



Contrail prevention case study: **Etihad Airways flight EY914**

Green aviation's contrail challenge

How SATAVIA cuts aviation's climate impact with optimised flight planning

Summary

- Aviation is going green and decarbonising, yet most initiatives overlook non-CO₂ climate impacts such as aircraft contrails
- Persistent aircraft contrails account for up to 60% of aviation's overall climate impact, but are challenging to predict and avoid
- SATAVIA's DECISIONX:NETZERO platform now enables eco-conscious aircraft operators like Etihad Airways to forecast and avoid contrail-forming regions
- On one flight alone (EY914), Etihad prevented over 260 tonnes of carbon dioxide equivalent (CO₂e) – with a total of over 7,000 tonnes prevented to date

Challenge



Recent scientific research suggests that contrails formed by aircraft at cruise account for over double the global climate impact of direct engine emissions



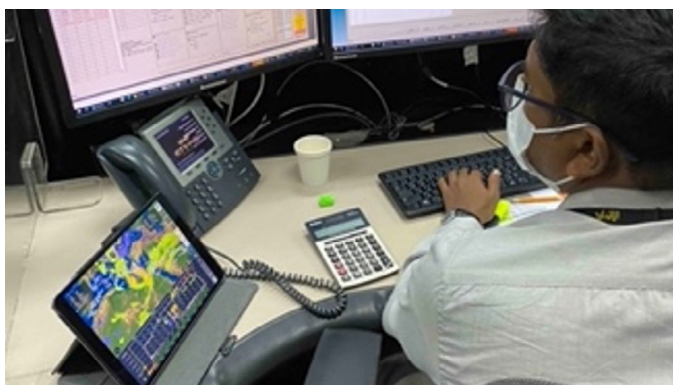
In addition to flight dispatch and air traffic control engagement, contrail prevention requires high-resolution atmospheric modelling supported by high-performance-computing



Etihad Airways is leading aviation in tackling the climate impact of necessary flight operations, including non-CO₂ impacts such as those generated by contrails



Contrail prevention is a necessary part of climate neutral flight operations, but raises formidable scientific, technical, and operational barriers



Solution



SATAVIA's unique DECISIONX:NETZERO platform solves the contrail challenge by creating a digital twin of the entire atmosphere from surface to space



DECISIONX:NETZERO generates best in class, validated, and high-resolution forecasts of persistent contrails at all flight levels, based on localised conditions



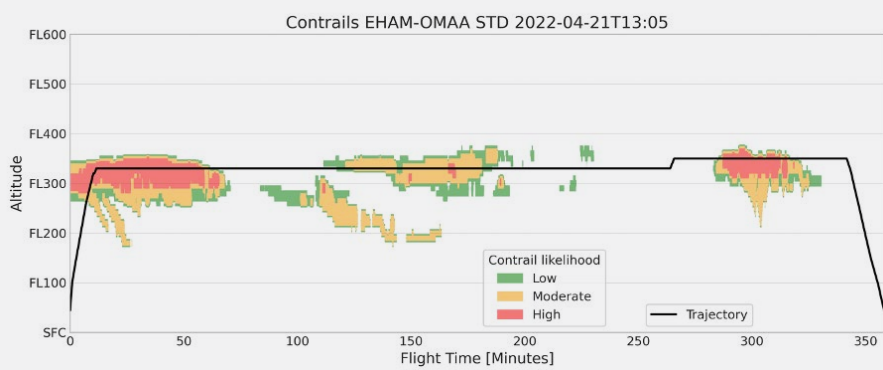
SATAVIA works with operators like Etihad to integrate DECISIONX:NETZERO forecasts into industry-standard flight planning software, modifying flight plans for contrail prevention



SATAVIA also quantifies and validates achieved climate benefit for sustainability reporting and conversion into future carbon equivalent offset benefits

