Annual Sustainability Update

2023 Emissions Year

Published May 2026

Executive summary

MTA transit is sustainable transit. Each year, we estimate that our system prevents a net of 22 million metric tons of carbon dioxide from being emitted into the atmosphere. Even so, the MTA is committed to reducing greenhouse gas emissions from our own operations (known as Scope 1 and Scope 2 emissions) by at least 85% by 2040, from a 2015 baseline. In 2023, the latest year for which data is available,[1] our overall emissions footprint was approximately 2.1 million metric tons, attributed to three broad sources: facilities, fleets, and traction power. Trends across individual emissions categories varied as follows.

- Total emissions per passenger mile (carbon intensity): **down since 2020** as our ridership increases and emissions stabilize as we return to normal service following the COVID-19 pandemic.
- Direct emissions from fossil fuels and refrigerants (Scope 1): **down since 2015** from investments in our facilities and fleets, such as new buses and locomotives, renewable fuels, and facility energy efficiency upgrades.
- Indirect emissions from purchased energy (Scope 2): **up since 2015 despite decreased electricity usage**, due to the growing carbon intensity of the NYC and Westchester electric grid since the shuttering of Indian Point nuclear plant.

Our emissions data is invaluable information allowing us to decipher progress toward our target and inform strategies to further reduce emissions in the future.

Vision for climate sustainability

Across the Metropolitan Transportation Authority's (MTA's) buses, rails, and subway lines, 5.25 million passengers use our region's transit system each day. On a given weekday, over 170,000 riders swipe in at Times Sq-42 St station alone. By supporting and using public transit, MTA riders help our system prevent greenhouse gas (GHG) emissions from being pumped into the atmosphere. A typical subway commute in New York City (NYC) is nearly four times greener than the same commute by car (Figure 1).

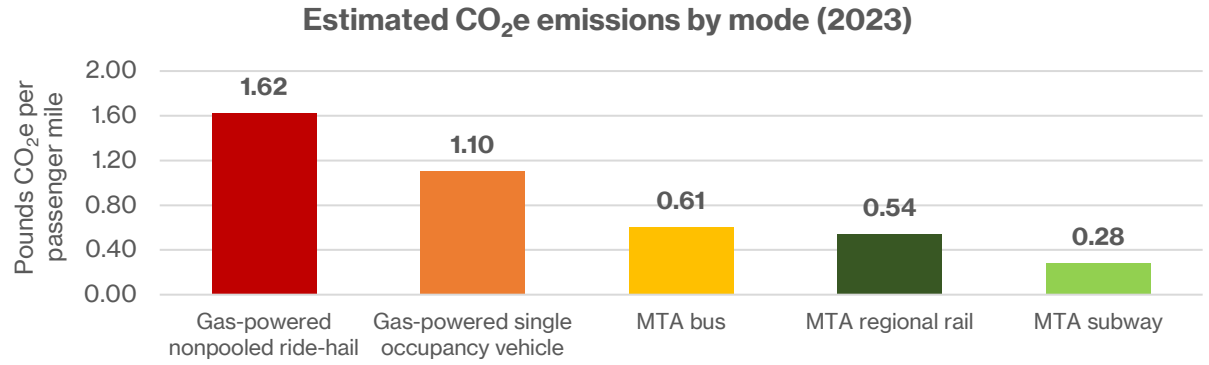

Figure 1: A typical subway commute in NYC is nearly four times greener than a trip of the same length by car (1.10 pounds CO_2e vs. 0.28 pounds CO_2e).

[1] Our emissions data undergoes a rigorous verification process to ensure it aligns with the five core principles of emissions reporting – relevance, completeness, consistency, transparency, and accuracy. Given the necessary thoroughness of the high standards we set for reporting, there is typically a two-year lag time on published data.

We have estimated the gross magnitude of these avoided emissions to be approximately 24 million metric tons (MT) of carbon dioxide equivalent (CO_2e) per year. By comparison, to operate our transit service, our GHG emissions are approximately 2 million MT CO_2e per year. This means that we provide a net benefit of approximately 22 million MT CO_2e each year (Figure 2) – equivalent to the carbon absorbed by a forest the size of Indiana annually.

