

AeroSpace and Defence Industries Association of Europe

ASD-IMG⁴

- **Industrial Management Group**
- **Aircraft, Aero Engines, Equipment, ATM**
- **Research & Technologies**

IMG⁴ Strategy

V21

ASD-IMG⁴

The European Aeronautics industry network for R&T

- ASD-IMG⁴ coordinates the manufacturing industry position with regard to the EC Civil Aeronautics Framework Programmes
- ASD-IMG⁴ represents the European Aeronautics Industry through the Industry Management Groups (IMG)

IMG⁴ comprises representation from four groupings :

Euromart IMG (*Airframe*)

Aernnova Aerospace	Airbus SAS
Aero Vodochody	Saab AB
AgustaWestland	EADS IW.
Alenia Aeronautica	EADS MAS
AleniaAermacchi	Eurocopter
Bombardier Aerospace	PZL-Swidnik
Dassault-Aviation	HAI
GE Aviation Systems	Latecoere
GKN Aerospace Services	RUAG
LET Aircraft Industry	Patria Oyj
Piaggio Aero Industry	SONACA
PZL Mielec	Stork Fokker
S.A.B.C.A	
AeroPortal, IAI (observers)	

Engine IMG

AVIO
ITP
MTU Aero Engines
PBS Velká Bíteš
Rolls-Royce
RRD
SNECMA
Techspace Aero
Turbomeca
Volvo Aero
WSK Rzeszow

Equipment IMG

Selex Galileo	Auxitrol
BAE systems avionics	Cesa
Diehl Aerospace	Dräger AG
Hellenic Aerospace Ind.	Fokker-Elmo
Liebherr-Aerospace	Sagem
Lindenberg GmbH	Selex Comms
Messier-Dowty Ltd	Nord-micro
Messier-Bugatti	Skysoft
GE Aviation Systems	Saab AB
Goodrich	Barco
Thales Aerospace	Qinetiq
Thales avionics electronic systems	
ZF Luffahrttechnik GmbH	Megitt
INASCO	ISQ
Jihostroj	GIFAS

