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NEWAC

Workshop

Warsaw

Aeronautics Research and associated EU policies

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2 June 2009



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Content

CLEAN SKY
Public-Private Partnership
Joint Undertaking

**ENVIRONMENTAL
POLICY**

**ENERGY
POLICY**

**AERONAUTICS
RESEARCH**

**TRANSPORT
POLICY**

**TECHNOLOGY
PLATFORM
ACARE**

**RESEARCH
POLICY**



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Inclusion of Aviation in the EU ETS Directive

EU climate change objectives

- Limiting the global temperature change to 2° Celsius above pre-industrial levels
- Implies need for global GHG emissions to peak within 2 decades, followed by substantial reductions by 2050
- Order of magnitude of reductions by industrialised world:
 - 15-30% by 2020
 - 60-80% by 2050



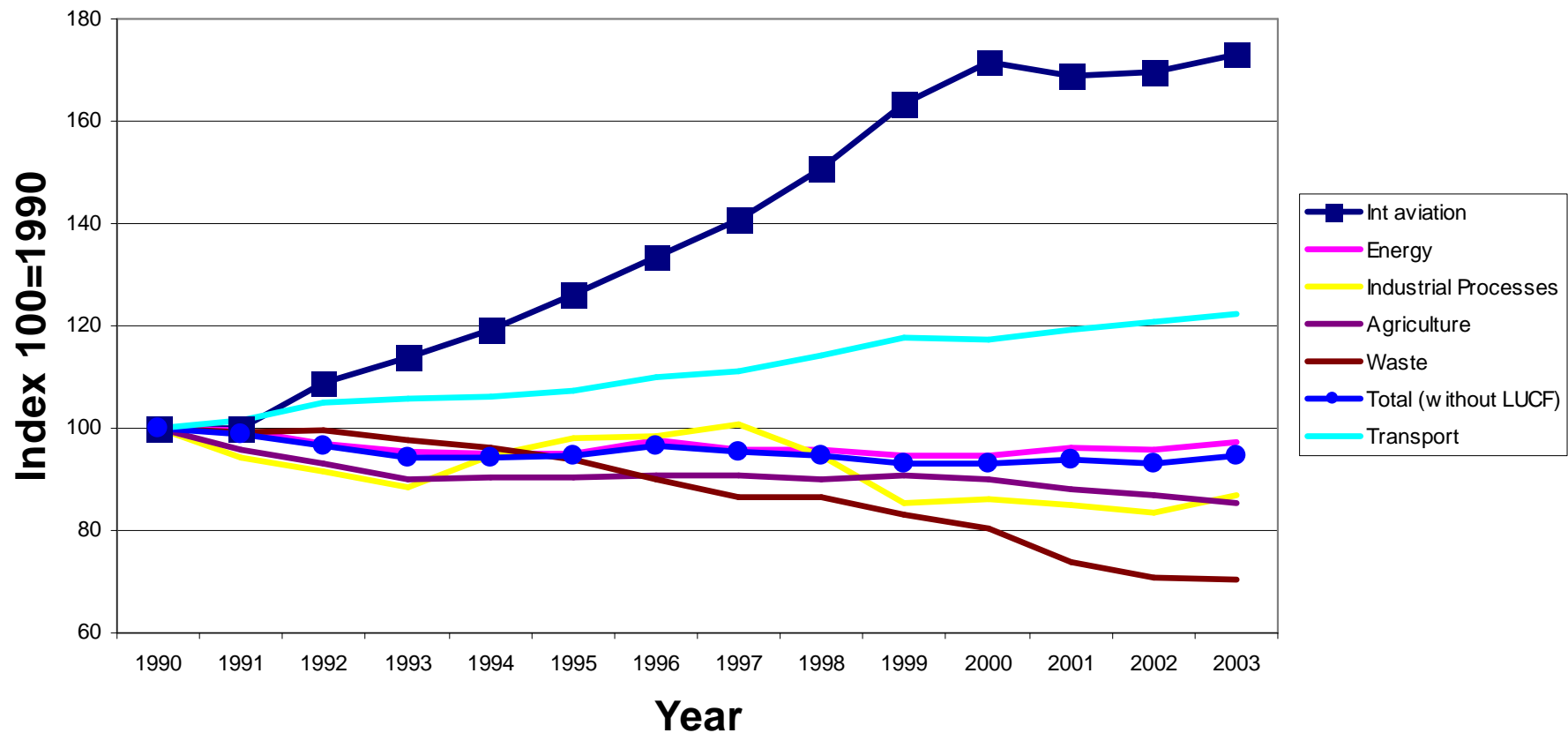
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Inclusion of Aviation in the EU ETS Directive

