



# City of Kingston Corporate GHG Inventory Report – 2019

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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 2018 and 2019. 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<sub>2e</sub>), and energy expenditures (\$).

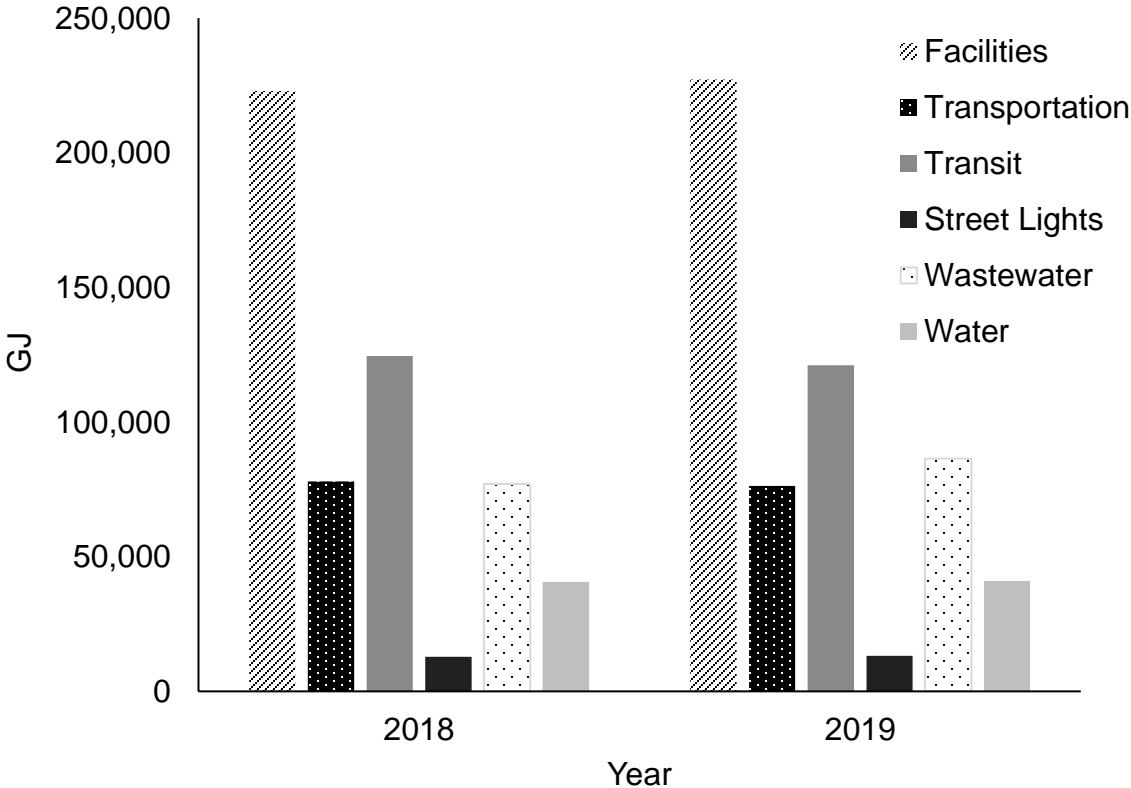
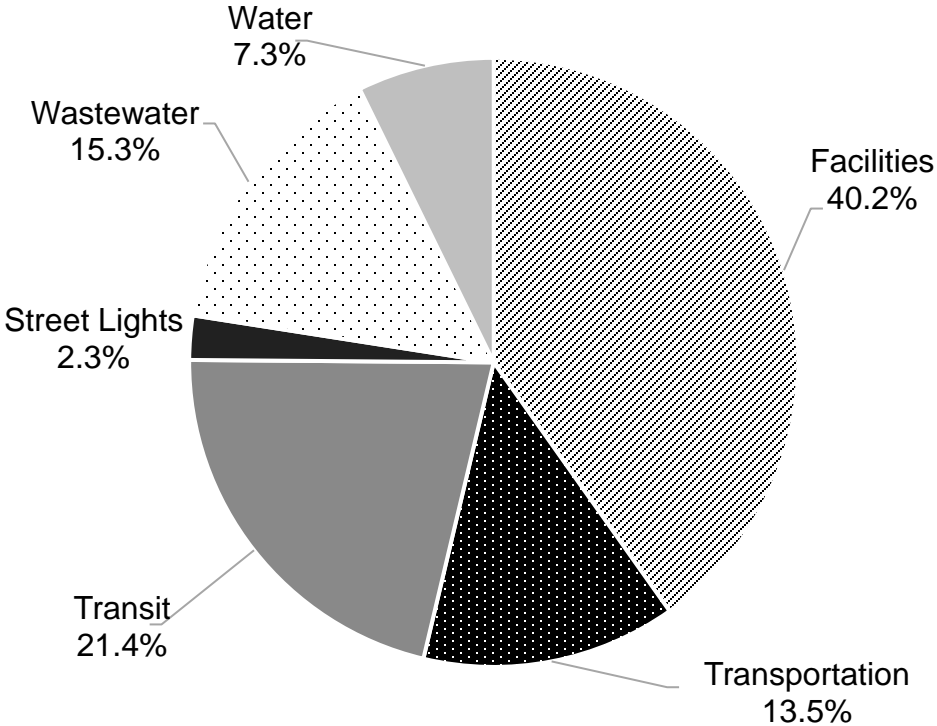
Data sources for the report were provided by the City of Kingston and Utilities Kingston. All emission factors used were derived using published emission factors from the National Inventory Report 1990-2019 and 1990-2018 (ECCC 2020; ECCC 2021) for 2018 and 2019. Corporate waste emissions were calculated using the same method stated in the previous 2018 report to ensure results were comparable. Energy conversions were derived from the Canada Energy Regulator. A complete description of methods, data, and emission factors used for these results are available in the Supplemental Information Report submitted along with this results-focused report.

