Mayor's Office of Climate & Environmental Justice

NYC Greenhouse Gas Inventory

Isabela Brown, Sylvie Binder

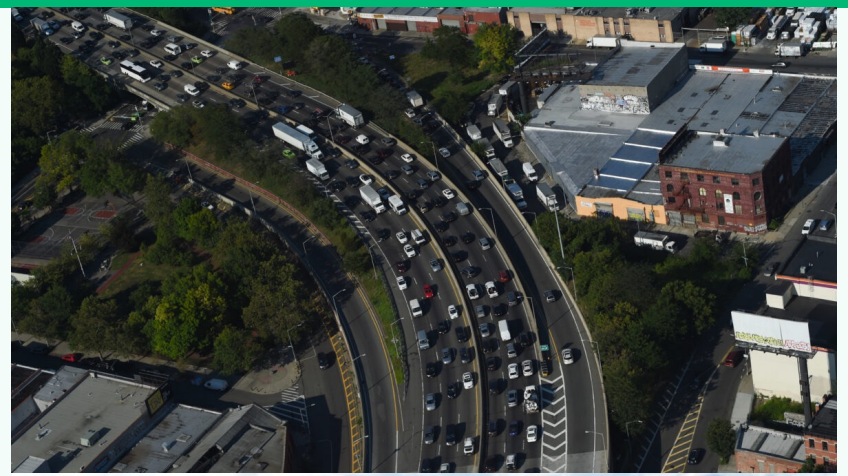
February 1st, 2024

Agenda

- GHG Inventory 101
- Key findings
- City Government
- Citywide
- Reaching our goals

What is a GHG Inventory?

A greenhouse gas (GHG) inventory is a list of emission sources and the associated emissions quantified using standardized methods.



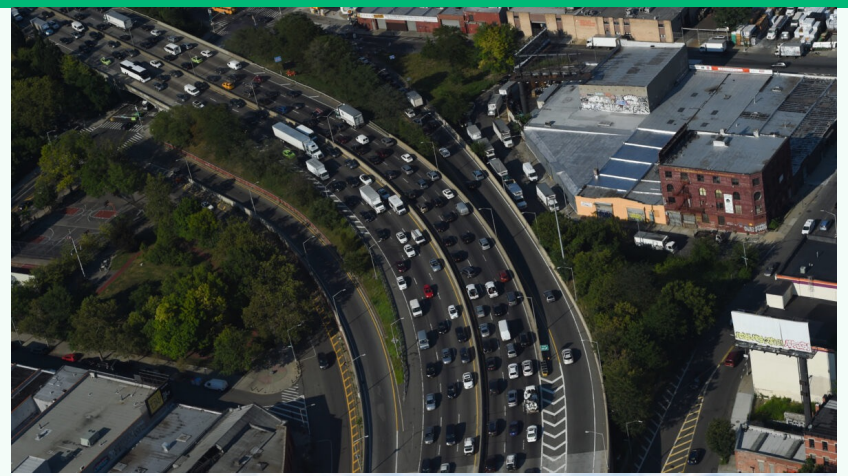
Inventory Basics

Purpose:

- Track the City's progress toward its carbon neutrality goals
- Identify opportunities to reduce emissions
- Support policy development and implementation
- Standardized methods allow for benchmarking against other cities, states, and countries

History:

- Longest running US city with annual GHG inventory reporting
- 17+ years of data: 2005 – 2022



Current GHG Inventories

Required to track Local Law 97 Goals

Per Local Law 22 of 2008

City Government

Reports only activities associated with City government operations which benchmarks the City's progress towards net-zero and our compliance with LL97.

City government emissions must reduce by:
- 40% by 2025
- 50% by 2030
-Carbon neutrality by 2050

Citywide - GPC

Considers emissions from activity within the five boroughs plus imported electricity and waste shipped out of the city.

Citywide emissions must reduce by:
- 40% by 2030
- Carbon Neutrality by 2050

Current GHG Inventories

City Government

Reports only activities associated with City government operations which benchmarks the City's progress towards net-zero and our compliance with LL97.

Citywide - GPC

Considers emissions from activity within the five boroughs plus imported electricity and waste shipped out of the city.

Per Local Law 22 of 2008 and Required to track Local Law 97 Goals

Integrated Citywide & Consumption

Supports MOFP Initiatives. Helps us understand the emissions impacts from our consumption of goods and services no matter where those emissions take place.

Citywide - CLCPA

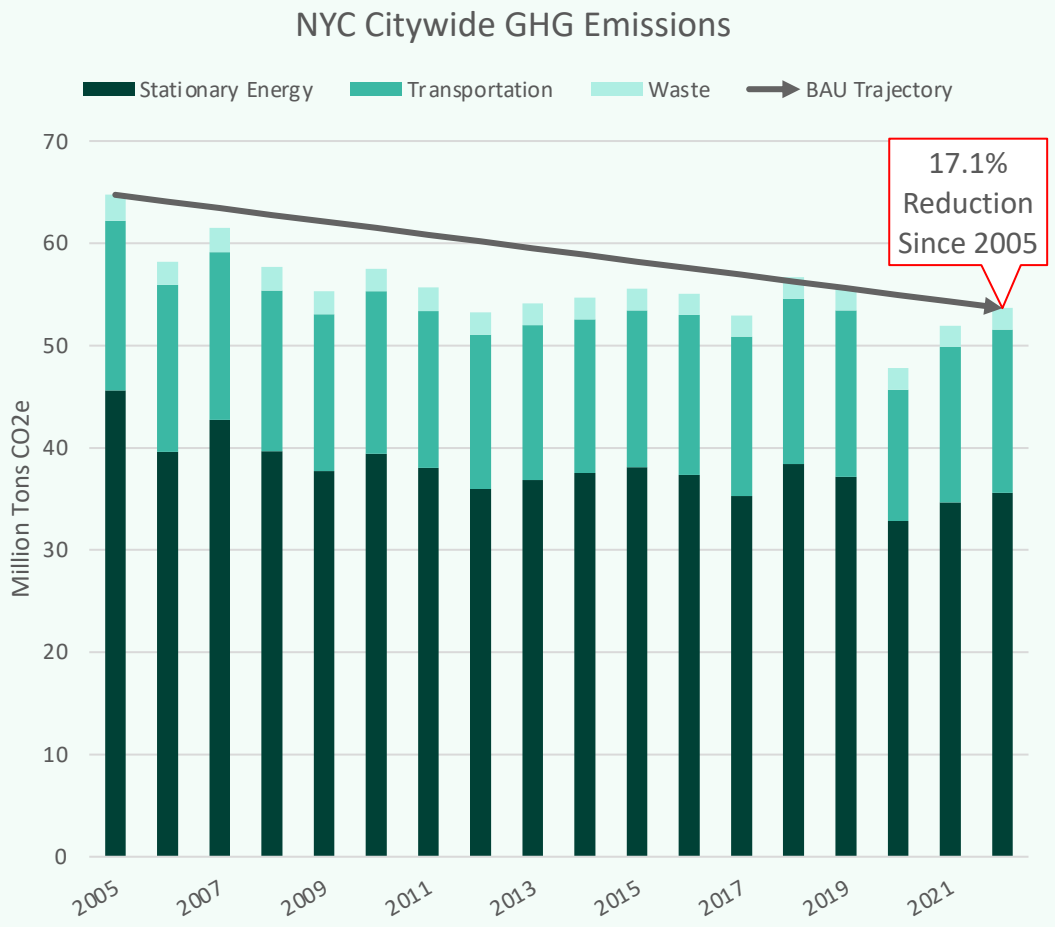
Aligns NYC reporting with NY State methods. Covers all Citywide-GPC sources & fugitive energy-related emissions, while highlighting methane's near-term warming impacts.

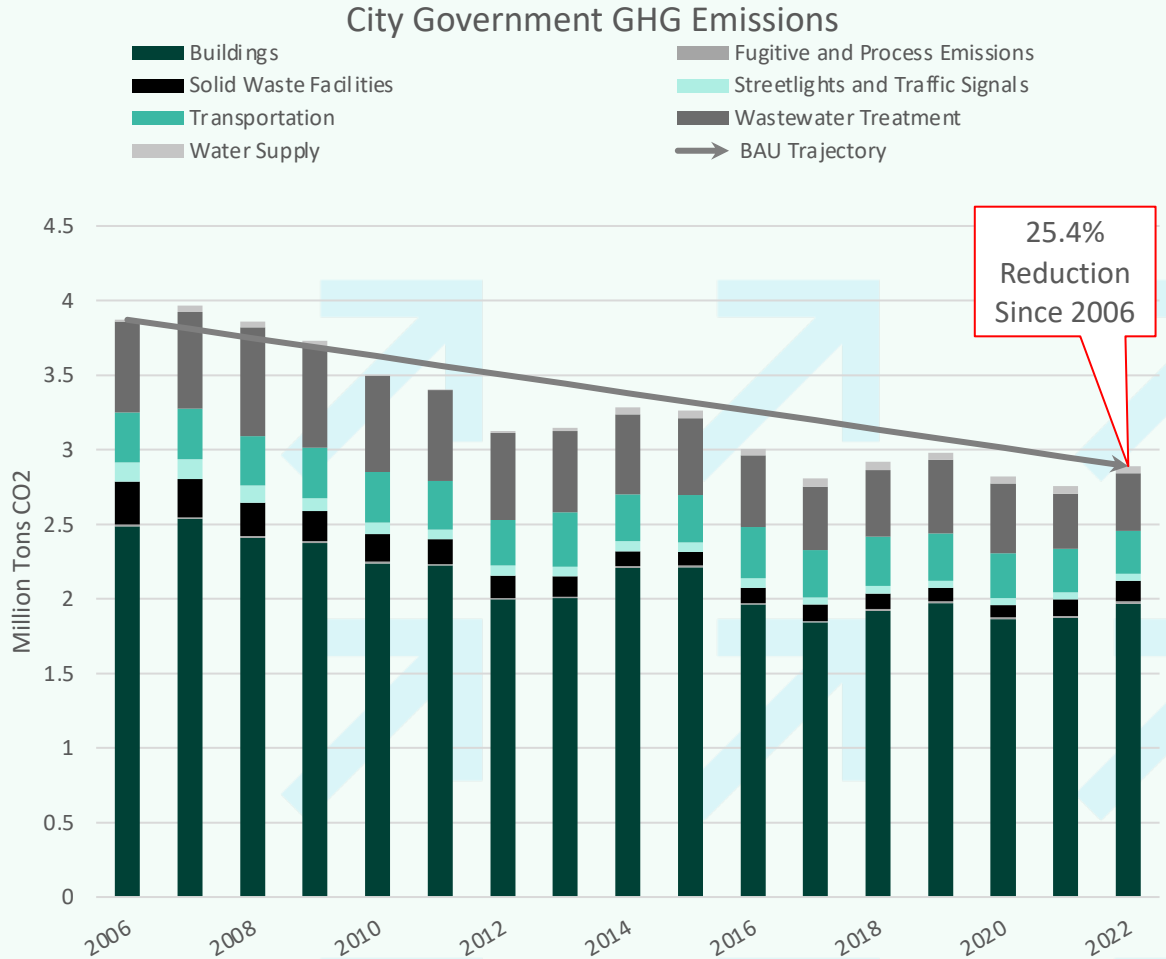
New Findings & Not Mandated under Local Law

Key Findings

Leading by Example:

City government is trending better than citywide in relative emissions reductions





