NEW JERSEY

GREENHOUSE GAS INVENTORY

2025 MID-CYCLE UPDATE REPORT

April 2025

Introduction

The New Jersey Global Warming Response Act (GWRA, P.L. 2007, c.112, as amended 2019) calls for an annual compilation of statewide greenhouse gas (GHG) emissions data. This inventory is used to monitor and track progress towards New Jersey's goals of reducing GHG emissions to below 1990 levels by 2020 (known as the 2020 goal), to below 50% of 2006 levels by 2030 (known as the 50x30 goal), and to 80% of 2006 levels by 2050 (known as the 80x50 goal).[1]

Since 2008, the New Jersey Department of Environmental Protection (DEP) has released a comprehensive statewide GHG inventory report approximately every two years. Following the 2019 amendments to the GWRA, the DEP is also committed to releasing updated data annually to help inform the state's climate mitigation planning and implementation efforts.

The DEP therefore releases a full Emissions Inventory Report every other year and provides a "Mid-Cycle Update" during intervening years. The full Emissions Inventory Reports contain detailed analyses, including updated emissions calculations, review of GHG trends, adjustments to baselines (when necessary), and discussion of any changes in emission calculation methodologies.[2] In contrast, the Mid-Cycle Update is a brief summary of the latest emissions data, with concise complementary analysis. The inventory presented below is a Mid-Cycle Update.

New Jersey's Greenhouse Gas Reporting Framework

Emissions Inventory Report

- Full report released every two years
- Includes the latest emissions estimates and projections
- Includes a detailed discussion on:
  - Statewide Greenhouse Gas trends
  - Federal and International trends and policy
  - Changes in methodologies
  - Adjustment of Baselines

Mid-Cycle Update

- Brief summary released between Emissions Inventory Reports
- Includes the latest emissions estimates and projections
- Features a discussion of key findings

Greenhouse Gas Inventory Emissions

Data used to develop the New Jersey greenhouse gas inventory is gathered from multiple sources, including state, local and federal agencies, as well as global organizations such as the International Panel on Climate Change. Federal data becomes available approximately two years after the end of a given calendar year, establishing the time frame for publication of the New Jersey inventory reports. During development of the inventory reports, estimates for earlier years may also be revised in light of updates to underlying data, emissions factors and methods.

[1] Based on current estimates, the emissions goal for 2030 is 60.2 MMT CO2e, and the goal for 2050 is 24.1 MMT CO_2e, both based on GWP_{100}. The 2030 goal is established under Governor Murphy's Executive Order 274; the 2050 goal is established under the GWRA, P.L. 2007, c.112, as amended. Future refinements to assessment methods may lead to adjustments in the 2006 estimate, and therefore the 2030 and 2050 figures. The 2020 goal of 109.2 MMT CO_2e was successfully met.

[2] The 2024 Greenhouse Gas Emissions Inventory Report 1990-2021, revision 1, is available from https://dep.nj.gov/ghg/nj-ghg-inventory/inventory-archive/

2022 Estimates

Total net greenhouse gas emissions for 2022 (Figure 1; Table 1) were 97.6 million metric tons carbon dioxide equivalent (MMT CO_2e), based on 100-year global warming potentials (GWP_{100}). This represents an increase of 1.3 MMT CO_2e, or 1.4%, from 2021 (Table 1). When calculated using 20-year global warming potentials (GWP_{20}), 2022 emissions were 120.7 MMT CO_2e, an increase of 0.7 MMT CO_2e (0.6%) from 2021 levels (Figure 2; Table 2). The emissions changes in 2022 can be attributed in part to greater energy consumption as the economy continued its rebound from the COVID-19 pandemic; the long-term trend of increasing energy efficiency; greater reliance on renewable energy; and reduced emissions of methane and refrigerant gases. However, to meet the State's 2030 emissions goal, an additional 37 MMT CO_2e (based on GWP_{100}) must be eliminated, more than a third of current emissions in less than five years, and 74 MMT CO_2e must be eliminated by 2050, 75% below current levels. Based on GWP_{20}, reductions of 52 MMT CO_2e are called for by 2030, a 43% reduction from current levels, and 93 MMT CO_2e by 2050, a 77% reduction.

