

SATAVIA
DECISIONX:NETZERO

ICELANDAIR 



Contrail prevention case study: **Icelandair flight FI853**

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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 35% 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 Icelandair to forecast and avoid contrail-forming regions
- On one flight alone (FI853), Icelandair prevented 99 tonnes of carbon dioxide equivalent (CO₂e)

Challenge



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



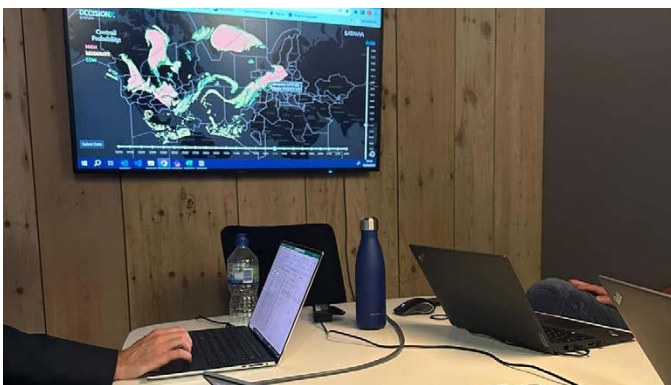
In addition to flight dispatch and air traffic control engagement, contrail prevention requires high-resolution atmospheric modelling supported by high performance-computing



Icelandair is proving itself as an aviation industry leader 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



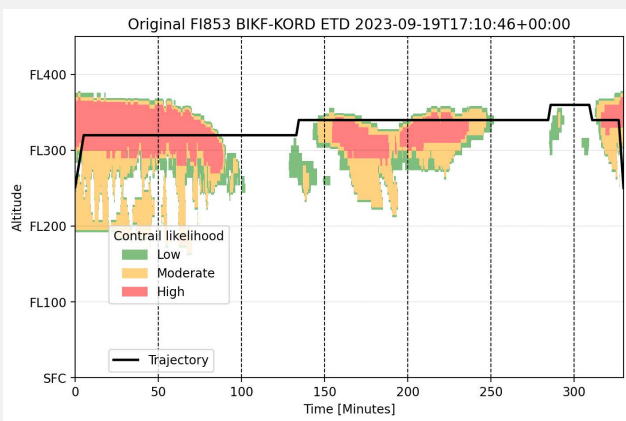
SATAVIA works with operators like Icelandair to integrate DECISIONX:NETZERO forecasts into industry-standard flight planning software, modifying flight plans for contrail prevention



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

Results

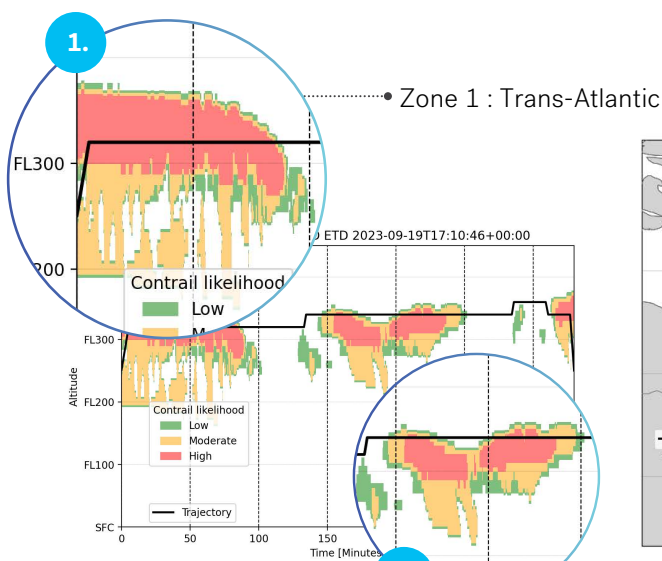
FI853 flew from Reykjavik to Chicago on 19th September 2023 as part of a European Space Agency (ESA) funded flight trial with Icelandair.



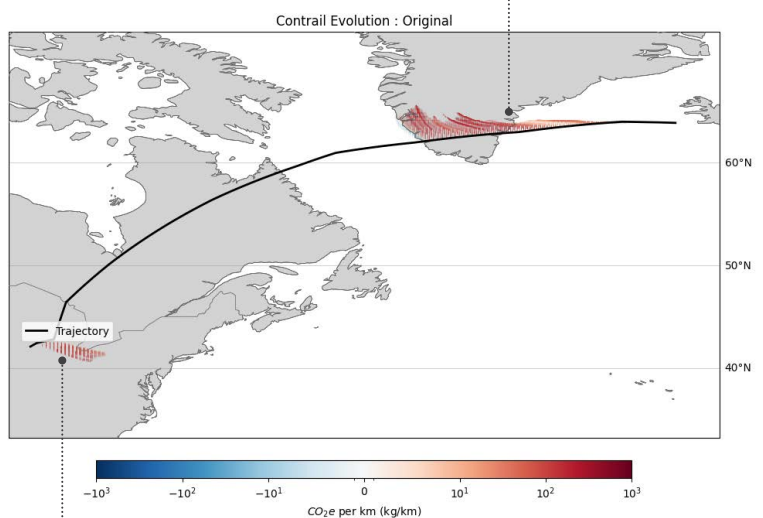
Based on the original filed flight plan, DECISIONX:NETZERO forecasts showed FI853 flying through two atmospheric regions predicted to generate persistent contrails

Once at the beginning of the flight and secondly during the middle. When analysing the impact of the flight it could be seen that the majority of impact would be generated at the beginning of the flight.

