WSK „PZL-Rzeszów" S.A.

EU Collaborative research - Aerospace Industry area of Interest

Canadian Aerospace R&D Mission to Poland

March 02, 2009 ● CAT Aeronet ● RUT

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EU Funding Opportunities

Overview

POLISH GOVERNMENT

"Structural Funds"

National Strategic Reference Framework Programmes 2007-2013

DIRECT UE

Framework Programmes 2007-2013

FUNDING OPORTUNITIES

Structural Funds 2007-2013

3 Priorities

- Europe as a more attractive place to invest and work
- Improving knowledge and innovation for growth
- More and better jobs

3 Objectives

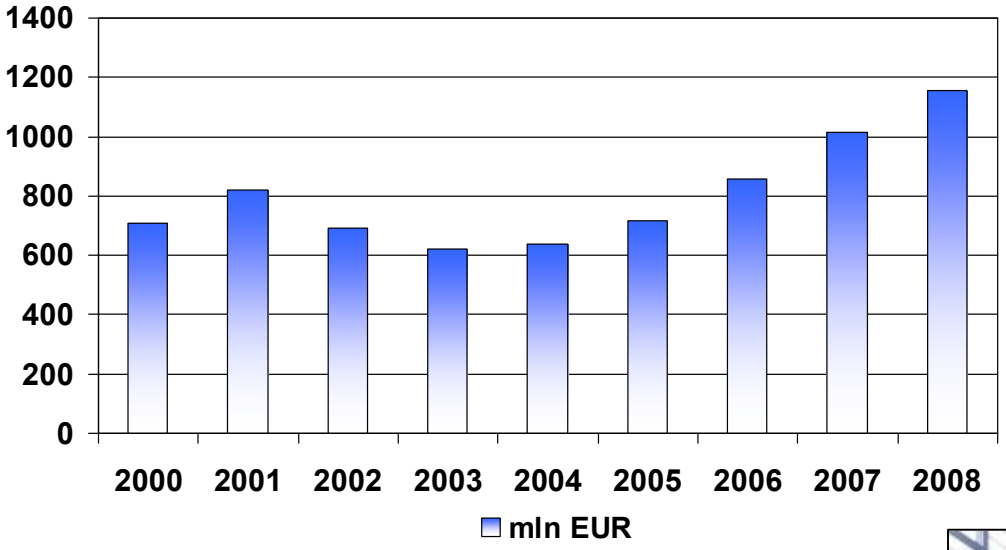
- 'Convergence' (ERDF, ESF, Cohesion Fund) ~ 251.6 billion EUR
- 'Regional Competitiveness and Employment' (ERDF, ESF) ~ 48.7 billion EUR
- 'European territorial cooperation' (ERDF) ~ 7.5 billion EUR

The key opportunity to streamline and improve R&D and innovation in Poland

National Strategic Reference Framework Programmes in Poland 2007-2013

PROGRAMMES	EU funds (Millions €)	Percentage	Instruments used by WSK or/and Scientific Partner
16 Regional	15 985,5	24%	
OP Development of Eastern Poland	2 273,8	3%	CBR – (R&D Center)
OP Innovative Economy (EX-KBN)	**8 254,9**	**12,3%**	Targeted Projects (EX-KBN) Aeronautics Material Lab - RUT
OP Human Capital	9 707,2	14,5%	Trainee programs (student exchange) Extension of CBR
OP Infrastructure and Environment	27 848,3	41%	
European Cooperation	731,1	1%	
Technical Assistance	516,7	0,5%	
Reserve	2 001	3%	
TOTAL	**65 317,50**	100%	

