City of Brantford
Corporate and Community Greenhouse Gas Emissions Inventory
2019/2020

Brantford.ca/ClimateAction

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1.0 INTRODUCTION

1.1 BACKGROUND

Baseline emissions were measured in 2018 to understand the City of Brantford's current state of greenhouse gas emissions from the Corporation and the Community. After that time, emissions are collected annually, and consolidated into a report every second year. This report provides the emissions data for the years 2019 and 2020. This newly collected data is compared to the baseline data and trends can be analyzed.

COVID-19 interrupted normal life for residents, businesses and City operations in 2020 and the results of this emissions inventory update will reflect this unusual time period. Trends emerging in this report may not continue in the same direction once COVID-19 is no longer a concern for day to day activities.

Data will continue to be collected year over year and the true impact of COVID-19 will be observed as it relates to energy consumption patterns and Greenhouse Gas (GHG) emissions.

Emission reduction targets were approved for the Corporation in 2020 along with the Corporate Climate Change Action Plan. Those emission targets are 30% reduction by 2030, 80% reduction by 2040 and net-zero carbon emissions by 2050. These values indicate a percentage reduction from the 2018 baseline emission levels.

1.2 OVERVIEW OF CURRENT CLIMATE CHANGE MODELLING

The most recent report from the Intergovernmental Panel on Climate Change (AR6) was released in 2021 and provided evidence to show that global temperatures will likely surpass the 1.5°C target that so many nations committed to in the Paris agreement. It stated that the planet will likely reach 1.5°C sometime between 2030 and 2035 depending on emissions scenarios. Additionally, the planet is likely to reach 2°C of warming during the 2040s or 2050s depending on emissions scenarios unless strong emissions mitigation is taken in the near-term.

The report also provides a carbon budget of 460 billion tonnes of CO_2 before being committed to 1.5°C, which is approximately 11 years of emissions at current levels.[1]

[1] Carbon Brief. (2021) What the new IPCC report says about when world may pass 1.5C and 2C. Retrieved on November 10, 2021 from https://www.carbonbrief.org/analysis-what-the-new-ipcc-report-says-about-when-world-may-pass-1-5c-and-2c

If emissions levels are reduced drastically and carbon sequestration technologies are expanded, the report predicts that temperatures could come back down to 1.5°C by the end of the century.

This report provides a harsh reality of the damage that is likely unavoidable, but also a reminder that our actions and emissions reduction work are still very important to work toward an improved circumstance for the next generations. Many children alive today will live to see the end of the century and the potentially declining global temperatures as a result of our efforts today.

1.2.1 Climate Change in Brantford

The impacts of climate change are already visible in Brantford. The City is experiencing increasing temperatures, increasing rainfall and more frequent flooding. Trends in weather and other metrics impacted by climate change are included below from the 2018 baseline year.

Table 1: Weather Metrics for Brantford[2]

	Average in 2018	Average in 2019	Average in 2020
Average annual temperature	7.8°C	7.8°C	8.9°C
Max temperature	33.1°C	33.7°C	35.9°C
# of very hot days (>30C)	20	15	32
# of tropical nights (Min temp >20C)	9	6	4
# of Frost Free Days	196	210	218
Annual precipitation (mm)	882	904	697
Max 1 day rainfall (mm)	35	40.8	35.6
# of heavy precipitation days (>10 mm)	27	32	18
Heating Degree Days (total)*		4076	3674
Cooling Degree Days (total)*		47	98

*Heating Degree Days (HDD) and Cooling Degree Days (CDD)[3]

These metrics quantify the temperatures during the year that require heating or cooling. Heating and cooling require energy of some form, so this figure can provide an

[2] Environment Canada Daily Data Report and GRCA Monitoring Data
[3] BizEE Software. 2021. Degree Days. www.degreedays.net

indication of how much energy was required for indoor climate control. For HDD, a base temperature of 18°C was used, so when the indoor temperature drops below this threshold, energy is used to heat the space. The HDD for the year shows how many degree points were required to keep the space at a minimum of 18°C. A higher number means a colder year and more energy required to heat a building. For CDD the base temperature of 24°C was used, so if indoor temperatures rise above 24°C, energy for cooling will be used to lower the temperatures. A higher number means a warmer year.

2.0 METHODOLOGY

A detailed methodology is included in the 2018 Baseline Emissions Inventory.

2.1 DATA COLLECTION

The data for the inventory was gathered from the sources listed in Table 2 for the corporate inventory and Table 3 for the community inventory.

Table 2: Data sources for 2019 and 2020 corporate emissions inventory

Category	Data Source	Data Type
Buildings	City Buildings (excl. Community Housing)	• Data collected from Energy Management System database
	Community Housing	• Provided by Community Housing Dept
Fleet	City Fleet (excl. Golf)	Data received from Fleet Services fuel records
	Golf	Data received from Finance Dept from Gas Tax reconciliation records
	Emergency Services • Brant Paramedics	Fleet inventory and total fuel consumption from Brant Paramedics and service division for jurisdictions (City vs County)
	Emergency Services • Fire • Police	• Fleet inventory from Fire Department fleet manager • Fleet inventory from Police Department fleet manager • Fuel consumption data from City Fleet Services records
Streetlights/ Traffic Signals	Streetlights	Consumption data from Traffic System Technologist based on kW installed and calculated run time
	Traffic Signals	Finance Dept from utility bills
Water and Wastewater	Public Works	Data collected from Energy Management System database

Table 3: Data sources for 2019 and 2020 community emissions inventory

Category	Data Source	Data Type
Transportation - On-Road	Kalibrate	Fuel sales from commercial suppliers within Brantford (gasoline/diesel)
Buildings: • Residential • Commercial/ Institutional • Industrial	Electricity: Ontario Energy Board Utility Yearbook 2019 and 2020	Aggregated electricity consumption data for Brantford Power service area for each customer type (residential, >50 kW, <50 kW) and # of customers
	Electricity: Energy + (Energy Plus)	Aggregated electricity consumption data for each customer type (residential, >50 kW, <50 kW) within City of Brantford boundary and # of customers
	Natural Gas: Enbridge	Gas consumption data for all customers within Brantford disaggregated by sector (residential/ commercial/ industrial) and postal code
Solid Waste (Landfill)	Public Works: Environmental Services	Data from Solid Waste Technologist

2.2 Calculating Greenhouse Gas emissions from energy usage

There are a variety of greenhouse gases (GHGs) that contribute to climate change and they vary in potency (ability to trap heat) based on their molecular characteristics and lifetime in the atmosphere. The most common GHGs are carbon dioxide (CO_2) and methane (CH_4). Methane is approximately 25 times more potent than carbon dioxide. These multiplication factors are taken into account and presented as tonnes of carbon dioxide equivalency often written as T of CO_2 eq. or T of CO_2e. Emissions are calculated based on the emission factors found in Table 4 below. These are the greenhouse gas emissions produced from burning one unit (identified in each row) of that fuel.

The values under T of CO_2e are what have been used for the calculations in the sections that follow. Additional information on the emission factor for electricity is provided in the next section.

Table 4: Greenhouse Gas Emission Factors for Energy Sources[4]

	Grams emitted				Tonnes
	CO_2	CH_4	N_2O	CO_2e	T CO_2e
Gasoline (per L)	2307	0.100	0.020	2315.46	0.00231546
Diesel (per L)	2681	0.078	0.022	2689.51	0.00268951
Natural Gas (per m^3)	1888	0.037	0.035	1899.36	0.00189936
Electricity (per kWh)*	30	0.007	0.001	30.473	0.00003047

* Specific to Ontario in 2018 and 2019

2.2.1 Electricity Emission Factor explained

Greenhouse gas emissions for electricity are calculated from the emissions produced during the generation of that electricity based on the energy source. In Ontario, electricity has low greenhouse gas emissions because coal plants have been decommissioned. A majority of Ontario's electricity is generated by nuclear power, which does not produce greenhouse gas emissions. Other sources of electricity in Ontario include hydro power, natural gas and renewables (wind, solar, biomass).

The emissions from electricity in Ontario in 2018 and 2019 are measured at 30.473 g CO_2e/kWh. Data for 2020 is not yet available. While this is relatively low compared to some other provinces and jurisdictions around the world, it is a sharp increase from 2017 levels which were 17.298 g CO_2e/kWh.[5] This is due to an increase in electricity production from natural gas generating stations.

This increase in electricity emissions factor has resulted in increased emissions from electricity sources even if actual consumption has remained stable or decreased.

3.0 Results of Corporate Inventory

3.1 Overview of Corporate Inventory

Corporate greenhouse gas emissions include all municipally owned and operated assets. The majority of these assets are geographically located within the boundaries of the City of Brantford, but also include four areas within the neighbouring County of Brant

[4] Environment and Climate Change Canada. (2020). National Inventory Report 1990-2019: Greenhouse Gases Sources and Sinks Part 2.

including three community housing complexes and the municipal airport buildings to understand the full impact of the Corporation's carbon footprint even though it is outside of the geographical area. The total emissions for the City of Brantford were calculated for natural gas consumption and electricity consumption separately and in total. Fuel consumption was also calculated for diesel and gasoline separately and in total.

The emissions data calculated within the corporate inventory are a subsection of the community inventory and were not subtracted from the community inventory totals in the next section. Emissions produced by the Corporation of the City of Brantford contribute approximately 2% of the emissions in the community inventory.

The tables below provide an overview of all the data collected for 2019 and 2020 separately. More details related to analysis and methodology are discussed in the sections that follow. The total emissions detailed in this section are included in Appendix A.

Table 5: Results of 2019 Corporate Greenhouse Gas Emissions Inventory

	Electricity (kWh)	Elec Emiss. (T CO_2e)	Natural Gas (m^3)	NG Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Buildings	23,359,859	712	3,294,636	6,258	6,970
Streetlights/ Traffic signals	7,514,057	229	-	-	229
Water/Wastewater	18,575,675	566	454,234	863	1,429
	Gas (L)	Gas Emiss. (T CO_2e)	Diesel (L)	Diesel Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Fleet	729,242	1,689	1,900,007	5,110	6,799
Total Corporate Greenhouse Gas Emissions					**15,426**

Table 6: Results of 2020 Corporate Greenhouse Gas Emissions Inventory

	Electricity (kWh)	Elec Emiss. (T CO_2e)	Natural Gas (m^3)	NG Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Buildings	21,376,532	651	2,984,825	5,669	6,321
Streetlights/ Traffic signals	7,402,743	226		-	226
Water/Wastewater	17,861,610	544	438,252	832	1,377
	Gas (L)	Gas Emiss. (T CO_2e)	Diesel (L)	Diesel Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Fleet	712,243	1,649	1,711,023	4,601	6,251
Total Corporate Greenhouse Gas Emissions					**14,174**

Table 7: Corporate Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Buildings	6,758	6,970	6,321
Streetlights/Traffic signals	135	229	226
Water/Wastewater	1,185	1,429	1,377
Fleet	6,631	6,799	6,251
Total	**14,710**	**15,426**	**14,174**
Change from Baseline		**+ 4.9%**	**- 3.6%**

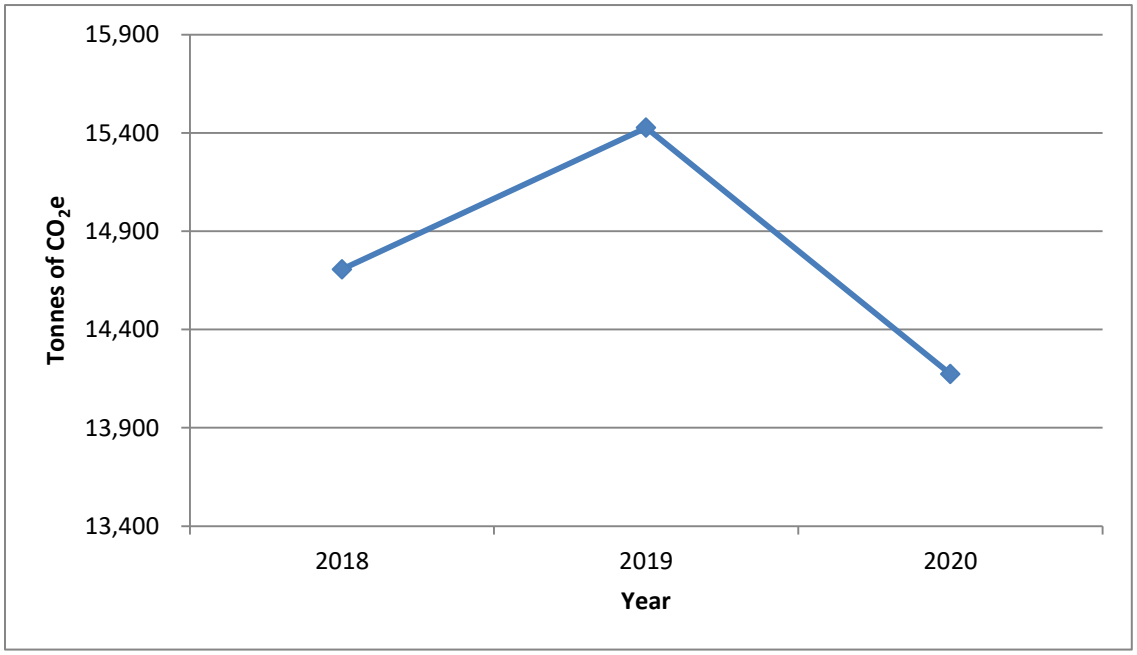

Figure 1: Total Corporate Emissions by Year

Table 7 and Figure 1 show the total emissions from the Corporation as whole over the past three years.

In 2019 emissions increased by almost 5% from 2018. There were emission increases in all sectors of the Corporation. This is partly due to the increase in electricity emissions factor. The 2018 emissions rating that was used in to calculate emissions was the lowest it has ever been (17 kg of CO_2/kWh). This is due to a very low emissions energy mix on the Ontario electricity grid. Since that time electricity production from gas

plants has increased and with it the CO_2 released with every kWh produced, therefore emissions associated with electricity have increased. This emissions factor is almost double what it was in the baseline inventory and therefore, emissions from electricity have gone up even though there was actually a decrease in electricity consumption over those years. This is due to provincial policy and is out of the control of the municipality.

In 2020, emissions decreased 8.5% from the previous year (2019) and 3.6% from the baseline year (2018). Electricity emissions factor continued to remain at the higher level used in 2019, but emissions were down in every sector due to decreased use. This is likely due in part to Covid-19 restrictions in place throughout most of 2020, but this will become clearer as additional data are collected over subsequent years.

