

# HOLLYWOOD, FLORIDA

## 2019 & 2021 Inventories of Community and Government Operations Greenhouse Gas Emissions



**Prepared For:**  
Hollywood, Florida

**Produced By:**  
ICLEI – Local Governments  
for Sustainability USA  
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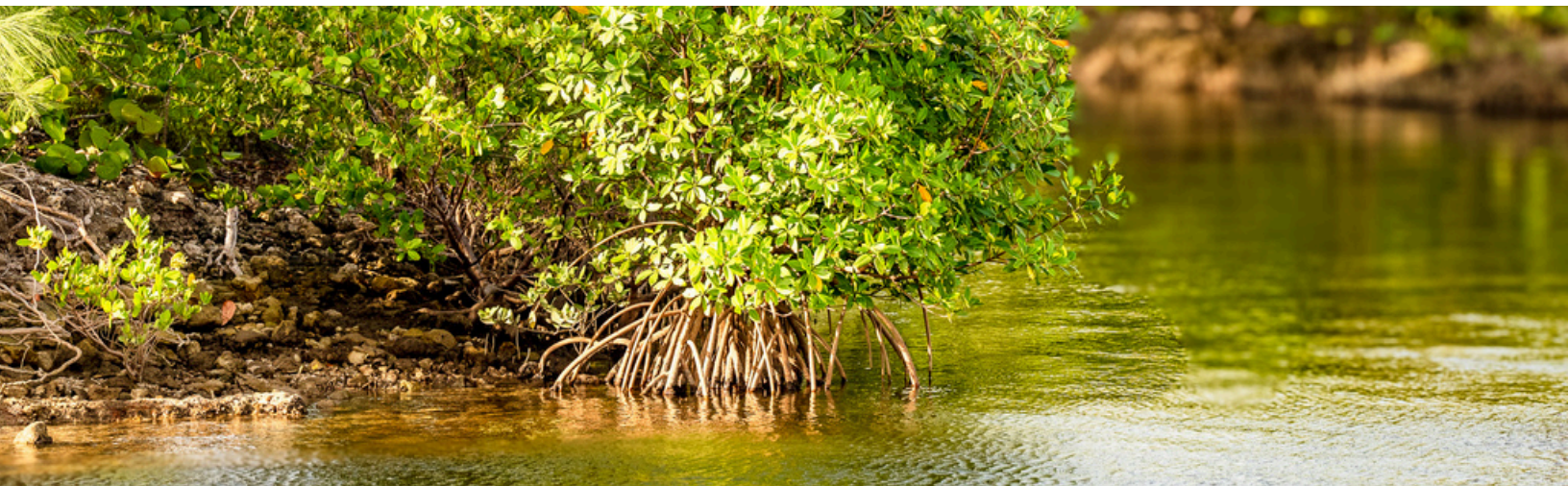
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# Executive Summary

The City of Hollywood recognizes that greenhouse gas (GHG) emissions from human activity are catalyzing profound climate change, the consequences of which pose substantial risks to the future health, wellbeing, and prosperity of our community. Per our Sustainability Action Plan, Hollywood is taking steps to reduce its contribution to climate change through several planned actions including:

- Include sustainability criteria in all City plans and guidelines.
- Improve energy efficiency at City properties
- Adopt green procurement policies.
- Increase the renewable energy generated and used by the City.
- Retrofit street lights to LED.
- Track community scale greenhouse gas emissions and set reduction targets.
- Create zoning regulations to encourage multi-modal transit.
- Enhance green building program.
- Mitigate Urban Heat Island.
- Develop energy efficiency programs.
- Increase renewable energy generation city-wide.
- Decrease emissions related to solid waste.
- Reduce air pollution related to vehicles.
- Increase air quality by planting trees.
- Increase the transit options available in the City.
- Increase ridership on existing transit system.
- Improve the City's bike infrastructure.
- Enhance walkability in the City.
- Create parking policies that will decrease vehicle miles traveled and congestion related to parking.
- Increase the number of vehicles which are fuel efficient or use alternative fuels.

This report provides estimates of greenhouse gas emissions resulting from activities in Hollywood as a whole in 2019 & 2021.



# Letter from the City Manager

I am pleased to introduce the City of Hollywood's Greenhouse Gas Inventories for 2019 and 2021. These inventories show city-wide emissions as well as those specifically from local government activities. We are all well aware that greenhouse gas emissions from human activity pose a serious threat to our health and prosperity. That's why I am committed to taking action to reduce those emissions in our community.

Our actions have a very real impact on future generations. These inventories highlight the progress we are making and the opportunities we have to further reduce emissions. The inventories illustrate a nearly 7% decrease in total community-wide emissions and a decrease of almost 8% in local government emissions between 2019 and 2021. These reductions reflect the decisions by all of us that increase energy efficiency, use clean energy sources, and more. It should be noted that a greenhouse gas inventory was not completed for 2020 as the City is conducting inventories every 2 years, and the City is using 2019 as the baseline year to track future progress.

Here at the City of Hollywood, we think it's important to lead by example. We are switching our streetlights, over 2,500 in all, to LED. We are reducing energy use in our facilities, and we are transitioning our city-owned fleet to electric and low emission alternative fuel vehicles. For example, the City's contract with Circuit for the Sun Shuttle on-demand electric shuttle service has avoided approximately 54,000 miles traveled in personal vehicles since July 2023, in turn avoiding more than 58 tons of carbon dioxide emissions from gas vehicles.

The City of Hollywood is striving to be carbon neutral by 2050. That means eliminating all the greenhouse gas emissions we can. The rest will be accounted for in our parks and green spaces where trees and other vegetation turn those emissions into clean air and more oxygen. To leverage these nature-based solutions, we are conducting a phased city-wide tree inventory and using those data to plant trees and expand the city's tree canopy. More shade will reduce the urban heat island effect, help reduce use of air conditioning, and help reduce people's electric bills.

Through our annual partnership with the Broward Solar Co-op, we make it easier and more affordable for homeowners to install solar panels on their homes. Our green building code is making homes more energy efficient. We are adding more electric vehicle charging stations in our parking garages and other public parking facilities to support the transition to electric vehicles.

While we still have a long way to go, I will continue doing everything in my power to make Hollywood a shining example for sustainability. In order to continue to be successful, we need your help.

For tips on what you can do, visit our Sustainability pages at [hollywoodfl.org/sustainability](http://hollywoodfl.org/sustainability).



Hollywood City Manager George Keller

# Key Findings: 2019 Community-Wide Inventory

Figure 1 shows community-wide emissions by sector in 2019. The largest contributor is Transportation & Mobile Sources with 68% of emissions. The next largest contributors are Commercial Energy (22%) and Residential Energy (6%). Actions to reduce emissions in all of these sectors are a key part of the City's Sustainability Action Plan. Water & Wastewater, Solid Waste, Industrial Energy, and Process & Fugitive Emissions were responsible for the remainder (less than 5%) of emissions.

The Inventory Results section of this report provides a detailed profile of emissions sources within Hollywood; information that is key to guiding local reduction efforts. These data will also provide a baseline against which the City will be able to compare future performance and demonstrate progress in reducing emissions.

## COMMUNITY EMISSIONS AT A GLANCE

- 1** Transportation  
68%
- 2** Commercial Energy  
22%
- 3** Residential Energy  
6%

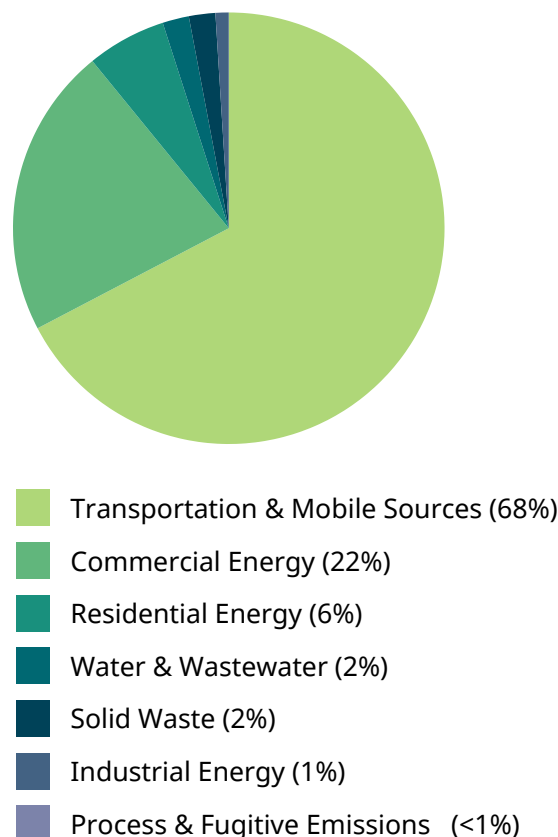


Figure 1: 2019 Community-Wide Emissions by Sector

# Key Findings: 2021 Community-Wide Inventory

Figure 2 shows community-wide emissions by sector in 2021. The largest contributor is Transportation & Mobile Sources with 67% of emissions. The next largest contributors are Commercial Energy (21%) and Residential Energy (6%). Actions to reduce emissions in all of these sectors are a key part of the City's Sustainability Action Plan. Industrial Energy, Solid Waste, Water & Wastewater, Agriculture, and Process & Fugitive Emissions were responsible for the remainder (less than 6%) of emissions.

