

FIRST WORKSHOP

Overview of the Aeroacoustic Activities in AFLoNext and Related Contributions to Flight Testing



AFLoNext

2ND GENERATION
ACTIVE WING

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Overview

- Aircraft Noise Control in the European Context
- Noise Control on Airframe - Landing Gear & Flap Side Edge (History)
- Noise Control on Airframe in the AFLoNext Project Structure
- WP4 - Objectives & Partnership
- Status and Next Steps
- Acknowledgments
- References

Aircraft Noise Control in the European Context

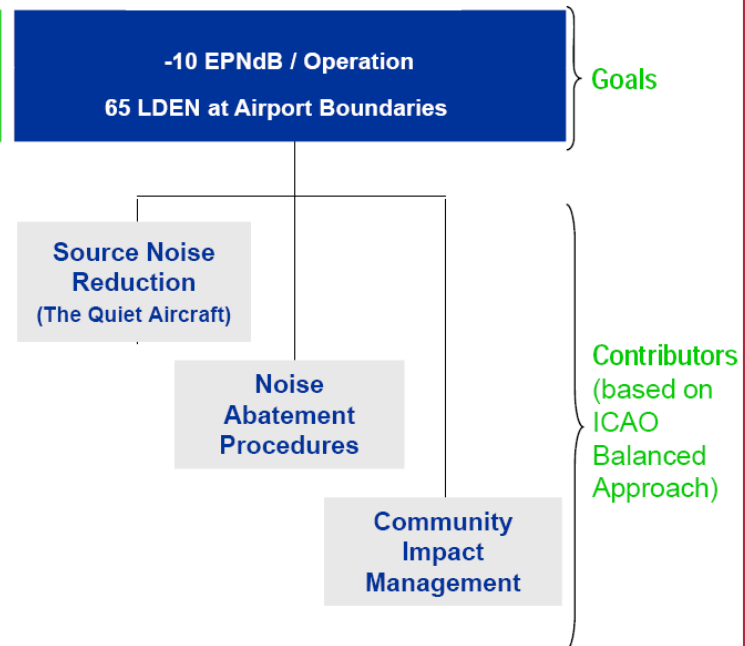


Environmental Goals Definition: The EU 2020 Vision Targets

2020 Vision Targets

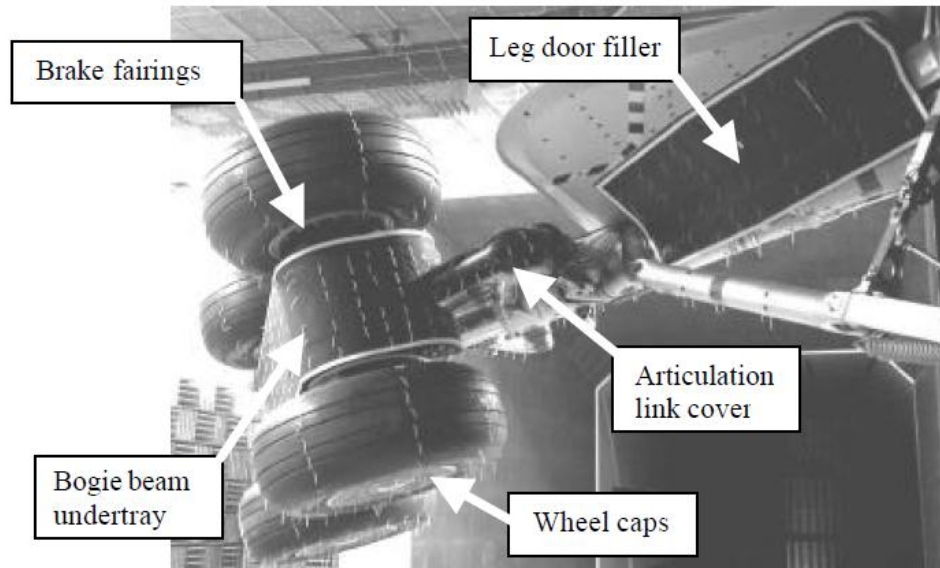
- Reduce CO₂ by 50%
- Reduce NO_x by 80%
- **Reduce perceived noise by half**
- **Eliminate noise nuisance outside airport boundaries**
- Substantial cuts in operating costs
- Five-fold reduction in accident rate
- Drastic reduction in the impact of human error
- 99% of flights within 15 minutes of timetable
- New standards of quality and effectiveness
- Halve the time to market
- Improve synergies between civil and military research

