Key Features

- Public-Private Partnership between Commission and Industry
- 7-year research project on Greening of Aeronautics
- Total budget 1.6 billion €
  - 800 million € from Commission in-cash
  - 800 million € from industry in-kind
- Independent legal entity, will employ own staff of up to 25 persons
- Commission pays annual contribution, Joint Undertaking will manage the payments and RTD activities

- In Interim Phase (before autonomy)
  the Joint Undertaking will be run by Commission services
**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
Environmental Impact

Emissions reduction expected from existing technology programmes (FP-only option) (assuming an expected traffic growth of 4.25)

Additional CO2 reduction attributable to the JTI

Gap to ACARE target of 50% emissions reduction from a year 2000 base aircraft

No action

Clean Sky Status
Integrated Technology Demonstrators (ITD)

- SMART Wing Aircraft
- Regional Air Transport
- Green Engines
- Eco-Design
- Technology Evaluator
  - Simulator Platform AC, ATM, AP (flight segment)
  - ATS Model
  - First Definition of ecology efficiency
  - Refined Definition of ecology efficiency
  - 2 years
  - 3 years
  - 3 years

- Systems for Green Operation

Linked to "SESAR" Joint Undertaking

CLEANSKY
### Technology Evaluator

<table>
<thead>
<tr>
<th>ITD</th>
<th>Smart Fixed Wing Aircraft</th>
<th>Green Regional</th>
<th>Green Rotorcraft</th>
<th>Sustainable &amp; Green Engines</th>
<th>Systems for Green Operation</th>
<th>Eco Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New Aircraft Configurations</td>
<td>Low Weight Structures</td>
<td>New Aircraft Configurations</td>
<td>New Engine Concepts (i.e. Open Rotor)</td>
<td>Aircraft Energy Management</td>
<td></td>
</tr>
<tr>
<td>Targets</td>
<td>CO₂ ~12 to 20% Noise ~10dB</td>
<td>CO₂ ~10 to 20% Noise ~10dB</td>
<td>CO₂ ~26 to 40% NOₓ ~53 to 65% Noise ~10dB</td>
<td>CO₂ ~15 to 20% NOₓ ~15 to 40% Noise ~15dB</td>
<td>CO₂ ~10 to 15% Noise ~17dB</td>
<td>CO₂ ~10% Noise ~10dB</td>
</tr>
</tbody>
</table>

*Note: Targets shown represent the incremental impact of JTI*
SMART Fixed Wing:
  - Airbus (F, D, UK, E) + SAAB (SE)

Green Regional Aircraft
  - Alenia Aeronautica (I) + EADS CASA (E)

Green Rotorcraft
  - AgustaWestland (I, UK) + Eurocopter (F, D)

Green Engines
  - Rolls-Royce (UK) + Safran (F)

Systems for Green Operation
  - Thales (F) + Liebherr (D)

Ecodesign
  - Dassault Aviation (F) + Fraunhofer Gesellschaft (D)
SMART Fixed Wing 372 24 %
Green Rotorcraft 155 10 %
Green Regional Aircraft 177 11 %
Green Engines 419 27 %
Systems for Green Operation 295 19 %
Eco Design 109 7 %
Technology Evaluator 31 2 %

Running Costs 48

Total 1600
Contracts not issued by Commission, but by the Joint Undertaking.

Annual contributions from the Commission

75% of work via Named Beneficiaries (Members)

25% via Calls for Proposals (Partners)

Calls are not «open» in scope, but very targeted.

Single entities can apply.

High industry involvement at various levels

Strategic management

Description of Calls topics

Direct participation in evaluation
**Calls for Proposals**: means open calls for specific tasks, resulting in the selection of Partners on a competitive basis

- Prepared by ITD Leaders and Associates
- Principles of excellence, transparency and equal treatment
- Made during all 7 year time span

**Partner** means a legal entity selected in the course of JTI to perform specific tasks and is not necessarily committed for the full duration of the Joint Undertaking

- Eligible for funding: Any public or private entity established in a Member State or in a country associated to the FP7
- Industries, SMEs, Research Institutes, Universities
- Grant Agreement with the Clean Sky JU
Definitions of Subcontractors

- **Calls for Tender** means calls for subcontracting specific tasks issued by ITD Leaders or Associates
  - Services and supply

- **Subcontractor** means a legal entity which performs tasks under contract to an ITD Leader or Associate
  - 100% paid
  - No Intellectual Property Rights (IPR)
Proposals will be selected according to open and transparent competitive procedures.

