BRIEFING

Aviation emissions on the rise

Analysis of aviation emissions for flights departing from Germany in 2025

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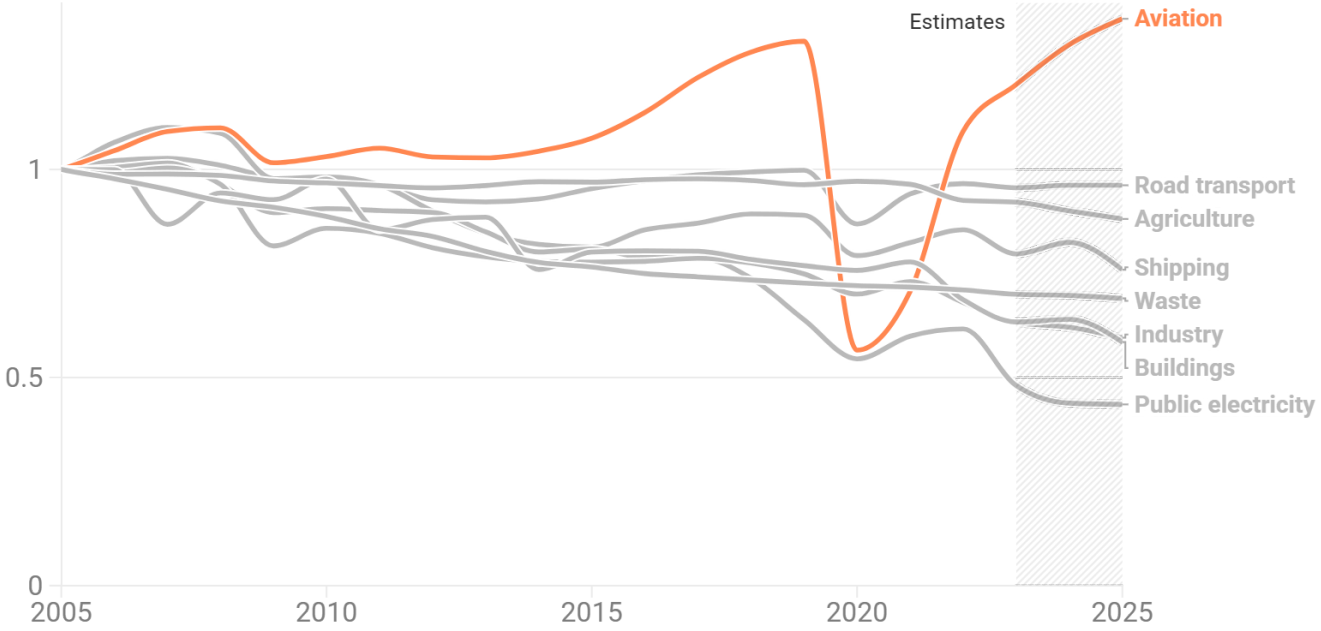
Lead author: Giacomo Miele, giacomo.miele@transportenvironment.org

European aviation has crossed a symbolic threshold. According to Eurocontrol data, in 2025, flights departing from European airports generated 195 Mt of CO_2, returning to and surpassing their 2019 pre-pandemic level for the first time (192 Mt of CO_2 in 2019). The picture is worse still since 2005. Indeed, aviation emissions have risen by more than 30% since 2005, moving in the opposite direction to virtually every other sector of the economy, making it the EU's fastest-growing source of emissions in the last 20 years.

Aviation is EU's fastest growing source of emissions

Aviation emissions have risen by more than 30% since 2005 - the start of the ETS - while emissions from other sectors have declined.

