



Advisory Council for Aeronautics Research in Europe

A European cooperation with International Impact

Joachim Szodruch

Francois Quentin

ACARE Co-Chairmen

ICAS 2010 von Karman Award Lecture



ACARE – we care for Aeronautics in Europe



- The Beginning
- Present Activities
- Future Considerations

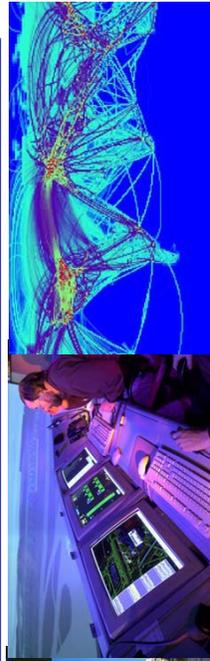
The Beginning : FP 6 Strategy to maintain position

- Develop the scope of aeronautics and by that win a wider stakeholder community favourable to aeronautics:
 - By embracing social dimensions of aeronautics.
 - By recognising the wider “Air Transport System”.
 - By identifying the benefits to the whole EU and not just the big aero nations.
- Sustain or increase the funds allocated.
- Influence their allocation strongly.
- Maintain a coherent industry position.
- Perform well in FP5 !!



The aeronautic environment in 2000

- Airbus was established as an integrated company across 4 countries.
- A380 was about to be launched, a major undertaking concerning technology, production, global partnerships, future operation, financing, etc.
- IPCC report on climate stimulated political debate
- Air Traffic growth planned at a steady ~5%.
- Economic environment good with high growth in emerging Asia
- Aeronautical research in Europe celebrates its 10th year



The way from the EAG to ACARE

Aeronautics
for Europe



External Advisory Group Report
April 2000

Vision 2020
January 2001

EUROPEAN AERONAUTICS:
A VISION FOR 2020



Le Bourget
Kick-Off
June 2001



ACARE: The Mission

- Establish a network for strategic research in aeronautics and the air transport sector for all European stakeholders
- Launch and approve the Strategic Research Agenda (SRA), update it periodically and monitor implementation towards the 2020 vision
- Make strategic and operational recommendations and priorities for implementing the SRA and achieving the 2020 Vision
- Recommend measures for optimising the use of existing research infrastructures and achieving cost-effective investments
- Recommend measures for improving educational policies to attract the scientists, engineers and other skills that the sector needs
- Develop and implement a communication strategy to promote awareness of the SRA and to disseminate information on stakeholders' research programmes for facilitating consensus on priorities





ACARE: The Members

36 Members of European Organisations of Stakeholders :

European Commission

Member States

ASD (Industry)

EREA (Research Establishments)

DLR, ONERA, NLR)

Eurocontrol (ATM)

JAA / EASA (Certification)

EASN / Pegasus (Universities)

AirTN (Ministries / Agencies)

Airlines and Airports

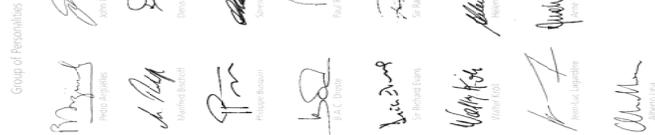


(ACARE - Advisory Council for Aeronautics Research in Europe)



ACARE: The Goals

Challenges and associated goals



Quality and Affordability

- o Reduced passenger charges
- o Increased passenger choice
- o Transformed freight operations
- o Reduced time to market by 50%

Environment

- o Reduction of CO2 by 50%
- o Reduction of NOx by 80%
- o Reduce perceived external noise by 50%
- o Substantial progress towards 'Green MMD'

Safety

- o Reduction of accidents rate by 80%
- o Drastic reduction in human error and its consequences

System Efficiency

- o 3X capacity increase
- o 99% of flights within 15' of schedule
- o Less than 15' in airport before short flights

