

Sustainability Action Plan

Community-Wide and Local
Government Operations
Greenhouse Gas (GHG)
Emissions Inventories for
2019 & 2021

Sustainable
Hollywood

Regular City Commission Meeting



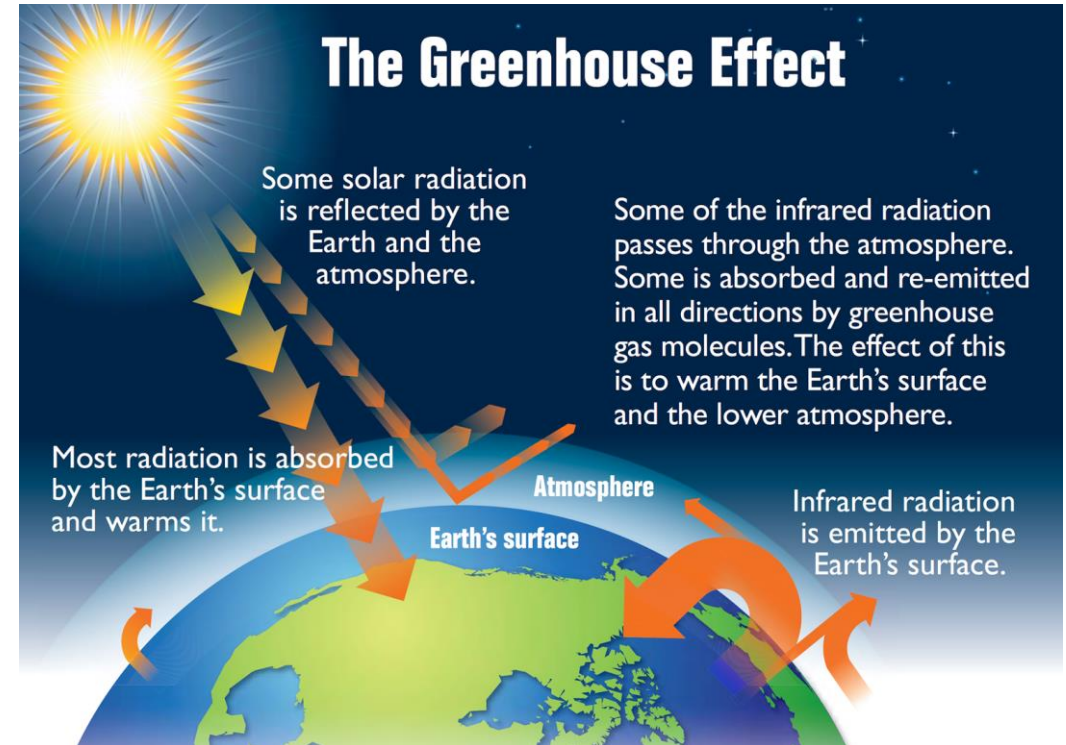
Agenda

1. Greenhouse Gas and Inventory 101
2. Inventory and Forecasting Importance
3. Inventory Results
4. Inventory Comparison
5. Key Takeaways & Principles



What is a greenhouse gas?

- “GHG” for short
- A gas that acts like the glass in a greenhouse, trapping the sun’s heat near the earth’s surface
- GHG emissions from human activities are largely responsible for our changing climate



Primary types of GHGs

GHG	Global Warming Potential (GWP)
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265
Hydrofluorocarbons (HFCs)	116-12,400 (varies based on type)
Perfluorocarbons (PFCs)	6,630-11,100 (varies based on type)
Sulfur Hexafluoride (SF ₆)	23,500

GHG Emissions are typically reported as Carbon Dioxide-Equivalent (CO₂e)

