



Creating the SRA

ACARE

The Creation of the Strategic Research Agenda

An introduction to the structure and significance of
the SRA



Creating the SRA

Commissioner Philippe Busquin, at the Framework 6 launch in November 2002 held up the SRA as "an excellent example of non interventionist, modern industrial policy at work " and proposed that it be used as "the model by other sectors."

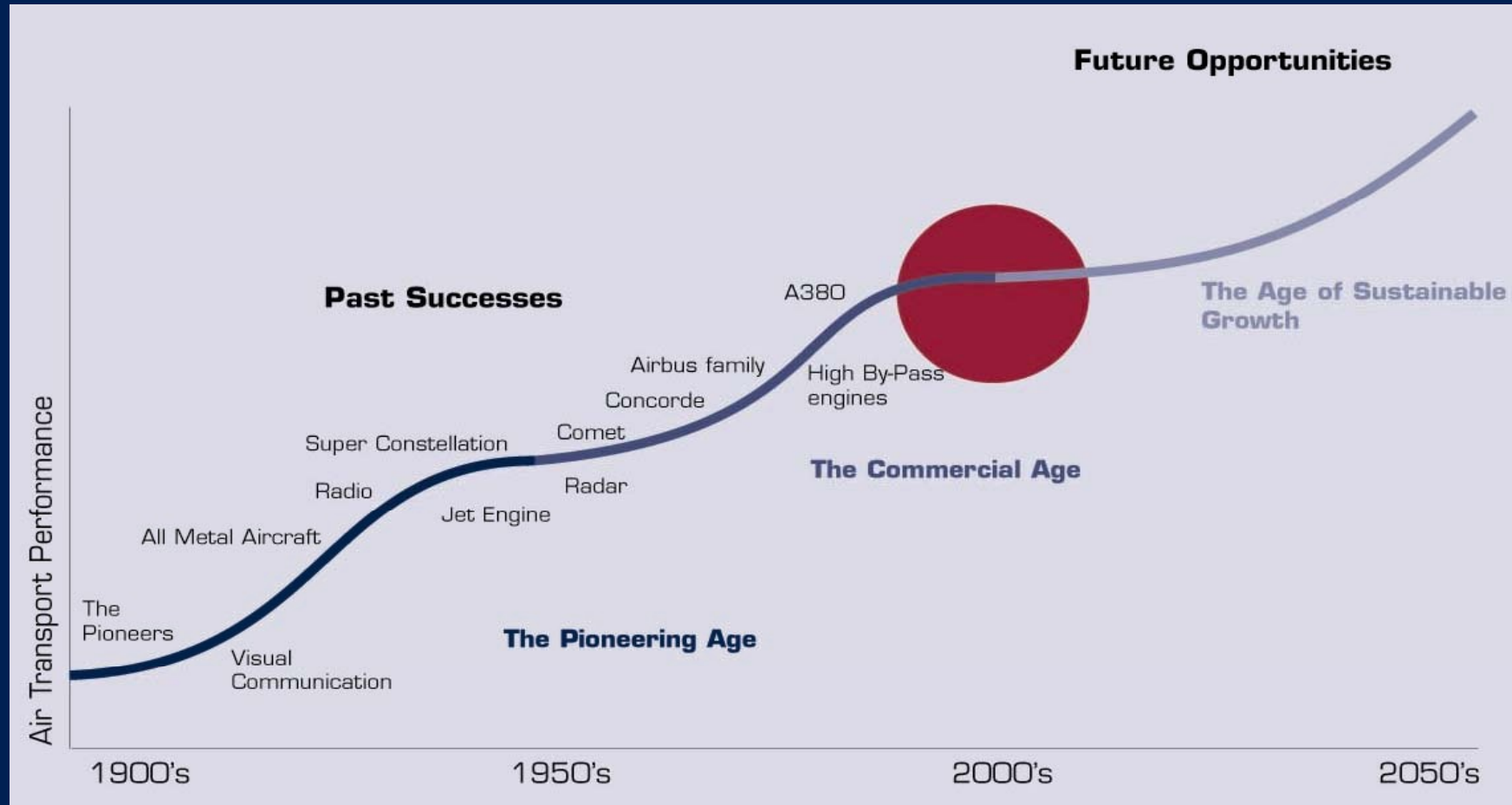
Why?