Transportation Sector

Transportation emissions continued their upward trend following the COVID-19 pandemic, now matching pre-pandemic levels. Between 2021 and 2022, overall transportation sector emissions, including rail, marine, aviation and on-road vehicles, increased by 1.1 MMT CO_2e, or 3.0%, to reach 38.4 MMT CO_2e, based on GWP_{100} (Table 1). When based on GWP_{20}, the 2022 transportation sector total was 38.6 MMT CO_2e (Table 2). The transportation sector as a whole represented 39% of the State's 2022 total net emissions.[3]

Because gasoline-powered passenger vehicles emitted 71% of on-road vehicle emissions in 2022, or 26% of the State's entire total net emissions, achieving reductions within this category will be vital to achieving the State's goals. Between 2021 and 2022, emissions from gasoline-powered passenger vehicles increased 0.6 MMT CO_2e, or 3%, to reach 25.1 MMT CO_2e. However, compared to the State's reference year 2006, gasoline-powered passenger vehicles emissions were 6.4 MMT CO_2e lower during 2022, a drop of 20%.

During 2022, diesel-powered freight and commercial vehicles emitted 5.9 MMT CO_2e, or 17% of all on-road emissions, and 6% of the State's overall total net emissions. This represents an increase of 0.1 MMT CO_2e compared to 2021 (a 2% rise). Diesel-powered on-road vehicles of all types emitted 7.2 MMT CO_2e during 2022, a decrease of 0.1 MMT CO_2e compared to 2021 (a 2% drop).

Black carbon emissions from on-road transportation were 0.36 MMT CO_2e in 2022, based on GWP_{100}, or by 11% lower than in 2021. Based on GWP_{20}, 2022 on-road black carbon emissions were 1.26 MMT CO_2e, again representing a drop of 11% from 2021.

[3] Because combustion processes emit little methane and nitrous oxide relative to carbon dioxide, calculations based on GWP_{100} and GWP_{20} are nearly identical for such sources. The rest of the discussion in the Transportation sector therefore cites estimates based on GWP_{100}. Table 2 includes a complete listing of sector-level emissions based on GWP_{20}.

Comparing pre-pandemic emissions during 2019 with post-pandemic emissions during 2022 highlights the impact of COVID-19 (Table 3). Passenger vehicles saw a 2.1 MMT CO_2e drop in emissions during 2022 compared to 2019, but these were offset by increases in commercial and freight emissions that were nearly as large (1.6 MMT $CO2_e$ combined). The overall result was a small net decrease (0.5 MMT CO_2e) in onroad transportation emissions compared to 2019 (a 1% reduction).

The emissions trends between 2022 and 2019 can also be considered by fuel type. The combined emissions from all gasoline-powered vehicles were 1.4 MMT CO_2e lower in 2022 than in 2019, a 5% reduction. On the other hand, emissions from diesel-powered vehicles increased by 0.9 MMT CO_2e, or 14%, over the same period. Within the diesel-powered category, emissions from diesel freight and commercial vehicle emissions increased by 1.1 MMT CO_2e, or 23% between 2019 and 2022. Gas freight and commercial vehicles also saw an increase of 0.5 MMT CO_2e, or 20% during this time. Taken as a whole, these estimates confirm widely-recognized changes in the economy following the pandemic, with fewer hours spent commuting, greater reliance on localized supply chains, and more goods delivered directly to the consumer.

With respect to the State's reference year, 2006, transportation-sector emissions in 2022 were 9.1 MMT CO_2e lower, a drop of 19.2% over the sixteen-year period. The average rate of decrease was 1.2% per year.

Electric Generation Sector

Emissions from electricity generation, including those from in-state generating stations, solid waste resource recovery facilities, and electricity imported from out of state, were estimated to total 18.1 MMT CO_2e in 2022, using either GWP_{100} or GWP_{20}.[4, 5] This represented a drop of 1.0 MMT CO_2e, or 5%, compared to 2021, driven primarily by a 1.1 MMT CO_2e decrease in emissions from imported electricity. Emissions associated with imported electricity were lower both because less electricity was brought into the State (in terms of MWh) and because the electric grid serving New Jersey, PJM, became cleaner in terms of kg CO_2e emitted per MWh generated.[6, 7] With respect to in-state generation, the amount of electricity supplied to the grid increased 6% compared to 2021,[8] but there was only a 0.6% increase in emissions from in-state resources (0.09 MMT CO_2e) compared to 2021. This reflects the State's expansion of clean renewable energy, and the relatively high efficiency of the State's existing generating resources. Compared to 2019,

[4] Electricity generation is a combustion process and therefore emits very little methane or nitrous oxide. Emissions estimates based on GWP_{100} and GWP_{20} were within 0.1 MMT CO_2e. Values reported in the text are based on GWP_{100}. Full GWP_{20} data is reported in Table 2.

[5] Emissions from the electricity sector ultimately originate from electricity demand in other sectors. However, by convention, the emissions estimates for other sectors in this report do not include their indirect emissions from electricity use.