Criteria comparable to FP7 evaluations (under final agreement now)

The selection will be done with the assistance of independent experts, supervised by the Joint Undertaking.

Calls for Proposals will contain clear details of the assessment criteria that will be defined to select the best proposals having regard to all relevant factors.

Calls = groupings of TOPICS, very specific descriptions

No minimum consortium size or composition, single entities are eligible respondents.
Research activities have started mid-2008

1st Call for Proposals has been launched:

- 72 topics
- Funding up to 25.6 million €
- Deadline 31st August 2009
- Evaluation in Brussels, September 2009
- Contracts closed before end of the year
<table>
<thead>
<tr>
<th>ITD</th>
<th>Number of Topics</th>
<th>Maximum Budget (M€)</th>
<th>Maximum funding (M€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRA – Green Regional Aircraft</td>
<td>34</td>
<td>4.888</td>
<td>3.666</td>
</tr>
<tr>
<td>GRC – Green Rotorcraft</td>
<td>4</td>
<td>4.367</td>
<td>3.275</td>
</tr>
<tr>
<td>SAGE – Sustainable and Green Engines</td>
<td>8</td>
<td>9.300</td>
<td>6.975</td>
</tr>
<tr>
<td>SFWA – SMART Fixed Wing Aircraft</td>
<td>9</td>
<td>4.250</td>
<td>3.188</td>
</tr>
<tr>
<td>SGO – Systems for Green Operations</td>
<td>17</td>
<td>9.53</td>
<td>7.148</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>72</strong></td>
<td><strong>32.335</strong></td>
<td><strong>24.252</strong></td>
</tr>
</tbody>
</table>
- Trailing edge devices for AFC applications; AFC technique upper side of flap
- Numerical tools for aerodynamic optimization of laminar wings
- Wing leading edge box design and manufacturing
- Design of innovative counter rotating open rotor blade and pylon
- Finite Element Models of counter rotating open rotor blades
- Wind tunnel test experimental rigs and means detailed design and manufacture
- Installed counter rotating open rotor characterisation: detailed design of innovative counter rotating open rotor model
- Ground based structural/systems demonstrator – Phase 1
- Natural Laminar Flow wind tunnel test
Sustainable and Green Engines – Topics of 1st Call

- Pitch change mechanism – conceptual and preliminary design activities
- Advanced planet bearings development
- Development of a thermoelectricity generator for the supply of the engine control system
- Development of a high pressure fuel pump with integrated metering system
- Development of high accuracy, low weight “Smart” sensors for pressure, position, temperature measurement
- Development of high temperature sensor for the measurement of turbine engine blades
- Development of high temperature survival electronic devices for engine control systems
- Development of high power density electrical actuators with Smart electrical interfaces in severe environment
- Actuator
- Diesel piston engine for light helicopter
- Emission analysis + Tools required to perform the emissions analysis and evaluation methodology
- ATM Regulations
Green Regional Aircraft (1) – Topics of 1st Call

- Software – Detailed weights and manufacturing costs
- FOBG sensors, system and technology - Optical section
- FOBG system, optical assembly, interconnection and technology - Electronic section
- New prepregs
- Stiffened panel evaluation Non Destructive Evaluation (NDE) of a Composite JTI GRA Stiffened Panel, Response Functions / Metamodel
- Stiffened panel Diagnostic/ Prognostic methodologies/ code (residual strength evaluation) of a composite sensorised multilayer stiffened panel
- Thermosetting resin
- Resin-nanofiller dispersion
- Intelligent Stress Health monitoring
- Smart maintenance with adapted patches
- FOBG - Design and validation of FOBG for SHM application
- Definition and fabrication of specimen, sensor integration, experimental set-up definition
- Design of sandwich structures for sensor integration, optimisation and manufacturing of sandwich core
- Modification of Resin
- Preparation and mechanical test of panels
- Definition of requirements and tests of practicability
- Numerical simulation
- System integration for broadband acousto-ultrasonics and electromechanical impedance monitoring technology
- Miniaturized Sensors
- Sensorised Composite
- Organic-modification tailored to promote the correct interaction between the polymer and the filler
- Functional laminates development. Components compatibility and feasibility assessment.
- Resin, Laminate and Industrial Nanoparticles Concept and Application
- Lightning tests of new concepts of composites
Green Regional Aircraft (2) – Topics of 1st Call