Governmental spending on R&D



- Engines
- Unmanned planes
- Safety
- Equipment
- Fuel

Development projects

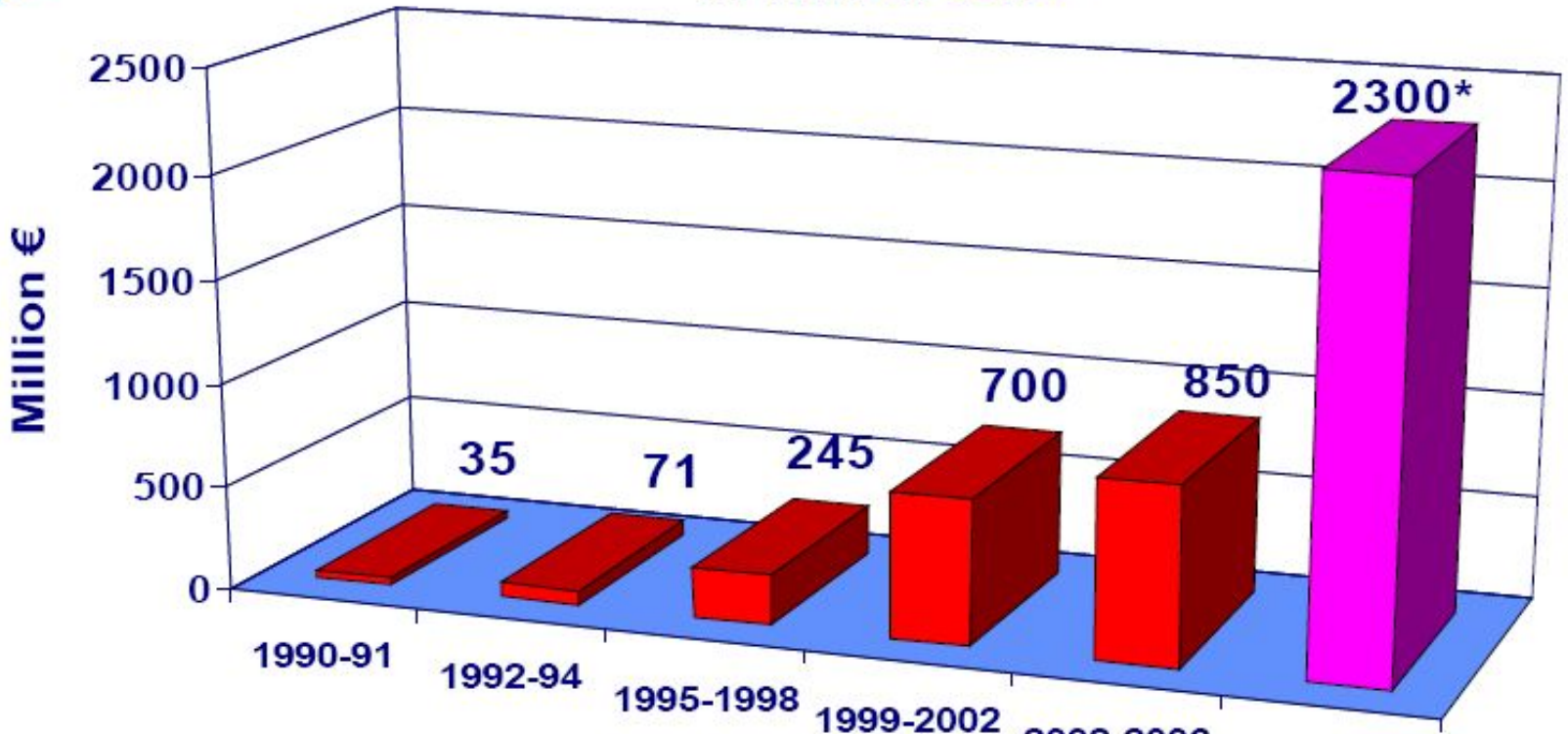
in aeronautics granted in 2007

Indirect funding through scientific Partner
MATERIAL LAB @ RUT – M6,5€

EUROPEAN COMMISSION
Community research

R&TD Funding for Specific Aeronautics Research on EU Level

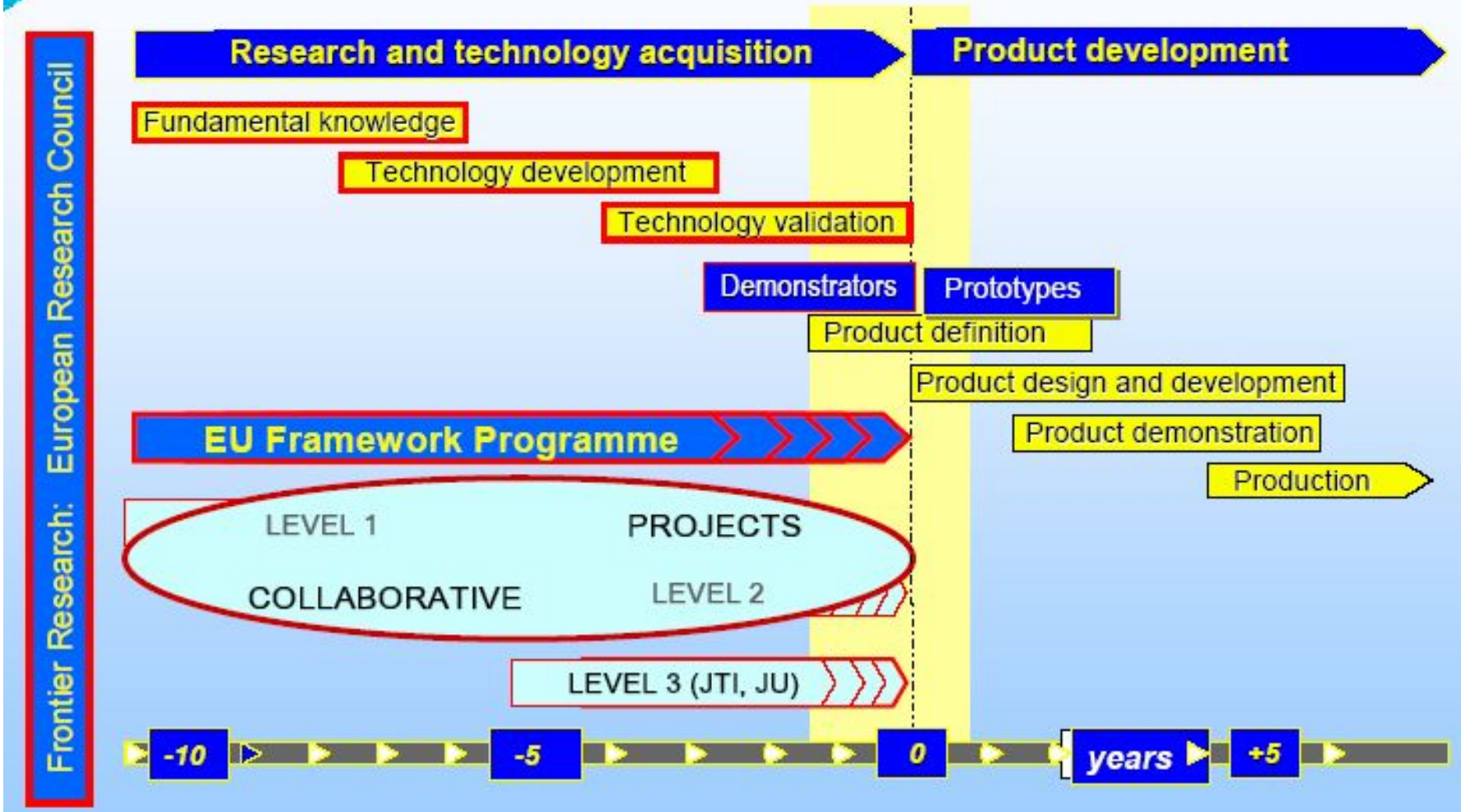
in million Euro



*) Budget 2007 - 2013: Aeronautics & Air Transport Collaborative Research, Clean Sky JTI (800 Mio Euro) and SESAR (300 Mio Euro)