When the annual emissions are compared to City approved emission reduction targets, trends begin to appear, although it is still very early in the tracking and monitoring process to identify strong trends. Figure 2 below shows the emissions in relation to the emissions targets out to 2030 as outlined in the Corporate Climate Change Action Plan. Figure 3 shows the annual emissions in relation to our long term goal of net-zero emissions by 2050.

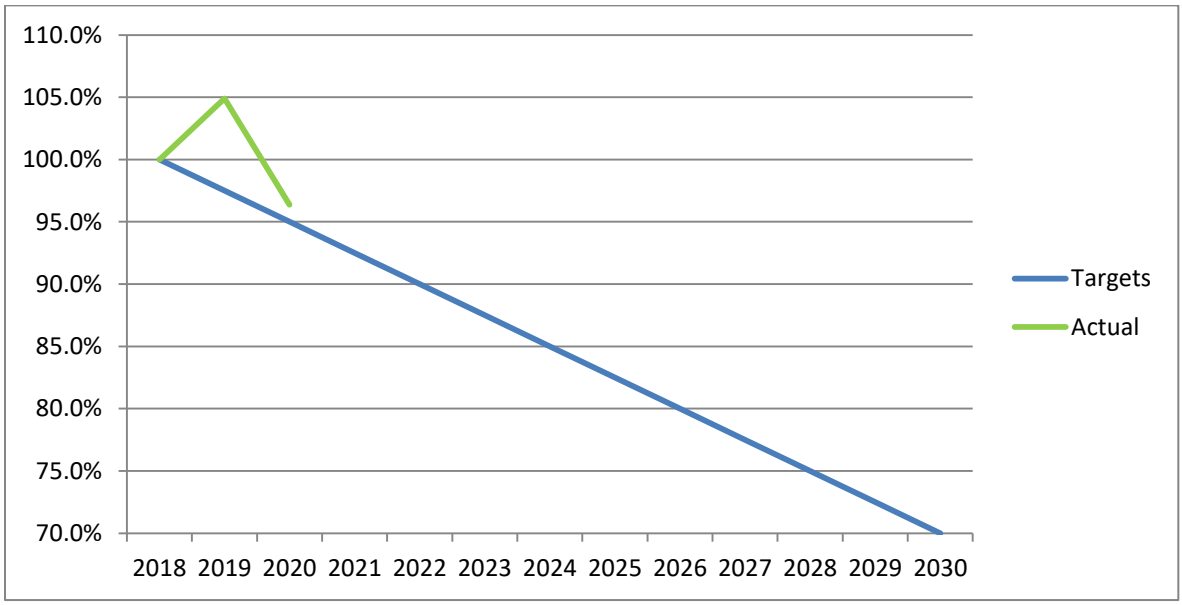

Figure 2: Annual Corporate Emissions to date compared to approved reduction targets to 2030

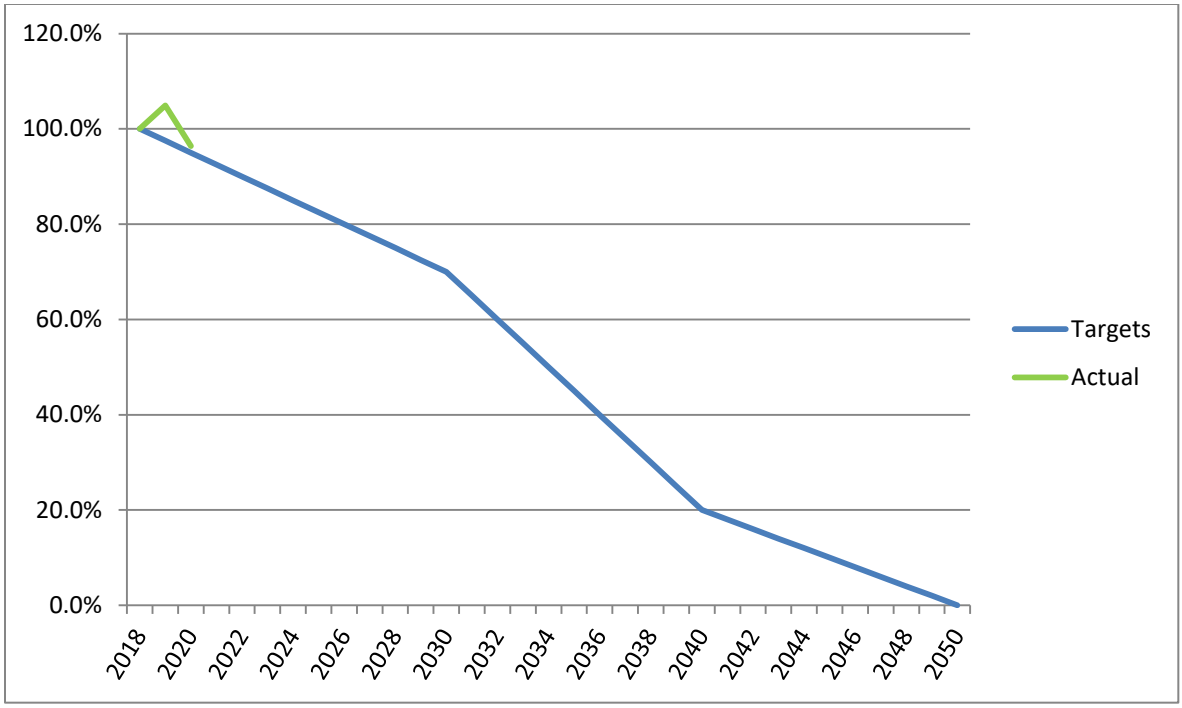

Figure 3: Annual Corporate Emissions to date compared to approved reduction targets to 2050

Figures 2 and 3 indicate that emissions reductions are not quite where they should be to make consistent progress toward the 2030 goal, but overall, emissions are below the baseline year. Ongoing monitoring and annual tracking will help identify where emissions trends are going.

A detailed breakdown of energy and emissions by Corporate sector is provided in the sections below.

3.2 BUILDINGS

The City of Brantford owns and manages 96 stationary assets which are mostly single buildings, but also includes groups of buildings (i.e. row of townhouses, multi-unit residential) or other infrastructure (i.e. pumping station, garage). This number excludes any stationary assets that are used for water and wastewater treatment which are considered in a separate section dedicated to the provision of that service. It also excludes assets that are owned by the municipality, but where utility bills are fully paid by the tenant.

Most of these buildings are within the City of Brantford's geographical boundaries, but there are four locations in neighbouring Brant County, including three Community Housing locations and the municipal airport.

In total the greenhouse gas emissions produced from all buildings owned and managed corporately was 6,970 T of CO_2e in 2019 and 6,321 T of CO_2e 2020 compared to 6,758 T of CO_2e in 2018.

Buildings account for 47% (2019) and 43% (2020) of the total emissions from the Corporation as a whole. The emissions from corporate buildings are 90% due to natural gas consumption and 10% due to electricity consumption. The primary use of natural gas in these buildings is for space heating.

The breakdown of the energy usage from buildings by department is provided in Tables 8 and 9. A summary of emissions from baseline year 2018 is provided in Table 10. A list of all individual stationary energy uses included in this analysis and their department category is attached as Appendix C.

Table 8: 2019 Corporate greenhouse gas emissions from buildings by department/use

	Electricity (kWh)	Elec Emiss. (T CO_2e)	Natural Gas (m^3)	NG Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Parks	10,605,517	323	1,221,869	2,321	2,644
Community Housing	6,296,433	192	1,267,183	2,407	2,599
Public Works	2,254,391	69	321,006	610	678
Administration	2,821,973	86	294,425	559	645
Emergency Services	1,381,546	42	190,153	361	403
Total Buildings	**23,359,859**	**712**	**3,24,636**	**6,258**	**6,970**

Table 9: 2020 Corporate greenhouse gas emissions from buildings by department/use

	Electricity (kWh)	Elec Emiss. (T CO_2e)	Natural Gas (m^3)	NG Emiss. (T CO_2e)	Total Emiss. (T CO_2e)
Parks	8,465,590	258	1,052,651	1,999	2,257
Community Housing	6,740,923	205	1,176,455	2,235	2,440
Public Works	2,205,300	67	285,599	542	610
Administration	2,572,026	78	289,199	549	628
Emergency Services	1,392,694	42	180,921	344	386
Total Buildings	**21,376,532**	**651**	**2,984,825**	**5,669**	**6,321**

Table 10: Corporate Building Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Parks	2,676	2,644	2,257
Community Housing	2,475	2,599	2,440
Public Works	654	678	610
Administration	562	645	628
Emergency Services	392	403	386
Total	**6,758**	**6,970**	**6,321**

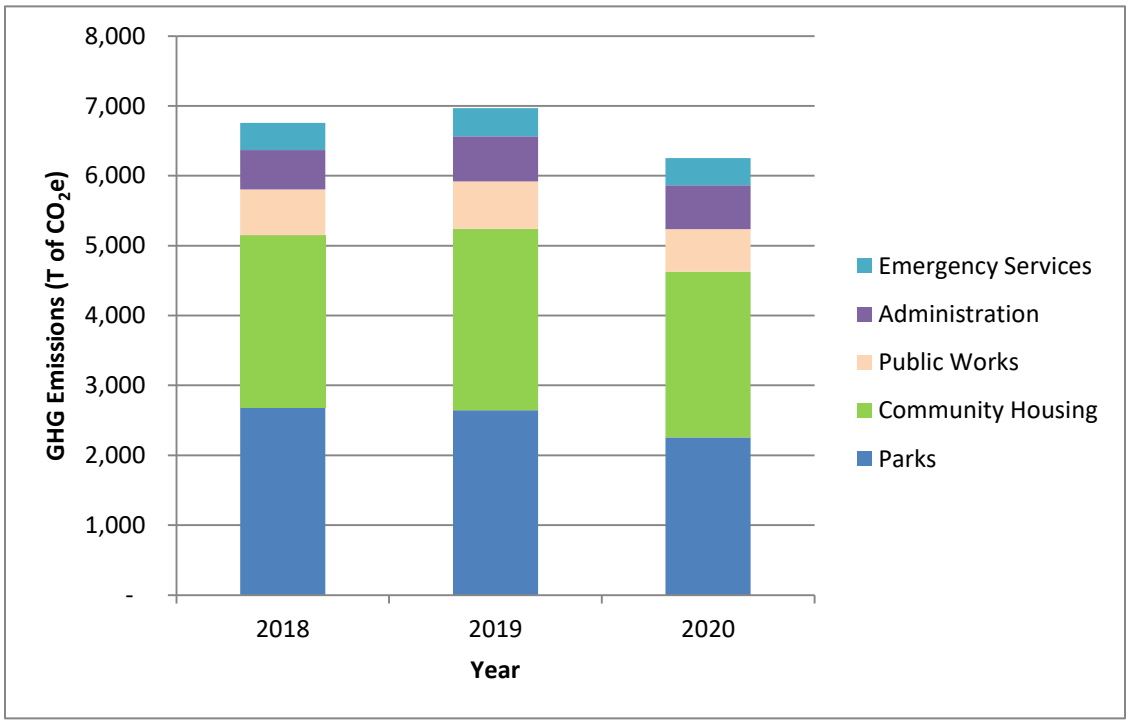

Figure 4: Relative Corporate Building Emissions by department by year

3.3 FLEET

The corporate fleet is made up of several distinct components including transit (including Lift), emergency services and operational uses for the various departments including Operational Services, Environmental Services, Parks, and Other.

The City of Brantford owns and manages 446 fleet assets which include everything from heavy duty equipment (construction equipment, fire trucks, buses) to small equipment

(lawnmowers) and a large number of vehicles in between such as trucks, SUVs and cars. This number excludes handheld equipment such as chainsaws and leaf blowers, etc. that use a mixture of gasoline and oil as fuel.

In total, the emissions produced from the entire fleet owned and managed corporately was 6,799 T of CO_2e in 2019 and 6,251 T of CO_2e in 2020. This amount is 46% and 43%, respectively, of the total emissions from the Corporation as a whole. Of the total emissions generated from the Corporate fleet, approximately 75% of emissions are generated by diesel consumption and 25% are generated by gasoline consumption. During this period the City owned two electric vehicles, but the electricity used to charge those vehicles would be captured in the building electricity consumption data.

The breakdown of the emissions from the fleet by department is provided in Tables 11 and 12 for the two years. Additional information on the various department uses is provided in the following section.