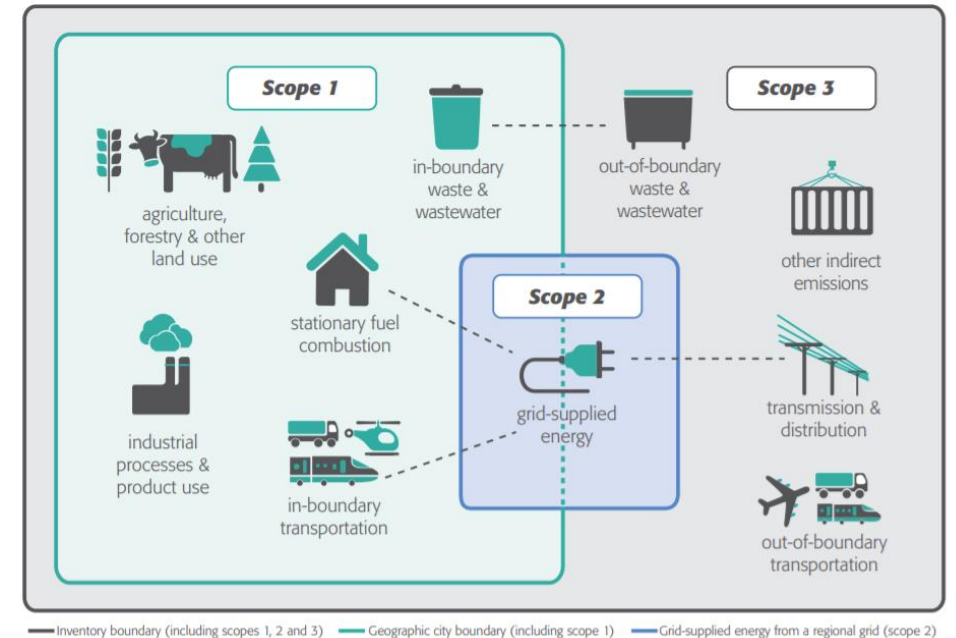


GHG Inventory Scopes

- **Scope 1:** Direct emissions
- **Scope 2:** Indirect emissions from electricity consumption
- **Scope 3:** All other indirect emissions (exported waste, out-of-boundary transportation, etc.)

Information-only / optional items:

- Biofuels, ozone depleting substances, carbon offsets, Renewable Energy Credits (RECs)



What is a community-wide GHG inventory?

Although communitywide GHG inventories do not necessarily include all of these activities, these are the majority of emissions-generating activities that might be included:

- Stationary energy use (e.g. buildings)
 - Electricity
 - Natural Gas
 - Other fuels (propane, kerosene, etc)
- Mobile fuel use (gas and diesel)
 - Vehicles
 - Off-road equipment
 - Aviation
 - Waterborne transportation
- Industrial processes
- Solid waste decomposition/combustion
- Wastewater treatment (such as digester gas combustion or nitrogen discharge)
- Agriculture, forestry, and land use
- Fugitive emissions

What is a local government operations GHG inventory?

The local government operations (LGO) protocol requires local governments to quantify and report all sources of GHG emissions they control. In Hollywood, those sectors and activities are:

- Buildings & facilities
 - Electricity
 - Natural gas
- Mobile fuel use
 - On-road vehicle fleet
 - Off-road vehicles and equipment
 - Employee commute
- Solid waste generation
- Wastewater treatment processes
 - Process nitrous oxide from wastewater treatment and effluent discharge
 - Digester gas combustion and flaring
 - Energy use
- Fugitive emissions

How are GHG emissions calculated?

Activity Data x Emissions Factor = Emissions Estimate

Activity Data	Emissions Factor	Emissions
Electricity Consumption (kilowatt hours)	CO ₂ emitted/kWh	CO ₂ emitted
Natural Gas Consumption (therms)	CO ₂ emitted/therm	CO ₂ emitted
Gasoline/Diesel Consumption (gallons)	CO ₂ emitted /gallon	CO ₂ emitted
Solid Waste Generated (tons)	CH ₄ emitted/ton of waste	CH ₄ emitted

Why is a GHG inventory important?

- This is a foundational element of our Sustainability Action Plan
- Our GHG inventory allows our community to:
 - Forecast business-as-usual emissions
 - Create emissions reduction targets
 - Model potential reduction scenarios
 - Monitor emissions reduction progress
 - Make informed decisions on mitigation
 - Demonstrate accountability and leadership
 - Motivate community action
 - Recognize GHG emissions performance relative to similar communities



ICLEI Five Milestones
for Climate Mitigation

Why is a GHG inventory important?

- Create emissions reduction targets - **Science Based Targets**
 - Measurable, actionable, and time-bound climate targets
 - Aligned with:
 - Earth's limits (1.5°C)
 - The global need for 50% reduction by 2030 and net zero by 2050
 - City of Hollywood Sustainability Action Plan
 - Southeast Florida Regional Climate Action Plan (RCAP 3.0)
 - Societal sustainability goals
 - A 2030 target that reflects maximum effort toward or beyond a fair share of 50% CO2 reductions by 2030

Why is a GHG forecast important?

