



Aeronautics & Air Transport Research in the 7th EU Framework Programme (FP7)



4TH CALL FOR PROPOSALS – WP2011

**EUROPEAN COMMISSION
DG Research Aeronautics**



Cooperation and 4th Call in EU FP7 Aeronautics Research

Contents

- ◆ Context, Structure, Examples
- ◆ 4th Call Synopsis
 - Topics per scheme / activity
 - Budget and timing
- ◆ Level 2 topics (6)
- ◆ Level 1 topics – Pioneering
- ◆ Support actions topics
- ◆ Contacts/Directions
- ◆ Clean Sky / 7th call

FP7 Research Framework Programme / Cooperation / Transport (incl. Aeronautics)

CIVIL ONLY !

Overall Objectives

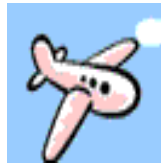
- ◆ Develop “**safer**”, “**greener**”, “**smarter**” and “**more integrated**” transport systems for:
 - respecting environment and natural resources
 - the benefit of citizens and society
- ◆ Secure and develop the **competitiveness** of European industry in the global market



FP7 Cooperation Transport (incl. Aeronautics)

Budget breakdown (7 years: 2007 - 2013)

Aeronautics & Air Transport (AAT): 2150 M€



Clean Sky JTI (Joint Tech Initiative) - 800 M€

SESAR JU (Single Eu Sky Research) - 350 M€

Collaborative Research & Support

Sustainable Surface Transport (SST):



Road (including urban)



Rail (including urban)



Waterborne (maritime & inland)

1510 M€

SST
integrated
approach

Horizontal actions (TPT) (co-modality synergies, impact,...)

Support to EU Navigation Satellite System (EGNOS & **Galileo**)

DG RESEARCH

DG MOVE

DG ENTR



FP7 Aeronautics & Air Transport Research

Activities

1. The **Greening** of air transport
2. Increasing **Time** efficiency
3. Ensuring **Customer** satisfaction and **Safety**
4. Improving **Cost** efficiency
5. **Protection** of the aircraft and passengers
6. **Pioneering** the air transport of the future



FP7 COOPERATION AERONAUTICS R&T Structure and Schemes

- ◆◆◆ **Level 3: Combination**, final **proof** in fully **integrated** system of systems. Public-Private-Partnerships:
 - SESAR (ATM), **CLEANSKY** (800 M€ EC+800 M€ Ind.)



- ◆◆ **Level 2: Downstream R&TD**,
Multidisciplinary **integration & validation**

- Collaborative Projects < 40 M€ EC fund

- ◆ **Level 1: Upstream R&TD**

Breakthrough up to validation at component level

- Collaborative Projects < 4M€ EC funding

Coordination Actions « CSA-CA » (no R&TD)