Change in greenhouse gas emissions by sector, $MtCO_2e$) (2005 = 100)



Source: T&E (2026) based on UNFCCC, EEA, Eurostat, IPCC, Ember

The situation in European countries is more heterogeneous. The United Kingdom, Germany, Spain, France and Italy together represent around 12% of global aviation emissions - for comparison, this is roughly the same level as China - but their trajectories diverge substantially. Spain and Italy have already surpassed their pre-pandemic emissions, at 11.2% and 9.6% above 2019 respectively, driven by strong tourism recovery and growing low-cost capacity. Germany is the notable outlier among major European markets, still -8.6% below its 2019 level. The breakdown of aviation emissions in Germany is as follows:

28.4
Mt of CO_2

Emissions growth 2024-2025: **+2.2%**
Almost back to the pre-COVID peak of 2019: **91.4%**

1
million flights

Traffic growth 2024-2025: **+2.6%**
Traffic has almost returned to 2019 levels: **85%**

Amongst this, Lufthansa stays the most polluting carrier for flights departing Germany[1].

8.3
Mt of CO_2

Lufthansa's emissions for flights departing Germany, representing one third of all national aviation emissions.

9.5
Mt of CO_2

Lufthansa's emissions for flights departing Europe.

Lufthansa dominates the picture, compared to other carriers:

Name of carrier	Emissions for flights departing Germany in 2025 (Mt of CO_2)
Deutsche Lufthansa AG	8.3
Eurowings	1.4
Condor Flugdienst	1.3
Ryanair	0.9
United Airlines	0.9
Emirates	0.7
SunExpress	0.6

[1] Emissions figures for individual airlines refer strictly to the specific operating brand rather than their broader corporate parent group. For example, estimates for Lufthansa apply solely to Deutsche Lufthansa AG and do not include subsidiaries within the wider Lufthansa Group, such as Brussels Airlines or ITA Airways.

Name of carrier	Emissions for flights departing Germany in 2025 (Mt of CO_2)
Air China	0.6
Singapore Airlines	0.4
Turkish Airlines	0.4

Alongside most polluting carriers, T&E has analysed the most polluting routes departing from Germany. The following picture emerges:

	Route	Emissions CO_2 2025 ($ktCO_2$)	Emissions growth 2024-2025 (%)
1	Frankfurt - Shanghai	732	= 0%
2	Frankfurt -New York	431	↓ -11%
3	Frankfurt - Singapore	419	↓ -11%
4	Frankfurt - Tokyo	405	↓ -24%
5	Frankfurt - Seoul	388	↓ -40%
6	Frankfurt - São Paulo	363	↑ +3%
7	Frankfurt - Hong Kong	339	↓ -28%
8	Frankfurt - San Francisco	315	↑ +3%
9	Frankfurt - Beijing	301	↓ -11%
10	Frankfurt - Bangkok	251	↓ -21%