SEVENTH FRAMEWORK PROGRAMME

Research, Technology & Product Development

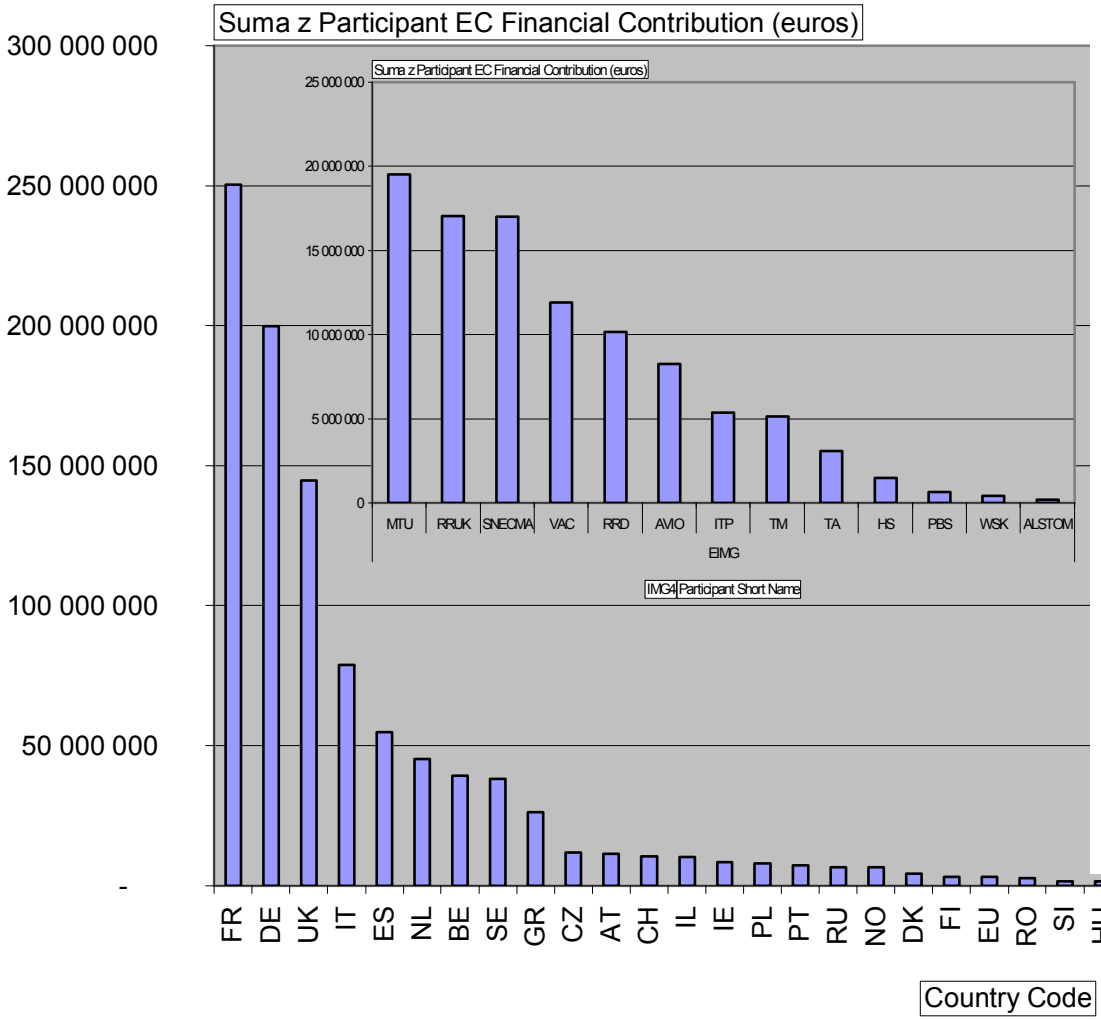


Aeronautics and Air Transport

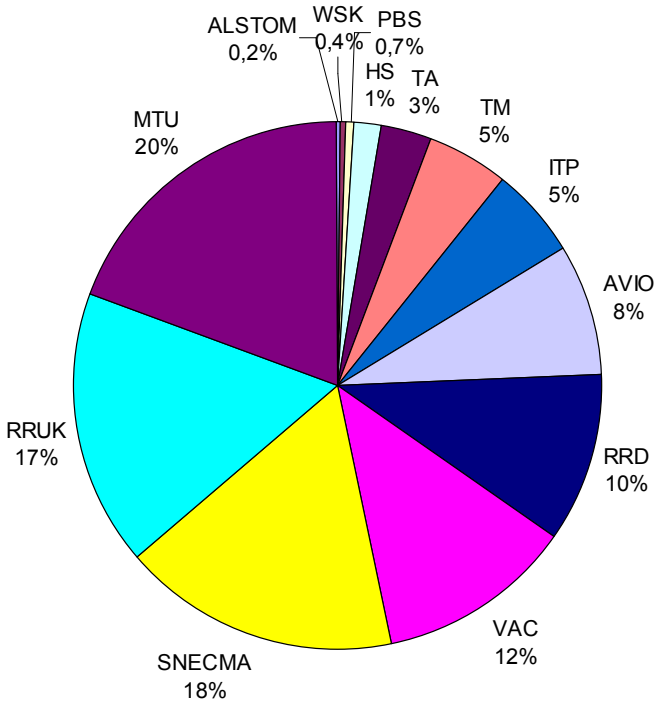
Collaborative Research Instruments

Level 1 (EU–funding: max. **up to 6 million €**) **Upstream research and technology development activities – CP-FP, CSA –** **Topics fairly stable throughout the Calls**	**Participant / WP or Project Coordinator**
Level 2 (EU–funding: min. 6 million € **up to max. 50 million €**) **Downstream research and technology development activities up to higher technology readiness, multidisciplinary integration and validation – CP-IP** **Topics will normally change from Call to Call**	**Participant / WP Coordinator**
Level 3 (JTI – Clean Sky) **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 – Clean Sky JTI, SESAR JU – Separate implementation**	**New Instrument in FP7** **Partner up on request for call**
Structuring Aeronautics Research **Activities strengthening excellence in research fields through lasting networking – NoE – Closed in this Call**	**Participant/ Coordinator**
Supporting Programme Implementation **Activities setting mechanisms or developing strategies for programme implementation – CSA (and CP-FP)**	**Participant/ Coordinator**

FP6 - Aeronautics



FP6 funding distribution of EIMG



Roadmap Calls

Aeronautics and Air Transport
2007- 2013

- Closure of 1st & 2nd Call for 'Aeronautics'- May 2008 – Total funding €400M,
- Tentative plan for CR:
  - L1, L2 - 6 Calls / Budget
    - 2007, 2008 / ~ M200€ each,
    - 2010, 2011, 2012, 2013 / M100-150€ each
  - L3 (JTI Clean Sky) launched in 2008:
    - Total budget €1.6B / funding €0.8B

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FP7 Aerospace Industry area of Interest

Engine Research in FP7 & beyond

EIMG Engine Industry Management Group

Organisation

EIMG: The European Engine Industry Management Group

Rolls-Royce UK

Techspace Aero

SNECMA

Turbomeca

ITP

Volvo Aero

Rolls-Royce D

WSK Rzeszow

PBS Velká Bíteš

MTU Aero Engines

AVIO

EIMG
Engine Industry Management Group for R&T
(Lead: Rolls-Royce D)

- Low Emission Combustion (RRD SNECMA)
- Turbomachinery (MTU)
- Mechatronics (MTU)
- Advanced Materials (TA)