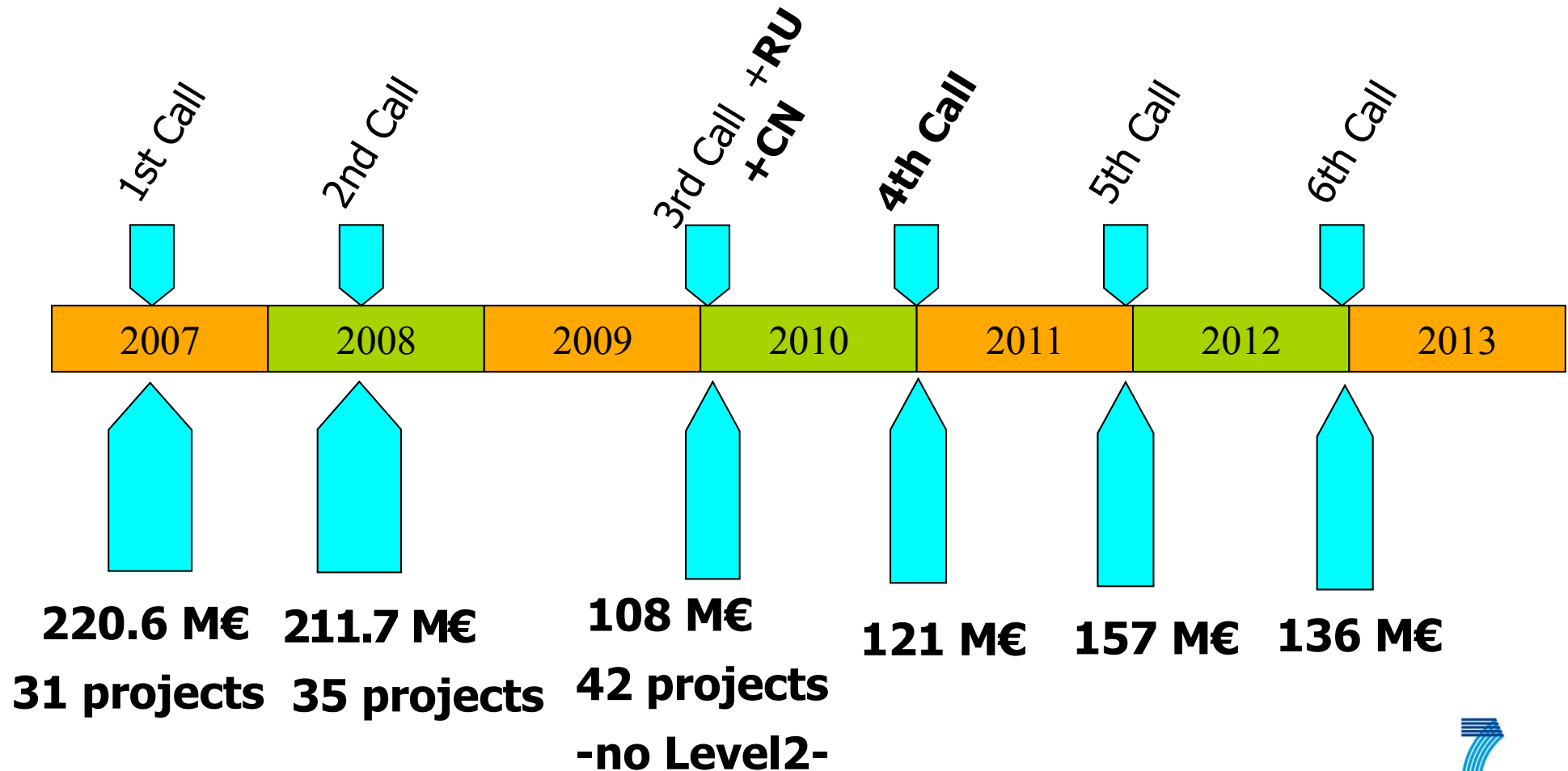
Support Actions « CSA-SA » (no R&TD) < 300 k€

R&TD up to 50/75% EC co-funding, others up to 100%.

Min. **3**
legal
entities
from
different
Member or
Associate
States

Indicative Roadmap Calls for Proposals

FP7 Aeronautics and Air Transport Collaborative Research & Support



FP7 Aeronautics & Air Transport Research

Examples: 1st & 2nd FP7 calls incl. Romanian orgs

OPENAIR Optimisation for Low Environmental **Noise** Impact Aircraft
SC Aerostar SA, COMOTI,

TEENI Turboshaft Engine **Exhaust** Noise Identification
COMOTI

FLOCON Adaptive & Passive Flow Control for **Fan** Broadband Noise Reduction
Sandu M. Constantin PF

DELICAT DEMonstration of **Lidar-based Clear Air Turbulence detection**
National Institute of Research and Development for Optoelectronics

HISVESTA High Stability Vertical Separation **Altimeter** Instruments
Microelectronica SA, Ceramica Ingenua S.R.L.