- 300 Experts
- 5,000 Man-Days of effort.
- To produce what?
- Why?
- Who for?
- So What?



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European Aeronautics - The New Age



The performance of the system as a whole is levelling off. New concepts and breakthrough technologies will be needed for the New Age



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A European opportunity – a decade of evolution

In 1990

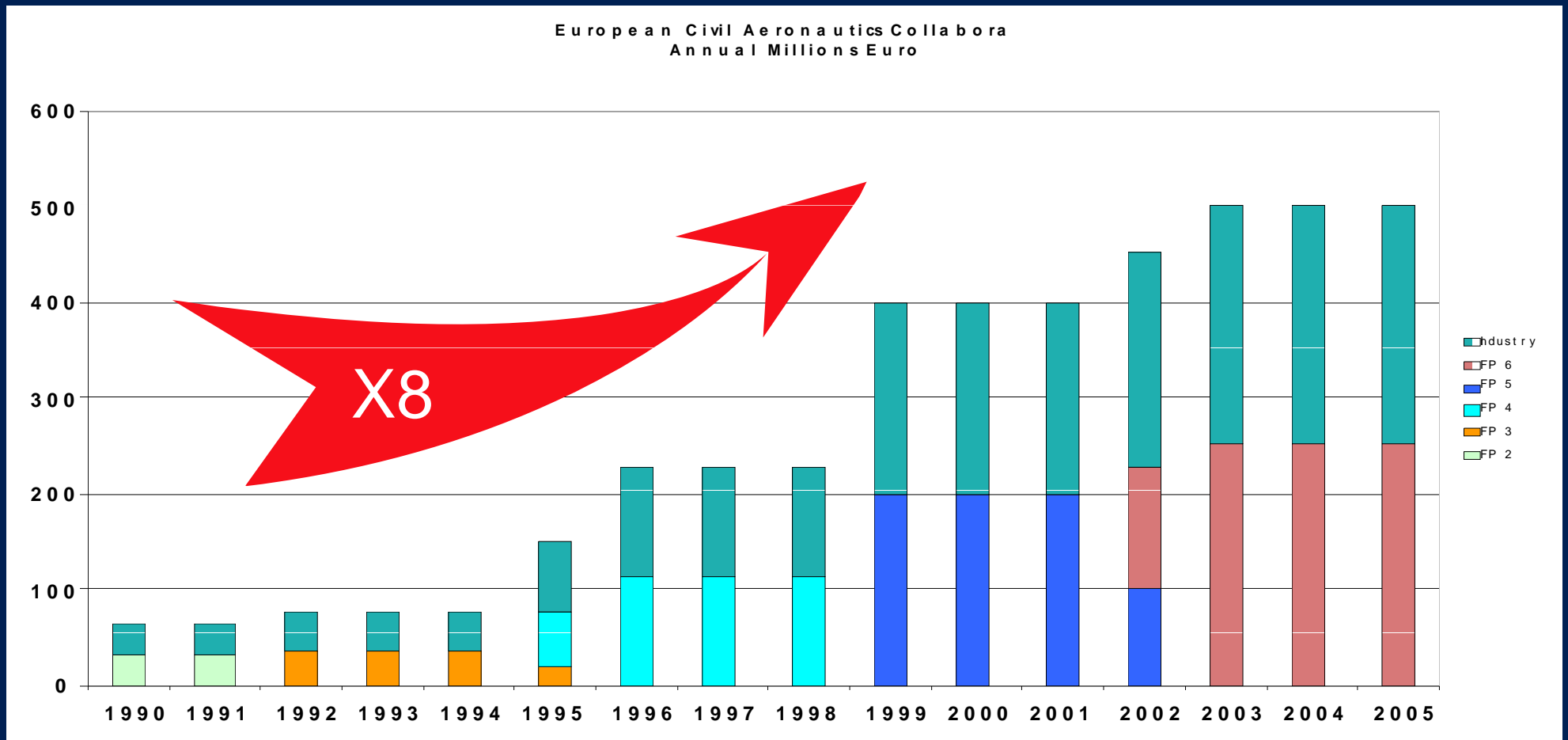
- European nations conduct independent research in aeronautics, supporting largely independent industries.
- Civil air traffic continued to grow steadily.
- Military aeronautics supported several independent capabilities although with some collaborative projects.
- Airbus operated as a set of independent partners.
- Collaborative “European” research virtually invisible.



