The Italian National Programme for Aeronautics
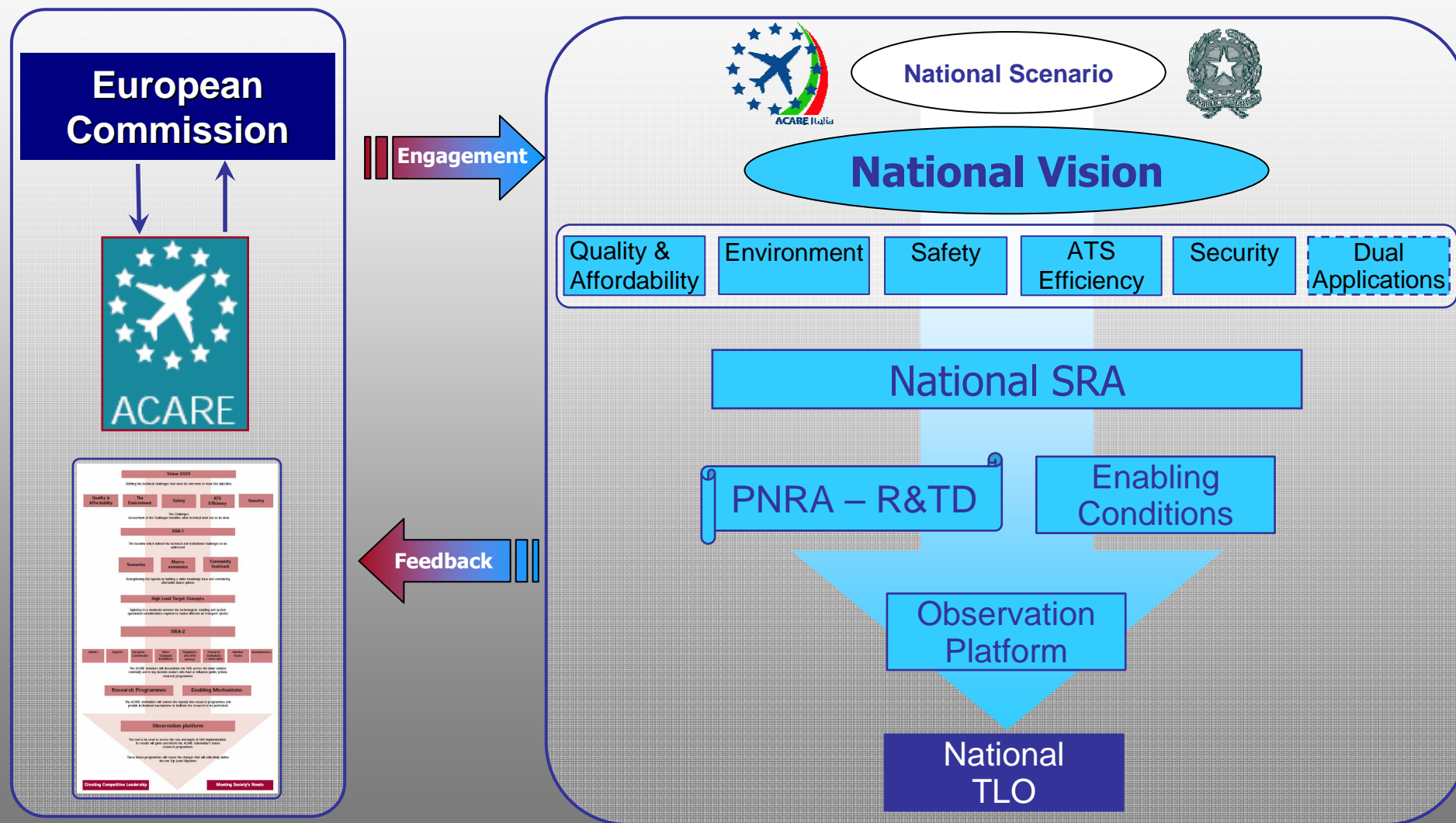
ACARE-Italia

Outline

- **Turning the ACARE approach into practice**

- **ACARE-Italia**
  - **Structure**
  - **Objectives**
  - **Status of the Activities**

- **Italian Vision**

- **Italian SRA**

- **Conclusions**

Turning the ACARE approach into practice

European Commission

ACARE

Engagement →

← Feedback

National Scenario

National Vision

| Quality & Affordability | Environment | Safety | ATS Efficiency | Security | Dual Applications |

