



Aeronautics & Air Transport in FP7



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2000
European Aeronautics:
A Vision for 2020

2002
Strategic Research Agenda
Six Challenges for Aeronautics

2005
**2nd Issue of the Strategic Research
Agenda**
Six High Level Target Concepts

Society's needs

Global leadership



Aeronautics and Air Transport Workprogramme Approach

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



Aeronautics and Air Transport Workprogramme Approach

Instruments

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

Upstream research and technology development activities – ***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, multidisciplinary integration and validation - ***CP***

Level 3

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

Structuring Aeronautics Research

Activities strengthening excellence in research fields through lasting networking - ***NoE***

Supporting Programme Implementation

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

Launching FP7 – Conference for Information Multipliers – Brussels, 7-8 February 2007



Research / Technology and Product Development in Aeronautics



Fundamental knowledge

Technology development

Technology validation

Demonstrators

Prototypes

Product definition

Product design and development

Product demonstration

Production

EU Framework Programme

Level 1

Collaborative Research

Level 2

Novel F.P.7 Concept: Joint Technology Initiative

EUREKA





Aeronautics and Air Transport Research Themes (1)

The Greening of Air Transport

Embraces both the **global issue of climate change** (CO₂, NO_x, soot, water vapour, particulates) as well as the **local issues of noise and air quality**

- **Green Aircraft**
 - **Flight Physics**
 - **Aerostructures**
 - **Propulsion**
 - **Systems and Equipment**
 - **Avionics**
- **Ecological Production and Maintenance**
 - **Production**
 - **Maintenance and Disposal**
- **Green Air Transport Operations**
 - **Flight and Air Traffic Management**
 - **Airports**



Aeronautics and Air Transport Research Themes (3)

Ensuring Customer Satisfaction and Safety

Aims at a **quantum leap in passengers choice and schedule flexibility** as well as at a significant **reduction in accident rate** in respond to the forecasted growth in air travel demand.

- **Friendly Cabin**
 - Design Systems and Tools
 - Noise and Vibration
 - Systems and Equipment
- **Passenger Friendly Air Transport Operations**
 - Maintenance and Repair
 - Airports
- **Aircraft Safety**
 - Aero-structures
 - Systems and equipment
 - Human factors
- **Operational safety**
 - Design Systems and Tools
 - Maintenance
 - Air Traffic Management
 - Airports
 - Human Factors



Aeronautics and Air Transport Research Themes (4)

Improving Cost Efficiency

Embraces all the **cost** that arise in the whole **air system design and operation**

- **Aircraft Development Costs**
 - Flight Physics
 - Aerostructures
 - Propulsion
 - Systems and Equipment
 - Avionics
 - Production
- **Aircraft Operational Costs**
 - Flight Physics
 - Aerostructures
 - Propulsion
 - Systems
 - Avionics
 - Maintenance
- **Air Transport System Operational Costs**
 - Design Systems and Tools
 - Air Traffic Management
 - Airports (*DG TREN Call*)
 - Human Factors



Aeronautics and Air Transport Research Themes (5)

Protection of Aircraft and Passengers

Aims to making **impossible** that an attacking force of any kind succeeds in creating **injury, loss, damage** or **disruption** either on the travellers or on citizens.

- **Aircraft Security**
 - **Aerostructures**
 - **Systems and Equipment**
 - **Avionics**

- **Operational Security**
 - **Air Traffic Management**
 - **Airports**
 - **Human Factors**



Aeronautics and Air Transport Research Themes (6)

Pioneering the Air Transport of the Future

Stretches the Vision 2020 horizon to **explore and pioneer the more radical, revolutionary, environmentally efficient and innovative technologies** that might configure the step changes required in the air transport of the second half of this century.

- **Breakthrough and Emerging Technologies**
 - **Lift**
 - **Propulsion**
 - **Interior Space**
 - **Life-cycle**

- **Step Changes in Air Transport Operation**
 - **Novel Air Transport Vehicles**
 - **Guidance and Control**
 - **Airports**



F.P.7 Scenario for Aeronautics & Air Transport (2007 – 2013)

Level 2 Themes for the 1st Call

- ***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.
- ***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**.