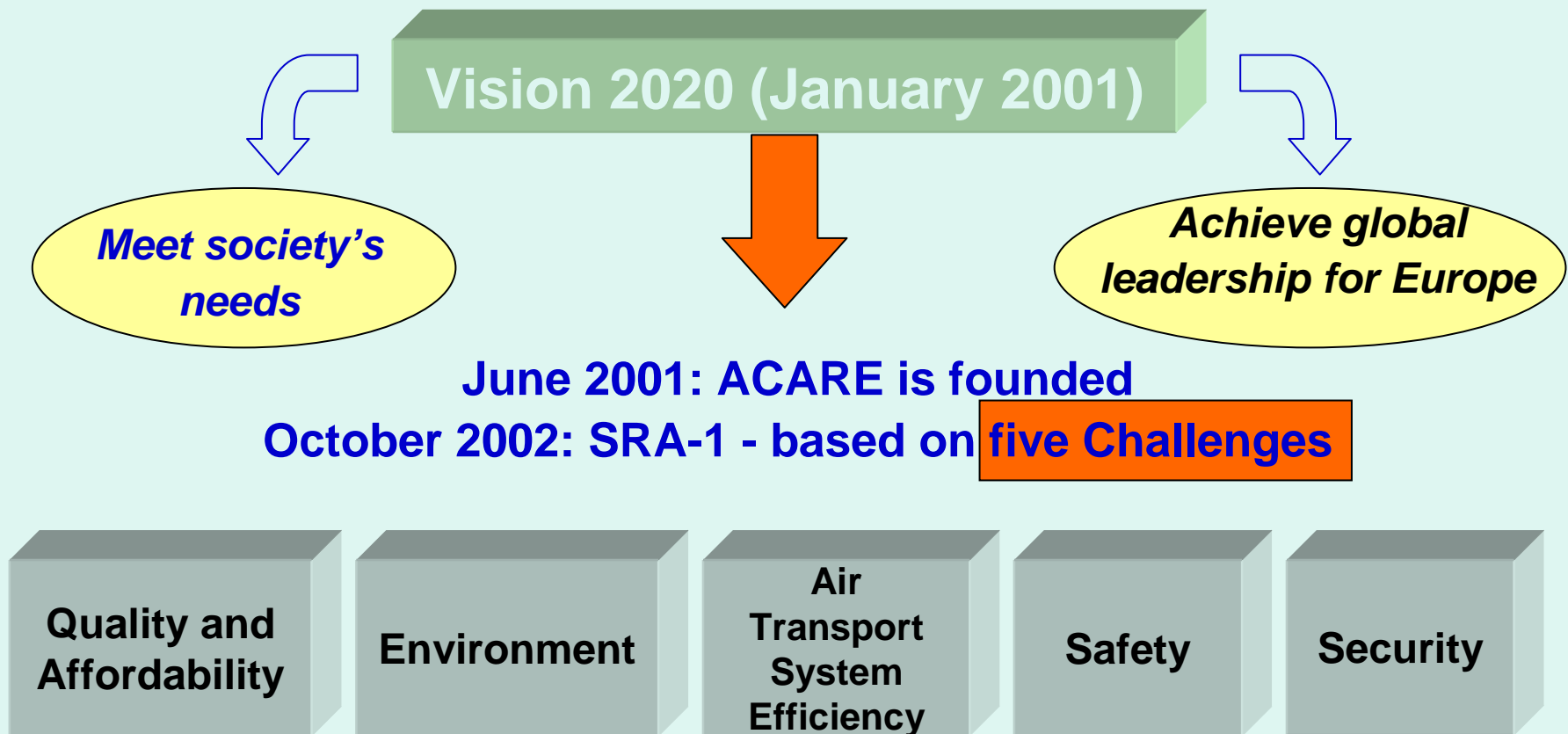
ATM - IMG

Airbus
Alenia Aeronautica
Bae Systems
Dassault Aviation
EADS
Eurocopter
Selex Galileo
Hellenic Aerospace Ind.
Indra
Raytheon Ltd
Selex Comms
GE Aviation Systems
Selex Sistemi Integrati
Thales Alenia Space
Thales Air Systems
Thales Aerospace

- Eligible for EC funding
 - Undertake research within EU member states
- Have a manufacturing base within the EU member states
- Exploitation path for research results within the EU member states
- Participate in the meetings and the decision making
- All activity is self-funded

ACARE SRA*: The reference

* *Advisory Council for Aeronautics Research in Europe
Strategic Research Agenda*



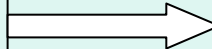
**Quality & Affordability
(Competitiveness)**



■ Challenges

- Halve time to market
- Competitive Supply Chain
- Reducing travel charges

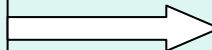
Environment



■ Challenges

- 50% cut in CO₂ emissions
- 80% cut in NO_x emissions
- 50% perceived aircraft noise

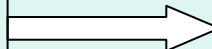
**Efficiency of the air
transport system**



■ Challenges

- 3 times increase in traffic
- 99% of all flights within 15 min of timetable

Safety and Security



■ Challenges

- Five-fold reduction in accidents
- Zero successful hijack

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Framework 7: Large Projects Road Map

LEMCOTEC

(Low Emissions Core Engine Technologies)

■ Major technical objective of the project :

- Innovative core technology to enable the ultra-high bypass ratio cycle, improve core thermal efficiency and reduce NO_x
- Develop to TRL5 core engine technologies also for architectural change

■ Project description :

- The primary focus of the project will be on large-scale rig tests of technology in the following areas:
 - ✓ Flow control (gas path, cooling air)
 - HPC stability control, intermediate casings (aero & materials)
 - New materials for structural components (HPC, Combust., HPT)
 - Integration of heat exchanger technology
 - Lean combustion

Health Monitoring

■ Major technical objective of the project :

- To deliver technologies demonstration at TRL5 that allow an optimised use and maintenance of the engine

■ Project description :

- Develop and demonstrate with engine tests, new technologies specific to engine environment and behaviour :

- ✓ New signal processing algorithms
- ✓ New real time modelling techniques

Mainly for monitoring of gas path anomalies, bearings & gears faults, blades rubbing & cracks, oil & fuels leaks, LRU fault isolation

