sesar JOINT UNDERTAKING

ALBATROSS

Delivering flight-efficient operations

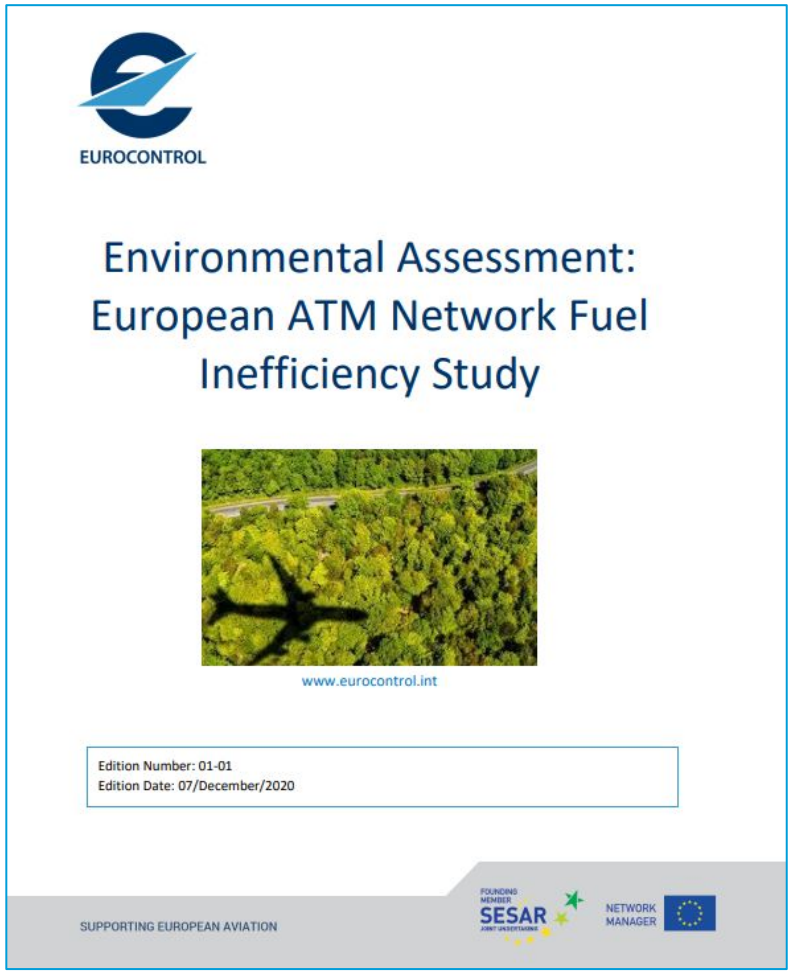
3rd ICAO-EASA Forum

AIRBUS AIRFRANCE austro CONTROL DLR dgac DSNA EUROCONTROL LFV Lufthansa NAVBLUE AN AIRBUS COMPANY novair SAS Schiphol Group SWISS swedavia SWEDISH AIRPORTS THALES Building a future we can all trust Wizz