ADVITAC ADVance Integrated **Composite Tail Cone**
RECOMET IMPEX SRL

TAUPE Transmission in Aircraft on Unique Path **wirEs**
EKIS Romania SRL

ATOM **Airport detection and Tracking** Of dangerous Materials by sensors arrays
Transylvania Tirgu-Mures Airport

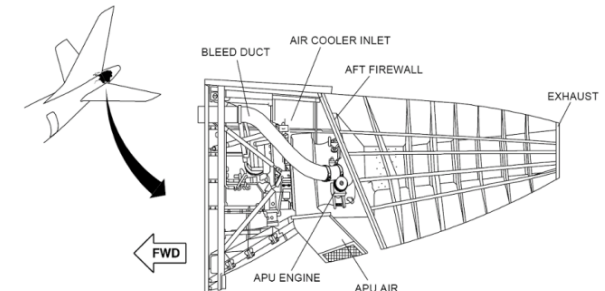
CEARES **Central European** Aeronautical Research Initiati
INCAS

AIRTN Air Transport **Net (AirTN)** – Support Action Members States
ROSA

REStARTS Raising European Student Awareness in Aeronautical Research Through **School labs**
INCAS

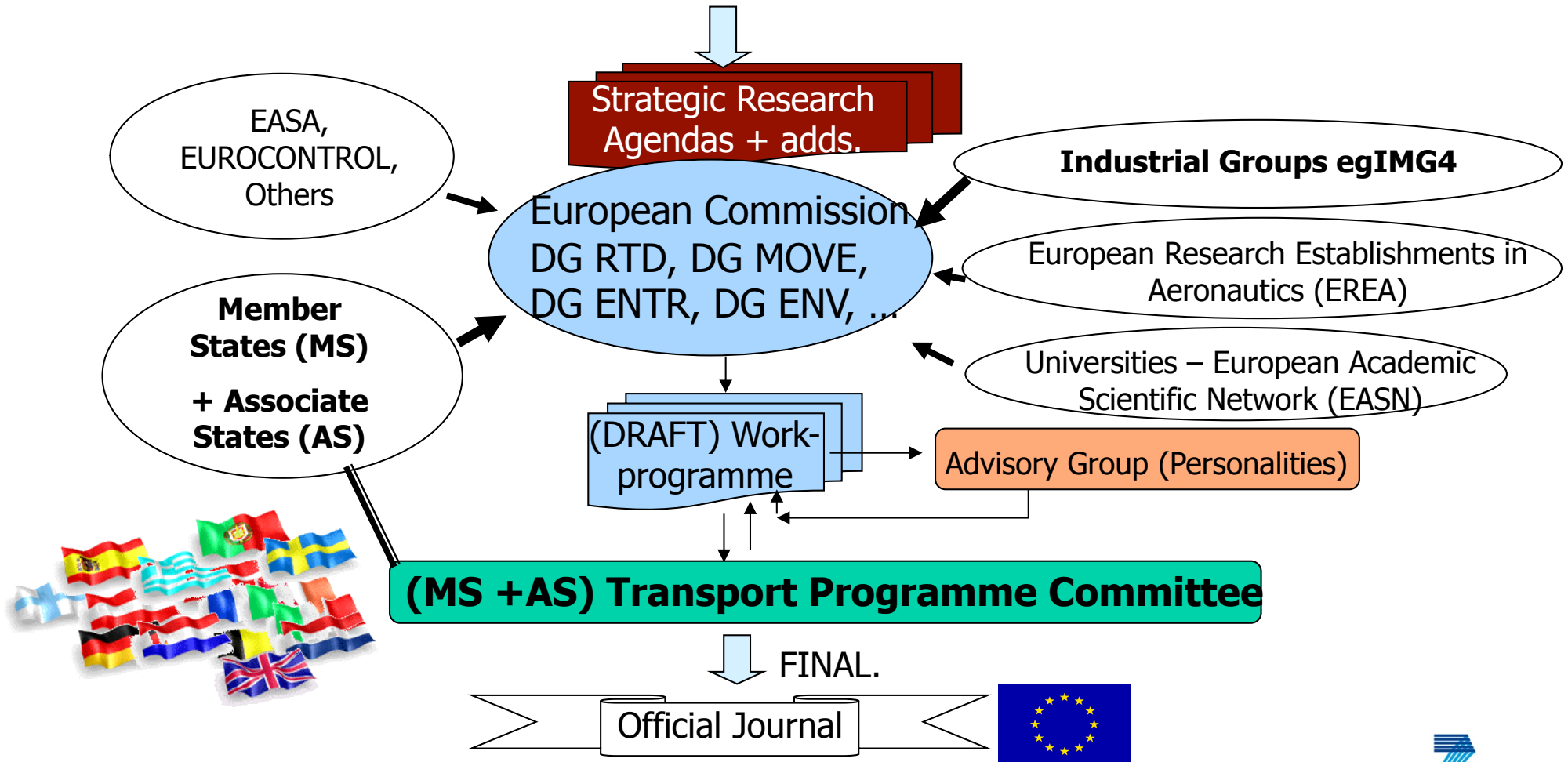


24-bladed rotor




Aeronautics & Air Transport Research Work-programme Preparation (DG RTD)

Technology Platform: **ACARE**
 (Advanced Council for Aeronautics Research in Europe)
 ie high-level stakeholders



FP7 Aeronautics – 4th Call Synopsis

Topics opened per Scheme \ Activity

121.3 M€	Greening	Time	Customer & Safety	Cost	Security	Pioneer
107 M€ ◆◆ Level2 max. 40 M€ grant/project (6 topics)	Core Engine thermal efficiency	Total Airport manage- ment	Human- centred Cabin environ- ment	- Smart airframe structures - Small aircraft propulsion & systems - Modular actuation systems	CLOSED	CLOSED
11.3 M€ ◆ Level 1 max. 4 M€ grant/project	CLOSED					10 topics OPEN
