

2019 Government Operations Greenhouse Gas Emissions Inventory for the City of Kingston, NY

Introduction

A greenhouse gas (GHG) emissions inventory is one of the first and most important steps in the local climate action process. A local government operations GHG inventory is an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of municipal government. It summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater and water treatment facilities, from municipal vehicle fleets, from government-owned outdoor lighting, and other sources. GHG inventories provide the data needed to set realistic goals and track progress toward reducing operating costs, energy use, and emissions. GHG inventory reports identify the largest energy users and sources of GHG emissions (e.g., by building, sector, or department). As a result, GHG inventories help local governments select actions that offer a good return on investment and should be highlighted in subsequent climate action planning. Over time, as a local government builds its capacity to conduct GHG inventories on a regular basis, the process helps to increase the ability of the local government to operate efficiently and use taxpayer resources effectively.

The City of Kingston recognizes that greenhouse gas (GHG) emissions from human activity are catalyzing profound changes in climate and weather, the consequences of which pose substantial risks to the future health, well-being, and prosperity of the community. The ultimate goal of this effort is to locally reduce GHG emissions. In addition, rising energy costs make it imperative that the City of Kingston local government take a leadership role in advancing energy saving measures and other sustainability initiatives that will stabilize and potentially reduce energy related expenditures for City government, local businesses, and City residents.

The City of Kingston local government has a strong role to play in reducing GHG emissions. Through proactive measures around land use planning, transportation, energy efficiency, green building, waste reduction, and more, the City can dramatically reduce energy use and emissions in the community. Reducing GHG emissions will improve public health and safety and create a cleaner and more sustainable City. In order to reduce energy use and GHG emissions an accounting of the current energy use and emissions was necessary to establish a baseline and set reduction goals. For what gets measured gets managed. In response, the City of Kingston has taken action by completing comprehensive energy assessments and GHG emissions inventories for government operations.

Kingston has completed a variety of adaptation and mitigation strategies, including appointing the Climate Smart Kingston Commission, conducting a Greenhouse Gas Inventory in 2010 and creating a Climate Action Plan in 2012. The Climate Action Plan outlines strategies and actions for the city to take to reduce greenhouse gas emissions and set a goal for energy use reduction of 20% by 2020. The City

formally recognized and supported the original GHG emissions inventory and concurrent Climate Action Plan with Resolution #200 of 2012, Adopting the Climate Action Plan and GHG Emissions Inventory.

Climate Smart Communities

New York State Climate Smart Communities (CSC) Program is a network of New York communities engaged in reducing greenhouse gas emissions and improving climate resilience. Municipalities become involved with the CSC Program by adopting the CSC Pledge, which includes 10 elements that lead to a reduction of greenhouse gas emissions, and provide guidance on climate change adaptation. Municipalities can opt to participate in the Climate Smart Certification Program, which has two certification levels: Bronze and Silver. Communities can access technical support and funding opportunities to reach their certification goals.

The City of Kingston achieved Bronze Climate Smart Community certification in 2014, and Silver certification in 2018, both the highest levels achieved by any municipality in New York State. Maintaining an annual GHG emissions inventory of municipal operations is one of the priority actions of the Climate Smart Communities Program.

To take the City's commitment even further, in 2017, the City adopted Resolution #179 of 2017: Resolution of the Common Council of the City of Kingston, NY Committing to 100% Clean Energy by 2050 and Continuing Support of the Principles of the Paris Agreement.