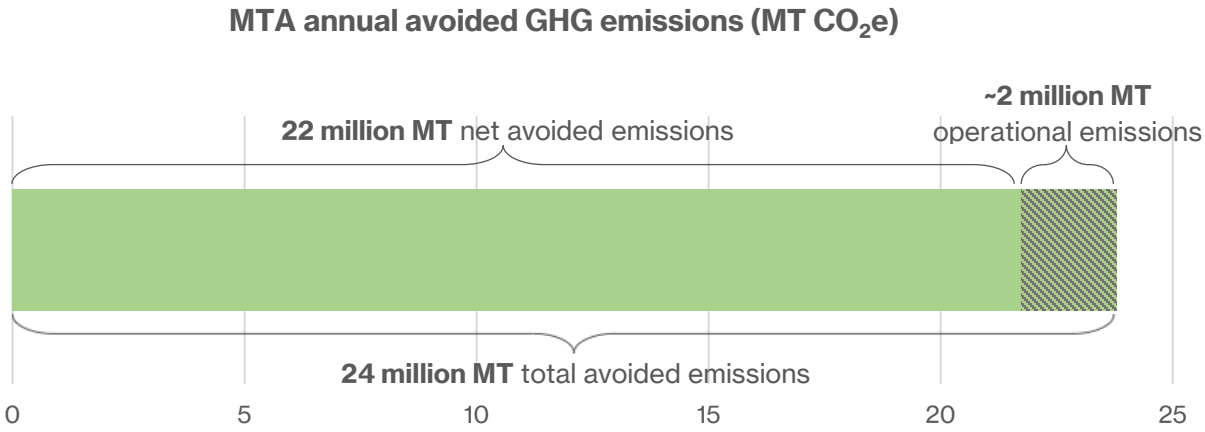

Figure 2: Annually, the MTA's transit network avoids 24 million MT of emissions, 12x our operational emissions.

Making transit even greener

Even as the MTA provides sustainable transit services, we recognize the increasing urgency of the climate crisis and the need to act. This is why on April 20, 2023, we committed to reduce the Scope 1 and Scope 2 emissions from our own operations by at least 85% by 2040 (85x40), from a 2015 baseline. To achieve the total scale of emissions reductions needed to reach our ambitious target, we must take actions to reduce energy consumption and transition away from the use of fossil fuels. Specifically, we aim to update facilities, transition fleets, and optimize traction power.

Our emissions

The Climate Registry reporting

Since 2008, the MTA measures and reports operational emissions annually to The Climate Registry (TCR). TCR reports aggregate data into the following categories:

Carbon intensity – emissions per unity of activity

- Emissions per passenger mile: emissions normalized by service level to account for potential emissions increases associated with increases in ridership demand

Scope 1 – direct emissions from fossil fuels and refrigerants

- Stationary combustion: emissions from the combustion of fossil fuels in buildings (e.g., natural gas, fuel oil, propane)
- Mobile combustion: emissions from the burning of fuel in trains, buses, and other vehicles (e.g., gasoline, diesel, compressed natural gas)
- Fugitive: emissions from accidental vapor or gas releases (e.g., refrigerants)

Scope 2 – indirect emissions from purchased energy

- Purchased electricity: emissions from the electricity purchased for use in buildings, electric buses and vehicles, and trains
- Purchased steam: emissions from the steam purchased for use in buildings

Biogenic – emissions from fuel originating from natural sources

- Stationary combustion: emissions from the combustion of biofuels and renewable fuels in buildings (e.g., biodiesel)
- Mobile combustion: emissions from the burning of biofuels and renewable fuels in trains, buses, and other vehicles (e.g., renewable natural gas, renewable diesel, ethanol flex fuel)

Sources of MTA operational greenhouse gas emissions

MTA operational emissions are largely split between our transit services (subways, buses, regional rail) and the buildings that support these services. Emissions can be attributed to three broad sources: facilities, fleets, and traction power. In 2023, GHG emissions from these sources totaled approximately 2.1 million MT CO_2e (Figure 3).