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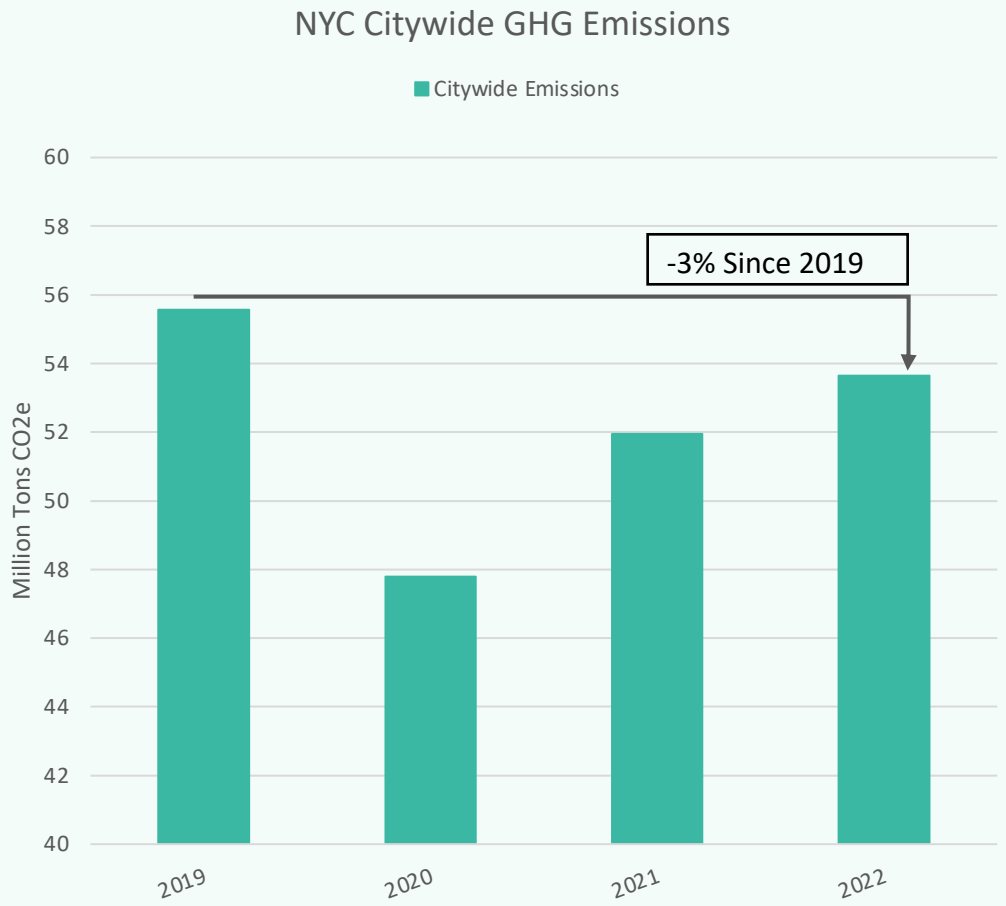
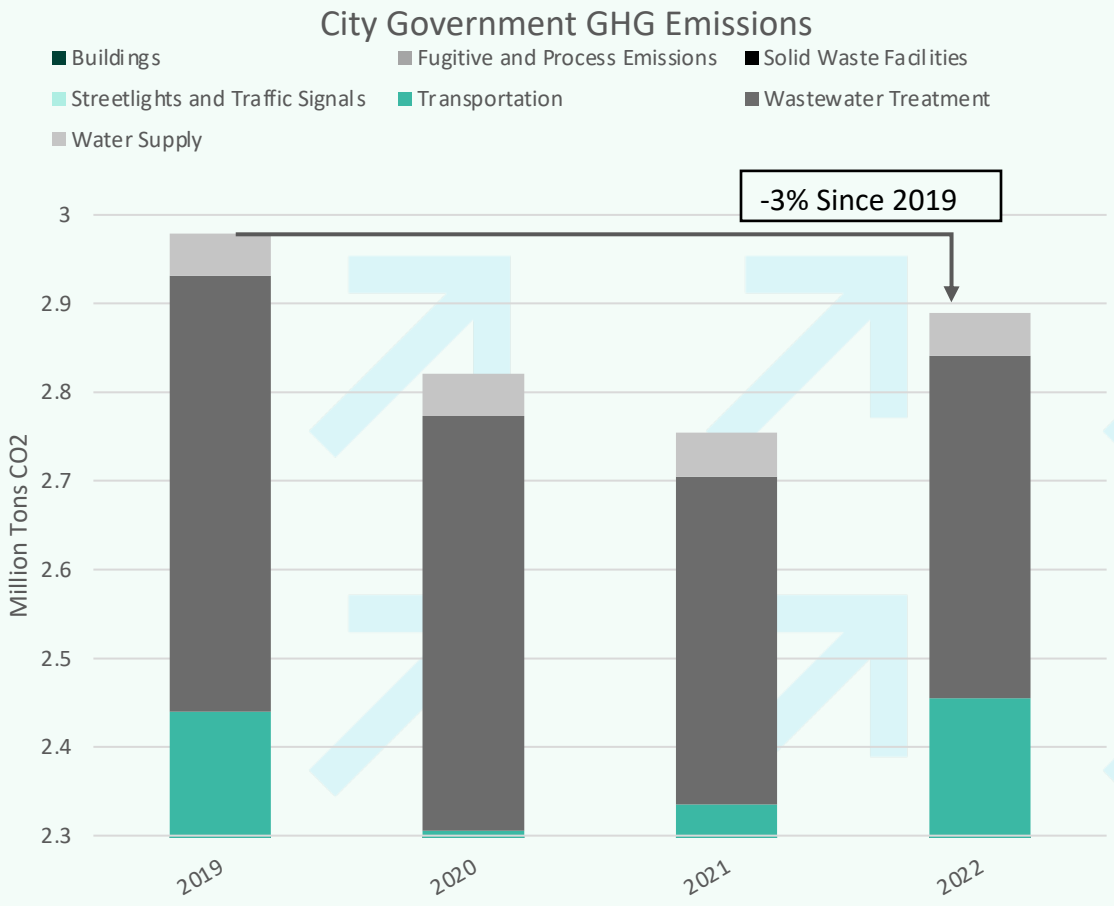
Emissions are Down

Total GHG emissions remain below pre-pandemic levels





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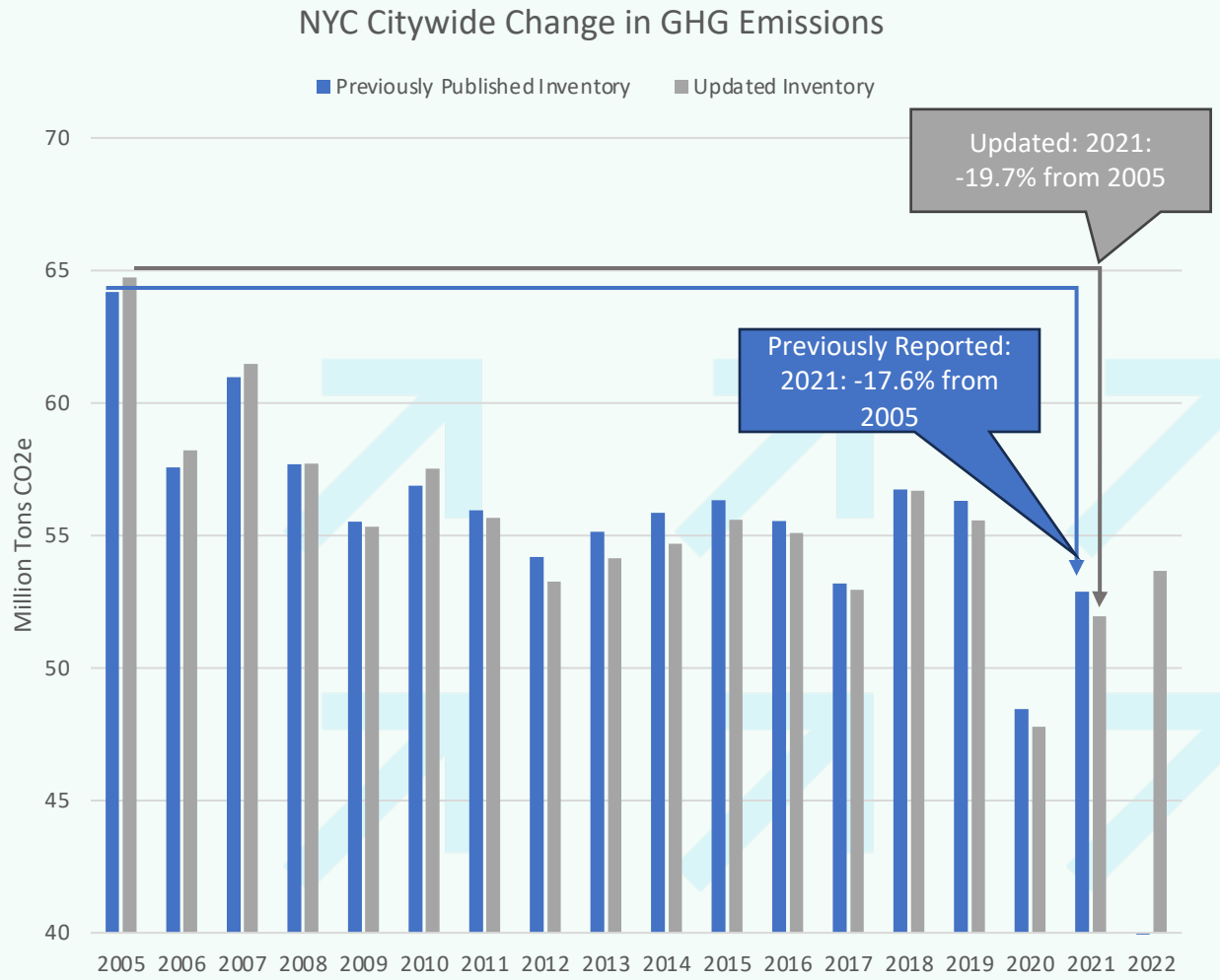
We've Updated our Numbers

Transportation Updates:

- Updated citywide transportation modeling to be informed by city-specific bridge and tunnel crossings for inventory years 2005-2019

Electricity Carbon Intensity Updates:

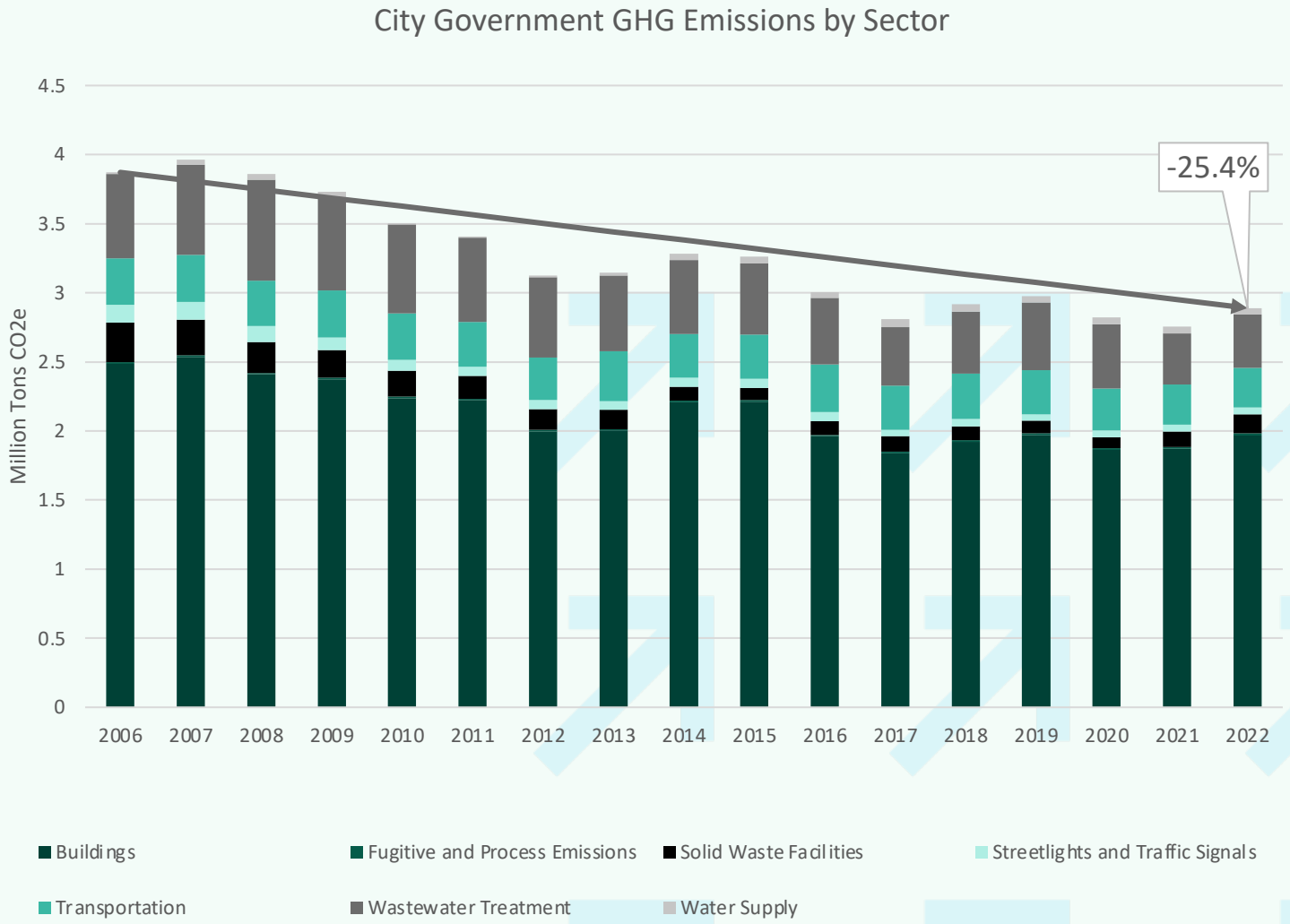
- Accounted for Indian Point's activity in 2021 before its final closure
- Incorporated IPCC's Fifth Annual Reported Global Warming Potential values
- Incorporated Advanced Generator settings into electricity grid coefficient modeling



City Governmernt

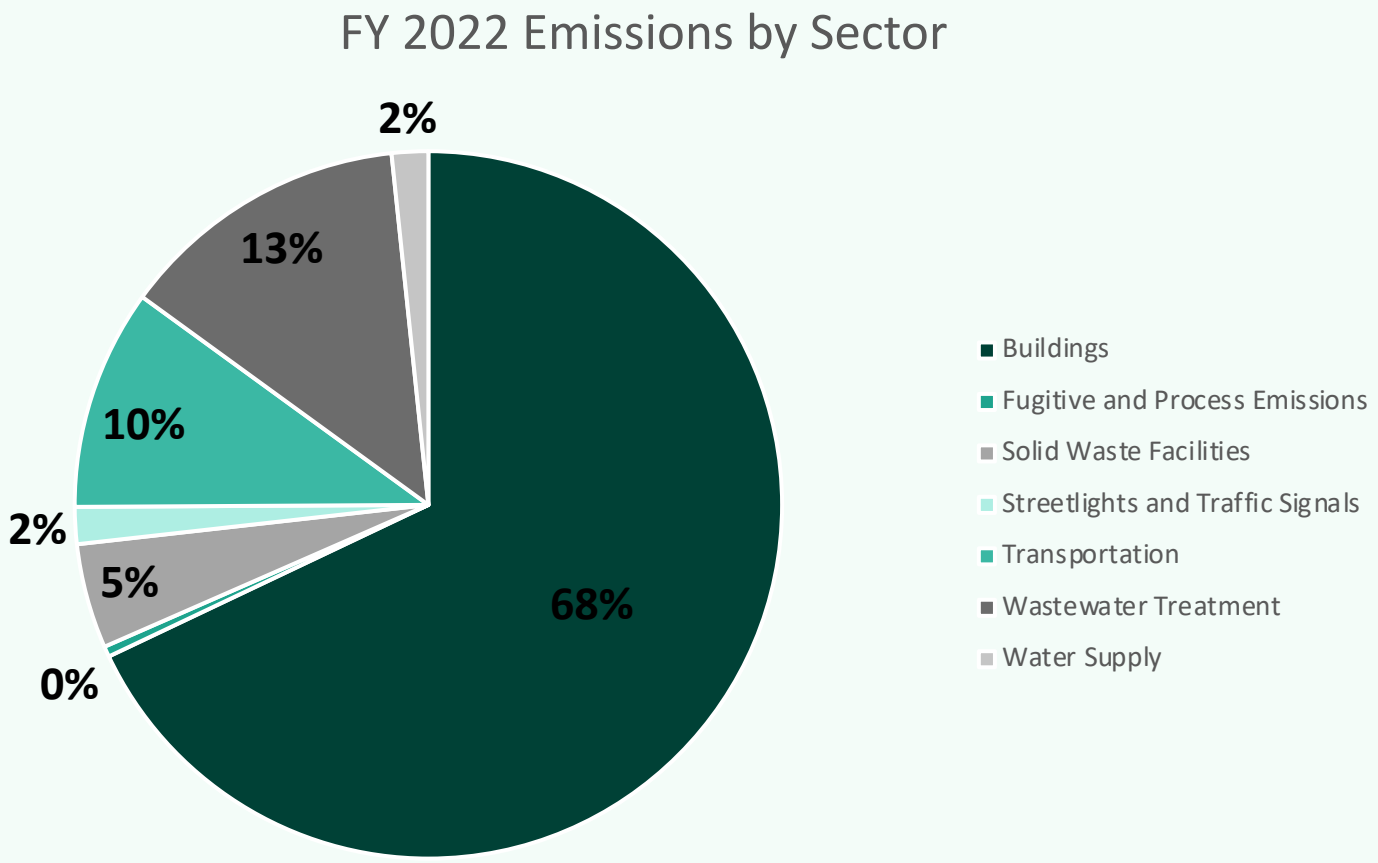
City Government Inventory

- Roughly 10% of the 25% reduction since baseline can be attributed to overall reduction in electricity grid emissivity