Table 11: 2019 Corporate Greenhouse gas emissions from fleet by department

	Gas Usage (L)	Gas Emissions (T CO_2e)	Diesel Usage (L)	Diesel Emissions (T CO_2e)	Total Emissions (T CO_2e)
Transit & Lift	135,448	314	1,174,18	3,158	3,472
Emergency Services	350,470	811	78,222	210	1,022
Environmental Services	43,084	100	343,254	923	1,023
Operational Services	103,536	200	136,211	366	606
Parks	86,179	200	161,719	435	634
Remainder of Fleet	10,526	24	6,383	17	42
Total Fleet	**729,242**	**1,689**	**1,900,007**	**5,110**	**6,799**

Table 12: 2020 Corporate Greenhouse gas emissions from fleet by department

	Gas Usage (L)	Gas Emissions (T CO_2e)	Diesel Usage (L)	Diesel Emissions (T CO_2e)	Total Emissions (T CO_2e)
Transit & Lift	76,762	178	995,599	2,678	2,855
Emergency Services	375,133	869	59,738	161	1,029
Environmental Services	40,123	93	432,985	1,165	1,257
Operational Services	109,981	255	150,534	405	660
Parks	93,182	216	66,704	179	395
Remainder of Fleet	17,061	40	5,462	15	54
Total Fleet	**712,243**	**1,649**	**1,711,023**	**4,602**	**6,251**

Table 13: Corporate Fleet Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Transit & Lift	3,358	3,472	2,855
Emergency Services	1,040	1,022	1,029
Environmental Services	975	1,023	1,257
Operational Services	825	606	660
Parks	330	634	395
Remainder of Fleet	103	42	54
Total	**6,631**	**6,799**	**6,251**

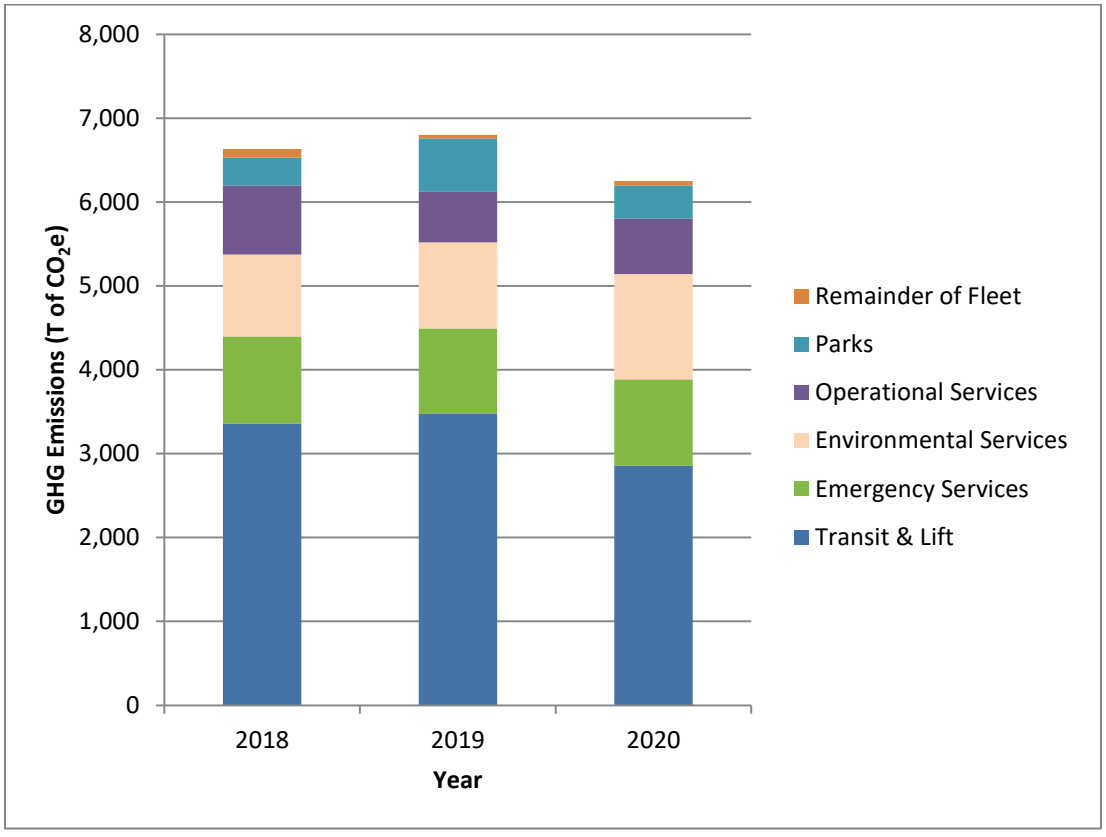

Figure 5: Relative Corporate Fleet Emissions by department by year

There are 31 buses in the transit fleet, four of which are diesel hybrids and the remaining 27 run on diesel. There are 18 Lift buses in the fleet. The Lift buses are smaller, accessible buses that run on gasoline, with the exception of one Lift bus that runs on diesel. Transit and Lift Services made up 51% of the emissions in the corporate

fleet in 2019 and dropped to 46% in 2020, which is likely due to reduced service due to Covid-19. Within this category, transit is responsible for 91-94% of emissions and Lift is responsible for 6-9% of emissions.

Emergency Services make up 15% of the Corporate emissions and include all vehicles managed by ambulance, fire and police. Ambulance Services are shared between the City of Brantford and Brant County and therefore the emissions have been adjusted accordingly. The percentage of ambulance calls from within the City of Brantford is 77% and the fuel usage and emissions were adjusted by this amount for this inventory. Ambulance Services has 20 vehicles in their fleet, 12 of which are ambulances and the remainder are smaller vehicles. Ambulance Services makes up 20% of emergency services emissions. The fire department has 26 vehicles in their fleet, 8 of which are fire trucks. The fire department makes up 15% of emissions in this category. The police department has 77 vehicles in their fleet and makes up 64% of the emissions in this category.

Environmental Services makes up 15% - 20% of the fleet emissions and includes mostly light duty trucks and some specialized equipment for departmental use, but also includes collection trucks for garbage and recycling. Garbage and recycling trucks are operated by a third party, but this is a municipal service and is therefore included in this figure. Emissions from this department increased by 174 T of CO_2e in 2020 due the change in the location of recycling processing from Cainsville to Norfolk.

Operational Services makes up 9-11% of the emissions in the corporate fleet and includes vehicles such as construction equipment (dump trucks, bucket trucks, sign trucks, etc.), seasonal equipment (snow plows, sanders, etc.), street sweepers, light duty trucks and cars.

Parks makes up 9-6% of emissions from fleet and includes vehicles used exclusively in their department, mostly light duty trucks and some specialized equipment.

Remainder of fleet includes other smaller departments and makes up 1% of the emissions of the corporate fleet. This includes other departments that may have a vehicle such as By-law, Facilities or cross departmental vehicles. These are mostly cars and SUVs and light duty trucks.

3.4 Water and Wastewater

The water and wastewater component of the corporate inventory is separated from other stationary energy uses because it focuses on a specific service that the municipality delivers and one that is a high energy user.

The water component of this sector is for treatment and distribution of municipal water throughout the city. The water is taken from the Grand River, treated to ensure it is clean and then pumped at various points to homes and businesses across the city.

The wastewater component is for pumping wastewater (sewage, grey water, etc.) from homes and businesses to the wastewater treatment plant. Here the wastewater is treated and water and sludge are separated out for disposal. The water is treated and returned to the river and the sludge is gathered and disposed of by a third party.

The data gathered in this section includes any building or other infrastructure associated with that service, such as office space, treatment plant or pumping stations.

The water and wastewater energy usage makes up 9% of the total energy consumption for the Corporation. Total emissions for this sector were 1,429 T of CO_2e in 2019 and 1,377 T of CO_2e in 2020. The table below shows the energy consumption for water and wastewater for the previous two years. Table 16 shows the comparison to the baseline data.

Table 14: 2019 Energy consumption for water and wastewater uses within the corporation

	Electricity (kWh)	Elec Emissions (T CO_2e)	Natural Gas (m^3)	NG Emissions (T CO_2e)	Total Emissions (T CO_2e)
Water	10,642,366	324	228,589	434	758
Wastewater	7,933,308	242	225,645	429	670
Total	18,575,675	566	454,234	863	**1,429**

Table 15: 2020 Energy consumption for water and wastewater uses within the corporation

	Electricity (kWh)	Elec Emissions (T CO_2e)	Natural Gas (m^3)	NG Emissions (T CO_2e)	Total Emissions (T CO_2e)
Water	10,302,524	314	200,745	381	695
Wastewater	7,559,087	230	237,507	451	681
Total	17,861,611	544	438,252	832	**1,377**

Table 16: Corporate Fleet Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Water	618	758	695
Wastewater	567	670	681
Total	**1,185**	**1,429**	**1,377**

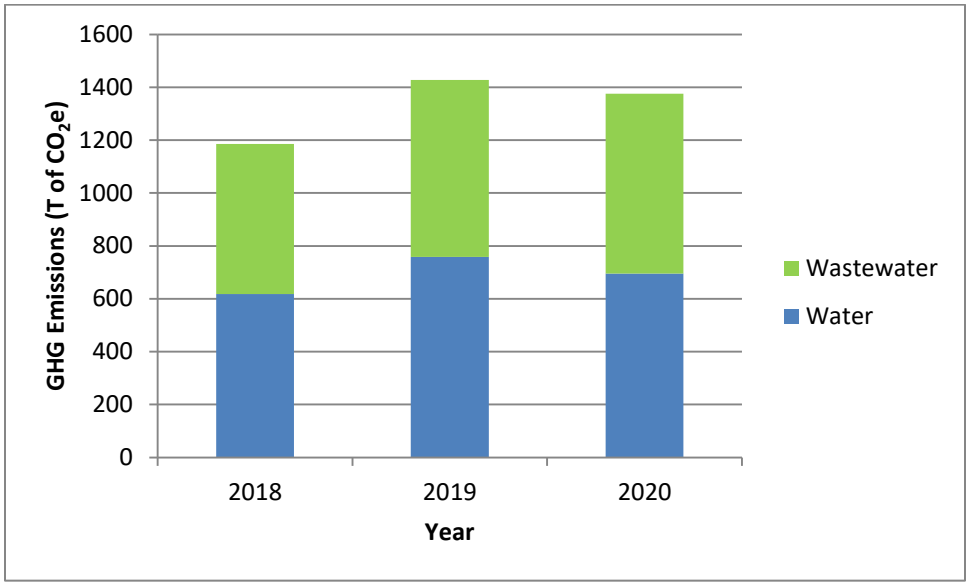

Figure 6: Relative Corporate Water and Wastewater Emissions by Year

Water treatment and pumping makes up 51-53% of the emissions from this sector and wastewater treatment and pumping makes up 47-49%.

Electricity consumption is responsible for 40% of the total emissions and natural gas consumption is responsible for 60%.

3.5 Streetlights and Traffic Signals

Streetlights and traffic signals energy use has been totaled city-wide. These are exclusively operated with electricity and therefore do not contribute high emissions to the total Corporate inventory. As explained in section 2.2.1 of this report, emission associated with electricity doubled between the City's 2018 inventory and this report due to an increase of fossil fuel generation on the provincial electricity grid; this leads to increased emissions/kWh of electricity generated. This is most apparent in this category where there are only electricity emissions to consider. Table 17 and 18 show the

detailed energy consumption and emissions between the two uses and Table 19 shows the total emissions over the three years of data collection.

Table 17: 2019 Energy consumption for streetlights and traffic signals within the corporation

	Electricity (kWh)	Electricity Emissions (T CO_2e)
Streetlights	7,270,625	222
Traffic Signals	243,432	7
Total	7,514,057	229

Table 18: 2020 Energy consumption for streetlights and traffic signals within the corporation

	Electricity (kWh)	Electricity Emissions (T CO_2e)
Streetlights	7,159,311	218
Traffic Signals	243,432	7
Total	7,402,743	226

Table 19: Corporate Streetlights and Traffic Signal Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Streetlights	131	222	218
Traffic Signals	4	7	7
Total	**135**	**229**	**226**

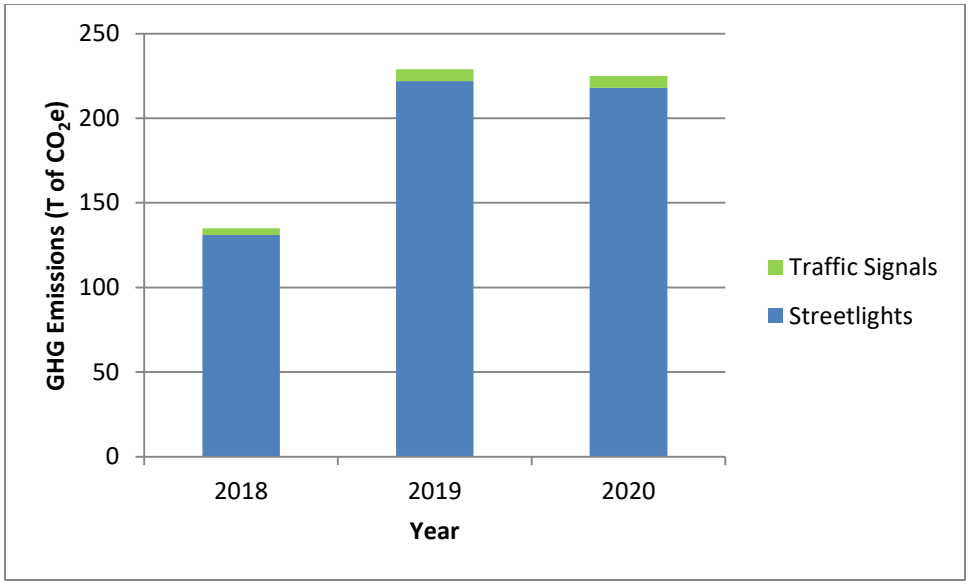

Figure 7: Relative Corporate Water and Wastewater Emissions by Year

Emissions associated with streetlights and traffic signals in the City contribute approximately 1.5% of the total overall emissions within the corporate inventory. This is up from the 2018 inventory where this category contributed only 0.9%. Electricity consumption continues to decrease in this category as high pressure sodium (HPS) bulbs are replaced with LED bulbs, but due to the increase in emissions factor for electricity, emissions have increased over the previous two years.

4.0 Results of Community Inventory

The baseline emissions inventory conducted for the community was first completed in 2018 and this report provides 2019 and 2020 data to show how the emissions are changing. The inventory gathers data on most sources of energy used inside the geographical boundaries of the City of Brantford. This section has aggregated consumption data from the major energy suppliers in the City (Brantford Power, Energy +, Enbridge Gas and fuel providers). This section is divided into five sections: Residential, Commercial/ Institutional, Industrial, Transportation, and Waste.

The results of the community inventory for 2019 are summarized in Table 20 and 2020 data are summarized in Table 21. Overall emissions are compared to baseline data in Table 22. Additional details on each sector are included in the following sections. The total emissions detailed in this section are included in Appendix B.

Table 20: 2019 Results of Community Emissions Inventory

Stationary (Buildings)						
	Electricity (MWh)	Electricity emissions (T CO_2e)	Natural Gas (m^3)	Natural Gas emissions (T CO_2e)	Total energy (MWh)	Total emissions (T CO_2e)
Resi.	312,357	9,518	68,485,845	130,079	1,024,267	139,597
Inst./ Comm.	104,839	3,195	69,451,402	131,913	826,787	135,108
Industrial	558,201	17,010	57,621,186	109,443	1,157,173	126,453
Transportation						
	Gasoline purchased (L)	Gasoline emissions (T CO_2e)	Diesel purchased (L)	Diesel emissions (T CO_2e)		Total emissions (T CO_2e)
On-road	97,798,124	214,870	6,130,019	16,487		231,357
Waste						
Landfill						18,510
Emission Total						
Community Greenhouse Gas Emissions Total (T of CO_2e)						**651,025**

Table 21: 2019 Results of Community Emissions Inventory

Stationary (Buildings)						
	Electricity (MWh)	Electricity emissions (T CO_2e)	Natural Gas (m^3)	Natural Gas emissions (T CO_2e)	Total energy (MWh)	Total emissions (T CO_2e)
Resi.	334,915	10,206	47,989,749	91,150	833,79	101,355
Inst./ Comm.	97,089	2,959	59,596,331	113,195	716,593	116,153
Industrial	529,247	16,128	51,654	98,109	1,066548	114,236
Transportation						
	Gasoline purchased (L)	Gasoline emissions (T CO_2e)	Diesel purchased (L)	Diesel emissions (T CO_2e)		Total emissions (T CO_2e)
On-road	85,276,399	197,454	5,954,911	16,016		213,470
Waste						
Landfill						15,255
Emission Total						
Community Greenhouse Gas Emissions Total (T of CO_2e)						**560,470**

The table below shows total GHG emissions for the major categories starting from the first year data was collected, 2018. It should be noted that the baseline figure has changed from the original report due to some data clarity in the Transportation category. This is explained in more detail in Section 4.4. The “change from baseline” figures are calculated from this revised 2018 figure provided in Table 22.