Aviation GHG emissions have been growing rapidly

EU GHG emissions by sector as an index of 1990 levels





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Inclusion of Aviation in the EU ETS Directive

Directive Timing

- **Directive 2008/101/EC** was published on 13 January 2009
- Entered into force on 2 February 2009
- Benchmarking (ton-km) reports in 2010 necessary to apply for free allowances
- Precompliance emissions reporting in 2010 and 2011
- Aviation included in the EU ETS from 2012



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Inclusion of Aviation in the EU ETS Directive

The Directive 2008/101/EC so as to include aviation activities in the scheme for greenhouse gas

- was adopted in November 2008
- entered into force on 2 February 2009

Annex IV of the directive specifies that biomass fuel is considered as having a Zero CO₂ emission factor

Commission committed to propose NO_x measures

- Strong request for the Commission to cover NO_x
- Examining options at the moment
- Proposal possible this year



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Energy

Policy Framework

- **An Energy Policy for Europe (2007)**
 - Reduce Greenhouse gases emission by 20% by 2020 compared to 1990
 - 20% share of renewable energy in overall EU consumption by 2020
 - 10% of biofuel binding target for Member States
- **Aeronautics biofuel study: SWAFAE**

The aim is to establish the status of the situation worldwide and make recommendations.



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Technology Platforms (TPs)

A Strategic Approach

- ACARE for Air Transport
- ERRAC for Rail Transport
- ERTRAC for Road Transport
- WATERBORNE for Waterborne Transport

have elaborated **Strategic Research Agendas (SRA)** which constitute inputs to approach and activities of the Transport theme

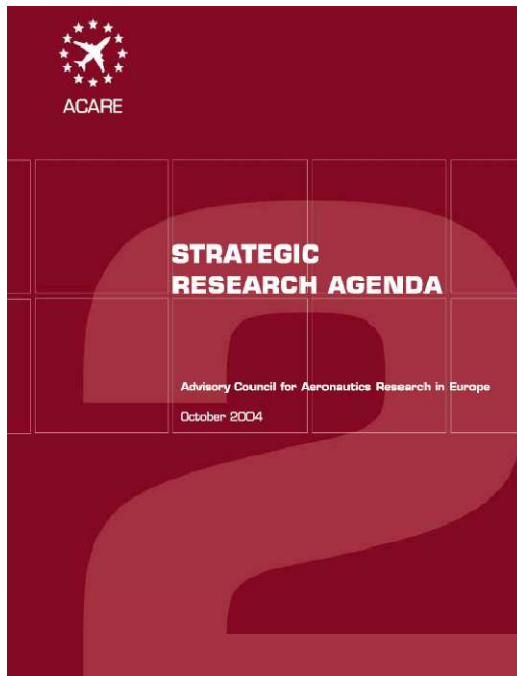


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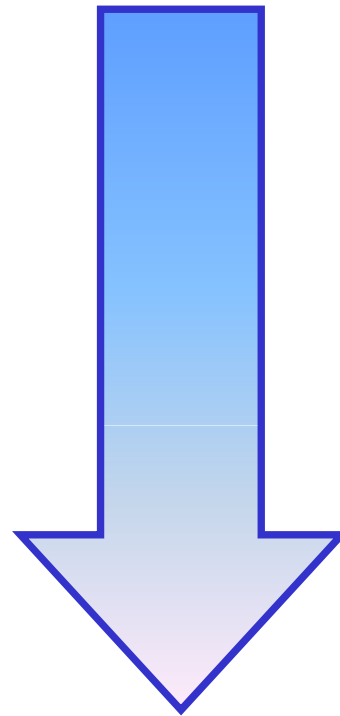
ACARE

A Policy Driven Work Programme



Strategic Research Agendas
Developed by the ACARE
(Advisory Council for
Aeronautics Research in
Europe)

2000



2020

- **50% cut in CO2 emissions per passenger/km**
- **80% cut in NOx emissions**
- **Halving perceived aircraft noise**
- **Five-fold reduction in accidents**
- **Air traffic system capable of handling 16 million flights a year**
- **99% of all flights within 15 minutes of timetable**