Security

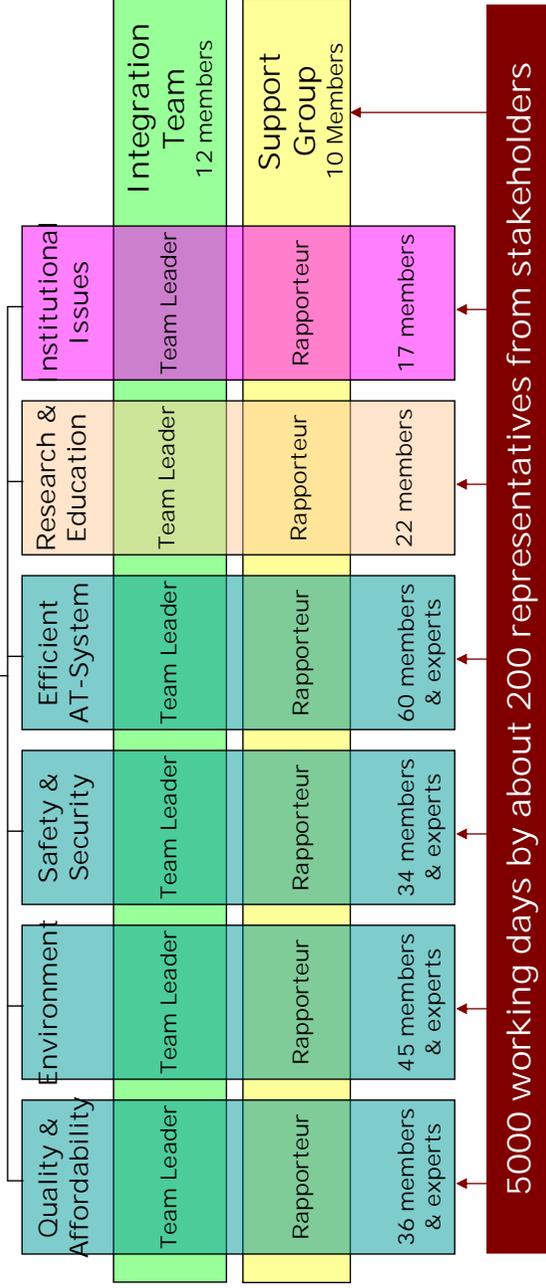
- o Airborne - zero hazard from hostile action
- o Airport - zero access by unauthorised persons or products
- o Air navigation - No misuse. Safe control of hijacked aircraft



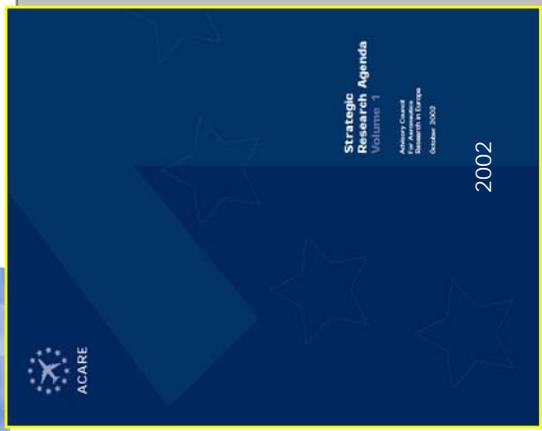
Strategic Research Agenda – Organising the work

ACARE Plenary
Chairman/Vice-Chairman
36 Members from

Governments, Industry, Airlines, Airports, Research Establishments, Universities, Regulators, EC