EUROPEAN PARTNERSHIP

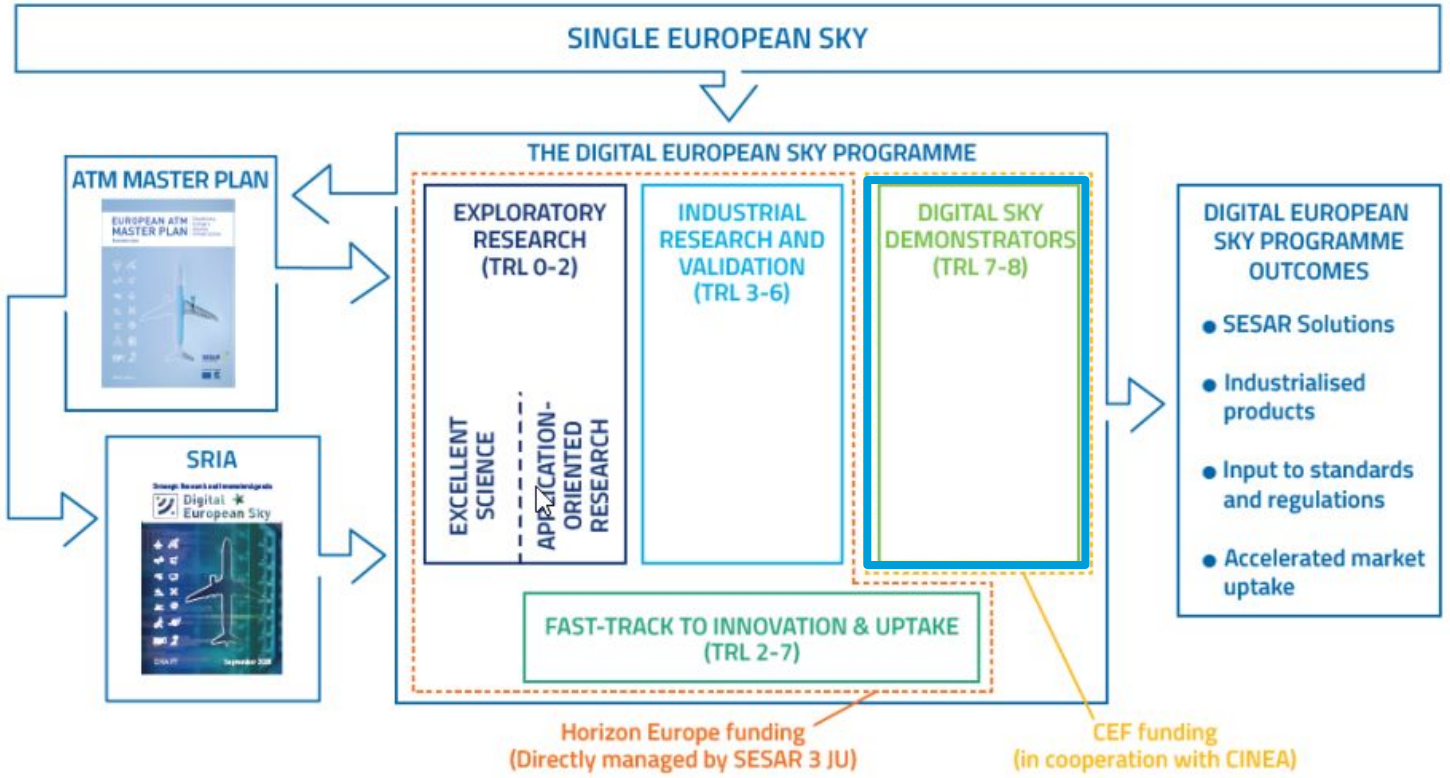
Co-funded by the European Union

ATM & operations contribution to LTAG



Potential CO2 reduction ~6%

Single European Sky Research Framework



Want to know more

Albatross

A Gate to Gate holistic approach implementing mature solutions for quick wins improvements

ALBATROSS GOALS:

- Reduce aviation's environmental footprint
- Demonstrate operational mature solutions and processes allowing greener flights
- Make changes permanent
- Provide measurable and traceable results showing the impact of the solutions applied