Emissions went up slightly in 2019 and then dropped significantly in 2020. The drop in 2020 is likely due to Covid-19 impacts due to lockdowns, reduced working hours, less travel, etc., but long term trends will become clear over the next several years of data collection and emissions reporting and once limitations due to Covid-19 have passed.

Table 22: Community Emissions Summary from Baseline

	Tonnes of CO_2e		
	2018	2019	2020
Transportation	220,669	231,357	213,470
Residential	140,395	139,597	101,355
Institutional/Commercial	138,332	135,108	116,153
Industrial	123,388	126,453	114,236
Landfill	13,051	18,510	15,525
Total	**635,834**	**651,025**	**560,470**
Change from Baseline		**+ 2.4%**	**- 11.9%**

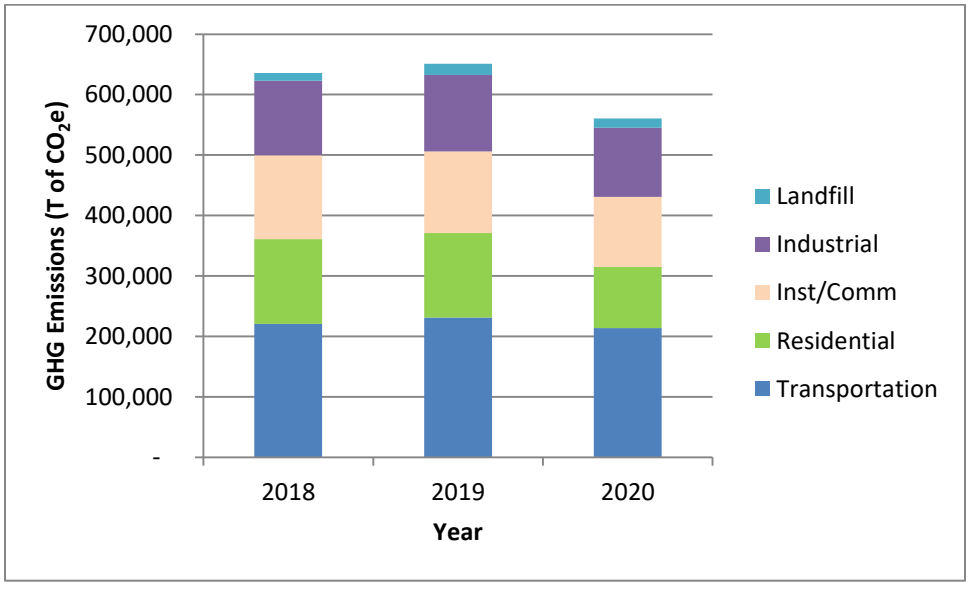

Figure 8: Relative Community Emissions Sources by year

Figure 9 below illustrates the break down in emissions from the different fuel sources between all sectors. The largest source of emissions is 54% due to natural gas use in buildings for space heating. Gasoline is the next highest source of emissions from personal transportation at 35%. Electricity, Diesel and Landfill are each responsible for 5% or less of total emissions.

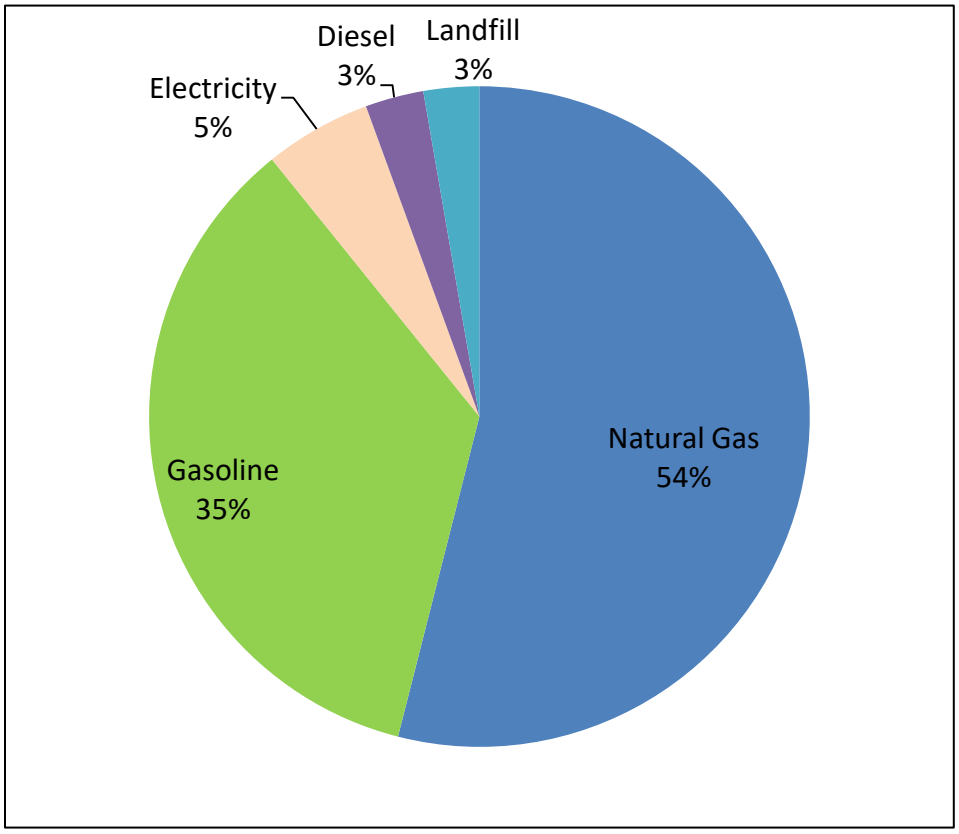

Figure 9: 2020 Community greenhouse gas emissions by fuel type

Figure 10 and Figure 11 below show the total emissions year to year starting in 2018 in comparison to the emissions targets that have been established for Corporate emissions. Emission targets have not been established for Community emissions as of the date of preparing this report, but the long term target of net-zero emissions by 2050 will remain the same. Interim targets established for the Corporation have been used here in the absence of other targets. It is clear that Community emissions dropped in 2020 far below the expected or targeted emission reduction trajectory, however, it is anticipated that this will increase again once Covid-19 limitations have passed, but to what extent is unknown.

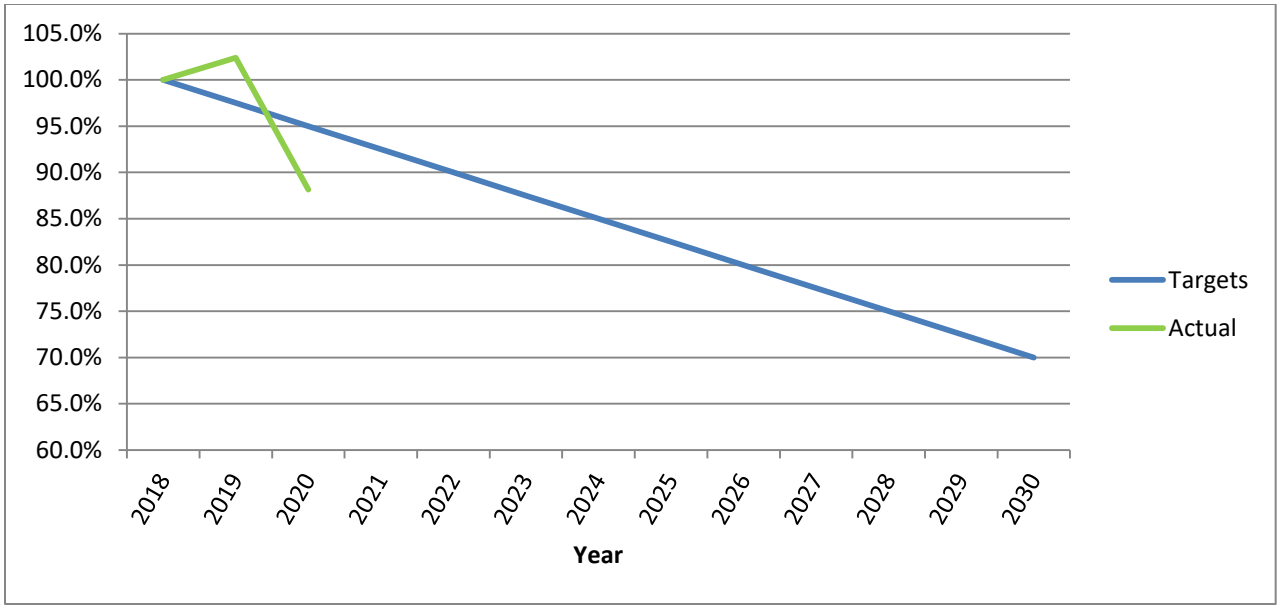

Figure 10: Annual Community Emissions to date compared to emissions reduction targets to 2030

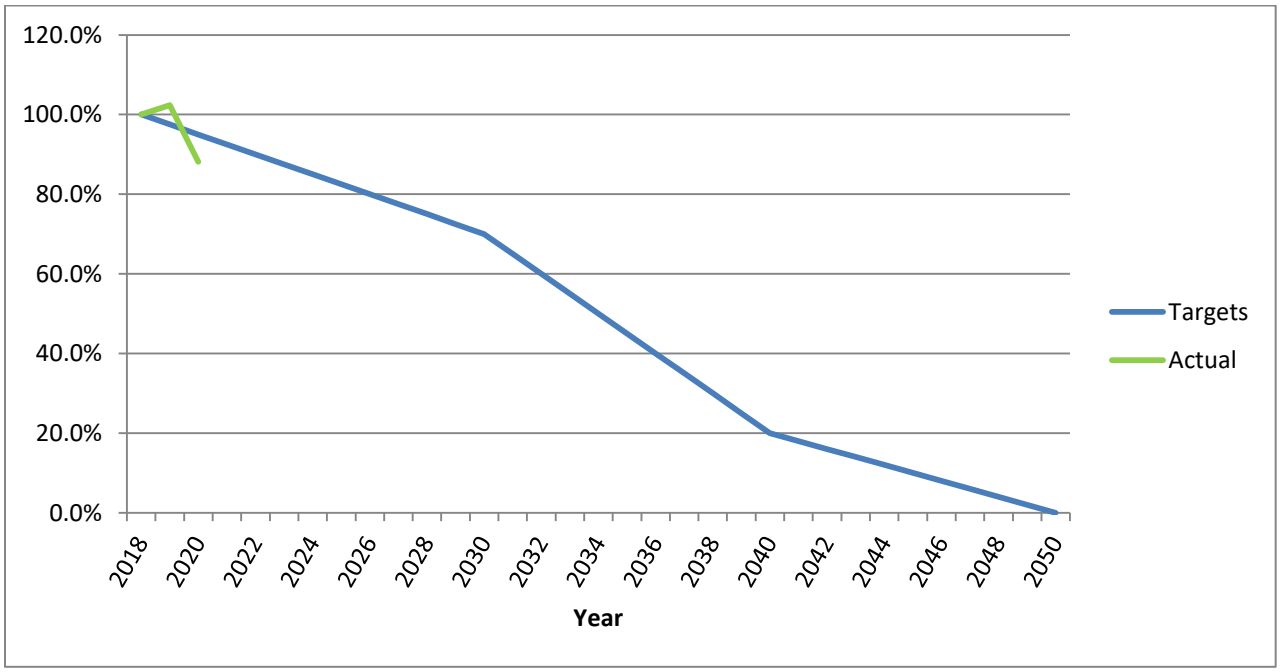

Figure 11: Annual Community Emissions to date compared to emissions reduction targets to 2050

4.1 RESIDENTIAL

4.1.1 ELECTRICITY USAGE

Electricity consumption in the home can be attributed to many uses such as lighting, appliances (such as refrigerator, microwave, washing machine, dishwasher, some dryers), air conditioners, and anything else that is plugged into wall outlets (clocks, fans, chargers, TVs, etc.). Some homes are heated with electricity, although most homes are heated with natural gas if available, but heating for other uses could be electric or natural gas such a water heater or a pool heater.

Electricity is provided by two local distribution companies within the City of Brantford. Primarily the City is serviced by Brantford Power Inc. (BPI), a municipally owned utility. In parts of the north and south of Brantford where city land has expanded beyond its earlier boundaries, but BPI service territory has not, customers are served by Energy + (Energy Plus). It was announced in 2021 that BPI will be merged with Energy+ at the beginning of 2022, so that change will be visible in the 2022 inventory update. The image below illustrates the current service area of each utility within Brantford.

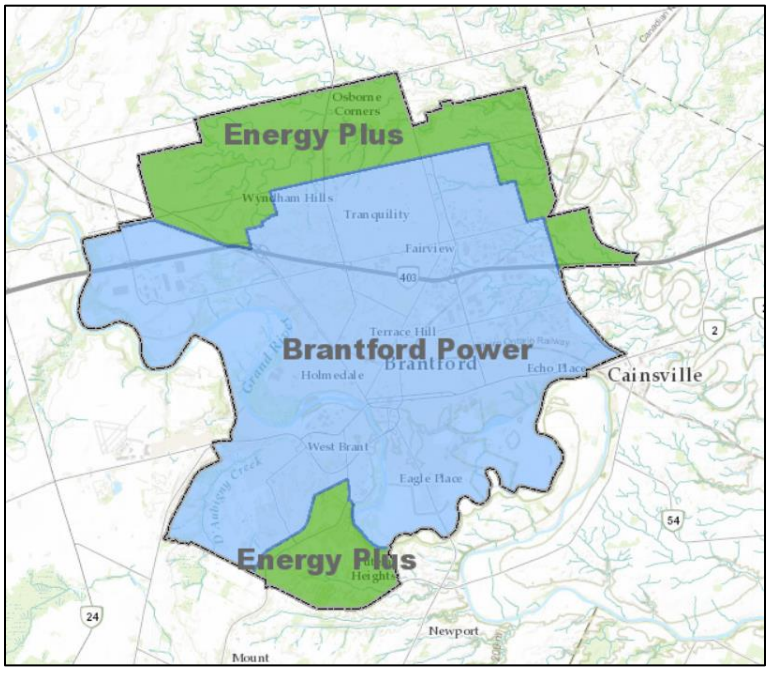

Figure 12: Service areas of local electricity providers within Brantford.