[6] In 2021, the state imported 11.6 TWh of electricity, but only 9.4 TWh in 2022, based on the difference between USEIA annual in-state generation from https://www.eia.gov/electricity/data/state/ and USEIA retail sales from the State Energy Data System, https://www.eia.gov/state/seds/seds-data-fuel.php?sid=US under code ESTCP).

[7] The emissions rate in the PJM region decreased from 384 kg CO_2e/MWh in 2021 to 369 kg CO_2e/MWh in 2022 (PJM GATS System Mix, https://gats.pjm-eis.com/gats2/PublicReports/PJMSystemMix, adjusted to account for CH_4 and N_2O).

[8] In-state generation rose from 61 TWh in 2021 to 65 TWh in 2022. (USEIA, 2024, https://www.eia.gov/electricity/data/state/)

2022 emissions in the electric sector were 1.3 MMT (7%) lower. Compared to 2006, 2022 emissions in the electric sector 12.8 MMT CO_2e lower, a drop of 42% from 2006 levels. This corresponds to an average annual rate of decrease of 2.6% per year over the sixteen-year period. The electric sector represented 19% of the State's 2022 total net emissions.

Commercial and Residential Sectors

Combined, the commercial and residential sectors represented 26% of the State's 2022 total net emissions, emphasizing their central role in meeting the State's greenhouse gas reduction targets. 2022 commercial-sector emissions of 10.2 MMT CO_2e represented a 0.3 MMT CO_2e increase over 2021, an annual growth rate of 2.9%.[9] The residential sector also saw an increase in emissions over this period, rising 0.4 MMT CO_2e to reach 15.2 MMT CO_2e (a 2.4% year-to-year increase). Emissions in both sectors were nearly unchanged from pre-pandemic 2019 levels of 10.2 MMT CO_2e (commercial) and 15.3 MMT CO_2e (residential). Compared with 2006, commercial emissions grew by 1.0 MMT CO_2e across the sixteen year period (7%) while residential sector emissions grew by 0.7 MMT CO_2e (7%). Across the sixteen-year period, the average annual rates of increase were 0.4% per year for each sector.

Industrial Sector

Industrial-sector emissions associated with combustion of fuels reached 8.6 MMT CO_2e in 2022, an increase of 1.1 MMT CO_2e, or 14%, over 2021.[10] Emissions of carbon dioxide from industrial processes (as opposed to fuel consumption) were essentially constant between 2021 and 2022 at 0.3 MMT CO_2e. Fuel-based emissions were also 0.6 MMT CO_2e greater than 2019, an increase of 8%, suggesting expanded industrial activity beyond pandemic rebound effects. Across the sixteen year period since 2006, emissions dropped by 3.4 MMT CO_2e, or by 28%. Industrial emissions as a whole (fuel-based and process-based) accounted for 9% of the State's overall net total in 2022.

Other Non-Energy Emissions

Non-energy sources include halogenated gases, natural gas transmission and distribution, waste management, and agricultural activities other than those associated with fuel combustion.[11]

Based on GWP_{100}, emissions of halogenated gases decreased by over 0.1 MMT in 2022 compared to 2021, a 3% drop, to reach 5.0 MMT CO_2e. This continued a downward trend first seen in 2021, and can be attributed to federal and state mandates to phase out highly warming refrigerant compounds. When calculated using GWP_{20}, emissions dropped by 0.3 MMT CO_2e in 2022 compared to 2021, again by 3%, to reach 11.5 MMT CO_2e.

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[9] Emissions in the commercial and residential sectors are almost entirely from combustion processes, and result in exceedingly small releases of methane and nitrous oxide compared to carbon dioxide. Estimates based on GWP_{100} and GWP_{20} are therefore within approximately 0.02 MMT CO_2e. Estimates presented in the text are based on GWP_{100}. Full GWP_{20} data is reported in Table 2.

[10] As with the transportation, commercial, and residential sectors, industrial emissions from combustion of fossil fuels contain minimal quantities of methane and nitrous oxide compared to carbon dioxide, and estimates based on GWP_{100} and GWP_{20} are nearly identical. Estimates presented in the text are based on GWP_{100} while Table 2 contains estimates based on GWP_{20}.

[11] Agriculture is considered to be in the industrial sector since it produces a product. As a result, emissions from fuel consumption in the agriculture sector are included within the industrial heading.

Sulfur hexafluoride emissions continued their long-term decline as the material is phased out of use. Based on GWP_{100}, emissions dropped from 0.115 MMT CO_2e in 2021 to 0.096 MMT CO_2e in 2022, a drop of 16%. Based on GWP_{20}, emissions dropped from 0.086 MMT CO_2e in 2021 to 0.072 MMT CO_2e in 2022, again representing a drop of 16%. In each case, the rounded value appears as 0.1 MMT CO_2e in Tables 1 and 2.