Re-calculation and restatement of 2018 results was performed for energy consumption (GJ) and GHG emissions (t CO<sub>2e</sub>) due to availability of updated emission factors and application of enhanced methodologies to improve the accuracy of the previously reported 2018 results. The newly derived values for 2018 are recommended as the new baseline with which to benchmark progress in GHG emissions reductions. Figures are presented in this report to allow for comparison with the 2018 report.

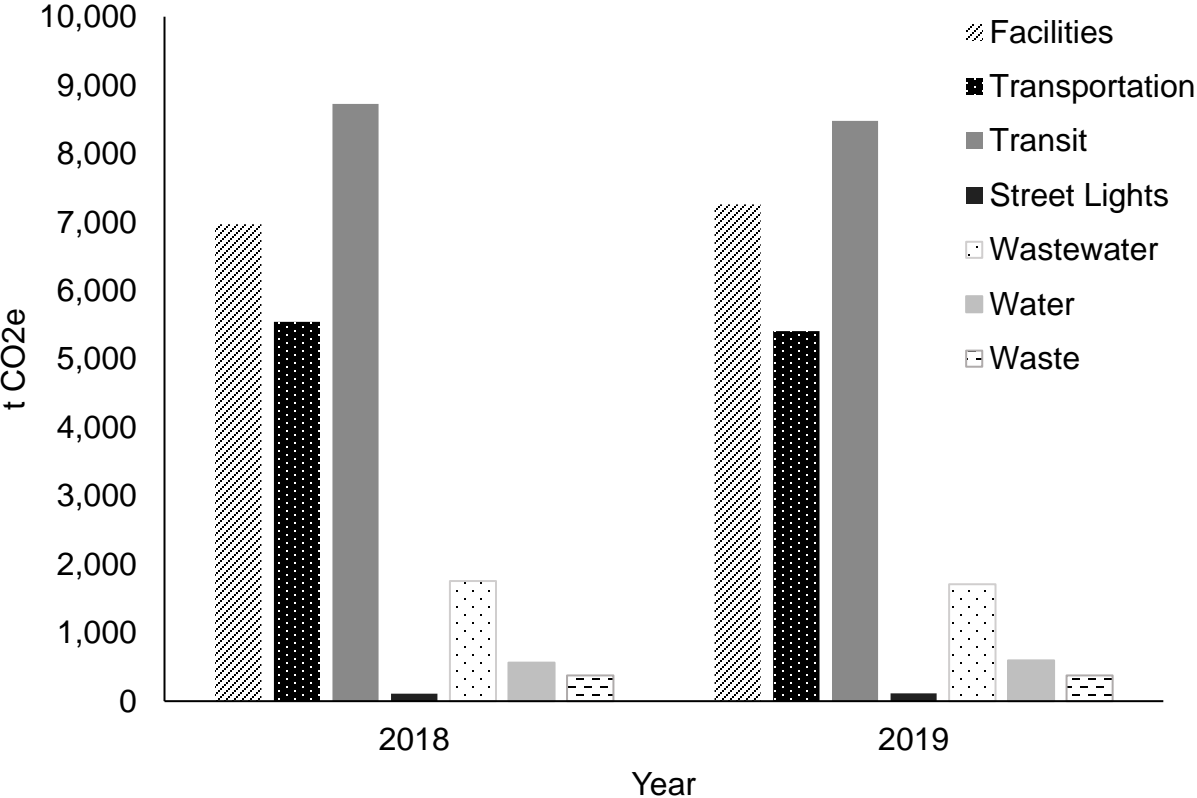
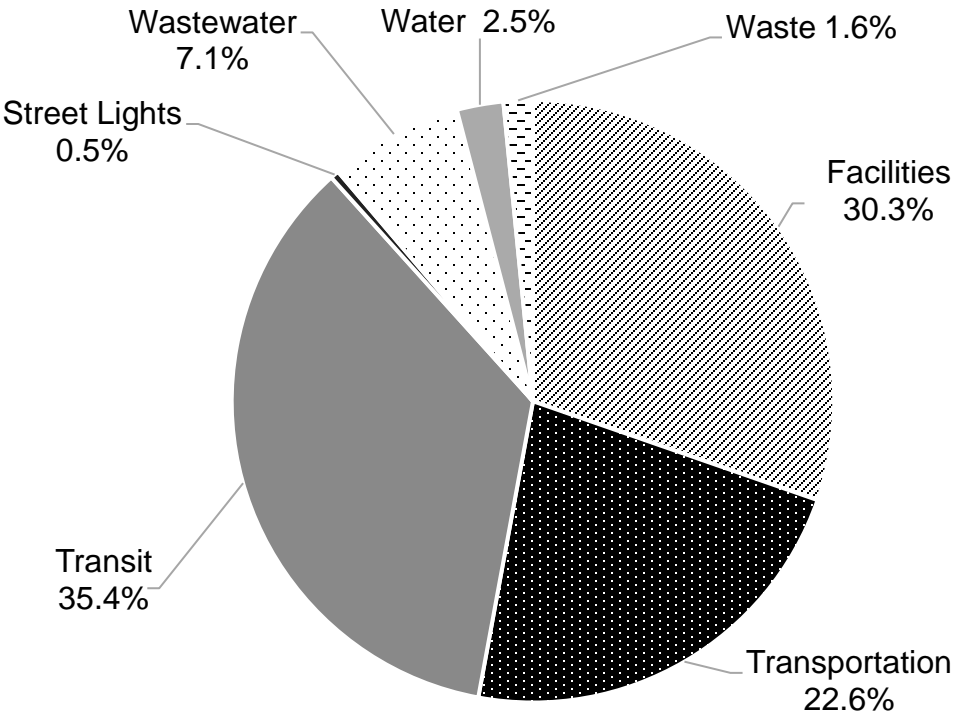
### Report Summary

