



Avio Aero

Collaborative network established in Clean Sky: a success story

Information Day: Clean Sky 2 and synergies with PT2020
Lisboa, 3rd February 2017

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Avio Aero overview

Historical background

100+ years of success



Over 4,600 employees

4,000 of whom in Italy

ON SERVICE FLEETS



over 30,000 engines



over 7,000 engines



over 12,000 engines



over 2,000 engines

Over 80%

of all commercial aircraft fly with **Avio Aero components**



Industrial plants

6 in Italy and 2 abroad



Avio Aero Involvement in Clean Sky

LifeRCraft



LGB

MGB

AGB



Open Rotor

IDS

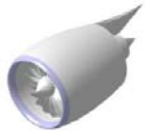
LPT

REG



Engine system opt

UHPE



IDS



MAESTRO

SAT

CS2

ITDs

Small Air Transport

Airframe ITD

Engines ITD

Systems ITD

ECO-design

Technology Evaluator

IADPs

Fast Rotocraft

Large Pax Aircraft

Regional Aircraft

CS1 SAGE2

IDS

LPT

IDS

CS1 SAGE4



Avio Aero Collaborative Network in Clean Sky

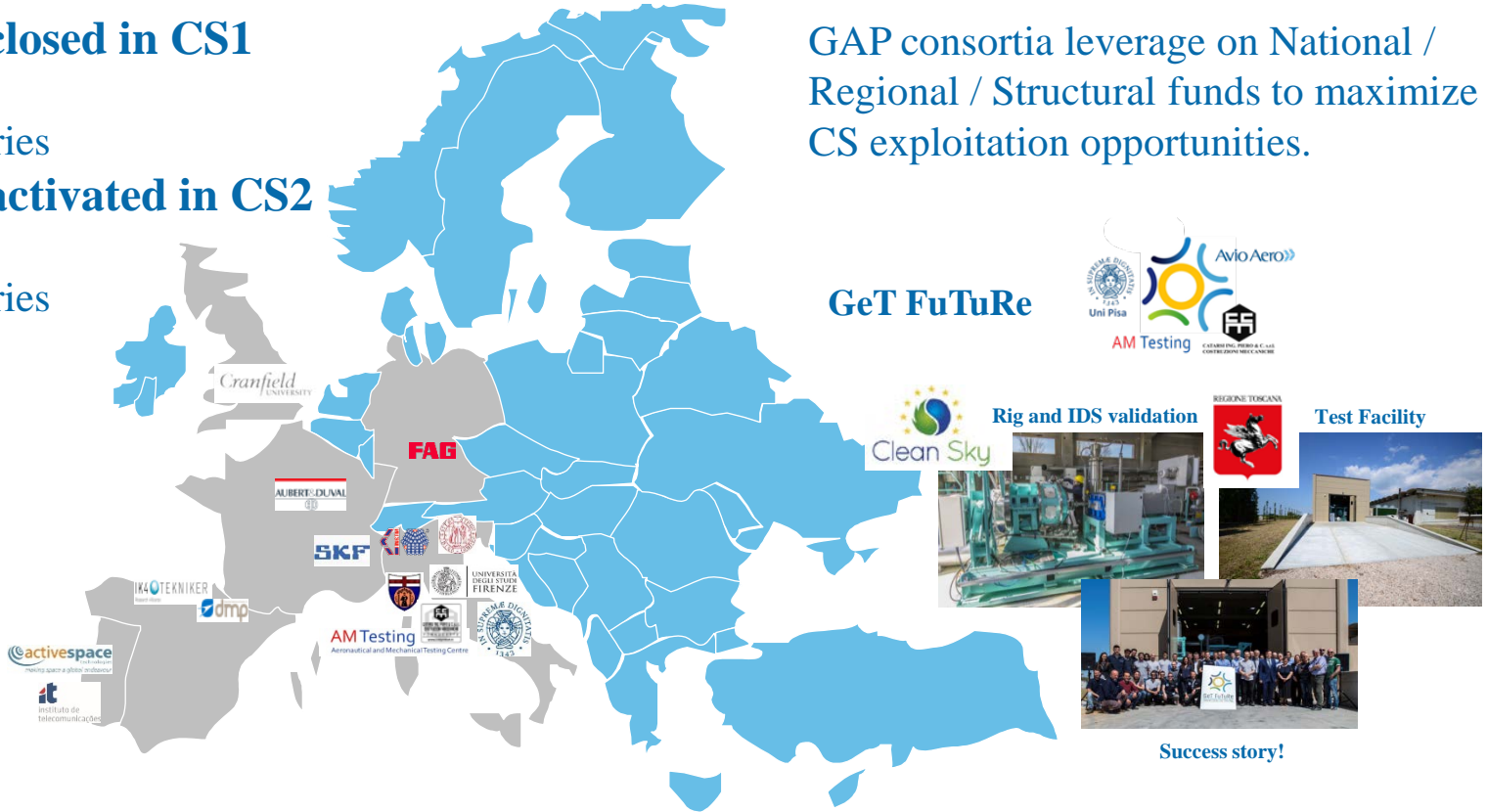
9 CfP projects closed in CS1

- 14 partners
- 5 EU countries

2 CfP projects activated in CS2

- 5 partners
- 4 EU countries

GAP consortia leverage on National / Regional / Structural funds to maximize CS exploitation opportunities.



Focus on Portuguese collaborations

CS1 SAGE CfP - RTM GEAR

Completed

Target

Develop innovative instrumentation for rotating gauges in harsh environment

Duration

25 months

Participants



Major Achievements

- Telemetric system developed and tested on dedicated test bench at High Temperature
- Surface Acoustic Wave (SAW) tested on bench to measure temperature and torque on rotating parts
- Test completed (TRL 4 achieved)

CS2 FRC CfP – iGear

Target

Develop an on-the-fly Structural Health Monitoring (SHM) system for the LiferCRaft Transmission system

Duration

26 months

Participants



Major Objectives

- Assessment of the technologies suitable to characterize health monitoring condition of gearboxes
- Innovative approach to the use of ceramic ball bearings for the high speed shaft definition
- SHM system validation



Proposed Topics for CfP Call #6 (mid Feb '17)