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ACARE

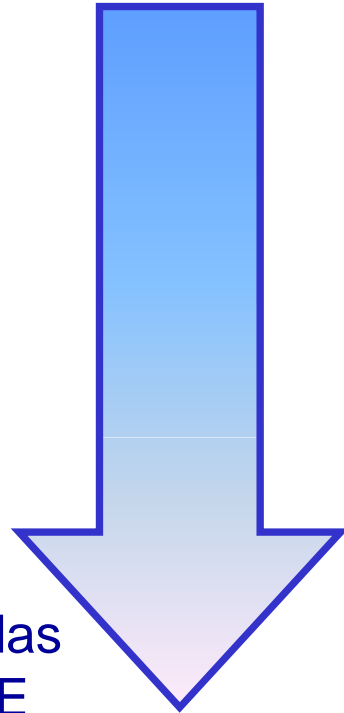
Fuel Burn

50% cut
in CO₂ emissions
per
passenger/km



Strategic Research Agendas
Developed by the ACARE
(Advisory Council for
Aeronautics Research in
Europe)

2000



2020

15-20% from engines

20-25 % from structures

5-10% from ATM



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- **Duration:** 7 years (2007-2013)
- **Budget:** 53.3 billion €
- **Structure:**
 - 4 specific programmes
 - 10 thematic priorities in the

Cooperation programme

- **Transport (including Aeronautics):** 4.15 billion €
- **Energy:** 2.35 billion €