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Evolution of European Perspectives.

8 x growth of European collaborative activity in civil aeronautics.



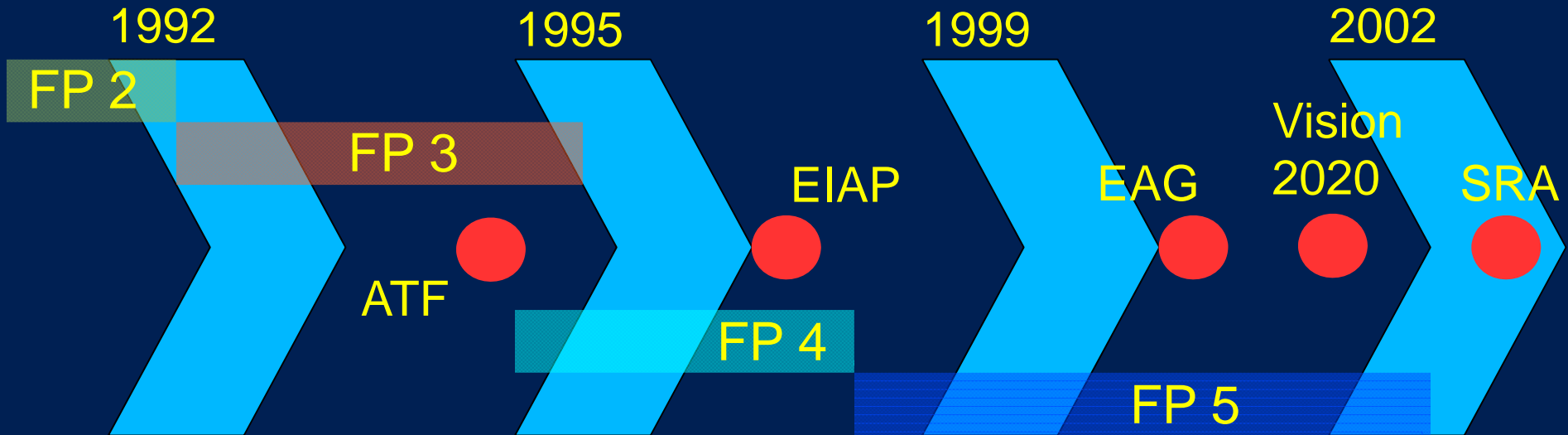


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Milestones of Evolution

Technology Led

Issues Led



Fragmented
Small scale
Independent
Aircraft
Manufact'g

Coherent
Larger scale
Independent
Aircraft systems
Manufacturing

Coherent
Large scale
Integrated
Inter-dependent
Aircraft systems

Coherent
Integrated
Large scale
ATS-wide



Creating the SRA

A Vision for 2020

EUROPEAN AERONAUTICS:
A VISION FOR 2020



Winning global leadership and **meeting societies needs**

- Commissioned by Philippe Busquin – European commissioner for Research.
- Produced by the ‘Group of Personalities’ for the aeronautics sector.
- Defines a broad and comprehensive vision for the European air transport industry in the global marketplace of 2020.
- Sets challenging goals for all stakeholders.
- Aims to ensure Europe remains a global leader in Aeronautics.
- Raises the opposing issues of a rising demand for air transport and its environmental and societal impact.
- Recommends the formation of an Advisory Council for Aeronautics Research in Europe (ACARE).