- Another foundational element of our Sustainability Action Plan
- Projects future emissions based on a Business-as-usual scenario

Business-As-Usual= “on the books” expected emissions reductions/growth before reduction strategies are enacted

Examples: fuel efficiency standards for on-road vehicles, grid decarbonization, population growth

- GHG reduction strategies (e.g., energy efficiency) are then applied to forecasted emissions



ICLEI Five Milestones
for Climate Mitigation

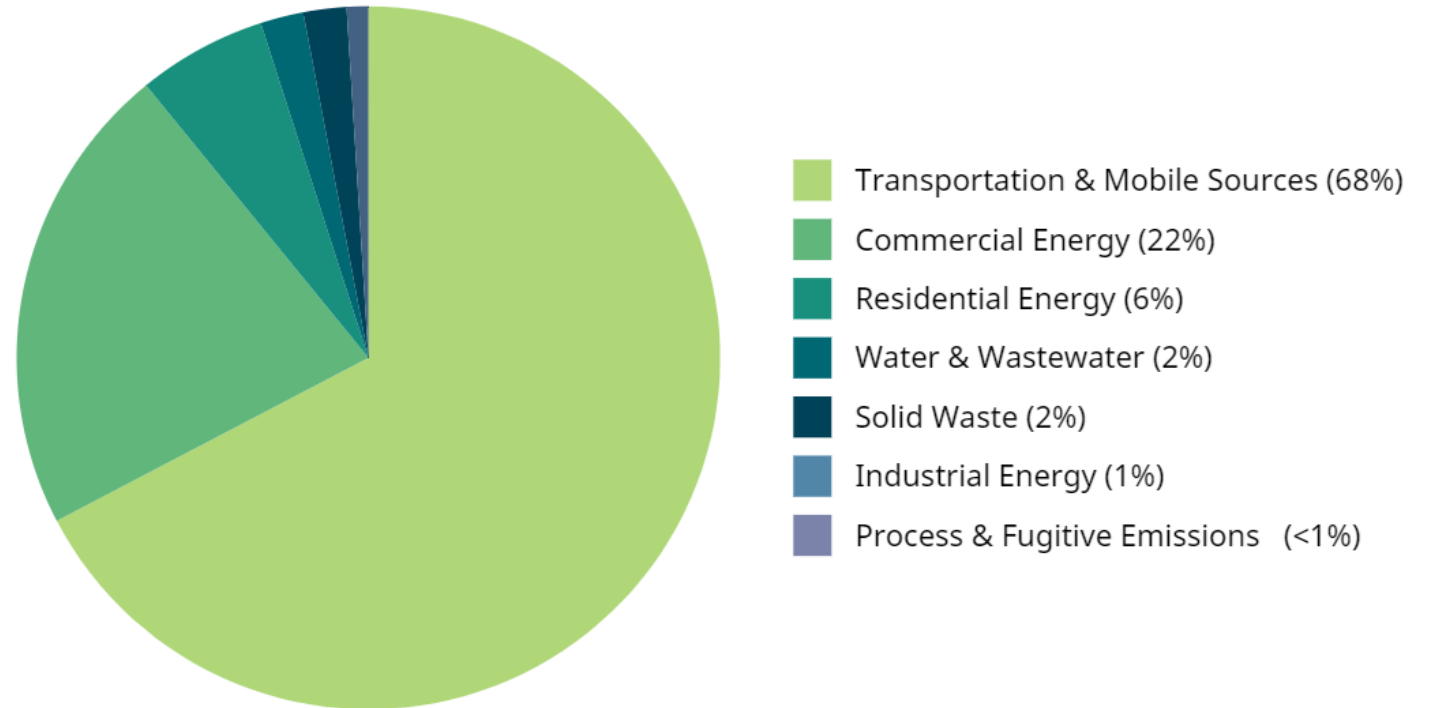
Inventory Results - 2019 Community-Wide

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
Residential Energy Total				47,315
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
Commercial Energy Total				186,211
Industrial Energy	Grid Electricity - FPL	19,779,180	kWh	6,004
Industrial Energy Total				6,004
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

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	
Transportation & Mobile Sources Total				581,171
Solid Waste	Waste Generation	46,813	Tons	14,222
Solid Waste Total				14,222
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

Inventory Results - 2019 Community-Wide

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
Water & Wastewater Total				15,634
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution	7,070,675	Therms	1,227
Process & Fugitive Emissions Total				1,227
Total Gross Emissions				851,784
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
Forests and Trees Total				-10559
Total Emissions with Sequestration				841,225