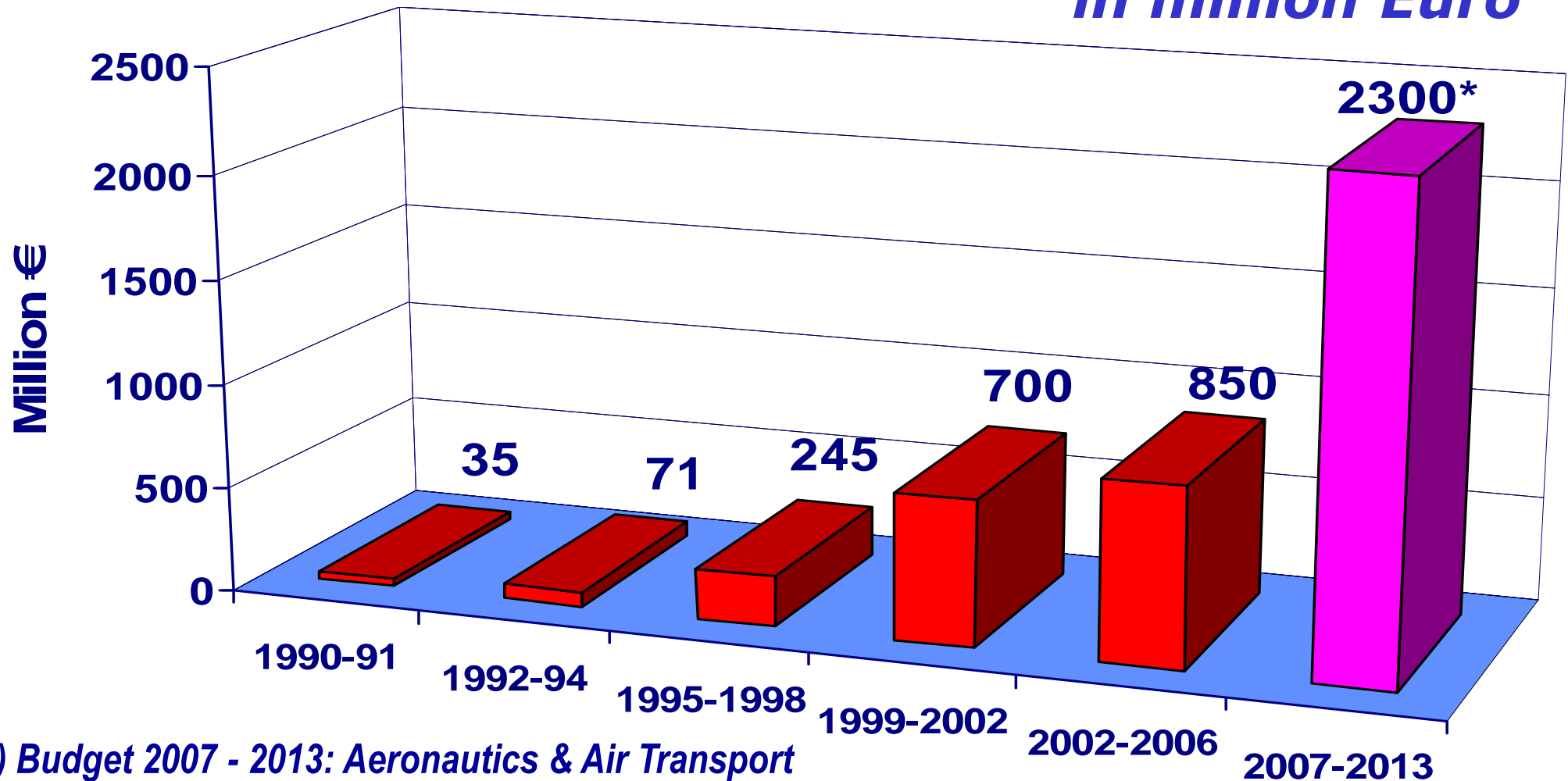


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R&TD Funding for Specific Aeronautics Research on EU Level *in million Euro*



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



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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 Research

Level 2

Level 3 *JTI: Clean SKY*

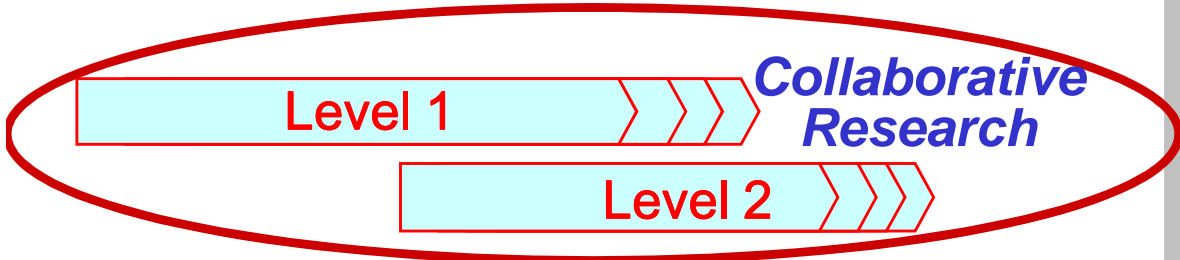
-10

-5

0

years

+5





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Aeronautics & Greening

- The aeronautics work programme conforms to the **Ultra Green High Level Target of ACARE** and is in line with the European policies
- Concept of ACARE's Strategic Research Agenda 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, Maintenance and Disposal**
- **Green Air Transport Operations,** Flight and Air Traffic Management, Airports



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Collaborative research