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## COMMUNITY EMISSIONS AT A GLANCE

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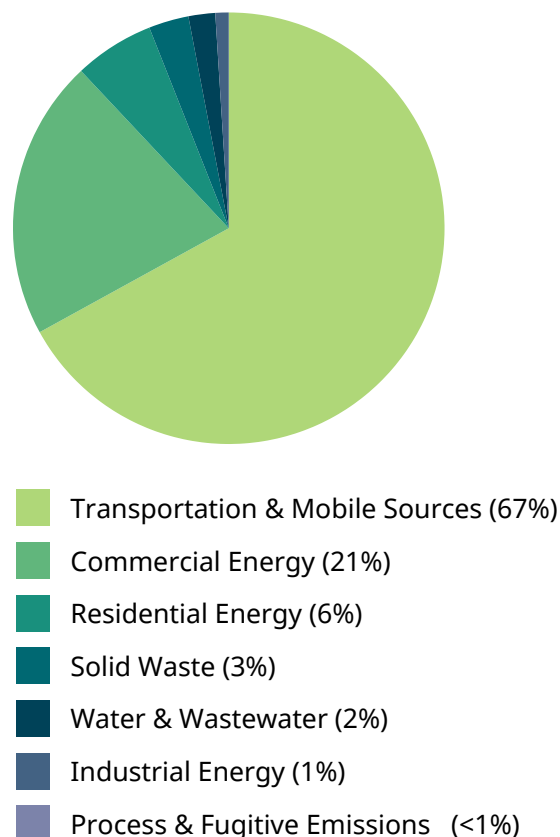


Figure 2: 2021 Community-Wide Emissions by Sector

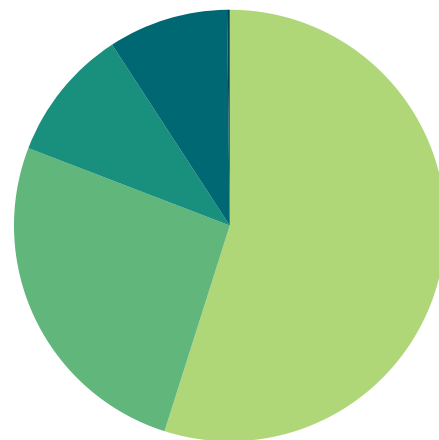
# Key Findings: 2019 Government Operations Inventory

Figure 3 shows government operations emissions by sector. The largest contributor is Buildings & Facilities with 55% of emissions. The next largest contributors are Water & Wastewater Treatment Facilities (26%), Vehicle Fleet (10%), and Employee Commute (9%). Actions to reduce emissions in all of these sectors are a key part of the City's Sustainability Action Plan. Solid Waste Facilities and Process & Fugitive Emissions were responsible for the remaining (less than 1%).

Emissions from government operations are 2.7% of community-wide emissions.

## GOVERNMENT OPERATIONS EMISSIONS AT A GLANCE

- 1** Buildings & Facilities  
55%
- 2** Water & Wastewater Treatment Facilities  
26%
- 3** Vehicle Fleet  
10%



- Buildings & Facilities (55%)
- Water & Wastewater Treatment Facilities (26%)
- Vehicle Fleet (10%)
- Employee Commute (9%)
- Solid Waste Facilities (<1%)
- Process & Fugitive Emissions (<1%)

**Figure 3: 2019 Government Operations Emissions by Sector**



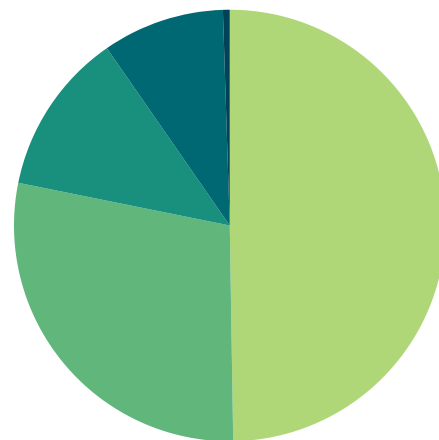
# Key Findings: 2021 Government Operations Inventory

Figure 4 shows government operations emissions by sector. The largest contributor is Buildings & Facilities with 49% of emissions. The next largest contributors are Water & Wastewater Treatment Facilities (28%), Vehicle Fleet (12%), and Employee Commute (9%). Actions to reduce emissions in all of these sectors are a key part of the City's Sustainability Action Plan. Solid Waste Facilities and Process & Fugitive Emissions were responsible for the remaining (less than 1%).

Emissions from government operations are 2.8% of community-wide emissions.

## GOVERNMENT OPERATIONS EMISSIONS AT A GLANCE

- 1** Buildings & Facilities  
49%
- 2** Water & Wastewater Treatment Facilities  
28%
- 3** Vehicle Fleet  
12%



- Buildings & Facilities (49%)
- Water & Wastewater Treatment Facilities (28%)
- Vehicle Fleet (12%)
- Employee Commute (9%)
- Solid Waste Facilities (<1%)
- Process & Fugitive Emissions (<1%)

**Figure 4: 2021 Government Operations Emissions by Sector**

# Introduction to Climate Change

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence shows that human activities are increasing the concentration of greenhouse gases and changing the global climate. In an urban setting, the most significant contributor is burning fossil fuels for transportation, electricity generation and other purposes, which introduces large amounts of carbon dioxide and other greenhouse gases into the atmosphere.

Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise, threatening the safety, quality of life, and economic prosperity of global communities. Although the natural greenhouse effect is needed to keep the earth warm, a human-enhanced greenhouse effect with the rapid accumulation of greenhouse gases (GHGs) in the atmosphere leads to too much heat and radiation being trapped. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report confirms that human activities have unequivocally caused an increase in carbon emissions [1]. Many regions are already experiencing the consequences of global climate change, and Hollywood is no exception.



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[1] IPCC, 2021: [Summary for Policymakers](#). In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [MassonDelmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

According to the 2023 National Climate Assessment, the Southeast's growing population and rich biodiversity faces significant risk due to its coastal concentration of metropolitan areas and centuries of political and land-use decisions.

As the Southeast's rapid growth has primarily occurred in metropolitan areas, drawing inhabitants away from rural and under-resourced communities, it has put the majority of Florida and Hollywood's population at significant risk of coastal-specific climate effects, impacts which compound with growth patterns and land use changes the city and region have experienced since 1985. Hollywood's land area is currently about 84.0% covered by settlement, and is expected to expand an additional 9% by 2060 if adhering to regional growth trends [2]. Should this occur, our area's unique terrestrial and aquatic biodiversity, already reduced by rising sea levels and shifting climate patterns, will be further transformed.

In addition to the environmental concerns, our residents will also face increased vulnerability to flooding. Brought on by greater exposure to shifting precipitation patterns and a higher likelihood of hurricanes intensifying and slowing/stalling near our coast, these events can bring about catastrophic infrastructure damage and thus risk to human health and safety. For instance, more frequent flooding can exacerbate the strain on wastewater treatment systems and transportation network, creating dangerous floodwater conditions and limiting access to emergency services and resources. Increased rainfall can also compound with sea level rise, inundating urban coastal areas like ours with water more often and reducing benefits to community health and prosperity like property values and access to goods and services. We are expected to suffer these consequences of climate change far more frequently given current projections, as Hollywood's current sunny day flooding event frequency stands at less than 8 days/year thus far. By 2060, sea levels are expected to rise by at least 2 feet NAVD, increasing that rate to 226 days/year [3].



[2] U.S. Global Change Research Program. 2023. National Climate Assessment – Ch 22: Southeast. Retrieved from <https://nca2023.globalchange.gov/chapter/22/>.

[3] City of Hollywood. 2017. Climate Change. Retrieved from <https://www.hollywoodfl.org/1097/Climate-Change>

While environmental and flooding concerns are very apparent, rising temperatures can also produce direct challenges for the socioeconomic wellbeing of our residents. Due to lengthier heat seasons, the number of extreme warm days (above 95°F) are expected to continue to increase, with Hollywood experiencing an additional 10-20 of these days by 2050. More intense heat will increase the economic burden on residents, bringing further financial strain in a region already paying the highest energy bills in the country despite the lowest energy rates [4].

Many communities in the United States have started to take responsibility for addressing climate change at the local level. Hollywood adopted new regulations for seawall heights in 2022 based on Broward County's ordinance in 2020. Higher seawalls will not only address tidal flooding and surge protection, but will also help keep national flood insurance rates affordable [5]. Other strategies include reducing fossil fuel use in the community, which can have many benefits in addition to reducing greenhouse gas emissions. More efficient use of energy decreases utility and transportation costs for residents and businesses. Retrofitting homes and businesses to be more efficient creates local jobs. In addition, when residents save on energy costs, they are more likely to spend at local businesses and add to the local economy. Reducing fossil fuel use improves air quality, and increasing opportunities for walking and bicycling improves residents' health.



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[4] U.S. Global Change Research Program. 2023. National Climate Assessment – Ch 22: Southeast. Retrieved from <https://nca2023.globalchange.gov/chapter/22/>.

[5] City of Hollywood Florida. 2023. Climate Change. Retrieved from <https://www.hollywoodfl.org/1097/Climate-Change>.

# Greenhouse Gas Inventory as a Step Toward Carbon Neutrality

Facing the climate crisis requires the concerted efforts of local governments and their partners, those that are close to the communities directly dealing with the impacts of climate change.

Cities, towns and counties are well placed to define coherent and inclusive plans that address integrated climate action — climate change adaptation, resilience and mitigation. Existing targets and plans need to be reviewed to bring in the necessary level of ambition and outline how to achieve net-zero emissions by 2050 at the latest. Creating a roadmap for climate neutrality requires Hollywood to identify priority sectors for action, while considering climate justice, inclusiveness, local job creation and other benefits of sustainable development.