Inventory Results - 2021 Community-Wide

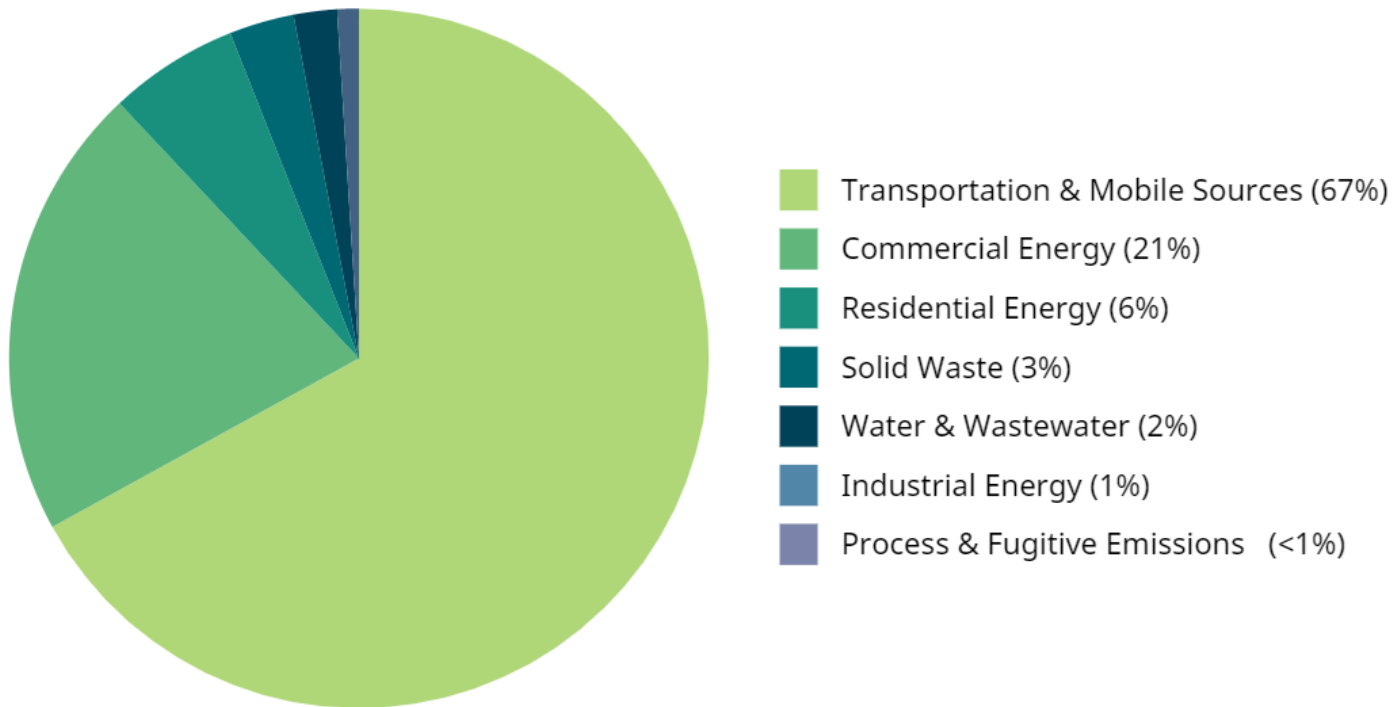
Sector	Fuel or Source	2019 Usage	Usage Unit	2019 Emissions (Mt CO2e)
Residential Energy	Grid Electricity - FPL	132,504,836	kWh	39,666
	Natural Gas - TECO	1,093,129	Therms	5,814
	Distillate Fuel Oil No.2	31	MMBtu	2
	Propane	29,252	MMBtu	1,815
Residential Energy Total				47,297
Commercial Energy	Grid Electricity - 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
Commercial Energy Total				169,918
Industrial Energy	Grid Electricity - FPL	20,990,374	kWh	6,284
Industrial Energy Total				6,284
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

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
Transportation & Mobile Sources Total				534,135
Solid Waste	Waste Generation	46,964	Tons	21,613
Solid Waste Total				21,613
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