1. Overall, corporate annual GHG emissions were reduced by 100 tonnes from 2018 to 2019.
2. Similar to previous years, the most significant sources of municipal emissions were from diesel use by Kingston Transit and fleet vehicles, and natural gas consumption from heating municipal facilities.
3. The most significant reductions in emissions occurred in the transportation sectors, but reductions were offset in the City's overall GHG inventory by increased emissions from facilities. The addition of two new facilities (Rideau Heights Community Centre, KFPL Central) and an increase in heating degree days are the likely source of this increase.
4. Total energy consumption (GJ) and total expenditures (\$) increased.

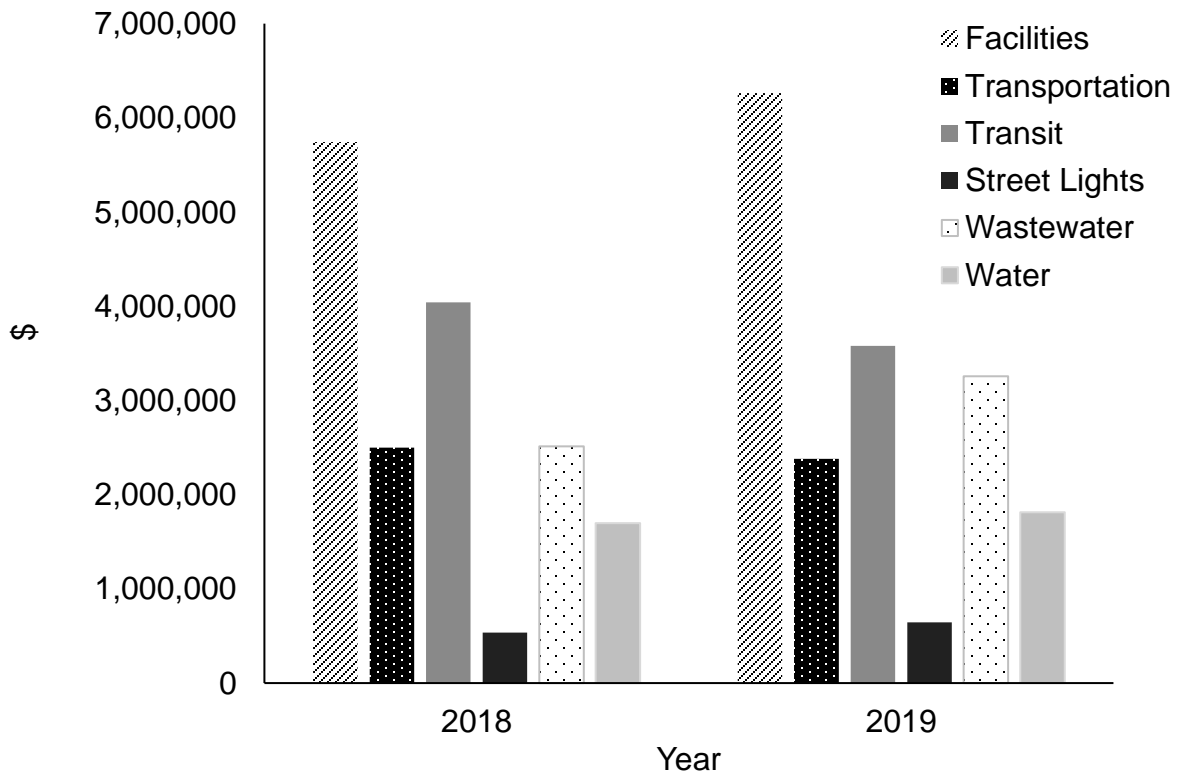
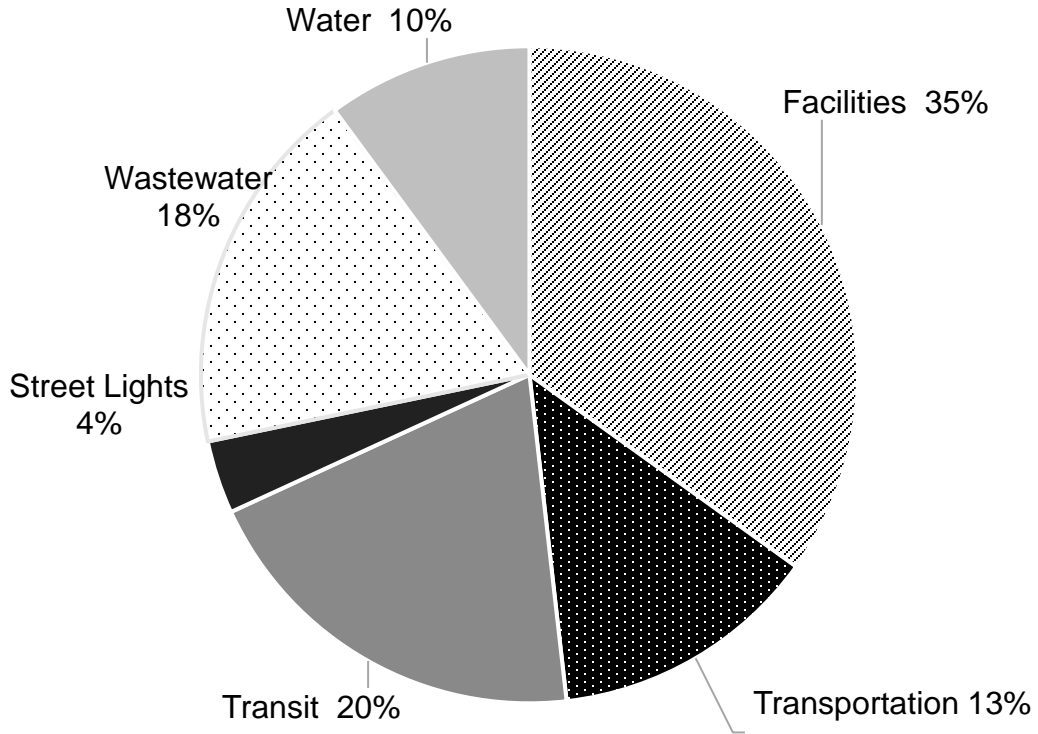
**2019 Energy Consumption by sector (total: 555,818 GJ) and historical trend**