To complete this inventory, Hollywood utilized tools and guidelines from ICLEI - Local Governments for Sustainability (ICLEI), which provides authoritative direction for greenhouse gas emissions accounting and defines climate neutrality as follows:

The targeted reduction of greenhouse gas (GHG) emissions and GHG avoidance in government operations and across the community in all sectors to an absolute net-zero emission level at the latest by 2050. In parallel to this, it is critical to adapt to climate change and enhance climate resilience across all sectors, in all systems and processes.

To achieve ambitious emissions reduction, and move toward climate neutrality, Hollywood will need to set a clear goal and act rapidly following a holistic and integrated approach. Climate action is an opportunity for our community to experience a wide range of co-benefits, such as creating socio-economic opportunities, reducing poverty and inequality, and improving the health of people and nature.

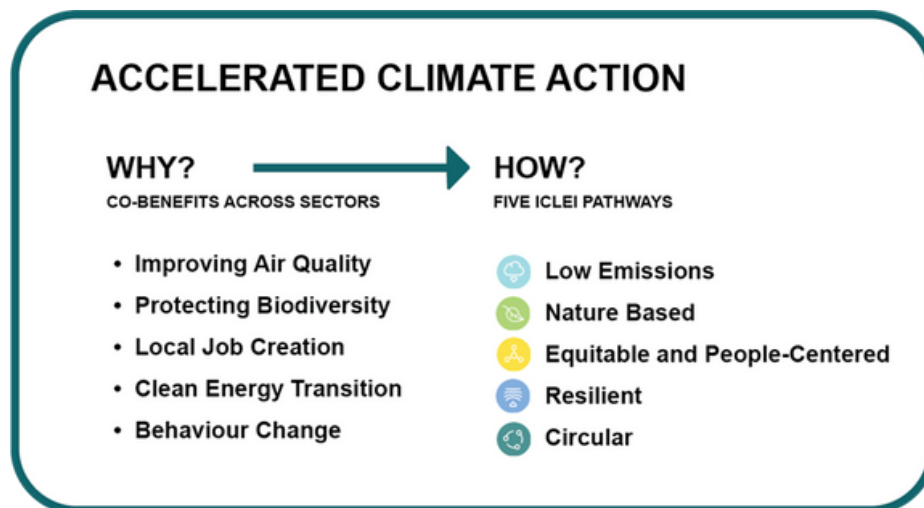


Figure 5: Co-Benefits and ICLEI Pathways to Accelerated Climate Action

# ICLEI GreenClimateCities Framework

For this inventory, Hollywood’s process is informed by ICLEI’s GreenClimateCities Framework for integrated climate action. The City follows the stepwise approach shown below in Figure 6, which involves collecting and analyzing climate data, action, implementation, leadership, and collaboration —always with an equity lens.

The Framework is organized into Analyze, Act, and Accelerate phases for communities pursuing integrated climate action. The Framework incorporates greenhouse gas emissions reductions, climate adaptation actions, and equitable, inclusive decision-making. Hollywood’s inventory has Science-Based Targets [6] and falls under Step C- Analyze and set a baseline.

Over 600 U.S. communities have followed this basic Framework, previously known as ICLEI’s Five Milestones for Emissions Management, and today, it is represented through the streamlined Analyze-Act-Accelerate model shown below.



**Figure 6: ICLEI GreenClimateCities Framework**

[6] Science-Based Targets are calculated climate goals, in line with the latest climate science, that represent your community’s fair share of the ambition necessary to meet the Paris Agreement commitment of keeping warming below 1.5°C. To achieve this goal, the Intergovernmental Panel on Climate Change (IPCC) states that we must reduce global emissions by 50% by 2030 and achieve climate neutrality by 2050. Equitably reducing global emissions by 50% requires that high-emitting, wealthy nations reduce their emissions by more than 50%.

# Inventory Methodology

## Understanding a Greenhouse Gas Emissions Inventory

The first step toward achieving tangible GHG emission reductions requires identifying baseline emissions levels and sources and activities generating emissions in the community. This report presents emissions from the Hollywood community as a whole. The government operations inventory is mostly a subset of the community inventory, as shown in Figure 7. For example, data on commercial energy use by the community include energy consumed by municipal buildings, and community vehicle-miles-traveled estimates include miles driven by municipal fleet vehicles.

As local governments continue to join the climate protection movement, the need for a standardized approach to quantify GHG emissions has proven essential. This inventory uses the approach and methods provided by the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Community Protocol) and the Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions (LGO Protocol), both of which are described below.

Three greenhouse gases are included in this inventory: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Many of the charts in this report represent emissions in “carbon dioxide equivalent” (CO<sub>2</sub>e) values, calculated using the Global Warming Potentials (GWP) for methane and nitrous oxide from the IPCC 5th Assessment Report.



**Figure 7: Relationship of Community and Government Operations Inventories**

**Table 1: Global Warming Potential Values (IPCC, 2014)**

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	28
Nitrous Oxide (N <sub>2</sub> O)	265

# Community Emissions Protocol

Version 1.2 of the U.S. Community Protocol for Accounting and Reporting GHG Emissions [7] was released by ICLEI in 2019, and represents a national standard in guidance to help U.S. local governments develop effective community GHG emissions inventories. It establishes reporting requirements for all community GHG emissions inventories, provides detailed accounting guidance for quantifying GHG emissions associated with a range of emission sources and community activities, and provides a number of optional reporting frameworks to help local governments customize their community GHG emissions inventory reports based on their local goals and capacities.

The community inventory in this report includes emissions from the five Basic Emissions Generating Activities required by the Community Protocol. These activities are:

- Use of electricity by the community
- Use of fuel in residential and commercial stationary combustion equipment
- On-road passenger and freight motor vehicle travel
- Use of energy in potable water and wastewater treatment and distribution
- Generation of solid waste by the community

The community inventory also includes the following activities:

- Public transit
- Off-road transportation
- Rail transportation
- Aviation travel by Hollywood residents and staff through Fort Lauderdale-Hollywood International Airport
- Waterborne transportation
- Wastewater treatment processes
- Fugitive emissions from natural gas distribution

## Local Government Operations (LGO) Protocol

In 2010, ICLEI, the California Air Resources Board (CARB), and the California Climate Action Registry (CCAR) released Version 1.1 of the LGO Protocol [8]. The LGO Protocol serves as the national standard for quantifying and reporting greenhouse emissions from local government operations. The purpose of the LGO Protocol is to provide the principles, approach, methodology, and procedures needed to develop a local government operations greenhouse gas emissions inventory.

The following activities are included in the LGO inventory:

- Energy and natural gas consumption and fugitive emissions from buildings & facilities
- Wastewater treatment processes
- On-road transportation from employee commute and vehicle fleet
- Solid waste generation by employees

[7] ICLEI. 2012. US Community Protocol for Accounting and Reporting Greenhouse Gas Emissions. Retrieved from <http://www.icleiusa.org/tools/ghg-protocol/community-protocol>

[8] ICLEI. 2008. Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions. Retrieved from <http://www.icleiusa.org/programs/climate/ghg-protocol/ghg-protocol>



# Quantifying Greenhouse Gas Emissions

## Sources and Activities

Communities contribute to greenhouse gas emissions in many ways. Two central categorizations of emissions are used in the community inventory: 1) GHG emissions that are produced by “sources” located within the community boundary, and 2) GHG emissions produced as a consequence of community “activities.”

**Table 2: Source vs. Activity for Greenhouse Gas Emissions (GHG)**

Source	Activity
Any physical process inside the jurisdictional boundary that releases GHG emissions into the atmosphere.	The use of energy, materials (solid waste), and/or services by members of the community that result in the creation of GHG emissions.

Activities within a community include, but are not limited to: heating and cooling of homes, driving cars, and throwing away trash. Sources are where the emissions from those activities occur, which may or may not be the same place the activity occurs. When you drive your car, the source is the car's tailpipe. Similarly, when a gas furnace in your home runs, the source is the exhaust vent of the furnace. On the other hand, when you throw away trash the source is at the landfill the trash is sent to. When you flip a switch and use electricity, the source is the power plant where the electricity is generated. Because landfills and power plants are usually located outside the community, careful inclusion of both sources and activities provides a fuller picture of community emissions.

## Base Year

The inventory process requires the selection of a base year with which to compare current emissions. Hollywood's LGO greenhouse gas emissions inventory utilizes 2019 as its baseline year to base actions and investments off a more accurate inventory due to the age of the previous 2014 baseline.



## Quantification Methods

GHG emissions can be quantified in two ways:

- Measurement-based methodologies refer to the direct measurement of GHG emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.
- Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used:

$$\text{Activity Data} \times \text{Emission Factor} = \text{Emissions}$$

Most emissions sources in this inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other GHG-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Please see the appendices for a detailed listing of the activity data used in composing this inventory.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO<sub>2</sub>/kWh of electricity). For this inventory, calculations were made using ICLEI's [ClearPath Climate Planner](#) tool.



# 2019 Community Emissions Inventory Results

The total community-wide emissions for the 2019 inventory are shown in Table 3 and Figure 8.

