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# Aeronautics and Air Transport Research 1st Call - 2007



***European Commission – DG Research***  
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***Madrid – 20 February 2007***

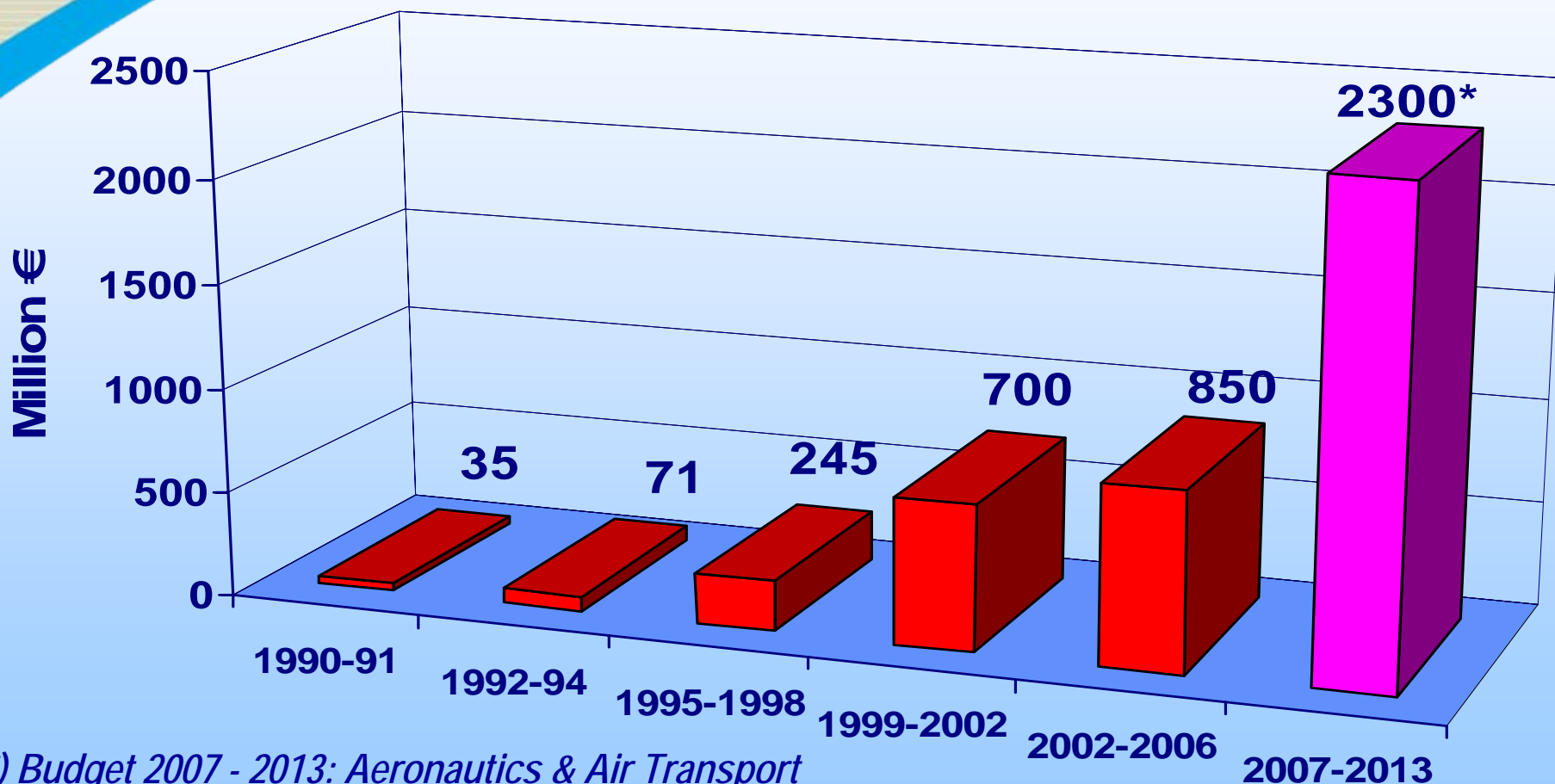


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## R&TD Funding for Specific Aeronautics Research on EU Level *in million Euro*