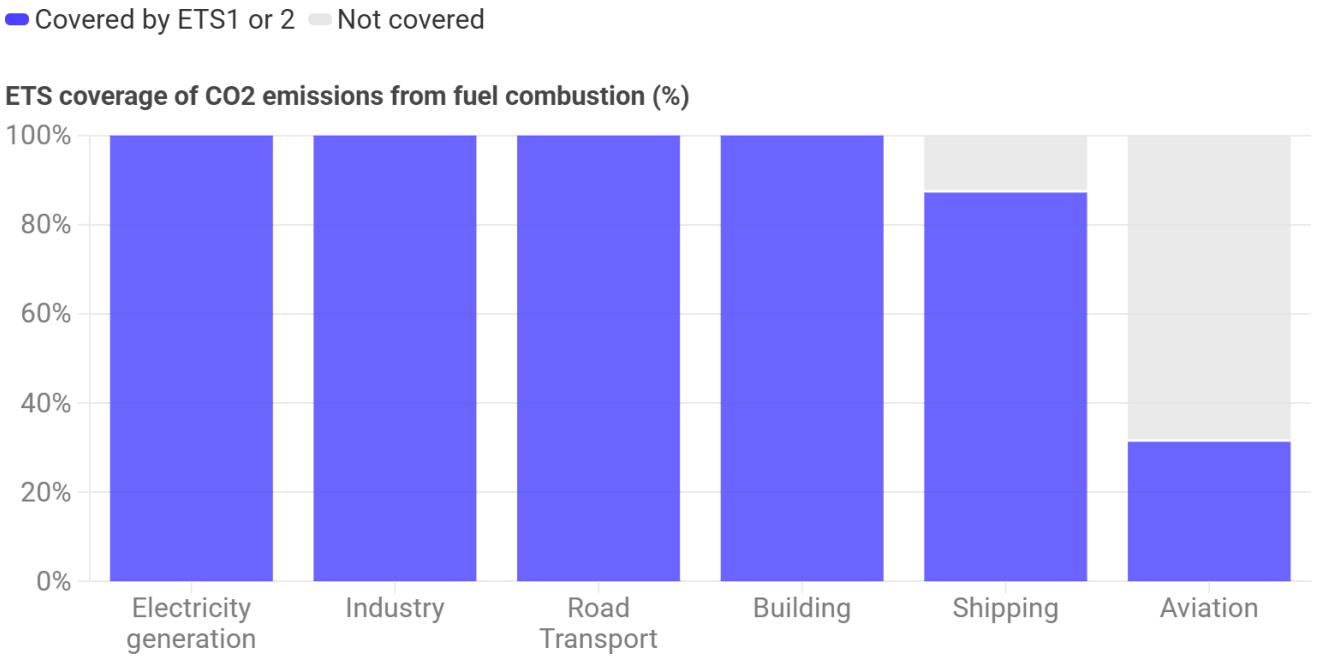
All of this data comes amidst the backdrop of the revision of the European carbon market for aviation, the Emissions Trading System (EU ETS). The ETS has covered intra-EEA flights since 2012, with UK-to-EU routes switching to the UK ETS in 2021 following Brexit. Under both systems, airlines surrender allowances equal to their prior-year CO_2 emissions, acquired through annual allocations, auctions or secondary purchases, under a cap that tightens progressively over time. In principle, a rising carbon price creates an incentive to cut emissions when doing so costs less than purchasing permits.

The most fundamental shortcoming of the aviation ETS remains scope, as only flights in Europe are covered. The European carbon markets covered 74 Mt of CO_2 in 2025 (considering emissions from EU and Swiss administered airlines, plus UK ETS estimated emissions). Had they applied to all departing flights, a further 107 Mt would have been included. Taking unpriced international emissions and remaining free allowances together, **68% of CO_2 from European departing flights went unpriced in 2025**.

This means that aviation is the only major emitting sector in Europe that does not fully pay for its pollution. While industry, power generation and other heavy emitters face a progressively tightening carbon price across their full output, aviation benefits from a combination of scope exemptions and free allowances that leave the majority of its emissions unpriced. The gap has widened as the sector has grown.

68% of EU aviation emissions escape pricing

ETS2 puts a carbon price on driving and heating - yet long-distance flights remain largely unpriced.