**Table 3: 2019 Community-Wide Emissions Inventory**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Residential Energy	Grid Electricity - FPL	133,057,858	kWh	40,391
	Natural Gas - TECO	1,072,698	Therms	5,705
	Distillate Fuel Oil No.2	30	MMBtu	2
	Propane	19,610	MMBtu	1,217
<b>Residential Energy Total</b>				<b>47,315</b>
Commercial Energy	Grid Electricity - Commercial - FPL	433,781,460	kWh	131,678
	Grid Electricity - Government - FPL	74,555,514	kWh	22,632
	Natural Gas - Commercial - TECO	4,198,531	Therms	22,331
	Natural Gas - Government - TECO	1,799,249	Therms	9,570
<b>Commercial Energy Total</b>				<b>186,211</b>
Industrial Energy	Grid Electricity - FPL	19,779,180	kWh	6,004
<b>Industrial Energy Total</b>				<b>6,004</b>
Transportation & Mobile Sources	Gasoline - On Road	839,499,149	VMT	350,559
	Diesel - On Road	86,945,229	VMT	128,102
	Gasoline - Off Road	336,853	MMBtu	23,865
	Diesel - Off Road	595,344	MMBtu	44,034
	Other - Off Road	70,179	MMBtu	3,724
	Gasoline - Broward County Transit	95,718	Gallons	841

**Table 3: 2019 Community-Wide Emissions Inventory (Continued)**

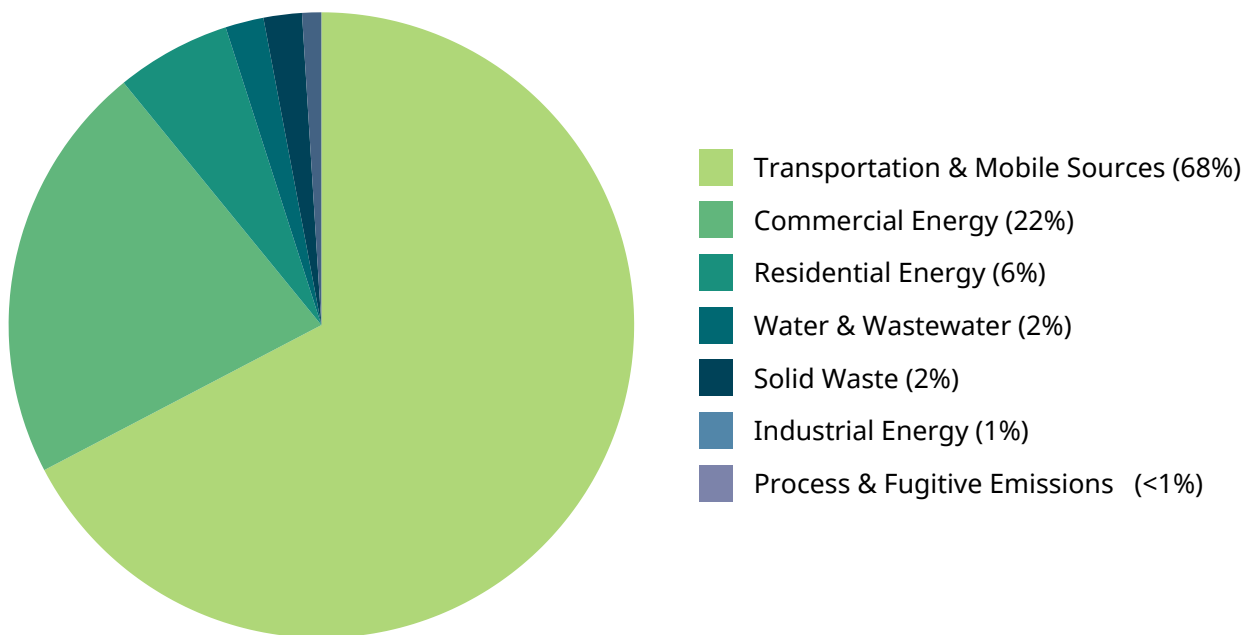
Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Transportation & Mobile Sources	Diesel - Broward County Transit	978,935	Gallons	9,996
	Propane - Broward County Transit	297,410	Gallons	1,722
	Jet Kerosene - Fort Lauderdale-Hollywood International Airport	26,717,099	Gallons	13,267
	Diesel - Brightline Rail	103,670	Gallons	1,068
	Diesel - Amtrak Rail	1,348	MMBtu	101
	Diesel - Florida East Coast Rail	939	MMBtu	70
	Diesel - Tri-Rail	16,623	MMBtu	1,240
	Diesel - Water Taxi	89,091	MMBtu	918
	Gasoline - Hollywood Marina	124,155	Gallons	1,100
	Diesel - Hollywood Marina	54,799	Gallons	564
<b>Transportation &amp; Mobile Sources Total</b>				<b>581,171</b>
Solid Waste	Waste Generation	46,813	Tons	14,222
<b>Solid Waste Total</b>				<b>14,222</b>
Water & Wastewater	Supply of Potable Water - Hollywood Water Treatment Plant	21,969,047/198	kWh/Therms	6,670
	In-boundary Process N2O - Hollywood Wastewater Treatment Plant	155,008	People	164
	Imported Process N2O - Hollywood Wastewater Treatment Plant	166,968	People	177
	In-boundary Effluent N2O - Hollywood Wastewater Treatment Plant	397	kg N/Day	302

**Table 3: 2019 Community-Wide Emissions Inventory (Continued)**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Water & Wastewater	Imported Effluent N2O - Hollywood Wastewater Treatment Plant	427	kg N/Day	324
	In-boundary Digester Gas Flaring - Hollywood Wastewater Treatment Plant	155,008	People	193
	Imported Digester Gas Flaring - Hollywood Wastewater Treatment Plant	166,968	People	208
	In-boundary Digester Gas Combustion - Hollywood Wastewater Treatment Plant	155,008	People	10
	Imported Digester Gas Combustion - Hollywood Wastewater Treatment Plant	166,968	People	10
	Septic Systems	62,359	People	7,576
<b>Water &amp; Wastewater Total</b>				<b>15,634</b>
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution	7,070,675	Therms	1,227
<b>Process &amp; Fugitive Emissions Total</b>				<b>1,227</b>
<b>Total Gross Emissions</b>				<b>851,784</b>
Agriculture, Forestry, and Other Land Use (AFOLU)	Non-forest to Forest	0.1	Hectares	-1
	Forest Disturbances	2.9	Hectares	206
	Undisturbed Forests	435	Hectares	-2549
	Emissions - Trees Outside of Forests	19	Hectares	890
	Removals - Trees Outside of Forests	477	Hectares	-9105
<b>Forests and Trees Total</b>				<b>-10559</b>
<b>Total Emissions with Sequestration</b>				<b>841,225</b>



Figure 8 shows the distribution of community-wide emissions by sector. Transportation & Mobile Sources is the largest contributor, followed by Commercial and Residential Energy.



**Figure 8: 2019 Community-Wide Emissions by Sector**

## Transportation Data Considerations

The Community-wide inventory is based on ICLEI’s U.S. Community Protocol, which requires on-road transportation to be included at minimum. However, additional transportation activities (Aviation, Waterborne, Rail, and Off-road transportation) were incorporated in accordance with the Global Protocol for Community-Scale GHG Emissions Inventories.

When comparing Hollywood’s share of transportation emissions to other communities, it is important to note that many Florida communities have not regularly reported transportation activities other than of on-road transportation. This omission of additional transportation activities often leads to an underrepresentation of transportation emissions.

# 2021 Community Emissions Inventory Results

The total community-wide emissions for the 2021 inventory are shown in Table 5 and Figure 9.

**Table 4: 2021 Community-Wide Emissions Inventory**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Residential Energy	Grid Electricity - FPL	132,504,836	kWh	39,666
	Natural Gas - TECO	1,093,129	Therms	5,814
	Distillate Fuel Oil No.2	31	MMBtu	2
	Propane	29,252	MMBtu	1,815
<b>Residential Energy Total</b>				<b>47,297</b>
Commercial Energy	Grid Electricity - Commercial - FPL	383,752,557	kWh	114,878
	Grid Electricity - Government - FPL	65,979,950	kWh	19,751
	Natural Gas - Commercial - TECO	3,853,247	Therms	20,494
	Natural Gas - Government - TECO	2,781,800	Therms	14,795
<b>Commercial Energy Total</b>				<b>169,918</b>
Industrial Energy	Grid Electricity - FPL	20,990,374	kWh	6,284
<b>Industrial Energy Total</b>				<b>6,284</b>
Transportation & Mobile Sources	Gasoline - On Road	745,466,594	VMT	300,546
	Diesel - On Road	89,066,790	VMT	128,285
	Gasoline - Off Road	357,376	MMBtu	25,319
	Diesel - Off Road	661,808	MMBtu	48,950
	Other - Off Road	79,350	MMBtu	4,210
	Gasoline - Broward County Transit	120,915	Gallons	1,062

**Table 4: 2021 Community-Wide Emissions Inventory (Continued)**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Transportation & Mobile Sources	Diesel - Broward County Transit	823,027	Gallons	8,404
	Propane - Broward County Transit	119,222	Gallons	690
	Jet Kerosene - Fort Lauderdale-Hollywood International Airport	20,048,457	Gallons	12,445
	Diesel - Brightline Rail	23,786	Gallons	245
	Diesel - Amtrak Rail	1,348	MMBtu	101
	Diesel - Florida East Coast Rail	939	MMBtu	70
	Diesel - Tri-Rail	16,623	MMBtu	1,240
	Diesel - Water Taxi	89,091	MMBtu	918
	Gasoline - Hollywood Marina	120,915	Gallons	1,177
	Diesel - Hollywood Marina	53,376	Gallons	473
<b>Transportation &amp; Mobile Sources Total</b>				<b>534,135</b>
Solid Waste	Waste Generation	46,964	Tons	21,613
<b>Solid Waste Total</b>				<b>21,613</b>
Water & Wastewater	Supply of Potable Water - Hollywood Water Treatment Plant	21,383,178	kWh	6,401
	In-boundary Process N2O - Hollywood Wastewater Treatment Plant	152,131	People	161
	Imported Process N2O - Hollywood Wastewater Treatment Plant	162,291	People	172
	In-boundary Effluent N2O - Hollywood Wastewater Treatment Plant	775	kg N/Day	589