City Government

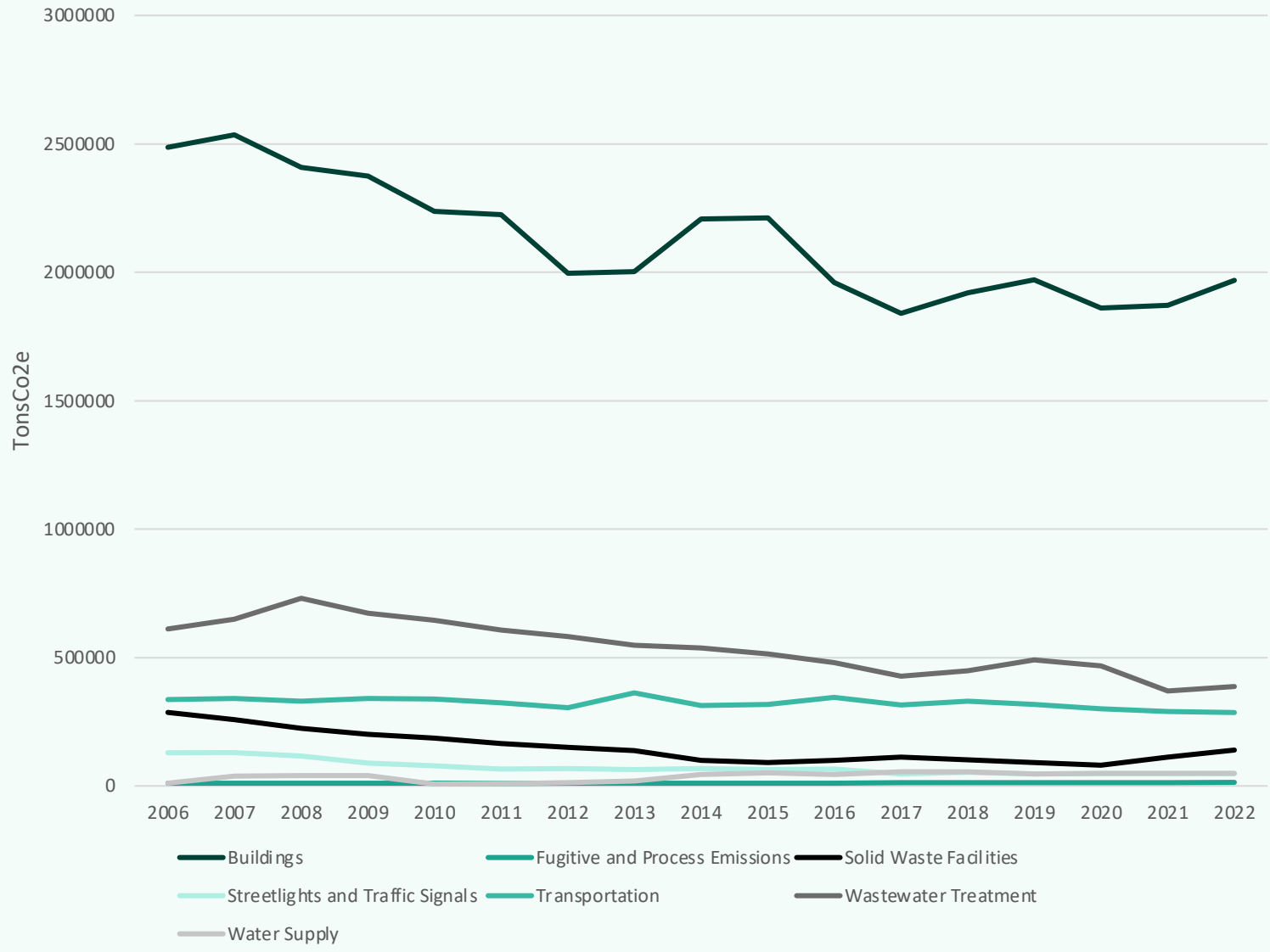
- Buildings are the largest source of municipal emissions (FY22 Municipal Building Emissions 68% of total)
- Wastewater Treatment (13%) and Transportation (10%) sectors are the second and third largest sources of emissions
- LL97 and Electrification of City Fleet



City Government

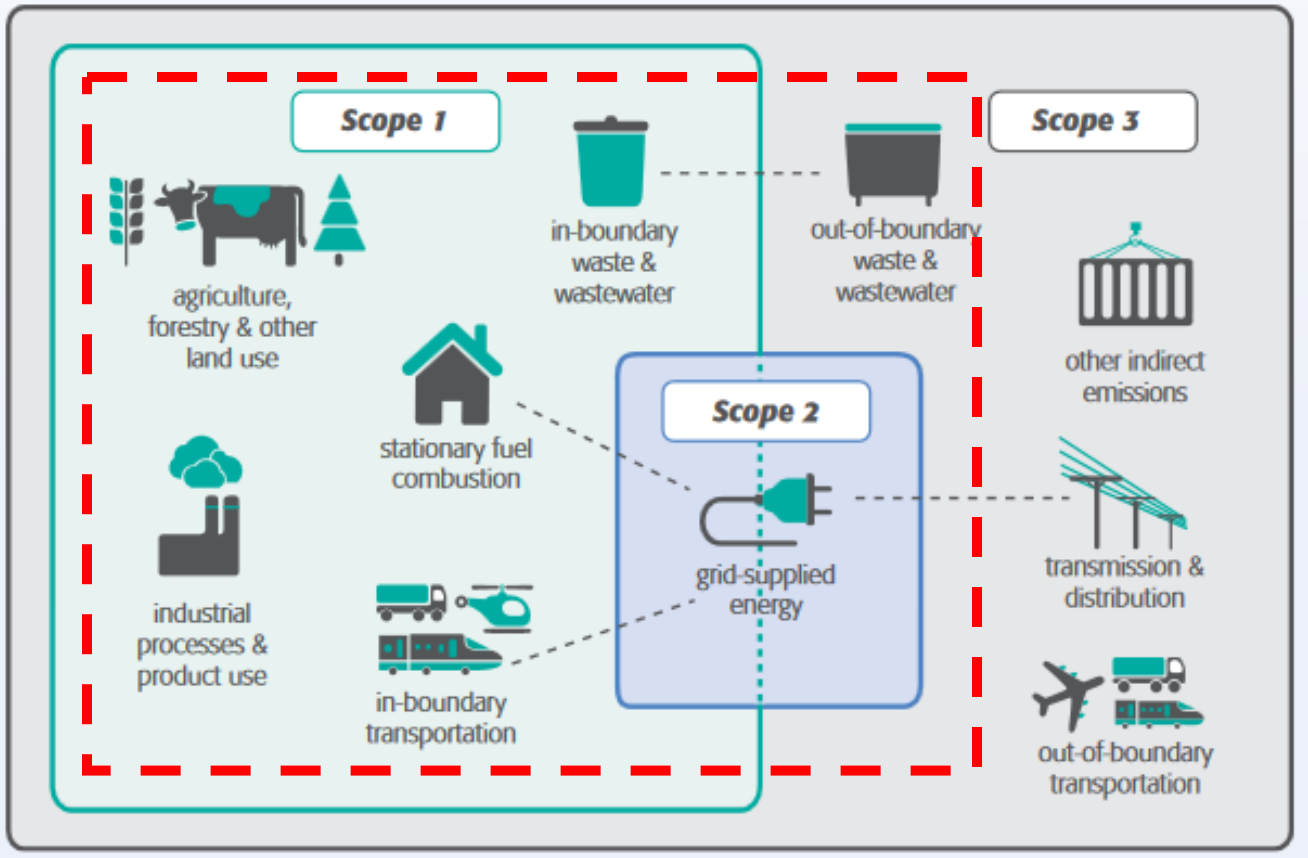
- Buildings have greatest overall emissions decrease
  - #6 fuel oil eliminated, energy efficiency gains, natural gas
- Wastewater Treatment
  - #4 fuel oil eliminated, decrease in steam, transition to electricity
- Transportation
  - Reduction in gasoline, incorporation of biodiesel in gasoline mix (E10), 19% of light duty fleet is electric
- Streetlights saw greatest % decrease in emissions from energy efficiency upgrades

Sector	% change since baseline
Buildings	-21%
Fugitive and process emissions	22%
Solid waste facilities	-52%
Streetlights and traffic signals	-62%
Transportation	-15%
Wastewater treatment	-37%
Water supply	356%



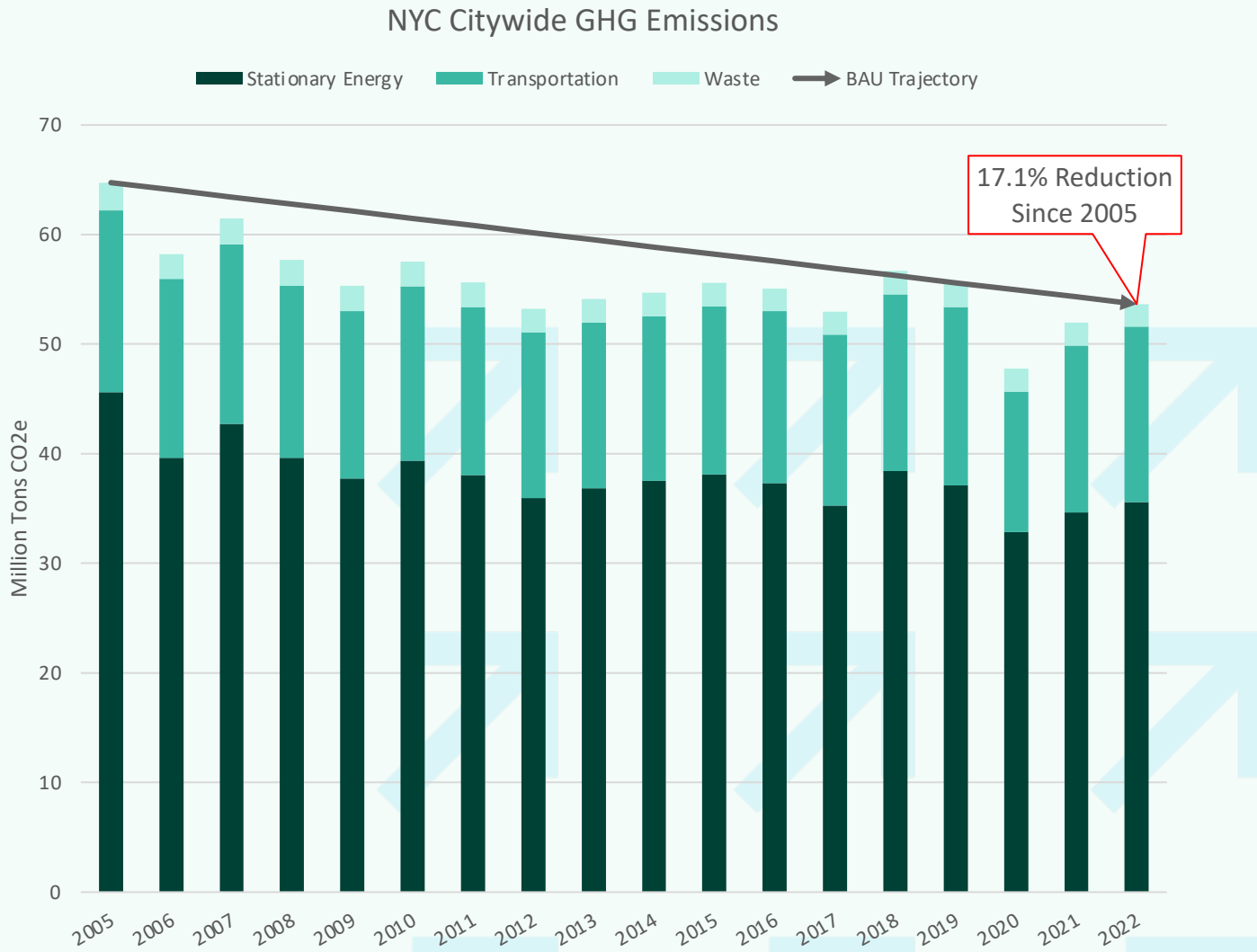
Citywide

Reporting boundary includes activity w/in the five boroughs + imported electricity