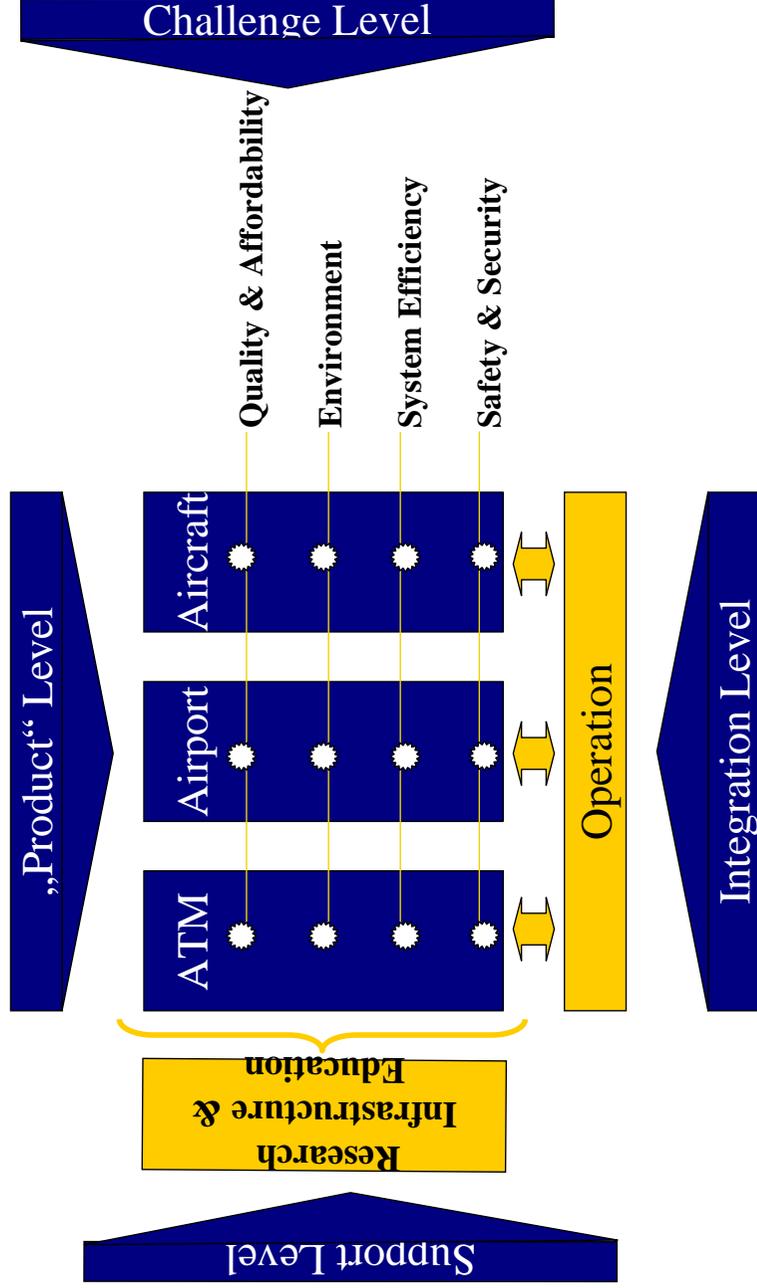
Strategic Research Agenda I in 2002



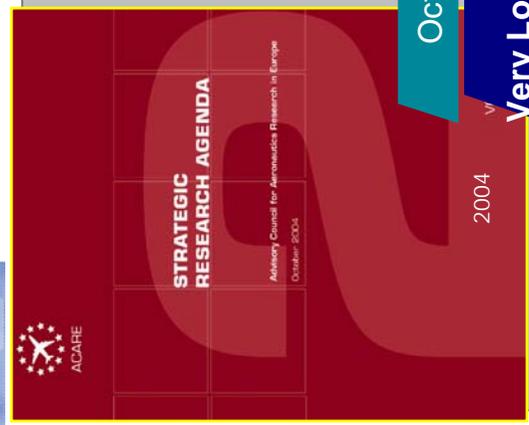
October '02 : The Strategic Research Agenda (SRA-1) Challenge



From SRA I to SRA II Working Focus Air Transport System



Strategic Research Agenda II in 2004



Addendum in 2008

SRA 1 & 2 cover all the main issues for 2020

- Some changes of emphasis
- Greater intensity of work on environment
- Increased attention to hassle-free security operation
- Alternative fuels in aviation, focusing on drop-in fuels for 2020 timescale
- In International Collaboration, emphasise strategic collaborations to establish European positions
- Airspace use and ATM aspects of potential European air taxi and personal air transport business
- Consider the role of rotorcraft and the progress on autonomous air vehicles in future air transport system.
- Europe to devote effort to Key Aeronautical Facilities
- Increase technological progress and effectiveness including the deployment and exploitation of technology