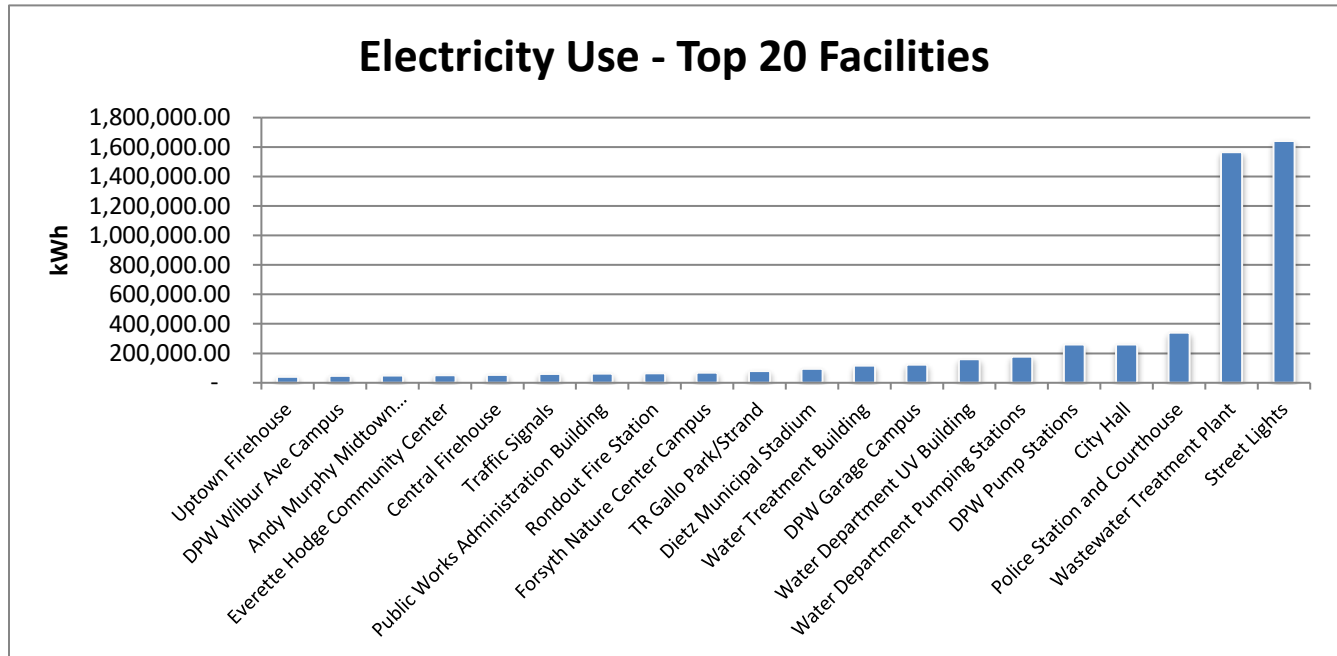
Purpose of the Annual GHG Inventory

This report comprehensively examines the electricity, natural gas and vehicle fuel used by City government operations for calendar year 2019. City government operations covered in this analysis include the activities and functions of all city departments including the Department of Public Works, the Kingston Police and Fire Departments, and Parks and Recreation. By identifying the facilities that use the largest amount of electricity or the types of fuel sources that contribute the largest amount of GHG emissions the city can pinpoint areas to focus efficiency efforts on in the future. In the past these projects have included LED lighting retrofits, HVAC upgrades, and the purchase of electric vehicles.