- Manufacture&Overhaul (Volvo Aero)
- Whole Engine (RR UK)
- Mechanical Systems (Turbomeca AVIO)
- Noise (RR UK)

EIMG Engine Industry Management Group

Objectives

- EIMG was formed in 1990 in response to a request from the European Commission.
- EIMG consists of one representative from each of the major European Aero-engine companies.
- The Purpose of EIMG is:
  - to provide a European Aero-engine view on research and technology programmes
  - to maximise leverage of technology acquisition between partners in pre-competitive areas
  - to support the European Commission in developing future framework Programmes

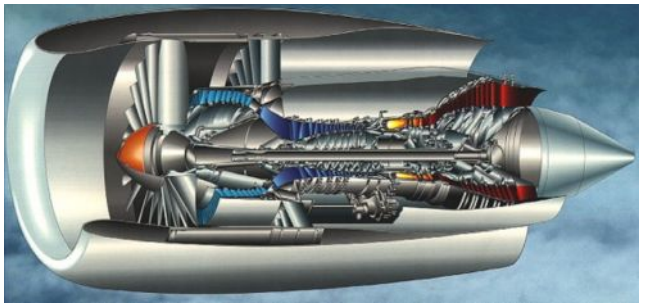
The EIMG companies undertake joint actions such as co-ordinated preparation and submission of project proposals to be carried out under European Commission contracts within the Research Framework Programmes

EIMG Engine Industry Management Group

ACARE 2020 Environmental Goals : The Engine Contribution

ACARE 2020 OBJECTIVES (reference : 2000 aircraft)

- Reduce perceived noise by half (10 EPNdB)
- Reduce NOx by 80%
- Reduce CO2 by 50%
- Acceptable cost



ACARE 2020 OBJECTIVES Engine Contribution

- Reduce noise by 6 EPNdB at each certification point
- Reduce NOx by 80%
- Reduce CO2 by 20%
- Acceptable cost

EIMG Engine Industry Management Group

SRA 2 Addendum

TUNING OF THE AGENDA IN RESPECT OF **SEVEN MAIN** AREAS:

- **small changes are generally needed** (with the exceptions below) to the technical topics that should be researched and in which new technologies need to be developed together with some changes in priority.
- Increased intensity of work in the area of **environmental impact**.
- Consider the aviation aspects of **new and alternative fuels**.
- **Increased attention in the security area** to hassle-free operation dynamically adaptable security screening.
- Consider the **airspace use and ATM aspects** of the large scale introduction of the European air taxi and personal air transport business.
- Emphasized development of the **mechanisms that support the deployment and exploitation of technology**.
- **New work in the areas of strategic collaboration**, to establish European positions, our strengths and targets for strategic co-operation.