3 M€ Support Actions max. 300k€ EC grant	7 topics OPEN: Canada, Japan, SMEs, Education needs, Crisis management, Air Freight; Conferences					 <small>SEVENTH FRAMEWORK PROGRAMME</small>

FP7 Aeronautics – 4th Call

Budget and Timing

Overall Budget:	121.3 million Euro
◆◆ Level 2:	6 topics, 107 million €
◆ Level 1:	only “Pioneering”, 11.3 million €
Support Actions:	3 million €

Time schedule

Call opening date:	July 20 th 2010
Call closing date:	December 2nd 2010 17:00 h Brussels local time
Evaluation phase:	January 24 th to Feb 24 th
Start of first projects:	June to July 2011

FP7 Aeronautics – 4th Call

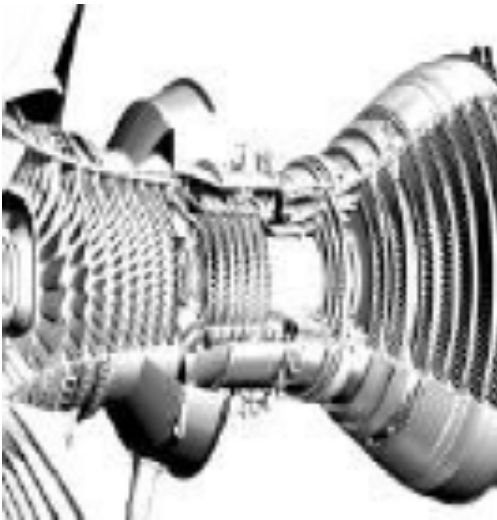
Topics for Level 2 projects - Greening

Systems approach to improved core engine thermal efficiency

Objective: Increase engine thermal efficiency above overall pressure ratio OPR 50:1 for reduced CO₂ emissions minimising NO_x increase

Scope: Further development and Integration of key technologies:

- Innovative **compressor** for ultra-high pressure ratio up to 70:1
- HP-LP compressor **inter-cooling**
- Low NO_x **combustion**
- Advanced **structural** components for high OPR
- **Combustor-turbine** interaction.
- Active **heat management** for further increased thermal efficiency, including aspects of
 - turbine **cooling**,
 - core engine cooling and
 - **sealing**.



Validation platforms at component, subsystem and system level, where appropriate.

