

2019 Municipal Greenhouse Gas Inventory: University Park

What is a Greenhouse Gas Inventory?

A Greenhouse Gas (GHG) Inventory is an accounting of greenhouse gas emissions resulting from activities within a given boundary. These inventories help decision-makers identify the greatest sources of GHG emissions, establish goals, and track progress towards reduction targets.

Emissions are broken down into three categories, or scopes, by the [Greenhouse Gas Protocol](#) in order to better understand the source of emissions. Inventory results are typically expressed in Metric Tons of Carbon Dioxide Equivalent, or MT CO₂e, for ease in comparison. This measure converts all greenhouse gases emitted into the equivalent amount of CO₂ by weighing its relative global warming potential.

A municipal GHG Inventory, otherwise known as a Municipal Carbon Footprint, specifically focuses on the emissions associated with municipal government operations. It usually includes emissions from activities under the municipality's operational or financial control such as energy used by government-owned buildings, streetlights, and vehicles, plus emissions associated with other municipal operations such as solid waste, wastewater treatment, landscaping, etc.

Municipal GHG Inventories allow a local government to understand the major sources of its emissions, provide a basis for developing an action plan, and track changes in its carbon footprint over time. Inventories can also be compared to other municipalities; however, it is important to keep in mind that the scope of operations varies widely across different municipal governments. Thus, comparisons are most useful with municipalities of a similar size and between those that provide similar services.

A GHG Inventory is divided into three categories:

Scope 1

- Direct emissions from sources released within the inventory boundaries
- For example: natural gas combustion or the application of fertilizer for lawn care

Scope 2

- Indirect emissions from sources that are controlled by the organization
- For example: electricity, heat, or steam purchased and used by the organization

Scope 3*

- Other indirect emissions that are a consequence of an institution's activities, but are from sources neither owned nor controlled by the institution
- For example: emissions from waste generated within a specific geography that is sent to a landfill elsewhere or emissions from staff commuting

**Scope 3 emissions are not considered in this inventory*

The Town of University Park

University Park is a municipality in Prince George's County, Maryland, with a population of approximately 2,300. This municipal Greenhouse Gas (GHG) Inventory considers the emissions from the following:

- Energy used by the two municipally-owned buildings (Town Hall and Public Works)
- Street and area lighting paid for by University Park (231 lights, the majority of which are 70 or 100-watt high pressure sodium [HPS] lamps)
- Vehicle usage (the Town has a fleet of about two dozen vehicles, which are a mix of gasoline and diesel-fueled, composed of passenger cars, light trucks, and utility / heavy-duty vehicles)

The Town does not own its own waste or wastewater treatment facilities, and emissions from other sources such as employee commutes or refrigerants and chemicals were not considered in this inventory.

A Note on Renewable Energy

The Town of University Park owns a 60 kilowatt (kW) solar photovoltaic (PV) installation that is located on the roof of the University Park Elementary School, which is within the municipality. Through an aggregated virtual net metering arrangement, approximately 75% of the electricity produced by the system is supplies Town Hall (which also serves as the police headquarters) and the Department of Public Works building. The remaining electricity is sold to Pepco, the local electric utility. In addition, University Park sells off all of the [Renewable Energy Credits](#) (RECs) associated with the solar energy generated.

RECs are a market-based instrument that represent the property rights to the environmental, social and other non-power attributes of renewable electricity generation. When you own a renewable energy system, the implications for emissions depend on whether you own the RECs. If you do, then onsite green power is counted as zero emissions in your GHG inventory, and you can also track the total avoided emissions associated with the system. However, if you sell the RECs, then you can no longer claim an environmental benefit.

While the Town of University Park’s solar PV system does contribute to cleaner overall grid emission factors and lowers energy costs for the municipality, the Town is unable to claim credit for the environmental benefit of the system for the purposes of their GHG Inventory because they do not own the associated RECs. In other words, by selling the RECs, the Town has sold the carbon emissions reduction associated with that electricity.