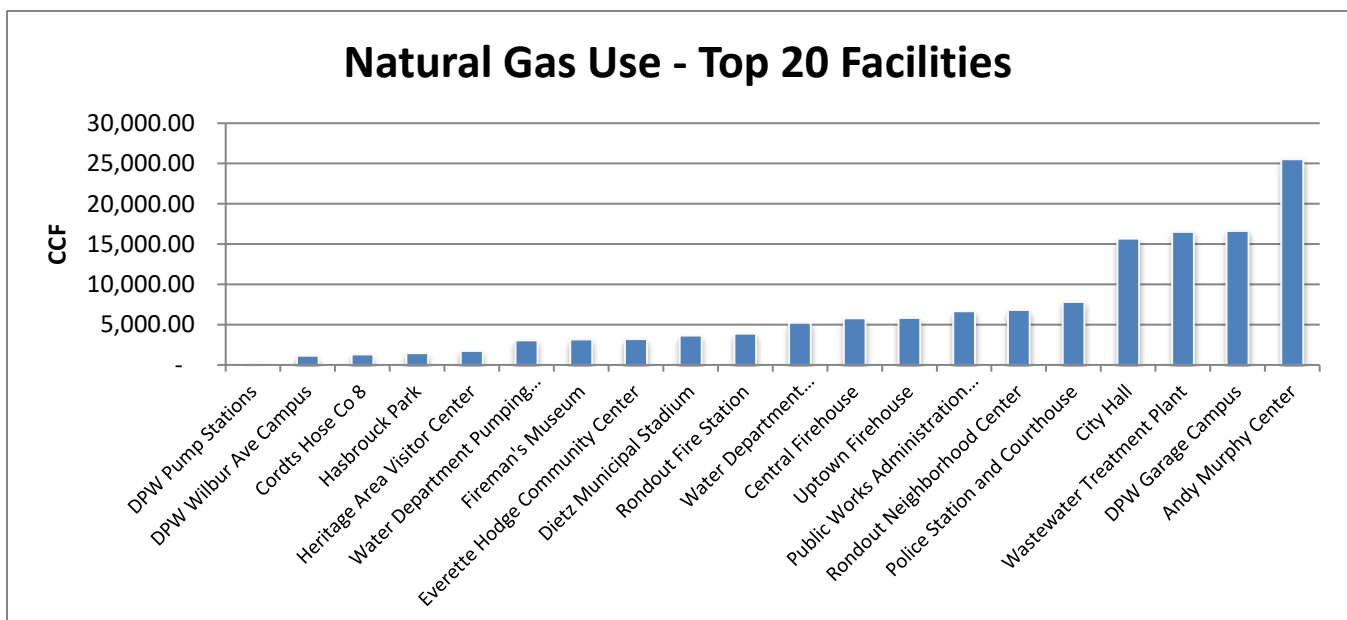
In 2010 the City of Kingston began monitoring the amount of energy used by each of its departments in order to establish a 2010 greenhouse gas (GHG) emissions baseline for City government operations. By measuring energy and greenhouse gas information and comparing it against an established baseline the City can assess the efficacy of its strategies and measures developed in the Climate Action Plan. This inventory can also be used to determine if previous energy and GHG emissions reduction goals set by the City are being met.

Inventory Results – Municipal Energy Use

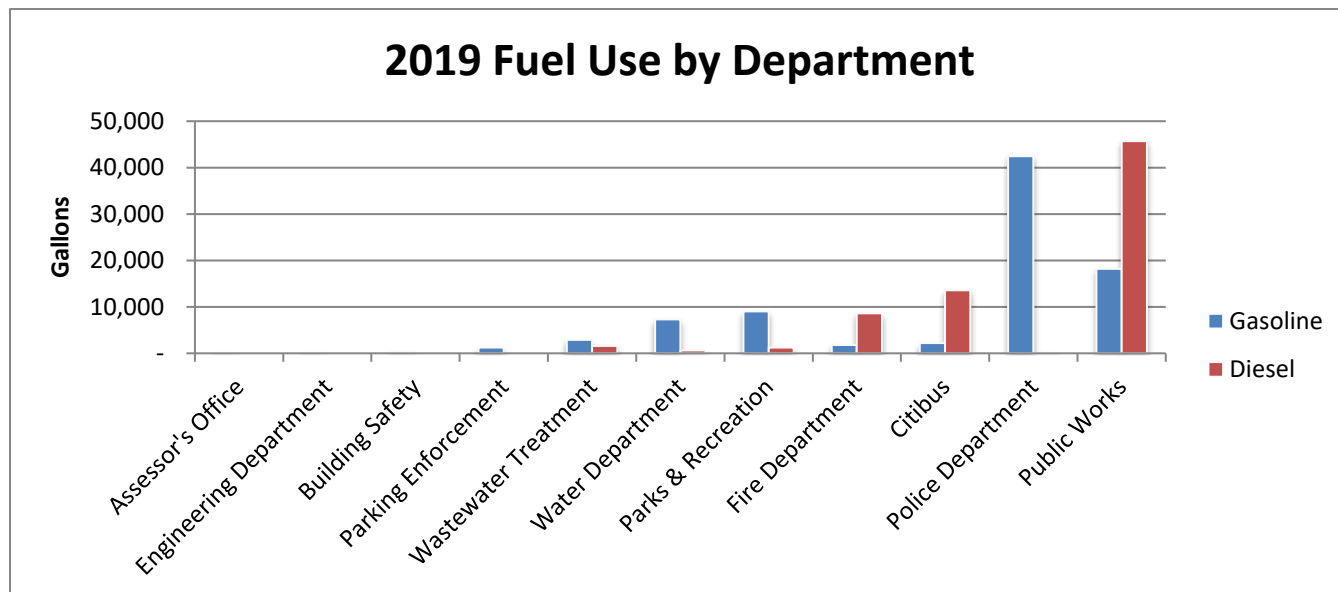
In 2019 the City of Kingston used 5,571,155 kilowatt-hours (kWh) of electricity to power the offices, parks, pumping stations, street lights, and other important aspects of municipal operations. The top two consumers of electricity were the City's streetlights (1,641,690 kWh), and the wastewater treatment facility (1,565,263 kWh).