Emissions from agricultural activities other than fuel combustion dropped 9%, from 0.49 MMT CO_2e in 2021 to 0.44 MMT CO_2e in 2022 based on GWP_{100}, or from 0.66 MMT CO_2e to 0.61 MMT CO_2e (8%) based on GWP_{20}.

Emissions from the State's natural gas transmission and distribution network experienced a small increase in emissions between 2021 and 2022, rising from 2.66 MMT CO_2e in 2021 to 2.71 MMT CO_2e in 2022, or by 0.06 MMT CO_2e (2%), based on GWP_{100}. Emissions based on GWP_{20} were 7.97 MMT CO_2e in 2021 and 8.14 MMT CO_2e in 2022, an increase of 0.17 MMT CO_2e, again a 2% year-to-year rise.

Since the mid-1980s, New Jersey has sent considerable amounts of solid waste to other states for disposal. To better account for the long-term impacts of these solid waste exports over time, the Department revised its methodology for estimating emissions from exported solid waste in this report, as discussed in Appendix A. Emissions from landfill disposal of solid waste decreased 6% between 2021 and 2022, falling from 5.1 MMT CO_2e to 4.8 MMT CO_2e (6%), based on GWP_{100}, or from 15.3 MMT CO_2e to 14.3 MMT CO_2e, based on GWP_{20} (again by 6%).[12] Emissions from in-state landfills dropped from 2.7 MMT CO_2e in 2021 to 2.5 MMT CO_2e in 2022, or by 8%, based on GWP_{100}, or from 8.1 MMT CO_2e to 7.4 MMT CO_2e based on GWP_{20}, again by 8%. Emissions from exported solid waste dropped from 2.0 MMT CO_2e in 2021 to 1.9 MMT CO_2e in 2022 based on GWP_{100}, or from 6.1 MMT CO_2e to 5.7 MMT CO_2e based on GWP_{20}, a 5% drop in both cases.

Emissions from wastewater treatment were virtually unchanged from 2021 to 2022 at 0.83 MMT CO_2e based on GWP_{100} or 2.10 MMT CO_2e based on GWP_{20}.

Black carbon emissions other than those from on-road transportation were not calculated for 2022 due to a lack of available data at the time of publication. Also, estimates of emissions and removals due to land use change, forestry, and related activities were carried over from prior years.

[12] Solid waste incineration is included in the Electricity sector.

Figure 1. Projected Greenhouse Gas Emissions for 2022 (GWP_{100})
In millions of metric tons CO_2e. Total net emissions 98.6 MMT CO_2e.

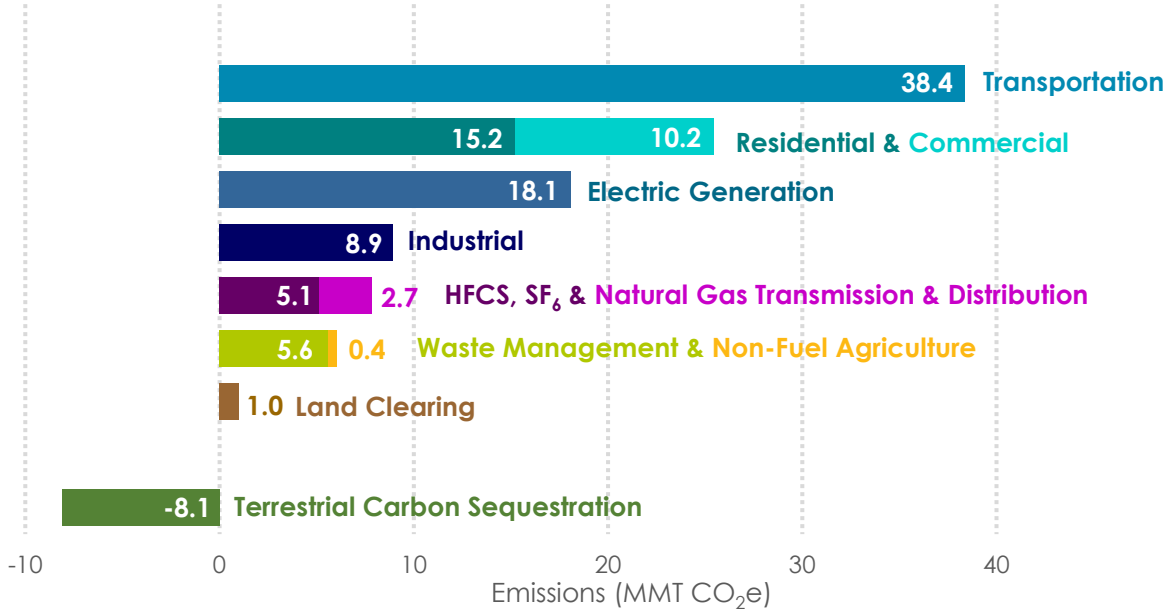

Figure 2. Greenhouse Gas Emissions for 2022 (GWP_{20})
In millions of metric tons CO_2e. Total net emissions 123.6 MMT CO_2e.