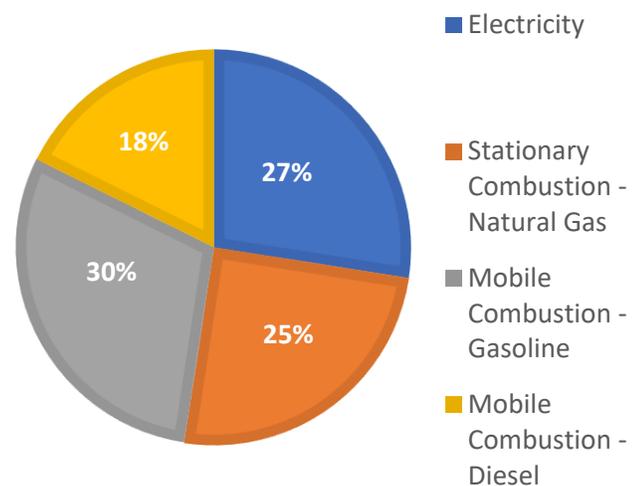
University Park Carbon Footprint: By the Numbers

2019 Total University Park Emissions (MTCO2e)					
	CO2	CH4	N2O	Total MT CO2e	Percent of Total
Scope 1	397.73	0.26	0.70	398.68	86%
Scope 2	65.78	0.16	0.25	66.19	14%
Scope 3	-	-	-	-	0%
Total Gross Emissions	463.51	0.41	0.95	464.9	100%

Energy Use by Source

More than 50% of University Park’s energy use is from gasoline and diesel fuel for its vehicles and equipment. Electricity makes up just under over one third of the total energy use. Approximately 60,000 kilowatt hours (kWh) of the Town’s total electricity use is supplied by the solar array that it owns. However, as noted above, this electricity is not treated as emissions-free for the purpose of greenhouse gas accounting because the Town has sold the RECs associated with that energy. Thus, the electricity is accounted for as though it were supplied by the local utility.

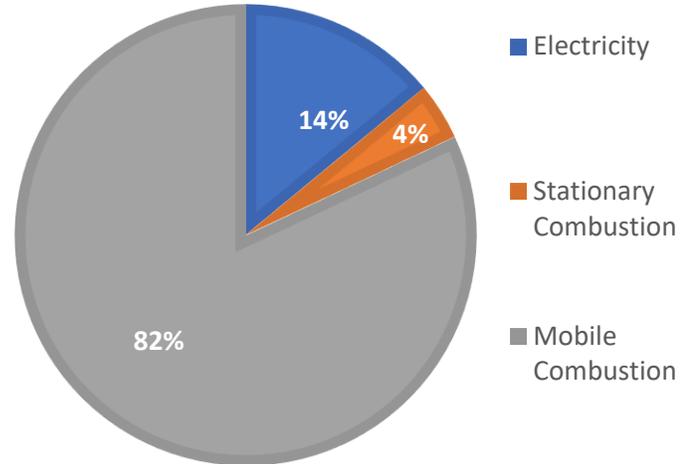
2019 Energy Consumption by Source			
	Usage	BTU equivalent	Percent of Total
Electricity (kWh)	170,375	581,319,500	36%
Stationary Combustion Natural Gas (mcf)	338	350,506,000	22%
Mobile Combustion Gasoline (gallons)	3,503	421,361,858	26%
Mobile Combustion Diesel (gallons)	1,803	247,697,943	15%
Total		1,600,885,301	100%



Emissions by Source

While gasoline and diesel use represent more than 50% of University Park’s energy consumption, it makes up an even larger share of the Town’s emissions. This is likely because a number of the Town’s vehicles are older – the average fleet age is about 10 years, and some of the oldest vehicles are trucks or heavier-duty equipment that likely have higher emissions.

