GEESE

Gain Environmental Efficiency by Saving Energy

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AIRBUS NATS

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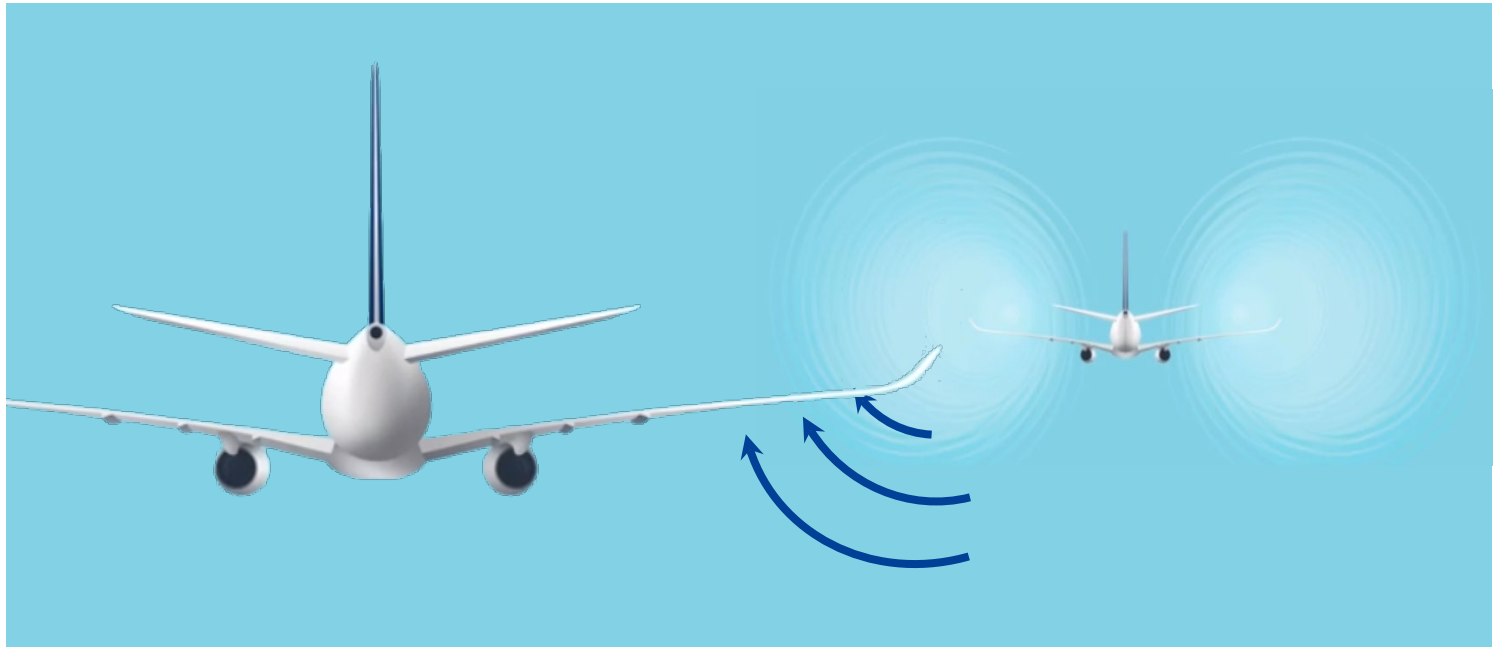
The GEESE mechanism – Wake Energy Retrieval

- Lead aircraft produces tip vortices
- Follower aircraft surfs in updraft, reducing drag
- Concept will realise fuel and costs savings



-> Benefits for a two-engine widebody aircraft across the North Atlantic:

2.2 t

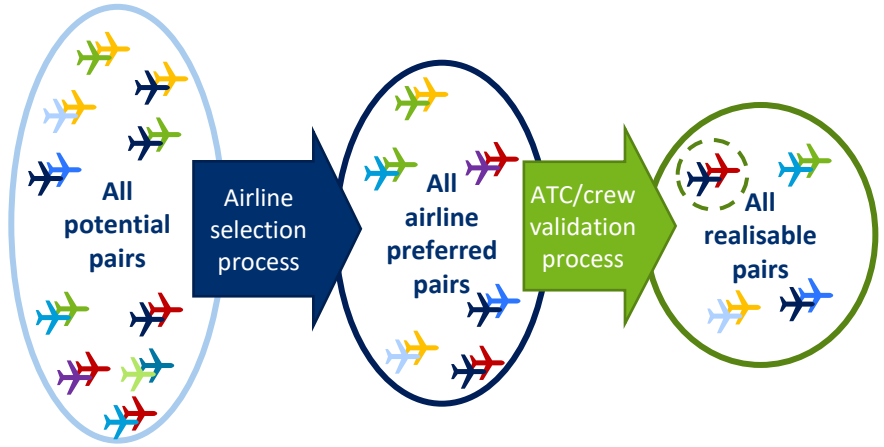
CO_2 6.9 t

€1716

For the North Atlantic flow:
Fuel savings of 190 kT fuel/year!

NATS core activities

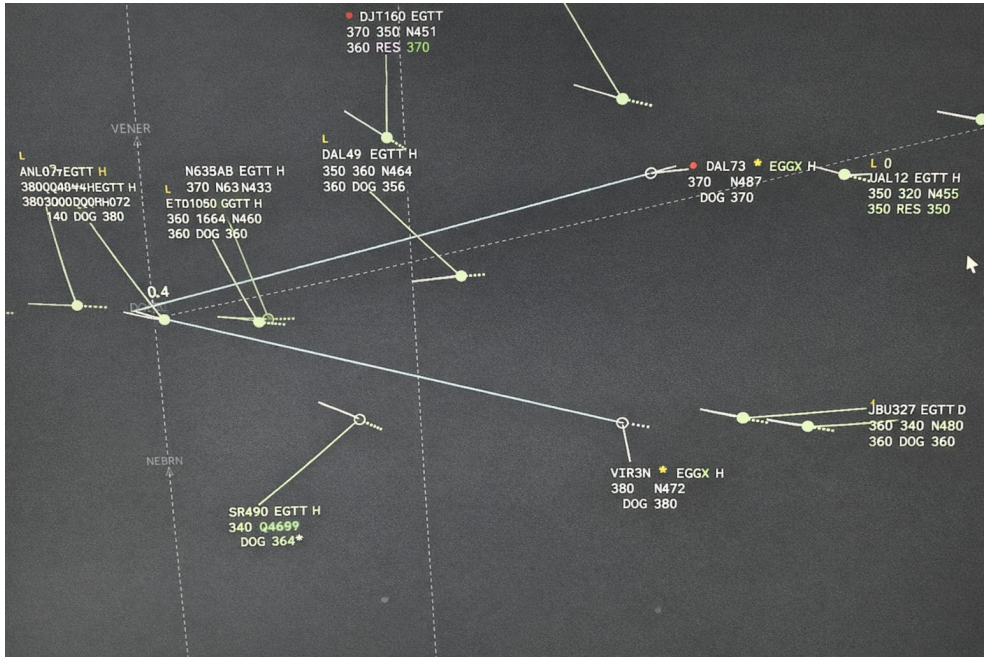
- Development of oceanic CONOPS
- Support of Airbus-led flight trials
  - Facilitate trajectory changes requested by participating aircraft
  - Objective: Assess if GEESE CDM processes enable meeting of two aircraft within narrow time window



- Execution of Real Time Simulation
  - Investigate all ATC aspects of the GEESE CDM and WER CONOPS
  - Objectives:
    - Validate ATCO roles and responsibilities in GEESE
    - Determine necessary system adaptations
    - Test nominal, non-nominal and failure operations
    - Validate phraseology

Key findings

- Flight trials:
  - After learning phase, high levels of success of A/C reaching meeting point in time (6/7)
  - Cockpit and ATC procedures need to be simplified
  - More complex route changes need to be tested
- RTS:
  - CONOPS largely acceptable; majority of ATCOs positive about concept
  - Better tool integration needed
  - WL impacts acceptable, though streamlining of procedures recommended
  - CWP changes, coordination procedures, and phraseology in need of further maturation



Trial aircraft converging at meeting point, courtesy of AirNav Ireland

Next steps: GEESE 2

- Combining oceanic and continental CONOPS into one
- Advancing maturity level to pre-industrialisation
- Validating CONOPs for eastbound flows

Thank you!

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