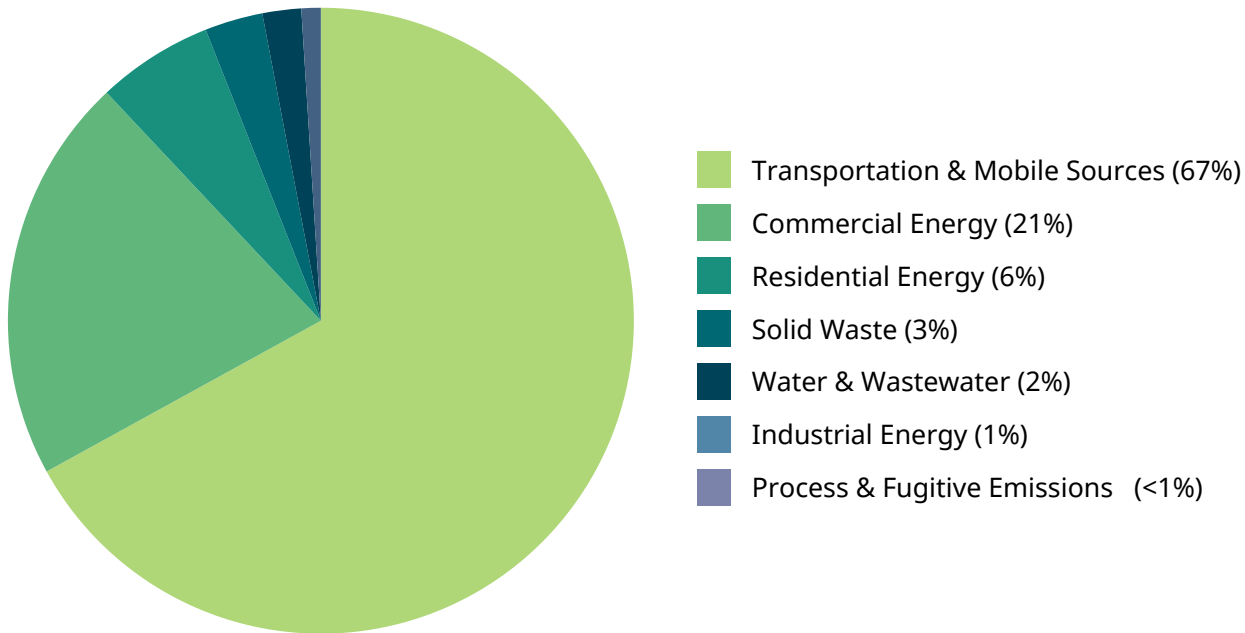


**Table 4: 2021 Community-Wide Emissions Inventory (Continued)**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Water & Wastewater	Imported Effluent N2O - Hollywood Wastewater Treatment Plant	827	kg N/Day	628
	In-boundary Digester Gas Flaring - Hollywood Wastewater Treatment Plant	152,131	People	189
	Imported Digester Gas Flaring - Hollywood Wastewater Treatment Plant	162,291	People	202
	In-boundary Digester Gas Combustion - Hollywood Wastewater Treatment Plant	152,131	People	10
	Imported Digester Gas Combustion - Hollywood Wastewater Treatment Plant	162,291	People	10
	Septic Systems	62,359	People	7,576
<b>Water &amp; Wastewater Total</b>				<b>15,938</b>
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution	7,728,176	Therms	1,341
<b>Process &amp; Fugitive Emissions Total</b>				<b>1,341</b>
<b>Total Gross Emissions</b>				<b>796,526</b>
Agriculture, Forestry, and Other Land Use (AFOLU)	Non-forest to Forest	0.1	Hectares	-1
	Forest Disturbances	2.9	Hectares	206
	Undisturbed Forests	435	Hectares	-2,549
	Emissions - Trees Outside of Forests	19	Hectares	890
	Removals - Trees Outside of Forests	477	Hectares	-9105
<b>Forests and Trees Total</b>				<b>-10,559</b>
<b>Total Emissions with Sequestration</b>				<b>785,967</b>



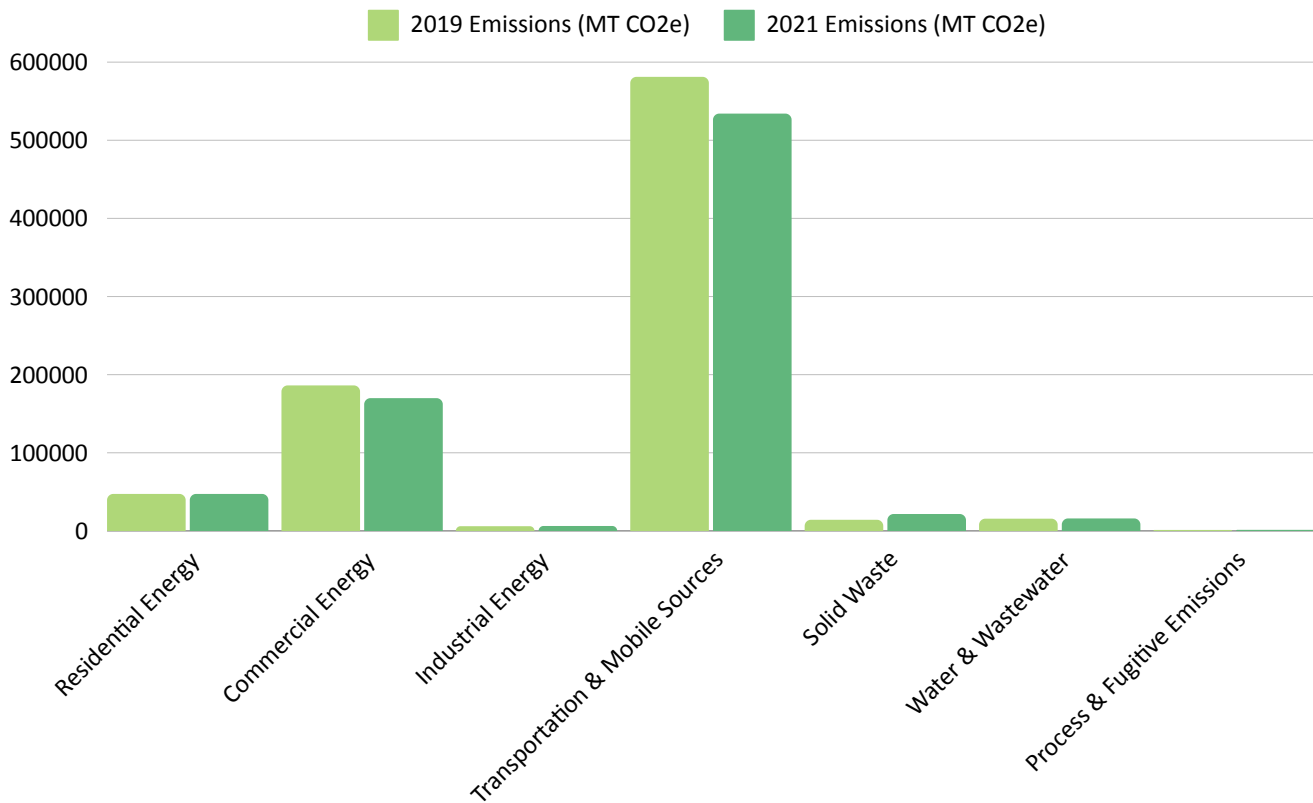
Figure 9 shows the distribution of community-wide emissions by sector. Transportation & Mobile Sources is the largest contributor, followed by Commercial and Residential Energy.



**Figure 9: 2021 Community-Wide Emissions by Sector**

## 2019 and 2021 Community-Wide Comparison Discussion

Figure 10 provides a comparison of emissions by sector between the 2019 and 2021 community-wide inventories. The chart indicates that while all sectors experienced changes in their total emissions, CO<sub>2</sub>e amounts remained fairly similar. The largest fluctuations were in Commercial Energy and Transportation & Mobile Sources, which both saw the most significant decrease in emissions across the two year period. Commercial Energy emissions fell by 16,293 MT CO<sub>2</sub>e, while Transportation & Mobile Sources experienced 47,036 MT CO<sub>2</sub>e less output. Residential Energy also experienced a loss in emissions, though only about 18 MT CO<sub>2</sub>e. The decrease in emissions in both of these sectors outweighs increases elsewhere in the Industrial Energy, Solid Waste, Water & Wastewater, and Process & Fugitive sectors. Of these, Solid Waste saw the greatest increase in emissions output, with CO<sub>2</sub>e jumping by a value of 7,391 MT. Other changes saw Industrial Energy gain 280 MT CO<sub>2</sub>e, Water & Wastewater increase by 304 MT CO<sub>2</sub>e, and Process & Fugitive attain an additional 114 MT CO<sub>2</sub>e.



**Figure 10: 2019 and 2021 Community-Wide Emissions Comparison**

## 2014 Comparison Discussion

In 2014, the City of Hollywood contracted the creation of a community-wide greenhouse gas inventory. When comparing inventories 5 or more years apart, it must be recognized that data collection methodologies have become more accurate and data sources have changed. The various patterns and outliers found between the 2014, 2019, and 2021 inventories might be partly based on the aforementioned considerations.