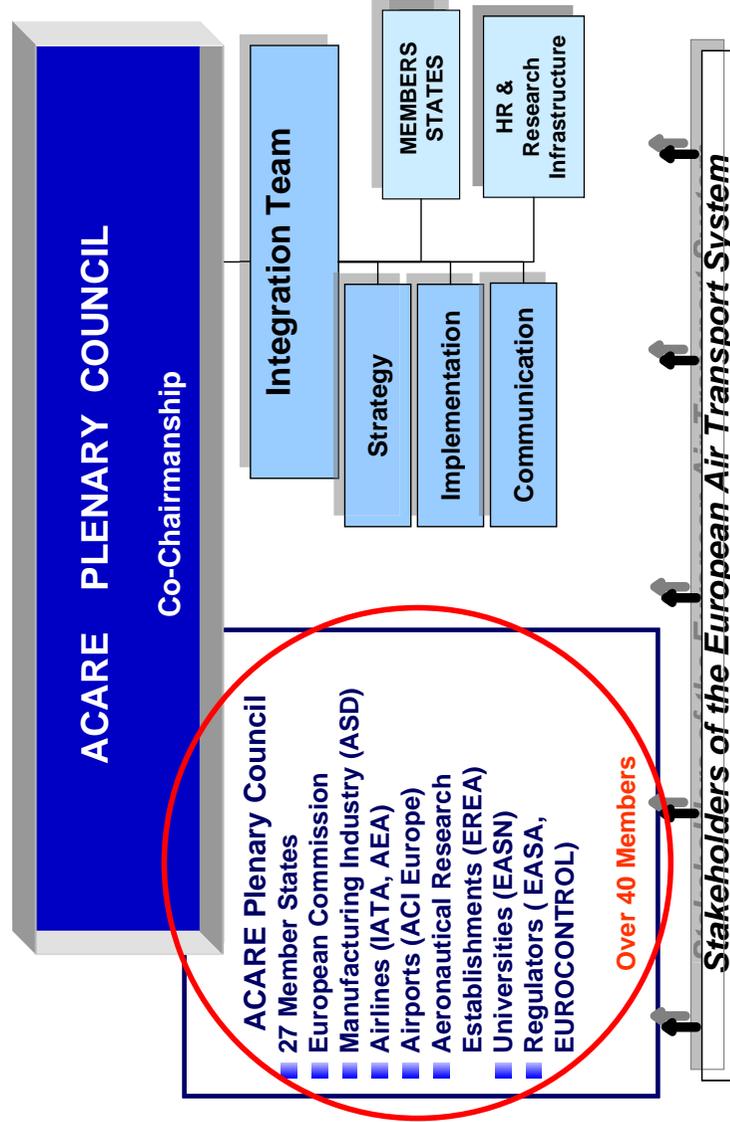
ACARE – we care for Aeronautics



The world of ACARE:

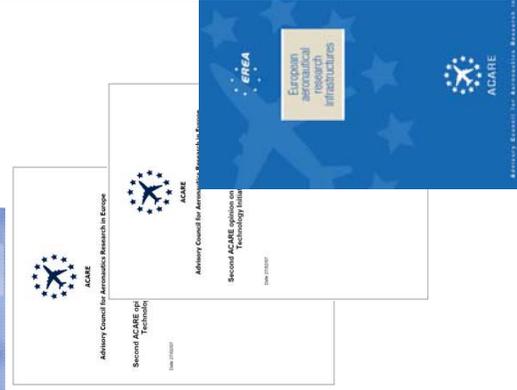
- ▶ The Beginning
- ▶ Present Activities
- ▶ Future Considerations

ACARE: Present Organisation

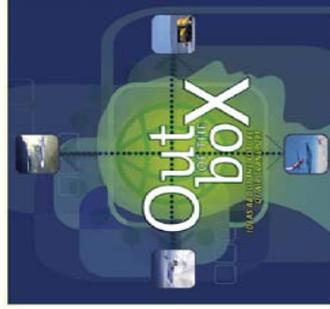


ACARE: Various Supporting Activities

- Aerodays contribution
- First Position Paper on JTI's
- Input to SESAR
- Assessment Papers on Clean Sky
- Recommendation papers for EC
- Input to work-programmes
- Representation in Member States Activities
 - Support of national ACARE set-up's
- Representation in ETP's leaders conferences
- Contribution to ESFRI Programme