EIMG Engine Industry Management Group

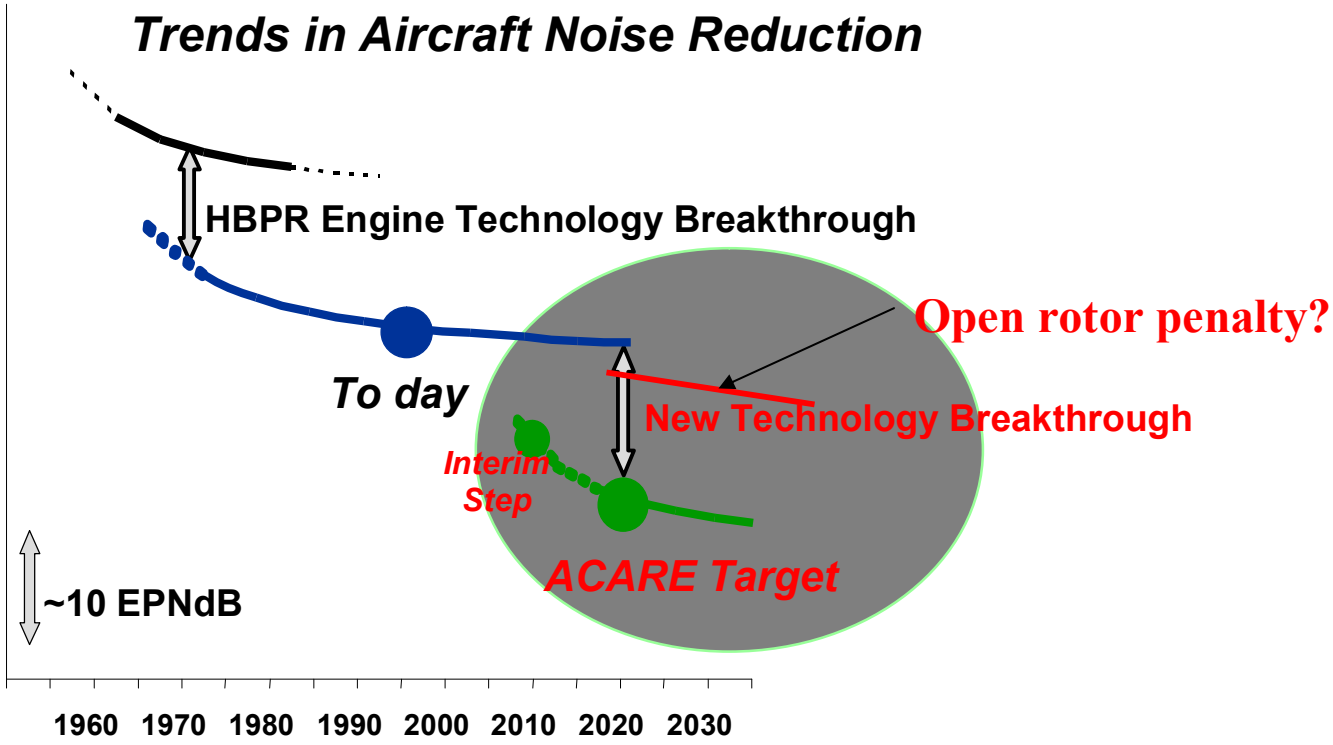
SRA 2 Addendum

„Air transport" scope of the SRA should take in to account:

- new models for **business aviation** using smaller aircraft
- any new consideration should examine the role of **rotorcraft** more widely
- the progress made and needed on **UAVs**.

