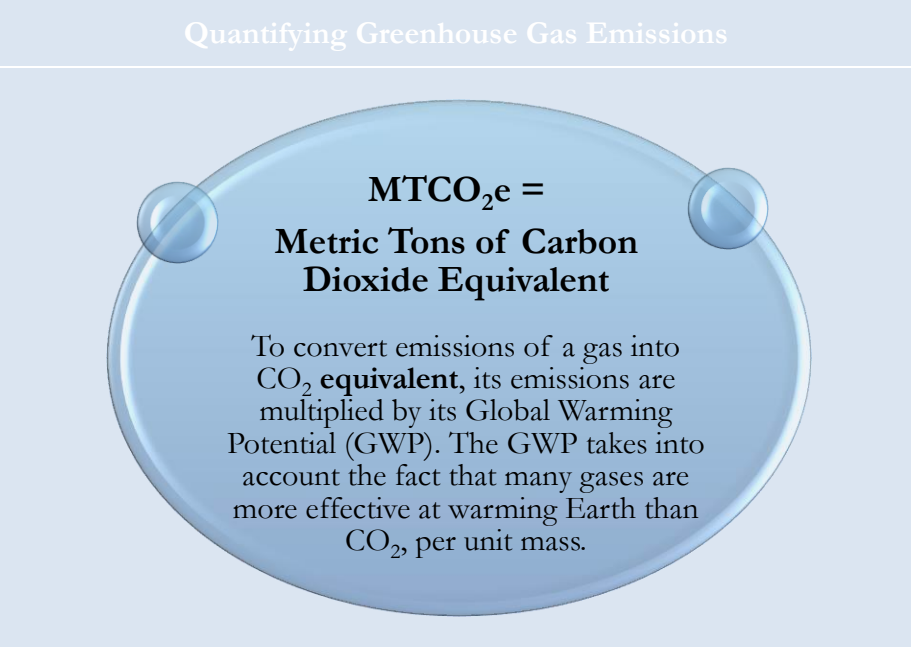
Rockville Greenhouse Gas Emissions

A community greenhouse gas (GHG) inventory represents the total emissions produced by all activities within the city limits as well as emissions resulting from electricity use within the jurisdiction, even if the electricity is generated elsewhere. A municipal GHG inventory is a subset of the community emissions and only includes the emissions associated by city government facilities and operations. To estimate baseline emissions and track progress, global warming potential values are used to combine emissions of various greenhouse gases into a single weighted value for emissions, commonly referenced as metric tons of carbon dioxide equivalent (MTCO2e).