TOTAL AIRPORT

- Integration of all sub-systems of the landside and airside activities and their information flows
- Improvement of service level, overall airport predictability and passenger satisfaction
- Time efficient, safe and secure passenger and luggage flow in the terminal area
- Time efficient operations, including comprehensive planning of airport operations
- Advanced fleet management concepts and techniques for fast turnaround at the apron area
- Improvement of flexibility and optimum use of the landside and airside airport's resources
- Improved flexibility and optimum use of airports in the context of the full air transport system
- Greener apron operations
- Detection and monitoring of local air quality and aircraft noise around airports.
- Comprehensive and fully integrated airport security system (Total Security system)

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ASHLEY – Large scale demonstration of the future avionics platforms

Based on Distributed Modular Electronics pillars from Scarlett in terms of new architecture concepts and key basic components and supporting tools.

Fault tolerance systems architectures, Platform prognostics services and Reconfiguration mechanisms

Digital aircraft / smart sensors & actuators architecture: standardization of the interfaces and impact on the Distributed Modular Electronics

New services for platforms management (platform power network management, platform supervision)

Certification process and associated tools to ensure a designed time valid fault tolerant reconfiguration-based

Actuation 20-15

Objective:

- Validate the next generation of actuation technologies for the all-electric aircraft

Innovation:

- Next generation EMA actuation
- Actuation based on smart self actuating materials
- Embedded health monitoring
- Actuation of micro surfaces or inherent panel/wing shape ie morphing
- Architectures: including supporting power and signal distribution including new processing and networking

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ISAP

Integrated System for Air Protection

Objectives:

- Improve the effectiveness and success rate of response actions in air transport crisis management
- Prepare and promote implementation of EU aviation security regulations

Technologies:

- Technologies for passenger boarding and baggage security checks (biometry, explosive detection ...)
- On board detection of abnormal behaviour
- Link to global Risk Assessment System (RAS)
- On board / on ground database link
- Security analysis / protection / encryption of data in on ground / on board communication network
- Legal, Regulatory and Certification issues

FAME

Fleet & Aircraft Time Management

Eradicate many root causes of turnaround time problems with better on-board information management and with better interconnection of on-board and ground-based information management systems

End to end AOC applications through an integrated network including on-board applications (cockpit, cabin and maintenance), ground applications and Airlines IT systems



Aircraft connectivity architecture with airline ground information systems

Demonstration of benefits of new aircraft operations processes at both flight and fleet operational level in terms of turn around cycle and operations efficiency



SARISTU (Smart Intelligent Airframe Structures)

Self-Sensing Structures, Nanotechnologies and Morphing are the three pillars of this new **integrated approach** for future **Smart Airframes** to be realised in SARISTU.

Integrated Approach from a structural point of view:

-  **global & interdisciplinary vs. technology focused development**
-  **considering whole life cycle, materials and processes**

Smart Intelligent Airframe:

-  **multifunctionality of materials and components is key to smart airframes**
-  **inherent sensing, integrated actuating structures and nanotechnologies enable multifunctionality and a truly intelligent airframe**

- **Human Factors Issues: e.g. Anthropometrics, Ergonomics, Illumination, Loudness, Pressure, Multidisciplinary COMFORT Index ...**
- ▣ **Air Conditioning - Future Air Conditioning Equipment and interior / cabin and fuselage**
 - ▣ Focus on: e.g. Humidity
- ▣ **Acoustics – Noise & Vibrations in Carbon Fuselage**
 - ▣ Focus on: e.g. Composite structure damping
 - ▣ Focus on: e.g. Interior furnishing design for noise
- ▣ **Lighting**
 - ▣ Focus on: e.g. light interface with passenger and crew
- ▣ **Multimedia integration**
 - ▣ Focus on: e.g. flexible integration
- ▣ **Interior Architecture**
 - ▣ Focus on: e.g. Development of Pre Standard
 - ▣ Focus on: e.g. Human Factors Interactions
 - ▣ Focus on: e.g. Architecture against stakeholder requirements (safety, modularity, maintainability)