In 2019 the City of Kingston used 135,036 hundreds of cubic feet (CCF) of natural gas to heat offices, community centers, the police station, and other important facilities. The top two consumers of natural gas were the Andy Murphy Midtown Neighborhood Center (25,531 CCF) and the Public Works garage and maintenance facility (16,628 CCF).



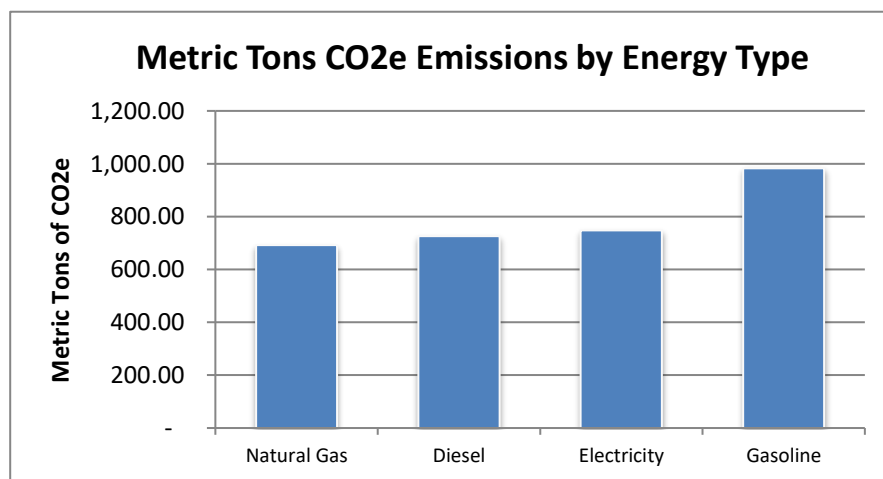
In 2019 the City used 85,697.7 gallons of gasoline and 71,283.24 gallons of diesel. These fuels powered police cars, dump trucks, fire trucks, and other administrative vehicles that the City operates. The largest user of gasoline was the Police Department (42,471.55 gal.) and the largest user of diesel fuel was the Department of Public Works (45,673.41 gal.).



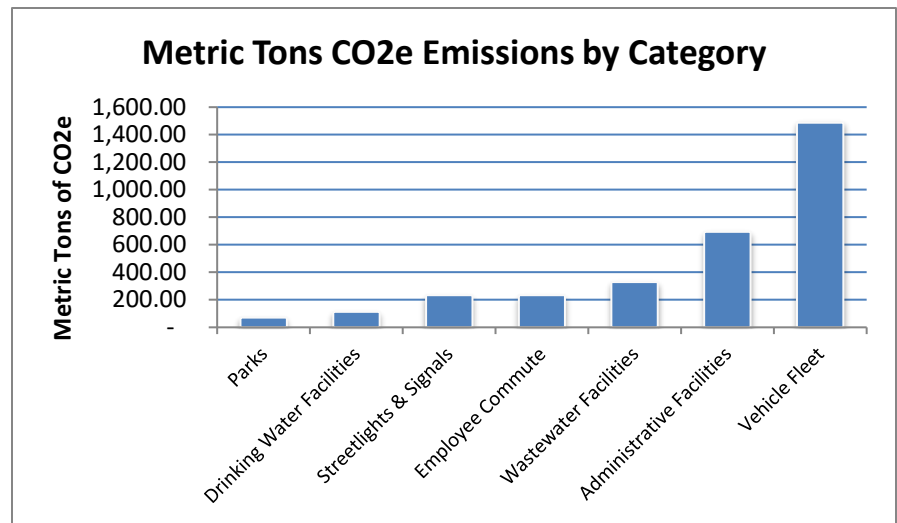
Inventory Results – Municipal Greenhouse Gas Emissions