EIMG Engine Industry Management Group

Background for Noise

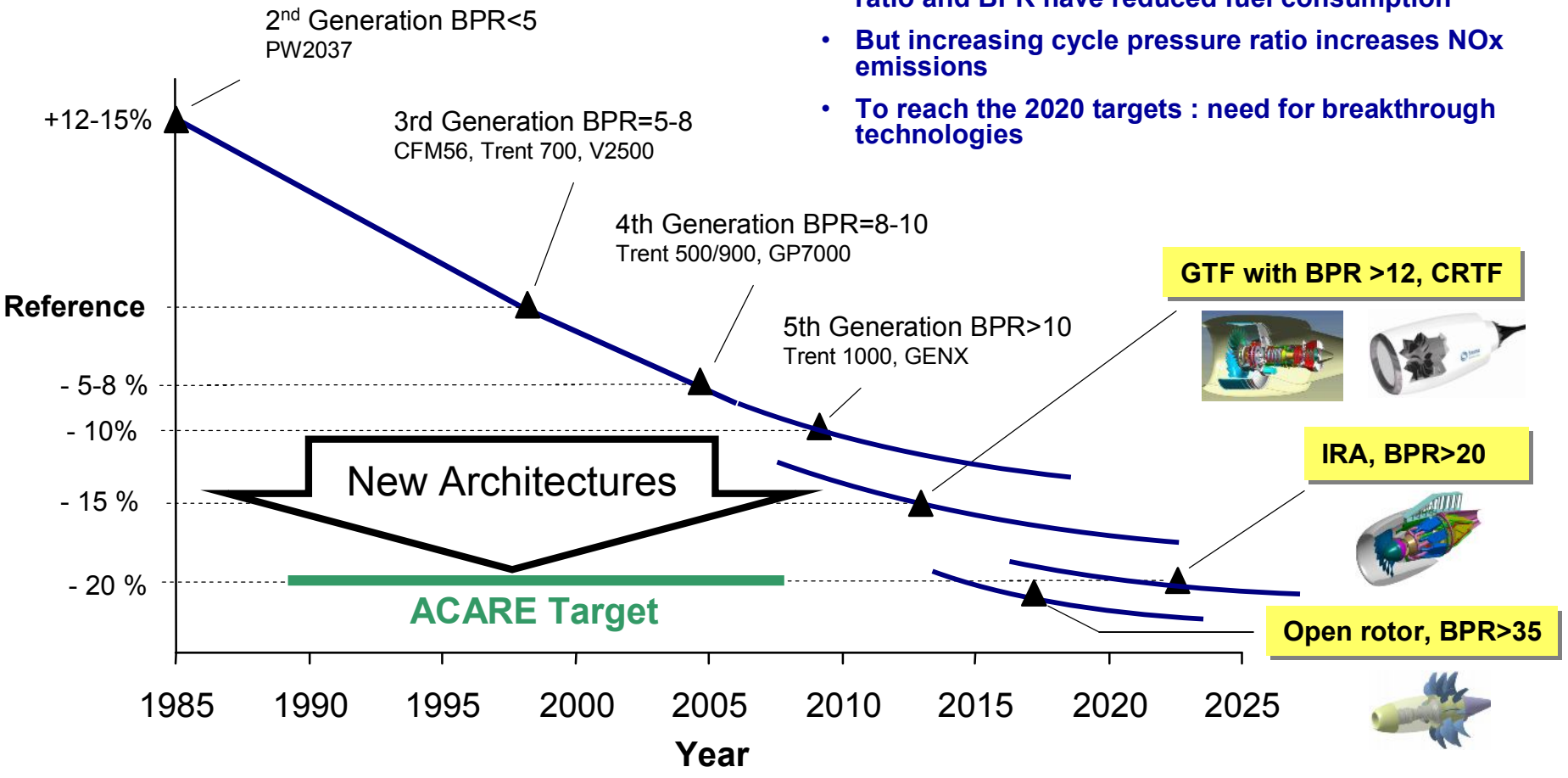


- High bypass-ratio (BPR) turbofan engines represented a technology breakthrough allowing a 20 db noise decrease in 40 years.
- To reach the 2020 targets : need for new breakthrough technologies
- Priority over CO2 reduction not clear

EIMG Engine Industry Management Group

Impact of Bypass-Ratio on Fuel Consumption / CO2

- **Introduction of high bypass-ratio turbofan engines in the 1970's and then increasing cycle pressure ratio and BPR have reduced fuel consumption**
- **But increasing cycle pressure ratio increases NOx emissions**
- **To reach the 2020 targets : need for breakthrough technologies**



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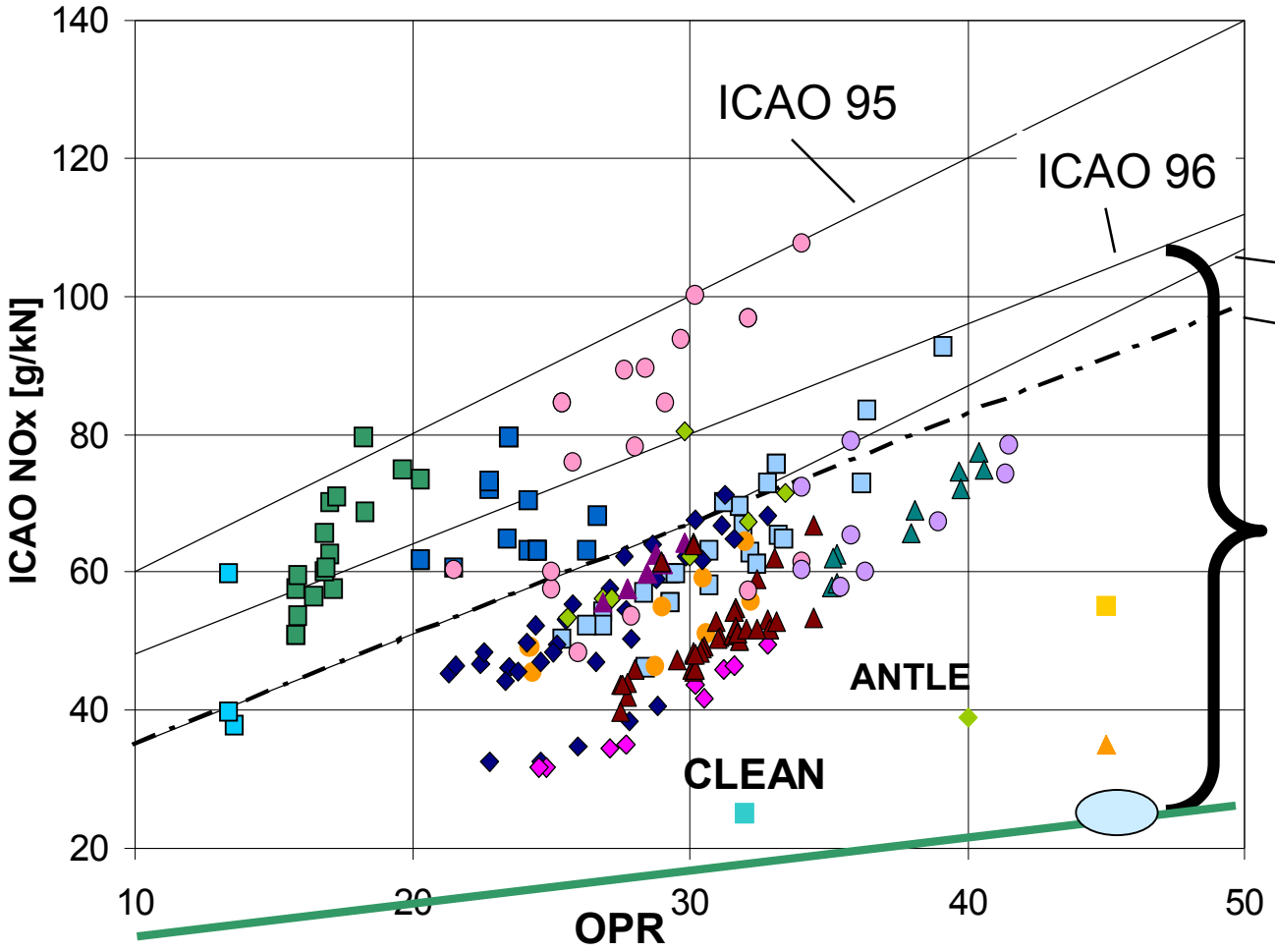
Impact of Overall Pressure Ratio (OPR) on NOx