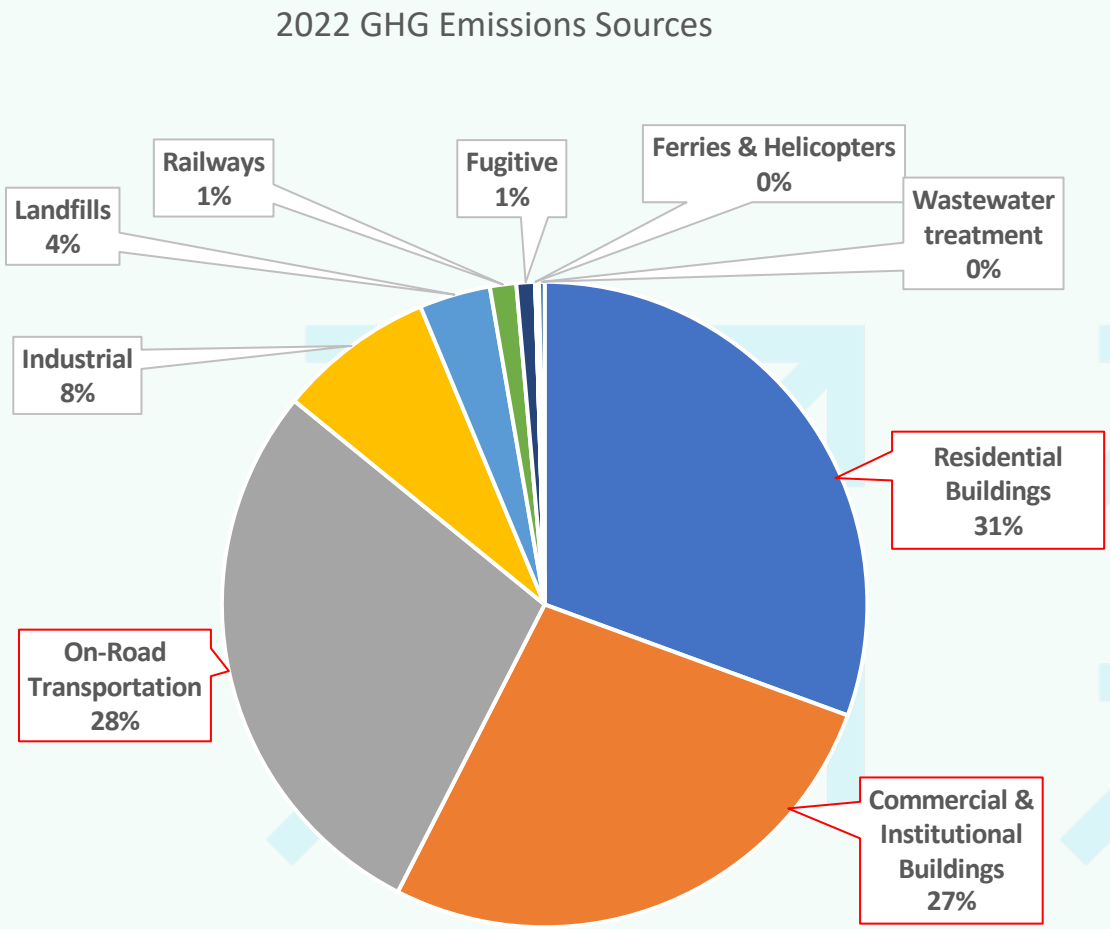
Citywide GHG Emissions Have Guided NYC Climate Policy

Sectors	Buildings	Transportation	Waste
Percent of 2022 Emissions	66%	30%	4%
Policies	• Benchmarking • Building Energy Grades • Local Law 97	• School Bus Electrification • Select Bus Service • Green Rides	• Organics • Anaerobic Digestion
Percent Reduction from 2005	- 22%	- 3%	- 18%



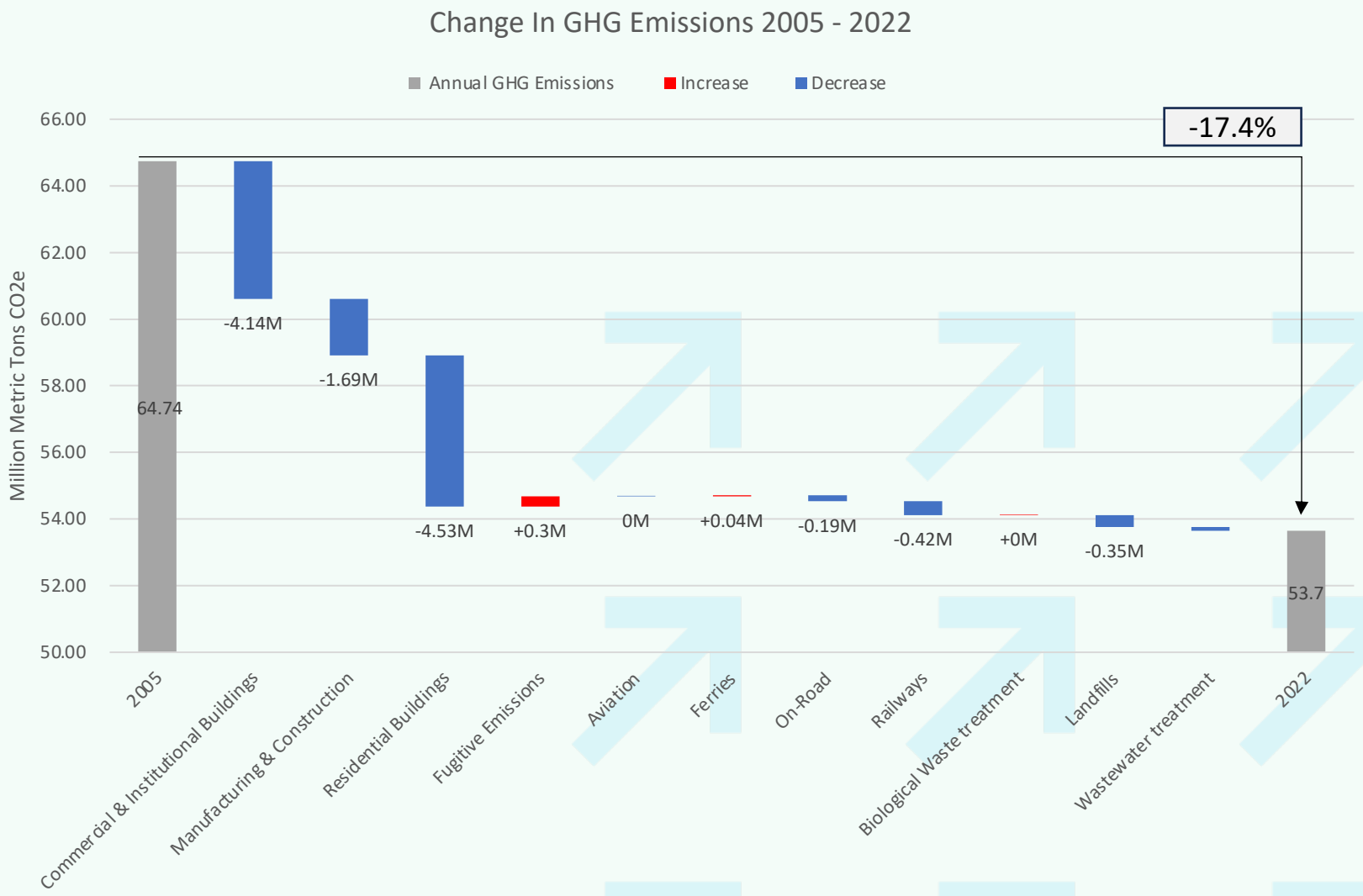
Citywide GHG Emissions

- 2022 Emissions Source Distribution:
  - 66% Buildings
  - 30% Transportation
  - 4% Waste
- Largest Sources of Emissions:
  - Residential Buildings
  - Commercial & Institutional Buildings
  - On-Road Transportation



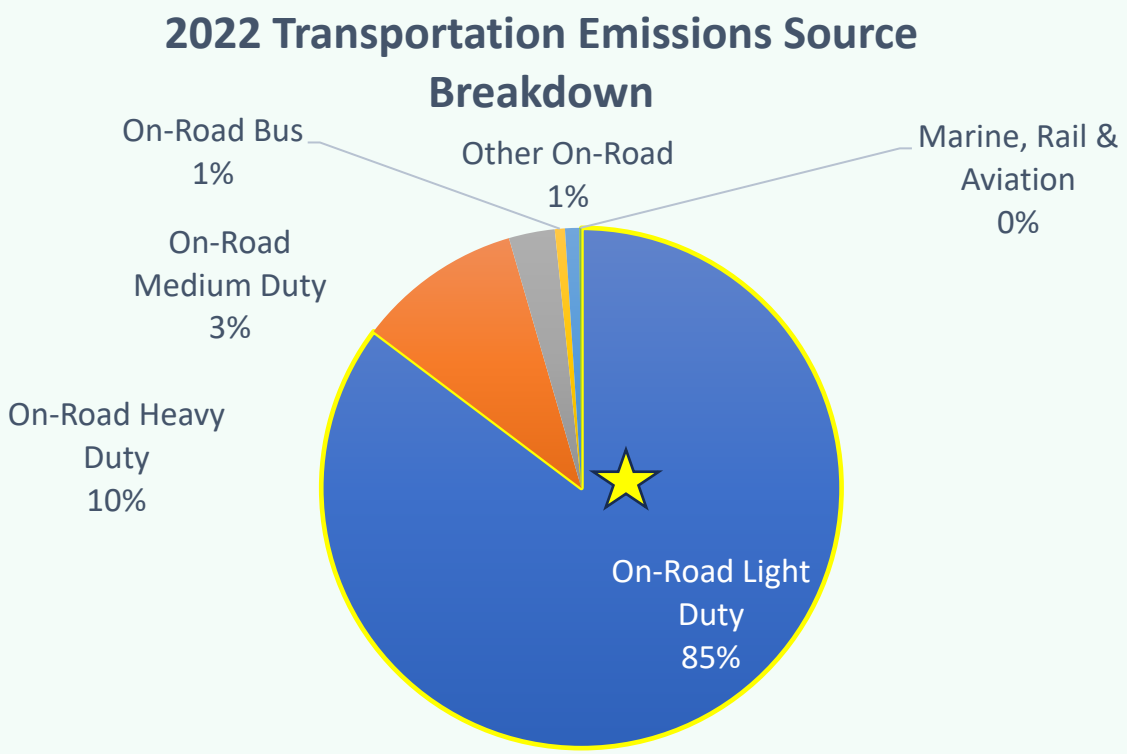
Drivers of Citywide Emissions Changes

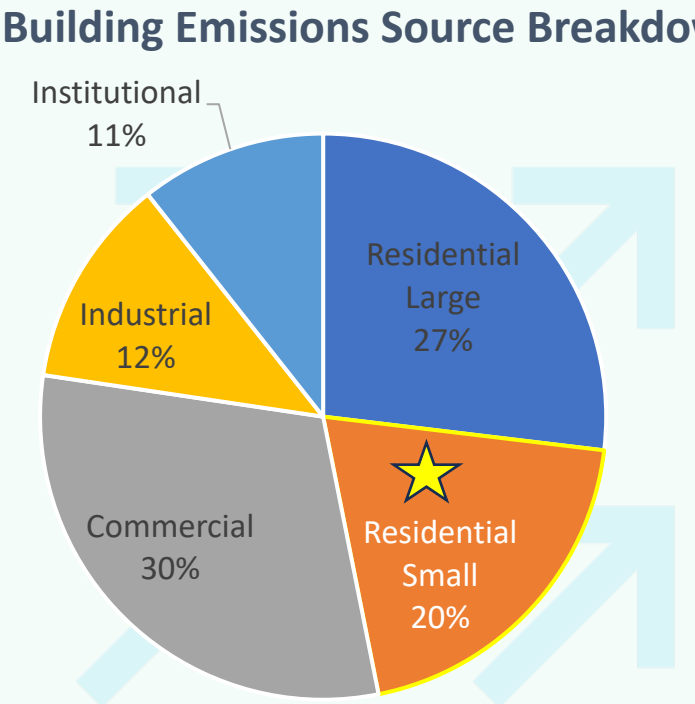
- Drivers of reduction from 2005:
  - Fuel Oil Phase Out
  - Electrification
  - More “efficient” grid



More Data Needed:

We cannot achieve reduction goals without access to more on-road transportation and small buildings data