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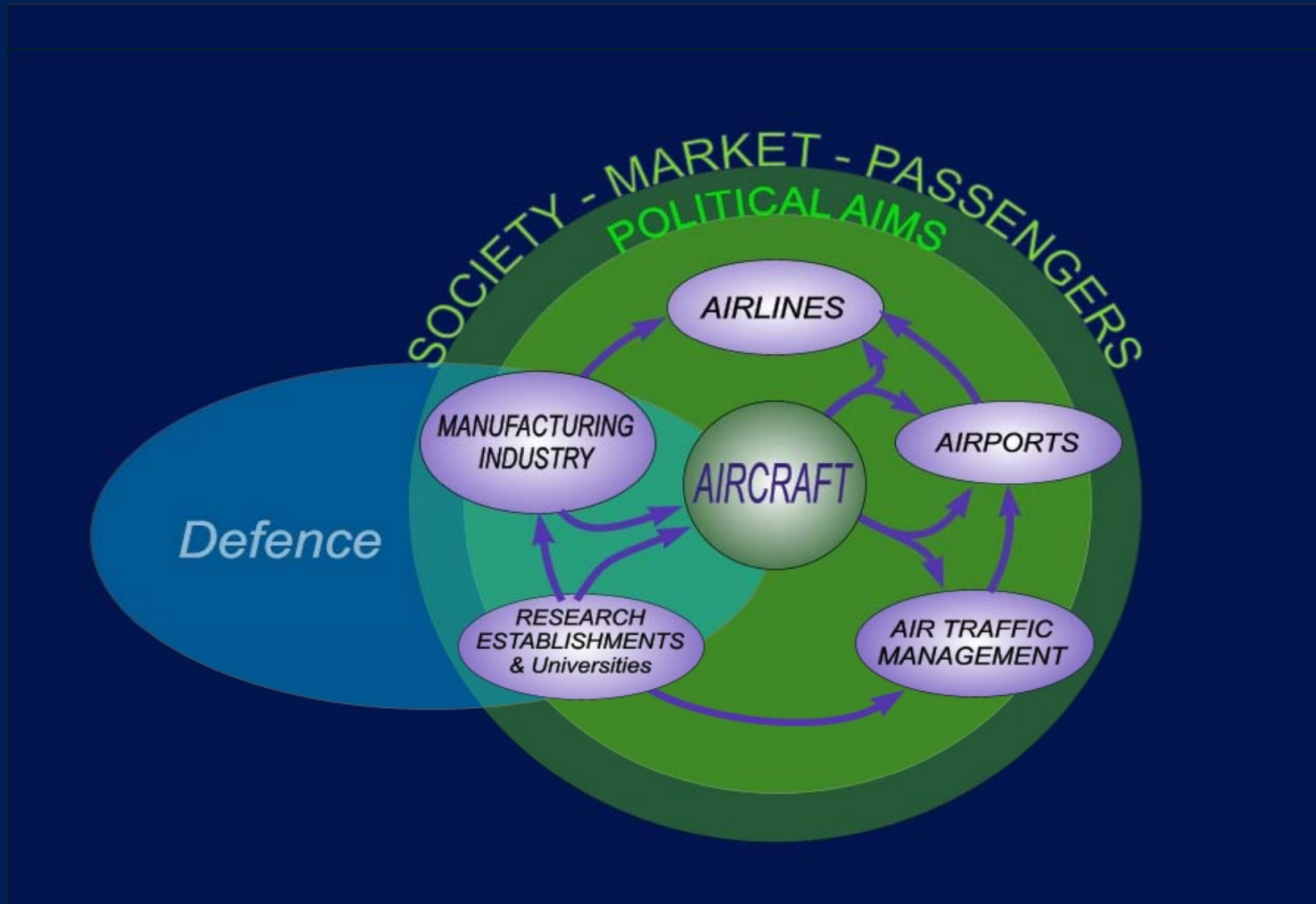
Issues for European Aeronautics

- Global competition.
 - The Environment and Sustainability.
 - Traffic Growth.
 - System weaknesses in the ATS.
 - Society's needs.
 - Technology deficiencies.
- We need SYSTEMS to provide SOLUTIONS not “just” technology.



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The Systems Arena





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Setting the Technical Agenda

Europe needs a coherent agenda for the delivery of technical solutions to the challenges and issues that are faced by the Air Transport System that is ambitious, long term, driven by the issues and which embraces the whole system.

The SRA sets out to provide that agenda – a non-prescriptive, non-authoritarian, collaborative, informed and dynamic strategy for developing technologies for a successful Europe.