In 2019 the municipal operations of the City of Kingston resulted in the emission of 3,159.98 metric tons of carbon dioxide equivalent. The following graphs represent the greenhouse gas emissions attributed to the municipal operations of the City of Kingston. All of the values are in Metric Tons of CO₂ Equivalent (MTCO_{2e})

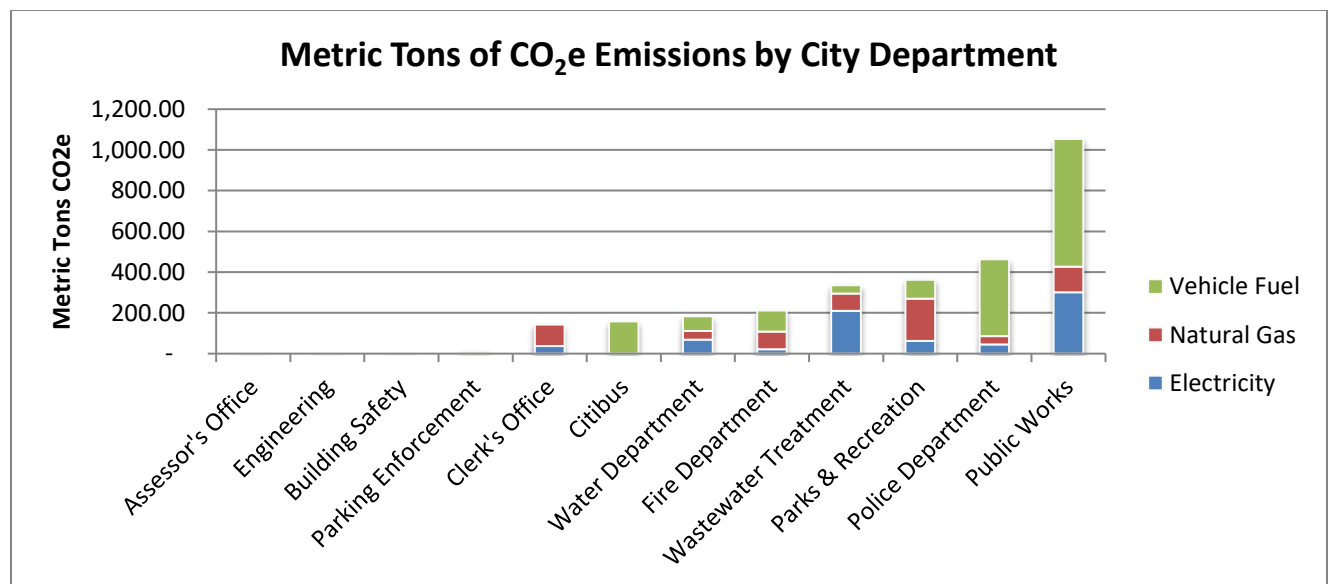
Gasoline use by the City's fleet and employee commutes produced the largest amount of GHG emissions compared to other energy source used by Kingston in 2019.