Fast RotorCraft - LifeRCraft

Topic Title

Enhanced gear strength through cavitation peening tech.

Duration

24 months

Indicative funding

400 k€

Topic Content

Development of technologies for enhancing the gear strength, specifically through cavitation peening, on high loaded applications. The applicant shall:

- define the optimal parameters for the cavitation peening process.
- process appropriate T/As through an optimized cavitation peening system
- test the T/A for confirming higher achieved mechanical properties
- determine an appropriate method to identify the cavitation parameters

Topic Title

Hybrid bearing technologies

Duration

36 months

Indicative funding

600 k€

Topic Content

Development of hybrid tapered bearings (Si3N4 tapered rollers having steel inner and outer races) for aerospace application.

The main areas of analyses will be:

- the comparison of all steel vs. ceramic bearings in clean and contaminated conditions (through subscale and full scale testing)
- the investigation on allowable contact limits
- the investigation on the critical defects
- the optimization of the heat to oil characteristics
- the investigation on oil off behavior



Proposed Topics for CfP Call #6 (mid Feb '17)

ENGINE / SAT - MAESTRO Demo

Topic Title

Advanced investigation of ultra compact RQL reverse flow combustor

Duration

18 months

Indicative funding

600 k€

Topic Content

Extremely compact reverse flow combustor architectures are required for future turboprop engines development, where geometry and space saving are strictly linked to fuel burn and emission reduction. The target of the CfP is to adapt the available Quick-Design-Rapid-Validation methodology to this family of combustors. Design-for-additive, Virtual combustor simulation and advanced diagnostic testing, addressed to innovative architectures and cooling concepts, quick quench modules design and low soot production, shall be developed to support in a period of 18 months the achievement of the objective. Strong collaboration among the possible partners and focus on available rigs is a strong requirement of the project.





Thank you for your attention