Creating the SRA

Building the SRA

Challenges

Mechanisms for Progress

Research Infrastructure

Competitive Supply Chain

Certification & Qualification

Educational System

Trans-European Synergy

Quality & Affordability

Environment

Safety

Air Transport System

Security

Vision 2020



Creating the SRA

The structure of the challenges

Winning global leadership

meeting societies needs



Vision 2020

**Quality &
Affordability**

Environment

Safety

**Air Transport
System
Efficiency**

Security

The challenge of delivering products and services to airlines, passengers, freight and other customers whilst increasing quality, economy and performance

the challenge of meeting continually rising demand whilst demonstrating a sensitivity to society's needs by reducing the environmental impact

The challenge of sustaining the confidence of both the passenger and society that notwithstanding greatly increased traffic incidence of accidents will reduce

Rising traffic shall not exacerbate congestion, delays and lost opportunities. The challenge is therefore that the efficiency of the whole system must be increased.

The challenge is to devise measures that will improve security, on a global basis, within a highly diverse and complex system and against a strong backdrop of increasing traffic.



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Creating change

Vision 2020

Quality &
Affordability

Environment

Safety

Air Transport
System efficiency

Security

Strategic Research Agenda

Research Programmes

Capabilities

Winning global leadership

Meeting society's needs



Creating the SRA

SRA documentation structure

Volume 1



Introduction



The Technical Agenda



Realising the Technical Agenda

Volume 2



Introduction



Quality and Affordability



Environment



Safety



Air Transport System Efficiency



Security



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ACARE conclusions to date

- The ambitious Top Level Objectives
 - are **achievable but require important breakthroughs** in both technology and in concepts of operation
 - will be achieved through the strategic directions and R&T road maps in the SRA.

- Delivering these Top Level Objectives will require
 - substantially **more output** from the European aeronautic research community, which must devise new ways to make the system of research **more efficient**.
 - a number of additional and significant Pan-European supporting mechanisms
 - **more public and private investment**. The preliminary estimate “possibly in excess of 100 billion euro over 20 years” has been confirmed.
 - that major corporations, with international links and options, should be encouraged to continue to invest their resources in Europe, but **Europe must provide a receptive environment**, ensuring an equal competitive footing with other countries and regions.

- Genesis of new culture
 - SRA published based upon consensus and common denominator of interests of different stakeholders. This is the **first time that a holistic view of R&T planning has been taken in aeronautics across Europe**.



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Who is the SRA for?

- Operators within the Air Traffic System
- Users of technology
- Research Managers
- Funding sources
- Industry and Operators
- Government
- Academia



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Implementation - who must do it

- SRA is a collective initiative, providing a common framework for all the European Stakeholders. This *does not mean* that it will be owned, or managed, centrally.
- Each institution or stakeholders will maintain its autonomy within its specific field of action. A decision making process, in autonomy tailored to the needs of each Member State, but in line with the SRA indications, is expected to provide a better return not only for the community, but also for individual Organisations.



Whose money ?

