



# Aeronautics & Air Transport Research in the 7<sup>th</sup> EU Framework Programme (FP7)



## III. 4<sup>TH</sup> CALL FOR PROPOSALS – WP2011

**EUROPEAN COMMISSION**  
**DG Research      Aeronautics**



# Cooperation and 4<sup>th</sup> Call in EU FP7 Aeronautics Research

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# 4<sup>th</sup> call context

## WP2011 STRATEGY

- **Principle of annuality** of budget consumption → future calls of the Transport theme will be smaller than the first two calls
- **Balance** between *bottom-up* and *top-down* research
- **Balance** between *upstream* research and research on *technology integration*
- **Balance** between various *research areas* and *funding instruments* for the successive WPs in the period 2010-2013
- **Results** of **2007** and **2008** calls – and other initiatives



**A multi-annual perspective !**

# FP7 Aeronautics – 4th Call Synopsis

## Topics opened per Scheme \ Activity

121.3 M€	Greening	Time	Customer & Safety	Cost	Security	Pioneer
<b>107 M€</b> <b>◆◆ Level 2</b> <b>max. 40 M€</b> <b>grant/project</b> <b>(6 topics)</b>	<b>Core Engine</b> thermal efficiency	Total <b>Airport</b> management	Human-centred <b>Cabin</b> environment	- Smart <b>airframe</b> structures - <b>Small aircraft</b> propulsion & systems - Modular <b>actuation</b> systems	<b>CLOSED</b>	<b>CLOSED</b>
<b>11.3 M€</b> <b>◆ Level 1</b> <b>max. 4 M€</b> <b>grant/project</b>	<b>CLOSED</b>					<b>10 topics</b>  <b>OPEN</b>
<b>3 M€</b> <b>Support Actions</b> <b>max. 300k€</b> <b>EC grant</b>	<b>7 topics OPEN:</b> Canada, Japan, SMEs, Education needs, Crisis management, Air Freight; Conferences					

# 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<sup>th</sup> 2010
- ▶ Call closing date: **December 2<sup>nd</sup> 2010**  
17:00 h Brussels local time
  
- ▶ Evaluation phase: January 24<sup>th</sup> to Feb 24<sup>th</sup>
- ▶ Start of first projects: June to July 2011

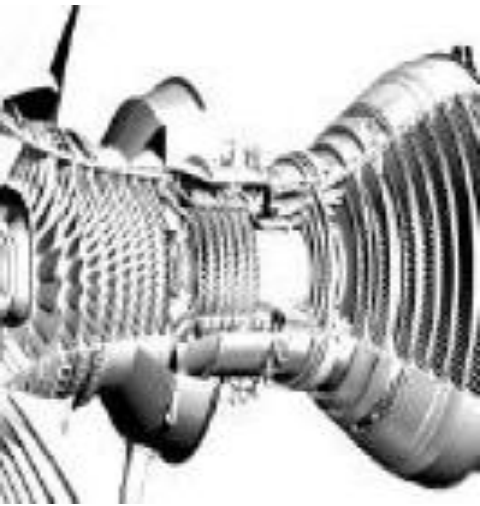
# FP7 Aeronautics – 4th Call

## 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 CO<sub>2</sub> emissions minimising NO<sub>x</sub> 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<sub>x</sub> **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 – 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>

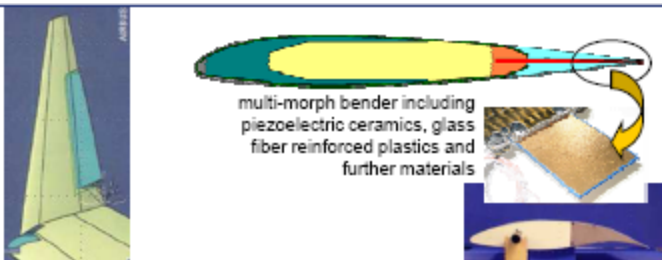


## Topics for Level 2 projects – Cost efficiency

### 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

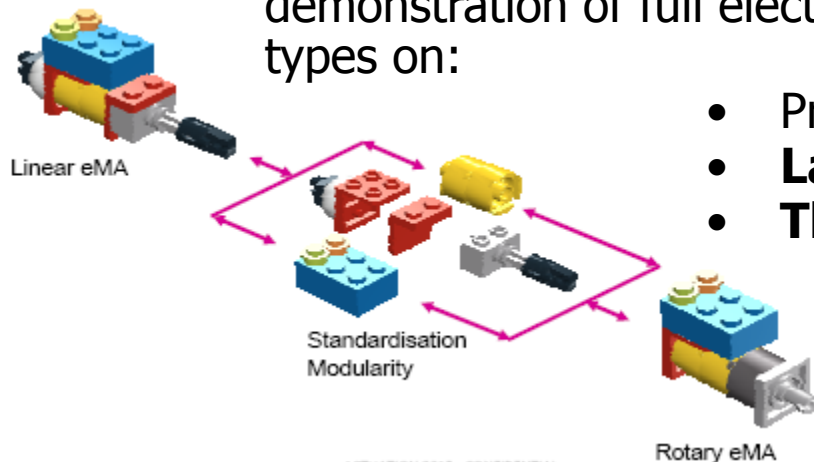
## Topics for Level 2 projects – Cost efficiency