Due to limited source data available for most sectors and activities in the 2014 inventory, general updates and improvements in the accuracy and methodology of emissions calculations, and differences in the depth of represented emissions sources across comparable sectors, the utility of comparing 2014 data with the two most recent inventories is significantly weakened. As a result, the 2014 data are not included in this report. The City will use 2019 as the baseline year to track future progress.

# Tree Canopy Analysis

The manner in which GHG inventories are estimated for different types of land use is more complicated than for other sectors. In addition to both emitting and removing GHGs, there are multiple carbon pools that respond differently to management activities and natural disturbances, interannual variability is high, and measurements may not be as precise as they are in other sectors (see the USCP, Appendix J). For this reason, forestry emissions and sequestration are not included in total gross emissions. Beginning in 2019, a number of updates to protocols and guidance on estimating carbon from the Agriculture, Forestry, and Other Land Use (AFOLU) sector required that communities include the "net flux" of carbon emissions and removals - carbon emitted to the atmosphere from the land and carbon removed from the atmosphere to the land.

In coordination with ICLEI USA, Hollywood was able to use the US Community Protocol's Land Emissions And Removals Navigator (LEARN) tool to calculate the net flux of AFOLU emissions from 2013-2019 [9]. This analysis reported six "land use" categories which were defined by data on land cover—forest land, grassland, cropland, wetland, settlement and other land (barren). In 2019, Hollywood's total land base was approximately 18,726 acres (29 square miles), with 84.0% settlement (i.e. developed areas of varying intensity), around 9.9% wetland, 5.7% forest, 0.2% other land, 0.1% grassland (which includes hay/pasture, shrub/scrub and other herbaceous cover), and 0.1% cropland. 2019 is the most recent year available of the National Land Cover Dataset. Over the period 2013 to 2019, the Net GHG balance of forests and trees was -10,559 Mt CO<sub>2</sub>e per year. Total GHG emissions for Hollywood across all sectors could be reduced if additional forests/trees were added to its land base, and/or if losses of trees were reduced further. These measurements are only for trees, so carbon sequestration from other vegetation, such as grassland, likely mean that what is measured by the LEARN tool is actually an underestimate of total sequestration for the city.

While GHG Inventories are recommended every 2-3 years, AFOLU data are meant to measure change over the course of six years. Therefore, this analysis could not be used to measure differences between 2019 and 2021. Hollywood can expect its next AFOLU analysis to cover changes from 2019-2025.



[9] US Community Protocol's Land Emissions And Removals Navigator (LEARN) tool. Available at <https://icleiusa.org/LEARN/>

## Next Steps

The inventory should be used to focus and prioritize actions to reduce emissions. Based on the inventory results, the following areas have the greatest potential for emissions reduction:

- Residential Energy
  - Improved energy efficiency
  - Building and appliance electrification
- Commercial Energy
  - Improved energy efficiency
  - Building and appliance electrification
- Transportation
  - General VMT reduction (increased bike infrastructure, carpooling efforts, etc.)
  - Transition to electric vehicles

Completion of another GHG inventory in two to five years is recommended to assess progress resulting from any actions implemented. The detailed methodology section of this report, as well as notes and attached data files in the ClearPath Climate Planner tool and a master data Excel file provided to the Hollywood, will be helpful to complete a future inventory consistent with this one.



# 2019 Government Operations Emissions Inventory Results

The total government operations emissions for the 2019 inventory are shown in Table 5 and Figure 10.

**Table 5: 2019 Government Operations Emissions Inventory**

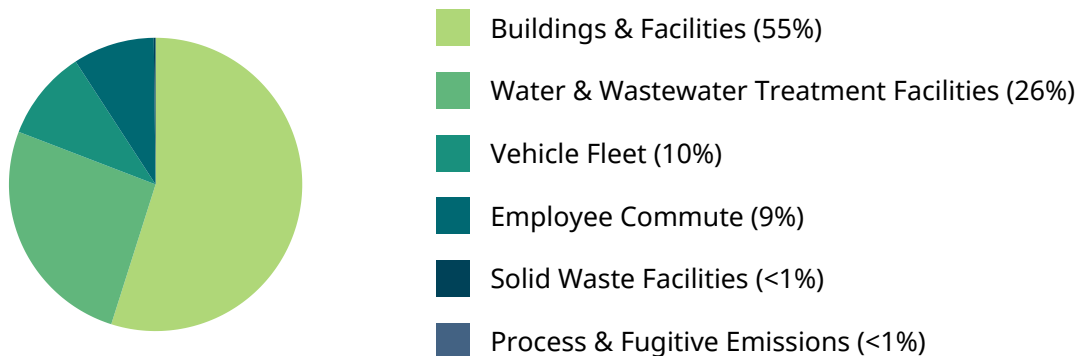
Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Buildings & Facilities	Grid Electricity - FPL	52,586,467	kWh	15,963
	Natural Gas - TECO	22,990	Therms	122
<b>Buildings &amp; Facilities Total</b>				<b>16,085</b>
Vehicle Fleet	Gasoline - On Road	134,120	Gallons	1,178
	Diesel - On Road	97,145	Gallons	992
	CNG - On Road	869,961	Standard Cubic Feet	47
	E85 - On Road	389,978	Gallons	514
	Gasoline - Marina - Off Road	1,897	Gallons	17
	Gasoline - Beach - Off Road	13,727	Gallons	122
	Diesel - Off Road	8,283	Gallons	85
<b>Vehicle Fleet Total</b>				<b>2,955</b>
Employee Commute	Gasoline - All Employees	6,648,747	Miles	2,640
<b>Employee Commute Travel Total</b>				<b>2,640</b>
Solid Waste	Waste Generation	272	Tons	83
<b>Solid Waste Total</b>				<b>83</b>
Water & Wastewater	Grid Electricity - Hollywood Water Treatment Plant	21,969,047	kWh	6,669
	Natural Gas - Hollywood Water Treatment Plant	198	Therms	1



**Table 5: 2019 Government Operations Emissions Inventory (Continued)**

Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Water & Wastewater	Process N2O from Wastewater Treatment - Hollywood Wastewater Treatment Plant	321,976	People	341
	Process N2O from Effluent Discharge - Hollywood Wastewater Treatment Plant	824	kg N/Day	313
	Digester Gas Flaring	321,976	People	401
	Digester Gas Combustion	321,976	People	20
<b>Water &amp; Wastewater Total</b>				<b>7,745</b>
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution - TECO	23,187	Therms	4
<b>Process &amp; Fugitive Emissions Total</b>				<b>4</b>
<b>Total Government Operations Emissions</b>				<b>29,512</b>

Figure 10 shows the distribution of Government Operations emissions by sector. Buildings and Facilities is the largest contributor, followed by Water & Wastewater Treatment Facilities and Vehicle Fleet.



**Figure 11: 2019 Local Government Operations Emissions by Sector**

# 2021 Government Operations Emissions Inventory Results

The total government operations emissions for the 2021 inventory are shown in Table 6 and Figure 11.

**Table 6: 2021 Government Operations Emissions Inventory**

Sector	Fuel or Source	2021 Usage	Usage Unit	2021 Emissions (Mt CO <sub>2</sub> e)
Buildings & Facilities	Grid Electricity - FPL	44,596,772	kWh	13,350
	Natural Gas - TECO	12,659	Therms	67
<b>Buildings &amp; Facilities Total</b>				<b>13,417</b>
Vehicle Fleet	Gasoline - On Road	180,987	Gallons	1,589
	Diesel - On Road	104,493	Gallons	1,067
	CNG - On Road	12,100	Standard Cubic Feet	1
	E85 - On Road	410,644	Gallons	541
	Gasoline - Marina - Off Road	2,673	Gallons	24
	Gasoline - Beach - Off Road	14,085	Gallons	125
	Diesel - Off Road	5,287	Gallons	54
<b>Vehicle Fleet Total</b>				<b>3,401</b>
Employee Commute	Gasoline - All Employees	6,648,747	Miles	2,520
<b>Employee Commute Travel Total</b>				<b>2,520</b>
Solid Waste	Waste Generation	272	Tons	125
<b>Solid Waste Total</b>				<b>125</b>
Water & Wastewater	Grid Electricity - Hollywood Water Treatment Plant	21,383,178	kWh	6,401

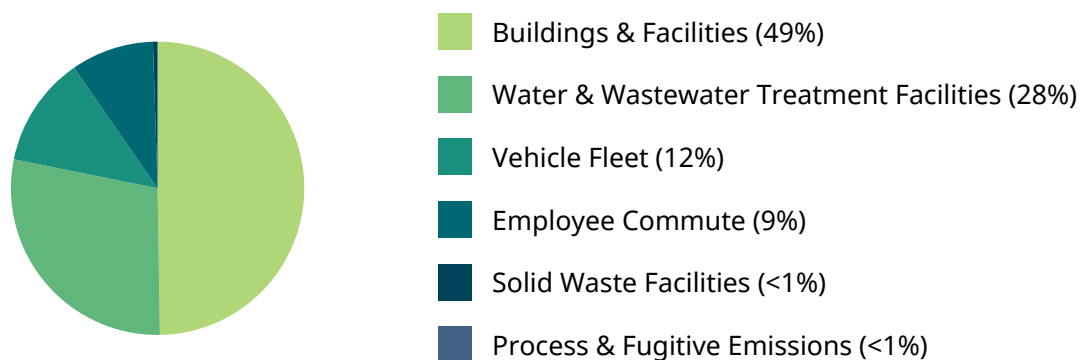




**Table 6: 2021 Government Operations Emissions Inventory (Continued)**

Sector	Fuel or Source	2021 Usage	Usage Unit	2021 Emissions (Mt CO <sub>2</sub> e)
Water & Wastewater	Process N <sub>2</sub> O from Wastewater Treatment - Hollywood Wastewater Treatment Plant	314,422	People	333
	Process N <sub>2</sub> O from Effluent Discharge - Hollywood Wastewater Treatment Plant	1,602	kg N/Day	609
	Digester Gas Flaring	314,422	People	392
	Digester Gas Combustion	314,422	People	20
<b>Water &amp; Wastewater Total</b>				<b>7,755</b>
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution - TECO	12,659	Therms	2
<b>Process &amp; Fugitive Emissions Total</b>				<b>2</b>
<b>Total Government Operations Emissions</b>				<b>27,220</b>

Figure 11 shows the distribution of Government Operations emissions by sector. Buildings and Facilities is the largest contributor, followed by Water & Wastewater Treatment Facilities and Vehicle Fleet.