On Going Projects FP6 – FP7

- Engines: larges Integrated / Level 2 project examples
 - VITAL (- 7% CO₂, Ref CFM56/7 & Trent 772B)
 - NEWAC (- 6% CO₂, same reference)
 - DREAM (- 7% beyond ACARE objectives, same reference)
- In Total for FP6 and FP7 (end of 2008)
 - more than 200 collaborative projects addressing all ACARE objectives. At least one third of them claim to have some impact on fuel burn reduction
 - amongst which 23 large Integrated projects in FP6

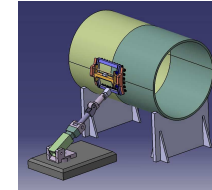


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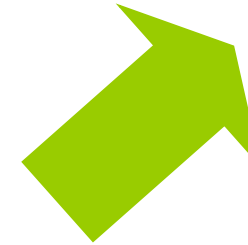
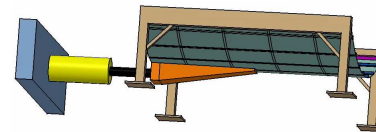
Structures

Collaborative research

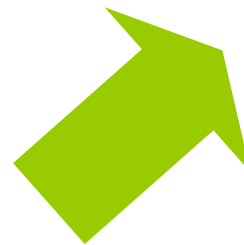


MAAXIMUS
 'As-built'
Component Level
 Simulation-based design

3rd Generation
 High-fidelity simulation
 for fast production of
 integrated composite
 airframes