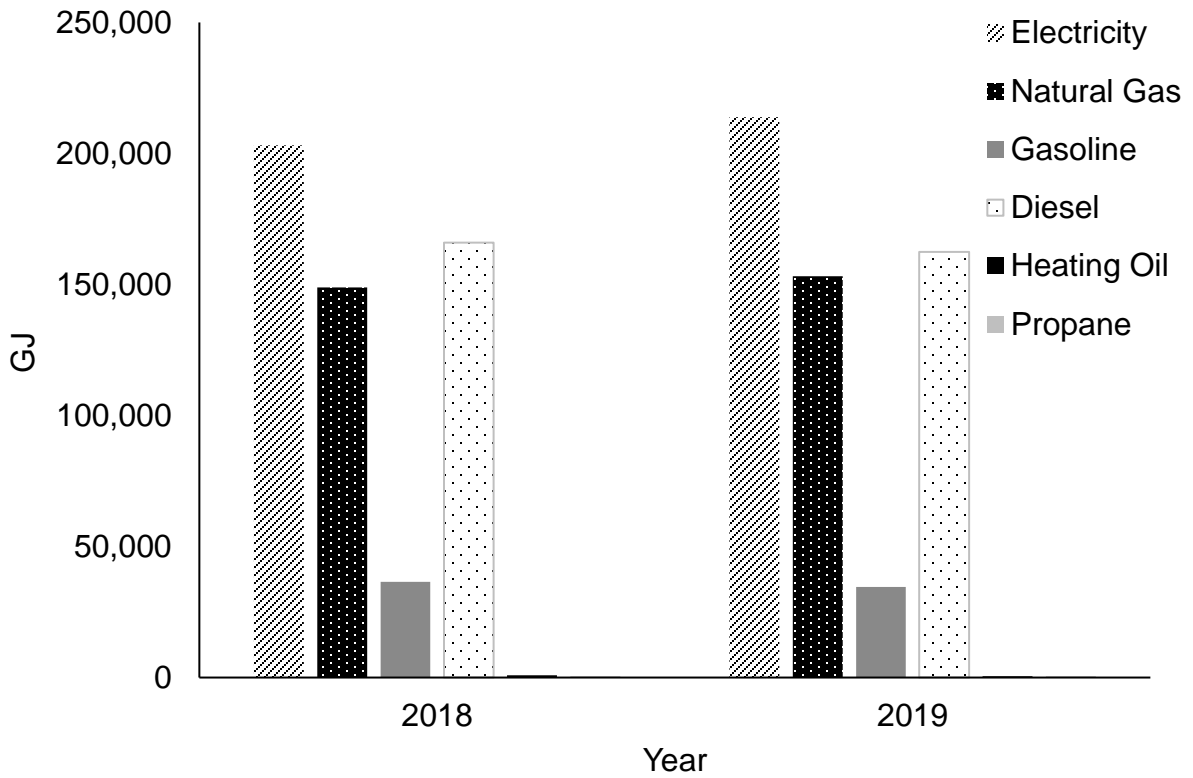
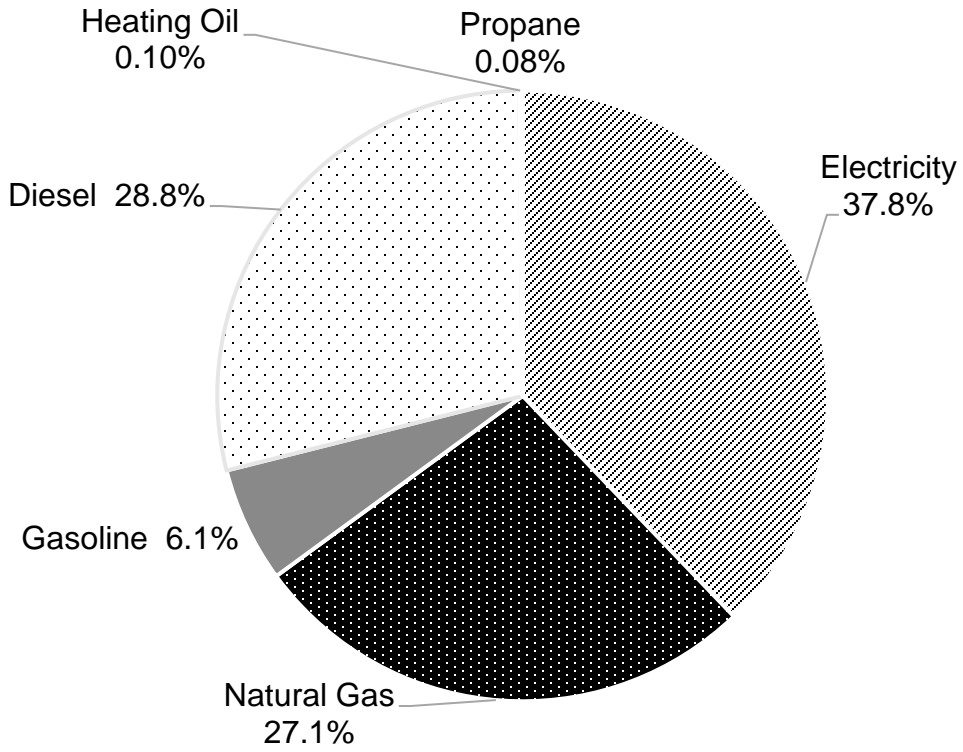
**2019 GHG Emissions by sector (total: 23,937 tonnes CO<sub>2</sub>e) and historical trend**