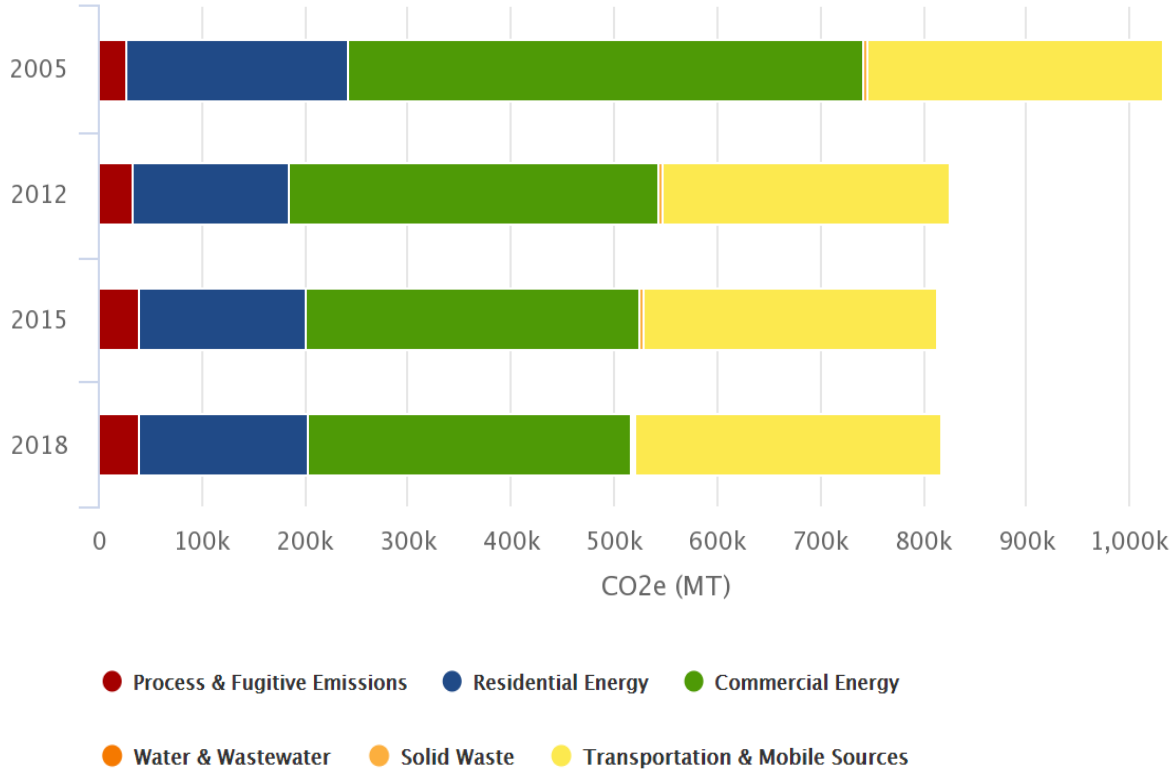
Rockville is a member of the Metropolitan Washington Council of Governments (COG), an independent, nonprofit association that brings area leaders together to address major regional issues in the District of Columbia, suburban Maryland, and Northern Virginia. COG has taken a leadership role in developing community greenhouse gas inventories for member jurisdictions, hosting regional climate impacts and resiliency planning workshops, and developing a Regional Climate and Energy Action Plan (2017-2020) that offers a variety of voluntary and flexible options for local governments to implement to support regional GHG emissions reduction goals. Rockville, working in coordination with other organizations and cities, can draw on a range of support services to address the key barriers to city climate action. Benefits include technical support, improved access to data, broader community networks, and access to business and financing opportunities to transform markets.

Emissions Trends

Rockville's community GHG emissions inventory was developed by COG to be consistent with regional and jurisdiction inventories and is based on the ICLEI U.S. Community Protocol and ClearPath tool (Figure 1). The inventory accounts for emissions from local residential and commercial building energy use, transportation energy use, emissions from solid waste incineration, and process and fugitive emissions (leaks from natural gas infrastructure and cooling systems). The estimated emissions from water and wastewater processes is relatively small.

To track progress, COG calculated jurisdiction and regional GHG estimates for 2005, 2012 and 2015, and 2018. Despite Rockville's 17% population growth between 2005 to 2018, GHG emissions reduced 21% in 13 years. Over this period, per capita emissions decreased from 17.3 to 11.7 MTCO2e per person. Rockville surpassed COG's 2020 emissions reduction goals, demonstrating that GHG reductions are possible even as the population and economy grows. Efficiency and switching to cleaner fuel sources for electricity production contributed to these reductions. COG is currently compiling data to generate Rockville's "business as usual" projections.