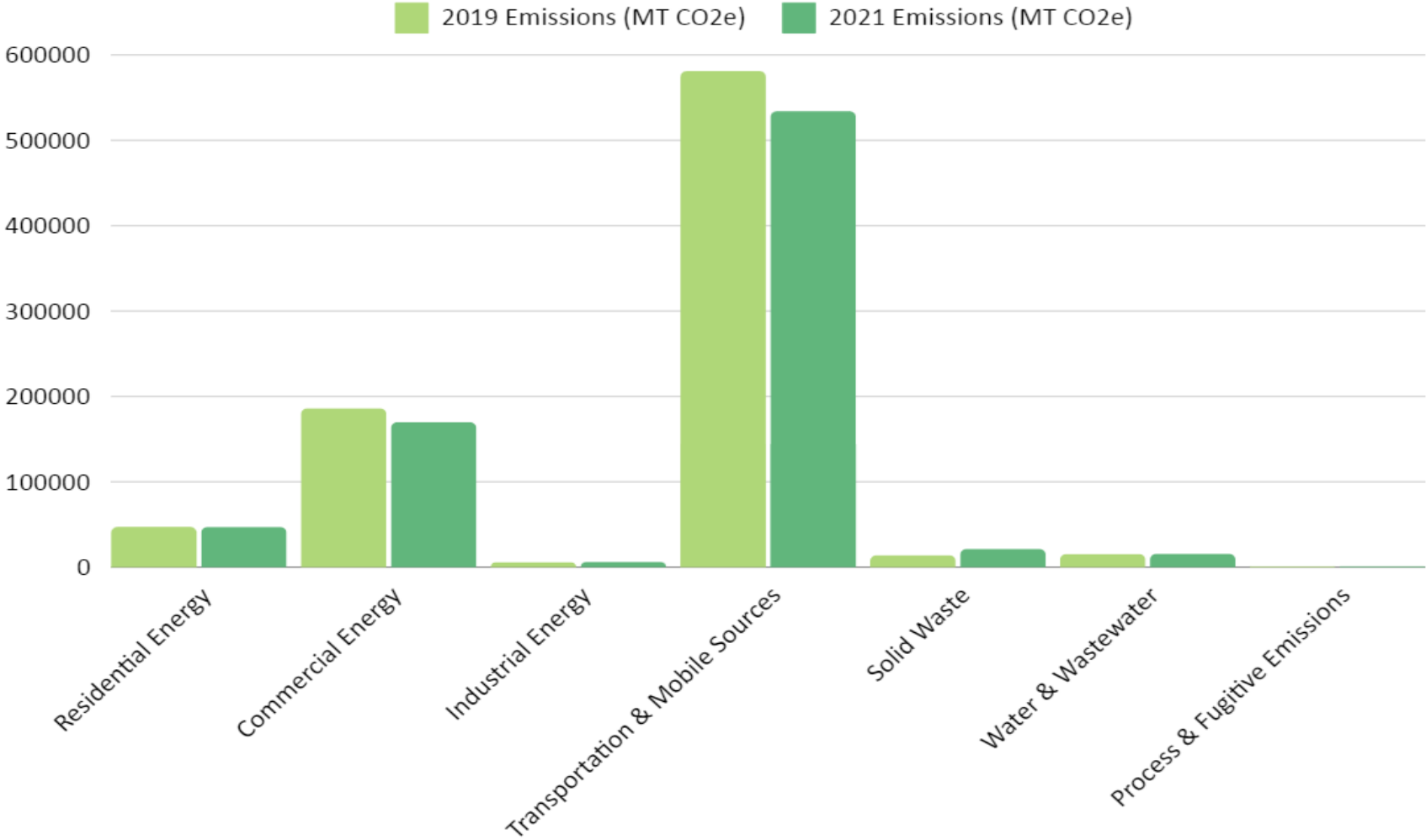


Inventory Results - 2021 Community-Wide

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
Water & Wastewater Total				15,938
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution	7,728,176	Therms	1,341
Process & Fugitive Emissions Total				1,341
Total Gross Emissions				796,526
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
Forests and Trees Total				-10,559
Total Emissions with Sequestration				785,967



Community-Wide 2019 and 2021 Comparison



Inventory Results - 2019 Local Government Operations

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
Buildings & Facilities Total				16,085
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
Vehicle Fleet Total				2,955
Employee Commute	Gasoline - All Employees	6,648,747	Miles	2,640
Employee Commute Travel Total				2,640
Solid Waste	Waste Generation	272	Tons	83
Solid Waste Total				83
Water & Wastewater	Grid Electricity - Hollywood Water Treatment Plant	21,969,047	kWh	6,669
	Natural Gas - Hollywood Water Treatment Plant	198	Therms	1

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
Water & Wastewater Total				7,745
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution - TECO	23,187	Therms	4
Process & Fugitive Emissions Total				4
Total Government Operations Emissions				29,512