- 3D Fluid dynamic and aero-acoustic numerical analyses of wing high-lift Devices low-noise configurations
- Feasibility analyses of potential HLD passive acoustic treatments to support the ranking of best conceptual solutions.
- D&M SJ actual actuator, actuator wind tunnel model system
- Acoustic semi-empirical laws for 2D design of conventional HLD architectures and gapless HLD architectures
- Software – Development of a software tool to estimate impacts of avionic and on-board general systems on aircraft sizing and performances.
- Study regarding regional aircraft avionics architecture supporting new MTM functionalities.
- Preliminary design methodologies
- Theories and Numerical code for prediction of near and far field noise generated by new generation propellers and open rotors blade
- Future Green Regional Aircraft requirements
- Pod techniques
- Acoustic and thermal instrumentation, tests and modelling of engine surface coolers in representative aerodynamic conditions
- Nacelle anti-ice power generation design and manufacture
- Tool for wire gauge optimization
- Development and manufacturing of an Electro-thermal Ice Protection Assembly
- Develop and manufacture scoop intake and channel incl. ice and debris protection and acoustics absorbers
- Supercooled large droplets icing wind tunnel adaptation and ice detection test sessions for pre-design validation and final tests for qualification.
- Development and manufacturing of the EPDS Integration rig(s)
- Actuator test bench
- Development of an hybrid low power ice protection modelisation tool and Icing Wind tunnel tests to validate the tool and the system performance.
- Engine Thrust Reverser Actuation System (ETRAS) electric motor & resolver
- Engine Thrust Reverser Actuation System (ETRAS) mechanical transmission design and manufacture
- Advanced turbofan engine gaseous emissions model
- Advanced turbofan equipped aircraft noise model
- Supply of weather data service for simulation
- Economical modelling according to airline model
- Generic aircraft flight dynamics modelling
- Statistical models for representative weather phenomena
Calendar of Events

- Call Launch: 15 June 2009
- Information Day: 10 July 2009
- Call Close: 31 August 2009, 17:00
- Evaluations (indicative): 14-19 & 21-26 Sept ‘09
- Start of negotiations (indicative): 01 October 2009
- Final date for signature of GA by Partner: 15 December 2009
- Final date for signature of GA by Clean Sky JU: 31 Dec. 2009
10 July 2009 in the Madou Auditorium
Place Madou 1, 1210 Brussels

**Tentative Agenda**
- Clean Sky – Current status
- Proposal Preparation
- Evaluation Process
- Contractual arrangements
- Support for SME's

**Content of the Call - Presentation by ITD's**
- Engines: Arnaud Lebrun*, SAFRAN
- Fixed Wing: Jens Koenig*, AIRBUS
- Systems: Sébastien Dubois*/ Sébastien Vial*, THALES
- Regional: Gennaro Totaro e Rocco Pinto*, ALENIA
- Rotorcraft: François Toulmay*, EUROCOPTER

*) To be confirmed
Future Prospects

- Executive Director has been nominated:
  - Eric Dautriat
- 11 staff members will start working in summer 2009
- Further 7 staff to be added later this year.
- Autonomy foreseen later this year,
  - target date 15 Oct. 2009
- Research activities will continue until 2014 - 2015:
  - 2-4 calls per year
  - Few hundred Grant Agreements to manage
- JU will last until the end of 2017
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Tel./ Fax: +32 2 29 64080/ 66757
E-mail: Johan.Blondelle@ec.europa.eu

Clean Sky Web page
http://www.cleansky.eu

Call information:
RTD-Cleansky@ec.europa.eu

Specific assistance for SME
Aeroportal (http://www.aeroportal.eu)
Specific information on F.P.7
http://www.cordis.lu
http://ec.europa.eu/research/