ACARE - Examples of Activities: From „Out of the Box“ to „Strategic Infrastructures“



- **OUT OF THE BOX** with all stakeholders generated 100 novel ideas clustered and expanded into 6 larger concepts



- **STRATEGIC FACILITIES** were investigated which are a key element to the research tasks envisaged:
Aerodynamic-, Structural-, Propulsion- and System-Testing
Flying test beds, Flight simulators, ATM Simulators, Human factors and High Fidelity Computing / Simulation



ACARE: Human Resources Workshop

Industry View

- No big shortage of engineering graduates but of professionals
- Ideal is technical background, teamwork, multicultural skills and passion
- Aeronautical industry no longer prestige industry !!

SME and Research Establishments

- High level graduates, innovative thinking
- Extensive curricula, total air transport system approaches desirable

University Viewpoint

- Concern about industry policy and communication
- European quality system for confidence and mobility
- Job Preparation by involvement in industrial European research
- Encouragement of women to come into aeronautics





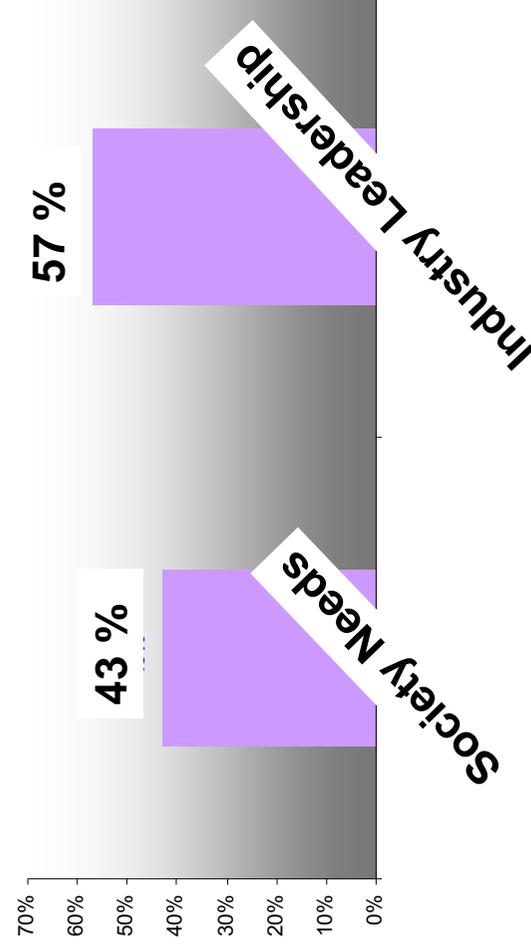
ACARE in 2010

- The Air Transport System is now acknowledged as the relevant scope for optimization.
- FP 6 and 7 have integrated ATS as designated area of strategic importance.
- New tools have been designed and implemented to accommodate special needs: JU's SESAR and CLEAN SKY.
- Cooperation is now the rule of the game between stakeholders, even between competitors.
- National programmes are fully aligned with the SRA recommendations.
- A recent assessment of the research conducted within the framework of the SRA is giving good reasons to believe that in 2025 new aircraft will deliver the objective level of performance set in 2000.