ACARE SRA1



Noise Control on Airframe - Landing Gear (History)

- Using model for large scale wind tunnel tests (SILENCER, OPENAIR).
- Definition of low noise configurations.



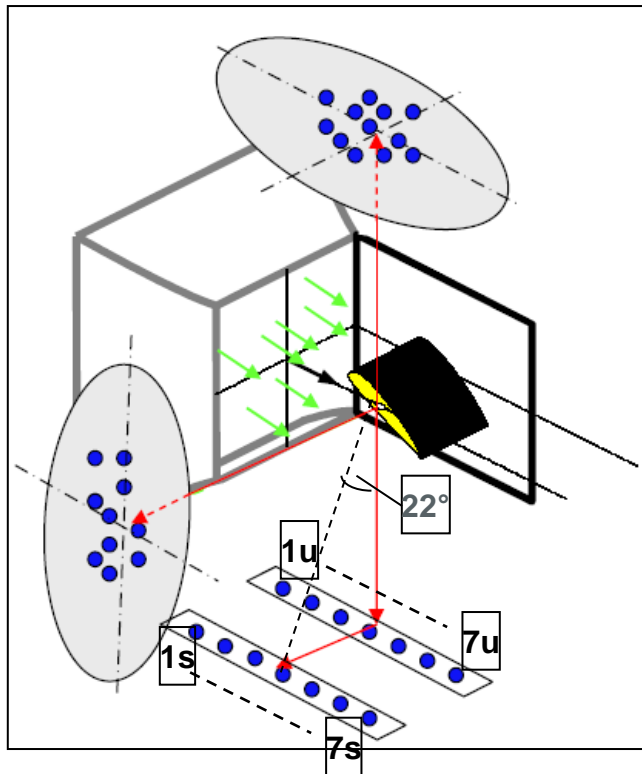
Source: Chow L.C., Dobrzynski W., Landing Gears Airframe Noise Research Study, ICSV9, 8-11 July 2002, Orlando, Florida, USA.



Noise reduction achieved on source level ~ 4dB.

Noise Control on Airframe – Flap Side Edge (History)

- Using a generic flap model.
- Side edge noise localization & quantification by microphone array and farfield microphones.