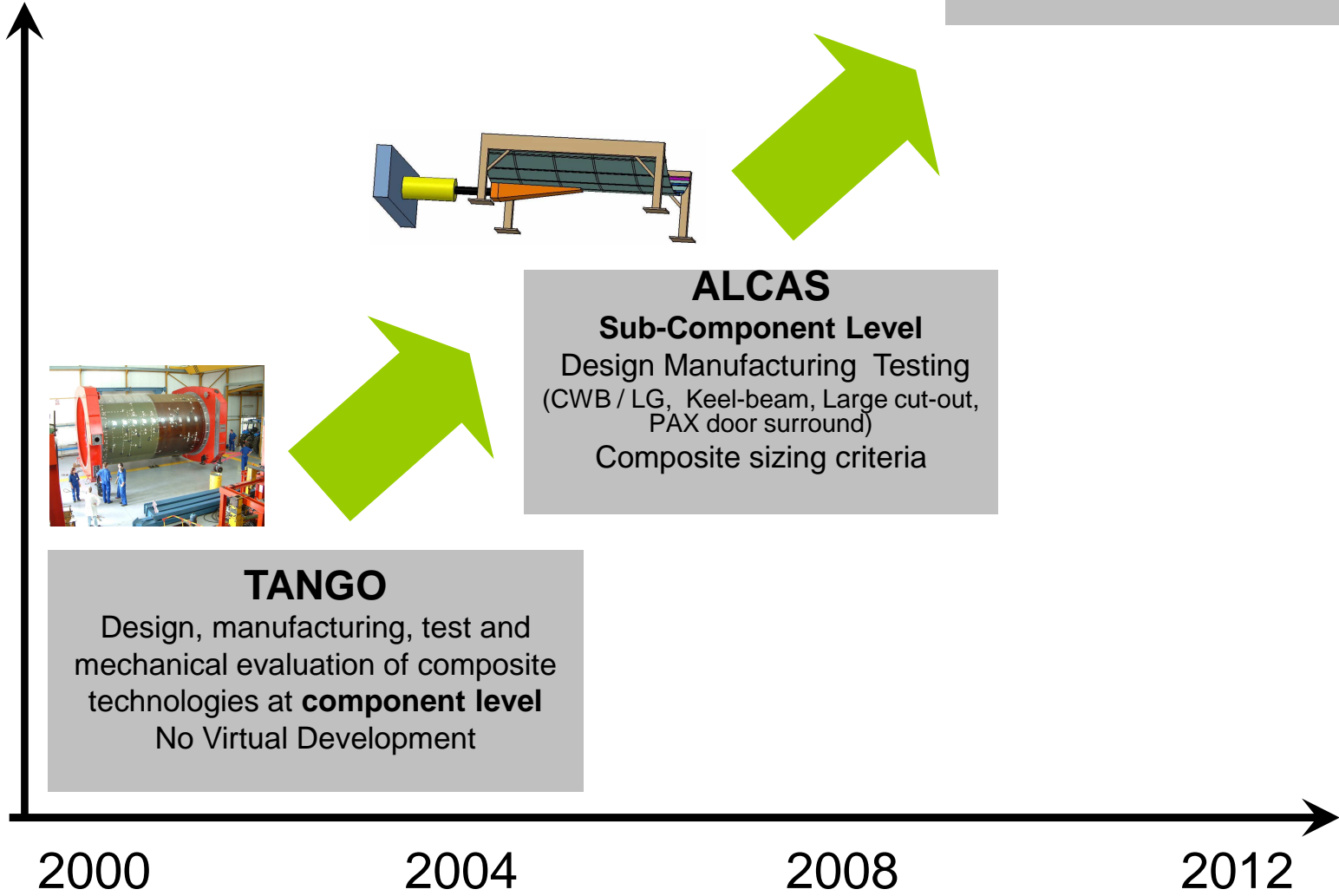
2nd Generation
 "Composite-oriented
 design"



ALCAS
Sub-Component Level
 Design Manufacturing Testing
 (CWB / LG, Keel-beam, Large cut-out,
 PAX door surround)
 Composite sizing criteria

1st Generation
 "Black metal CRFP
 parts design"

TANGO
 Design, manufacturing, test and
 mechanical evaluation of composite
 technologies at **component level**
 No Virtual Development



2000

2004

2008

2012





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Public Private Partnership

CLEAN SKY

1600M€ budget

50% from FP7

→ 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





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CLEAN SKY

Joint Technology Initiative (JTI)

Overall Budget: 1600 M€ for 7 years

Integrated Technology Demonstrators (ITD)