Want to know more

A large consortium

Airlines

novair AIRFRANCE Lufthansa Wizz SWISS

A/C Manufacturer

AIRBUS

System & Services suppliers

THALES NAVBLUE

ANSP / Airspace

LFV austro CONTROL DSNA

EUROCONTROL NM

EUROCONTROL

ANSP / Airport platforms

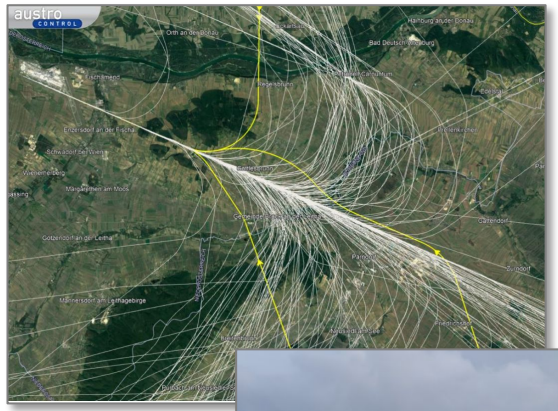
swedavia SWEDISH AIRPORTS Schiphol

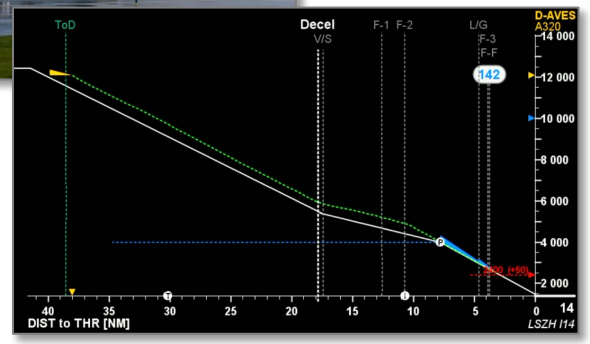
Research / Support and Taxibot

SAS DLR

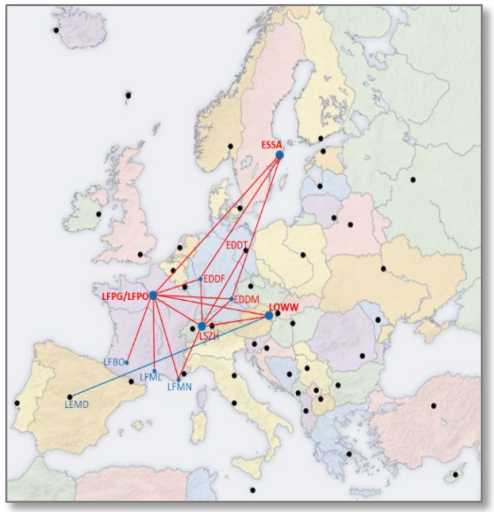
Project approach

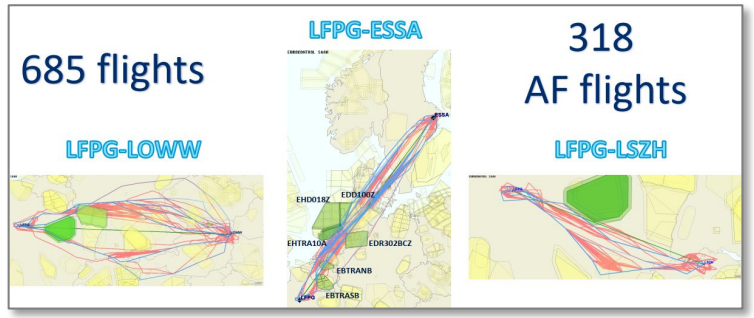
From local studies

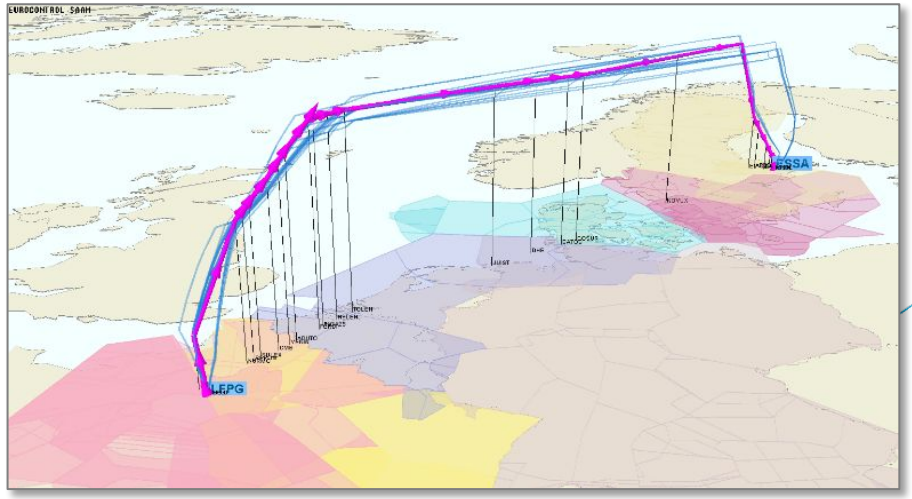




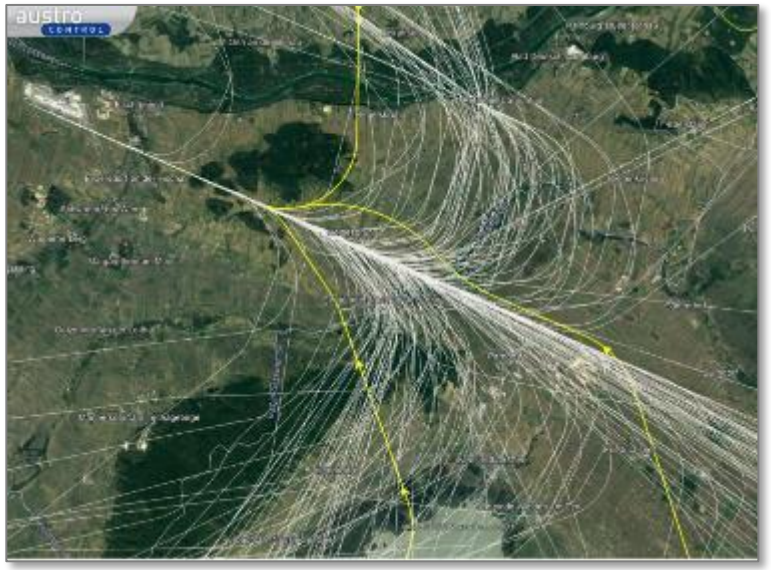