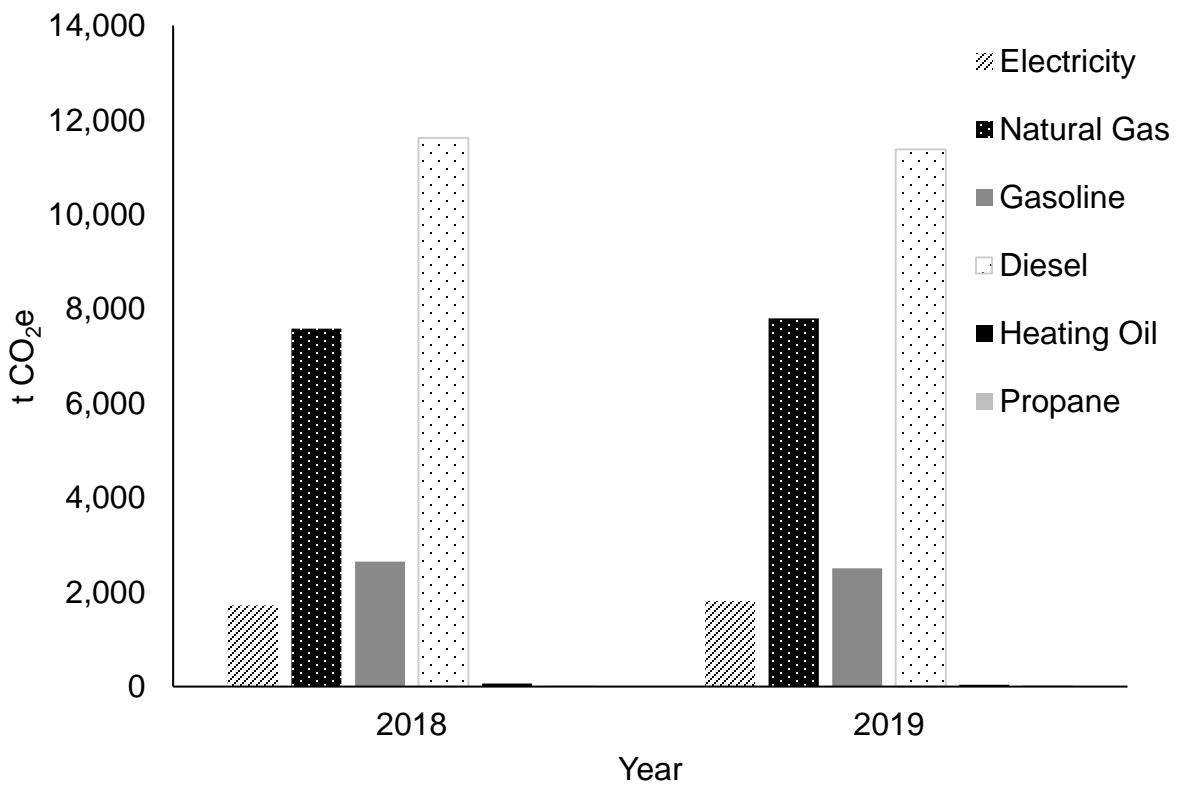
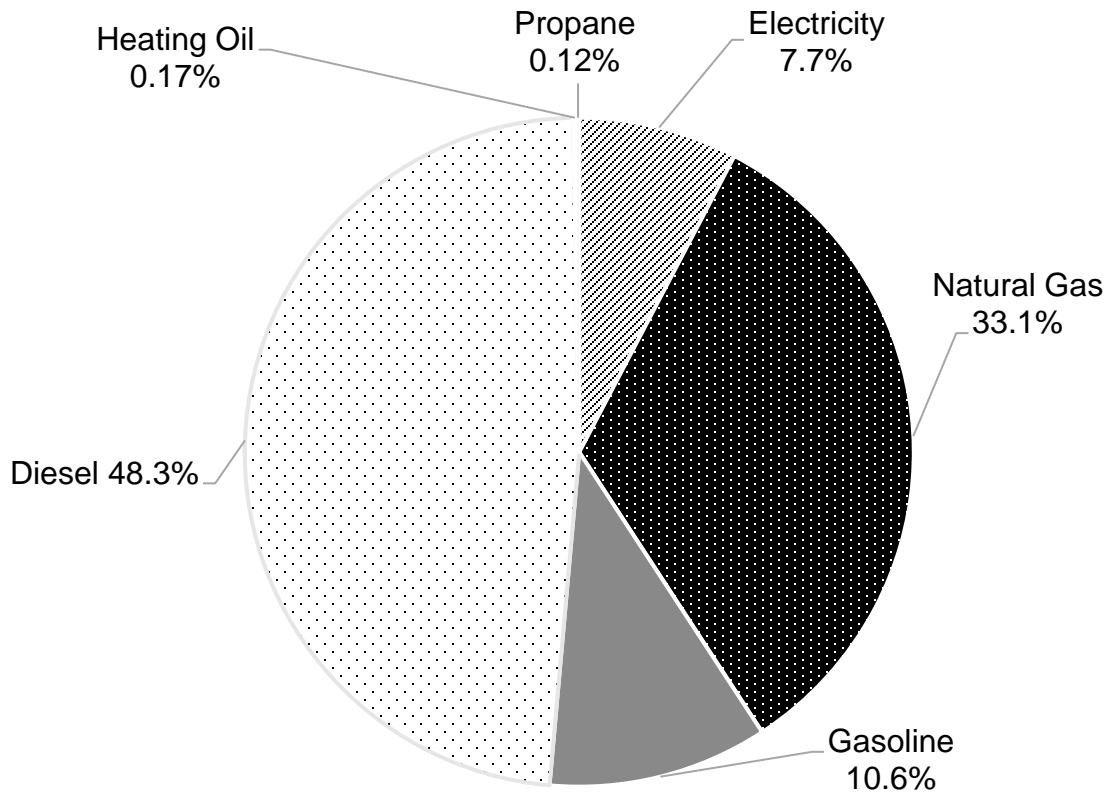
**2019 Expenditures by sector (total: \$17,029,376) and historical trend**