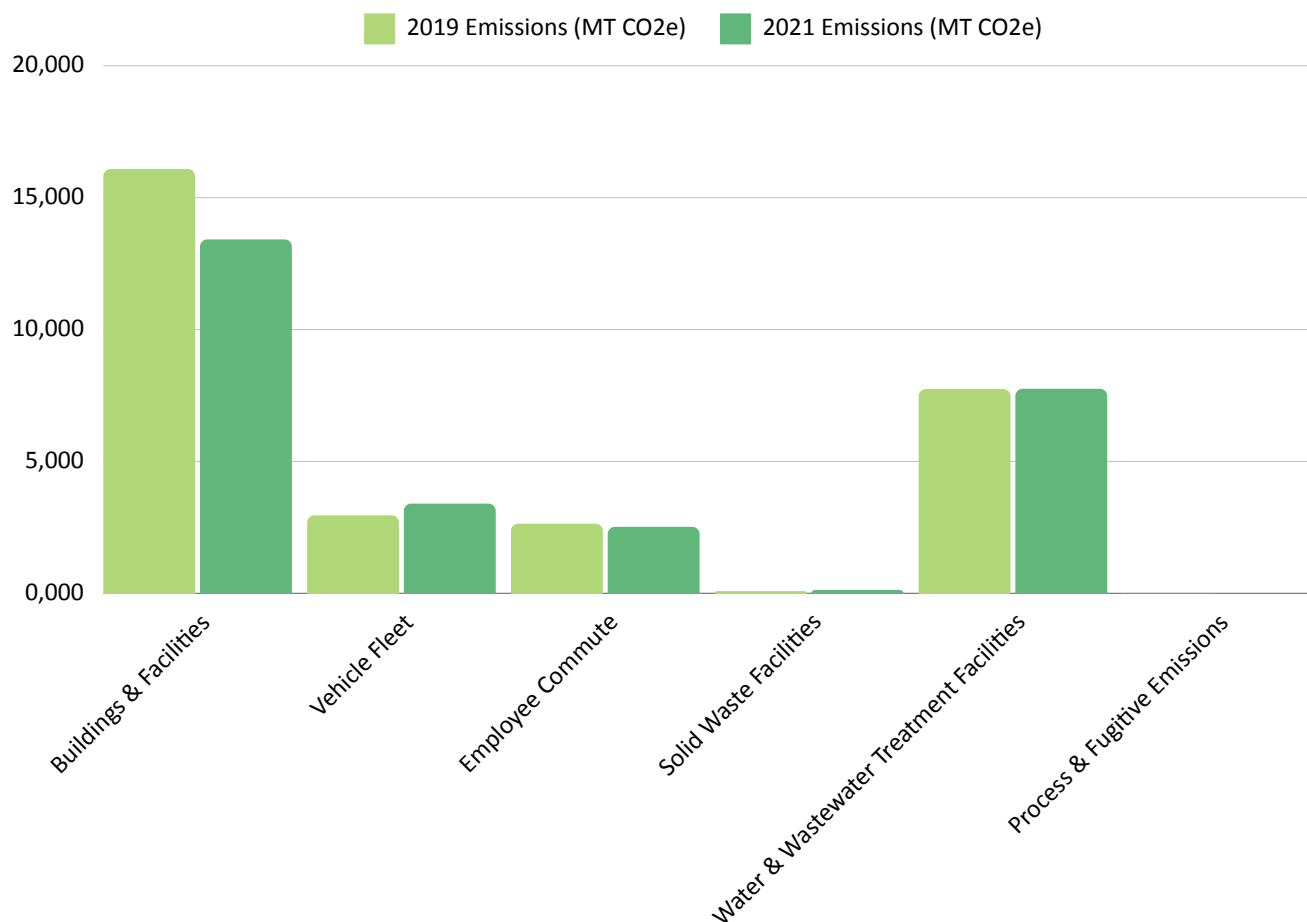


**Figure 12: 2021 Local Government Operations Emissions by Sector**



## 2019 and 2021 Local Government Operations Comparison Discussion

Figure 13 provides a comparison of emissions by sector between the 2019 and 2021 local government operations inventories. The chart indicates that besides Buildings & Facilities, emissions remained fairly similar between the two years. Buildings & Facilities, the source of the largest change in emissions, saw them fall 2,668 MT CO<sub>2</sub>e. Process & Fugitive Emissions, in association with natural gas use in the Buildings & Facilities sector, also saw a slight drop of 2 MT CO<sub>2</sub>e. The other sector that experienced a decrease was Employee Commute, which saw Hollywood employees produce 120 MT CO<sub>2</sub>e less in 2021 than 2019. All other sectors saw emissions climb between 2019 and 2021. Vehicle Fleet increased 446 MT CO<sub>2</sub>e, the second largest change in emissions across the two inventories. More minor fluctuations occurred in both Solid Waste Facilities and Water & Wastewater Treatment Facilities of 42 MT CO<sub>2</sub>e and 10 MT CO<sub>2</sub>e, respectively.



**Figure 13: 2019 and 2021 Local Government Operations Emissions Comparison**

## Next Steps

The inventory should be used to focus and prioritize actions to reduce emissions. Based on the inventory results, the following areas have the greatest potential for emissions reduction:

- Buildings and Facilities
  - Building and appliance electrification
  - Improved energy efficiency
- Vehicle Fleet
  - Electric vehicle conversion
- Employee Commute
  - Encourage teleworking

The City of Hollywood will complete GHG inventories every two years to assess progress resulting from all actions that are implemented. The detailed methodology section of this report, as well as notes and attached data files in the ClearPath Climate Planner tool and a master data Excel file provided to the City of Hollywood, will be helpful to complete a future inventory consistent with this one.



# Greenhouse Gas Emissions Forecasts

Hollywood’s most recent community-wide greenhouse gas (GHG) inventory includes emissions from activities and sources that took place within the city during the 2021 calendar year. Using the 2021 GHG inventory as a baseline, ICLEI prepared a basic “business-as-usual” forecast for 2030.

## Business-As-Usual (BAU) Forecast

The BAU forecast (Figure 14) is a projection of emissions through the year 2030. The projected emissions estimated population growth [10], changes in automotive fuel efficiency standards [11], and changes to the carbon intensity of grid electricity [12].

Hollywood’s 2021 emissions were 796,526 Metric Tons Carbon Dioxide equivalent (MT CO<sub>2</sub>e). Based on population growth, increasing on-road vehicle fuel efficiency, and utility decarbonization plans, Hollywood’s 2030 emissions will be 669,226 CO<sub>2</sub>e. This is a 16.0% reduction in emissions.

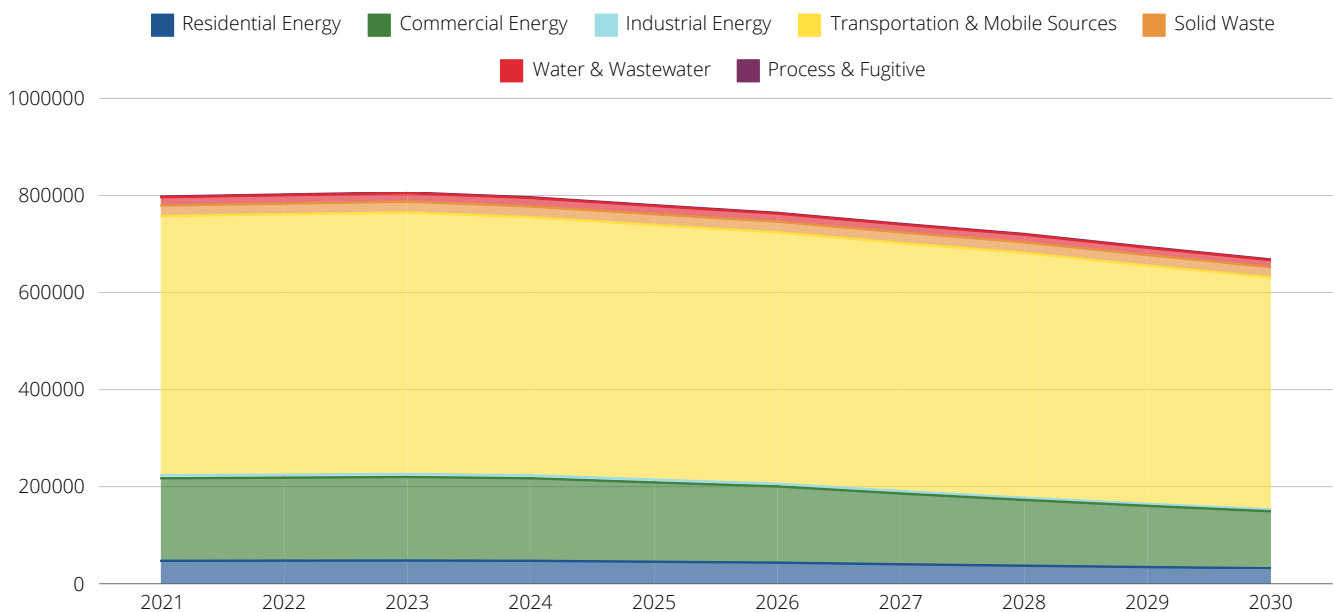


Figure 14: Business-As-Usual Forecast for Community-Wide Emissions from 2021-2030

[10] Costar Demographic Summary Report - 3 Mile Radius. 1700 N 47th Ave, Hollywood, FL 33021

[11] ICLEI’s Carbon Intensity Reference Sheet

[12] NREL. 2023. Cambium 2022 Scenario Descriptions and Documentation. Retrieved from <https://www.nrel.gov/analysis/cambium.html>

# Conclusion

This inventory marks the completion of Step C of ICLEI's GreenClimateCities Framework, Analyze and Set a Baseline. As Hollywood already has an existing City of Hollywood Sustainability Action Plan with detailed projects, the City should place emphasis on the cyclic system of evaluation and action found in Step F - Implement and Monitor.