Objectives

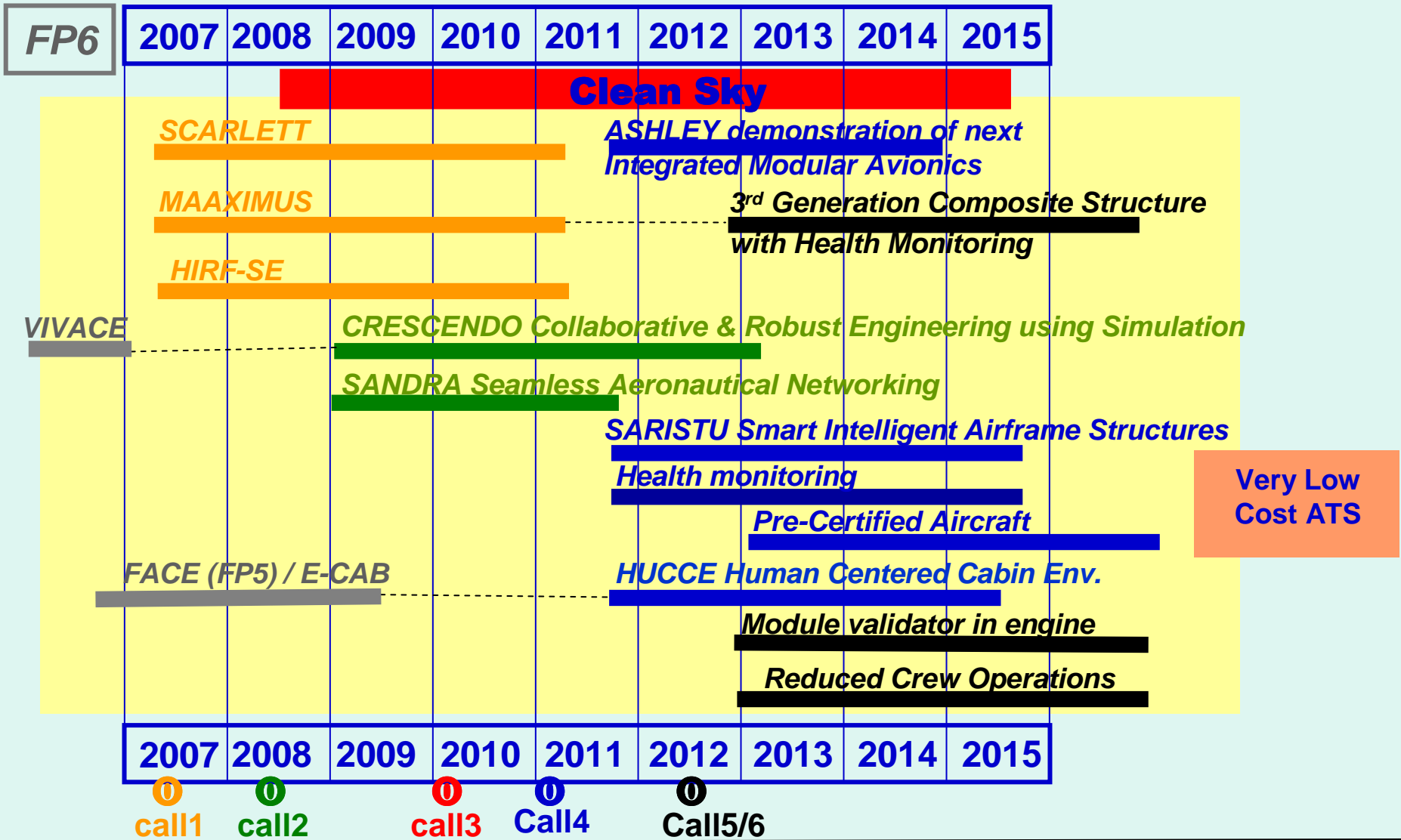
- ▣ To pave the way for an ultra green and time efficient aircraft (clean and fast)
- ▣ To maintain European competitiveness and attractiveness for a future supersonic small transport aircraft development
- ▣ To continue the works on new supersonic regulations