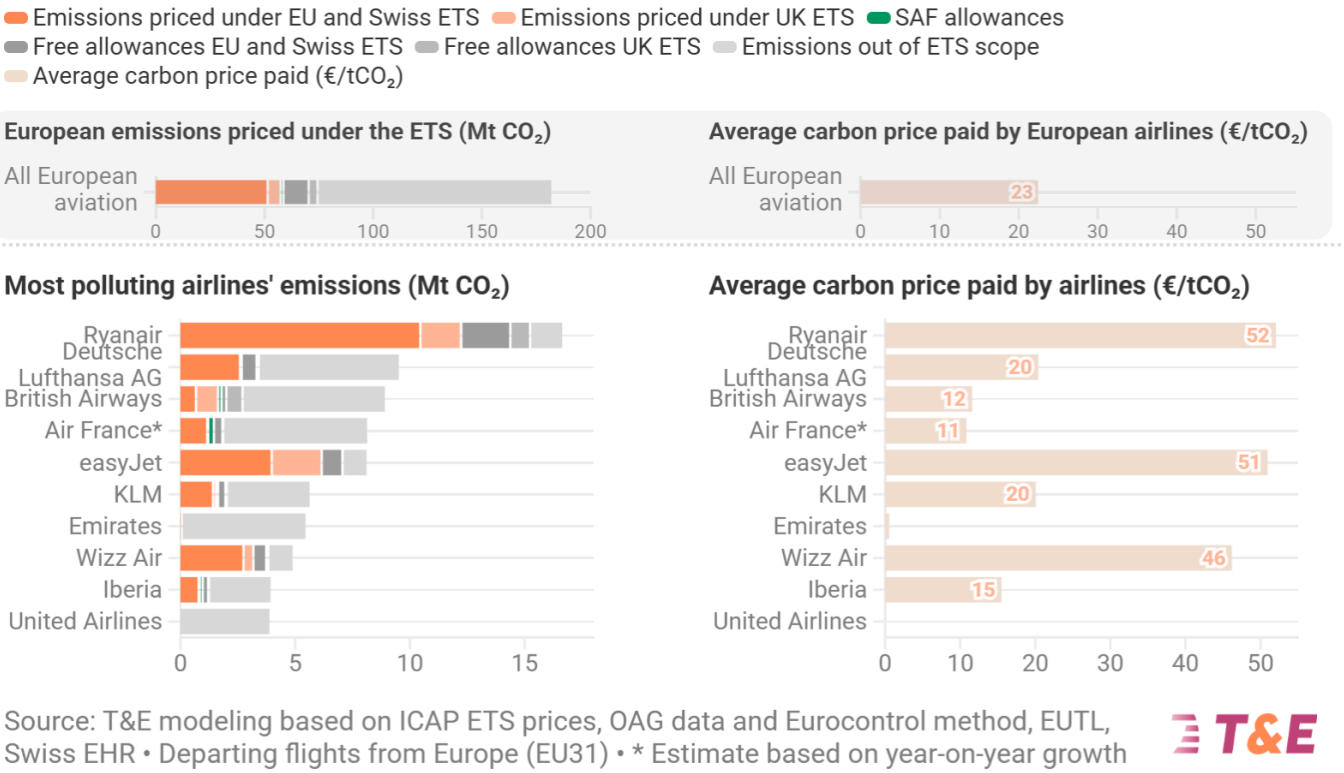
Source: UNFCCC, OAG, T&E SEA model • Chart scope (100% base): Aviation: departing EU flights; Maritime: intra-EU + 50% extra-EU voyages.
'Covered' means regulated under the ETS - some allowances are allocated free of charge.

Low-cost carriers, whose networks are concentrated within Europe, pay for a higher share of their emissions simply because more of their flights fall within the ETS scope. Legacy carriers, with large long-haul networks, pay for far less. Non-European carriers pay the least of all.

The chart below shows the effective price paid per tonne of CO_2 by the ten highest-emitting airlines in 2025, considering the average EU, Swiss and UK ETS prices of €73 and £48 (€55), free allocations and scope exemptions.

Airlines paid an average of €23 per tonne of CO_2, one third of the ETS allowance price

Paid emissions and free emissions



Source: T&E modeling based on ICAP ETS prices, OAG data and Eurocontrol method, EUTL, Swiss EHR • Departing flights from Europe (EU31) • * Estimate based on year-on-year growth