### 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>

## 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

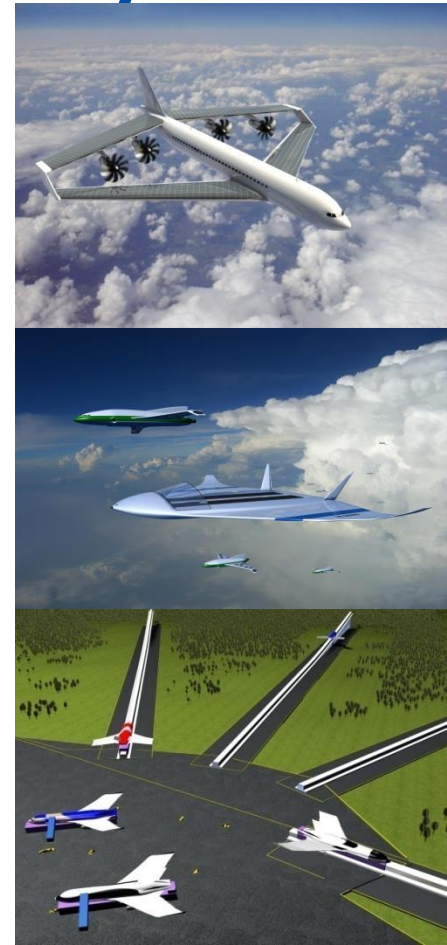
### ◆ Step Changes in Air Transport Operation

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**

# FP7 Aeronautics – 4th Call

## Support Actions (SA)

( No technical research / development / demo activities...)

Activities under a Support Action can be:

- **Conferences**, seminars, **workshops**, meetings
- **Studies**, fact finding, monitoring,
- **Strategy** development,
- Awards and competitions,
- Working or **expert groups**,
- Operational support, data access and **dissemination**,
  - Information and **communication** activities
  - Cooperation with other European research schemes;

\* Or a combination of these plus management of the activities.

Max. **EU funding** : **300 k€** + third country/party contribution

\* Typical max. 300 k€, only in well justified cases up to 500k€

\* Typically up to 2 year duration.

NB: Competition with proposals in same or other SA topics



# Cooperation in EU FP7 Aeronautics Research

## WHO to contact ? – Directions

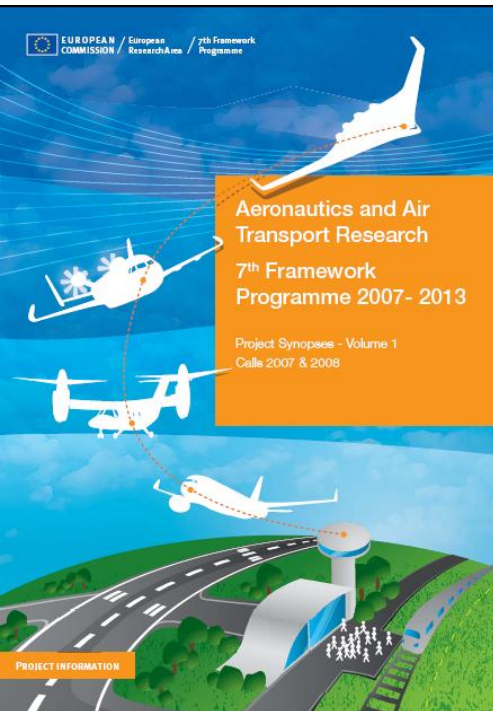
European Commission – DG Research:

- ◆ Directorate H “Transport (incl. Aeronautics)”:  
Aeronautics (H3) Head of Unit: [Liam.Breslin@ec.europa.eu](mailto:Liam.Breslin@ec.europa.eu)  
International Cooperation: [Pablo.Perez-Illana@ec.europa.eu](mailto: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](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](http://cordis.europa.eu/fp7/third-countries_en.html)

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



# Thank you for your attention & Good luck !



EU Transport Research - Towards future air transport - Microsoft Internet Explorer

Address: [http://ec.europa.eu/research/transport/transport\\_modes/aeronautics\\_en.cfm](http://ec.europa.eu/research/transport/transport_modes/aeronautics_en.cfm)

## RESEARCH

European Commission - Research - Transport

TRANSPORT RESEARCH

### Towards future air transport

The performance of the air transport sector as a whole is levelling off. New concepts and breakthrough technologies will be needed to bring a new age of air flight. Air transport demand is predicted to double in the next 40 - 45 years and triple in 20 years time. This offers a significant opportunity for Europe, but also major challenges with regard to environmental effects, safety, security and affordability and increasing the capacity of our air transport system through improved air-traffic management.

#### Issues and challenges:

New concepts and breakthrough technologies for a better air transport future

- The 'greening' of air transport
- Increasing time efficiency
- Customer satisfaction and safety
- Improving cost efficiency
- Protection of aircraft and passengers
- Air transport of the future

Using new technology and innovative operational advances Europe will develop competitive, integrated, safer, 'greener' and 'smarter' air transport systems for the benefit of all citizens and society that deliver mobility in a sustainable manner by respecting the environment and natural resources.

Europe is one of the world's leading exporters of aeronautics-related products and services. The EU aeronautics and aerospace sectors represent multi-billion Euro industries in the European economy and supporting millions of jobs for European citizens. The air transport system in Europe can call on a fleet of some 5 000 aircraft and moves one billion passengers every year.

NEWS

- 12 February 2008 "Clean Sky" research takes off
- 12 February 2008 Aeronautics Information Day draws large audience
- 14 January 2008 ISTRES 2008 'joining the dots'

PRESS RELEASE

- High-level experts call for more performance-driven air traffic management Reference: 19/07/2003
- European air traffic management: further steps towards the Single European

Visit our web: <http://ec.europa.eu/research/aeronautics>