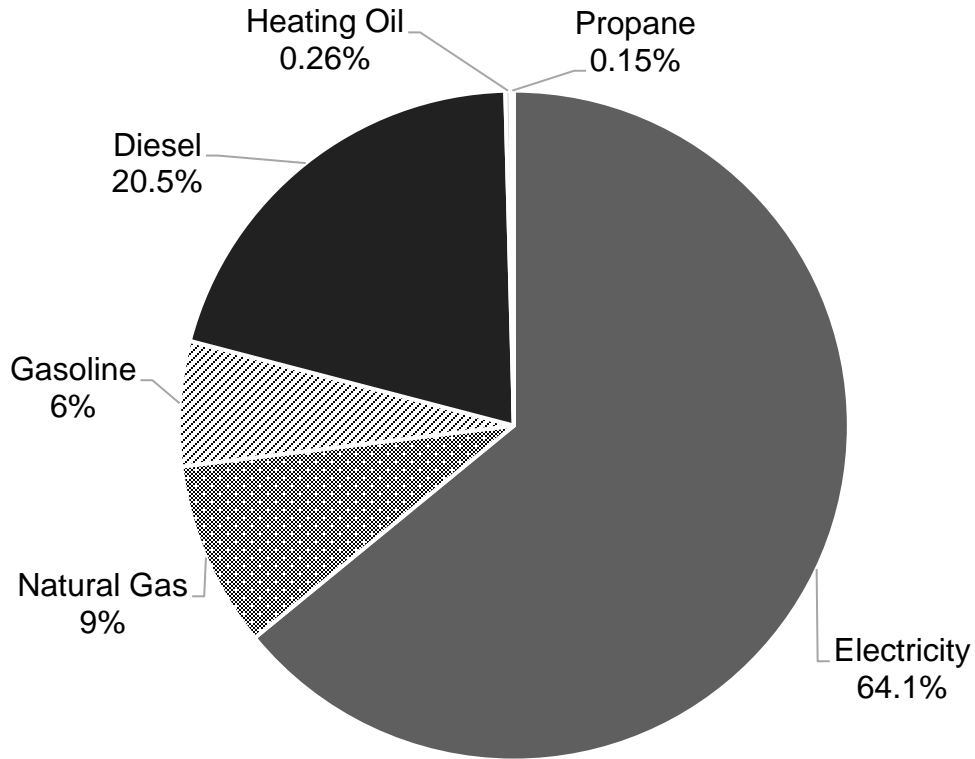


Table 1. Summary of energy consumption (GJ), GHG emissions (t CO₂e), and expenditures (\$) for 2019 - 2020 across all sectors.

Sector	2019			2020			Energy Consumption Change (GJ)	GHG Emissions Change (tCO ₂ e)	Expenditure Change (\$)
	Energy Consumption (GJ)	GHG Emissions (t CO ₂ e)	Expenditure (\$)	Energy Consumption (GJ)	GHG Emissions (t CO ₂ e)	Expenditure (\$)			
Facilities	227,174	7,313	6,237,839	188,328	6,089	5,151,614	-38,846	-1,224	-1,086,224
Transportation	76,330	5,407	2,379,842	64,876	4,611	1,562,886	-11,453	-795	-816,955
Transit	121,029	8,478	3,577,799	95,253	6,672	2,047,919	-25,776	-1,806	-1,529,879
Street Lights	7,221	61	354,517	7,378	62	362,195	156	1	7,678
Wastewater	86,332	1,709	3,255,734	68,578	1,246	2,703,434	-17,754	-463	-552,299
Water	40,990	597	1,811,825	39,587	578	1,748,515	-1,403	-20	-63,309
Waste	0	376	0	0	369	0	0	-1	0.00
TOTAL	559,076	23,941	17,617,556	464,000	19,627	13,576,565	-95,076	-4,308	-4,040,991

Table 2. Summary of energy consumption (GJ), GHG emissions (tCO₂e), and expenditures (\$) for 2019 - 2020 for energy sources.

Energy Source	2019			2020			Energy Consumption Change (GJ)	GHG Emissions Change (tCO ₂ e)	Expenditure Change (\$)
	Energy Consumption (GJ)	GHG Emissions (t CO ₂ e)	Expenditure (\$)	Energy Consumption (GJ)	GHG Emissions (t CO ₂ e)	Expenditure (\$)			
Electricity	206,998	1,752	10,107,514.77	177,543	1,503	8,699,560	-29,455	-249	-1,407,953
Natural Gas	153,091	7,796	1,504,220.43	124,764	6,353	1,217,760	-28,327	-1,442	-286,460
Gasoline	34,595	2,504	1,130,754.07	32,938	2,384	817,863	-1,656	-120	-312,890
Diesel	162,462	11,378	4,812,039.91	127,044	8,897	2,785,691	-35,418	-2,480	-2,026,348
Heating Oil	1,233	93	38,599.84	1,137	86	35,596	-96	-7	-3,003.25
Propane	698	42	24,427.15	574	35	20,092	-124	-7	-4,335
TOTAL	559,076	23,565	17,617,556	464,000	19,258	13,576,565	-95,076	-4,307	-4,040,991

Report Takeaways

- The total reduction in GHGs from 2019 to 2020 at the corporate level was 4,308 tonnes. This represents a reduction of 18% from 2018.
- The reduction of 18% exceeds the short-term target of 15% below 2018 levels by 2022.
- The reduction in GHGs reported in this inventory should be viewed with caution – over most of 2020, many staff remained home and many buildings remained closed during the COVID pandemic shutdown. For example, the number of cooling degree days (CDD) increased by nearly 51% from 2019, and while the heating degree days (HDD) did decrease by 11%, the Facilities sector still reduced emissions by more than 16%. Additionally, sectors that were impacted less by pandemic shutdowns, such as Water and Streetlights, saw modest reductions of only 2.7%.
- Understanding what reductions were due to programs and initiatives and what were due to reduction in use of services and buildings is difficult to understand based only on GHG inventory data. A better understanding of Kingston's corporate GHG reduction progress is likely to come from the upcoming 2021 and 2022 inventory reports.

References

Canada Energy Regulator. 2022. Energy Unit Conversion Table. Webpage: <https://apps.cer-rec.gc.ca/Conversion/conversion-tables.aspx?GoCTemplateCulture=fr-CA>

Environment and Climate Change Canada (ECCC). 2022. National Inventory Report 1990-2020: Greenhouse Gas Sources and Sinks in Canada. Canada's Submission to the United Nations Framework Convention on Climate Change. Parts 1-3. <https://publications.gc.ca/site/eng/9.506002/publication.html>

Environment and Climate Change Canada (ECCC). 2021. National Inventory Report 1990-2019: Greenhouse Gas Sources and Sinks in Canada. Canada's Submission to the United Nations Framework Convention on Climate Change. Parts 1-3. <https://publications.gc.ca/site/eng/9.506002/publication.html>