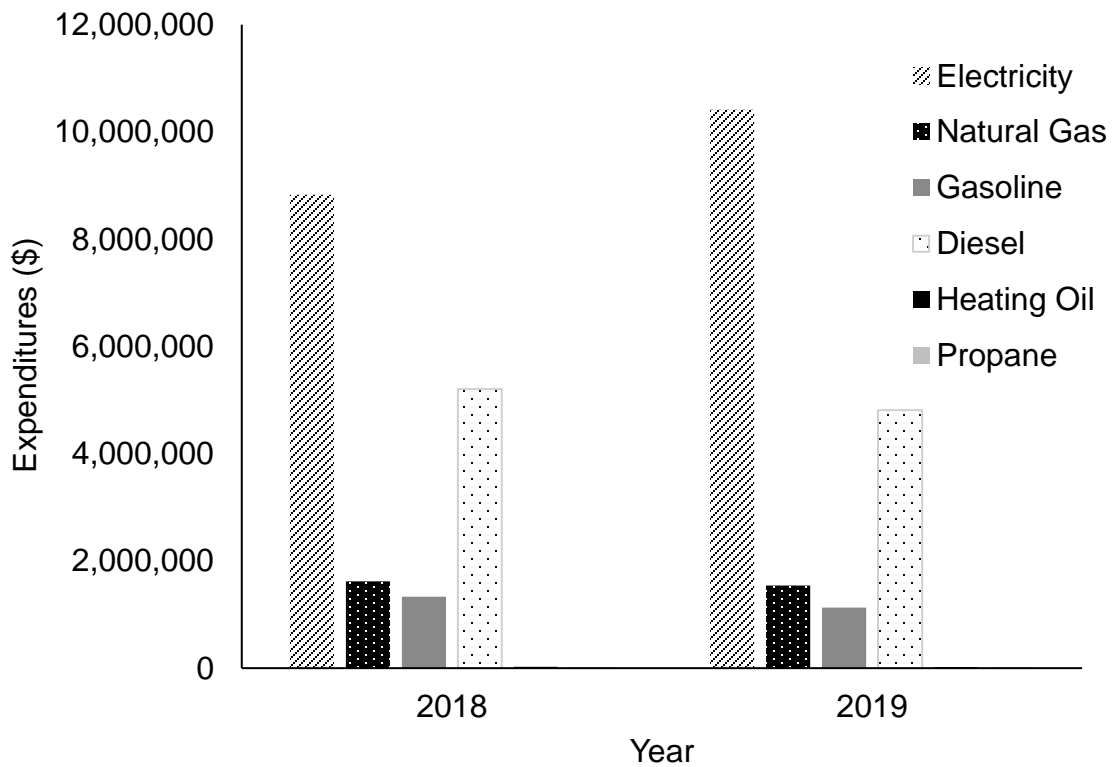
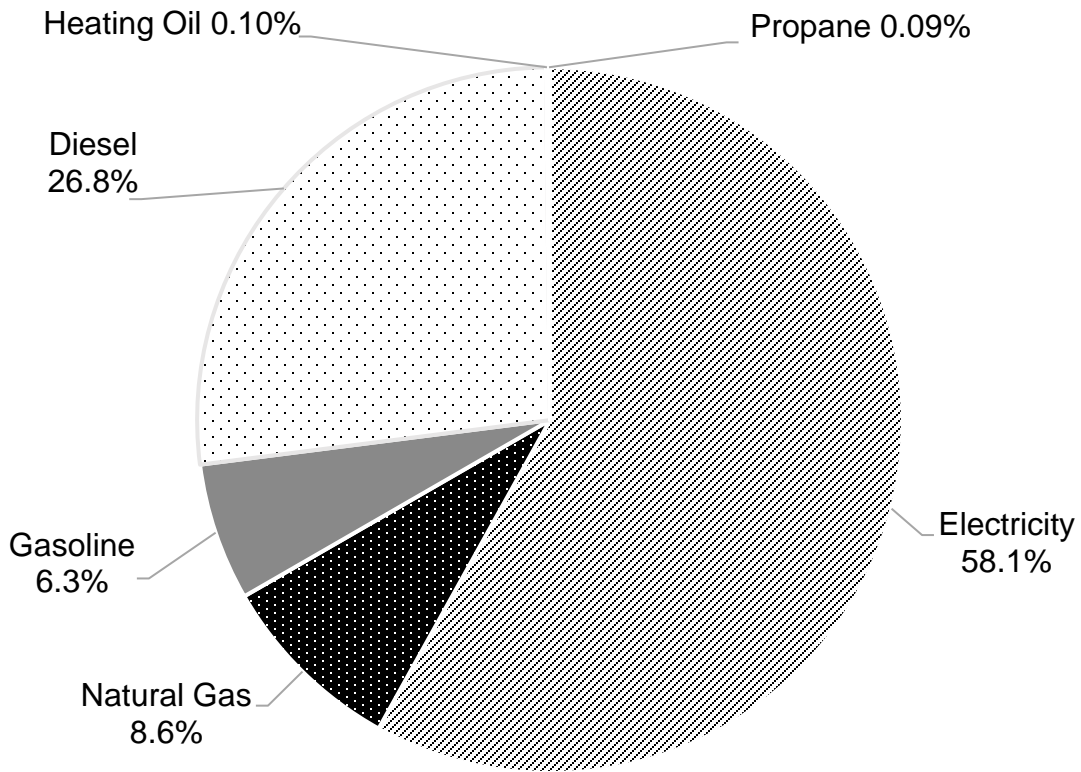
**2019 Energy Consumption by source (total: 555,818 GJ) and historical trend**



**2019 GHG Emissions by source (total: 23,561 tonnes CO<sub>2</sub>e) and historical trend**



**2019 Expenditures by source (total: \$17,029,376) and historical trend**





**Table 1.** Summary of energy consumption (GJ), GHG emissions (tCO<sub>2</sub>e), & expenditure (\$) of 2018 - 2019 for all sectors.