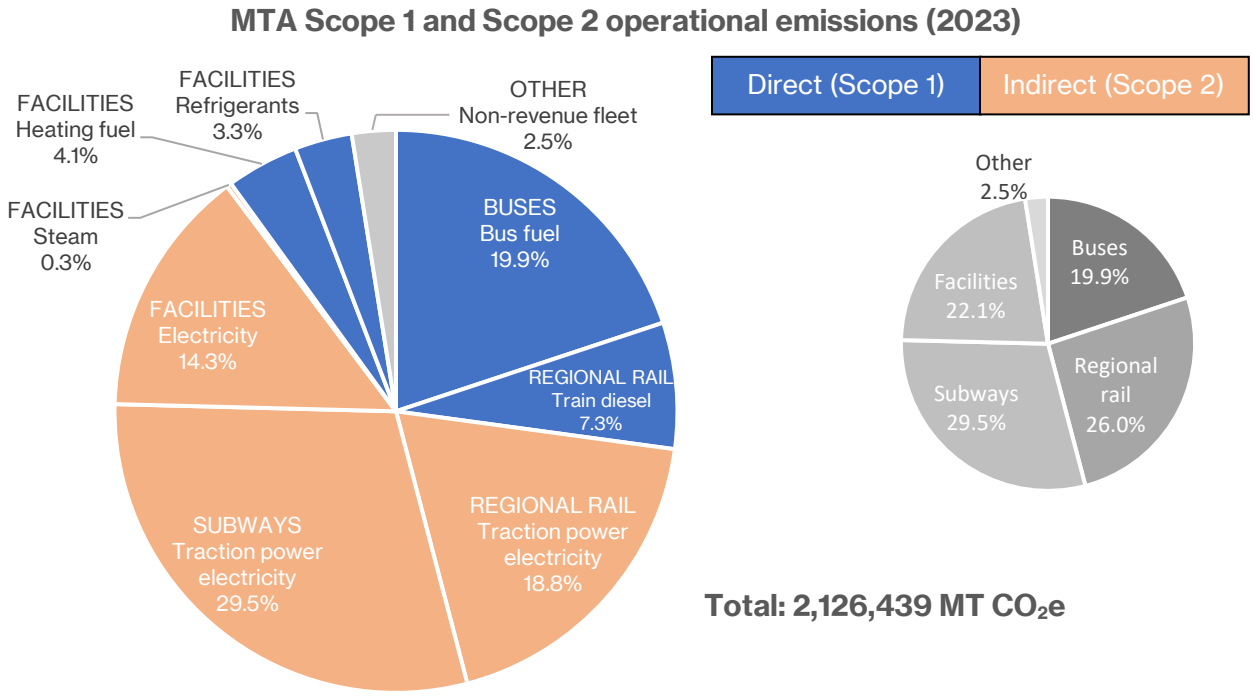

Figure 3: MTA 2023 Scope 1 and Scope 2 operational emissions broken down by source.

Facilities – train and subway stations, bridges and tunnels, and operations and maintenance facilities including train shops and yards, bus depots, and administrative offices – consume energy as we go about our day-to-day operations. Electricity is used to operate building systems including lighting, ventilation, and air conditioning; heating fuel and steam are primarily used for building heating systems; and refrigerants are used for heating and cooling buildings, vehicles, and trains.

Fleets – buses, locomotives, and non-revenue vehicles – are a significant source of emissions. Existing buses run primarily on diesel fuel and compressed natural gas (CNG), and regional railroad trains run on diesel fuel where the track is not electrified. Our non-revenue fleet – service vehicles that enable operations, such as track maintenance – primarily uses gasoline in light-duty vehicles and diesel in heavy-duty vehicles. While fossil fuels are currently the primary source of fuel for these vehicles, the MTA is phasing in electric buses and electric non-revenue vehicles into our fleet.

Finally, **traction power** – electricity used to power our subways and electrified portions of our regional rail network – is the largest source of our GHG emissions, enabling the essential operation of our subways and powering roughly half of our regional rail service.

Trends and progress

It can be hard to decipher progress on emissions goals based purely on individual years of reporting. To understand true emissions reduction trends, it is helpful to break out data into categories and compare emissions year-over-year (Table 1; Figure 4).