*\*) Budget 2007 - 2013: Aeronautics & Air Transport  
(Collaborative Research + JTI) and SESAR (350 mio €)*



# 1st Calls Aeronautics and Air Transport - 2007

## Call AAT – 2007 RTD-1

- *153 million Euro*  
(plus 2008 budget contribution) Indicative total of *217 million Euro*
- *Full workprogramme* (except airport capacity topic)

## Call AAT – 2007 TREN-1

- *4 million Euro*
- *Airport capacity* topic ( 4.3.3.3)

Publication: 22 December 2006

Deadline: 3 May 2007

Proposals evaluation: June 2007

Contracts negotiation: July – October 2007

First contracts: December 2007



# Aeronautics & Air Transport

## Aim and Scope of the Workprogramme

### Aim

- To meet *society's needs* for greener, more economic, more reliable, safer, smarter and secure air transport system
- To ensure the *leadership* of the *European aeronautical industry*

### Scope

- *Includes:*
  - *Technologies, services and operations of all components of the air transport system from airport kerbside to airport kerbside (i.e. aircraft, airport and air traffic management)*
- *Excludes:*
  - *Non-travel aspects, ticketing and ground vehicles*



# Aeronautics & Air Transport

## *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





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# Research, Technology & Product Development



Research and technology acquisition

Product development

Fundamental knowledge

Technology development

Technology validation

Demonstrators

Prototypes

Product definition

Product design and development

Product demonstration

Production

EU Framework Programme

Level 1

Collaborative Projects

Level 2

FP7 Concept: Level 3

JTI: Joint Technology Initiative

EUREKA

-10

-5

0

years

+5



# Aeronautics & Air Transport Workprogramme Approach

## **Level 1** (*EU-funding: max. up to 8 million €*)

Upstream research and technology development activities from basic research to validation at component or subsystem level through analytical and/or experimental means in the appropriate environment – CP, CSA

## **Level 2** (*EU-funding: min. 8 million € up to max. 60 million €*)

Downstream research and technology development activities up to higher technology readiness, centred on the multidisciplinary integration and validation of technologies and operations at a system level in the appropriate environment (large scale flight and/or ground test beds and/or simulators) - CP

## **Level 3**

Research and technology development activities up to the highest technology readiness, focusing on the combination of systems and the final proof of the comprised technologies in fully integrated system of systems in the appropriate operational environment – JTI, JU

## **Structuring Aeronautics Research**

Activities aiming at strengthening excellence in particular research fields through lasting networking - NoE

## **Supporting Programme implementation**

Activities aiming at setting mechanisms or developing strategies for programme implementation – CSA (and CP)





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# Aeronautics and Air Transport Workprogramme



The Greening of Air Transport	Increasing Time Efficiency	Ensuring Customer Satisfaction and Safety	Improving Cost Efficiency	Protection of Aircraft and Passengers	Pioneering the Air Transport of the Future
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## Level 1

Upstream RTD from basic  
research to validation at  
component or subsystem  
level – CP, CSA

## Level 2

Focussed downstream  
RTD – Multidisciplinary  
integration and validation  
at systems level - CP

## Level 3

RTD up to the highest  
technology readiness –  
final proof in systems of  
systems – JTI, JU

	"Clean Sky" JTI		
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		SESAR JU	
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## Structuring Aeronautics Research

through  
lasting integration - NoE

*Supporting Programme  
implementation* –  
setting mechanisms  
and strategies  
– CSA (and CP)