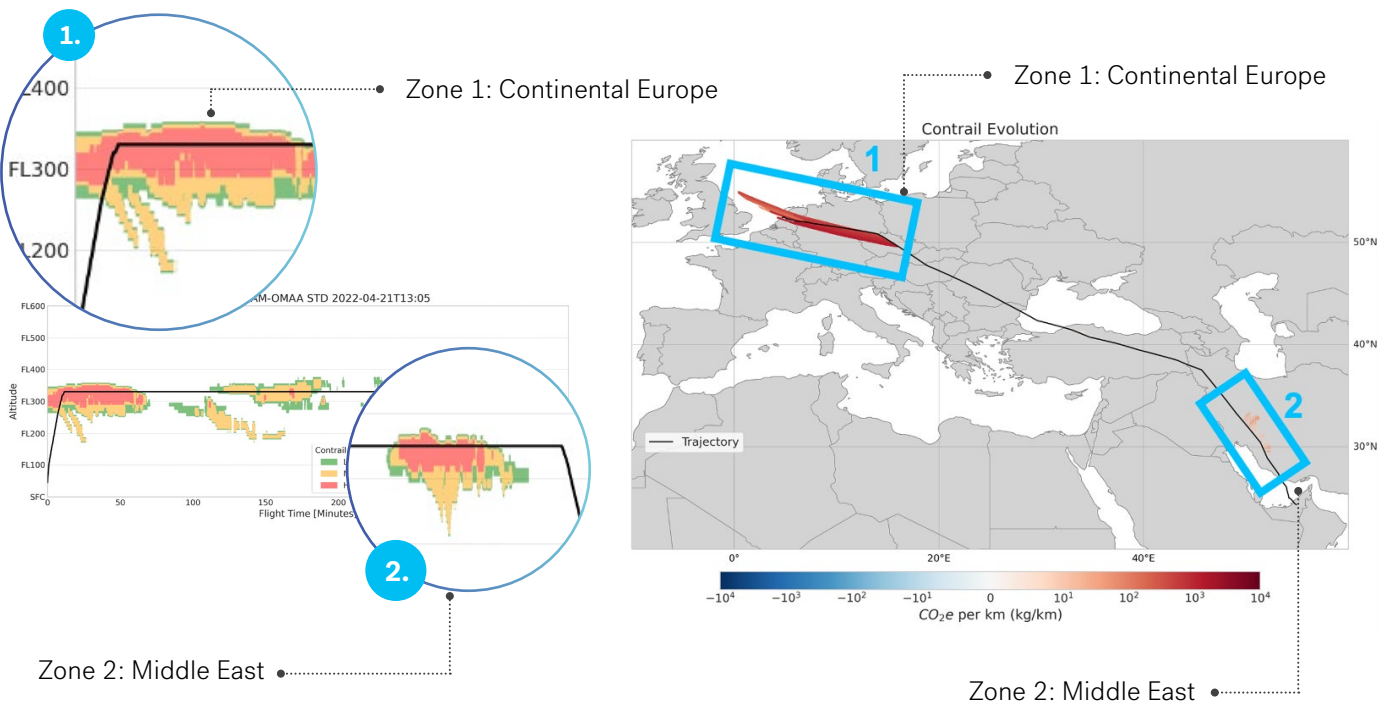
Results

EY914 flew from Amsterdam to Abu Dhabi on 4th April, 2022, as part of Etihad and SATAVIA’s world-first collaboration for contrail prevention flight planning