SATAVIA climate impact modelling predicted contrail climate impact of over 100 tonnes of carbon dioxide equivalent (CO₂e)



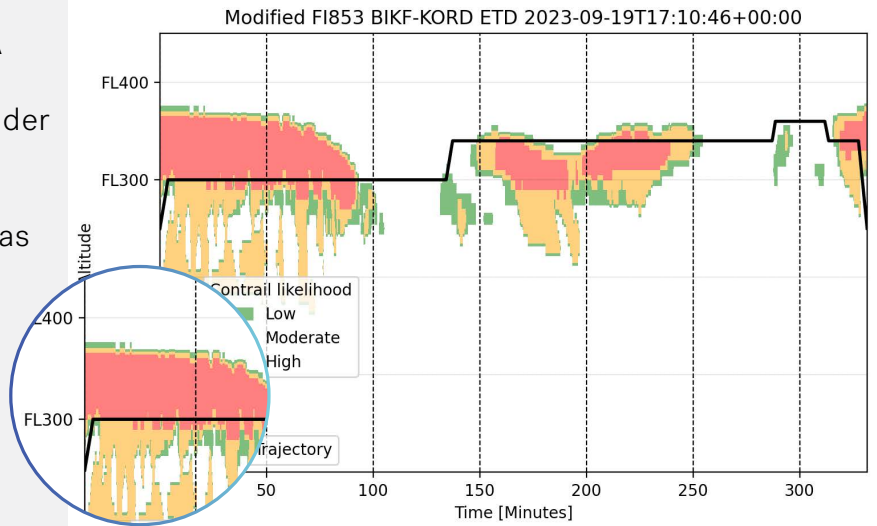
Zone 1 : Trans-Atlantic



Zone 2 : US Airspace

Zone 2 : US Airspace

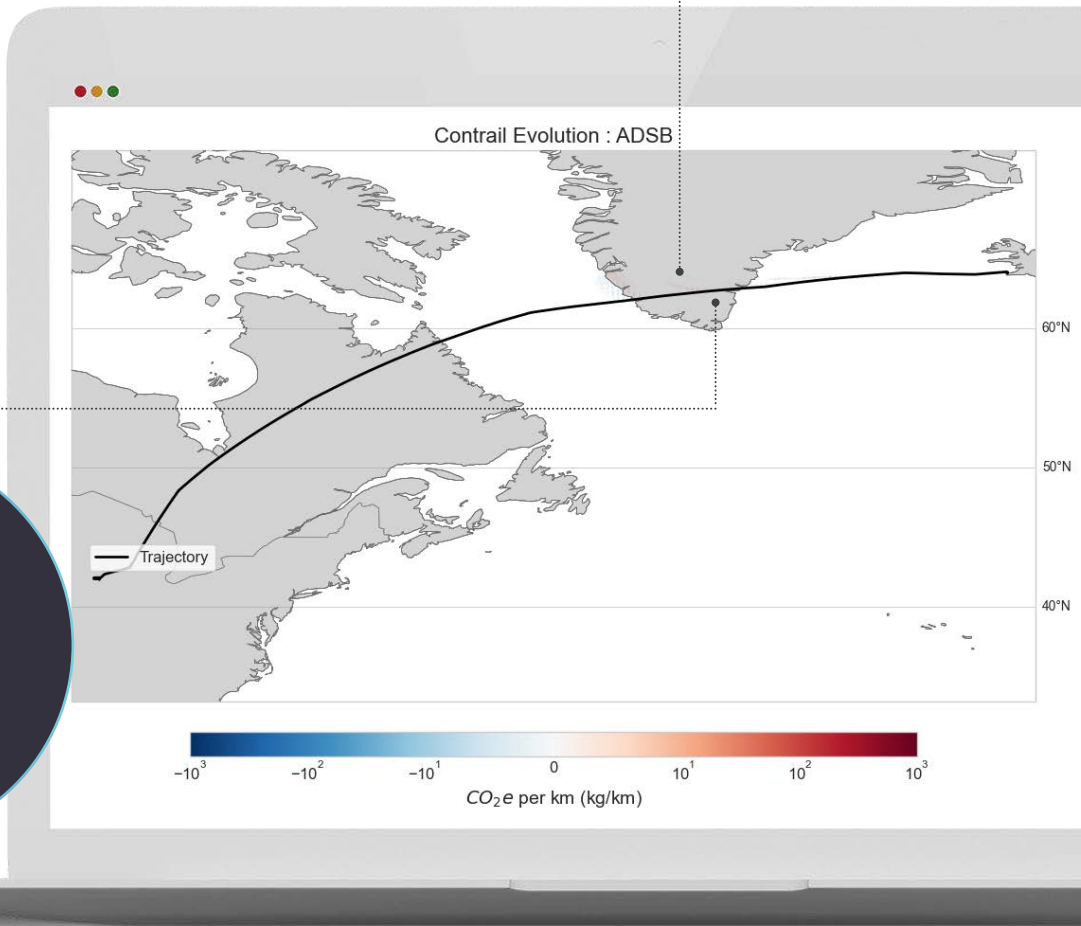
Based on this analysis, SATAVIA recommended a modified flight trajectory to fly either over or under the warming regions at the beginning of the flight. Due to aircraft constraints a decision was made that flight FI853 would fly under the warming region. Subsequent post-flight analysis demonstrated achieved climate savings of 99 tonnes of carbon dioxide equivalent