Inventory Results - 2019 Local Government Operations



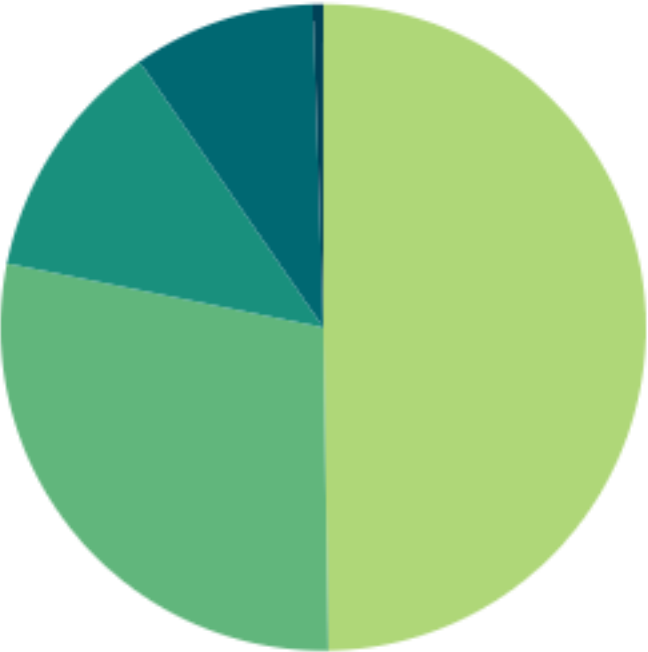
- Buildings & Facilities (55%)
- Water & Wastewater Treatment Facilities (26%)
- Vehicle Fleet (10%)
- Employee Commute (9%)
- Solid Waste Facilities (<1%)
- Process & Fugitive Emissions (<1%)

Inventory Results - 2021 Local Government Operations

Sector	Fuel or Source	2021 Usage	Usage Unit	2021 Emissions (Mt CO2e)
Buildings & Facilities	Grid Electricity - FPL	44,596,772	kWh	13,350
	Natural Gas - TECO	12,659	Therms	67
Buildings & Facilities Total				13,417
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
Vehicle Fleet Total				3,401
Employee Commute	Gasoline - All Employees	6,648,747	Miles	2,520
Employee Commute Travel Total				2,520
Solid Waste	Waste Generation	272	Tons	125
Solid Waste Total				125
Water & Wastewater	Grid Electricity - Hollywood Water Treatment Plant	21,383,178	kWh	6,401