- 80 %

To reach the 2020 targets : need for breakthrough technologies

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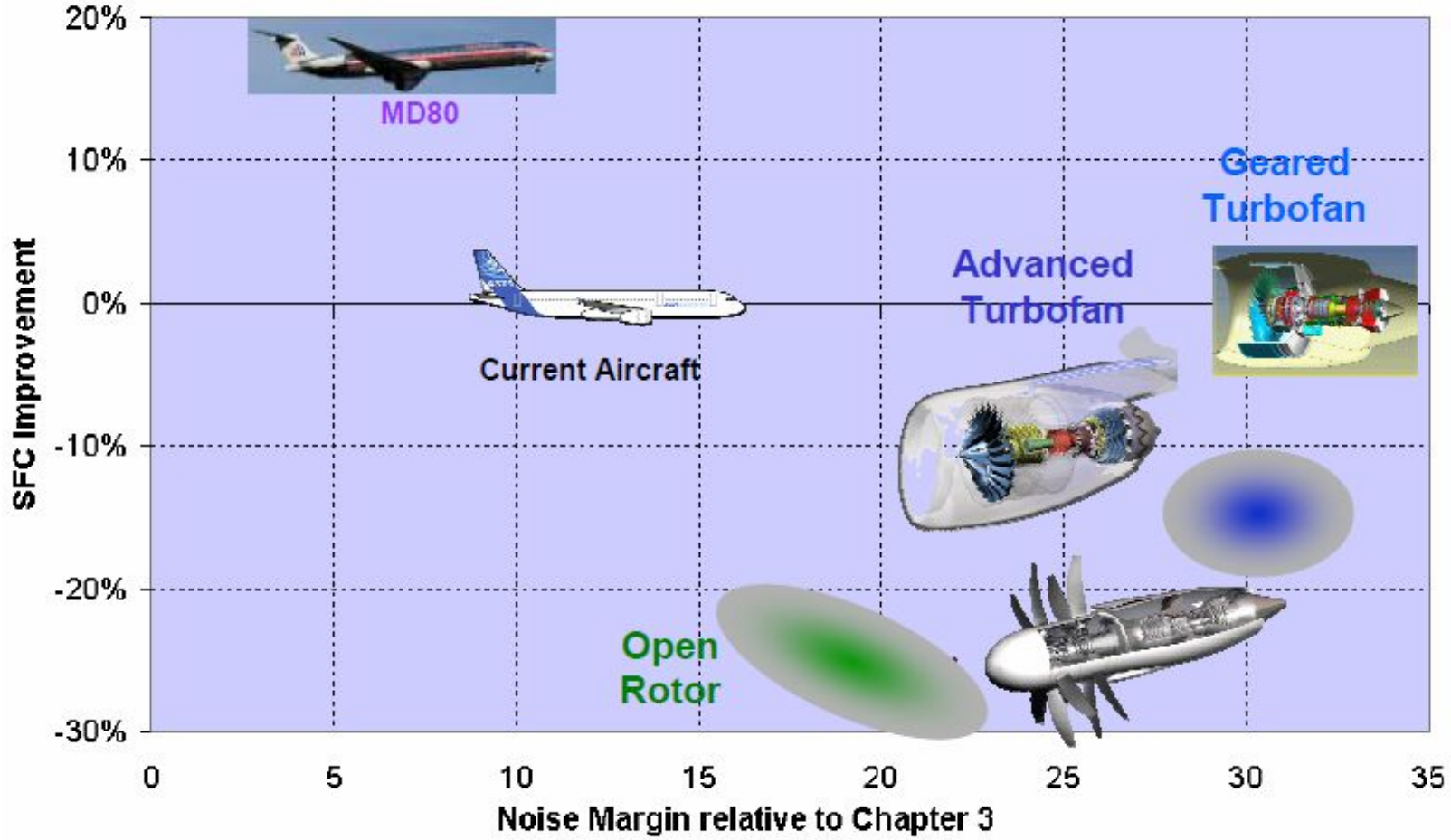
Noise and SFC improvement