Figure 1: Rockville Greenhouse Gas Emissions Trends ($MTCO_2e$)



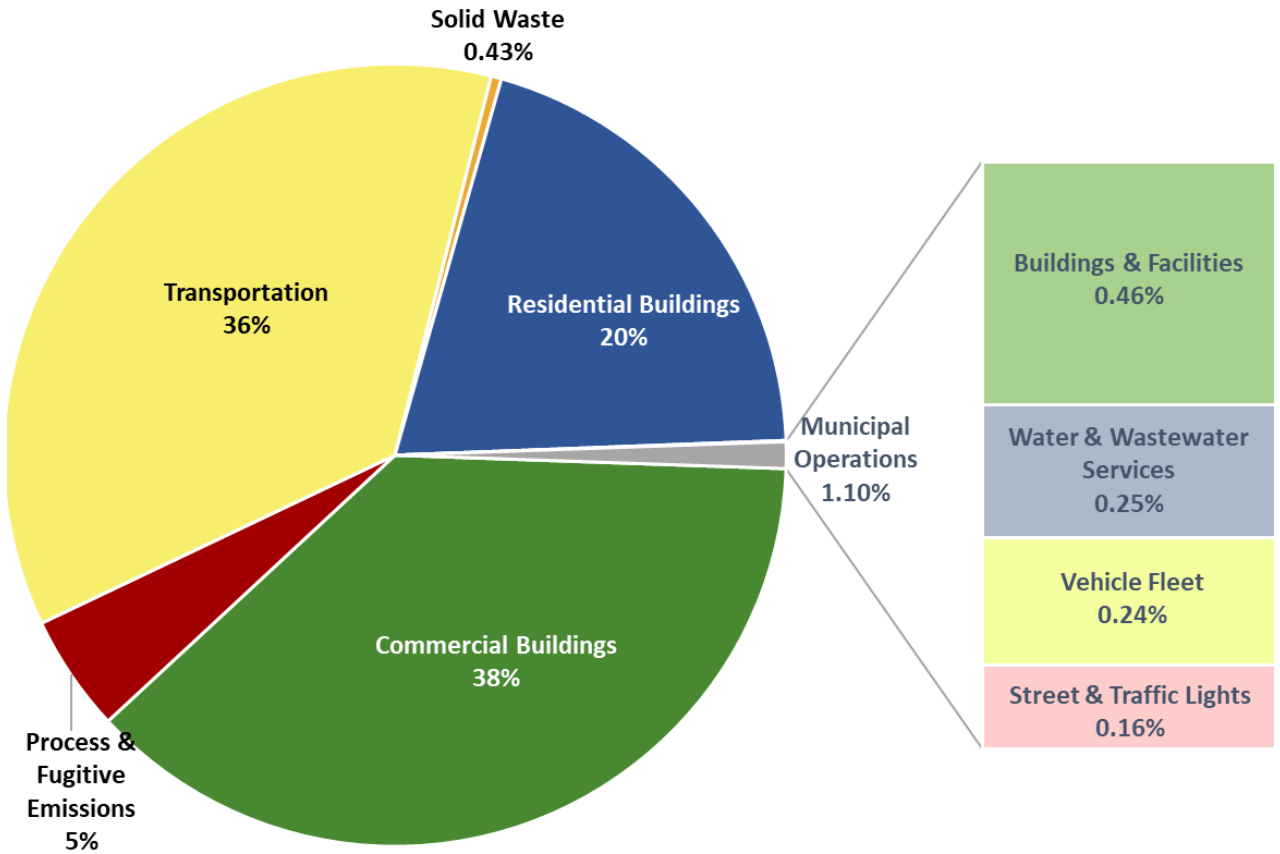
The inventory does not account for consumption-based emissions associated with products and services consumed in the community nor for the positive effects of voluntary purchases of Renewable Energy Credits (RECs) on the part of the city, businesses and residents.

Community and Municipal Emissions Overview

The largest emissions contributors are commercial building energy consumption (38%), transportation (36%) and residential building energy consumption (20%) (Figure 2). GHG emissions from Rockville government operations contributed approximately one percent of Rockville's total community emissions[1].