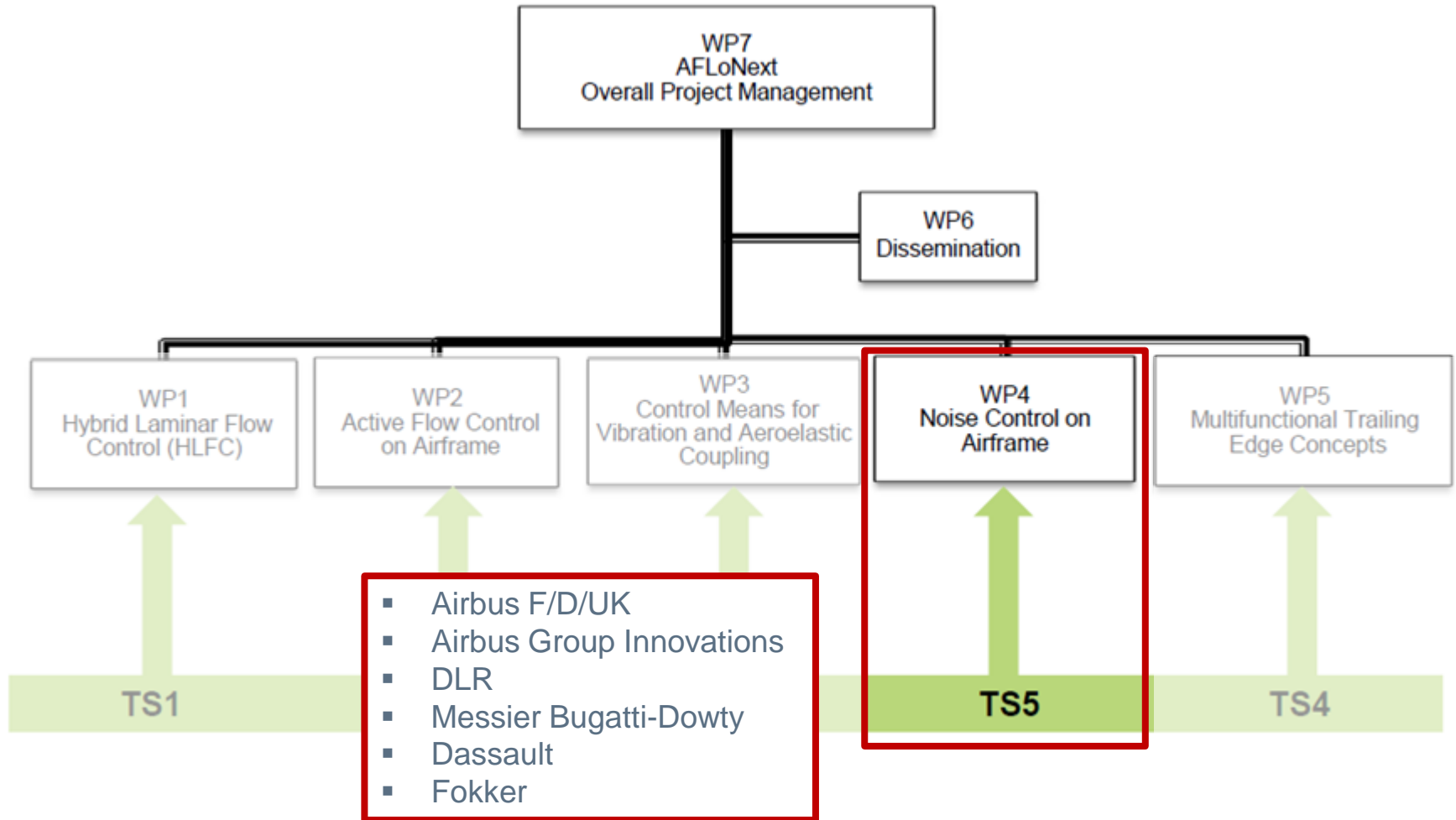


Noise reduction achieved on source level 4-5 dB.



Source: Bauer M., Novel Noise Reduction Technologies: A Contribution from EADS Innovation Works to OPENAIR, Greener Aviation Conference, 12-14 March 2014, Brussels, Belgium.