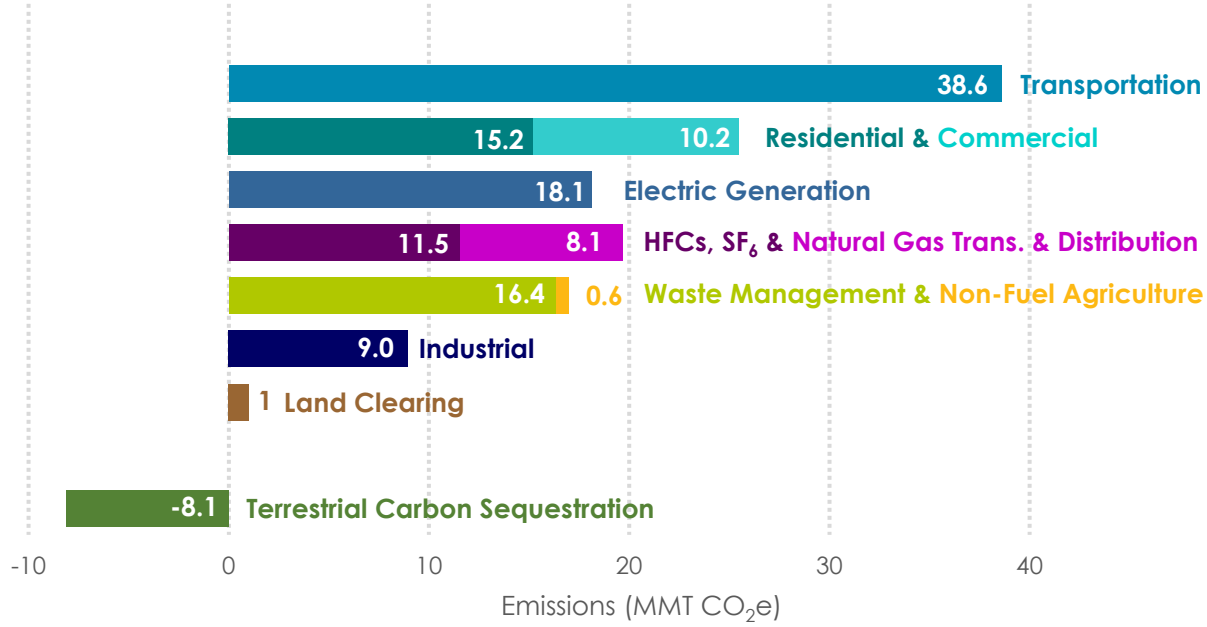

Table 1. Estimated NJ Greenhouse Gas Emissions, 2019-2022 (GWP_{100})

Values are in millions of metric tons CO_2e. 2022 projected values are noted with an asterisk. See notes below table.

	YEAR	1990	2006	2019	2020	2021	2022
ENERGY	**Transportation**	**33.2**	**47.5**	**38.0**	**34.0**	**37.3**	**38.4**
	On-Road Gasoline	26.2	34.4	29.7	24.8	27.0	28.3
	On-Road Distillate	4.0	8.4	6.3	6.6	7.3	7.2
	On-Road CNG and Other	0.0	0.0	0.1	0.1	0.1	0.1
	Aviation	1.0	1.0	1.0	1.0	1.0	1.0
	Marine	1.6	3.2	0.6	1.1	1.5	1.4
	Rail (Distillate)	0.3	0.4	0.3	0.4	0.4 *	0.4 *
	Buildings	**26.5**	**23.8**	**25.5**	**23.1**	**24.8**	**25.4**
	Residential	15.6	14.2	15.3	14.1	14.9	15.2
	Commercial	11.0	9.6	10.2	9.0	9.9	10.2
	Fuel-Based Industrial	14.7	12.0	8.0	7.2	7.6	8.6
	Electricity	**26.9**	**30.9**	**19.4**	**18.7**	**19.1**	**18.1**
	In-State Electric	12.3	18.5	17.3	13.7	13.5	13.5
	MSW Incineration	0.2	0.8	0.9	0.8	0.8	0.8
	Imported Electric	14.4	11.6	1.2	4.2	4.8	3.7