Figure 2: 2018 Rockville Greenhouse Gas Emissions by Sector

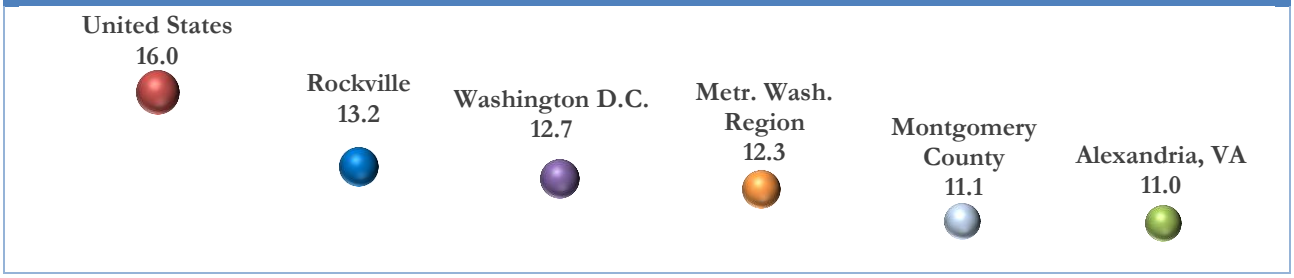
Total Community Emissions = 817,523 MTCO2e **Municipal Emissions =** 8,994 MTCO2e



[1] Municipal emissions are estimated based on Fiscal Year 2016 data.

On a per capita basis, Rockville generated 13.2 metric tons per capita in 2015, the latest year for which data is available to compare the different jurisdictions. Rockville was below the U.S. average, but slightly higher than other neighboring jurisdictions (Figure 3).

Figure 3: 2015 Emissions Per Capita ($MTCO_2e$)



Community Emissions by Sector

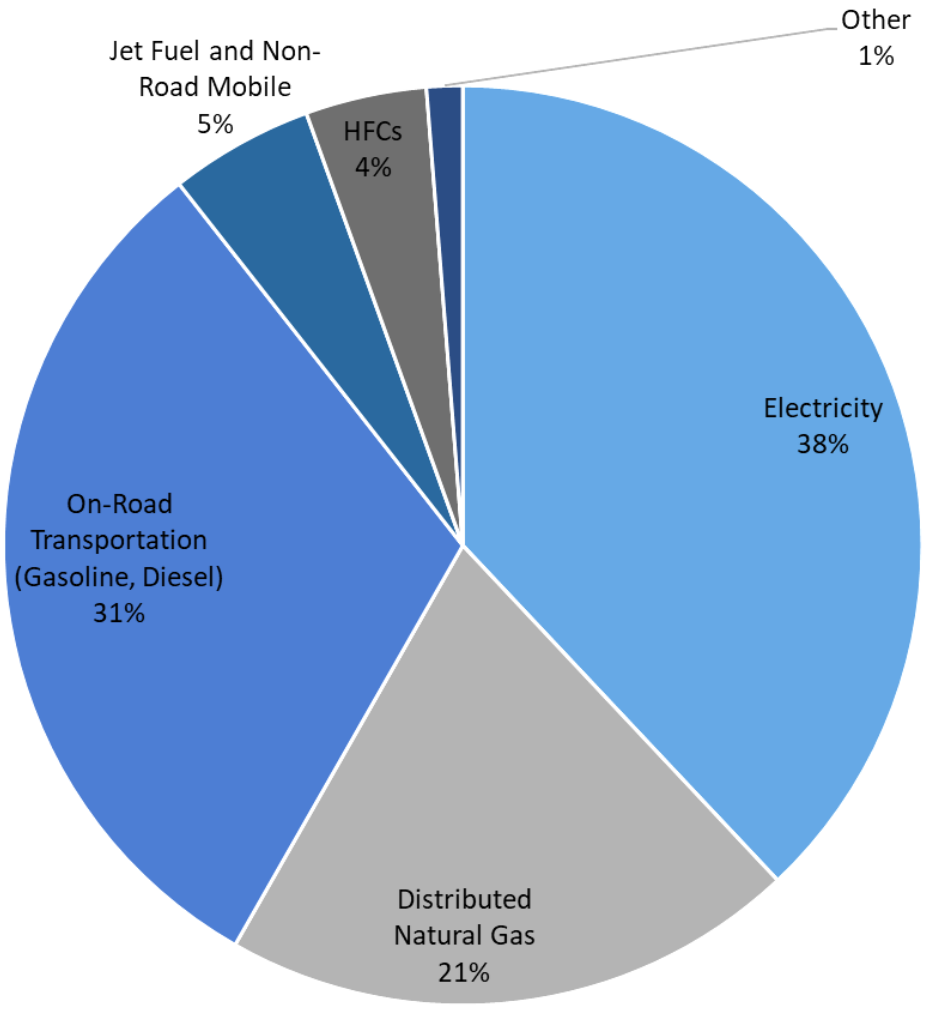
Sectors contributing to Community emissions include:

- **Buildings (58%):** The electricity, natural gas and fuel oil used in all buildings account for the majority of Rockville's GHG emissions. Commercial buildings generated approximately 38 % of emissions, 28% from electricity and 10% from natural gas. Residential buildings account for approximately 20% of emissions, with 10% from electricity, 10% from natural gas, and < 1% from home heating fuels.
- **Transportation** (**36%)**: The transportation sector, including on-road passenger vehicles, aviation, rail and off-road vehicles, contributed approximately 36% of emissions. The majority of transportation emissions, approximately 31% of total emissions, were generated by diesel and gasoline fuel consumed by on-road mobile sources, such passenger vehicles, buses and commercial vehicles.
- **Process and Fugitive Emissions (5%):** Process and fugitive emissions are derived from national figures to account for leaking natural gas infrastructure and cooling systems.
- **Other sources**: Solid waste, agriculture and wastewater make up the remaining 1% of emissions.

Community Emissions by Source

Rockville's greenhouse gas emissions come from three primary sources: electricity use (38%), natural gas use in buildings (21%), (approximately 40%), and on-road transportation fuels including gasoline, diesel (31%) (Figure 4).

Figure 4: Community Emissions by Source



Most electricity-related greenhouse gases are emitted by coal and natural gas-fired plants, which together generate over half of the electricity on the grid subregion that serves Rockville. The other major source of electricity is nuclear.[2]

[2] For more information on the electricity fuel mix that was used in the greenhouse gas inventory, see: https://www.epa.gov/energy/power-profiler#/RFCE

Municipal Emissions by Sector

Rockville used ICLEI's ClearPath tool to estimate GHG emissions generated from municipal facilities and operations for fiscal year 2016 (July 1, 2015 through June 30, 2016) (Figure 5). The government analysis data was sorted into buildings/facilities, street and traffic lights, water and wastewater services and vehicle fleet. Data on employee commutes, process and fugitive emissions, and waste from city facilities was not available. While GHG emissions from local government operations represent approximately one percent of Rockville's total community emissions, the city has direct influence over these sources and the ability to 'lead by example'. Sectors contributing to municipal emissions include:

- **Buildings and facilities (41%)**: City buildings, facilities and parks are the largest source of municipal GHG emissions through electricity, natural gas and fuel oil for heating, cooling, lighting, and other purposes. City facilities include City Hall, Swim and Fitness Center, Senior Center, Police Station, Civic Center Complex, Public Works and Parks Maintenance Complex, and several community centers.
- **Water and wastewater services (23%)**: The city provides drinking water and sewer services to 70 percent of the city. Approximately 23% of emissions are associated with electricity-intensive water treatment and pumping operations.
- **Fleet (22%)**: Fuel (diesel and gasoline) consumed by a fleet of approximately 278 on-road vehicles and equipment accounted for approximately 22% of emissions. Police vehicles and refuse and recycling trucks account for most municipal fuel consumption.
- **Street and traffic signals (14%):** The electricity used to power approximately 6,573 municipal streetlights and 46 traffic signals accounts for 14% of emissions.

Figure 5: City of Rockville Municipal Emissions