Data for residential electricity consumption for 2019 and 2020 are included in Table 23. The breakdown by service provider for all residential customers is approximately 97% serviced by Brantford Power and 3% serviced by Energy +.

Ontario average residential consumption in 2020 was 9,006 kWh[6]; Brantford's electricity consumption is approximately 4% below the Ontario average.

Table 23: Residential Electricity consumption in Brantford for 2019 and 2020

Year	Total Electricity (kWh)	Elec. Emissions (T of CO_2e)	# of customers	Avg kWh / household
2019	312,357,079	9,518	38,113	8,196
2020	334,915,158	10,205	38,673	8,660

Historical data for Brantford Power customers are available as far back as 2006. Since this portion of the electricity customers makes up 97% of the total, this evaluation is generally indicative of usage in the City for residential customers. Looking at the graph below, it is clear that electricity usage is declining overall. The highest point in the graph was 2007 at just under 9,000 kWh/year, with a steady decline and then a sharp drop in 2017 to its lowest point of 7,500 kWh/yr and fluctuating significantly since.

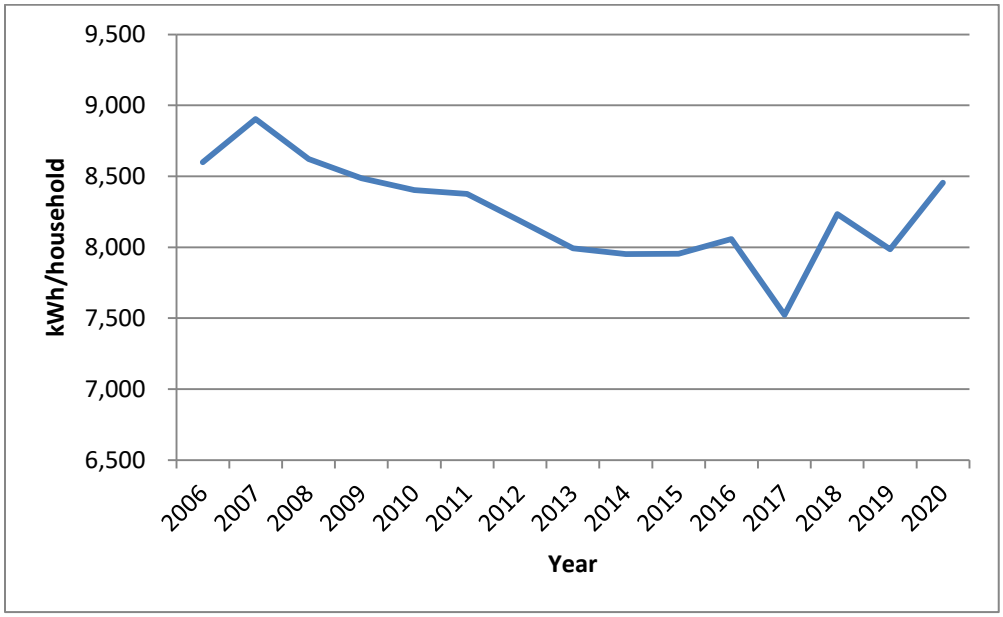

Figure 13: Average kilowatt-hour (kWh) usage for Brantford Power residential customers over the past 15 years.

[6] Ontario Energy Board. (2021). Yearbook of Electricity Distributors 2020.

4.1.2 Natural Gas Usage

Natural gas usage in the home is primarily used for heating with a natural gas furnace, boiler and/or fireplace. Natural gas is also sometimes used for cooking (stove, barbecue), some water heaters and some dryers.

Natural gas usage data was provided by the sole supplier in the area, Enbridge Gas (formerly Union Gas).

Data for residential natural gas consumption for 2019 and 2020 are included in Table 24. The average natural gas consumption per household for the City of Brantford was 2,029 m^3 and 1,409 m^3 2020. This decline in 2020 may be due in part to Covid-19 changes, but also due the warmer year in 2020. The heating degree days listed for 2020 (see Table 1) were significantly lower in 2020 meaning there was less energy required for heating. The average natural gas consumption in 2020 for Ontario households was 2,145 m^3.[7]

Table 24: Residential Natural Gas consumption in Brantford for 2019 and 2020

Year	Total Natural Gas (m^3)	NG Emissions (T of CO_2e)	# of customers	Avg m^3/ household
2019	68,485,845	130,079	33,758	2,029
2020	47,989,749	91,150	34,059	1,409

4.1.3 Greenhouse Gas Emissions from Community Residential

Based on the above recorded consumption of electricity and natural gas and their respective greenhouse gas emissions factors, the greenhouse gas emissions are calculated in Table 25 in tonnes of carbon dioxide equivalent (T of CO_2e) for the residential sector of the City of Brantford. In 2020, Natural gas usage accounts for approximately 90% of residential emissions and electricity usage accounts for 10%.

[7] Ontario Energy Board. (2021). Yearbook of Natural Gas Distributors 2020.

Table 25: Greenhouse gas emissions produced by Community Residential in Brantford since baseline

	GHG Emissions (Tonnes of CO_2e)		
	2018	2019	2020
Electricity	5,533	9,518	10,206
Natural Gas	134,861	130,079	91,150
Total	**140,395**	**139,597**	**101,355**

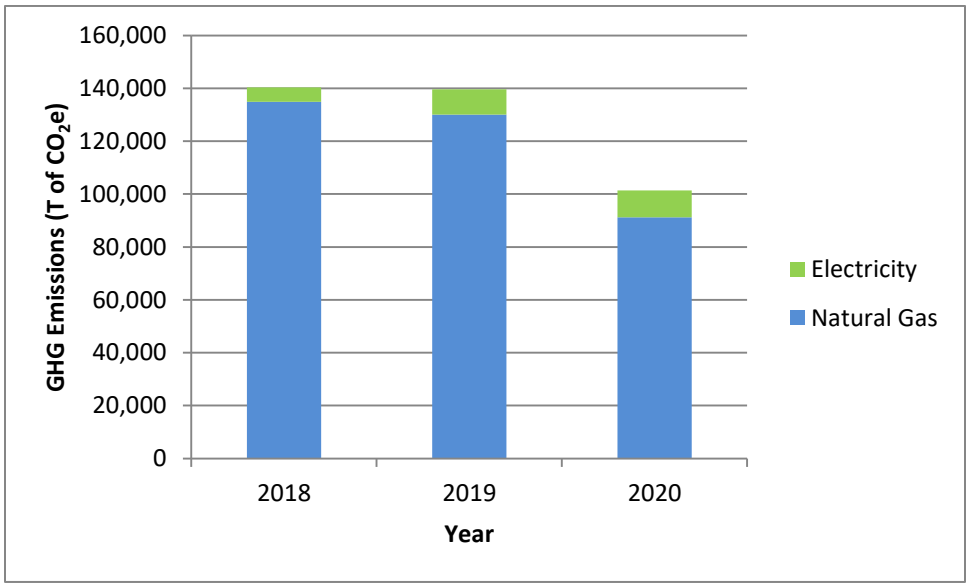

Figure 14: Relative Emissions of Residential Energy sources by year

Based the average usage of electricity and natural gas per residential household the total emissions per household are provided in the table below for the past three years. The large drop in 2020 is likely due to fewer heating degree days (warmer winter temperatures). This is an average across all building types (apartments, detached dwellings, etc.) and sizes.

Table 26: Average GHG emissions per residential household 2018-2020

	GHG Emissions (Tonnes of CO_2e)/ per residential household		
	2018	2019	2020
Electricity	0.15	0.25	0.26
Natural Gas	4.21	3.85	2.68
Total	**4.36**	**4.10**	**2.94**

4.2 Commercial and Institutional

4.2.1 Electricity Usage

The commercial sector includes all types of businesses and services; the institutional sector includes schools of all levels, hospitals, etc. For the purposes of this inventory, it has been assumed that the commercial/institutional sector is any non-residential user with a peak use of <50 kW (less than 50 kilowatts). This category is defined by the utility and additional detail on the specific use within that category is not available. This categorization will not always align with the sector, some businesses and institutions may have a higher peak load, but this categorization will simplify the data analysis and discussion. The resulting emissions calculation for the community as a whole will not be affected, just the amount attributed to a particular sector.

Electricity consumption in the commercial and institutional sector can be attributed to many similar uses that you would find in a home (lighting, appliances, air conditioning, etc.), but will also include specialized equipment needed in the facility or business.

Electricity is provided by two local distribution companies within the City of Brantford. The City is primarily served by Brantford Power Inc. (BPI), a municipally owned utility. In part of the north and south of Brantford where city land has expanded beyond its earlier boundaries, but BPI service territory has not, customers are served by Energy + (Energy Plus). See Figure 12 for a delineation of the service territories.

In 2020, commercial and institutional customers served by Brantford Power accounted for 87% of customers and Energy + accounted for 13%.

Table 27: Commercial/Institutional Electricity Consumption in Brantford for 2019 and 2020

Year	Total Electricity (kWh)	Elec. Emissions (T of CO_2e)	# of customers	Avg kWh / customer
2019	104,839,338	3,195	3,264	32,120
2020	97,089,426	2,959	3,260	29,782

4.2.2 Natural Gas Usage

Natural gas usage in the commercial and institutional sector is similar to that of the residential sector where heating is the primary use. Natural gas could also be used for specialized equipment for commercial and institutional uses.

Natural gas usage data was provided by the sole supplier in the area, Enbridge Gas (formerly Union Gas).

Table 28: Commercial/Institutional Natural Gas consumption in Brantford for 2019 and 2020

Year	Total Natural Gas (m^3)	NG Emissions (T of CO_2e)	# of customers	Avg m^3/ customer
2019	69,451,402	131,913	2,844	24,420
2020	59,596,331	113,195	2,835	21,022

4.2.3 Greenhouse Gas Emissions from Community Commercial/ Institutional

Based on the above documented consumption data for electricity and natural gas, and the greenhouse gas emissions factors outlined Table 4, the greenhouse gas emissions for the Commercial/Institutional are totaled for the previous three years in Table 29 Natural gas usage accounts for 97% of these emissions and electricity usage accounts for 3%.

Table 29: Greenhouse gas emissions produced by Community Institutional/Commercial in Brantford since baseline

	GHG Emissions (Tonnes of CO_2e)		
	2018	2019	2020
Electricity	1,832	3,195	2,959
Natural Gas	136,500	131,913	113,195
Total	**138,332**	**135,108**	**116,153**

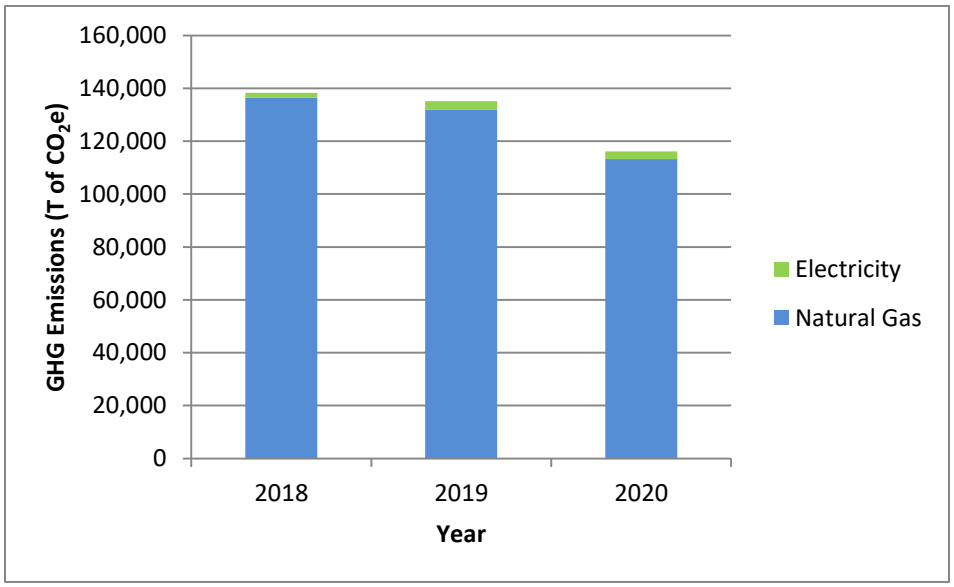

Figure 15: Relative Emissions of Commercial/Institutional Energy Sources by year

4.3 Industrial

4.3.1 Electricity Usage

The industrial sector includes businesses involved in activities such as manufacturing, packaging, food processing, refining, warehousing and distribution, etc. which tend to be heavy energy users. For the purposes of this inventory, it has been assumed that the industrial sector is any non-residential user with a peak use of >50 kW (greater than 50 kilowatts). This category is defined by the utility and additional detail on the specific use is not available. This categorization will not always align with the sector, some industrial customers may have a lower peak load, but this categorization simplified the data

analysis and discussion. The resulting emissions calculation for the community as a whole will not be affected, just the amount attributed to a particular sector.

Electricity consumption in the industrial sector can be attributed to many similar uses that you would find in a home or business (lighting, air conditioning, etc.), but may also include specialized equipment needed in the specific industrial process.

Electricity is provided by two local distribution companies within the City of Brantford. Primarily the City is served by Brantford Power Inc. (BPI), a municipally owned utility. In part of the north and south Brantford where city land has expanded beyond its earlier boundaries, but BPI service territory has not, customers are served by Energy + (Energy Plus). See Figure 12 for a delineation of the service territories.

In 2020, industrial customers served by Brantford Power totaled 97% and similar customers served by Energy + totaled 3%.

Table 30: Industrial Electricity Consumption in Brantford for 2019 and 2020

Year	Total Electricity (kWh)	Elec. Emissions (T of CO_2e)	# of customers	Avg kWh / customer
2019	558,200,612	17,010	501	1,114,173
2020	529,246,673	16,128	506	1,045,942

4.3.2 Natural Gas Usage

Natural gas usage in the industrial sector may be used for a variety of purposes, including heating. Natural gas could also be used for specialized equipment for industrial uses.