## The Greening of Air Transport

### **Level 1**

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level –  
CP, CSA

### Expected Impact

- *Reduction of CO<sub>2</sub>, CO and unburnt hydrocarbons by 50%*
- *Reduction of NO<sub>x</sub> by 80%*
- *Reduction of external noise by 10 EPNdB*
- *Reduce impact of manufacturing, maintenance and disposal on the environment*

### Green Aircraft

- *Flight physics*
- *Aerostructures*
- *Propulsion*
- *Systems & equipment*
- *Avionics*

### Ecological Production and Maintenance

- *Production*
- *Maintenance and disposal*

### Green operations

- *ATM (SESAR)*
- *Airports*



## Increasing Time Efficiency

### **Level 1**

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level –  
**CP, CSA**

### Expected Impact

- *Air transport system to accommodate 3 times more movements*
- *99% of flights within 15 minutes of schedule in all weather*
- *Reduction of time spent in airports for transport procedures to under 15 minutes for short-haul flights and under 30 minutes for long-haul flights*

### Systems and Equipment for Improved Aircraft Throughput

- *Systems and Equipment*
- *Avionics (SESAR)*
- *Maintenance and Repair*

### Time-Efficient Operations

- *ATM (SESAR)*
- *Airports*



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# Aeronautics and Air Transport Workprogramme



## Ensuring Customer Satisfaction and Safety

### **Level 1**

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level  
– CP, CSA

### Expected Impact

- *Increase passenger choice of on-board services and comfort*
- *99% of flights within 15 minutes of schedule in all weather*
- *Reduction of time spent in airports for transport procedures to under 15 minutes for short-haul flights and under 30 minutes for long-haul flights*
- *Reduction of accident rate by 80%*
- *Substantial improvement in the elimination of and recovery of human errors*
- *Mitigation of effects of survivable accidents*

### Passenger Friendly Cabin

- *Design systems and tools*
- *Noise and Vibration*
- *Systems & equipment*

### Passenger Friendly Operations

- *Maintenance and repair*
- *Airports*

### Aircraft Safety

- *Aerostructures*
- *Systems & equipment*
- *Avionics (SESAR)*
- *Human factors*

### Operational Safety

- *Design systems and tools*
- *Maintenance*
- *ATM (SESAR)*
- *Airports*
- *Human factors*



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## Improving Cost Efficiency

### **Level 1**

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level

– CP, CSA

### Expected Impact

- *Reduction of aircraft development costs by 50%*
- *Halving time to market through a competitive supply chain*
- *Reduction of aircraft operating costs by 50%*
- *Reduction of travel charges*

### Aircraft Development Cost

- *Design systems and tools*
- *Aerostructures*
- *Systems and equipment*
- *Avionics*
- *Production*

### Aircraft Operational Cost

- *Flight physics*
- *Aerostructures*
- *Propulsion*
- *Systems*
- *Avionics*
- *Maintenance*

### ATS Operational Cost

- *Design systems and tools*
- *ATM (SESAR)*
- *Airports (Call TREN-1)*
- *Human factors*



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## Protection of Aircraft and Passengers

### ***Level 1***

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level –  
**CP, CSA**

### Expected Impact

*• Elimination of hostile on-board or external actions  
against aircraft or in the air transport system*

#### Aircraft Security

- *Aerostructures*
- *Systems and equipment*
- *Avionics*

#### Operational Security

- *ATM (SESAR)*
- *Airports*
- *Human factors*



## Pioneering the Air Transport of the Future

### **Level 1**

Upstream RTD from  
basic research to  
validation at  
component or  
subsystem level  
– CP, CSA

### Expected Impact

- *Setting the foundations of technology base and new paradigms for step changes in air transport in the long term*

### Breakthrough and Emerging Technologies

- *Lift*
- *Propulsion*
- *Interior space*
- *Life-cycle*

### Step Changes in Air Transport Operation

- *Novel air transport vehicles*
- *Guidance and control*
- *Airports*



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## **Level 2**

Focussed  
downstream RTD –  
Multidisciplinary  
integration and  
validation at systems  
level - CP