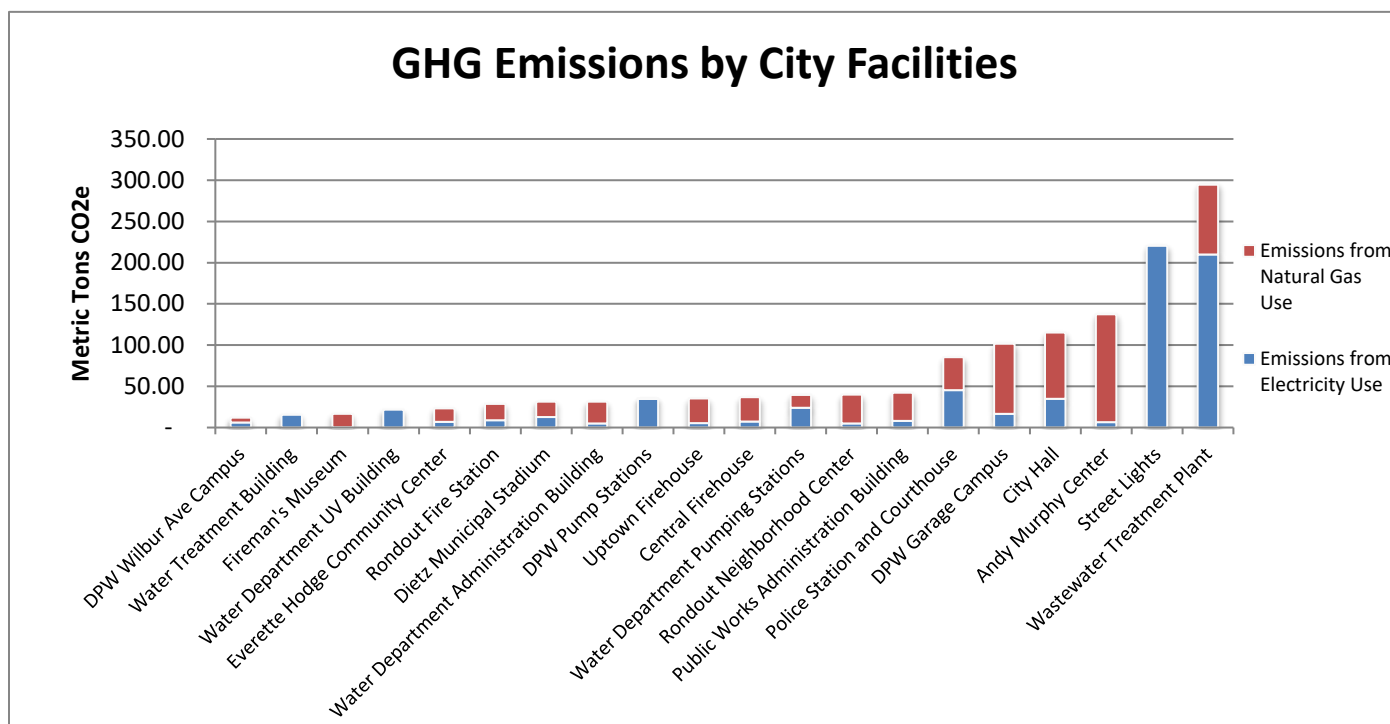
The category with the largest amount of GHG emissions in 2019 was the operation of the City's municipal fleet of vehicles.



The Department of Public Works was responsible for the largest amount of GHG emissions in 2019 with roughly one-third of the entire City's emissions for the year (1,053.92 MTCO₂e). The Kingston Police Department was responsible for the second largest amount of GHG emissions (463 MTCO₂e). In both departments the operation of their vehicle fleets accounts for the majority of their GHG emissions.



The Wastewater Treatment Plant was the City facility with the largest GHG emissions in 2019 (294.65 MTCO₂e). The facility with the second highest GHG emissions was the operation of the City's 2,700 streetlights (220.36 MTCO₂e). Most City facilities contribute to Scope 1 and Scope 2 GHG emissions though electricity and natural gas usage.



Methodology

The information presented in this inventory is limited to local government operations of Kingston's City government. City government can have a direct impact on its cumulative contribution of greenhouse gases through implementation of efficiency projects as well as policy development. The City of Kingston government operations are divided into two categories. *Scope 1* includes the direct emissions from sources within the City's organizational boundaries that the local Government owns or controls. For example, emissions from natural gas fired burners at City buildings and mobile emissions from City owned vehicles. *Scope 2*: includes the direct emissions associated with the consumption of purchased or acquired electricity at city owned and operated buildings and facilities, including public lightings such as street lights and traffic signals.