Complement research work, e.g. on-going in Clean Sky, FP6 NEWAC.

Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

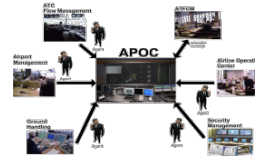
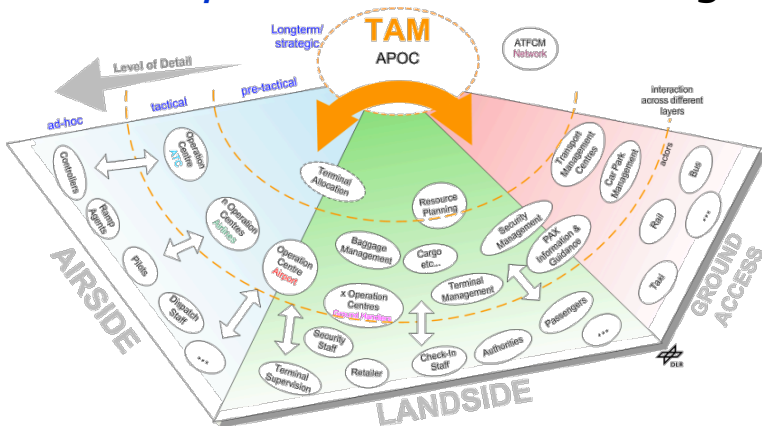
FP7 Aeronautics – 4th Call

Topics for Level 2 projects – Time efficiency

Integrated approach to **total airport management** for operational efficiency

Objective: Overcome fragmentation of airport activities –land side and air side– aiming at improving the efficiency, capacity, punctuality, safety, security and environment sustainability.

Scope: Innovative integration of all airport operations (system of systems):



- Passenger flow
- Baggage flow
- Apron operation
- Fleet management
- Security monitoring
- Air quality and noise monitoring
- Single IT management system

It will also consider a **multi-airport** management concept for **shared operation** of proximity alternative airports.

Techniques, modelling tools, devices and emerging technologies; integrating existing solutions. Validation with real and representative examples with **actual data** and use key performance indicators e.g. from ATMAP and Airport Observatory initiatives. Airport operation centre **demonstrator**.

Complement research work, e.g. FP6 SPADE-2, FP7 SECURITY e.g. checking points.

Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

FP7 Aeronautics – 4th Call

Topics for Level 2 projects – Customer Satisfaction

Integrated approach to a human-centred cabin physical environment

Objective: Place human needs at the centre of future cabin designs regarding **health, safety, comfort** as well **work-load** conditions for **crew**

Scope: Integration of technologies and concepts key to physical environment :



- **Noise** and **vibration** (active & passive)
- **Air quality** and cabin pressure
- **Low Energy** and Materials and systems
- On-board **safety** related systems and procedures incl. **fire**
- **Lighting** and **virtual** environments
- **Human factor** issue



Incl. **standardization** efforts, step-wise validation incl. full-scale test **demonstrators**, to a range of different types of aircraft, from the smaller size to large airliners.

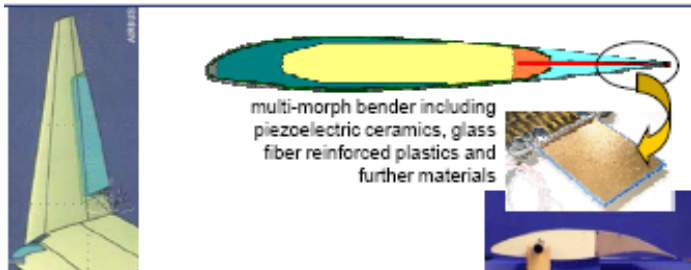
Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

Topics for Level 2 projects – Cost efficiency

Integrated approach to smart airframe structures

Objective: Step change in 'intelligent' structures regarding **self-sensing**, **multifunctional** materials and **morphing** for reduced operational costs

Scope: Further development and Integration of key technology developments, including supporting modelling tools, focusing on two major applications:



- Wing morphing for improved lift and reduced drag during take-off, cruise and landing
- Self-sensing and multifunctional materials for smart process control and quality assurance in **manufacturing** and for smart **in-service** self-monitoring and **self-healing** of structures.