To gate to gate demonstrations



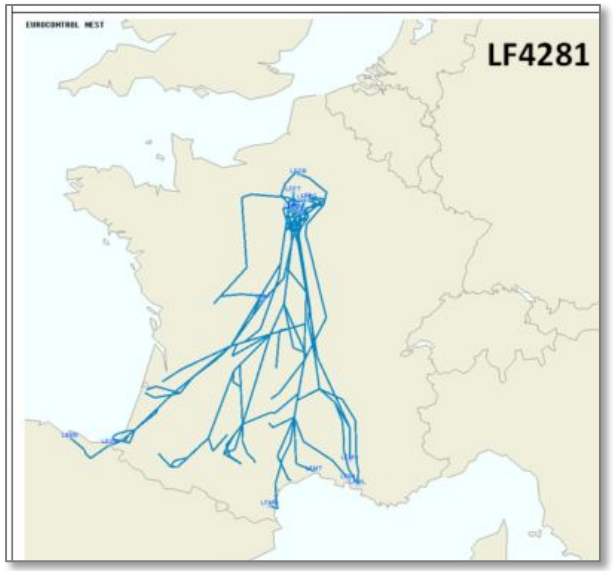




The local exercise



Improved trajectories

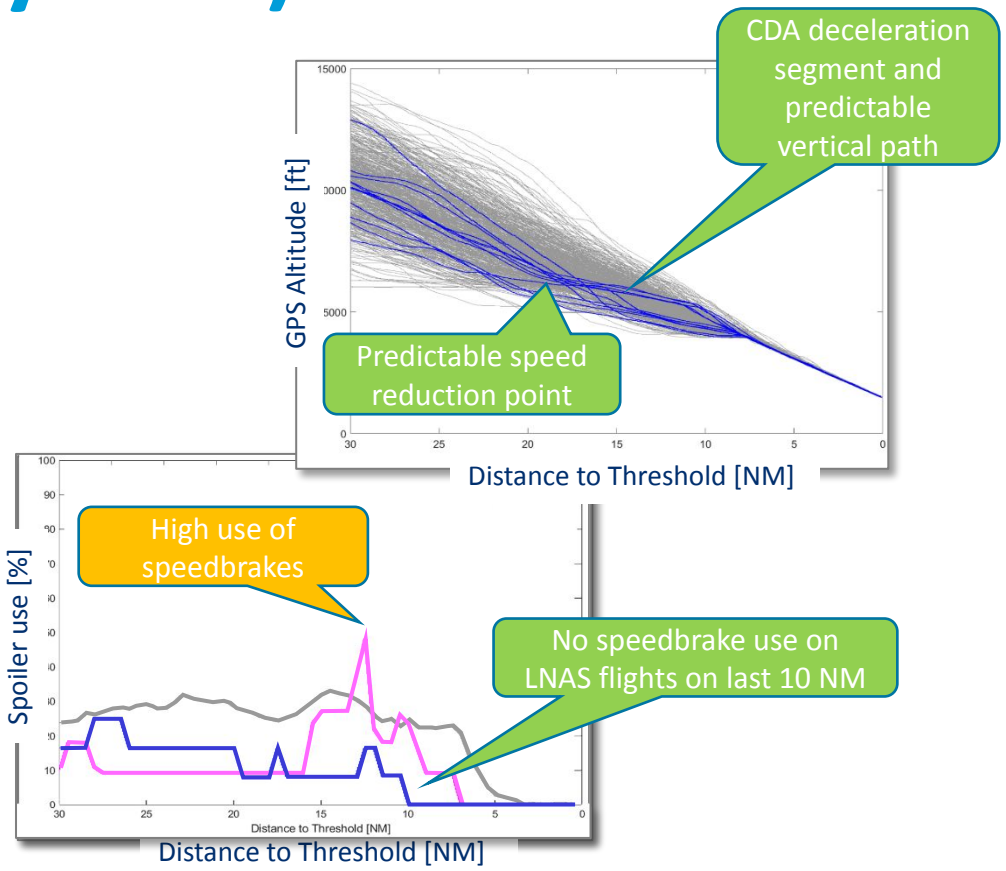


Dynamic airspace

Air-ground integration

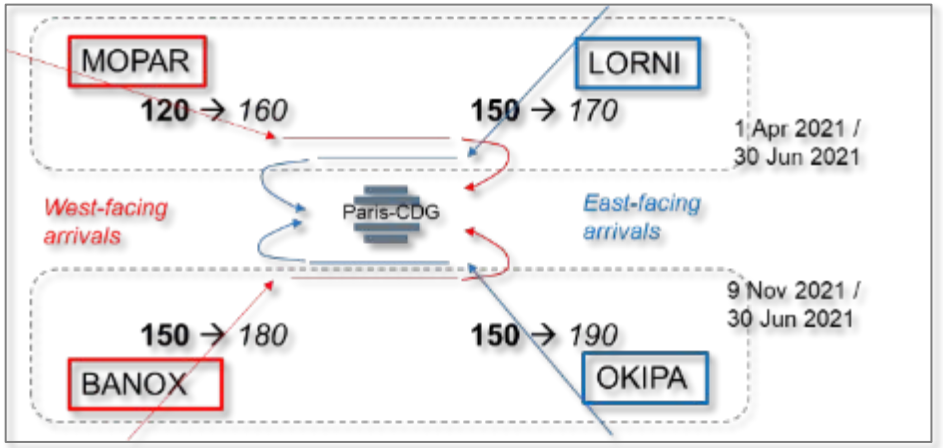
LNAS (Low Noise Augmentation System)