Natural gas usage data was provided by the sole supplier in the area Enbridge Gas (formerly Union Gas).

Table 31: Industrial Natural Gas consumption in Brantford for 2019 and 2020

Year	Total Natural Gas (m^3)	NG Emissions (T of CO_2e)	# of customers	Avg m^3/ customer
2019	57,621,168	109,443	293	196,659
2020	51,653,612	98,109	296	174,505

4.3.3 Greenhouse Gas Emissions from Community Industrial

Based on the above documented consumption data for electricity and natural gas, and the greenhouse gas emissions factors outlined Table 4, the greenhouse gas emissions calculated for the Industrial sector are provided in Table 32 alongside the baseline data. In 2020, Natural gas usage accounts for 86% of these emissions and electricity usage accounts for 14%.

Table 32: Greenhouse gas emissions produced by Community Industry in Brantford since baseline

	GHG Emissions (Tonnes of CO_2e)		
	2018	2019	2020
Electricity	9,311	17,010	16,127
Natural Gas	114,076	109,443	98,109
Total	**123,388**	**126,453**	**114,236**

It should be noted that the emissions provided in the table above only account for the emissions produced through the consumption of energy such as electricity and natural gas. It does not account for additional energy use such as propane, coal, oil, etc. It also does not account for emissions produced as a result of industrial processes.

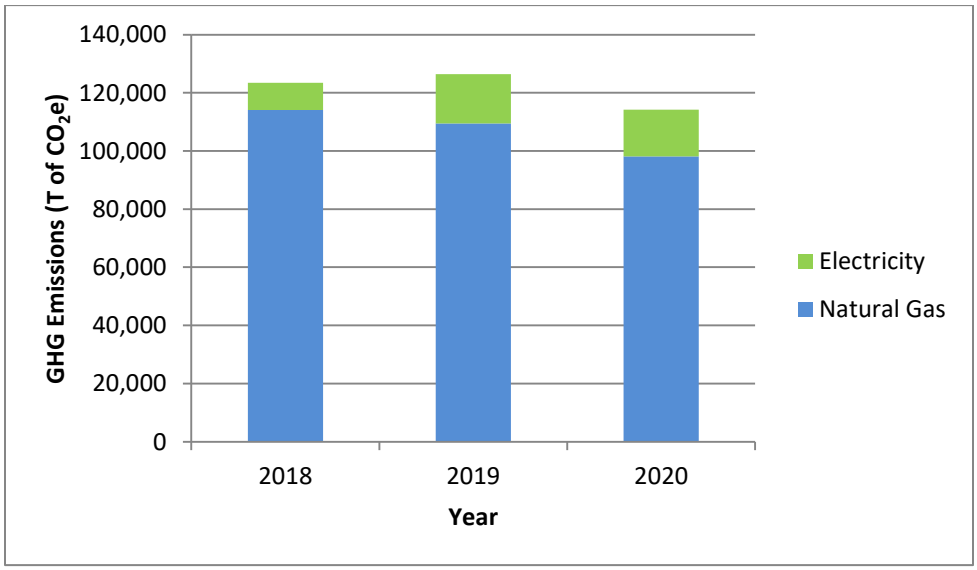

Figure 16: Relative Emissions of Industrial Energy Sources by year

4.4 TRANSPORTATION

4.4.1 VEHICLE FUEL

Getting an accurate calculation of the emissions from vehicle traffic generated within the City limits is complex due to the number of variables to consider such as number of trips, distance of trip, length of trip, speed, type of vehicle, maintenance of vehicle, fuel type of vehicle, etc.

For this purposes of this report, the emissions from transportation is assumed to be equal to the burning of all fuel sold commercially within the City limits.

Fuel data was purchased from Kalibrate (formerly Kent Group). This data source provided all gasoline and diesel sold at all publicly accessible commercial gas stations located within the City.

It should be noted that the baseline figure has changed from the original report due to some data clarity in the Transportation category. Transportation emissions are calculated from the total amount of gasoline and diesel purchased within the City of Brantford geographical boundaries. The original data included some fuel that is categorized as “Brantford”, but not located within the City of Brantford limits. This excess data has now been removed and the baseline data corrected in all tables, most notably Table 35.

An in-depth survey of transportation habits within the City of Brantford called the Transportation Tomorrow Survey (TTS) was funded by the Ontario Ministry of Transportation and partner agencies. The study is conducted every five years and was most recently completed in 2016. Data from this survey provides some key metrics to include in the emissions inventory to help gauge the amount of personal driving in the City. Table 33 includes some of the results of this survey for the City of Brantford for 2016.

Table 33: Transportation Tomorrow Survey 2016 select results for City of Brantford[8]

Metric	Result
Avg. vehicles per household	1.6
# of households in Brantford	39,200
Total vehicles in Brantford*	62,720*
Avg. trips/household/day	5
Avg. trips/person/day	2.3
Avg. # of trips in City per 24 hr period	194,500
% of trips as driver of personal vehicle	75%
% of trips not in a personal vehicle (bus, bike, etc.)	11%
Avg. length of trip as driver (km)	4

*Number not included in survey results, but calculated from results

4.4.2 Greenhouse Gas Emissions from Community Transportation

Based on the above documented consumption data for on-road transportation, and the greenhouse gas emissions factors outlined in Table 4, the greenhouse gas emissions calculated for the Transportation sector of the City of Brantford are included in the Table 34. Emissions are totaled and compared to baseline data in Table 35. In 2020, Gasoline usage accounted for 92% of the total emissions and diesel usage accounted for 8%.

Table 34: Greenhouse gas emissions produced by community transportation sector in Brantford in 2018

Year	Gasoline Purchased (L)	Gasoline emissions (T of CO2e)	Diesel Purchased (L)	Diesel emissions (T of CO2e)
2019	92,798,124	214,870	6,130,019	16,487
2020	85,276,399	197,454	5,954,911	16,016

[8] Malatest. (2018). Transportation Tomorrow Survey 2016. Retrieved from http://www.dmg.utoronto.ca/pdf/tts/2016/2016TTS_Summaries_TTSarea.pdf

Table 35: Greenhouse gas emissions produced by Community Transportation in Brantford since baseline

	GHG Emissions (Tonnes of CO_2e)		
	2018	2019	2020
Gasoline	205,236	214,870	197,454
Diesel	15,433	16,487	16,015
Total	**220,669**	**231,357**	**213,470**

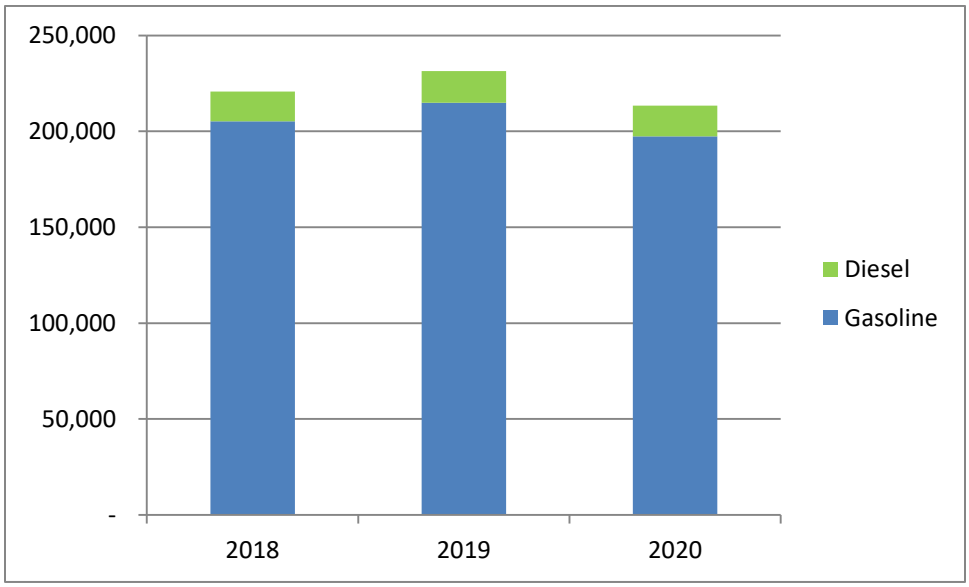

Figure 17: Relative Emissions of Transportation Energy Sources by Year

4.5 LANDFILL

The City of Brantford has a municipal landfill named the Mohawk Street Landfill Site located at 20 Morrison Road. Landfills create greenhouse gas emissions through the anaerobic (without oxygen) decomposition of organic matter, primarily food waste, but also paper products and other biodegradable materials. This process creates a gas which is primarily composed of methane (CH_4). Methane is approximately 25 times more potent as a greenhouse gas than carbon dioxide. The City of Brantford's landfill has a comprehensive landfill gas collection system, which collects the majority of the methane released from within the landfill and pipes it to a single location. Further, this landfill has a generator installed, which takes the methane and ignites it, creating energy and carbon dioxide as a by-product. The energy is turned into electricity and is sold to the provincial electricity grid. The benefits are two fold, the methane is converted

into CO_2 which is a less potent greenhouse gas and electricity is created from this process which can be sold for extra revenue from a “renewable” source. The emissions from the landfill will be created regardless, so the creation of electricity from this energy is considered to be a carbon neutral energy source as there are no additional emissions created. If the generator is not working or there is too much gas to send to the generator, the methane is simply flared (ignited and burned), which converts the methane to carbon dioxide, reducing its impact on climate change.

The emissions from the City of Brantford’s landfill are provided in Table 36 below including the baseline information from 2018.

Table 36: Landfill Emissions from baseline

Year	2018	2019	2020
Landfill gas collected (m^3)	4,535,955	6,433,376	5,302,087
Total Emissions (T of CO_2e)	**13,051**	**18,510**	**15,255**

The formula for calculating emission from the landfill is as follows:

$$CO_2e = \text{LFG} \bullet \text{F} \bullet [(1\text{-DE}) + (\frac{1-CE}{CE}) \bullet (1\text{-OX})] \bullet \text{unit conversion} \bullet \text{GWP}$$ [9]

CO_2e is the resulting emissions converted from methane to carbon dioxide. The other factors and their relevant values for the City of Brantford landfill are listed below.

Table 37: Landfill emission calculation factors

Factor	Description	Value
LFG	Landfill gas collected over the year (m^3)	Variable (see Table 36)
F	Fraction of methane in landfill gas	55%
DE	Destruction efficiency of methane	99%
CE	Collection efficiency of system	75%
OX	Oxidation factor (amt of gas not combusted)	10%
Unit conversion	Converting cubic metres to tonnes	0.000675
GWP	Global warming potential of methane	25

[9] Federation of Canadian Municipalities and ICLEI. PCP Protocol: Canadian Supplement to the International Emissions Analysis Protocol. Pg 24.

An additional metric to be considered in this inventory is the amount of waste received at the landfill over the course of the year. This is another way to track progress of any waste diversion programs that may be implemented in the future. Waste received at the landfill is from three sources: industrial/commercial/institutional waste, curbside pickup, and drop-offs at landfill. The totals are shown in the table and chart below for the past three years.

Table 38: Total waste received at Mohawk Landfill

	Weight of waste received (metric tonnes)		
Source	2018	2019	2020
Industrial/Commercial/Institutional	51,778	58,933	50,690
Curbside Pick-up	24,816	24,525	25,806
Drop-offs at Landfill	5,424	5,413	9,618
Total	**82,018**	**88,871**	**86,114**

6.0 Details of Report Compilation

This report was prepared in 2021 between the months of May and November. A summary of the results of this inventory was presented to Committee of the Whole – Operations on December 7, 2021. Report was finalized and posted in December 2021.

The report was authored by Rochelle Rumney, Climate Change Officer and supervised by Rick Cox, Acting Director of Facilities Management and Security.

Appendix A

Complete table of corporate greenhouse gas emissions 2019 and 2020

2019

Corporate Inventory					
Buildings	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Parks	10,605,516.56	323.18	1,221,869.00	2,320.76	2,643.94
Community Housing	6,296,433.00	191.87	1,267,183.00	2,406.83	2,598.70
Public Works	2,254,391.35	68.70	321,006.00	609.70	678.40
Administration	2,821,972.53	85.99	294,425.00	559.22	645.21
Emergency Services	1,381,545.93	42.10	190,153.00	361.17	403.27
Total Buildings	23,359,859.37	711.84	3,294,636.00	6,257.68	**6,969.53**
Water/Wastewater	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Water	10642366.11	324.3048225	228589	434.1716601	758.48
Wastewater	7933308.48	241.7517093	225645	428.579959	670.33
Total W/WW	18,575,674.59	566.06	454,234.00	862.75	**1,428.81**
Streetlights/traffic signals	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Streetlights/traffic signals	7,514,057.00	228.98	-	-	**228.98**
Fleet	Gas (L)	Gas Emissions (T CO2e)	Diesel (L)	Diesel Emissions (T CO2e)	Total Emissions (T CO2e)
Transit & Lift	135447.8	313.623963	1174217.9	3158.066087	3,471.69
Emergency Services	350470.063	811.4994121	78221.7	210.3777315	1,021.88
Environmental Services	43083.7	99.758584	343254.4	923.1847683	1,022.94
Operational Services	103536	239.7334666	136211.5	366.3416465	606.08
Parks	86178.7	199.5433327	161719	434.9442208	634.49
Remainder of Fleet	10526	24.37253196	6382.5	17.16577205	41.54
Total Fleet	729,242.26	1,688.53	1,900,007.00	5,110.08	**6,798.61**
			Total 2019 Corporate GHG Emissions (T of CO2e)		**15,425.92**