National SRA

PNRA – R&TD

Enabling Conditions
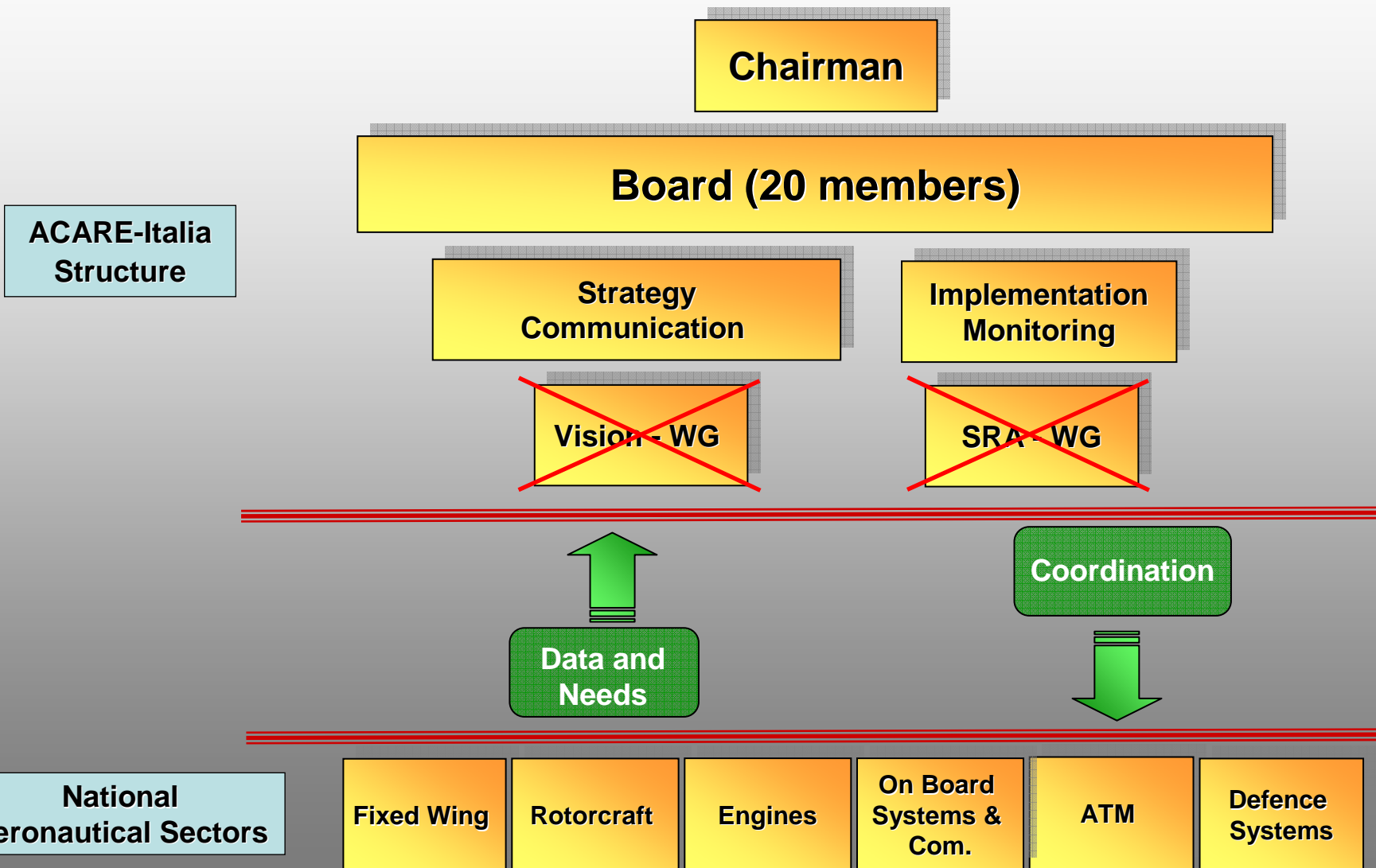
Observation Platform

National TLO

ACARE-Italia : Structure

- **Italian stakeholders, under AIAD coordination, created ACARE-Italia.**

- **In the Board, chaired by Finmeccanica, representatives from:**

  o **Industries** (AgustaWestland, Alenia Aeronautica, Avio, Elettronica, Galileo Avionica, Finmeccanica, Microtecnica, Selex Comms, Selex Sistemi Integrati,...)