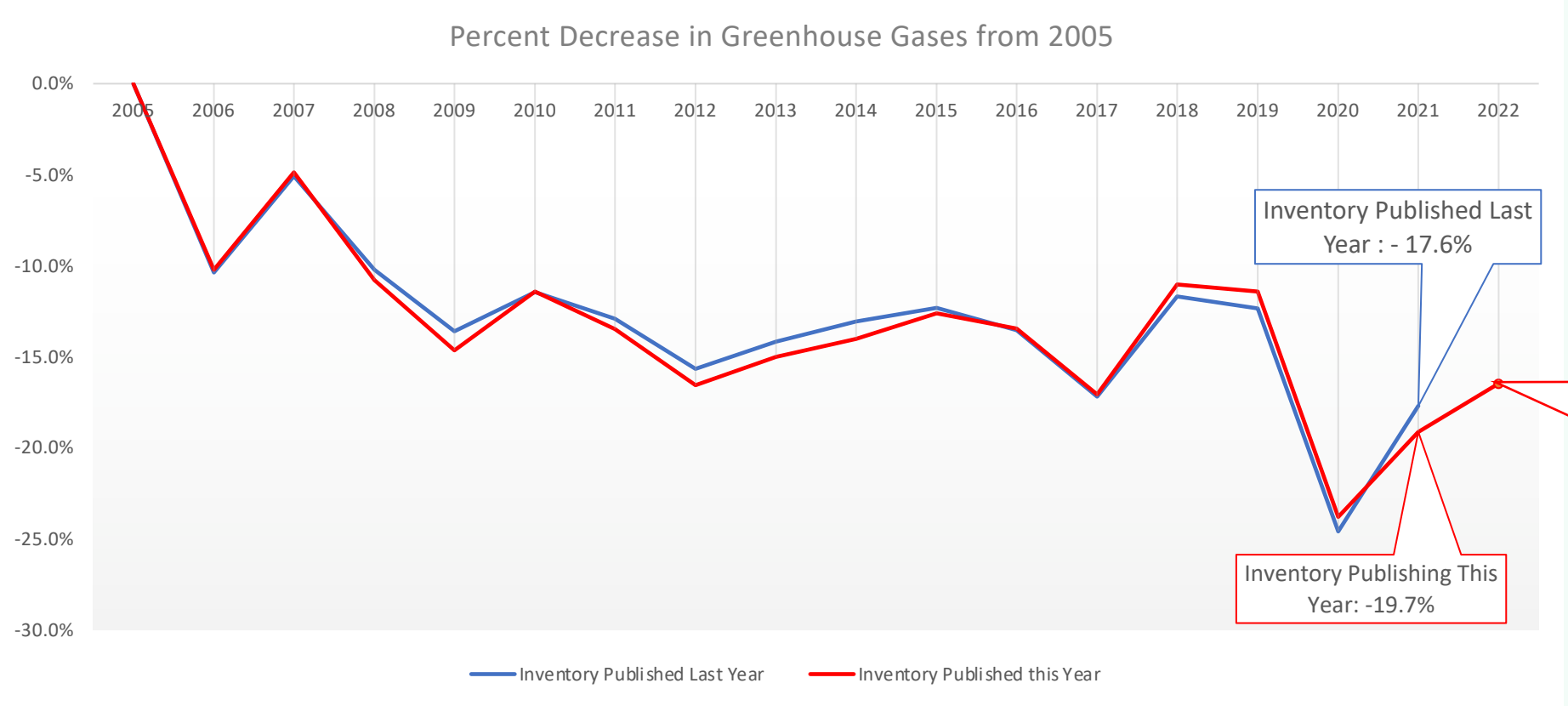




Citywide Transportation

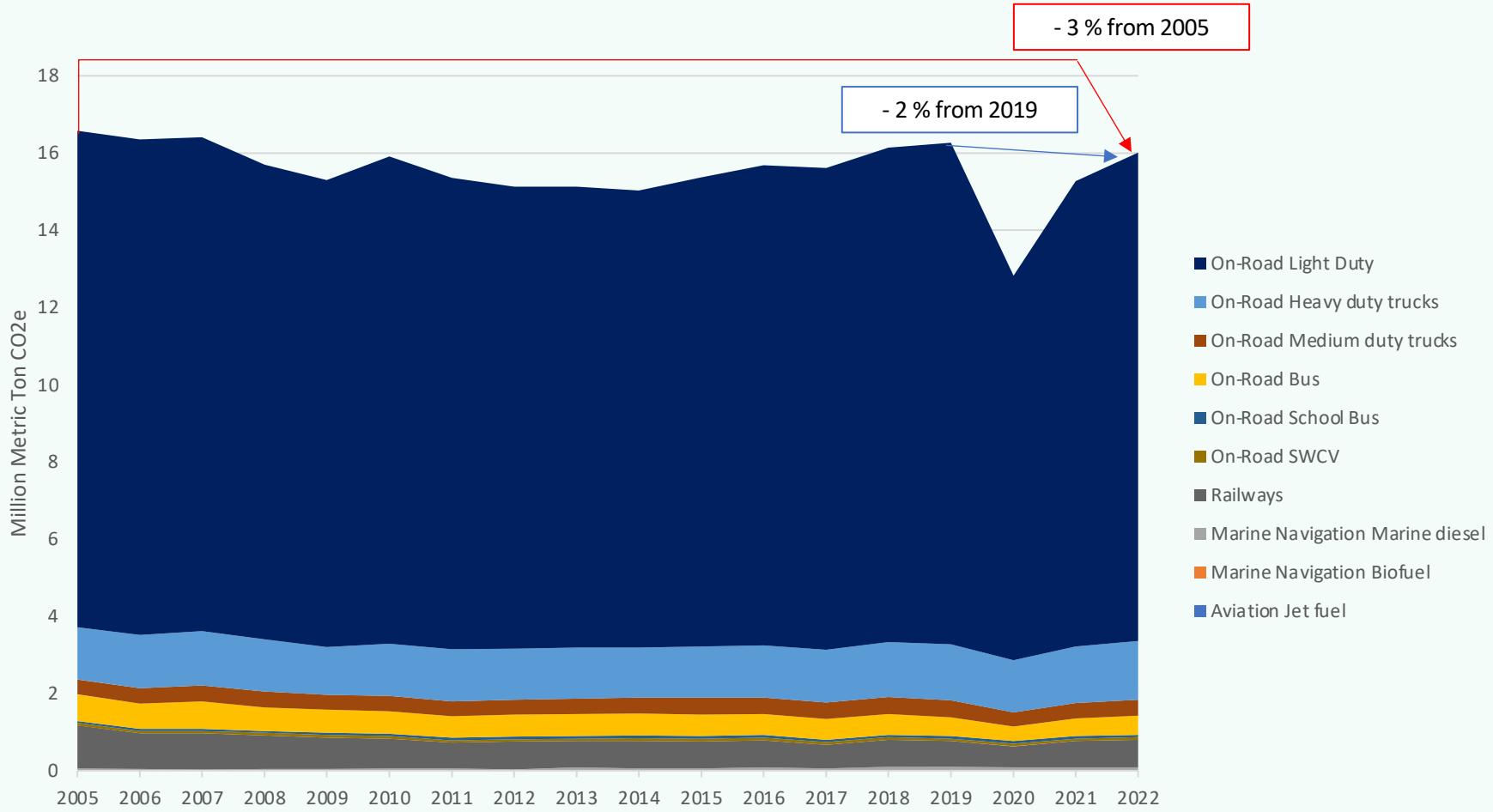
Updates to Transportation Model

Call for collaboration!



Citywide Transportation Emissions

Data Gap: We need fleet-specific fuel usage data for larger fleets

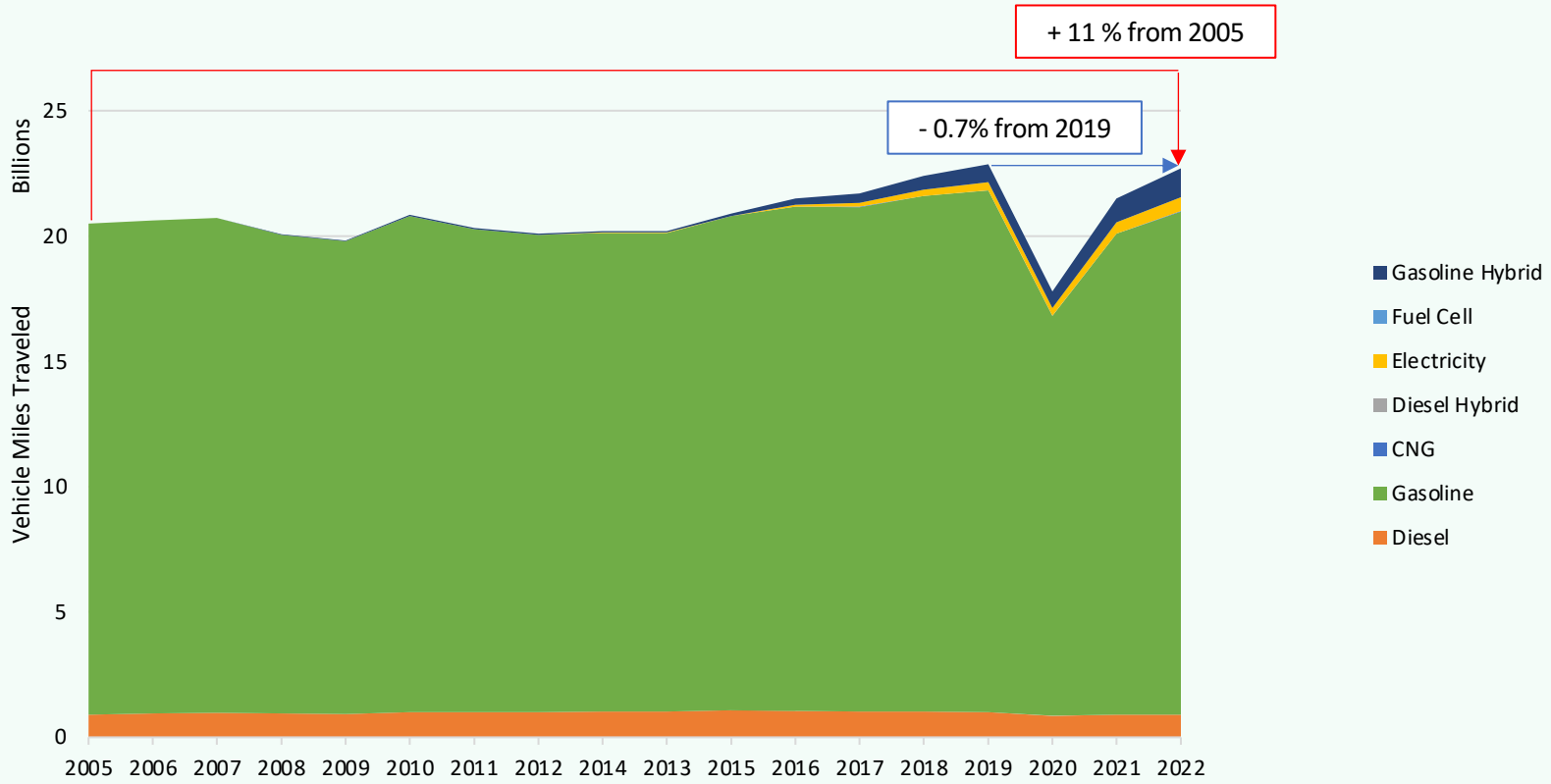


Citywide Miles Traveled by Fuel Type

Data Gap: We need fleet-specific fuel usage data for larger fleets

We've returned to pre-pandemic levels of mileage across the city

2.5% of the citywide fleet is electric

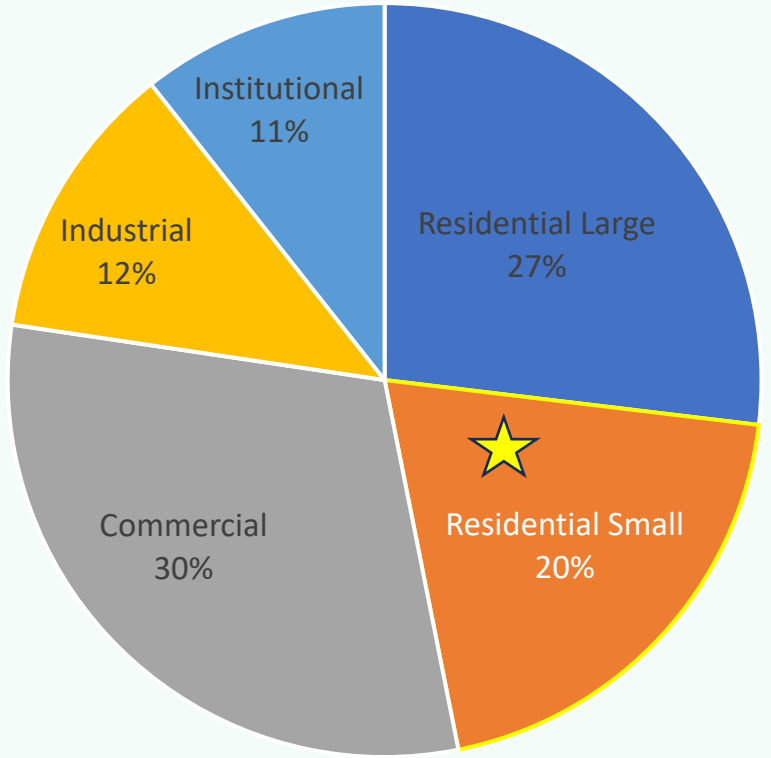


Citywide Buildings

Citywide Building Energy & Fuel Usage

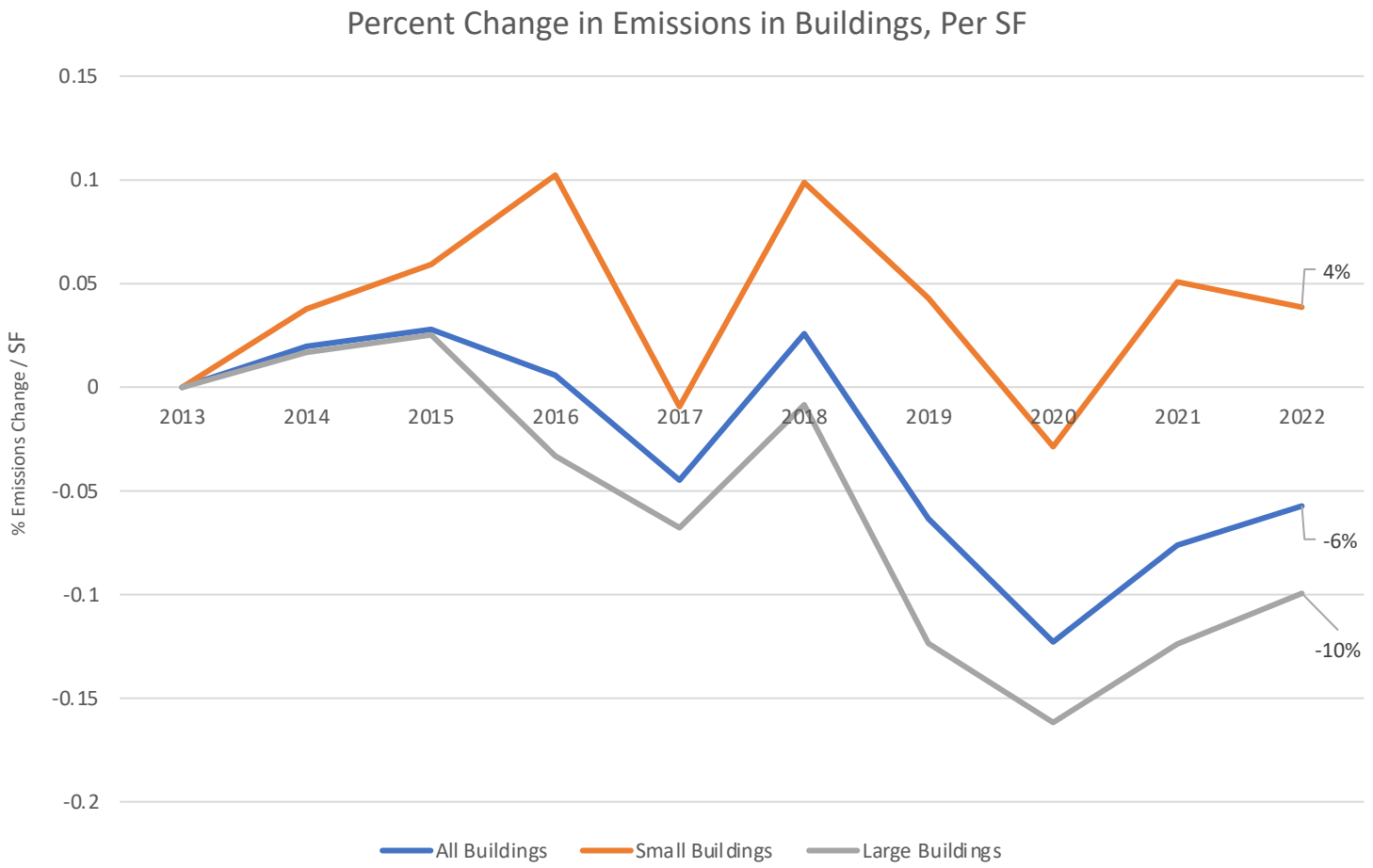
★ ***Policy Gap: LL97 addresses large residential and commercial emissions, but we have no policy to address the emissions from energy usage in small residential buildings***