ACARE: FP6 and ACARE Conformity

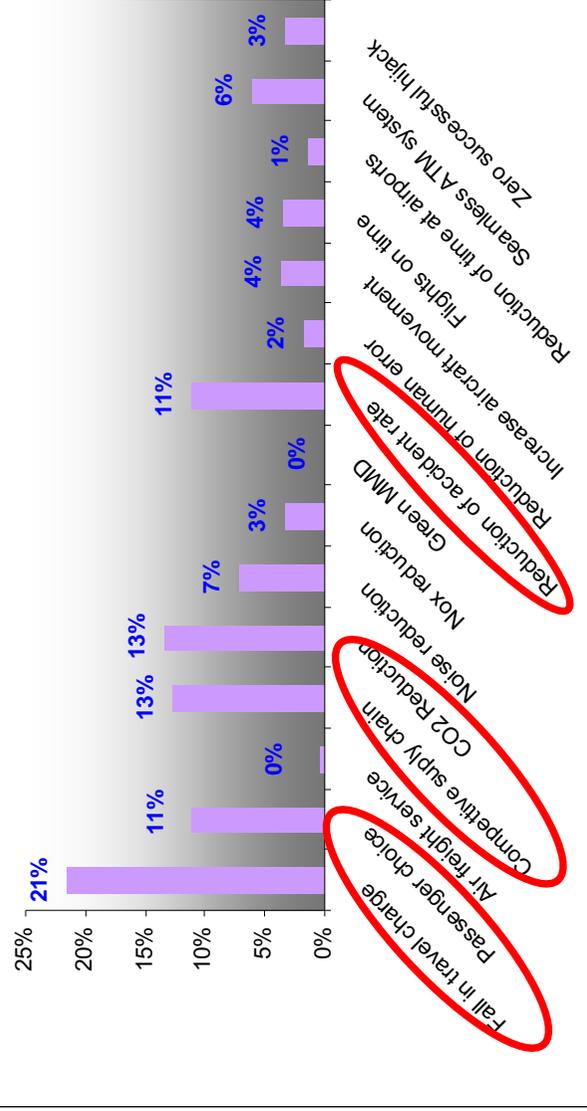
Top Level Objectives





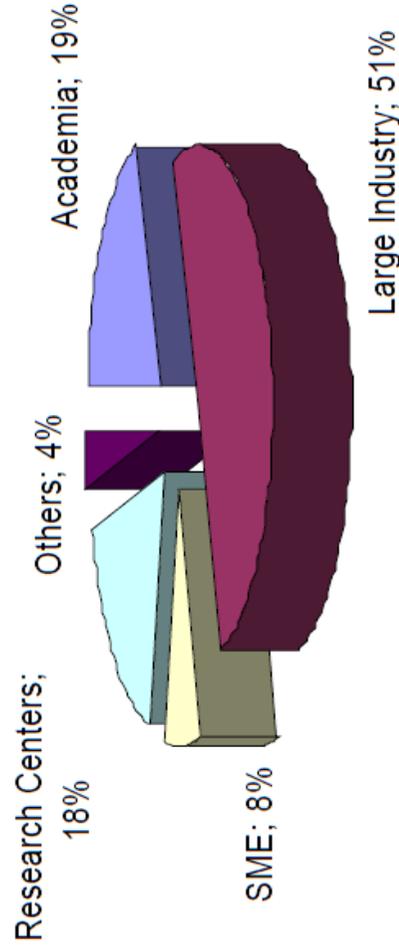
ACARE: FP6 and ACARE Conformity

Vision 2020 Goal

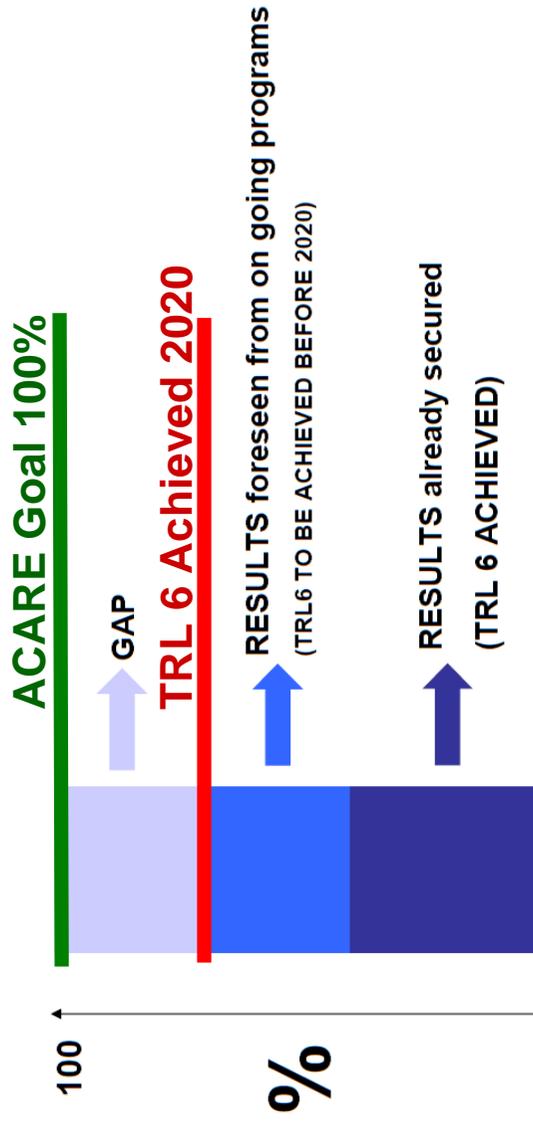


ACARE: FP6 and ACARE Conformity

Wide participation of stakeholders
basis for excellent research partnership



ACARE: AGAPE Study



- Provide ACARE with an evaluation of progress achieved in relation to VISION 2020 GOALS
- The evaluation of progress towards ACARE goals are processed from results identified from FPs as well as National and Privately funded Research projects

International Cooperation

Criteria for selection of primary cooperation partner countries:

Technology and capabilities

- Unique or special capability
- Supply chain development

Political support

- Cooperation agreements
- Financial support in country

Strategic benefits

- Market, competition, offset

Ease of business

- Bureaucracy, export control, IPR
- Communication, working practices, cooperation attitude

Exchange of scientists



International Cooperation

	Technology Domain some examples only
USA	alternative fuel
Singapore	technologies for flow control,
Russia	Flight physics, unconventional aircraft concepts
India	design process modelling,
China	flow control,
Brazil	alternative fuel
South Korea	vision assisted tracking
South Africa	natural fibers,
Canada	Flight Mechanics, nano technologies

Cooperation in EC Framework Programmes

RU - Russian Federation	CA - Canada
CN - China	SG - Singapore
YU - Serbia and Montenegro	JP - Japan
ZA - South Africa	NZ - New Zealand
BR - Brazil	KR - Korea (Republic of)
US - United States	TW - Taiwan
IN - India	Other developing countries
MA - Morocco	Other developed economies
AU - Australia	Total
	323 Mio €

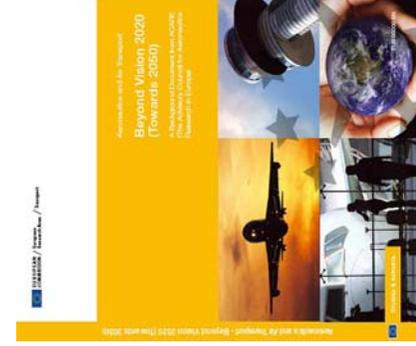
