Disclaimer: The data shown in this report constitutes best estimates at time of writing.

IATA Net Zero Progress Report 2024

IATA member airlines committed to a net zero carbon emissions goal in 2021, and ICAO member states adopted the long term aspirational goal (LTAG) at the 41st ICAO Assembly in 2022.[1] To reach this common target, it is critical to monitor progress on CO_2 emissions. IATA launched the TrackZero platform in 2024, to collect primary data directly from airlines to substantiate this target. To date, 82 aircraft operators, representing 45% of IATA's members by revenue-tonne-kilometer (RTK), have contributed to the initiative.

In 2024, airlines emitted a (gross) total of 942 million tonnes (Mt) of CO_2, of which 1.0% was mitigated through offsets or Sustainable Aviation Fuel (SAF) use, reducing net emissions to 933 Mt CO_2. Although total net emissions increased compared to 2023 as a result of more air traffic, net emissions per RTK decreased by 3.7% YoY thanks to improved operational efficiencies, including higher load factors.

Scope of the Report

The Report follows the IATA Net Zero Tracking Methodology to report the industry's progress toward net zero.[2] Therefore, the data presented focus on CO_2 tank-to-wake (TTW) emissions or the aircraft operators' tailpipe CO_2 emissions. Following the scope of emissions, emissions reductions associated with the use of SAF are also calculated using a 3.16 gCO_2/g of fuel and conventional aviation fuel (CAF) baseline of 89gCO2e/MJ.

Industry Overview

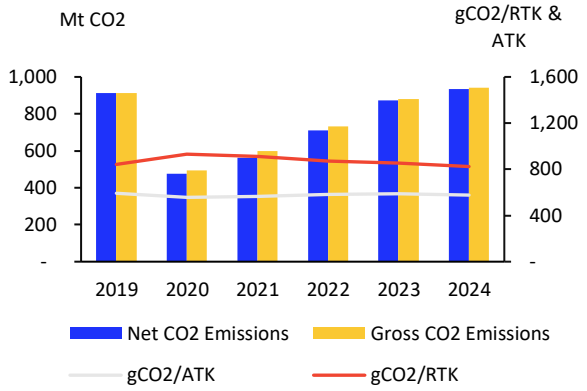
The CO_2 emissions of the aviation industry are monitored using three key metrics: net total CO_2 emissions, net CO_2 emissions per RTK, which takes traffic volumes into account, and net CO_2 emissions per available tonne-kilometer (ATK), which considers available capacity.

Table 1: Key Metrics for Net CO_2 Emissions.[3]

	2019	2020	2021	2022	2023	2024
Net CO_2 (Mt)	912	476	562	711	874	933
CO_2 per RTK (g/RTK)	845	931	912	869	856	824
CO_2 per ATK (g/ATK)	592	557	564	585	587	578

The first metric summarizes absolute CO_2 emissions after accounting for decarbonization measures (e.g., SAF use, carbon offsets, etc.), while the latter two show emissions intensity expressed as net CO_2 emissions per volume of air traffic. While net zero is an absolute target, tracking the intensity improvements gives key insights into progress made even when traffic growth exceeds the effects of mitigation measures.

Chart 1: Total Gross, Net CO_2 Emissions, and Emissions Efficiency of the Airline Sector, 2019-2024.



In 2024, total net emissions were up 6.7% YoY (year-on-year) with increased air traffic. However, CO_2 intensity (per RTK) improved (i.e., declined) by 3.7% over the same period, mainly thanks to higher load factors.

[1] IATA Net Zero 2050 commitment; ICAO Long term global aspirational goal (LTAG) for international aviation
[2] IATA Net Zero Progress Tracking Methodology
[3] Mt = million tonnes

Meanwhile, CO_2 per ATK also decreased by 1.6%. Improvements in CO2 per ATK have stagnated because deliveries of new and more fuel-efficient aircraft are severely delayed. Airlines have to operate older aircraft as a result, which negatively impacts emissions efficiency.

Emissions Mitigation

There are various emissions mitigations measures that can drive the airline industry to net zero. Carbon offsets and SAF use[4] are key levers with the highest potential in the short term.

Table 2: Emissions Reductions per Reduction Source in Mt, 2019-2024.

	2019	2020	2021	2022	2023	2024
Carbon offsets & CDR/CCS	1.7	18.7	35.2	21.9	6.1	6.5
SAF	0.05	0.09	0.18	0.53	1.11	2.53
New aircraft tech.	0	0	0	0	0	0

Offsets played the most significant role in emission reduction efforts in 2024, and they account for all emissions reductions in the "carbon offsets & CDR/CCS" category.

The use of offsets is expected to grow for CORSIA compliance purposes. Between 146 and 236 million tonnes of offsets are expected to be used for the first CORSIA compliance cycle, from 2024 to 2026.[5]

More airlines started investing in removals in 2024. However, these credits have not played a role in mitigating emissions as of 2024. The technology must scale up to be impactful for the aviation sector, and affordability is a barrier.

Meanwhile, SAF output for airline use doubled in 2024, from 2023. The only mature SAF pathway is Hydrotreated Esters and Fatty Acids (HEFA), which delivers an average emissions reduction in excess of 80%. To reach the 2050 target of net zero carbon emissions, it is both urgent and essential that more production pathways reach commercial viability.[6]

The development of new aircraft with greater fuel efficiency is an integral part of the aviation sector since its inception. Novel technologies, such as hydrogen, hybrid-electric, or electric propulsion aircraft, are integral long-term contributors to decarbonization.[7] Their impact on reaching net zero by 2050 will be better understood as these technologies mature and move closer to commercial readiness.

Raw Data

The raw data for the metrics included in this report are shown in Table 3.

Table 3: Raw data for 2024 Net Zero Progress Report.

	Net Emissions [$MtCO_2$]	Gross Emissions [$MtCO_2$]	Intensity Net [gCO_2/RTK]	Intensity net [gCO_2/ATK]	Carbon offsetting [$MtCO_2$]	Total neat SAF delivered [kt][8]	Reductions through SAF use [$MtCO_2$]
2019	912	914	845	592	1.7	22.5	0.05
2020	476	495	931	557	18.7	40	0.09
2021	562	597	912	564	35.2	80	0.18
2022	711	733	869	585	21.9	240	0.53
2023	874	882	855	587	6.1	500	1.11
2024	933	942	824	578	6.5	1000	2.53

Data source:
Data from internal IATA sources including TrackZero were considered to estimate the gross 2024 CO_2 emissions and compute the CO_2 emissions reductions per emissions reduction source.[9]

[4] Airline-funded SAF and offsets retired in 2024 are considered n the report.
[5] IATA's updated CORSIA Sectoral Growth Factor Forecast
[6] IATA - Global Feedstock Assessment for SAF Production
[7] IATA - Net Zero Roadmaps
[8] kt = thousand tonnes
[9] Totals may not sum due to rounding.