F.P.7 Scenario for Aeronautics & Air Transport (2007 – 2013)

Level 2 Themes for the 1st Call

- ***Life-cycle based development of structures***

The project should develop 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**.

- ***Network centric aircraft communications for global aircraft operations***

The project should define, develop and demonstrate an **aircraft communication concept** which will integrate 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. Account should be taken of communication concepts developed in SESAR for air traffic management.



F.P.7 Scenario for Aeronautics & Air Transport (2007 – 2013)

Level 2 Themes for the 1st Call

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

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

- ***Integrated approach to novel engine architectures***

The project should include the 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.



F.P.7 Scenario for Aeronautics & Air Transport (2007 – 2013)

Networks of Excellence (NoE)

- ***Integration of research capacities in the domain of aerodynamic flows modelling***

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

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

- ***Integration of research capacities in the domain of aviation safety***

Full range of research activities underpinning certification and regulator aspects in the different technical domains relevant to aviation safety.

Research capacities related to safety modelling and metrics, human behaviour, software and hardware, new approaches to certification, etc



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**)

- **Understanding interactions between air transport, energy, environment and society**
- **Understanding the behaviour of the different actors and drivers of the air transport system**
- **Improving passenger choice in air transportation with the incorporation of additional and new vehicles**
- **Stimulating radical technological challenges**
- **Stimulating participation of SMEs**
- **Stimulating participation of Member States with aeronautical RTD potential**
- **Stimulating research with INCO partner countries**



Aeronautics JTI Proposal *« Clean Sky »*

Objectives

- **to provide a step forward in the technology capability of ATS environmentally friendly systems:**
 - **integration of advanced technologies**
 - **full scale demonstrators**
- **to improve on the overall ATS impact on environment:**
 - **noise and emission reduction**
 - **fuel consumption**
- **to consolidate the European industry around a project of common European interest**



Status and Planning on the JTI « Clean Sky »

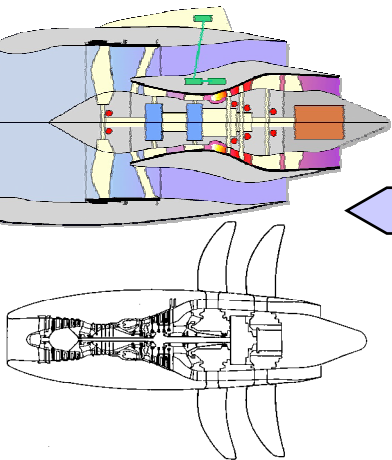
SMART Wing Aircraft



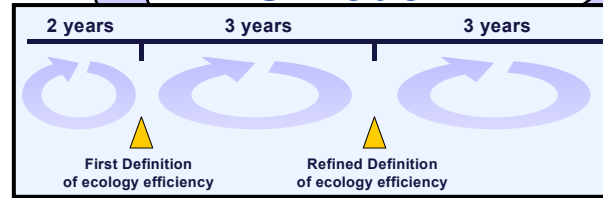
Systems for Green Operation



Green Engines

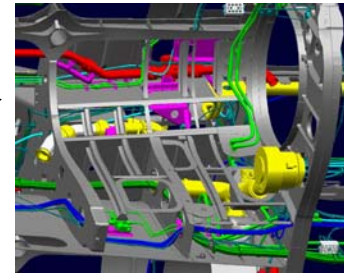


ATS Model



Simulator Platform AC, ATM, AP (flight segment)

Eco-Design



Green Rotorcraft



Regional Air Transport



Transport (incl. Aeronautics)

1st Call Aeronautics and Air Transport

Main Features

22nd Dec. 2006 ***Publication of Call for Proposals***

3rd May 2007 ***Closing of the Call for Proposals***

Budget: ***153 million € for 2007***
(about 217 million € for 2007 + 2008)
(4 million € of DG TREN)

Budget Split: ***50% Level 1 / 50% Level 2***



EUROPEAN
COMMISSION

community research



AWIATOR Project A340 Flight Test (Nov. 2006)



Dornier DoX (1929)

Thank you for your Attention