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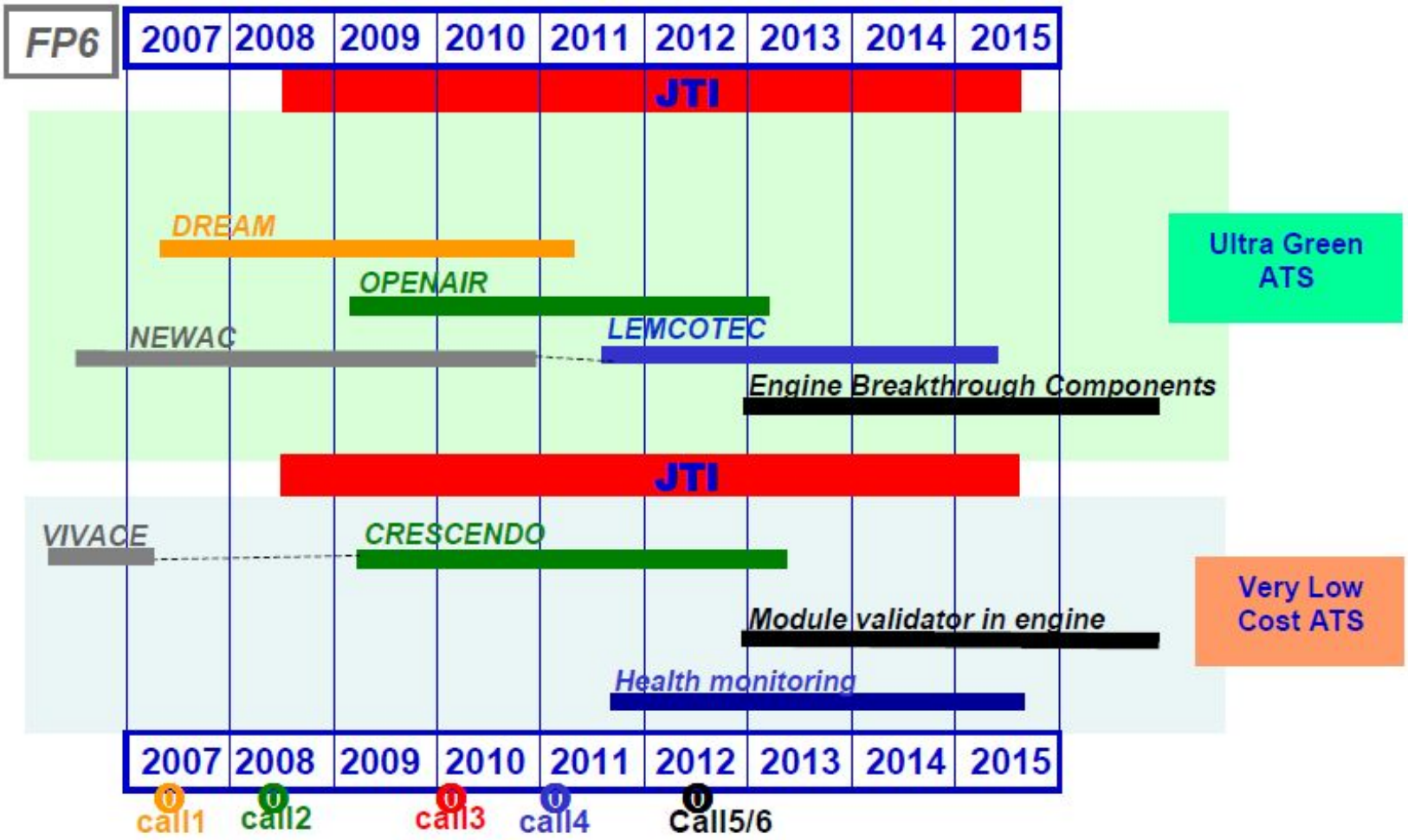
FP7 Technology Strategy - Level 2 Projects



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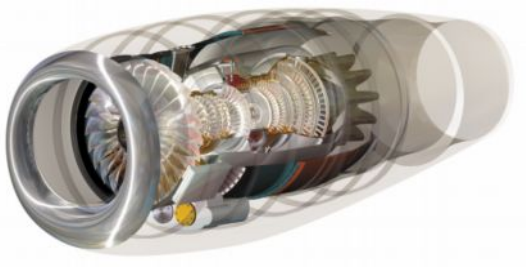
FP7 Call 3 Level 1 Priority Themes



ACTIVITY: 7.1.1 GREENING OF ATS

AREA 7.1.1.1 GREEN AIRCRAFT

AAT.2008.1.1.1. Flight Physics

- Reduced Installation noise due to airframe/propulsor interactions

AAT.2008.1.1.3. Propulsion

- Technologies for Advanced Combustors and Injectors with Low Emissions and Improved Operability. Intelligent Knowledge Based Engineering Systems.
- "Combustion modelling improvement: -Fuel preparation modelling-Soot modelling improvement"
- Technology development strategy and related capabilities in order to achieve reduced NOx targets.
- "Evaluation of the impact of real geometry effects on the performance of gas turbines, development of methods to minimize these effects"
- "Aero-thermal research on turbine integrated concepts to improve HP turbine efficiency"
- Development of ultra aggressive transition ducts for reduced weight & SFC
- "Optimisation of LPT performance through the improvement of the sealing (cavities) and thermal controls"
- Flexible Mission Adaptive Control & Airborne Power Management
- Reduced Combustion Noise
- Improved duct acoustics and liners for reduced noise

AREA: 7.1.1.2 ECOLOGICAL PRODUCTION AND MAINTENANCE

AAT.2008.1.2.1. Production

- Reduced environmental impact and improved cost efficiency of manufacture

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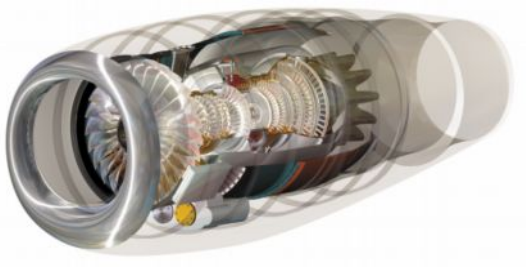
FP7 Call 3 Level 1 Priority Themes



ACTIVITY: 7.1.4 IMPROVING COST EFFICIENCY

AREA: 7.1.4.1 AIRCRAFT DEVELOPMENT COST

AAT.2008.4.1.1. Design Systems and Tools

- Integrated virtual product development including production data
- Rub-In tolerant material design for Improved Gas Turbine Seal Efficiency
- Composites Engine components-Optimal Manufacture & Methods for Advanced Numerical Design
- Predictable Welding and modelling of Gas Turbine Engine Materials

AAT.2008.4.1.5. Production

- High performance machining of Gas Turbine components

AREA: 7.1.4.2 AIRCRAFT OPERATIONAL COST

AAT.2008.4.2.3. Propulsion

- Integrated Engine Health Monitoring. Optimisation of health assessment strategies using smart components and novel sensor techniques to reduce DOC.
- Advanced concepts and technologies for test, innovation, improved knowledge and calibration of aircraft propulsion systems
- Rub-In tolerant material design for Improved Gas Turbine Seal Efficiency
- Composites Engine components-Optimal Manufacture & Methods for Advanced Numerical Design
- Predictable Welding and modelling of Gas Turbine Engine Materials

www.pptl.pl

Thank You!

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