ACARE – we care for Aeronautics



The world of ACARE:

- ▶ The Beginning
- ▶ Present Activities
- ▶ Future Considerations

ACARE: The Background Document



- Since 2000, society's perception of Air Transport has changed due to :
 - 11th September 2001,
 - growing environmental awareness,
 - the rise of oil prices in 2008,
 - and the recent financial crisis.
- In the future, aviation is likely to face even more radical challenges - with some arising from its own success.
- Europe needs to play its part in helping to meet such stringent goals in order for Europe's Air Transport sector to maintain its lead and its acceptability to society.
- The need for new knowledge and solutions has never been greater, international cooperation is a key issue.

ACARE: Preparing the Future

Apart from Strategy-, Communication-, Implementation- and Member States- Groups the following activities are pursued preparing information for the next Vision:

- Sub-Group on Environment
- Working Group on International Cooperation
- Working Group on Intergovernmental Issues
- Human Resources Working Group
- Working Group on Infrastructures
- Intermodal Transport Group



ACARE: The Background Document

A changing world

- Air Transport will have to find innovative ways to meet the future needs of society for mobility. This “new version” of aviation must be competitive and complementary with other transport modes.
- Europe, with its unique infrastructure, is able to develop advanced multimodal transport solutions Including an appropriate role for aviation in order to provide safe, affordable and sustainable transportation.
- This will be driven by the need for more fuel efficient and eco-efficient vehicles.
- Important changes in infrastructure and operations will also be needed.