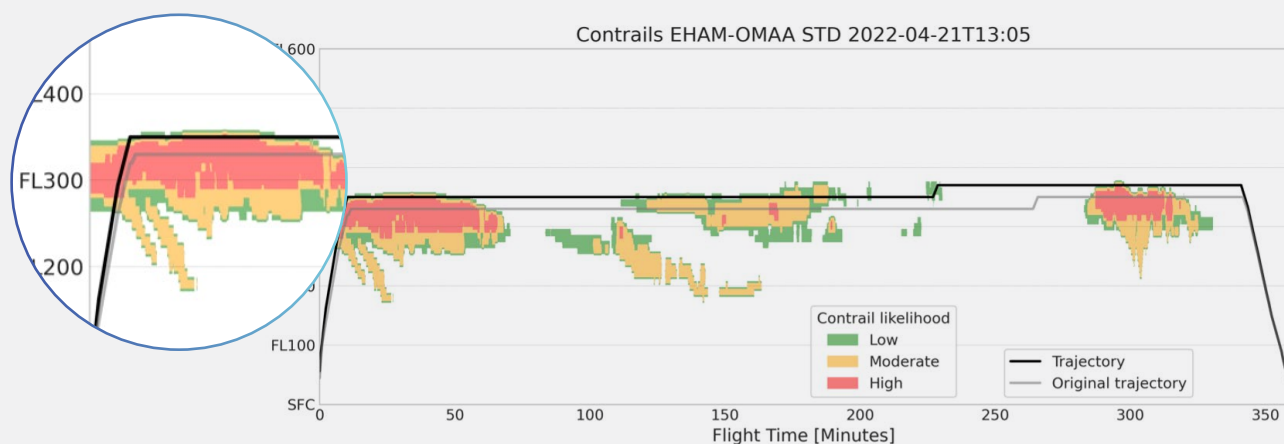


Based on the original filed flight plan, DECISIONX:NETZERO forecasts showed EY914 flying through two atmospheric regions predicted to generate persistent contrails

SATAVIA climate impact modelling predicted contrail climate impact of over 260 tonnes of carbon dioxide equivalent (CO₂e) from the first zone, over continental Europe



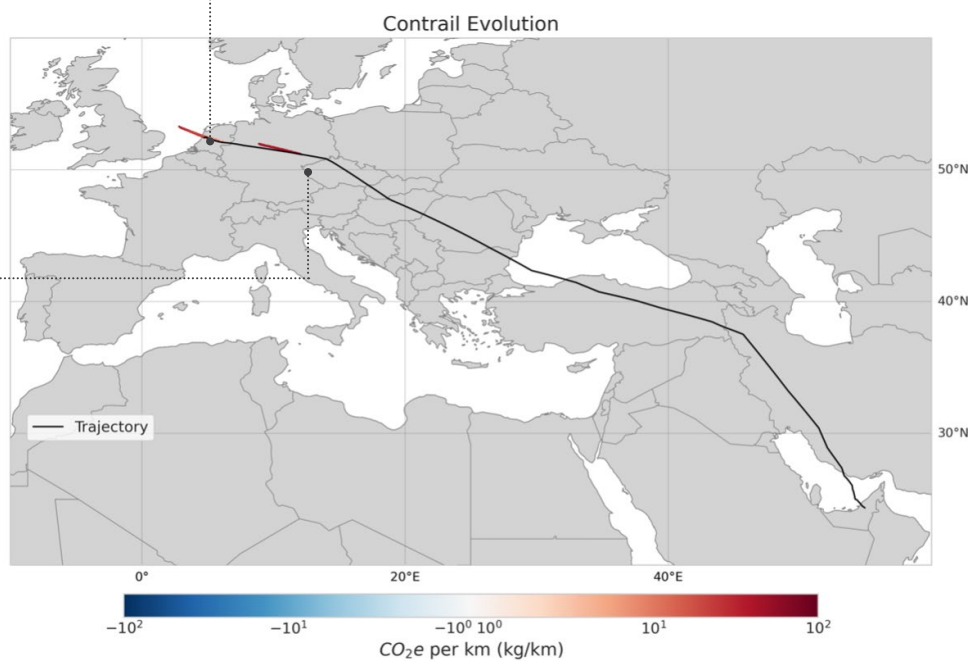
Based on this analysis, SATAVIA recommended a modified flight trajectory to fly over the warming regions. Subsequent post-flight analysis demonstrated achieved climate savings of over 260 tonnes of carbon dioxide equivalent