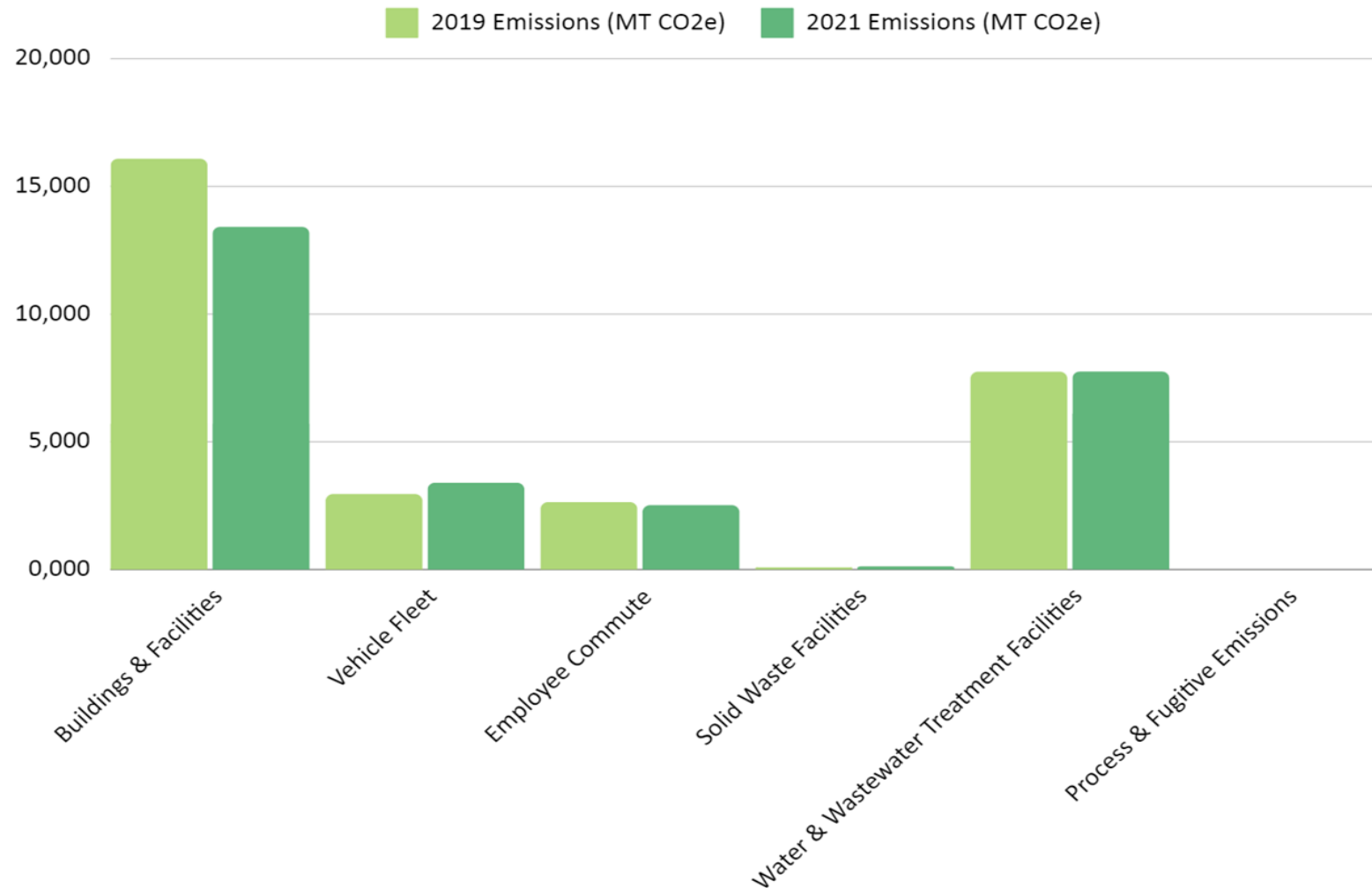
Sector	Fuel or Source	2021 Usage	Usage Unit	2021 Emissions (Mt CO2e)
Water & Wastewater	Process N2O from Wastewater Treatment - Hollywood Wastewater Treatment Plant	314,422	People	333
	Process N2O from Effluent Discharge - Hollywood Wastewater Treatment Plant	1,602	kg N/Day	609
	Digester Gas Flaring	314,422	People	392
	Digester Gas Combustion	314,422	People	20
Water & Wastewater Total				7,755
Process & Fugitive Emissions	Fugitive Emissions from Natural Gas Distribution - TECO	12,659	Therms	2
Process & Fugitive Emissions Total				2
Total Government Operations Emissions				27,220