Table 1: MTA carbon emissions, reported to The Climate Registry

	2015*	2020	2021	2022	**2023**	YoY%
Carbon intensity						
Carbon intensity (grams of CO_2e per passenger mile)	**117.4**	**221.0**	**217.5**	**179.8**	**162.0**	**-9.9%**
Emissions category (MT CO_2e)						
Scope 1	**881,409**	**704,057**	**794,099**	**834,067**	**789,586**	**-5.3%**
Stationary combustion	129,870	93,371	101,369	109,257	88,236	-19.2%
Mobile combustion	743,012	562,948	650,085	677,301	631,040	-6.8%
Fugitive	8,527	47,738	42,645	47,509	70,310	48.0%
Scope 2†	**1,185,624**	**1,016,269**	**1,187,531**	**1,233,282**	**1,336,853**	**8.4%**
Purchased electricity	1,177,665	1,008,857	1,181,584	1,226,865	1,330,885	8.5%
Purchased steam	7,959	7,412	5,947	6,417	5,968	-7.0%
Total footprint	**2,067,033**	**1,720,326**	**1,981,630**	**2,067,349**	**2,126,439**	**2.9%**
Biogenic	**1,872**	**745**	**778**	**838**	**61,441**	See note
Stationary combustion	1,657	744	776	828	468	
Mobile combustion	215	1	2	10	60,973	

Note: Mobile RNG consumption was classified as biogenic for the first time in emissions year 2023.

* 2015 represents the baseline year for the MTA's 85x40 emissions reduction goal.

† MTA Scope 2 emissions are the same whether calculated using a market-based or location-based method.

Carbon intensity

Trend: down since 2020

While transit operations generate GHG emissions, it also results in a net climate benefit for the region – more ridership means more cars off the road. This is why carbon intensity, the GHG emissions measured per passenger mile, is a more important metric for transit emissions than total GHG emissions. Carbon intensity indicates improvements in the sustainability of our service, even if added service and ridership growth causes our overall emissions to rise.

In 2020, due to the abrupt drop in ridership from the COVID-19 pandemic, our carbon intensity increased rapidly. Since then, **our carbon intensity has steadily decreased, with a 9.9% drop in 2023 compared to 2022 and significant 26.7% reduction compared to 2020.** This consistent decrease demonstrates our success in reducing the emissions of our service. Current carbon intensity is still higher than pre-2020 intensity, however, a trend that can be explained by analyzing individual emissions categories.

Scope 1 emissions

Trend: down since 2015

While our Scope 1 emissions have increased since 2020 as we return to normal service following the COVID-19 pandemic, they have remained lower than pre-2020 figures. **In 2023, we reduced our Scope 1 emissions by 5.3% compared to 2022 and 10.4% compared to our 2015 baseline.** These reductions are a result of investments we have made across our facilities and fleets. Examples of actions that have reduced our Scope 1 emissions include:

- Investment in newer, more fuel-efficient buses, locomotives, and vehicles
- Launch of battery electric transit buses
- Purchase of renewable natural gas (RNG) for the CNG bus fleet
- Facility upgrades that improve energy efficiency and reduce fossil fuel use

Our fugitive emissions increased 48% in 2023 compared to 2022 because of a planned refrigerant phase out in a portion of the Long Island Rail Road rolling stock fleet. We do not anticipate this increase to be sustained beyond 2023.

Scope 2 emissions

Trend: up since 2015

The year-over-year increase in total reported GHG emissions can largely be attributed to our Scope 2 emissions. These emissions increased by 8.4% compared to 2022 and 12.8% compared to our 2015 baseline, **despite decreased electricity usage of 6.3% compared to 2015**. This discrepancy is due to the growing carbon intensity of the NYC and Westchester electric grid. Since 2019, the grid has become steadily more carbon-intensive (56% increase in eGRID carbon-intensity between 2019 and 2023). Various factors have caused this increase, including but not limited to the shuttering of the Indian Point nuclear plant in April 2021, which previously generated large amounts of zero-carbon power. We are hopeful that the electric grid will become greener soon as the State pushes toward their established renewable energy targets.