Since 2012 the City of Kingston has utilized the online tool Portfolio Manager to measure and track energy use by City owned facilities. Portfolio Manager is a free online tool managed by the US Environmental Protection Agency (EPA) that allows the city to benchmark electricity and natural gas consumption as well as greenhouse gas emissions for each facility (portfolioenergymanager.epa.gov/). Electricity and natural gas use data is collected through pulling information from the website operated by the City's energy provider, Central Hudson. The information collected represents the total kilowatt-hours (kWh) of electricity and hundreds of cubic feet (CCF) of Natural Gas used by each City facility. By

identifying the department that operates each building as well as the operational category of the facility (Park, Wastewater, Administrative, etc.) the GHG emissions from each building can be attributed the appropriate classifications.

In 2018 the City of Kingston installed new hardware at its municipal fueling station. Along with the new hardware the City installed fleet management software that allows the City to track fuel use and mileage for each vehicle in the fleet. Data was pulled from the FuelMaster program for all City vehicles in 2019 so that the gallons of gasoline and diesel used can be attributed to each department within the City.

The City of Kingston administered an optional employee commute survey to all staff in 2018 through a digital link or hard copy option. Through this survey employees were asked to identify the municipality they live in, the distance they drive to work, the average Miles/Gallon of their vehicle, full-time or part-time employment status, and other useful information. 59 employees answered the survey representing approximately 20% of employees that worked for the City in 2019. By multiplying the average gallons of gasoline used by the respondents to the 287 staff that worked for the City in 2019, the impact of employee commutes on the City's GHG emissions inventory can be measured.

After collecting the data for all energy usage attributed to municipal operations the information is aggregated into an excel spreadsheet. By using the most up to date conversion factors of GHG emissions for each energy source Kingston can convert the annual energy use values to GHG emission volumes. For this inventory all conversion factors were sourced from EPA websites, details are listed below.

GHG Conversion by Energy Source	Value
GHG Emissions Rate for New York State Electricity eGRID NYUP(kgCO ₂ e/MBtu)	39.34
GHG Emissions From Natural Gas Use (kgCO ₂ e/MBtu)	53.11
GHG Emissions From Gasoline Use (MTCO ₂ e/Gal)	0.008887
GHG Emissions From Diesel Use (MTCO ₂ e/Gal)	0.01018

GHG Conversion Sources:

<https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf>

<https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>

Conclusion

In 2010 the City of Kingston set the municipal operations GHG emissions baseline at 5,022 MTCO₂e. In 2019 the municipal operations of the City of Kingston resulted in the emission of 3,159.98 MTCO₂e, a 37% reduction in overall GHG emissions since 2010. This reduction can be attributed to the many green efforts that the City has implemented such as purchasing electric vehicles, retrofitting buildings with LED lighting, and converting the City's street lights to LEDs. This reduction can also be

attributed to the extensive transition of the New York State power grid to renewable energy sources such as wind, solar, and hydro-power.

By identifying the largest consumers of energy and main emitters of greenhouse gases within the City of Kingston's municipal operations the City can focus efforts to continue this downward trend in overall GHG emissions. With gasoline being the energy source with the largest attributable GHG emissions and the operation of the City's vehicle fleet being the category with the largest GHG emissions the City should focus efforts on reducing the amount of fuel used through the continued purchase of electric vehicles, idling reduction policies, and other fleet management efforts. By identifying the Wastewater Treatment Plant, the Andy Murphy Center, and City Hall as the three buildings with the highest GHG emissions the City should continue to focus energy efficiency efforts on these buildings to continue to reduce their overall impact.

It is forecasted that the GHG emissions from the municipal operations of the City of Kingston will continue to decline in 2020. This is due to current energy efficiency projects such as the installation of insulating interior window inserts in City Hall, the completion of the City's efforts to convert street lights to LEDs, and energy efficiency projects at other City owned facilities.