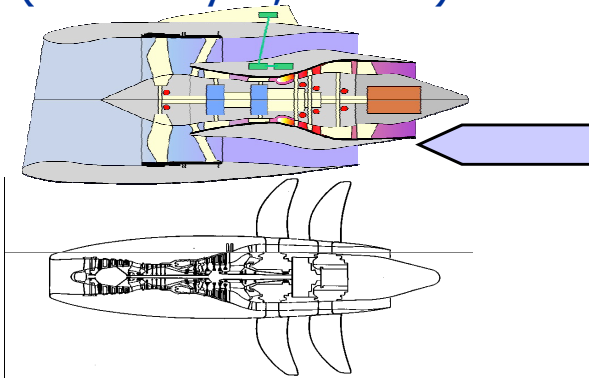
SMART Wing Aircraft (Airbus, SAAB)



Green Regional Aircraft (Alenia, EADS-CASA)



Green Engines (Rolls-Royce, Safran)

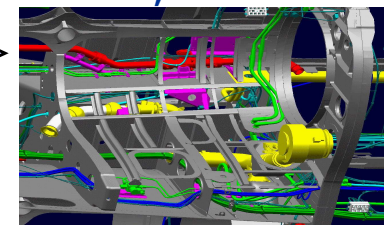


ATS Model



Simulator Platform AC, ATM, AP (flight segment)

Eco-Design (Dassault, Fraunhofer)



Systems for Green Operation (Thales, Liebherr)



Green Rotorcraft (Eurocopter, Agusta Westland)

Linked to "SESAR"





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Technology Evaluator

ITD	Smart Fixed Wing Aircraft	Green Regional	Green Rotorcraft	Sustainable & Green Engines	Systems for Green Operations	Eco Design
Activities	<ul style="list-style-type: none"> Active Wing New Aircraft Configurations 	<ul style="list-style-type: none"> Advanced Aerodynamics (Low Drag & Noise) Low Weight Structures 	<ul style="list-style-type: none"> New Powerplants Innovative Blades & Rotors New Aircraft Configurations 	<ul style="list-style-type: none"> Advanced LP & HP System Technology New Engine Concepts (i.e. Open Rotor) 	<ul style="list-style-type: none"> Mission & Trajectory Management Aircraft Energy Management 	<ul style="list-style-type: none"> Whole Life Cycle Environmental Impact Analysis

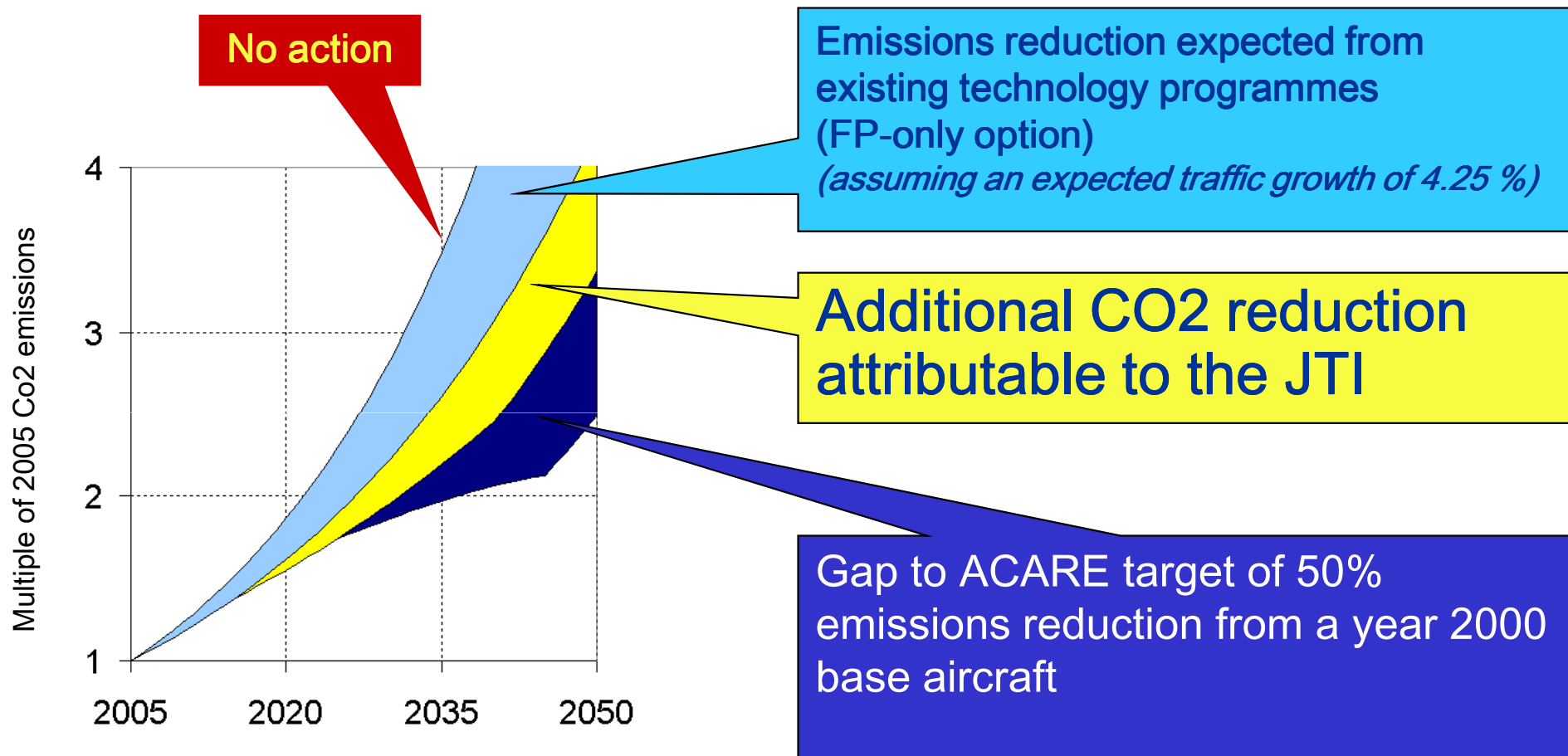
Product	Widebody 2020	Narrowbody 2015	Regional 2020	Corporate 2020	Rotorcraft 2020
					