Inventory Results - 2021 Local Government Operations



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

Local Government Operations 2019 and 2021 Comparison



Science-Based Target Analysis – Emissions Reduction

Per Capita - 62.8%

Absolute - 64.3%

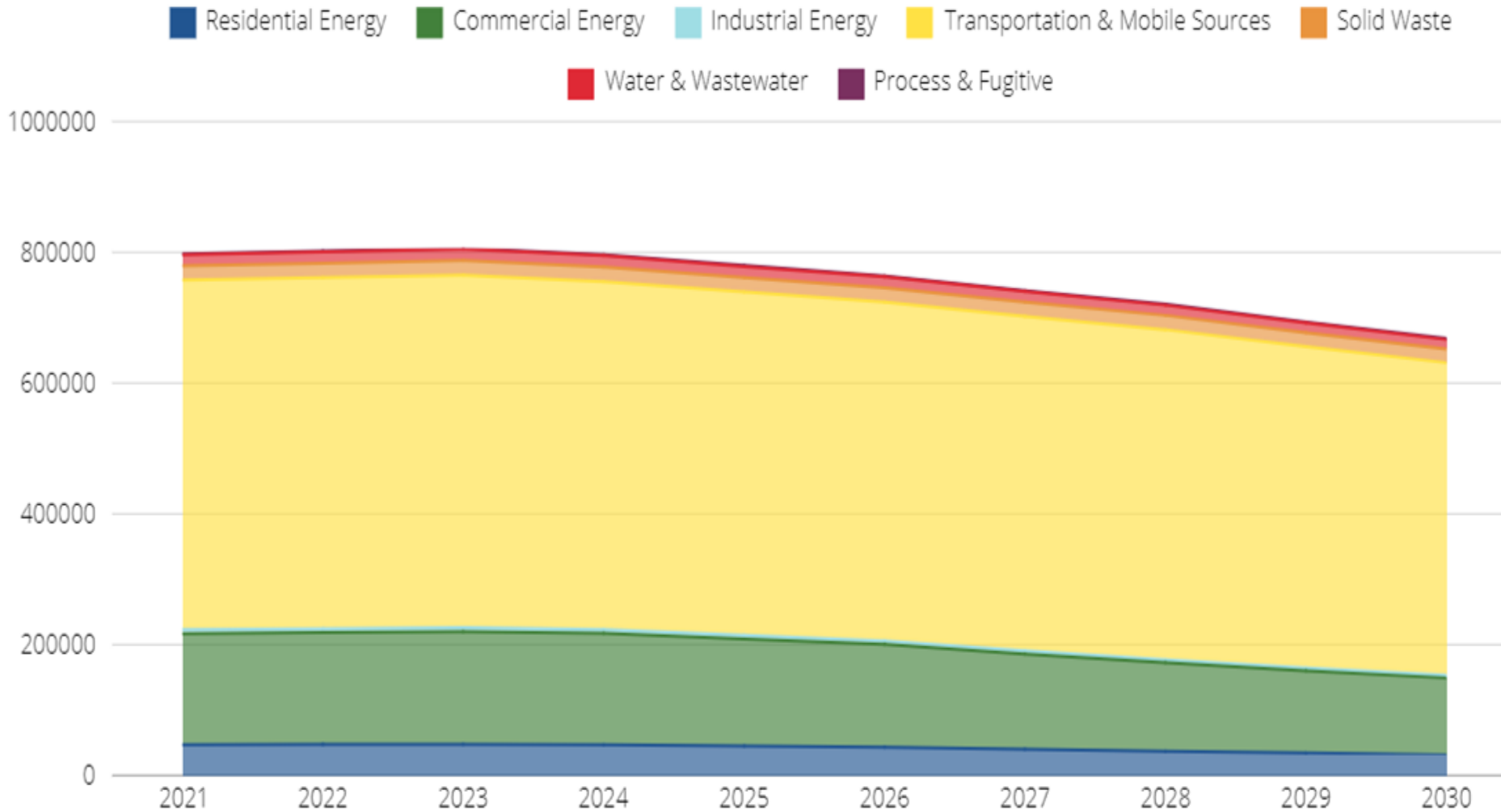
Science-Based Target (SBT)

Science-Based Targets for Emissions Reduction 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 Southeast Florida Regional Climate Action Plan (RCAP 3.0) and Paris Agreement commitment to keep warming below 1.5°C. Community education, involvement, and partnerships will be instrumental to achieve the science-based target.

Hollywood has set a 2030 per capita emissions reduction target of a 62.8% and absolute target of 64.3%. These targets were calculated with the assistance of ICLEI, which used population projections to determine the absolute target and human development index (HDI) to calculate the per capita reduction.



Business-As-Usual Forecast



Business-As-Usual Forecast

The BAU forecast is a projection of emissions through the year 2030. The projected emissions estimates population growth, changes in automotive fuel efficiency standards, and changes to the carbon intensity of grid electricity. Hollywood's 2021 emissions were 796,526 metric tons of carbon dioxide equivalent (MT CO2e). Based on population growth, increasing on-road vehicle fuel efficiency, and utility decarbonization plans, Hollywood's 2030 emissions will be 669,226 CO2e. This is a 16.0% reduction in emissions.



Key Takeaways - Community-Wide

- Transportation is the largest emitting sector in Hollywood at 68% in 2019 and 67% in 2021
 - Emissions in this sector decreased 8.1% between the inventories
- Commercial and residential energy are the next two highest emitting sectors, totaling 28% of the inventory in 2019 and 27% of the inventory in 2021
 - Commercial emissions have decreased by 8.7%, while the change in the residential sector has been negligible across years

Key Takeaways - Community-Wide

Next Steps:

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

Key Takeaways

Local Government Operations

- Buildings & Facilities is the largest emitting sector within the Hollywood government at 55% in 2019 and 49% in 2021
 - Emissions in this sector decreased 16.6% between the inventories
- Water & Wastewater Treatment Facilities is the next highest emitting sector totaling 26% of the inventory in 2019 and 28% in 2021
 - This has experienced very little change in total emissions between both inventories

Key Takeaways

Local Government Operations

Next Steps:

- Buildings and Facilities
 - Building and appliance electrification
 - Improved energy efficiency
- Vehicle Fleet
 - Electric vehicle conversion



Key Principles for Next Steps

1. It is critical to have a **2030 science-based target**.
2. Planning should incorporate rapidly **changing trends**.
3. Programs should take a **holistic approach**, including health, resilience, and equity.



Key Principles for Next Steps (continued)

4. Local government can't do it alone.
Collaboration with State and Regional Partners is essential.
5. Inventories provide the foundation for **informed decisions and transparency.**

Questions?