1. ***Integrated approach to novel engine architectures***  
Definition, development, integration and validation of **advanced engine concepts** and technologies at both components and system levels in **novel engine architectures**. The project shall include the latest advances in engine integration, validation and modelling.
2. ***Integrated approach to fault tolerant avionics***  
Integration and validation of basic elements of a **comprehensive aircraft electronics platform**, including the relevant tools and methods. Demonstration of the integrated platform in terms of functionality, re-configurability, fault tolerance and cost.
3. ***Integrated approach to aircraft electromagnetic environment***  
Development of integrated modelling, simulation, testing, certification and maintenance solutions able to cope with the **overall aircraft electromagnetic environment**. To consider the **different flight phases** and to cover a **broadband of electromagnetic perturbations**.





# Aeronautics and Air Transport Workprogramme

## **Level 2**

Focussed  
downstream RTD –  
Multidisciplinary  
integration and  
validation at  
systems level - CP

### **4. *Integrated approach to Life-cycle based development of aircraft structures***

Development of a **numerical modelling system** which provides a step change in **integrated virtual design, virtual manufacturing** and **in-service maintenance** and derivatives development so covering the **full life-cycle of an aircraft structure**.

### **5. *Integrated approach to Network centric aircraft communications for global aircraft operations***

Definition, development and demonstration of an **aircraft communication concept** integrating a **full range of applications and services**, including airlines operations, cabin crew operations, in-flight and on-ground passenger services, airport operations, security services and air traffic management related operations, including the unification of all the related networking protocols.

### **6. *Integrated approach to health monitoring and non-destructive evaluation of aircraft structures***

Assessment and improvement of **non-destructive testing techniques** and modelling for **health monitoring**. The approach will consider a large ensemble of techniques. The applications should cover fixed-wing and rotary-wing aircraft as well as engines components.



# Aeronautics and Air Transport Workprogramme

**Structuring  
Aeronautics Research**  
through networking  
and lasting integration  
- NoE

## 1. *Integration of research capacities in the domain of aviation safety*

Network to cover the full range of research activities underpinning **certification and regulatory aspects** in the different technical domains relevant to **aviation safety**, such as safety modelling and metrics, human behaviour, software and hardware, new approaches to certification, etc.

## 2. *Integration of research capacities in the domain of aerodynamic flows modelling*

Network to cover **key upstream modelling and simulation areas** relevant to the virtual prototyping activities of the European aeronautical industry in **advanced fluid dynamics**.

It will foster long-term goals in flow modelling and simulation from academia, research centres, etc. aiming at transferring fundamental research results into the industrial framework.



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# Aeronautics and Air Transport Workprogramme



The Greening  
of Air Transport

Increasing  
Time Efficiency

Ensuring Customer  
Satisfaction and  
Safety

Improving Cost  
Efficiency

Protection of  
Aircraft and  
Passengers

Pioneering the  
Air Transport  
of the Future

**Supporting  
Programme  
implementation** –  
setting  
mechanisms and  
strategies –  
**CSA** (and **CP**)

1. *Understanding interactions between air transport, energy, environment and society*
2. *Understanding the behaviour of the different actors and drivers of the air transport system*
3. *Improving passenger choice in air transportation with the incorporation of additional and new vehicles*
4. *Stimulating radical technological changes*
5. *Stimulating participation of SMEs*
6. *Stimulating participation of Member States with aeronautical RTD potential*
7. *Stimulating research with INCO partner countries*



# Roadmap Calls

## Aeronautics and Air Transport

### 2007- 2013

- *Tentative plan: 5 Calls in 2007, 2008, 2010, 2011 and 2012*
- *Budget distribution of about 200 million Euro per Call*
- *Level 1 topics fairly stable throughout the Calls*
- *Topics for Level 2, Networks of Excellence and Specific Support Actions will normally change from Call to Call*