2019 Emissions by Source (MT CO2e)					
	CO2	CH4	N2O	Total	Percent of Total
Electricity	65.8	0.16	0.3	66.2	14%
Stationary Combustion	18.4	0.0	0.0	18.4	4%
Mobile Combustion	379.9	0.3	0.7	380.3	82%
Total Gross Emissions	463.5	0.4	1.0	464.9	100%

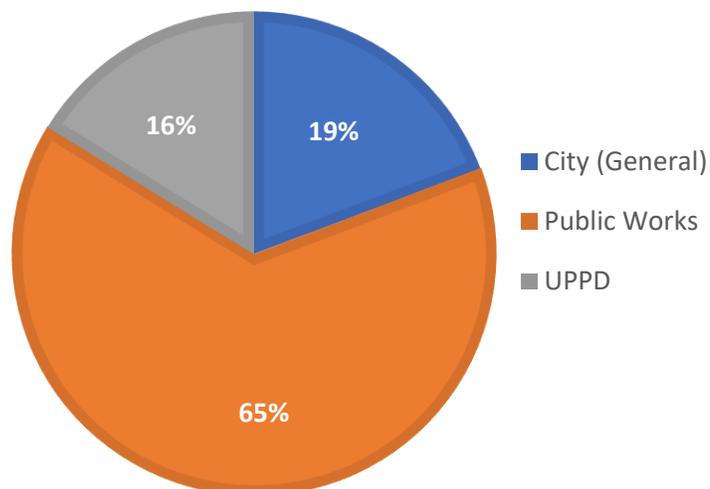


Emissions by Use

The operations of the Public Works Department represent the largest share of the Town’s carbon footprint, likely because Public Works is responsible for the majority of University Park’s vehicle fleet, including the oldest and most fuel-intensive vehicles. The Town’s police department accounts for just under 20% of total emissions (associated with several vehicles, mainly passenger cars), with an additional almost 20% from general Town operations, including the Town Hall building (which also serves as the police headquarters), lighting, and two shuttles buses.

Note: Because the police department offices are in the Town Hall, UPPD emissions accounts only for their fleet emissions. This inventory has not allocated a portion of the Town Hall building emissions to UPPD.

2019 Total Emissions by Department and Source (MT CO2e)					
Department	Electricity	Stationary	Mobile	Total	Percent of Total
City (General)	54.6	4.8	30.2	89.6	19%
Public Works	11.6	13.6	274.8	300.0	65%
UPPD	0.0	0.0	75.3	75.3	16%
Total	66.2	18.4	380.3	464.9	100%



Reducing Emissions through RECs

One strategy the Town of University Park could explore to reduce their GHG emissions is to retain a portion of the RECs associated with the University Park Elementary School solar PV system. If the Town should decide to retain the RECs associated with their renewable energy consumption, it would reduce overall GHG emissions. There would be a 33.5% decrease in emissions from electricity, which would decrease the Town's overall municipal carbon footprint by 4.8%.

2019 Emissions by Source with RECs (MT CO ₂ e)			
	Total Emissions with sale of RECs – Current Arrangement	Total Emissions with RECs Retained	Percent Difference
Electricity	66.2	44.0	-33.5%
Stationary Combustion	18.4	18.4	0.00%
Mobile Combustion	380.3	380.3	0.00%
Total Emissions	464.9	442.7	-4.8%

Sources & Assumptions

This inventory was completed using the Environmental Protection Agency's (EPA) [Local Greenhouse Gas Inventory Tool: Government Operations Module](#). Data on pounds of [CO₂ emitted per MWh of electricity](#) was provided by Pepco, the local utility. Other emissions factors are from the [EIA's State Electricity Profiles database](#). The [Energy Star Portfolio Manager Greenhouse Gas Emissions Technical Reference](#) provided guidance on how to account for the solar renewable energy consumed by the Town. All other assumptions and calculation methodologies are from the inventory tool.

Input Data: All data on energy and fuel usage was provided by the Town of University Park. Where data was incomplete, such as an occasional missing energy bill or gasoline consumption for a given month, assumptions were based on averages or comparable data. Some gasoline and diesel usage was not associated with a specific vehicle in the Town records. This gasoline usage was assumed to be for a passenger car, while unaccounted diesel usage was assumed to be for equipment.