2022 Building Emissions Source Breakdown



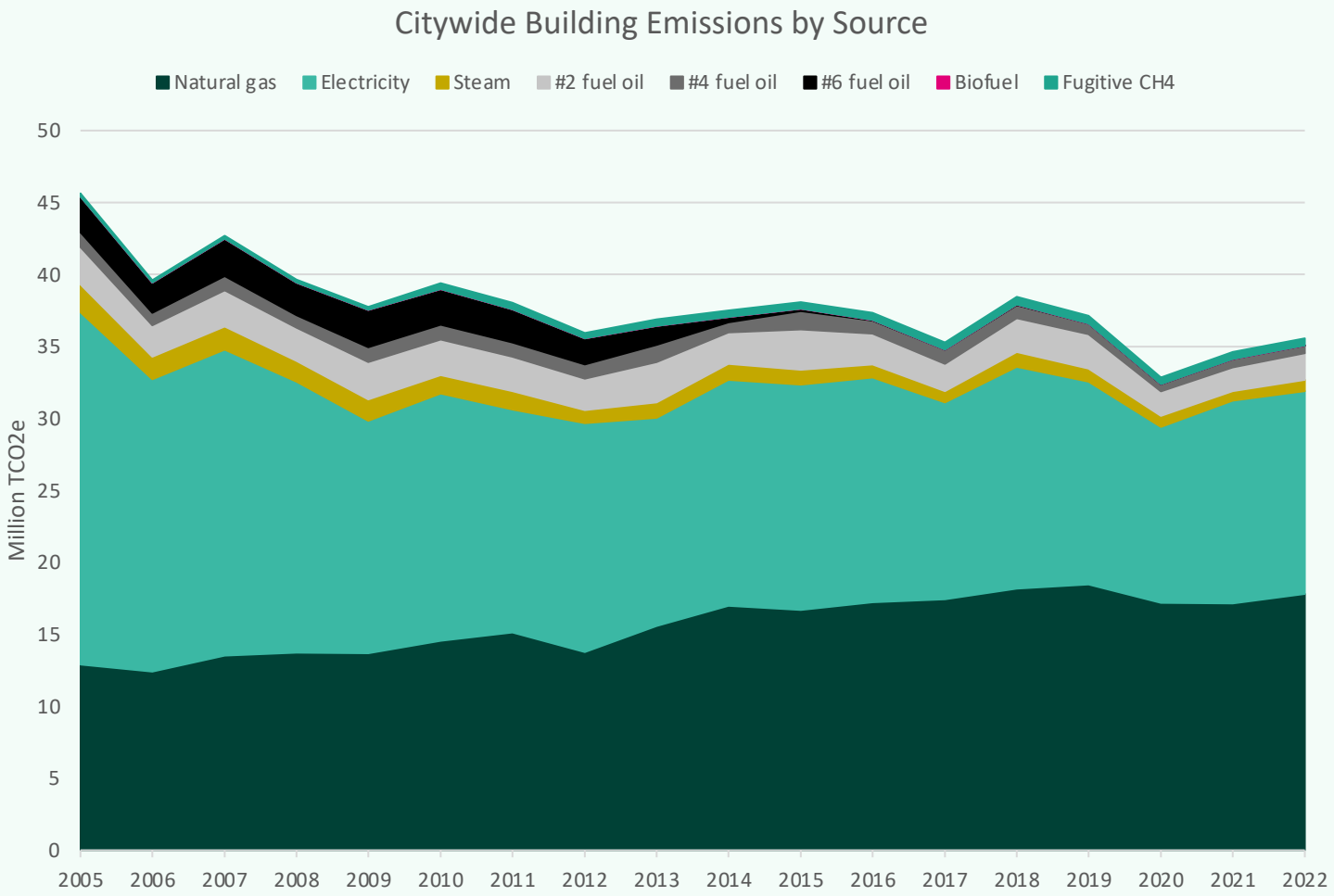
Small buildings are falling behind

- All buildings emissions: 6% decrease
- large residential, industrial, institutional, commercial emissions: 10% decrease since 2005
- Small residential emissions: 4% increase since 2005



Citywide Building Energy Usage and Fuels

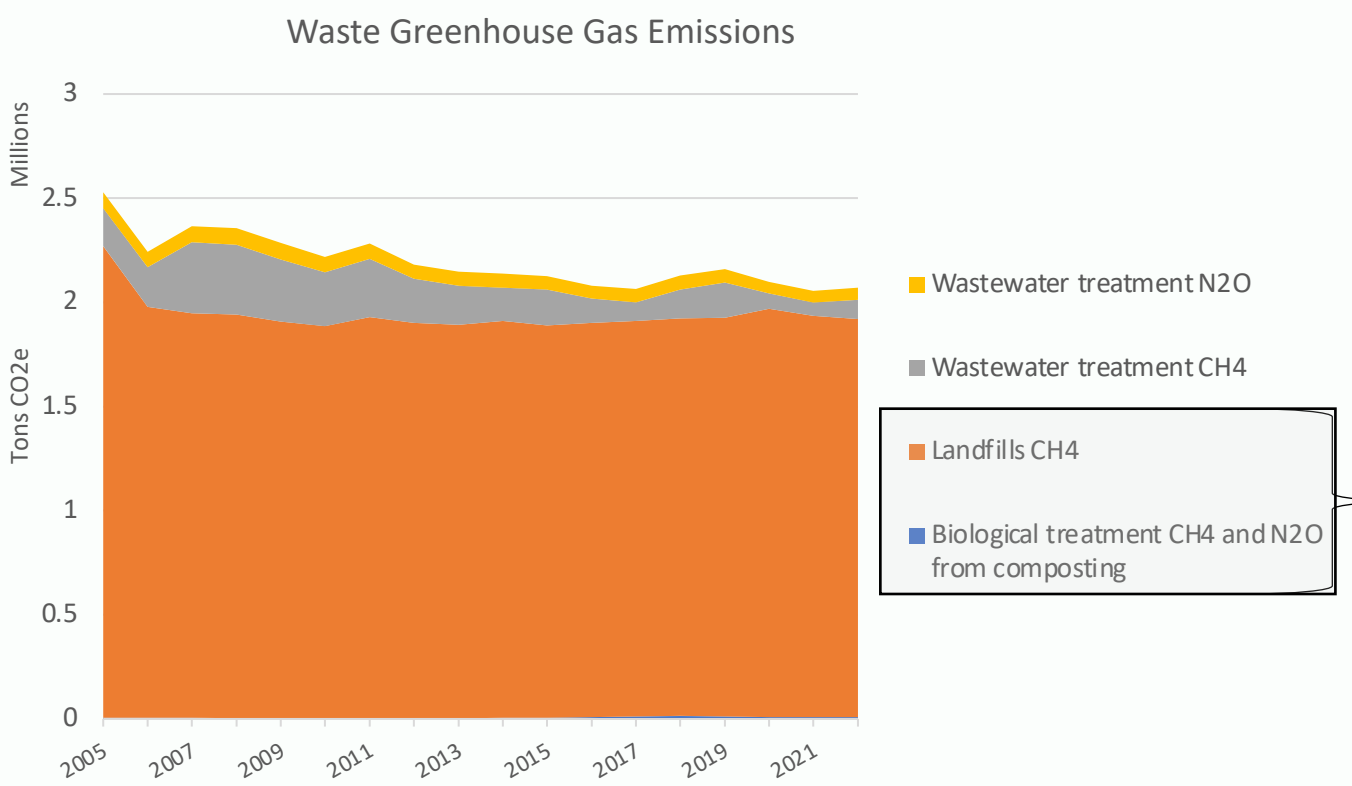
- Natural gas up 24%
  - 2022, 50% of emissions in buildings came from natural gas, up from 28% in 2005
- Fuel oil down 6%
  - Buildings moving off fuel oil (10% of emissions in 2005 -> 4% of emissions in 2022)
- Electricity emissions are decreasing
  - driven by energy efficiency and more “efficient” grid

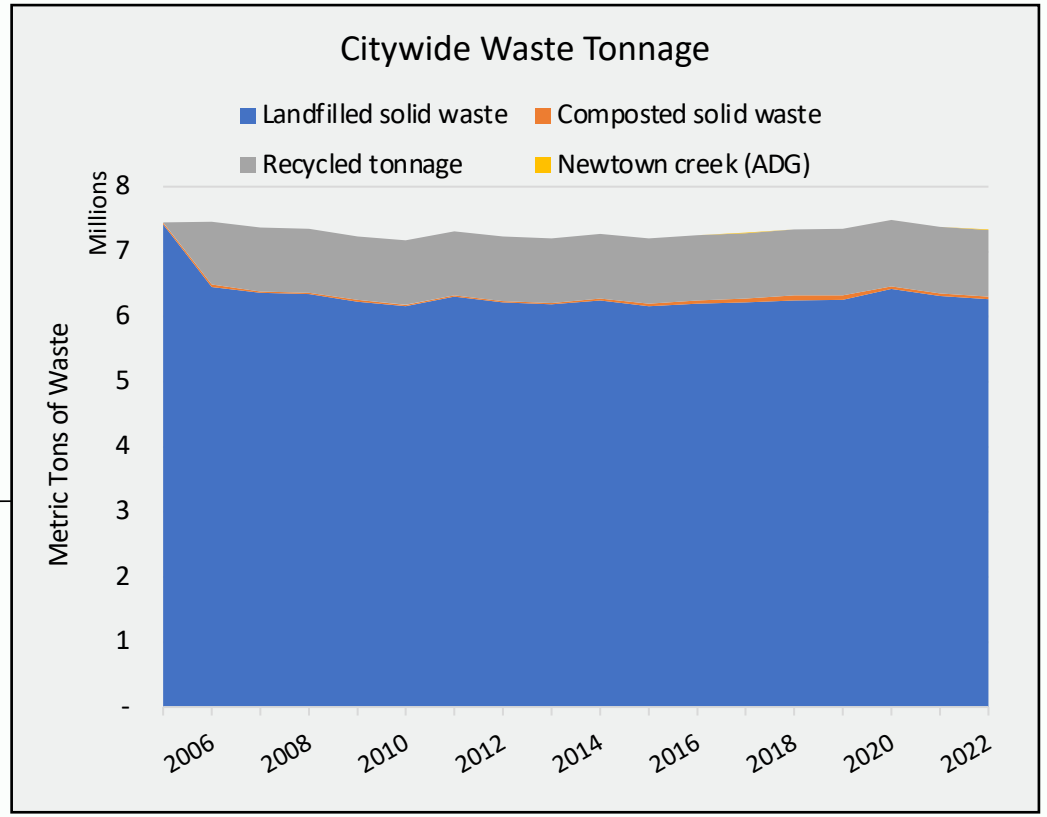


Citywide Waste

Citywide Waste

While wastewater emissions have reduced, landfilled waste has remained relatively constant since 2006





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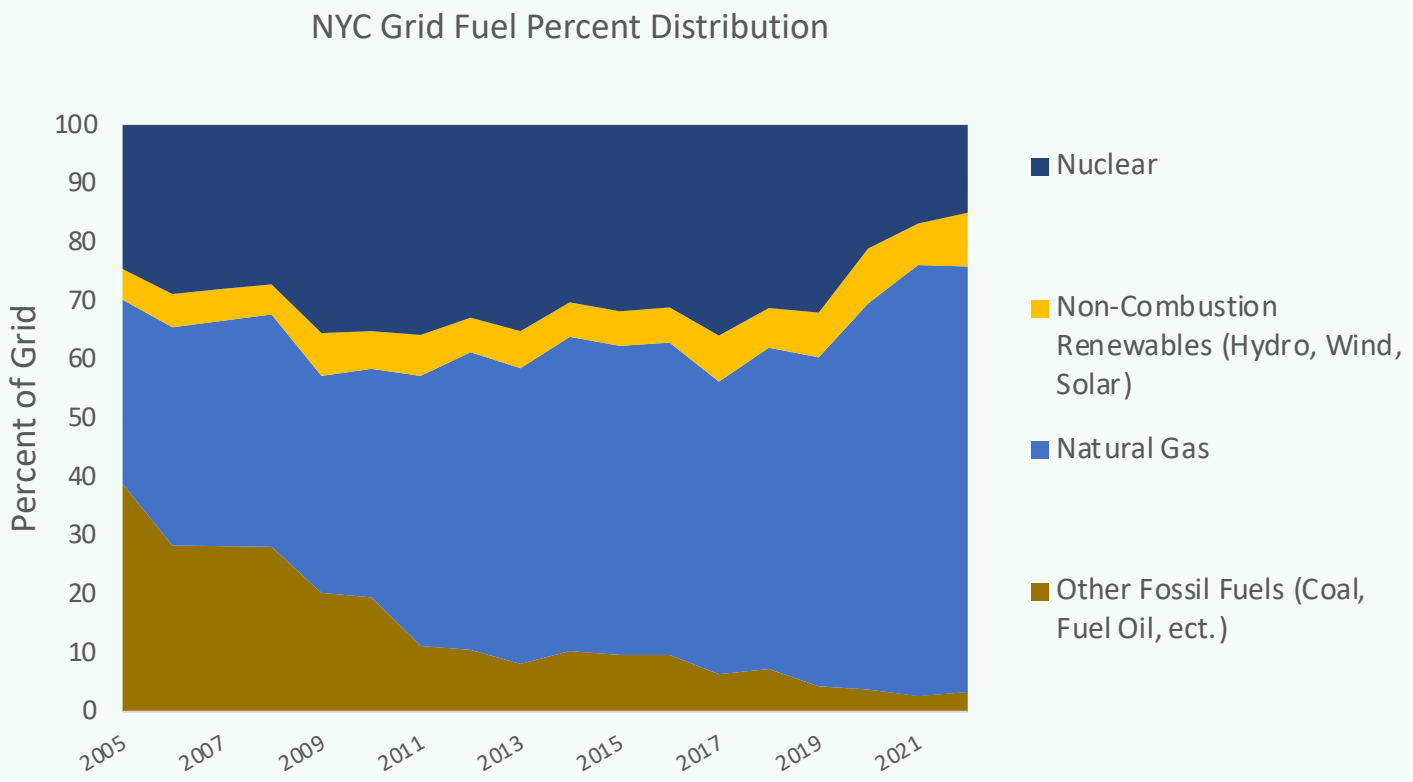
Carbon Intensity of the Grid