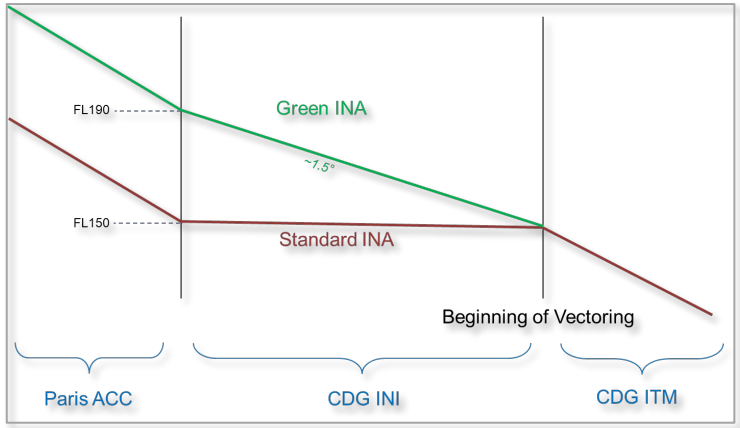
- Objective: to **evaluate the benefits of a closed-path PBN-to-ILS procedure with and without a CDA Energy Management Pilot Assistance System (LNAS)** compared to Radar Vectoring to the same runway.
- Flights along the PBN-to-ILS trajectory conducted with vs. without LNAS aircraft energy management support resulted in:
  - Significantly more predictable vertical and airspeed profiles
  - Lower use of speed brakes particularly at low altitudes
  - Lower average thrust settings
  - **6 % fuel and CO2 savings on last 30 NM** (compared to Baseline)