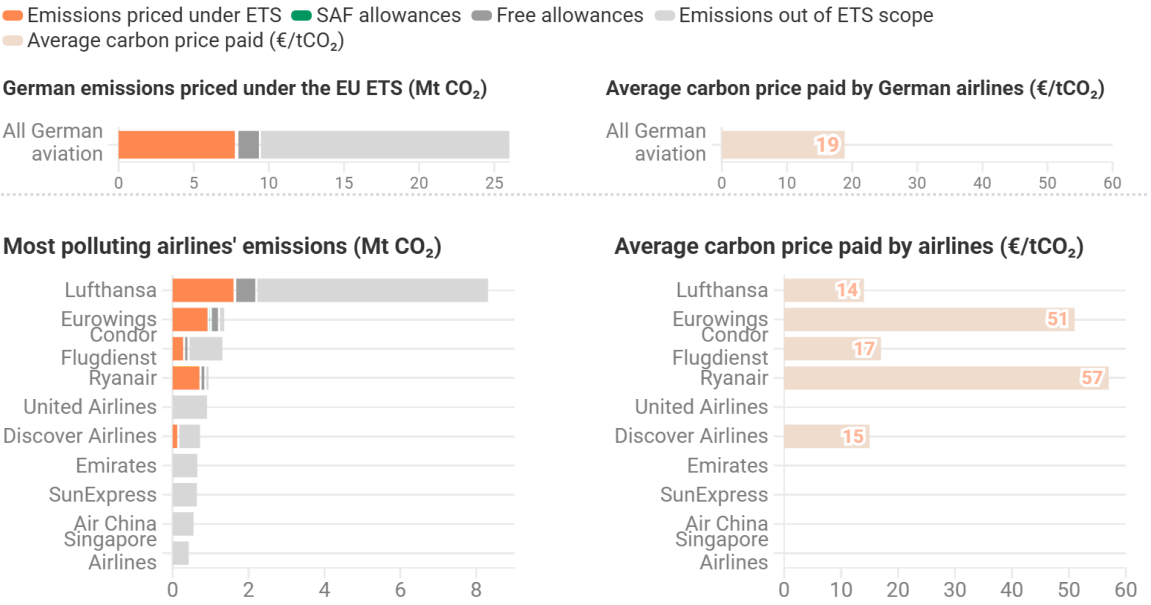
In total, airlines operating in Europe paid nearly €4.1 billion for EU, Swiss and UK ETS allowances in 2025. An estimated €8.5 billion in emissions costs went unpaid, a consequence of remaining free allowances and, more importantly, the exclusion of long-haul flights.

Legacy carriers such as Deutsche Lufthansa AG, British Airways and Air France left 72%, 78% and 82% of their emissions costs unpaid in 2025. This is largely explained by the high share of long-haul flights in their networks, falling outside of ETS coverage. Non-European carriers, including Emirates and United Airlines, emit at comparable levels to their European peers overall yet pay even less, if not zero, as virtually all their flights are international. This is a competitive distortion. Extending the carbon market to all departing flights would bring non-European airlines into scope and align the system with the polluter pays principle.

We have also broken down the data for flights departing from Germany.

German aviation paid an average of €19 per tonne of CO_2, one third of the ETS allowance price

Paid emissions and free emissions



Source: T&E modeling based on ICAP ETS prices, OAG data and Eurocontrol method, EUTL, Swiss EHR • Departing flights from Germany

As mentioned before, airlines operating in Europe paid €4.1 billion in 2025 under the ETS aviation, covering just 32% of departing emissions. Had the schemes applied to all departing flights, revenues could have reached nearly €12.7 billion under the same carbon price conditions, unlocking an additional €8.5 billion for public budgets to direct towards the green transition. The European Commission's upcoming revision of the carbon market offers a direct opportunity to transform it into a leading policy instrument for aviation decarbonisation, above all by scaling up sustainable aviation fuel production and incentivising contrail avoidance.

Recommendations

01

Expand the EU ETS to cover all departing flights from 2027, instead of continuing to rely on CORSIA. The European carbon markets covered 74 Mt of CO_2 in 2025. Had it applied to all departing flights, a further 107 Mt of CO_2 would have been included - generating an additional €8.5 billion in revenues.

02

Use the upcoming revision of the carbon market as an opportunity to transform it into a leading policy instrument for aviation decarbonisation, above all by scaling up sustainable aviation fuel production and incentivising contrail avoidance:

- Upgrade the Hydrogen Bank into a European-wide double sided auction mechanism to boost the uptake of e-SAF. Allocate e.g. 25% of aviation ETS revenues to the market intermediary.
- Reform the SAF allowances in order to better support e-SAF by extending the mechanism in time and amount; earmarking allowances for e-SAF and advanced biofuels; phasing out support for HEFA-SAF; reducing the price coverage of the different types of fuels; and by moving away from an ex-post allocation to an ex-ante system.
- Introduce an incentive scheme for airlines called *contrail allowances* using ETS revenues, to support airlines to perform contrail avoidance manoeuvres.