Noise Control on Airframe - WP4 in the AFLoNext Project Structure





WP4 - Objectives

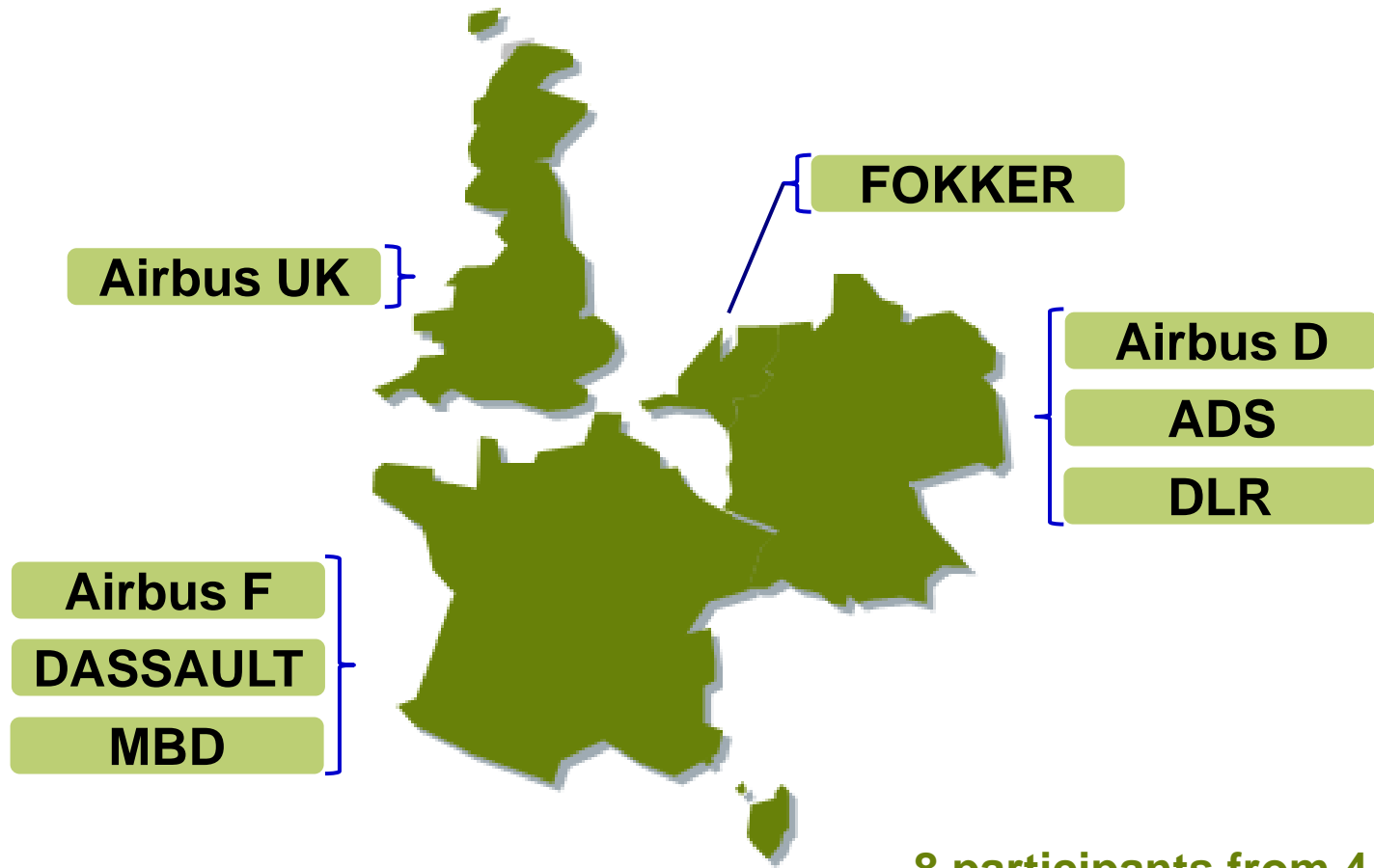
Landing Gear/Flap Interaction (WP4.1)

- Landing gear noise reduction by means of add-on treatments and optimized flap deflection angle.
- Investigate the landing gear wake/flap interaction; definition of flap deflection angle for minimised interaction noise level.
- Design of an add-on treatment for landing gear noise reduction (mesh fairings, blocker plates).
- Flight test clearance and flight test of low noise landing gear.
- To reach TRL 5 to 6.

Porous Flap Side Edge (WP4.2)

- Large-scale wind tunnel test on porous flap side edge at an A320 flap geometry.
- Airworthiness demonstration of a porous FSE.
- Flight test clearance and flight test of FSE treatment on airliner to prove capability.
- Technology development towards TRL 5 to 6.

WP4 - Partnership



8 participants from 4 countries



Status and Next Steps

- Wind tunnel tests have been concluded for both, landing gear and flap side edge.
- The design & manufacturing work to provide the selected configurations for the flight test have been started.
- The flight test campaign is planned to be conducted in 2016.

Technical details → Following Presentations



Acknowledgments

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