  o **Research Centers** (CIRA, CSM, ...)

  o **Academia** (through representatives - CRUI)

  o **Regulators** (ENAC)

  o **Governmental Bodies** (ASI, MIUR, ...)

  o **European Bodies** (ACARE, ASD-IMGs, EREA-ARG)

  o **National Industrial Associations** (AIAD, Confindustria)

ACARE-Italia : Structure

ACARE-Italia Structure

Chairman

Board (20 members)

Strategy Communication

Implementation Monitoring

Vision - WG

SRA - WG

Coordination

Data and Needs

National Aeronautical Sectors

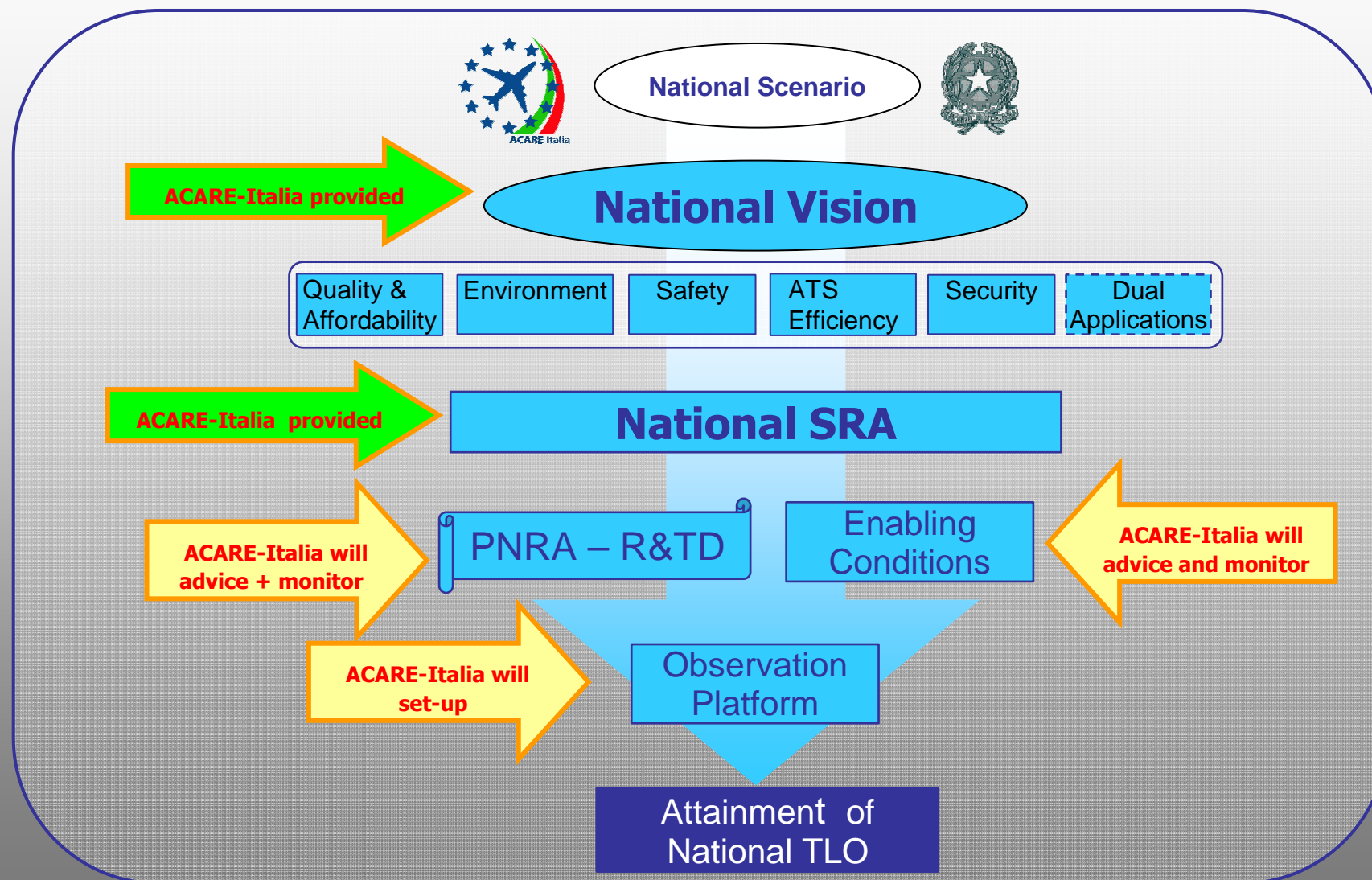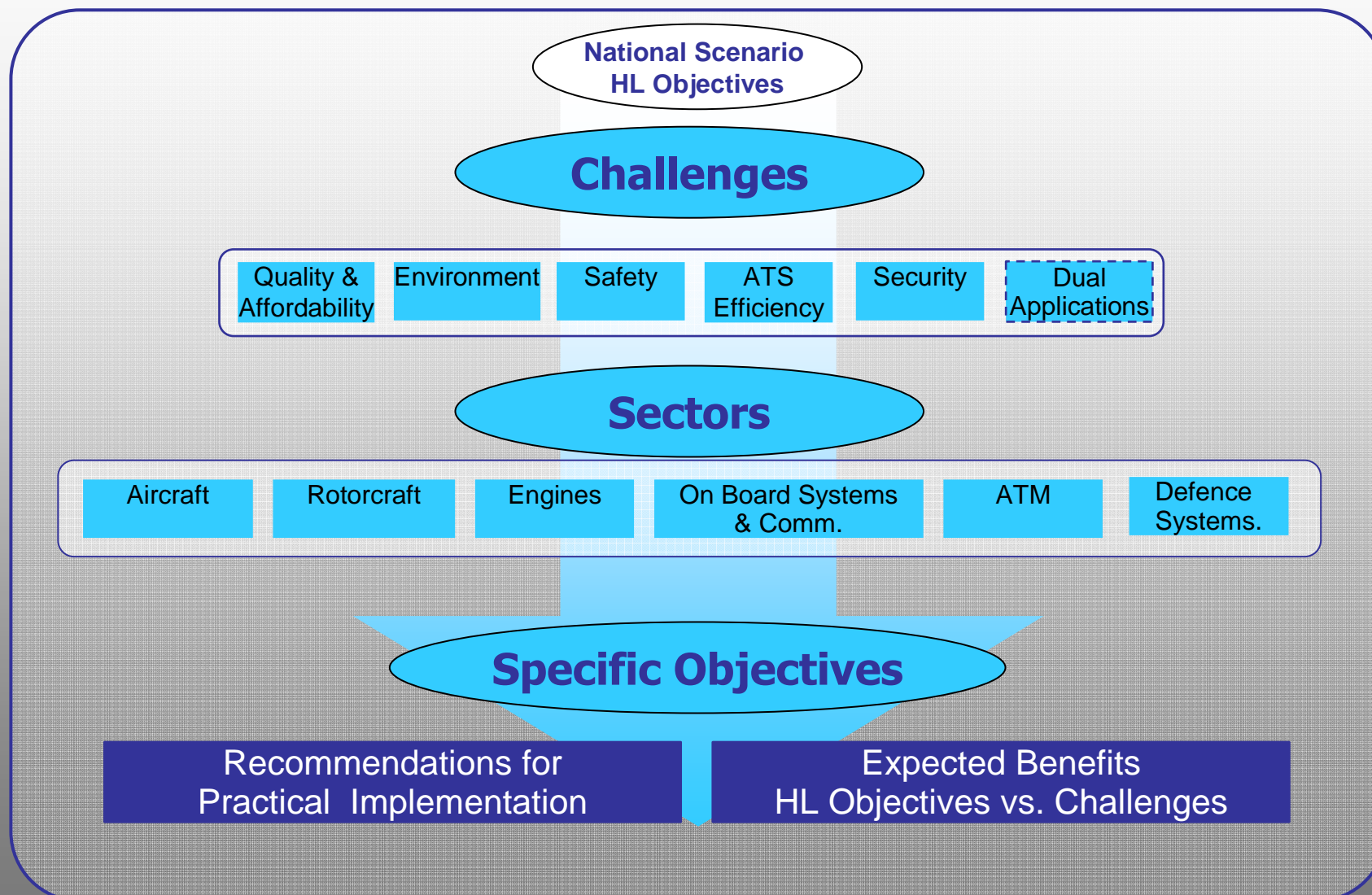| Fixed Wing	Rotorcraft	Engines	On Board Systems & Com.	ATM	Defence Systems

ACARE-Italia : Objectives

- **Adopt the ACARE approach and turn SRA1 and SRA2 into practice at a National level.**