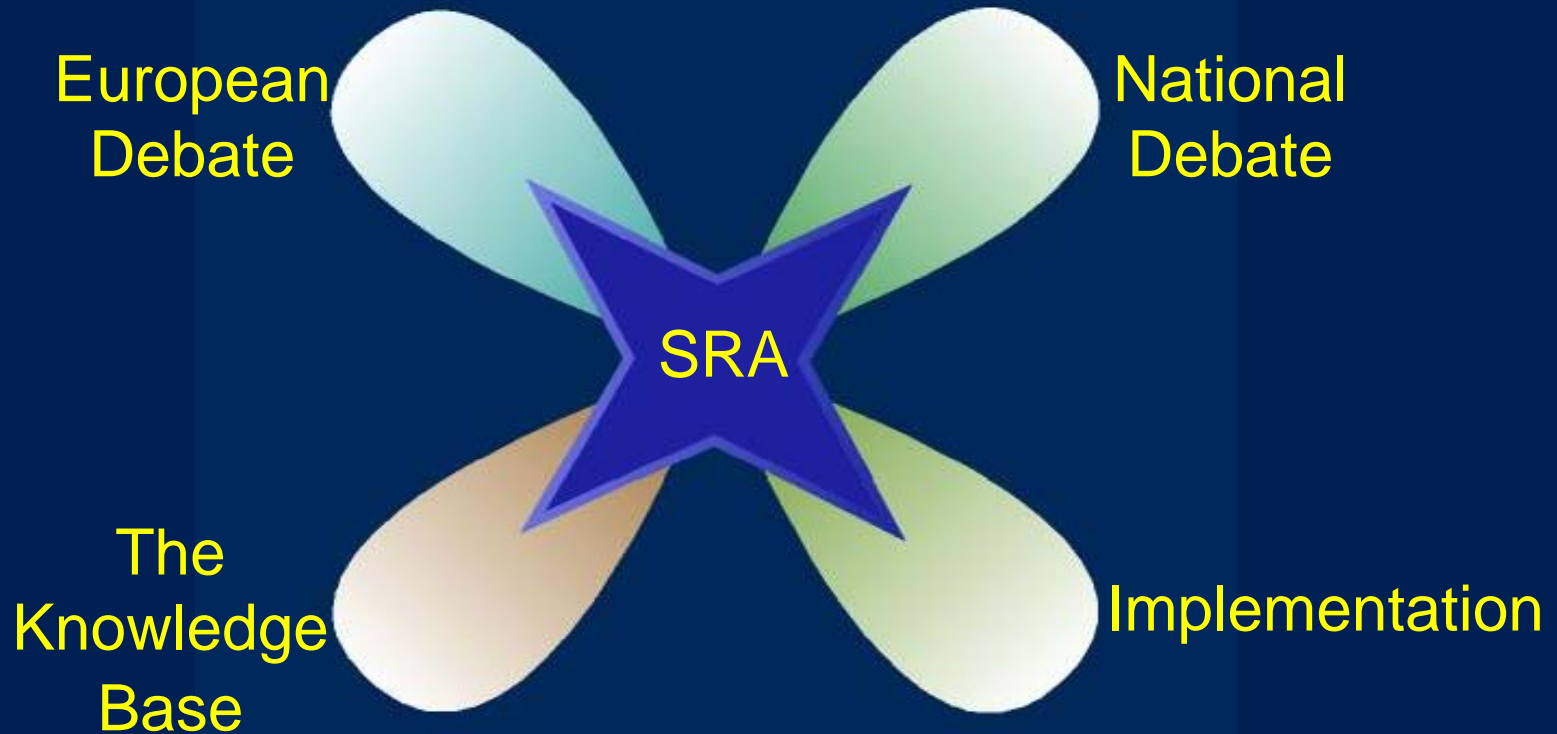
- Private sector funds – industry and operations.
- Discretionary academic funds.
- National Government R&T funding.
- European Community funding.

Balancing the attractions of
INDEPENDENCE against the benefits of
INTERDEPENDENCE to obtain the best
overall outcome.....



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The SRA as a propeller of progress.





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SRA Communities - 1 – National

- Assessment of national contributions
- Consideration of national strengths
- National investments and priorities
- Positions in the global market
- Strategies for development
- Place and priority of collaboration



SRA Communities - 2 – European

- Sub-system considerations (e.g. Airlines, Airports, ATC, Manufacturing etc).
- Integration aspects across Europe.
- System-wide issues.
- Global competitive issues.
- Europe-wide issues.



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SRA Communities - 3 – Implementation

- Construction, funding and management of research programmes
- Designing programmes in the light of the SRA – making choices about priorities
- Integration between programmes
- Relationship between private, academic, national and European funding sources
- Awareness of programmes in related fields



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SRA Communities - 4 – Knowledge Base

- Implications of the SRA
- Sensitivities of the SRA to alternative futures
- Identification of key sensitivities and change indicators
- Impact routes and dependencies
- Alternative solutions assessment
- Monitoring change



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The Significance of the SRA

- Edition 1 of the SRA is without precedent in Europe as a collaboration across the ATS in considering the long term technical agenda. It has already brought significant benefits.
- The work to date has built a strong consensus around the issues that face us, their European dimensions, and the need for a coherent and holistic approach.
- The process of creating and re-visiting the SRA has the potential to forge tremendous strength for aeronautics in Europe that will enable the aims of European competitive leadership and meeting society's needs to be met.
- Operators and enterprises across Europe have the opportunity to contribute to and to benefit from this initiative – whether their main markets lie in Europe or not.
- The approach opens up new horizons for the effective use of European talent and funds in a collaborative, participative but non-directed manner.