Increased use of **nano-particles** reinforced resins.

Validation in both the wing and fuselage demonstrators should take a modular approach to integrate and test components in incremental steps, so to reduce risks:

- **wing specific iron bird** in a modular approach, testing the comprised elements at component level and in wind tunnels
- a fuselage scaled **barrel demonstrator**

Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

FP7 Aeronautics – 4th Call

Topics for Level 2 projects – Cost efficiency

Integrated approach to efficient **propulsion** and aircraft **systems** for **small-size aircraft**

Objective: Improve the capability to develop environmentally acceptable, safe, reliable and economic propulsion units that the small size aircraft industry (up to **19 pax.** fixed-wing and rotorcraft) needs

Scope: Integration of key technologies for a range of small gas turbine engines and propulsion related systems. Two fronts of action:



- Performance improvements of key engine components, including modern **engine control** technologies, **health monitoring** and integrated systems.
 - **Airframe-propulsion integration** with regard to aircraft overall configuration
- Benefits of technologies already used** in larger aircraft or even outside aeronautics should also be exploited.

Test rig validation of the most appropriate technologies according to value/cost benefit, as well as their integration into functional complexes and evaluation on the real engine demonstrators; and, if appropriate, **on aircraft test beds** as well.

Complement research work e.g. FP6 CESAR

Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

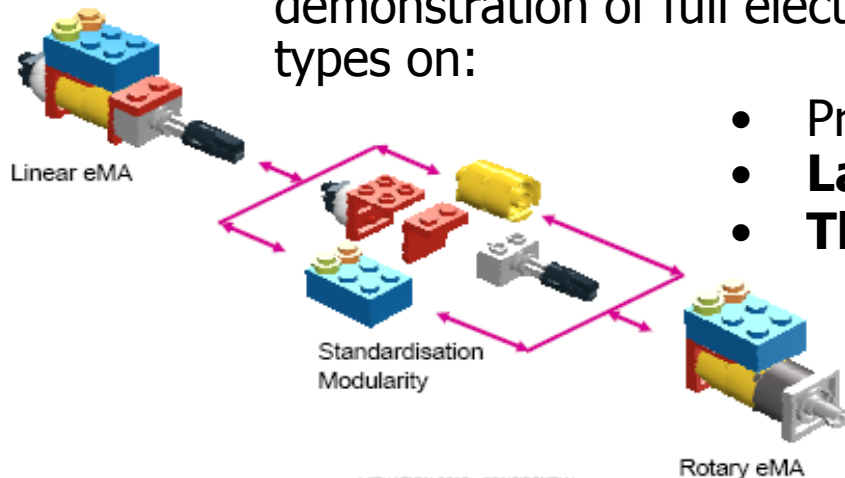
FP7 Aeronautics – 4th Call

Topics for Level 2 projects – Cost efficiency

Integrated modular actuation systems for the future all-electric aircraft

Objective: Introduce full electric actuation in all aircraft systems as a definite step in the **elimination of on-board hydraulics** for full electric aircraft

Scope: **Scalable** systems approach through modular components to demonstration of full electrical actuation for a broad range of aircraft types on:



- Primary and secondary **flight controls**
- **Landing** systems
- **Thrust reversers** and **doors**

Integrate sensors, motors, controller, materials, system health, wireless data flow ...

Drive **standardization** process, address **certification** requirements.

Validation should take place at components and system level, in lab testing and in a common multi-application **ground test bed**.

Complement and coordinate research work e.g. Clean Sky, FP POA, FP MOET.

Video-presentations at Info-day: <http://ec.europa.eu/research/aeronautics>

FP7 Aeronautics – 4th Call

Topics for Level 1 & CA projects: PIONEERING (up to max. 4M€ grant/project)

Beyond 2020 horizon, setting foundations of more **radical, revolutionary** technologies that might configure the **step changes** required for the **second half of this century**.