Sector	2018			2019			Energy Consumption Change (GJ)	GHG Emissions Change (tCO <sub>2</sub> e)	Change (\$)
	Energy Consumption (GJ)	GHG Emissions (t CO <sub>2</sub> e)	Expenditure (\$)	Energy Consumption (GJ)	GHG Emissions (t CO <sub>2</sub> e)	Expenditure (\$)			
Facilities	222,874	6,968	5,744,130	227,176	7,258	6,263,747	4,302	290	519,616
Transportation	77,941	5,542	2,498,998	76,330	5,407	2,379,769	-1,611	-136	-119,229
Transit	124,540	8,724	4,040,878	121,029	8,478	3,577,799	-3,511	-246	-463,079
Street Lights	12,838	109	534,929	13,221	112	645,836	382	3	110,906
Wastewater	76,983	1,754	2,512,121	86,332	1,709	3,255,734	9,349	-45	743,613
Water	40,642	562	1,698,320	40,990	597	1,811,825	348	35	113,504
Waste		377			376		0	-1	0.00
<b>TOTAL</b>	555,818	24,037	17,029,376	565,078	23,937	17,934,709	9,260	-100	905,333

**Table 2.** Summary of energy consumption (GJ), GHG emissions (tCO<sub>2</sub>e), and expenditure (\$) of 2018 - 2019 for energy sources.

Energy Source	2018			2019			Energy Consumption Change (GJ)	GHG Emissions Change (tCO <sub>2</sub> e)	Change (\$)
	Energy Consumption (GJ)	GHG Emissions (t CO <sub>2</sub> e)	Expenditure (\$)	Energy Consumption (GJ)	GHG Emissions (t CO <sub>2</sub> e)	Expenditure (\$)			
Electricity	203,146	1,720	8,826,920.00	213,837	1,810	10,415,175.36	10,690	90	1,588,255
Natural Gas	148,867	7,580	1,617,041.00	153,180	7,800	1,543,586.33	4,313	220	-73,454
Gasoline	36,527	2,644	1,332,836.00	34,595	2,504	1,130,754.07	-1,932	-140	-202,081
Diesel	165,953	11,622	5,207,040.00	162,462	11,378	4,812,039.91	-3,492	-245	-395,000
Heating Oil	874	66	26,201.00	545	41	17,069.39	-329	-25	-9,131
Propane	450	27	19,338.00	460	28	16,083.70	9	1	-3,254
<b>TOTAL</b>	555,818	23,660	17,029,376	565,078	23,561	17,934,709	9,260	-99	905,333

## Report Takeaways

- The total reduction in GHGs from 2018 to 2019 at the corporate level was 100 tonnes. This represents a reduction of 0.4% from 2018 baseline levels.
- A net reduction of 3,605 tonnes of CO<sub>2</sub>e will need to be accomplished in order to meet the short-term target of 15% below 2018 levels by 2022.
- Given that the highest emission source from corporate operations is from diesel fuel and the transportation and transit sectors overall, large emissions reductions could be achieved through accelerated fleet electrification in conjunction with increased share of bio-diesel use, which will be critical in meeting GHG targets.
- Facilities emissions grew by over 4%, which should be considered in the context of two new facility assets (Rideau Heights Community Centre, KFPL Central Branch) and weather variability during the same time period. The new facilities were responsible for approximately 30% of increased electricity use and nearly 50% of increased natural gas use.
- Heating degree days during 2019 also increased by 4% in comparison to 2018 which may partially explain additional increases in natural gas consumption. Cooling degree days decreased by 36% during the same time period which may partially explain the 1.8% decrease in electricity consumption. Energy consumption changes are not always explained explicitly by changes in heating and cooling degree days as energy consumption covers a large range of uses in the other sectors besides heating and cooling of buildings.
- Natural gas is the second biggest contributor to GHG emissions, suggesting that the ongoing significant improvements to improve building performance and switching to lower GHG emitting heating technologies and energy sources will substantially aid the City in achieving its GHG reduction targets.
- GHG emissions from sector sources has a slightly higher value than emissions from energy sources because there are no energy source emissions associated with the waste sector

## References

Canada Energy Regulator. 2021. Energy Unit Conversion Table. Webpage: <https://apps.cer-rec.gc.ca/Conversion/conversion-tables.aspx?GoCTemplateCulture=fr-CA>

Environment and Climate Change Canada (ECCC). 2020. National Inventory Report 1990-2018: 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>