Climate Impacts: Operational consequences of CO2 and non-CO2 measures

Sian Andrews NATS

CICONIA – High level outputs

Operational Efficiency

Operational costs in terms of average trip fuel will increase, but can be minimal

Human Performance

CICONIA procedures are largely aligned with existing roles, responsibilities and procedures

Environment

Significant benefits have been shown to be operationally viable

Capacity

There is a trade-off between environmental performance and capacity.

Safety

CICONIA solution does not negatively affect safety

Capacity

A trajectory selector could help to alleviate capacity issues created by CICONIA and avoid overloads in general

SWISS

Acting on 10-12% of fleet:
89-178 tCO2e saved
0.8-3.33 t additional fuel-related CO2

AIRFRANCE

Targeting big hits (3% of fleet):
7.5% of total contrail impact mitigated (20,500tCO2e)

easyJet

+63kg fuel per targeted flight, +1 minute average trip time, -20tCO2e

founding members
Project funded by
UK Research and Innovation

Operation Blue Skies
Airspace-scale trial in North Atlantic

Demonstration of efficacy of contrail impact mitigation

- Evidence & quantification of contrail reduction over the North Atlantic at airspace-scale: verifying observationally contrail reduction not isiolated to one flight in the airspace

Operational feasibility & know-how

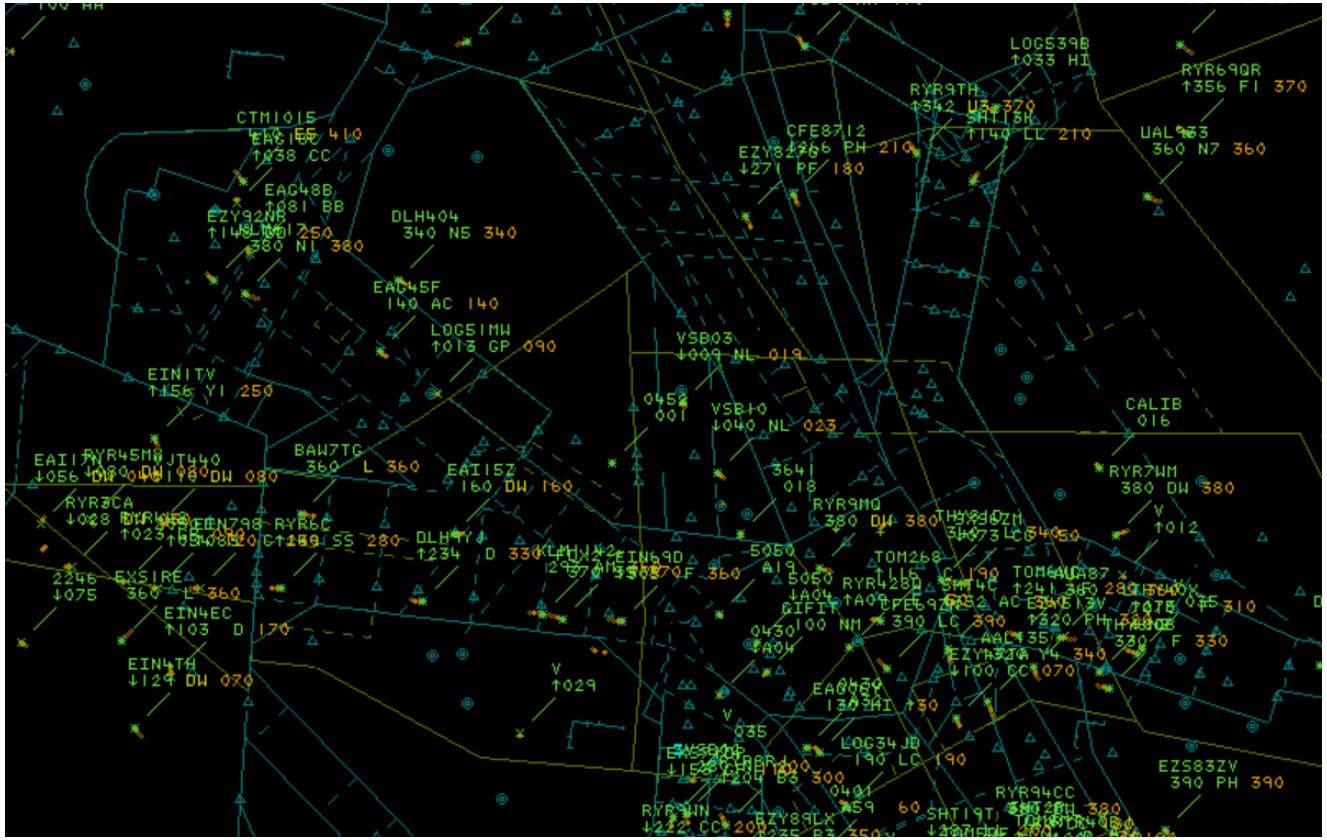
- Operational feasibility - impact on ATC workload and proportion of contrail reduction possible under ATC constraints
- Economic implications - *e.g.* analysis of fuel consumption increase at airspace level

Development of critical technologies: contrail impact mitigation tooling

- Assessment of different forecasts & development of forecast pipelines usable in airspace co-ordinated (*i.e.* scalable) navigational avoidance
- Co-benefit in understanding resilience of procedural ATC to more dynamic restrictions

Long term operational challenges

Research points towards a hybrid Airline/ATC-led Solution and a step-wise approach



Hybrid Airline/ATC-led mitigation

- Combination of Airline-led and ATC-led

Network Management support

- There is a trade-off between environmental performance and capacity
- Capacity impacts are localised rather than diffuse, which has implications for ATFCM measures in future

Step-wise approach to implementation

- Contrail mitigation in low traffic density situations implemented initially, building up to more challenging scenarios in future