Modified flight trajectory

Consequent adjustment in climate impact modelling

99T
CO₂e Saving
AV



✓ 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

Highlight

Throughout this trial, SATAVIA's primary objective was to maximise contrail climate savings while ensuring minimal additional fuel burn, effectively aligning with the airline's broader sustainability and operational initiatives. SATAVIA and Icelandair were still able to make a substantial saving even when navigating through potential barriers. Most notably the modifications were required at the beginning of the flight with the aircraft carrying a full tank of fuel. Nevertheless, through SATAVIA's innovative approach and effective communication with Icelandair, both parties were able to overcome these obstacles, ultimately achieving a 99-tonne CO₂e reduction with a negligible increase in fuel consumption.

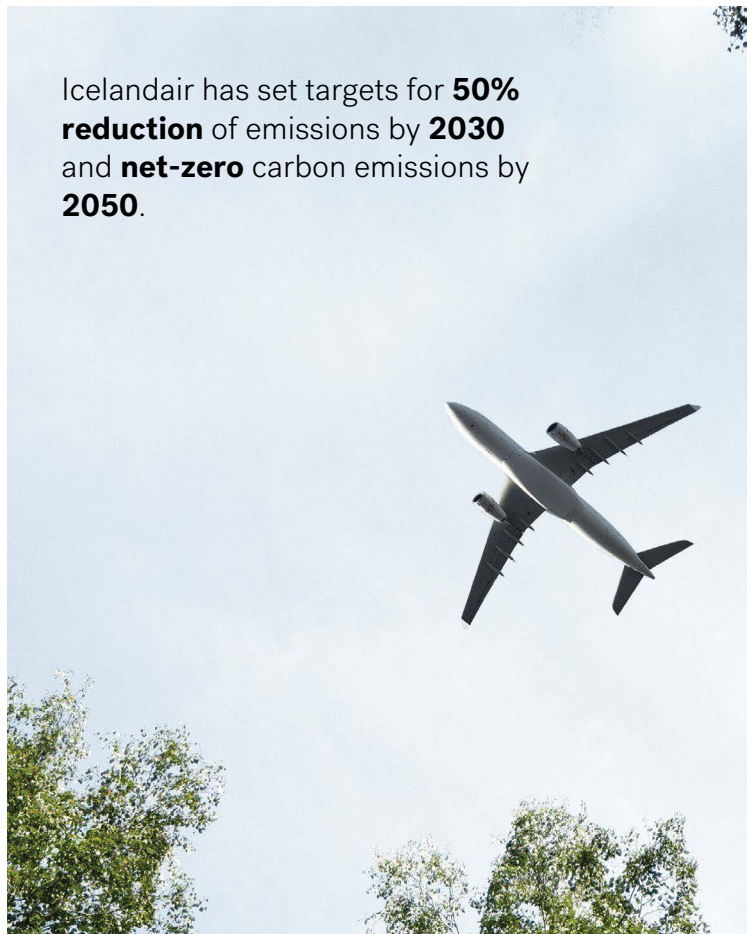


This success underscores the potential for impactful, sustainable practices in the aviation industry and highlights the power of collaboration in driving positive change.

The way forward

- ✓ The global potential for contrail prevention is vast, with up to 220 million tonnes of CO₂e generated by commercial flights each year (SATAVIA data)
- ✓ Only a small minority of flights require modification for contrail prevention: over 90% of climate impact can be prevented by modifying just 6% 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.

Icelandair has set targets for **50% reduction** of emissions by **2030** and **net-zero** carbon emissions by **2050**.



SATAVIA

SATAVIA Ltd

Address:

Park House, Castle Park
Cambridge,
CB3 0DU
United Kingdom



decisionx@satavia.com
satavia.com