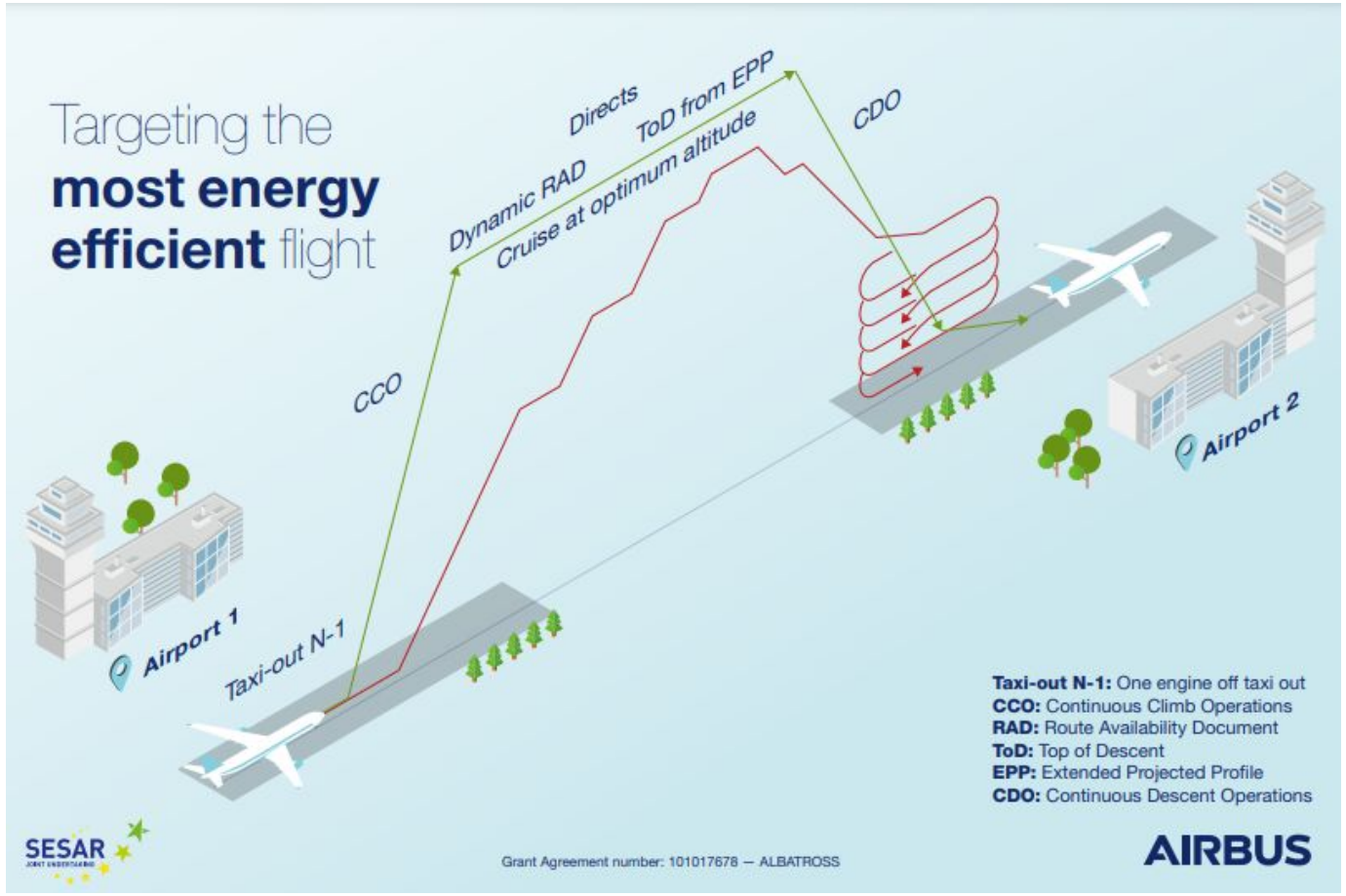
Optimized Descents on CDG

- Optimized descents in the Paris area, in specific traffic conditions
- Improved coordination between control centers allows to "relaxed" certain interfaces : "altitudes at the IAFs raised in low traffic conditions" (~4 hours per day) for the downwind arrivals
- Enables less or shorter level-offs, performed a higher flight levels
- Multiple rounds of trials resulted in semi-permanent activation via an AIP-SUP (permanent publication may follow soon)
- ***Between 50kg and 150kg of fuel saved per approach (Depending on the aircraft type)***
- ***Number of improved flights estimated at more than 5 000***





The “Gate to Gate” approach



Identification of City Pairs
Aircraft Operators, Airport Authorities, ATM service providers confirm availability NM‘s and military support

Calculation of Optimum Flights

Identification of ATM constraints
RAD restrictions (level-cap), Military Areas, Ground or TMA operations, ATFM measures, ATC instructions, Airspace Design, LoA‘s, Route Charges

Solutions towards the Optimum Flight
RNP, xBAS, ADS-C, air-ground information exchange, data analytics tools, etc.