- **Define a holistic approach to allow the coordination of the Italian R&TD efforts accordingly to the European scenario.**

- **Provide a National "VISION", based on "Vision 2020" challenges, which takes into account specific needs of the Italian aeronautical sector.**

- **Provide a National SRA defining a technology roadmap and the enabling conditions.**

- **Advice Ministries to define a specific National R&TD Programme for Aeronautics.**

- **Monitor the development of the National SRA.**
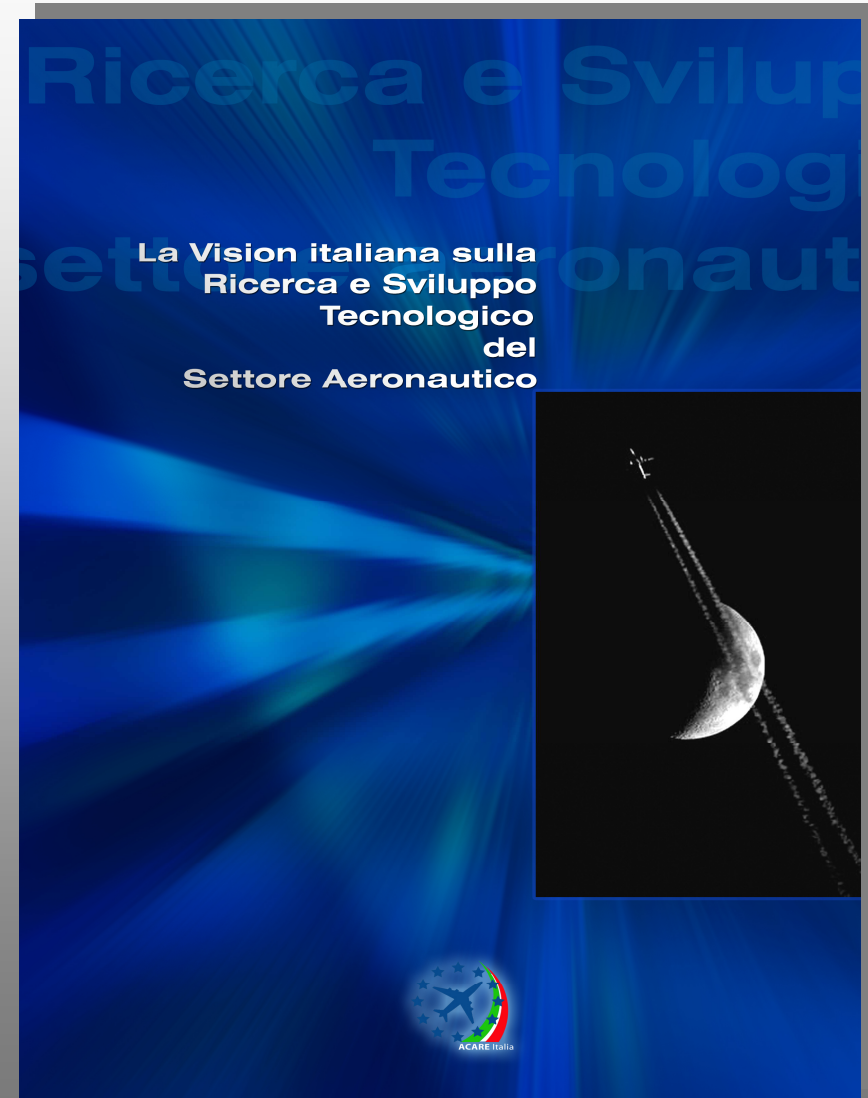
ACARE-Italia : Status of Activities

National Scenario

ACARE-Italia provided → **National Vision**

Quality & Affordability	Environment	Safety	ATS Efficiency	Security	Dual Applications

ACARE-Italia provided → **National SRA**

ACARE-Italia will advice + monitor → PNRA – R&TD

Enabling Conditions ← **ACARE-Italia will advice and monitor**

ACARE-Italia will set-up → Observation Platform

Attainment of National TLO

Italian VISION

National Scenario
HL Objectives

Challenges

Quality & Affordability	Environment	Safety	ATS Efficiency	Security	Dual Applications

Sectors

Aircraft	Rotorcraft	Engines	On Board Systems & Comm.	ATM	Defence Systems.