Modified flight trajectory

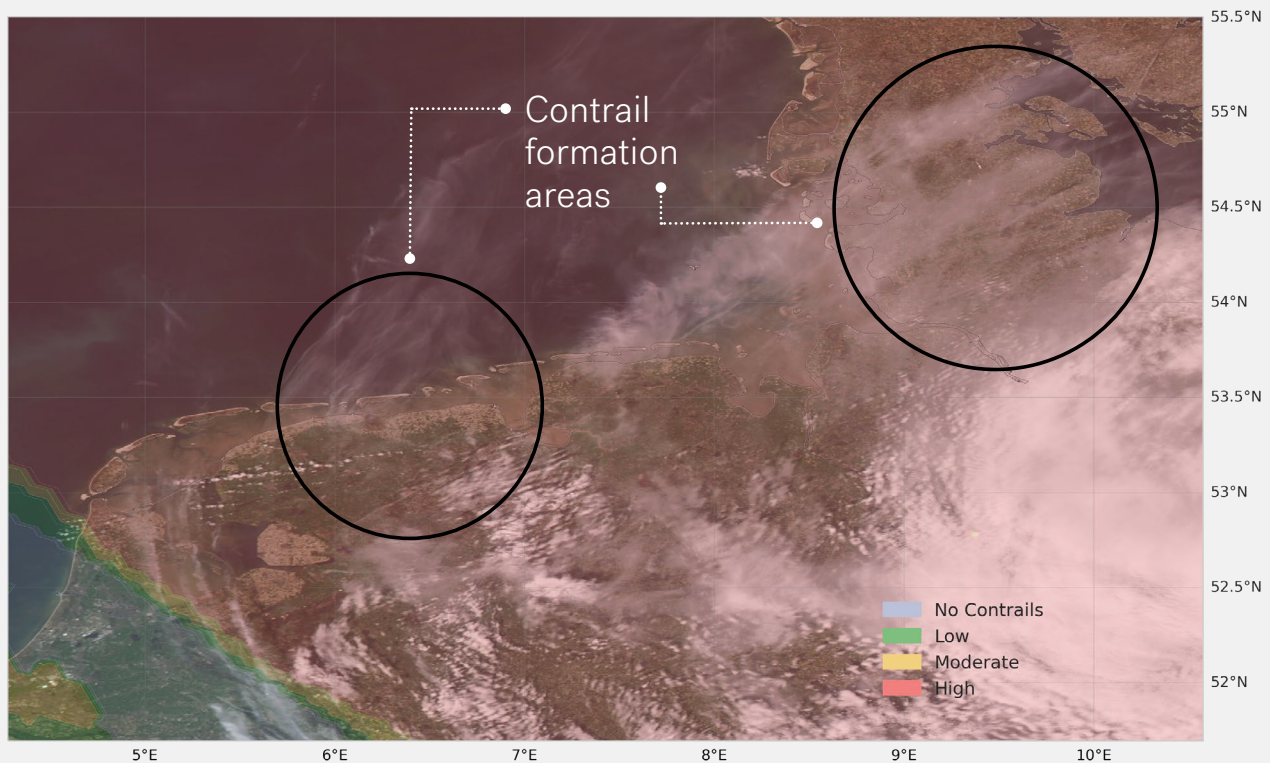
Consequent adjustment in climate impact modelling

261.8T
CO₂e Saving
ΔV



SATAVIA utilises hindcast weather data and aircraft tracking ADS-B data to reconstruct flown flight trajectories and real atmospheric conditions, enabling rigorous climate impact quantification

Validation: satellite imagery confirms contrail formation in predicted persistent contrail formation areas



The way forward

- ✓ The global potential for contrail prevention is vast, with up to 2.4 billion tonnes of CO₂e generated by commercial flights each year
- ✓ Only a small minority of flights require modification for contrail prevention: over 80% of climate impact can be prevented by modifying just 5% of flights
- ✓ SATAVIA's DECISIONX:NETZERO platform is the only solution offering contrail prevention within day-to-day commercial aviation flight operations
- ✓ Contrail prevention is the lowest-hanging fruit for green aviation. Reach out to SATAVIA today and learn how your organisation can engage with this ground-breaking sustainable transport initiative.

Etihad's commercial partnership with SATAVIA has already prevented over **7,000 tonnes of CO₂e**, equivalent to direct emissions from **over 18 days' continuous widebody jetliner flight**



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