	YEAR	1990	2006	2019	2020	2021	2022
NON-ENERGY	Halogenated Gases (excl. SF_6)		2.3	5.2	5.3	5.2	5.0
	SF_6	0.6	0.2	0.1	0.1	0.1	0.1
	Non-Fuel Agriculture	0.8	0.5	0.5	0.5	0.5	0.4
	Natural Gas Transmission & Distribution	3.0	3.1	2.7	2.7	2.7	2.7
	Landfills	**6.2**	**2.9**	**5.3**	**5.4**	**5.1**	**4.8**
	In-State	5.3	1.7	2.9	2.9	2.7	2.5
	Industrial	0.4	0.4	0.4	0.4	0.4	0.4
	Out-of-State	0.5	0.7	2.0	2.1	2.0	1.9
	Wastewater Treatment	0.7	0.8	0.8	0.8	0.8	0.8
	Non-Fuel Industrial	0.1	0.6	0.3	0.3	0.3	0.3
	Released through Land Clearing	0.6	1.8	1.0	1.0	1.0	1.0
TOTAL GROSS EMISSIONS		113.2	126.5	106.9	99.2	104.4	105.7
SEQUESTERED		-4.0	-6.0	-8.1	-8.1	-8.1	-8.1
TOTAL NET EMISSIONS		**109.2**	**120.5**	**98.8**	**91.1**	**96.3**	**97.6**
BLACK CARBON	Total	N/A	5.6	1.9	1.7	N/A	N/A
	On-Road	N/A	2.76	0.42	0.40	0.40	0.36

Notes

(*) 2021 and 2022 rail emissions (marked with an asterisk in the right-hand column) were set equal to 2020 estimated emissions, the most recent year for which fuel consumption data in this category was available from the US Energy Information Agency. Emissions in this sector have been consistent over time and it is thought unlikely to have changed significantly during this period.

Black carbon estimates other than those from on-road transportation were based on the USEPA National Emissions Inventory (NEI), for which the most recent data is for 2020. However, black carbon emissions likely continued their long-term downward trend due to replacement of older, high-emission diesel engines, as projected in Figure 6.4.4 of the NJDEP Global Warming Response Act 80x50 Report (October 2020). Black carbon is not included in the net emissions totals in the greenhouse gas inventory because it is an aerosol component of particulate matter (PM) and not a gas.

All numbers are rounded to the nearest tenth except where additional detail is needed. Subtotals may not agree exactly with sums of the numbers shown due to rounding.

Table 2. Estimated NJ Greenhouse Gas Emissions, 2019-2022 (GWP_{20})

Values are in millions of metric tons CO_2e. 2022 projected values are noted with an asterisk. See notes below table.

	YEAR	1990	2006	2019	2020	2021	2022
ENERGY	**Transportation**	**33.2**	**48.0**	**38.1**	**34.1**	**37.4**	**38.6**
	On-Road Gasoline	26.3	34.9	29.7	24.9	27.0	28.3
	On-Road Distillate	4.0	8.4	6.3	6.6	7.3	7.2
	On-Road CNG and Other	0.1	0.1	0.1	0.1	0.1	0.2
	Aviation	1.0	1.0	1.0	1.0	1.0	1.0
	Marine	1.6	3.3	0.6	1.1	1.5	1.4
	Rail (Distillate)	0.3	0.4	0.3	0.4	0.4 *	0.4 *
	Buildings	**26.6**	**23.8**	**25.5**	**23.1**	**24.8**	**25.5**
	Residential	15.6	14.2	15.3	14.1	14.9	15.2
	Commercial	11.0	9.6	10.2	9.0	10.0	10.2
	Fuel-Based Industrial	14.8	12.1	8.0	7.2	7.6	8.7
	Electricity	**26.9**	**30.9**	**19.4**	**18.8**	**19.1**	**18.1**
	In-State Electric	12.3	18.5	17.4	13.7	13.5	13.6
	MSW Incineration	0.2	0.8	0.9	0.9	0.9	0.8
	Imported Electric	14.4	11.6	1.2	4.2	4.8	3.7