◆ Breakthroughs & Emerging Technologies

Lift, Propulsion*, Interior space, Life-cycle

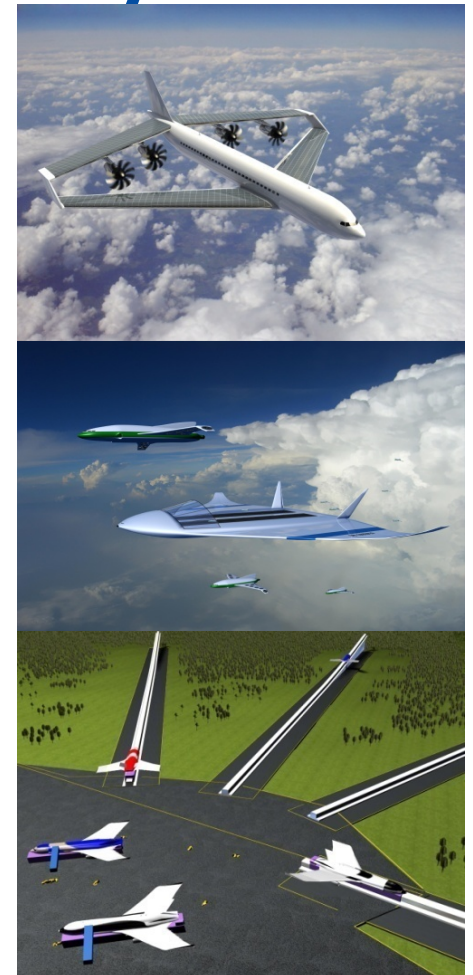
◆ Step Changes in Air Transport Operation

Novel vehicles, Guidance & control, Airports

◆ Step Changes in Air Transport Operation

- The cruiser/feeder concept.
- Take-off & land with ground-based power.
- New sources of main propulsive power*

* except H2 & Fuel Cells, covered by JTI FCH



FP7 Aeronautics – 4th Call

Topics for Support Actions (SA): (up to 300 k€ grant/project)

1. Supporting organisation of **conferences** / events of relevance to aeronautics & air transport **research as a whole**
2. Stimulating the participation of small and medium size enterprises (**SME**) and other small organisations for improved integration of the European Research Area
3. Assessing the role and needs of **air freight** in air transport
4. Exploring and stimulating research cooperation with **Canada**
5. Exploring and stimulating research cooperation with **Japan**
6. Assessing the **educational needs** of engineers and researchers in aeronautics and air transport
7. Technology support for **crisis coordination** for the air transport system following **major disruption events**

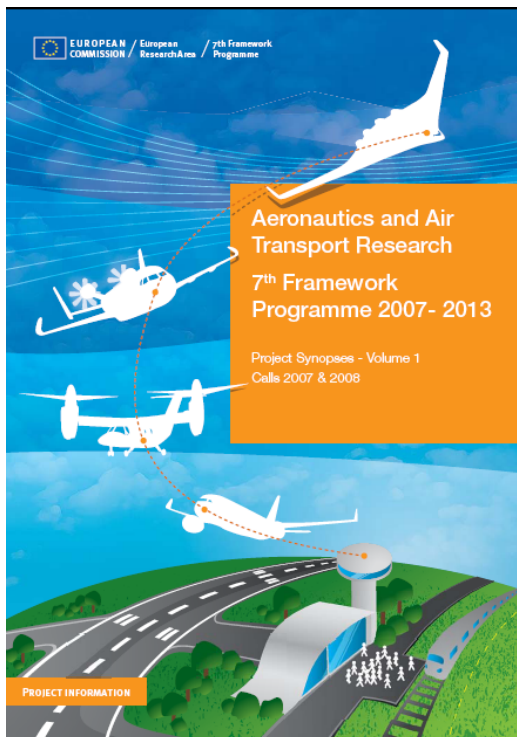


Cooperation in EU FP7 Aeronautics Research

WHO to contact ? – Directions 4th call

4th Call web-site: [http://cordis.europa.eu/fp7/dc/index.cfm?
fuseaction=UserSite.FP7DetailsCallPage&call_id=335](http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.FP7DetailsCallPage&call_id=335)