2020

Corporate Inventory					
Buildings	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Parks	8,465,589.79	257.97	1,052,651.00	1,999.36	2,257.33
Community Housing	6,740,923.00	205.42	1,176,454.57	2,234.50	2,439.92
Public Works	2,205,300.05	67.20	285,599.00	542.45	609.66
Administration	2,572,025.67	78.38	289,199.00	549.29	627.67
Emergency Services	1,392,693.86	42.44	180,921.00	343.63	386.07
Total Buildings	21,376,532.37	651.41	2,984,824.57	5,669.24	**6,320.65**
Water/Wastewater	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Water	10,302,523.96	313.95	200,745.00	381.29	695.23
Wastewater	7,559,086.54	230.35	237,507.00	451.11	681.46
Total W/WW	17,861,610.50	544.30	438,252.00	832.40	**1,376.69**
Streetlights/traffic signals	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO2e)
Streetlights/traffic signals	7,402,743.00	225.58	-	-	**225.58**
Fleet	Gas (L)	Gas Emissions (T CO2e)	Diesel (L)	Diesel Emissions (T CO2e)	Total Emissions (T CO2e)
Transit & Lift	76,761.50	177.74	995,598.70	2,677.67	2,855.41
Emergency Services	375,133.50	868.61	59,738.28	160.67	1,029.27
Environmental Services	40,123.10	92.90	432,985.10	1,164.52	1,257.42
Operational Services	109,981.10	254.66	150,534.40	404.86	659.52
Parks	93,182.20	215.76	66,704.30	179.40	395.16
Remainder of Fleet	17,061.20	39.50	5,462.30	14.69	54.20
Total Fleet	712,242.60	1,649.17	1,711,023.08	4,601.81	**6,250.98**
			Total 2020 Corporate GHG Emissions (T of CO2e)		**14,173.90**

Appendix B

Complete table of community greenhouse gas emissions 2019 and 2020

2019					
Community Inventory					
Buildings	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO_2e)
Residential	312,357,079.39	9,518.46	68,485,845.36	130,078.93	139,597.39
Institutional/Commercial	104,839,338.10	3,194.77	69,451,401.87	131,912.87	135,107.64
Industrial	558,200,612.32	17,010.05	57,621,186.26	109,443.09	126,453.14
Total Buildings					**401,158.16**
Transportation	Gas (L)	Gas Emissions (T CO2e)	Diesel (L)	Diesel Emissions (T CO2e)	Total Emissions (T CO2e)
On-road Transportation	92,798,124.00	214,870.34	6,130,019.00	16,486.72	**231,357.07**
Waste					Total Emissions (T CO2e)
Landfill					**18,510.03**
				Total 2019 Community GHG Emissions (T of CO_2e)	**651,025.26**

2020					
Community Inventory					
Buildings	Electricity (kWh)	Elec Emissions (T CO2e)	Natural Gas (m3)	NG Emissions (T CO2e)	Total Emissions (T CO_2e)
Residential	334,915,157.52	10,205.87	47,989,748.64	91,149.57	101,355.44
Institutional/Commercial	97,089,425.89	2,958.61	59,596,330.98	113,194.59	116,153.20
Industrial	529,246,672.55	16,127.73	51,653,612.44	98,108.55	114,236.28
Total Buildings					**331,744.91**
Transportation	Gas (L)	Gas Emissions (T CO2e)	Diesel (L)	Diesel Emissions (T CO2e)	Total Emissions (T CO2e)
On-road Transportation	85,276,399.00	197,454.09	5,954,911.00	16,015.77	**213,469.86**
Waste					Total Emissions (T CO2e)
Landfill					**15,255.10**
				Total 2020 Community GHG Emissions (T of CO_2e)	**560,469.87**

Appendix C

Complete table of greenhouse gas emissions from City-owned buildings 2019 and 2020

Energy Consumption Data for all Corporate Buildings owned and operated by the City of Brantford

			2019					
Property Address	Property Identification	Square metres	Electricity (kWh)	Electricity Emissions (T CO2e)	Naturgal Gas (m3)	Natural Gas Emissions (T CO2e)	Emissions Total (T CO2eq)	Emissions Intensity (T CO2e/Sq m)
11 Park Avenue (Burford)	12 Housing Units	418	27,853	0.85	5,596	10.63	11.48	0.02747
119 Woodlawn Avenue	Single Family Detached	124	12,946	0.39	2,541	4.83	5.22	0.04222
124 Ontario Street	44 Housing Units - Winston Court	2,555	193,866	5.91	48,956	92.98	98.89	0.03871
145 Woodlawn Avenue	Single family Detached	114	5,844	0.18	2,440	4.63	4.81	0.04205
147 Balmoral Drive	Single Family Detached Home	134	9,744	0.30	1,865	3.54	3.84	0.02862
150 Woodlawn Avenue	Single Family Detached	149	12,136	0.37	2,023	3.84	4.21	0.02834
162 Woodlawn Avenue	Single Family Detached	114	69,020	2.10	1,768	3.36	5.46	0.04787
17 Marie St., 43-45 Tecumseh St., 46-52 Pontiac St.	Riverside Gardens (50 units)	5,922	372,050	11.34	77,105	146.45	157.79	0.02664
170 Trillium Way Paris	50 Housing Units	2,287	62,040	1.89	41,705	79.21	81.10	0.03547
18 Aberdeen Avenue	44 Housing Units - Winston Court	2,555	205,514	6.26	46,258	87.86	94.12	0.03684
18 Shaftesbury Avenue	Single Family Detached	141	9,730	0.30	2,103	3.99	4.29	0.03047
19 Roman Crescent	Semi - Detached Residential	124	761	0.02	981	1.86	1.89	0.01527
219-225 Colborne Street (7 Bain St)	Beckett Building	9,620	711,790	21.69	103,024	195.68	217.37	0.02260
22 Gladstone Avenue	44 Unit Housing	2,555	237,912	7.25	72,107	136.96	144.21	0.05644
24 Colborne Street West	159 Seniors Units (Lorne Towers)	6,715	747,600	22.78	143,068	271.74	294.52	0.04386
25 Inverness Street	Single Family Housing	114	5,756	0.18	2,072	3.94	4.11	0.03609
301-303 Greenwich St.	Housing Residential - 2 units	190	10,292	0.31	4,353	8.27	8.58	0.04528
33 Main Street (Paris)	24 Housing Units Rental	1,023	38,784	1.18	19,594	37.22	38.40	0.03752
332 North Park St.	Northland Gardens Row A (Units 1-10)	1,161	54,938	1.67	12,659	24.04	25.72	0.02215
359 Darling St	Eastdale Gardens (Row A - Units 1-10)	1,227	93,266	2.84	72,899	138.46	141.30	0.11514
359 Darling St	Eastdale Gardens (Row E - Units 42-51)	1,227	59,995	1.83		0.00	1.83	0.00149
359 Darling St	Eastdale Gardens (Row C - Units 22-31)	1,227	64,826	1.98		0.00	1.98	0.00161
359 Darling St	Eastdale Gardens (Row D - Units 32-41)	1,227	96,294	2.93		0.00	2.93	0.00239
359 Darling St	Eastdale Gardens (Row B - Units 11-21)	1,227	72,128	2.20		0.00	2.20	0.00179
37-49 Albion Street	Albion Towers Seniors Housing Units	3,151	572,410	17.44	45,211	85.87	103.31	0.03279
40 Queen St.	Heritage House	6,309	429,445	13.09	97,386	184.97	198.06	0.03139
40-50 Willow Street	Paris Townhouses (6 units)	670		-	10,912	20.73	20.73	0.03092
41 Inverness Street	Single Family Housing	117	6,977	0.21	4,164	7.91	8.12	0.06938
41 Woodlawn Avenue	Semi Detached Residential	228	614	0.02	1,011	1.92	1.94	0.00851
5 Fordview Court	Brant Towers - 201 Seniors Units	8,423	1,113,725	33.94	228,933	434.83	468.76	0.05566
50 Hayhurst Rd.	Northland Gardens Row H (Units 62-71)	1,161	63,539	1.94	14,138	26.85	28.79	0.02479
51 Roman Crescent	Semi Detached Residential	243	14,132	0.43	1,297	2.46	2.89	0.01191
56 Memorial Dr.	Northland Gardens Row C (Units 21-28)	929		-	16,936	32.17	32.17	0.03462
56 Memorial Dr.	Northland Gardens Row D (Units 29-36)	929		-	12,196	23.16	23.16	0.02493
56 Memorial Dr.	Northland Gardens Row (Units 11-16)	581	209,583	6.39	8,099	15.38	21.77	0.03749
56 Memorial Dr.	Northland Gardens Row B(Units 17-20)	465		-	6,420	12.19	12.19	0.02625
676 Grey Street	Daleview Gardens (30 Units)	2,674	181,155	5.52	41,828	79.45	84.97	0.03177
68 Memorial Dr.	Northland Gardens Row F (Units 45-53)	1,045		-	15,097	28.67	28.67	0.02744
68 Memorial Dr.	Northland Gardens Row E (Units 37-44)	929		-	14,400	27.35	27.35	0.02944
68 Memorial Dr.	Northland Gardens Row G (Units 54-61)	929		-	7,306	13.88	13.88	0.01494
68 Memorial Dr.	Northland Gardens Other	-	256,630	7.82	6,808	12.93	20.75	
69 Woodlawn Avenue	Single Family Detached	206	11,820	0.36	2,104	4.00	4.36	0.02111
702 Colborne St	Shelter	586	16,418	0.50	3,086	5.86	6.36	0.01086
9 Inverness Street	Single Family Detached Housing	131	8,669	0.26	1,909	3.63	3.89	0.02970
9-27 Robertson Avenue	Semi Detached Rentals (12 Units)	1,067	61,736	1.88	14,353	27.26	29.14	0.02731
97 Mount Pleasant Street	John Noble Home	3,185	160,235	4.88	48,793	92.68	97.56	0.03063
97 Woodlawn Avenue	Single Family Detached	110	14,260	0.43	1,679	3.19	3.62	0.03308
Community HousingTotals			**6,296,433**	**192**	**1,267,183**	**2,407**	**2,599**	
400 Colbourne St	Ambulance Station	362	37,971	1.16	5,619.00	10.67	11.83	0.032649
344 Elgin Street	Police Station	6,039	982,525	29.94	124,026.00	235.57	265.51	0.043968
60 Clarence St.	Fire Hall 1	1,445	203,153	6.19	27,113.00	51.50	57.69	0.039917
311 St. Paul Avenue	Fire Hall 2	736	32,286	0.98	7,368.00	13.99	14.98	0.020348

Property Address	Property Identification	Square metres	Electricity (kWh)	Electricity Emissions (T CO2e)	Naturgal Gas (m3)	Natural Gas Emissions (T CO2e)	Emissions Total (T CO2eq)	Emissions Intensity (T CO2e/Sq m)
7 Lynden Road	Fire Hall 3	465	37,011	1.13	13,890.00	26.38	27.51	0.059223
400 Colbourne St	Fire Hall 4	845	88,600	2.70	12,137.00	23.05	25.75	0.030461
Emergency Services Totals			**1,381,546**	**42**	**190,153**	**361**	**403**	
135-137 Francis Street	Tranquility Com. Hall Park	3,716	1,146	0.03	7,052.00	13.39	13.43	0.003614
88 Dalhousie	Sanderson Centre	4,934	275,233	8.39	12,801.00	24.31	32.70	0.006627
1-3 Sherwood Drive	Parks Admin Office	1,254	118,242	3.60	10728	20.38	23.98	0.019119
254 North park St.	Wayne Gretzky Sports Complex	29,729	8,084,096	246.35	826,362.00	1569.55	1,815.90	0.061082
69 Market St S	Civic Centre	5,110	919,085	28.01	158,802	301.62	329.63	0.064511
12 & 20 Edge Street	Lions Park / Steve Brown Sports Complx.	3,382	421,109.97	12.83	39,984.00	75.94	88.78	0.026252
16 Morrell Street	TB Costain Community Centre	1,951	84,767	2.58	37,290.00	70.83	73.41	0.037628
333 Erie Avenue	Eagle Place Community Centre	1,093	26,614	0.81	26,088.00	49.55	50.36	0.046096
320 Balmoral Drive	Northridge Golf Course	2,323	201,334	6.14	21,281.00	40.42	46.56	0.020045
491 Grey Street	Woodman Park and Community Centre	1,161	124,882	3.81	17,514.00	33.27	37.07	0.031922
94 Tutela Heights	Bell Homestead	1,394	44,168	1.35	12,841.00	24.39	25.74	0.018468
51 Lynnwood Drive	Mohawk Park	790	81,587	2.49	13,955.00	26.51	28.99	0.036713
17 Jennings Road Brant County	Oakhill Cemetery / Office & Shed	975	9,736	0.30	9,636.00	18.30	18.60	0.019066
71 Herbert St.	Storage	251	3,609	0.11	8,520.00	16.18	16.29	0.064952
282 Stanley street	Arrowdale Golf Course & House	557	46,283	1.41	7,410.00	14.07	15.48	0.027779
24 Catharine Avenue (20)	Parks and Recreation Operations Yard	362	4,107	0.13	6,759.00	12.84	12.96	0.035777
169 Charing Cross Street	Mount Hope Cemetery	1,254	13,120	0.40	3,179.00	6.04	6.44	0.005133
101 Market Street S.	Earl Haig Family Fun Park	753	112,549	3.43	1,667.00	3.17	6.60	0.008765
35 Sherwood Dr	Arnold Anderson Stadium	111	33,848	1.03	0.00	0.00	1.03	0.009252
Parks Totals			**10,605,517**	**323**	**1,221,869**	**2,321**	**2,644**	
180-188 Greenwich Street	Pollution Control Office	3,233	24,075	0.73	28,606.00	54.33	55.07	0.017033
51 York Rd.	Airport Records Building	1,301	21,130	0.64	11,119.00	21.12	21.76	0.016732
33 Earl Ave.	Traffic Services Yard	3,716	106,703	3.25	35,168.00	66.80	70.05	0.018850
120 Colbourne St.	Harmony Square Garage	232	125,045	3.81	2,012.00	3.82	7.63	0.032860
59 Icomm Drive	Parking Gararge / Market Centre	232	311,019	9.48			9.48	0.040807
400 Grand River Ave.	Transit Garage	6,132	1,258,675	38.36	141,520.00	268.80	307.15	0.050093
64 Darling Street	Transit Terminal	334	145,746	4.44			4.44	0.013279
10 Earl Avenue	Public Works Yard	1,858	179,337	5.46	102,581.00	194.84	200.30	0.107802
Public Works Totals			2,171,730	66	321,006	610	676	
415 Mohawk St	Landfill Admin	1,301	4,297	0.13		0.00	0.13	0.000101
20 Morrison Road	Scale House Landfill Site	37	12,496	0.38		0.00	0.38	0.010247
529 Mohawk St	Landfill Compost	260	6,279	0.19		0.00	0.19	0.000736
180-182 Albion Street Brantford	Waste Disposal Pumping Station	929	59,590	1.82		0.00	1.82	0.001955
Solid Waste Totals			82,662	3	-	-	3	
Public Works + Solid Waste Totals			**2,254,391**	**69**	**321,006**	**610**	**678**	
173 Colborne Street	Brantford Public Library	5,667	650,847	19.83	24,887.00	47.27	67.10	0.011841
443 St. Paul Avenue	St. Paul Ave Branch Library	534	74,437	2.27	12,288.00	23.34	25.61	0.047937
399 Wayne Gretzky Parkway	Tourism Centre	1,059	118,808	3.62	23,900.00	45.39	49.02	0.046280
100 Wellington Street	City Hall	5,574	322,005	9.81	86,962.00	165.17	174.98	0.031392
78-84 Market Street	Information Services Building	3,797	422,990.72	12.89	44,873.00	85.23	98.12	0.025841
102 Wellington Street	Provincial Offenses Court	1,282	161,003	4.91	21,741.00	41.29	46.20	0.036036
20 Ava Road	Glenhyrst Gardens & Art Gallary	1,142	5,210	0.16	12,964.00	24.62	24.78	0.021709
220 Colbourne St.	Market Square Mall	6,808	711,483.38	21.68			21.68	0.003185
79 Icomm Drive	Farmer's Market Building	975	160,531.00	4.89	8,266.00	15.70	20.59	0.021109
58 Dalhousie	New City Hall	7,246	133,767	4.08	54,371.00	103.27	107.35	0.014814
12 Ava Road	Glenhyrst House	332	51,901	1.58	3,803.00	7.22	8.80	0.026532
220 Clarence St.	Beryl Angus Child Care Center	557	8,990	0.27	370	0.70	0.98	0.001752
Admistration Totals			**2,821,973**	**86**	**294,425**	**559**	**645**	
Corporate Buildings Totals			**23,359,859**	**712**	**3,294,636**	**6,258**	**6,970**	