	YEAR	1990	2006	2019	2020	2021	2022
NON-ENERGY	Halogenated Gases (excl. SF_6)		5.6	11.9	12.0	11.8	11.5
	SF_6	0.4	0.2	0.1	0.1	0.1	0.1
	Non-Fuel Agriculture	1.2	0.8	0.7	0.6	0.7	0.6
	Natural Gas Transmission & Distribution	8.9	9.2	8.2	8.1	8.0	8.1
	Landfills	**18.7**	**8.6**	**15.8**	**16.3**	**15.3**	**14.3**
	In-State	15.9	5.2	8.6	8.8	8.1	7.4
	Industrial	1.3	1.2	1.1	1.1	1.1	1.1
	Out-of-State	1.5	2.2	6.1	6.4	6.1	5.7
	Wastewater Treatment	1.7	2.0	2.1	2.1	2.1	2.1
	Non-Fuel Industrial	0.1	0.6	0.3	0.3	0.3	0.3
	Released through Land Clearing	0.6	1.8	1.0	1.0	1.0	1.0
TOTAL GROSS EMISSIONS		133.2	143.6	131.2	123.8	128.1	128.8
SEQUESTERED		-4.0	-6.0	-8.1	-8.1	-8.1	-8.1
TOTAL NET EMISSIONS		**129.2**	**137.6**	**123.1**	**115.7**	**120.0**	**120.7**
BLACK CARBON	Total	N/A	19.8	6.5	6.1	N/A	N/A
	On-Road	N/A	9.71	1.48	1.42	1.41	1.26

Notes

(*) 2021 and 2022 rail emissions (marked with an asterisk in the right-hand column) were set equal to 2020 estimated emissions, the most recent year for which fuel consumption data in this category was available from the US Energy Information Agency. Emissions in this sector have been consistent over time and it is thought unlikely to have changed significantly during this period.

Black carbon estimates other than those from on-road transportation were based on the USEPA National Emissions Inventory (NEI), for which the most recent data is for 2020. However, black carbon emissions likely continued their long-term downward trend due to replacement of older, high-emission diesel engines, as projected in Figure 6.4.4 of the NJDEP Global Warming Response Act 80x50 Report (October 2020). Black carbon is not included in the net emissions totals in the greenhouse gas inventory because it is an aerosol component of particulate matter (PM) and not a gas.

All numbers are rounded to the nearest tenth except where additional detail is needed. Subtotals may not agree exactly with sums of the numbers shown due to rounding.

Table 3. On-Road Emissions (2019, 2021 and 2022)
Values are in millions of metric tons CO_2e.[13]

Fuel and Vehicle Type	GWP100			GWP 20		
	2019	2021	2022	2019	2021	2022
Gasoline Motorcycle	0.16	0.15	0.15	0.16	0.15	0.16
Gasoline Passenger Car	11.67	9.37	8.69	11.70	9.39	8.71
Gasoline Passenger Truck	15.24	14.95	16.26	15.27	14.98	16.29
Gasoline Light Commercial Truck	1.95	1.92	2.31	1.95	1.92	2.31
Gasoline Other Buses	0.01	0.02	0.09	0.01	0.02	0.09
Gasoline Transit Bus	0.04	0.04	0.04	0.04	0.04	0.04
Gasoline School Bus	0.00	0.01	0.01	0.00	0.01	0.01
Gasoline Refuse Truck	0.00	0.00	0.00	0.00	0.00	0.00
Gasoline Single Unit Short-haul Truck	0.39	0.36	0.60	0.39	0.36	0.60
Gasoline Single Unit Long-haul Truck	0.11	0.11	0.02	0.11	0.11	0.02
Gasoline Motor Home	0.03	0.03	0.04	0.03	0.03	0.04
Gasoline Combination Short-haul Truck	0.00	0.00	0.00	0.00	0.00	0.00
Diesel Passenger Car	0.09	0.07	0.05	0.09	0.07	0.05
Diesel Passenger Truck	0.72	0.77	0.63	0.72	0.78	0.63
Diesel Light Commercial Truck	0.15	0.15	0.20	0.15	0.15	0.20
Diesel Other Buses	0.09	0.09	0.26	0.09	0.09	0.26
Diesel Transit Bus	0.26	0.23	0.14	0.26	0.23	0.14
Diesel School Bus	0.31	0.32	0.19	0.32	0.32	0.19
Diesel Refuse Truck	0.10	0.11	0.16	0.10	0.11	0.16
Diesel Single Unit Short-haul Truck	1.41	1.27	1.39	1.41	1.28	1.39
Diesel Single Unit Long-haul Truck	0.39	0.37	0.04	0.39	0.38	0.04
Diesel Motor Home	0.02	0.02	0.03	0.02	0.02	0.03
Diesel Combination Short-haul Truck	0.92	1.30	0.98	0.92	1.30	0.98
Diesel Combination Long-haul Truck	1.85	2.61	3.15	1.85	2.62	3.15