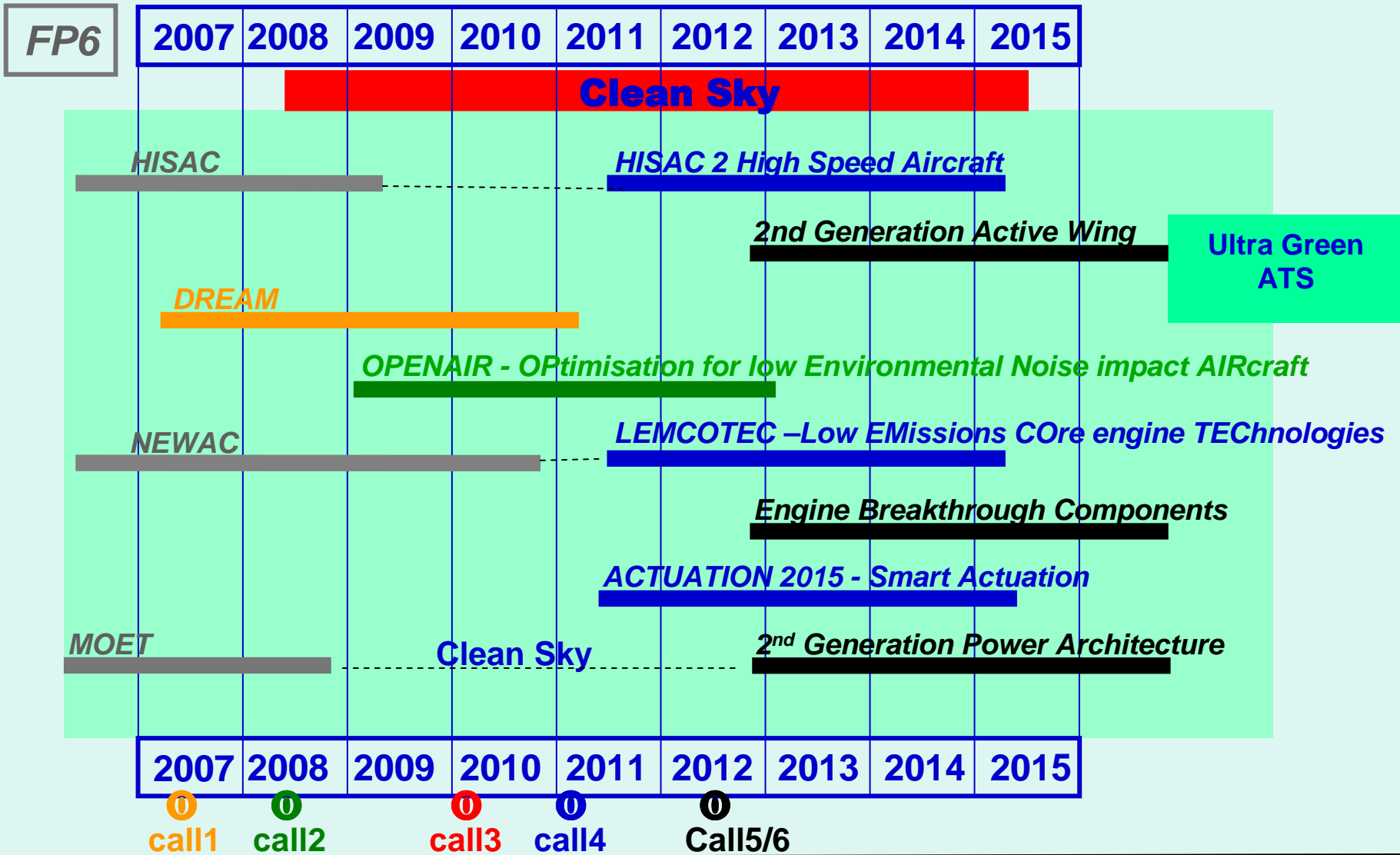
Innovation

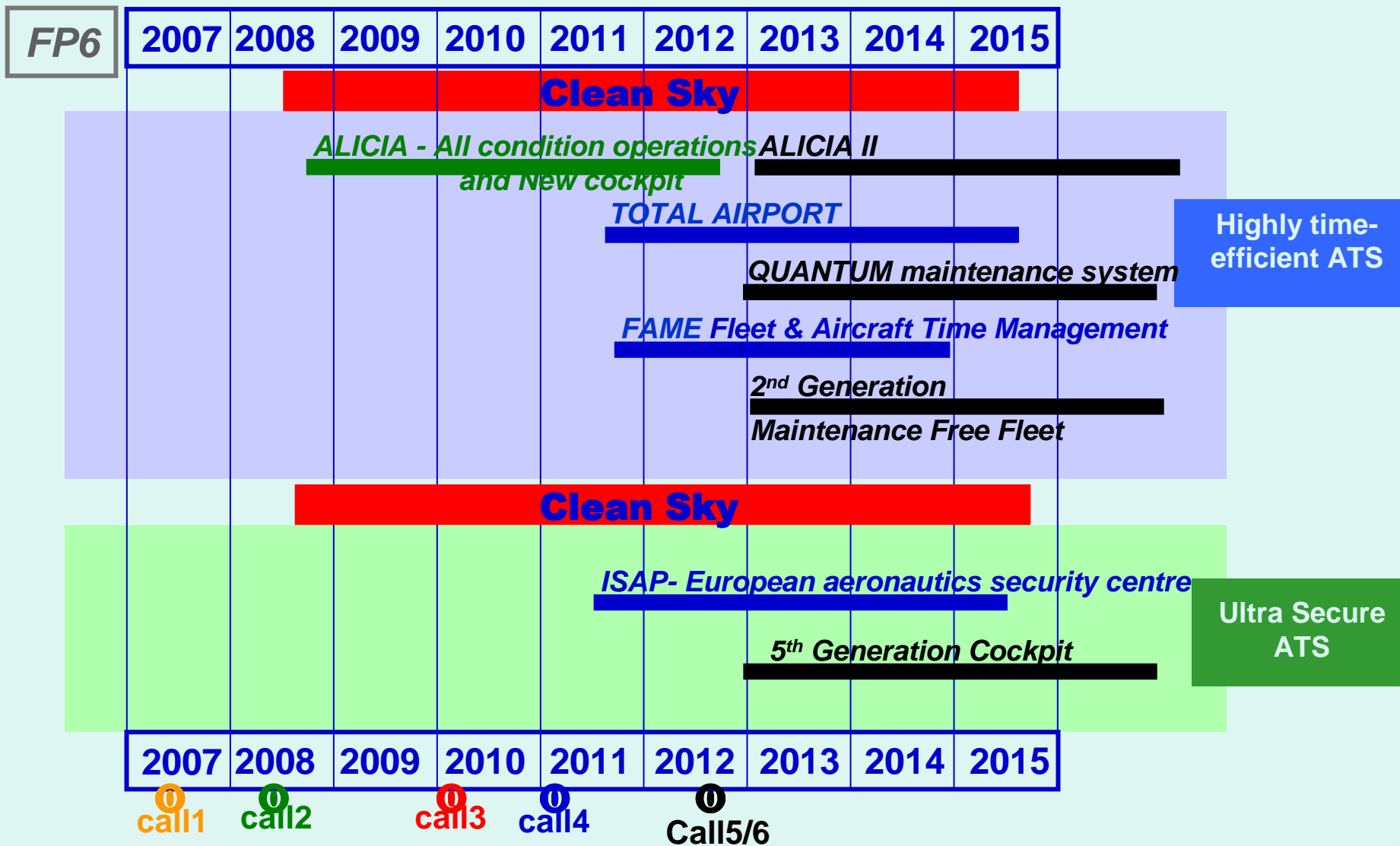
- ▣ Flight tests for sonic boom characterization
 - ▣ Create a database with recent well known supersonic aircraft and compare it to low sonic boom modified shapes
- ▣ New supersonic engine and nozzle architectures demonstrations (low noise and low emissions oriented)
- ▣ Advanced aerodynamics tests
- ▣ Innovative airframe and systems architecture for supersonic aircraft
- ▣ Building a new set of civil supersonic regulations with authorities
- ▣ In-flight procedures and operations of a supersonic aircraft
- ▣ High fidelity environmental models

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FP7 Technology Strategy - Level 2 Projects (1/3)







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END

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