A New Project: CooperateUS supporting international cooperation

Project is aiming at basic challenges, not product oriented. The objectives is to enhance aviation effect on the quality of life

- List of potential subjects for studies:
- Biofuels for the future in Aerospace. (BOEING- EADS)
- Meteorological phenomena modeling (EASA-FAA)
- Effects of Aviation on the Environment.(DLR/ONERA-NASA)
- Noise, airport vicinity and in flight (SNECMA-RR-GE- PW)
- Effect of speed cruise reduction (AIRBUS-BOEING)
- Increase safety by more automation (FIT- EASN)
- Seamless travelling (DASSAULT-TBD)
- Enhanced communication between air and ground for airlines and passengers (THALES and TBD)



ACARE: The Background Document

Environment

- New scientific knowledge will lead to re-formulation of the goals
- Environmental trade-offs (example: emissions and noise)
- Reducing disturbance around airports
- Aviation is directly impacted by energy trends
- The International Civil Aviation Organisation (ICAO) is promoting effort in four key areas: technology, operations, infrastructure and economic measures.
- Similarly, the International Air Transport Association (IATA) has declared a target to stabilize net CO2 emissions (carbon neutral growth) by 2020 with a long-term goal to reduce aviation net carbon emissions by 50% in 2050 compared to 2005 level.
- Global Research Establishments - IFAR (International Forum on Aviation Research) – will define a Roadmap in 2011



ACARE: The Future Recommendations

- ACARE recommends that for Europe to remain at the heart of the global aviation sector, policymakers must build on the **substantial results** the sector has achieved since setting the 2020 Vision
- In view of the changing landscape of challenges facing Air Transport since 2000 and with the prospect of new and greater challenges emerging in future, the formulation of a timely **new vision for the horizon towards 2050** is essential.
- The need for new knowledge and solutions has never been greater, hence, a new European vision is vital if Europe is to play its part in helping to meet the **needs of society** and in order for **Europe's Air Transport sector** to maintain its leading position.



3

ACARE: Summary

- ACARE has provided with its SRA's goals and roadmaps
- Over the last ten years the SRA's have contributed to better coordinate and implement the aeronautics research in Europe
- Key elements are sustainability, reliability and affordability
- Significant progress towards the ACARE goals during this period.
- Since 2000, significant changes that will oblige the whole aviation community to position aviation beyond 2020
 - reducing environmental footprint,
 - adapting to the changes of social and economic context, facing new competitors and opening for cooperation
 - improving safety, security and quality of the air transportation system.
- ACARE will further analyse this new background and the consequences for aeronautics and air transport towards 2050.
- A new Vision 2050 and the corresponding Strategic Research Agenda is required



Lessons learnt

- **Airlines and Airports** have not contributed as expected, for good reasons.
- **Education** was only partly taken into account.
- Two serious **crisis** have impacted the community in the decade somehow shaking the confidence of the stakeholders
- **Solutions** to address the new sets of constraints are more complex and less obvious to identify.



Personal Remarks I

- ACARE has inserted itself very well in the **working processes** of the community of stakeholders.
- **Working together** to achieve shared objectives has provided credibility and critical mass, different engineering cultures have contributed to the overall effectiveness of the team.
- ACARE had a **global influence** concerning the ambitious goals and the potential for further cooperation



Personal Remarks II

- Personally we are very proud of the achievements of ACARE and we would like to dedicate this Award to the hundreds of contributors to the SRA and to the founders of ACARE who built a very powerful vision and especially to
- Commissioners **Philippe Busquin** and **Janez Potocnik**
- The long and engaged support of **Jack Metthey** and **Andras Siegler**



European Aeronautics
A Vision for 2050



*Thank you for
listening*