While we cannot control the source and carbon intensity of electricity generation in our region, we are working to reduce our electricity use. Examples of measures taken by the MTA to reduce electricity usage include:

- Installation of energy efficient lighting and power equipment
- Modernized train cars and signals

- Upgraded third rail infrastructure, including improved materials that reduce traction power losses
- Investment in energy efficiency technologies, such as remote controls for third rail and switch heaters to minimize electricity consumption

Biogenic emissions

85x40 trend: up since 2015

Biogenic fuel sources are renewable energy materials derived from recently living organic matter, such as plants, animal waste, and algae. These fuels offer a lower-carbon alternative to fossil fuels by recycling atmospheric carbon dioxide. For this reason, the carbon dioxide emissions from biogenic fuels are categorized separately from typical Scope 1 emissions and are not included in our 85x40 emissions reduction goal. In 2023, for the first time, the MTA categorized emissions from our CNG bus fleet as biogenic in accordance with RNG reporting standards.[2] This shift caused a spike in our biogenic emissions and reduction in Scope 1 emissions compared to previous years and serves as further evidence toward the MTA's emissions reduction progress.

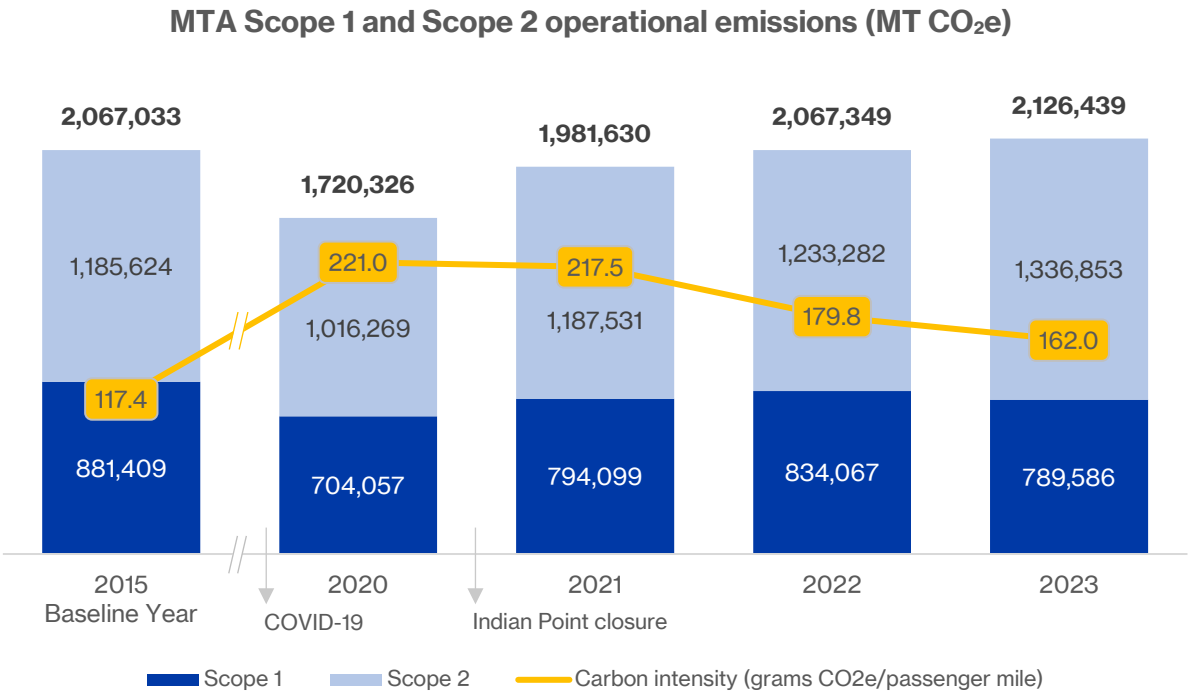

Figure 4: MTA Scope 1 and Scope 2 emissions and carbon intensity over time, compared to 2015 baseline.

[2] The MTA supports regional growth of the RNG market through an agreement with an RNG supplier in an amount equal to our mobile CNG consumption. RNG is a waste-derived, pipeline-quality gas that is fully interchangeable with fossil fuel-based CNG. In accordance with The Climate Registry reporting standards, the MTA reports biogenic CO_2 emissions from RNG separately from Scope 1 emissions.