The Intergovernmental Panel on Climate Change (IPCC) states that to meet emission reduction goals by the City of Hollywood, Broward County, the Southeast Regional Climate Change Compact and the Paris Agreement commitment of keeping warming below 1.5°C we must reduce global emissions by 50% by 2030 and reach climate neutrality by 2050. Equitably reducing global emissions by 50% requires that high-emitting, wealthy nations reduce their emissions by more than 50%. More than ever, it is imperative that countries, regions, and local governments set targets that are ambitious enough to slash carbon emissions between now and mid-century.

Science-Based Targets are calculated climate goals, in line with the latest climate science, that represent a community's fair share of the global ambition necessary to meet the Paris Agreement commitment. Community education, involvement, and partnerships are instrumental to achieve a science-based target. Hollywood has updated its baseline year for target setting from 2014 to 2019 in order to establish more ambitious emissions reduction goals.

To support the bold climate action of Hollywood, ICLEI has calculated the city's 2030 Science-Based Targets [13]. Hollywood should recognize that given the short timeline, these are highly ambitious:

- **Per-Capita SBT (based on baseline year Human Development Index): 62.8% reduction**
- **Absolute SBT (based on baseline year and 2030 populations): 64.3% reduction**

Science-Based Targets are climate goals in line with the latest climate science. They represent the city's fair share of the ambition necessary to keep warming below 1.5°C.

In addition, Hollywood will continue to track key energy use and emissions indicators on an on-going basis. It is recommended that communities update their inventories on a regular basis, especially as plans are implemented to ensure measurement and verification of impacts. Regular inventories also allow for "rolling averages" to provide insight into sustained changes and can help reduce the chance of an anomalous year being incorrectly interpreted. ICLEI recommends Hollywood to further engage with data providers to improve and streamline the data collection process. This inventory shows that transportation patterns as well as commercial and residential energy will be particularly important to focus on. Through these efforts and others, Hollywood can achieve environmental, economic, and social benefits beyond reducing emissions.



[13] "Science Based Climate Targets: A Guide for Cities." Science Based Targets Network, November 4, 2021. <https://sciencebasedtargetsnetwork.org/>.

# Appendix: Methodology Details

## Energy

**Table 7: Energy Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
Residential Electricity	FPL	N/A
Commercial Electricity	FPL	N/A
Industrial Electricity	FPL	N/A
Residential Natural Gas	TECO	N/A
Commercial Natural Gas	TECO	N/A
<b>Local Government Operations</b>		
Buildings & Facilities Electricity	FPL	N/A
Buildings & Facilities Natural Gas	TECO	N/A

**Table 8: Florida Power and Light Emissions Factors for Electricity Consumption**

Year	CO2 (lbs./MWh)	CH4 (lbs./GWh)	N2O (lbs./GWh)	Notes
2019	665	66	9	Emissions factors are provided by Broward County and utilize FPL reported CO2 and 2018 eGRID (to maintain consistency).
2021	657	49	6	Emissions factors are provided by Broward County and utilize FPL reported CO2 and 2020 eGRID (to maintain consistency).

# Transportation

**Table 9: Transportation Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
On Road Transportation	Google Environmental Insights Explorer (EIE)	N/A
Off Road Transportation	EPA National Emissions Inventory (NEI)	Small utility used as a default input for equipment type; Other used as a default input for sector type; CNG used as a default for "other" fuels, as other includes CNG and LPG emissions but is not broken out by fuel type
Aviation	Broward County Government	Hollywood's ratio of Broward County population used for local attribution
Rail	EPA National Emissions Inventory (NEI); Federal Railroad Administration; Google	CO <sub>2</sub> e/MMBtu emissions factor used to estimate fuel use via total CO <sub>2</sub> e emissions; Hollywood ratio of Broward County track length for Brightline used as local attribution for the railroad
Waterborne	Hollywood Department of Parks, Recreation, & Cultural Arts	Water Taxi data is estimated based on estimated miles, trip frequency, and mpg per boat
<b>Local Government Operations</b>		
On Road Vehicle Fleet	City of Hollywood Financial Services Department	Beach and marina fuel use excluded from the general fleet
Off Road Vehicle Fleet	City of Hollywood Financial Services Department; Hollywood Department of Parks, Recreation, & Cultural Arts	Marina gasoline use includes pump-out boat, pressure washer, Hollywood Police and Hollywood Fire
Employee Commute	City of Hollywood (Multiple Departments)	Calculations based on ICLEI's zip code estimate method; Assumes all vehicles are gasoline; Assumes 78% passenger and 22% light truck vehicle split; 2021 employee data also used for 2019

For vehicle transportation, it is necessary to apply average miles per gallon and emissions factors for CH4 and N2O to each vehicle type. The factors used are shown in Table 10.

**Table 10: MPG and Emissions Factors by Vehicle Type**

Fuel	Vehicle Type	MPG	CH4 (g/mile)	N2O (g/mile)
<b>2019 US National Defaults (Updated 2021)</b>				
Gasoline	Passenger car	24.1	0.0183	0.0083
Gasoline	Light truck	17.6	0.0193	0.0148
Gasoline	Heavy truck	5.371652	0.0785	0.0633
Gasoline	Motorcycle	24.1	0.0183	0.0083
Diesel	Passenger car	24.1	0.0005	0.001
Diesel	Light truck	17.6	0.001	0.0015
Diesel	Heavy truck	6.392468	0.0051	0.0048
<b>2021 US National Defaults (Updated 2023)</b>				
Gasoline	Passenger car	24.1	0.0183	0.0083
Gasoline	Light truck	17.6	0.0193	0.0148
Gasoline	Heavy truck	5.4	0.0785	0.0633
Gasoline	Motorcycle	24.1	0.0183	0.0083
Diesel	Passenger car	24.1	0.0005	0.001
Diesel	Light truck	17.6	0.001	0.0015
Diesel	Heavy truck	6.4	0.0051	0.0048



# Wastewater

**Table 11: Wastewater Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
Septic Systems	City of Hollywood Public Utilities	Hollywood has not updated GIS data since 2010. 2020 census data used as proxy for 2019 and 2021
<b>Community-wide &amp; Local Government Operations</b>		
Process N2O from Wastewater Treatment	City of Hollywood Public Utilities	Assume 25% increase from industrial and commercial discharges to the system
Process N2O from Effluent Discharge	City of Hollywood Public Utilities	N load divided by in-boundary/imported ratio of total population served
Digester Gas Flaring	City of Hollywood Public Utilities	No site specific data provided for fraction CH4 and destruction efficiency - ClearPath defaults used in its place
Digester Gas Combustion	City of Hollywood Public Utilities	Unknown if energy is recovered from combustion

# Potable Water

**Table 12: Potable Water Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
Supply of Potable Water	City of Hollywood Water Treatment Plant	Represents total population served (in-boundary and imported)

# Solid Waste

**Table 13: Solid Waste Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
Landfilled Waste	City of Hollywood Environmental Services; Waste Connections; Waste Pro	Represents municipal solid waste and bulk residential waste only
<b>Local Government Operations</b>		
Waste Generation	City of Hollywood; Environmental Protection Agency	Estimates waste based on EPA's per capita per day waste generation and hourly schedules of Hollywood employees; Assumes typical landfill methane collection scenario (same as community-wide)

# Fugitive Emissions

**Table 14: Fugitive Emissions Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide and Local Government Operations</b>		
Fugitive Emissions from Natural Gas Distribution	TECO	Only natural gas total consumption was provided - ClearPath defaults used for other inputs like leakage rate

# Agriculture, Forestry and Land Use (AFOLU)

**Table 15: Forests and Urban Trees Sequestration and Emissions Data Sources**

Activity	Data Source	Data Gaps/Assumptions
<b>Community-wide</b>		
Emissions and Removals from Forests	ICLEI LEARN Tool	N/A
Emissions and Removals from Trees Outside of Forests	ICLEI LEARN Tool	N/A

# Inventory Calculations

The 2019 & 2021 inventories were calculated following the US Community Protocol and ICLEI's ClearPath Climate Planner software. As discussed in Inventory Methodology, the IPCC 5th Assessment was used for global warming potential (GWP) values to convert methane and nitrous oxide to CO2 equivalent units. ClearPath Climate Planner's inventory calculators allow for input of the sector activity (i.e. kWh or VMT) and emission factor to calculate the final carbon dioxide equivalent (CO2e) emissions.



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