Energy Consumption Data for all Corporate Buildings owned and operated by the City of Brantford			2020					
Property Address	Property Identification	Square metres	Electricity (kWh)	Electricity Emissions (T CO2e)	Naturgal Gas (m3)	Natural Gas Emissions (T CO2e)	Emissions Total (T CO2eq)	Emissions Intensity (T CO2e/Sq m)
11 Park Avenue (Burford)	12 Housing Units	418	59,913	1.83	3,160	6.00	7.83	0.01873
119 Woodlawn Avenue	Single Family Detached	124	14,393	0.44	2,009	3.82	4.25	0.03440
124 Ontario Street	44 Housing Units - Winston Court	2,555	196,891	6.00	49,235	93.51	99.51	0.03895
145 Woodlawn Avenue	Single family Detached	114	6,514	0.20	2,234	4.24	4.44	0.03881
147 Balmoral Drive	Single Family Detached Home	134	10,806	0.33	1,887	3.58	3.91	0.02917
150 Woodlawn Avenue	Single Family Detached	149	13,032	0.40	1,999	3.80	4.19	0.02821
162 Woodlawn Avenue	Single Family Detached	114	79,506	2.42	2,442	4.64	7.06	0.06189
17 Marie St., 43-45 Tecumseh St., 46-52 Pontiac St.	Riverside Gardens (50 units)	5,922	425,734	12.97	72,348	137.41	150.39	0.02539
170 Trillium Way Paris	50 Housing Units	2,287	120,263	3.66	35,398	67.23	70.90	0.03100
18 Aberdeen Avenue	44 Housing Units - Winston Court	2,555	220,866	6.73	47,618	90.44	97.17	0.03803
18 Shaftesbury Avenue	Single Family Detached	141	8,769	0.27	1,799	3.42	3.68	0.02616
219-225 Colborne Street (7 Bain St)	Beckett Building	9,620	901,090	27.46	83,524	158.64	186.10	0.01934
22 Gladstone Avenue	44 Unit Housing	2,555	244,860	7.46	56,704	107.70	115.16	0.04507
24 Colborne Street West	159 Seniors Units (Lorne Towers)	6,715	687,555	20.95	123,214	234.03	254.98	0.03797
25 Inverness Street	Single Family Housing	114	6,135	0.19	1,817	3.45	3.64	0.03195
301-303 Greenwich St.	Housing Residential - 2 units	190	9,286	0.28	4,530	8.60	8.89	0.04689
33 Main Street (Paris)	24 Housing Units Rental	1,023	90,690	2.76	18,084	34.35	37.11	0.03626
332 North Park St.	Northland Gardens Row A (Units 1-10)	1,161	72,358	2.20	11,808	22.43	24.63	0.02121
359 Darling St	Eastdale Gardens (Row A - Units 1-10)	1,227	423,672	12.91	70,660	134.21	147.12	0.11988
359 Darling St	Eastdale Gardens (Row E - Units 42-51)	1,227		-		-	-	0.00000
359 Darling St	Eastdale Gardens (Row C - Units 22-31)	1,227		-		-	-	0.00000
359 Darling St	Eastdale Gardens (Row D - Units 32-41)	1,227		-		-	-	0.00000
359 Darling St	Eastdale Gardens (Row B - Units 11-21)	1,227		-		-	-	0.00000
37-49 Albion Street	Albion Towers Seniors Housing Units	3,151	532,864	16.24	54,360	103.25	119.49	0.03792
40 Queen St.	Heritage House	6,309	403,049	12.28	84,063	159.67	171.95	0.02725
40-50 Willow Street	Paris Townhouses (6 units)	670		-	10,564	20.06	20.06	0.02993
41 Inverness Street	Single Family Housing	117	8,207	0.25	3,280	6.23	6.48	0.05536
5 Fordview Court	Brant Towers - 201 Seniors Units	8,423	1,194,377	36.40	215,300	408.93	445.33	0.05287
50 Hayhurst Rd.	Northland Gardens Row H (Units 62-71)	1,161	75,348	2.30	12,785	24.28	26.58	0.02289
51 Roman Crescent	Semi Detached Residential	243	15,546	0.47	1,106	2.10	2.57	0.01059
56 Memorial Dr.	Northland Gardens Row C (Units 21-28)	929		-	14,275	27.11	27.11	0.02918
56 Memorial Dr.	Northland Gardens Row D (Units 29-36)	929		-	10,562	20.06	20.06	0.02159
56 Memorial Dr.	Northland Gardens Row (Units 11-16)	581	240,862	7.34	7,283	13.83	21.17	0.03647
56 Memorial Dr.	Northland Gardens Row B(Units 17-20)	465		-	6,478	12.30	12.30	0.02649
676 Grey Street	Daleview Gardens (30 Units)	2,674	48,830	1.49	40,548	77.01	78.50	0.02936
68 Memorial Dr.	Northland Gardens Row F (Units 45-53)	1,045		-	9,536	18.11	18.11	0.01733
68 Memorial Dr.	Northland Gardens Row E (Units 37-44)	929		-	13,239	25.15	25.15	0.02707
68 Memorial Dr.	Northland Gardens Row G (Units 54-61)	929		-	6,082	11.55	11.55	0.01243
68 Memorial Dr.	Northland Gardens Other	-	269,325	8.21	19,053	36.19	44.39	
69 Woodlawn Avenue	Single Family Detached	206	12,180	0.37	1,853	3.52	3.89	0.01886
702 Colborne St	Shelter	586	10,143	0.31	4,250	8.07	8.38	0.01430
9 Inverness Street	Single Family Detached Housing	131	9,810	0.30	1,711	3.25	3.55	0.02709
9-27 Robertson Avenue	Semi Detached Rentals (12 Units)	1,067	63,333	1.93	13,127	24.93	26.86	0.02517
97 Mount Pleasant Street	John Noble Home	3,185	179,021	5.46	48,714	92.52	97.98	0.03076
97 Woodlawn Avenue	Single Family Detached	110	15,090	0.46	1,342	2.55	3.01	0.02746
5 Marlene Avenue	Supportive Housing 30 units	6,400	70,605	2.15	6,478	12.30	14.45	0.00226
Community HousingTotals			**6,740,923**	**205**	**1,176,455**	**2,235**	**2,440**	
400 Colbourne St	Ambulance Station	362	37,384	1.14	4,856	9.22	10.36	0.02860
344 Elgin Street	Police Station	6,039	996,123	30.35	123,932	235.39	265.75	0.04401
60 Clarence St.	Fire Hall 1	1,445	194,499	5.93	24,539	46.61	52.54	0.03635
311 St. Paul Avenue	Fire Hall 2	736	34,678	1.06	5,473	10.40	11.45	0.01556
7 Lynden Road	Fire Hall 3	465	42,779	1.30	10,550	20.04	21.34	0.04594
400 Colbourne St	Fire Hall 4	845	87,230	2.66	11,571	21.98	24.64	0.02914
Emergency Services Totals			**1,392,694**	**42.44**	**180,921**	**343.63**	**386.07**	

Property Address	Property Identification	Square metres	Electricity (kWh)	Electricity Emissions (T CO2e)	Naturgal Gas (m3)	Natural Gas Emissions (T CO2e)	Emissions Total (T CO2eq)	Emissions Intensity (T CO2e/Sq m)
135-137 Francis Street	Tranquility Com. Hall Park	3,716	1,257	0.04	7,631	14.49	14.53	0.00391
88 Dalhousie	Sanderson Centre	4,934	189,575	5.78	8,496	16.14	21.91	0.00444
1-3 Sherwood Drive	Parks Admin Office	1,254	114,975	3.50	11,980	22.75	26.26	0.02094
254 North park St.	Wayne Gretzky Sports Complex	29,729	6,587,994	200.76	756,021	1435.95	1,636.71	0.05505
69 Market St S	Civic Centre	5,110	802,031	24.44	112,548	213.77	238.21	0.04662
12 & 20 Edge Street	Lions Park / Steve Brown Sports Complx.	3,382	186,663	5.69	36,251	68.85	74.54	0.02204
16 Morrell Street	TB Costain Community Centre	1,951	68,607	2.09	22,341	42.43	44.52	0.02282
333 Erie Avenue	Eagle Place Community Centre	1,093	13,168	0.40	27,079	51.43	51.83	0.04744
320 Balmoral Drive	Northridge Golf Course	2,323	155,416	4.74	15,580	29.59	34.33	0.01478
491 Grey Street	Woodman Park and Community Centre	1,161	106,889	3.26	15,932	30.26	33.52	0.02886
94 Tutela Heights	Bell Homestead	1,394	34,356	1.05	7,275	13.82	14.86	0.01067
51 Lynnwood Drive	Mohawk Park	790	76,963	2.35	3,508	6.66	9.01	0.01141
17 Jennings Road Brant County	Oakhill Cemetery / Office & Shed	975	8,904	0.27	7,717	14.66	14.93	0.01530
71 Herbert St.	Storage	251	2,722	0.08	6,183	11.74	11.83	0.04715
282 Stanley street	Arrowdale Golf Course & House	557	34,911	1.06	3,881	7.37	8.44	0.01513
24 Catharine Avenue (20)	Parks and Recreation Operations Yard	362	4,120	0.13	6,116	11.62	11.74	0.03241
169 Charing Cross Street	Mount Hope Cemetery	1,254	12,824	0.39	2,593	4.93	5.32	0.00424
101 Market Street S.	Earl Haig Family Fun Park	753	51,901	1.58	1,519	2.89	4.47	0.00594
35 Sherwood Dr	Arnold Anderson Stadium	111	12,313	0.38	-	0.00	0.38	0.00337
Parks Totals			**8,465,590**	**258**	**1,052,651**	**1,999**	**2,257**	
180-188 Greenwich Street	Pollution Control Office	3,233	40,314	1.23	16,065	30.51	31.74	0.00982
51 York Rd.	Airport Records Building	1,301	22,313	0.68	5,187	9.85	10.53	0.00810
33 Earl Ave.	Traffic Services Yard	3,716	109,480	3.34	31,951	60.69	64.02	0.01723
120 Colbourne St.	Harmony Square Garage	232	123,623	3.77	850	1.61	5.38	0.02317
59 Icomm Drive	Parking Gararge / Market Centre	232	395,534	12.05		0.00	12.05	0.05190
400 Grand River Ave.	Transit Garage	6,132	1,129,868	34.43	132,164	251.03	285.46	0.04656
64 Darling Street	Transit Terminal	334	127,781	3.89		0.00	3.89	0.01164
10 Earl Avenue	Public Works Yard	1,858	175,980	5.36	99,382	188.76	194.12	0.10448
Public Works Totals			2,124,894	65	285,599	542	607	
415 Mohawk St	Landfill Admin	1,301	1,962	0.06		0.00	0.06	0.00005
20 Morrison Road	Scale House Landfill Site	37	12,596	0.38		0.00	0.38	0.01033
529 Mohawk St	Landfill Compost	260	6,463	0.20		0.00	0.20	0.00076
180-182 Albion Street Brantford	Waste Disposal Pumping Station	929	59,385	1.81		0.00	1.81	0.00195
Solid Waste Totals			80,406	2	-	-	2	
Public Works + Solid Waste Totals			**2,205,300**	**67**	**285,599**	**542**	**610**	
173 Colborne Street	Brantford Public Library	5,667	574,662	17.51	14,132	26.84	44.35	0.00783
443 St. Paul Avenue	St. Paul Ave Branch Library	534	52,865	1.61	10,612	20.16	21.77	0.04075
399 Wayne Gretzky Parkway	Tourism Centre	1,059	104,016	3.17	19,214	36.49	39.66	0.03745
100 Wellington Street	City Hall	5,574	289,530	8.82	90,467	171.83	180.65	0.03241
78-84 Market Street	Information Services Building	3,797	401,392	12.23	43,287	82.22	94.45	0.02487
102 Wellington Street	Provincial Offenses Court	1,282	144,765	4.41	22,617	42.96	47.37	0.03695
20 Ava Road	Glenhyrst Gardens & Art Gallary	1,142	4,355	0.13	11,185	21.24	21.38	0.01873
220 Colbourne St.	Market Square Mall	6,808	581,985	17.73			17.73	0.00261
79 Icomm Drive	Farmer's Market Building	975	126,352	3.85	6,817	12.95	16.80	0.01722
58 Dalhousie	New City Hall	7,246	245,735	7.49	67,453	128.12	135.61	0.01871
12 Ava Road	Glenhyrst House	332	46,369	1.41	3,415	6.49	7.90	0.02380
Admistration Totals			2,572,026	78	289,199	549	628	
Corporate Buildings Totals			**21,376,532**	**651**	**2,984,825**	**5,669**	**6,321**	