[13] All numbers are rounded to the nearest one-hundredth

Fuel and Vehicle Type	GWP100			GWP 20		
	2019	2021	2022	2019	2021	2022
CNG Other Buses	0.01	0.01	0.05	0.02	0.01	0.07
CNG Transit Bus	0.03	0.03	0.03	0.04	0.04	0.04
CNG School Bus	0.00	0.01	0.00	0.01	0.01	0.00
CNG Refuse Truck	0.02	0.02	0.02	0.02	0.03	0.03
CNG Single Unit Short-haul Truck	0.03	0.03	0.02	0.04	0.04	0.03
CNG Single Unit Long-haul Truck	0.01	0.01	0.00	0.01	0.01	0.00
CNG Motor Home	0.00	0.00	0.00	0.00	0.00	0.00
CNG Combination Short-haul Truck	0.02	0.04	0.01	0.03	0.05	0.01
CNG Combination Long-haul Truck			0.02			0.03
E-85 Passenger Car	0.01	0.01	0.01	0.01	0.01	0.01
E-85 Passenger Truck	0.04	0.04	0.03	0.04	0.04	0.03
E-85 Light Commercial Truck	0.01	0.01	0.01	0.01	0.01	0.01
On-Road Gasoline	29.7	27.0	28.3	29.7	27.0	28.3
On-Road Distillate	6.3	7.3	7.2	6.3	7.3	7.2
On-Road CNG	0.1	0.1	0.1	0.2	0.2	0.2
Total	36.1	34.4	35.6	36.2	34.6	35.8

Appendix A: Methodology for Emissions from Out-of-State Solid Waste Disposal

Since publication of the first New Jersey Greenhouse Gas Inventory Report in 2008, the State has estimated emissions from exported municipal solid waste by multiplying emissions from in-state landfill disposal for the current year by the ratio of tons of solid waste disposed of out-of-state to tons disposed of within the state:

$$Emissions\ from\ Exported\ Solid\ Waste = Emissions\ from\ In-State\ Landfills\ x\ \frac{Tons\ of\ Waste\ Exported}{Tons\ of\ Waste\ Disposed\ of\ In-State}$$

A limitation to this method is that it only considers the quantity of solid waste disposed of out-of-state during the current year. Changes in exported quantities relative to in-state quantities during the current year therefore govern estimated emissions. A sudden drop in exports relative to in-state disposal quantities in the current year will make emissions from exported waste appear smaller, and vice versa if exports increase relative to in-state disposal.

In reality, landfills consist of accumulated waste deposited over a landfill's entire life, and these older deposits continue emitting methane regardless of how much waste is newly added. Even after a landfill closes, old deposits continue to release gas for decades, with newer deposits creating more gas and older deposits less. So even if solid waste exports cease, emissions from previously deposited waste continue. This phenomenon was not accurately reflected in the previous method. Further, the previous method did not capture the fact that New Jersey was a net importer of solid waste up until the mid-1980s, not an exporter, and this led to artificially high emissions estimates for the affected years.

Gas generation is more accurately evaluated using first-order decay calculations, where emissions from each layer of waste are found as a function of the age of that layer, the quantity of degradable organic material it contains, and the rate at which the waste decomposes. Emissions from each layer are then summed to find the overall total for the deposited waste. New Jersey's Greenhouse Gas Inventory Report has, from the beginning, used first-order decay calculations to estimate emissions from in-state landfill deposits. In recent years this has been accomplished using the USEPA's State Inventory Tool Solid Waste Module, as described in the 2024 NJ Greenhouse Gas Inventory Report.

With publication of this 2025 NJ Greenhouse Gas Inventory Report Mid-Cycle Update, first-order decay calculations are also used to estimate emissions from exported solid waste. In this analysis, in-state landfilled quantities and exported waste quantities are combined and the amount of methane produced is found using the same first-order decay method as for in-state calculations. Adjustments are then made for flaring, landfill gas-to-energy projects, and

oxidation as described below. The emissions attributed to out-of-state waste are then found by subtracting in-state emissions from combined waste emissions.

Removal of methane by flaring and landfill gas-to-energy projects are only provided in the EPA SIT as mass quantities for the State (in short tons removed per year), and these do not scale up when evaluating the combined in-state and export waste condition. To account for expected gas mitigation at out-of-state waste disposal facilities, percentage removal rates for flaring and landfill gas-to-energy were calculated from the in-state disposal emissions analysis. These percentages were then applied to emissions from the combined waste analysis. This approach implies that emissions from exported waste are attenuated by flaring and landfill gas-to-energy removals in the same proportions seen in New Jersey, which is reasonable since all States are subject to the U.S. Clean Air Act's mitigation requirements for landfill gas. With respect to methane oxidation in the landfill cap, the EPA SIT default attenuation rate of 10% was used in both cases, applied to gas quantities after accounting for removals by flare and landfill gas-to-energy.