- ◆ **DG RTD / Directorate H “Transport (incl. Aeronautics)”:**
Aeronautics (H3) Head of Unit: Liam.Breslin@ec.europa.eu
International Cooperation: Pablo.Perez-Illana@ec.europa.eu
- ➔ FP7/FP6 Aeronautics Synopses Books (Coordinators and EC):
http://ec.europa.eu/research/transport/more_info/publications_en.cfm



Networks of National Contact Points (NCPs):

- ◆ In EU Member States to facilitate connections & activities.
- ◆ In Third countries to aid participation in FP7:
http://cordis.europa.eu/fp7/third-countries_en.html

+ Video-presentations at Brussels' 4th Call Info-day
incl. Brokerage: <http://ec.europa.eu/research/aeronautics>

FP7 Aeronautics JTI « Clean Sky »

Demonstrators of environmentally-friendly systems

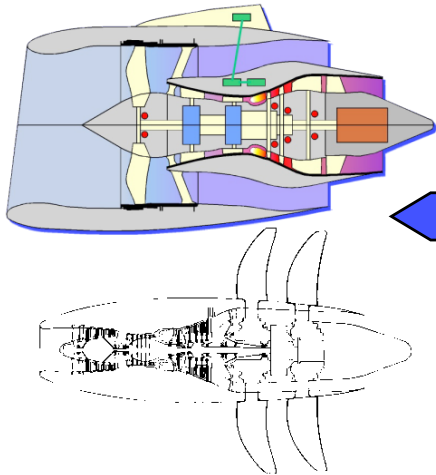
SMART Wing Aircraft



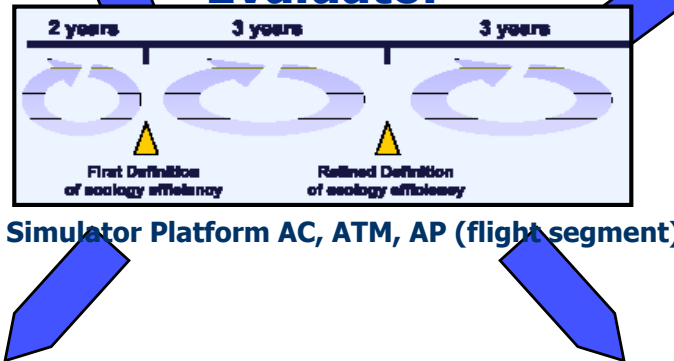
Systems for Green Operation



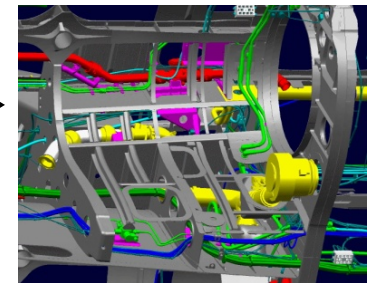
Green Engines



Evaluator



Eco-Design



Green Rotorcraft



Regional Air Transport



FP7 Aeronautics JTI « Clean Sky »

Demonstrators of environmentally-friendly systems

7th call for proposals launched: **38 topics** with total available funding of almost **23 million euros**.

* Very specific & focused topics.

* No need for consortium. One single organisation can submit.

Deadline for submitting proposals: **9th December 2010**.

Today 11th October CleanSky Call **Info-Day** in Brussels:

<http://www.cleansky.eu>

For more detailed descriptions of the work topics and information on how to submit your proposal:

<http://cordis.europa.eu/fp7/dc/index.cfm?>

[fuseaction=UserSite.CooperationDetailsCallPage&call_id=380](http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CooperationDetailsCallPage&call_id=380)

Mulțumesc & Noroc ! Thanks & Good luck !



Visit our web: <http://ec.europa.eu/research/aeronautics>
DG Research-H.3 Aeronautics - 23 / 23