CLEAN SKY

Environmental Impact



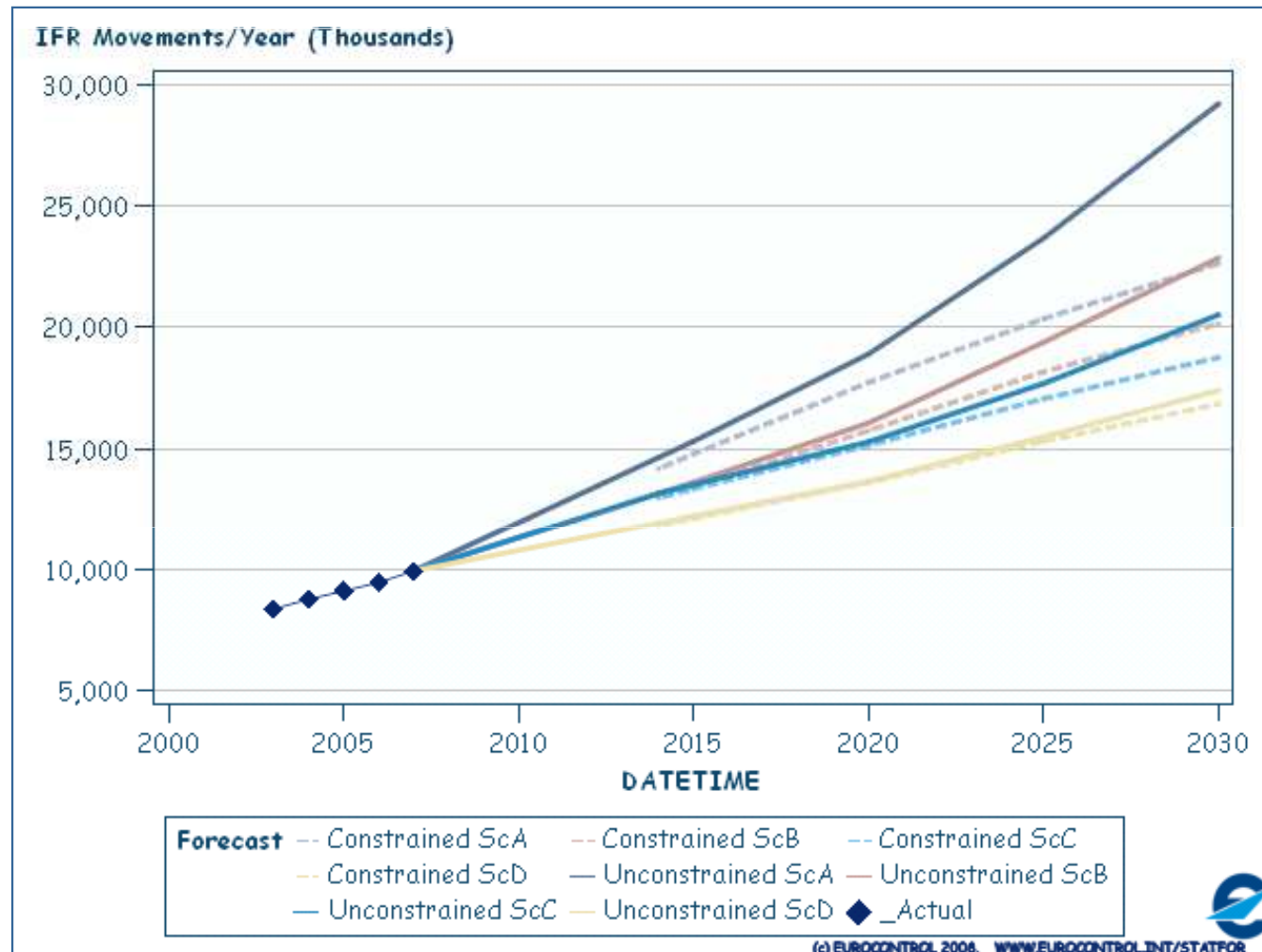


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CLEAN SKY

Traffic Growth EUROCONTROL Long-term Forecast





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SINGLE SKY

Four pillars of Single European Sky

1. Single European Sky legislation on ATM

- Binding performance targets
- Network management functions

2. Extension of EASA Competences to ATM and Airports

- Fill the missing links in EASA | address key safety issues

3. SESAR – Single European Sky ATM research

- Upgrade technology of ATM

4. Airport Capacity

- Co-ordination between air and ground bottlenecks



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SESAR

2015-2025

Deployment phase

Implementation of the results development phase, delivers **the performance increase**, foreseen in the ATM Master Plan

2008-2014

Development phase

Managed by the SESAR
Joint Undertaking

Based on the Master
Plan,

Results in Standards

New operational
procedures

New technologies and
pre-industrial
components

2006-2008

Definition Phase

Resulted in the
European ATM
Master Plan

It Will Minimise

Environmental Impact

- 10 % per flight
- Minimise NOx
- Minimise Noise
- Respect local constraints



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SESAR

The goals of SESAR

Enabling EU skies to handle 3 times more traffic

Improving safety by a factor of 10

Reducing the environmental impact per flight by 10%

Cutting ATM costs by 50%

Joint Undertaking

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EUROCONTROL

INDUSTRY

=

Public – Private Partnership

700M€

700M€

700M€

2 Funding members

3rd funding member

Created by the European Union Council Reg No 219/2007



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AERONAUTICS & AIR TRANSPORT Future calls

WP2010 & WP2011 are complementary

- WP2010 will address Level 1 topics
- WP2011 will address mainly Level 2 topics
- Total 50/50 split of budget for L1/L2
- Maximum funding per project:
 - 5 million € for Level 1
 - 40 million € for Level 2



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AERONAUTICS & AIR TRANSPORT Future calls

WP2010 will focus on the Specific Programme activities of greater strategic importance

The Greening of Air Transport

Improving Cost efficiency

Pioneering the Air Transport of the Future

Some topics would also be included on Safety, Time efficiency and Security & International cooperation

Complementarity and synergy with the Clean Sky, SESAR and Fuel Cell & Hydrogen JTI (Joint Technology Initiatives), particularly in the selection of topics for "The Greening of Air Transportation"



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2010 CALL FOR PROPOSALS

Will be open end of July 2009

Will close mid January 2010



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WEB LINKS

Research (DG/RTD), Transport:

http://ec.europa.eu/research/transport/index_en.cfm

Environmental policy (DG/ENV)

http://ec.europa.eu/environment/climat/aviation_en.htm

Transport policy (DG/TREN)

http://ec.europa.eu/transport/index_en.htm

CLEAN SKY:

http://www.cleansky.eu/index.php?arbo_id=83&set_language=en

SESAR:

http://www.sesarju.eu/public/subsite_homepage/homepage.html



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END



**Thank you
for
your
attention!**