Transition Time:

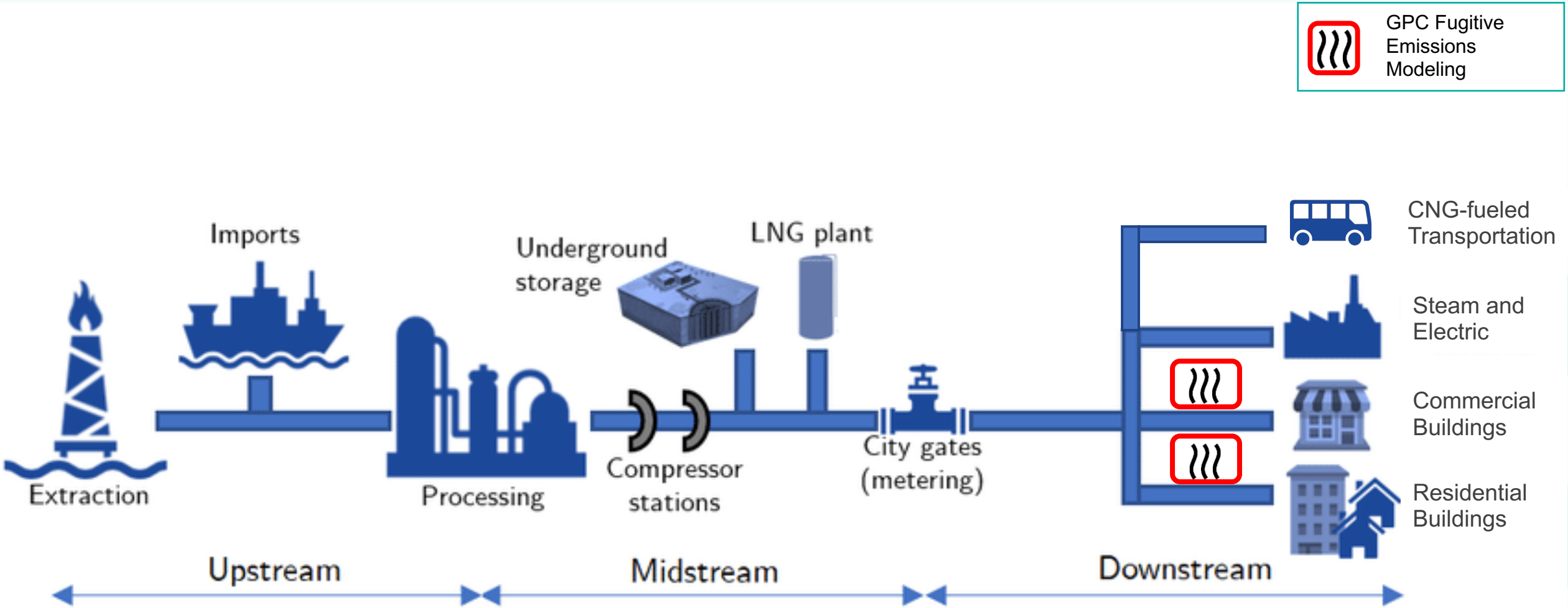
We've phased out dirtier fuels but now rely more on natural gas. Now's the time to shift to renewables



	2005	2019	2020	2021	2022
Fossil Fuels	70.2 %	60.4 %	69.5 %	76.2 %	75.8 %
Zero-Emissions	29.8 %	39.6 %	30.5 %	23.8 %	24.2 %
Source MMBtu	556 M	483 M	431 M	404 M	412 M
Grid Coefficient (kg/kwh)	0.4884	0.3159	0.3202	0.3284	0.3232

Citywide Inventory - CLCPA

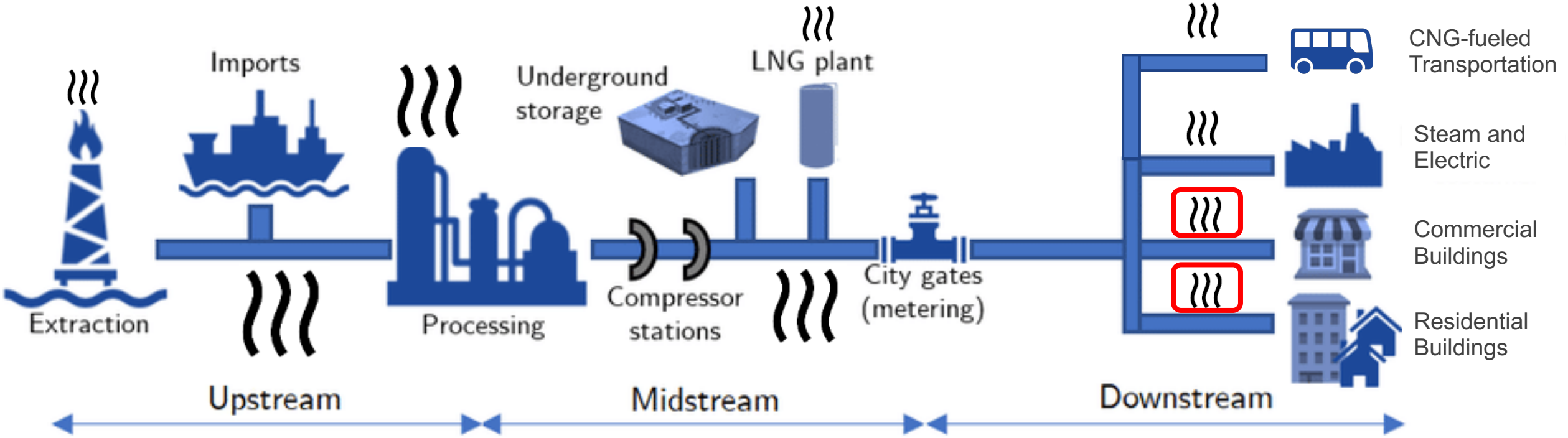
GPC Accounts for a Fraction of Natural Gas Leakages



CLCPA Method Captures the Leakages Across The Full Natural Gas Supply Chain

CLCPA Fugitive Emissions Modelling

NYC Fugitive Emissions Modeling

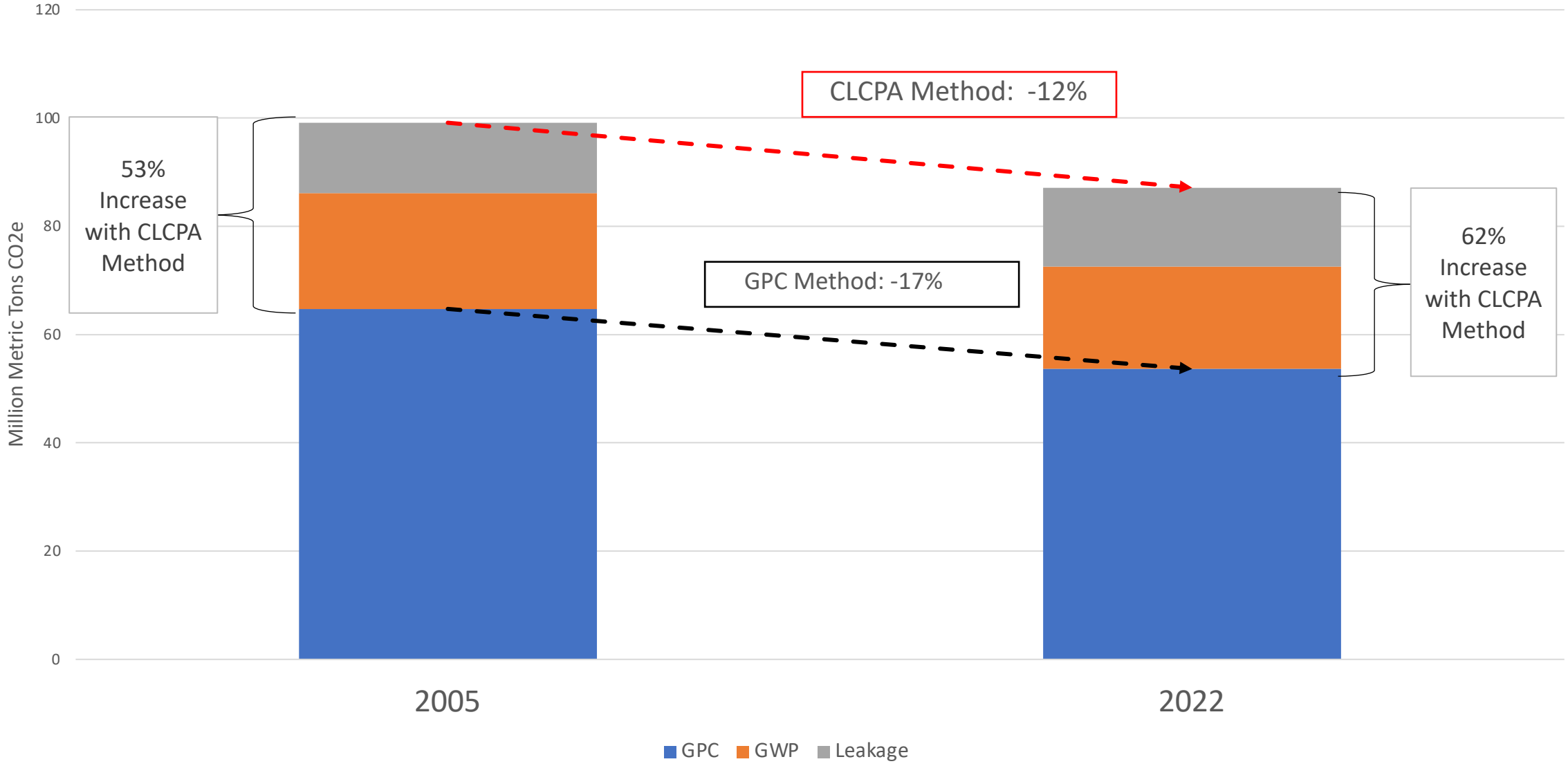


Adjusting Global Warming Potential

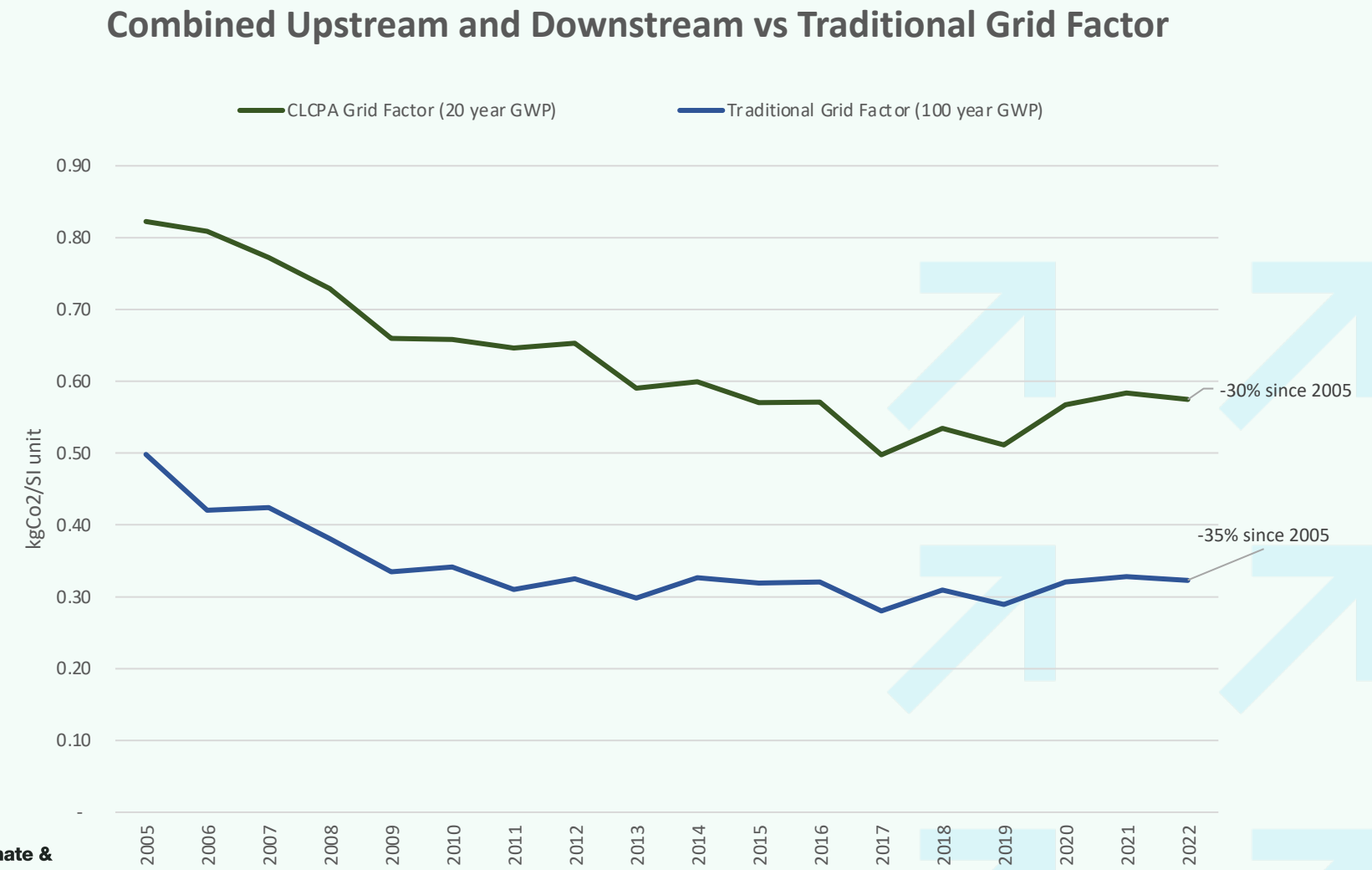
- GWP: A measure to compare the warming impact of different GHGs on Earth's climate
  - Allows for a common scale by expressing the warming impact of a gas relative to the warming impact of CO_2
- Citywide-GPC inventory uses 100-year GWP (Methane: 28)
- Citywide-CLCPA uses 20-year GWP (Methane: 84)