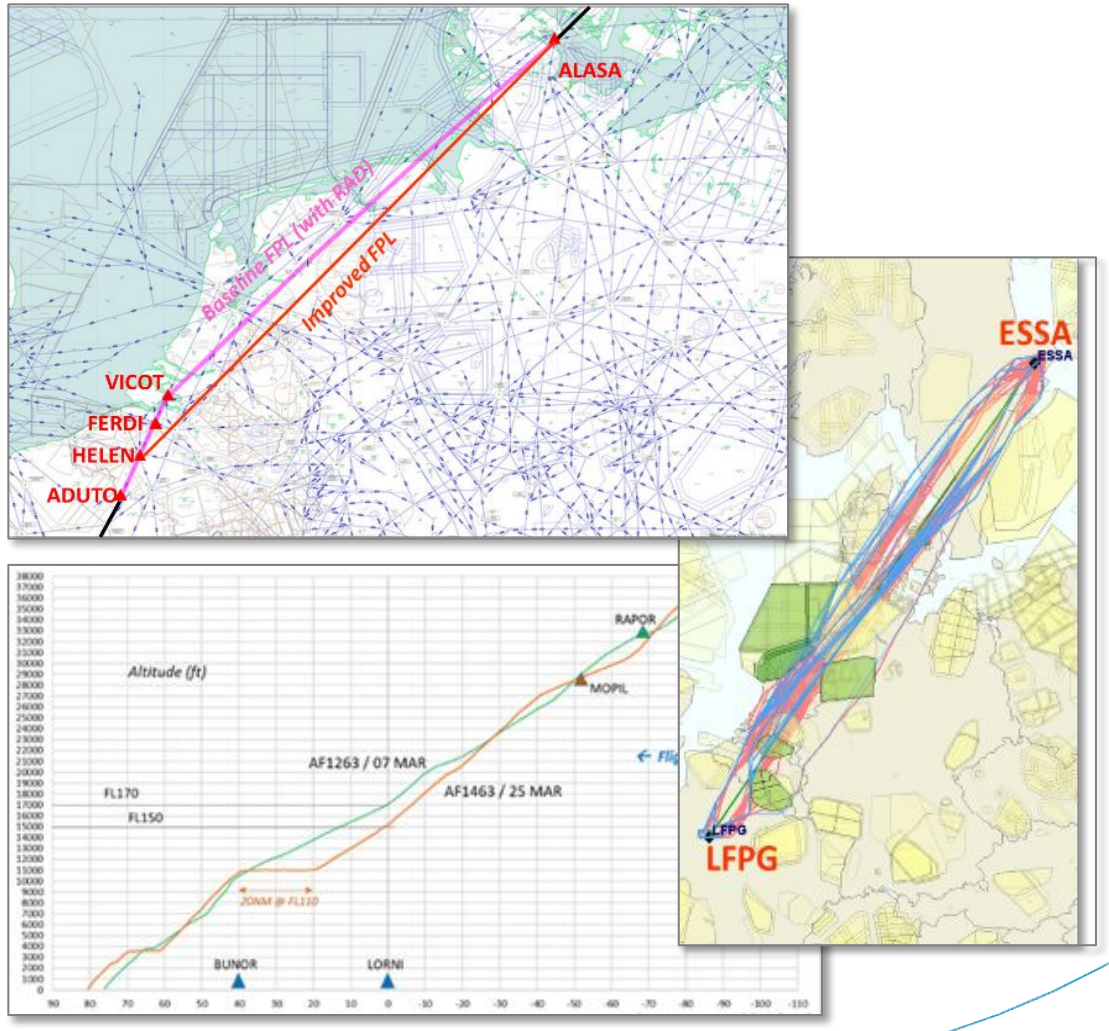
Finalization of the preparatory phase
Operational Instructions, safety assesments, trainings, publications (NOP, AIS, Bulletins)

Trials Planning & Execution

The “Gate to Gate”

Stockholm (and Vienna, Zürich) G2G

- Sorted by the coverage available to facilitate **CDM process required to apply the G2G Methodology**
- MUAC to Paris-ACC interface raised to FL310
- MUAC FMP identified greener trajectories and sent the re-route proposal (RRP) to the AOs
- MUAC offered to alleviate the mandatory waypoint VICOT, allowing an earlier turn to the north-east at FERDI.
- DSNA allowed, under specific circumstances, a less constraining altitude (FL170 instead of FL150) on the IAF point "LORNI“
- The flights took advantage of the FRA in Swedish Airspace



Conclusion

- The project focused on concepts having sufficient maturity to quickly become **ready for real operations**, and bring **immediate benefit**.

- **Hundreds of flights took benefits of the ATM improvements**

  The target was not to execute a single special flight, in exceptionally protected conditions.

- Engagement is continuing with HERON

Methodology can be replicated in ASEAN to contribute to save large amount of CO2!