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Summary

- The SRA has a Europe-wide perspective.
- It seeks to challenge and inform but not to instruct.
- It is open to, and demands, regular iteration.
- It will succeed through:
 - Its effect on research programme design, funding and execution.
 - Its ability to influence a more integrated approach to ATS evolution.
 - Its impact on system performance in meeting the objectives.



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Thank you for your attention



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Quality & Affordability goals

- Fall in travel charges (acquisition, maintenance, crew, fuel, fees and charges)
- Increased passenger choice (travel costs, time to destination, specific services, passenger needs and comfort)
- Transformed air freight services (aircraft costs, crew requirements, freighter configurations, intermodal compatibility, operational constraints)
- Competitive supply chain and 50% reduction in time to market (integrated supply chain, system engineering, design for life cycle value)



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Quality & Affordability challenges

- Increased demand of air transport services raises capacity, flexibility & quality challenges
- A balanced response to above demand is needed while meeting safety, security and environmental requirements
- Novel concepts and technological breakthroughs are required
- Higher capacity levels are interlinked with progress in environment, efficiency, safety and security
- Future demand remains segmented (long/short range, high/low capacity, transonic/supersonic speed, luxury/ economy, ...)



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Environment goals

- Reduce CO₂ by 50% per passenger kilometer (efficient aircraft, efficient engine, ATM of the future, alternative fuels)
- Reduce perceived noise to one half of current average levels (quiet aircraft, rotorcraft of the future, noise abatement procedures, community impact management)
- Reduce NO_x emissions by 80% (the clean engine)
- Minimise industries impact on the global environment (the green MMD*)

* Manufacturing, Maintenance & Disposal



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Environment challenges

- Contain aviation global emissions (currently 3% contribution) as low as practicable despite strong traffic increase
- Current technology is unable to sustain the environmental progress rate of the last 30 years
- Technological breakthrough is needed to achieve environmental performance aspirations
- Noise is a major cause of nuisance to citizens
- Comprehensive view of air transport system is needed to balance conflicting requirements between economy, competitiveness, environmental performance and efficiency of operation



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Safety goals

- Reduction of accident rate by 80% by addressing technology, systems design and operations (elimination of CFIT*, minimise factors of LoC**, safe aircraft separation, atmospheric hazards, safer approach & landing, safer ground operation, identification of future hazards, increased survivability, tools for engineering & certification)
- Reduction of human error and its consequences by addressing human factors in the chain of air transport activities (ensuring effective & reliable human performance)

* Controlled Flight Into Terrain

** Loss of Control



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Safety challenges

- Future development of air transport system depends on safety
- Safety improvements in the future air transport system to be user friendly
- Strategies have been identified to contain or reduce significant causes of accidents
- Human factor is recognized as an important parameter to be matched to the systems in operation to minimise human error consequences
- Impact of technology evolutions on possible future hazards to be continuously monitored



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Security goals

- Airborne - zero hazard from hostile action
- Airport - zero access by unauthorized persons or products
- Air navigation - no misuse of system and safe control of hijacked aircraft



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Security challenge

- Solutions to address to whole air transport system
- Solutions must be economically viable and convenient to passenger friendly
- Solutions to protect the navigation and ATM infrastructure from interference and misuse



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Air Transport System efficiency goals

- An air traffic management system that can handle 3 times the number of aircraft movements overall
- 99% of all flights arriving and departing within 15 minutes of schedule
- Less than 15 minutes spent in airports before departure and after arrival before short flights, and 30 minutes for long flights
- Creating a seamless european global ATM system



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Air Transport System efficiency challenges

- Meeting increase in demand, while increasing safety
- Using a total systems approach including airports, airlines, aircraft and the ATM system, is fundamental to success
- Creating a more efficient system must include a long-term perspective taking into account changing societal needs and a controlled transition from today's system
- Developing innovative concepts in the areas of ATM, airport systems and integration for a seamless operation