Increases Methane's Impact by 3X

CLCPA Accounting Reveals Natural Gas' Negative Impacts on NYC's GHG Emissions

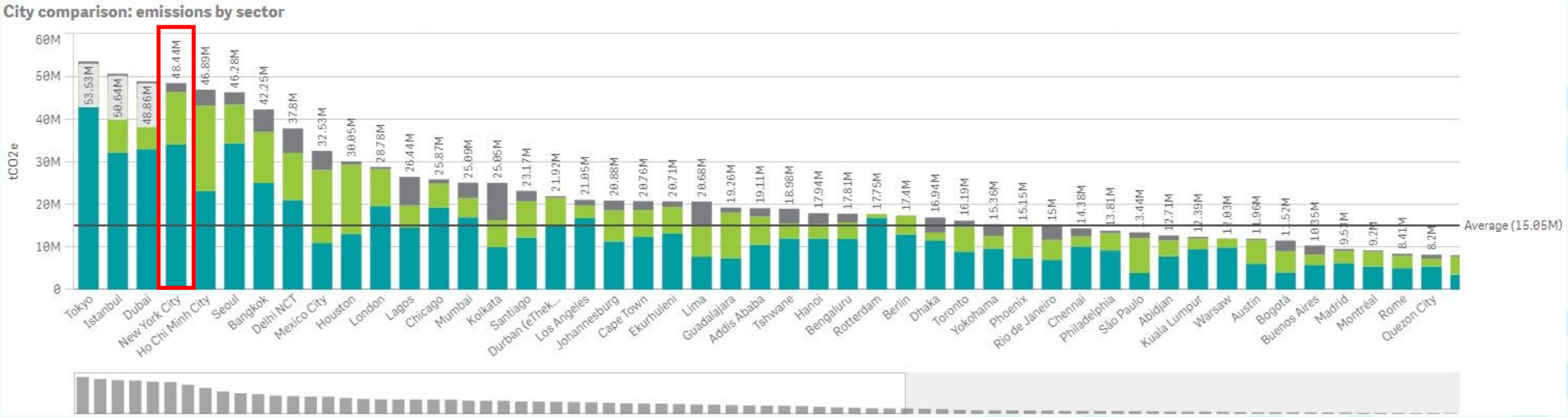


Combined Grid Factor: stagnating since 2009 due to Indian Point closure

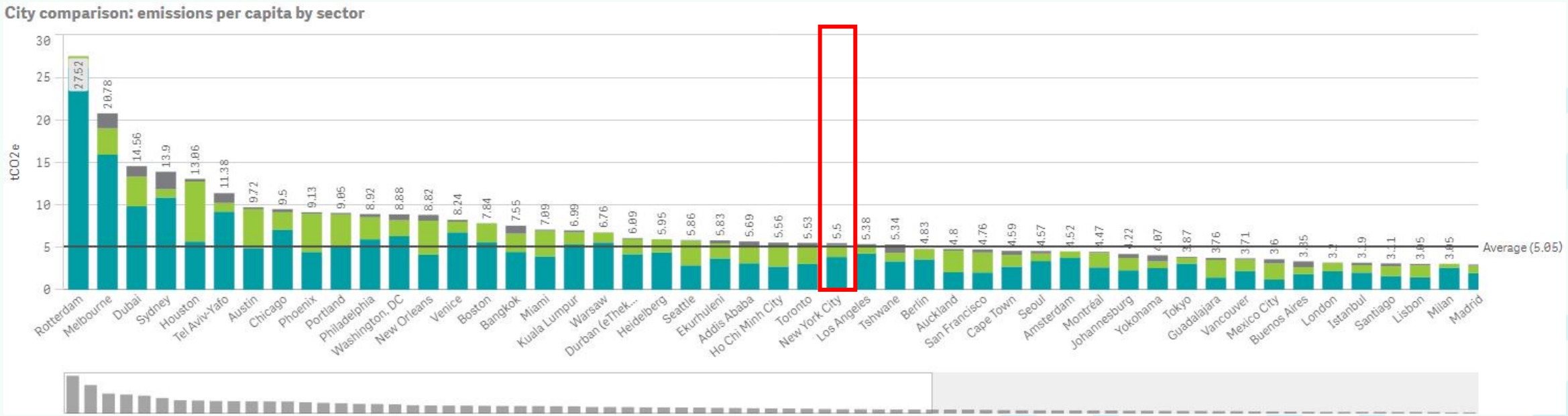


Comparison to Other Governments

NYC is the fourth largest emitter among C40 cities



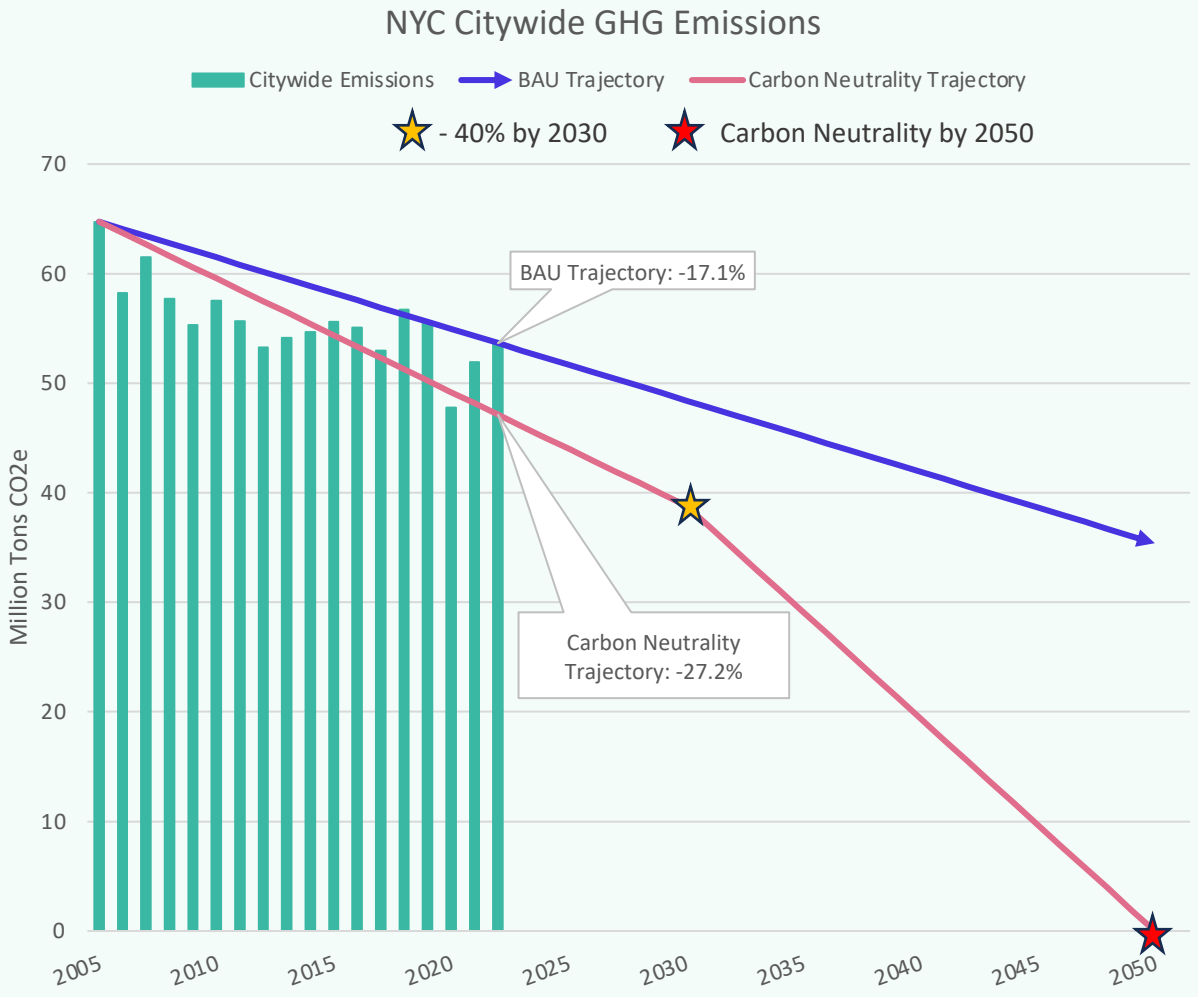
Yet our per capita emissions are just above average (ranked 27/80)

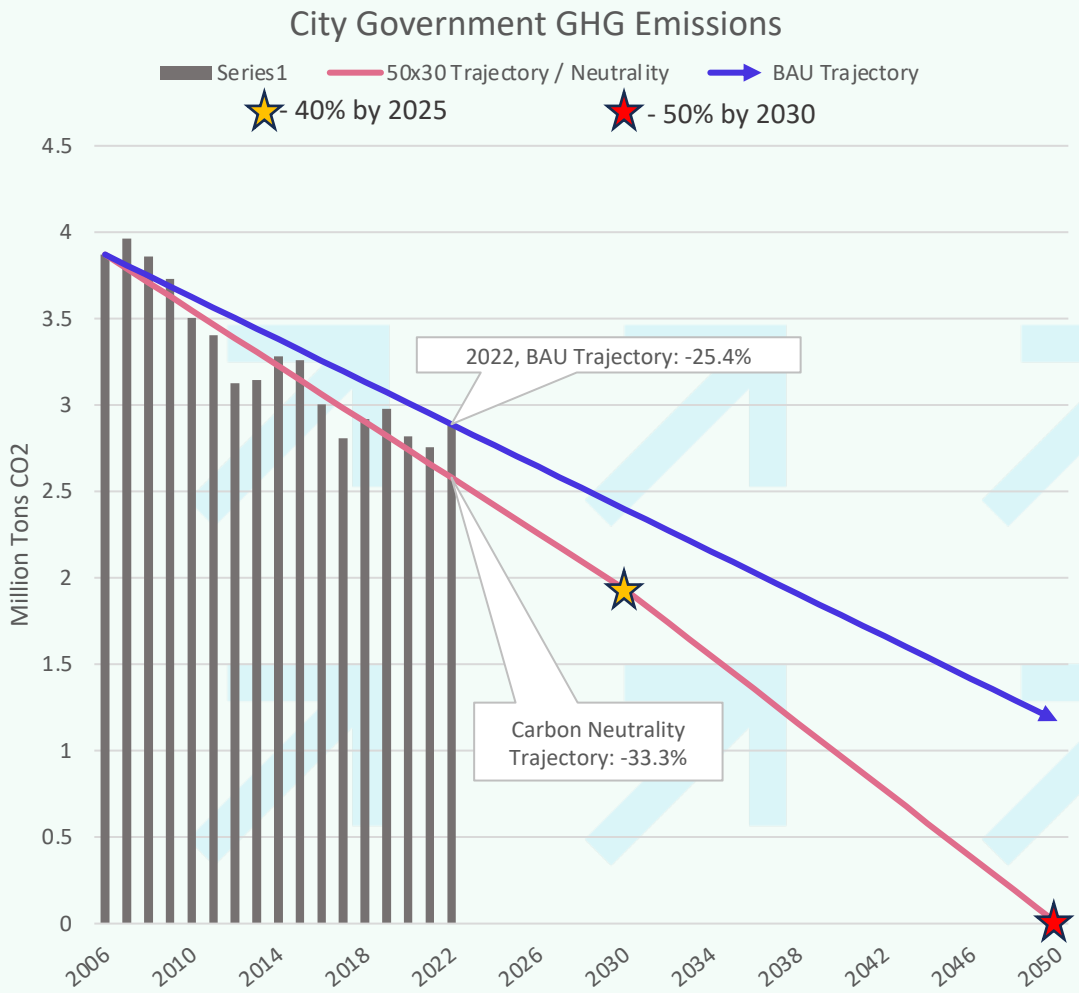


Reaching Our Goals

Urgent Action:

Despite some progress, there's more work needed to meet our goals





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The inventory is public!

- Collaborate with us.
  - Reach out to our team if you find issues or have questions.
    - **Sylvie Binder:** Sbinder@climate.nyc.gov
    - **Isabela Brown:** Ibrown@climate.nyc.gov
  - This is a "living" inventory: we are open to methodological improvements / suggestions
- Reaching our goals requires massive change – some elements of the inventory are outside of MOCEJ control – that's where you come in!
  - Use the inventory for your work. It's there to help justify and support NYC's climate goals.

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Thank You

Isabela Brown, Sylvie Binder

February 1st 2024

Questions + Discussion