Specific Objectives

Recommendations for Practical Implementation	Expected Benefits HL Objectives vs. Challenges

Italian VISION

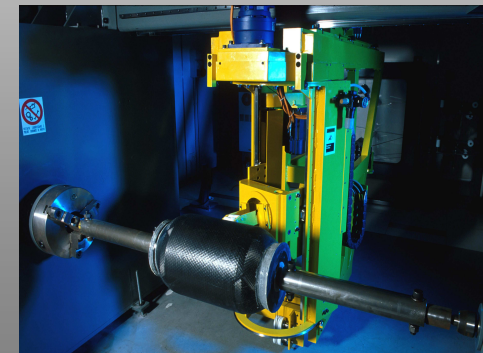## NATIONAL HIGH LEVEL OBJECTIVES

- **Increase competitiveness, positioning and occupational levels of the aeronautical sector.**

- **Consolidate and extend *leadership* in areas of excellence.**

- **Increase R&TD activities and widen the *High-Tech* fall-out.**

- **Improve the quality of the R&TD National system and involve all relevant players.**

La Vision italiana sulla
Ricerca e Sviluppo
Tecnologico
del
Settore Aeronautico

Italian VISION: Specific Objectives

FIXED WING AIRCRAFT

- **Keep up state of the art for the following capabilities: design the complete aircraft; perform aircraft system integration.**

- **Push beyond state of the art the engineering capabilities for aerostructures in order to achieve innovative products and materials.**

- **Develop, validate and integrate technologies for autonomous flight.**

- **Achieve a primary role for military transport and trainers.**
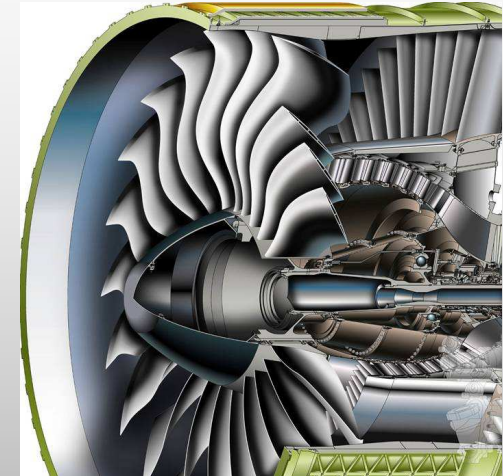
Italian VISION: Specific Objectives

ROTORCRAFT

- **Keep up competitiveness in the world wide market for light class helicopters.**

- **Sustain leadership and co-leadership in the world wide market for medium class helicopters.**

- **Create a market for tilt-rotor type of aircraft.**

- **Participate to joint ventures for the development of heavy class helicopters.**

- **Develop capabilities to design and produce unmanned VTOL to be integrated in civil and dual application systems.**

Italian VISION: Specific Objectives

PROPULSION

- **Keep up state of the art in the field of transmissions, turbines and burners, space boosters and mechanical electronics .**

- **Develop smart technologies: sensors and intelligent monitoring systems with prognostic capabilities.**

- **Develop innovative propulsion systems: highly efficient, high specific power, low environmental impact, low operational cost.**

- **Develop design capabilities and tools to increase competitiveness and security, and to reduce development costs.**

Italian VISION: Specific Objectives

ON BOARD SYSTEMS and COMMUNICATIONS

- **Increase design and production capabilities in the following areas:**

  o **Avionics and on board systems: all weather operations, zero maintenance.**

  o **Communications: secure networks, interoperability, network centric communications.**

  o **Dual systems: electro-optical technologies, Laser systems (countermeasures, warnings, telemetry), guidance and control technologies,...**

  o **Sensors and systems: data acquisition, surveillance and situation awareness.**

Italian VISION: Specific Objectives

ATM and AIRPORTS

- **Sustain leadership for surveillance systems in ATM.**

- **Increase competitiveness of ATM systems based on highly automation, open architecture, advanced interoperability, SWIM&CDM.**

- **Support the development of new on board systems for cooperative ATM and More-Autonomous Aircraft concepts.**

- **Support the development of new digital comm. systems for innovative CNS/ATM.**

- **Develop innovative technologies to increase airport and aircraft security.**

Italian SRA

Specific Objectives
from Italian Vision

Technological Objectives and Developments

| Aircraft | Rotorcraft | Engines | On Board Comm. & Systems | ATM | Dual Applications |

Technology Roadmap

| Enabling Technologies | Demonstrators | Mapping Tech.s to SRA | Maturity levels | Priorities |

Enabling Conditions

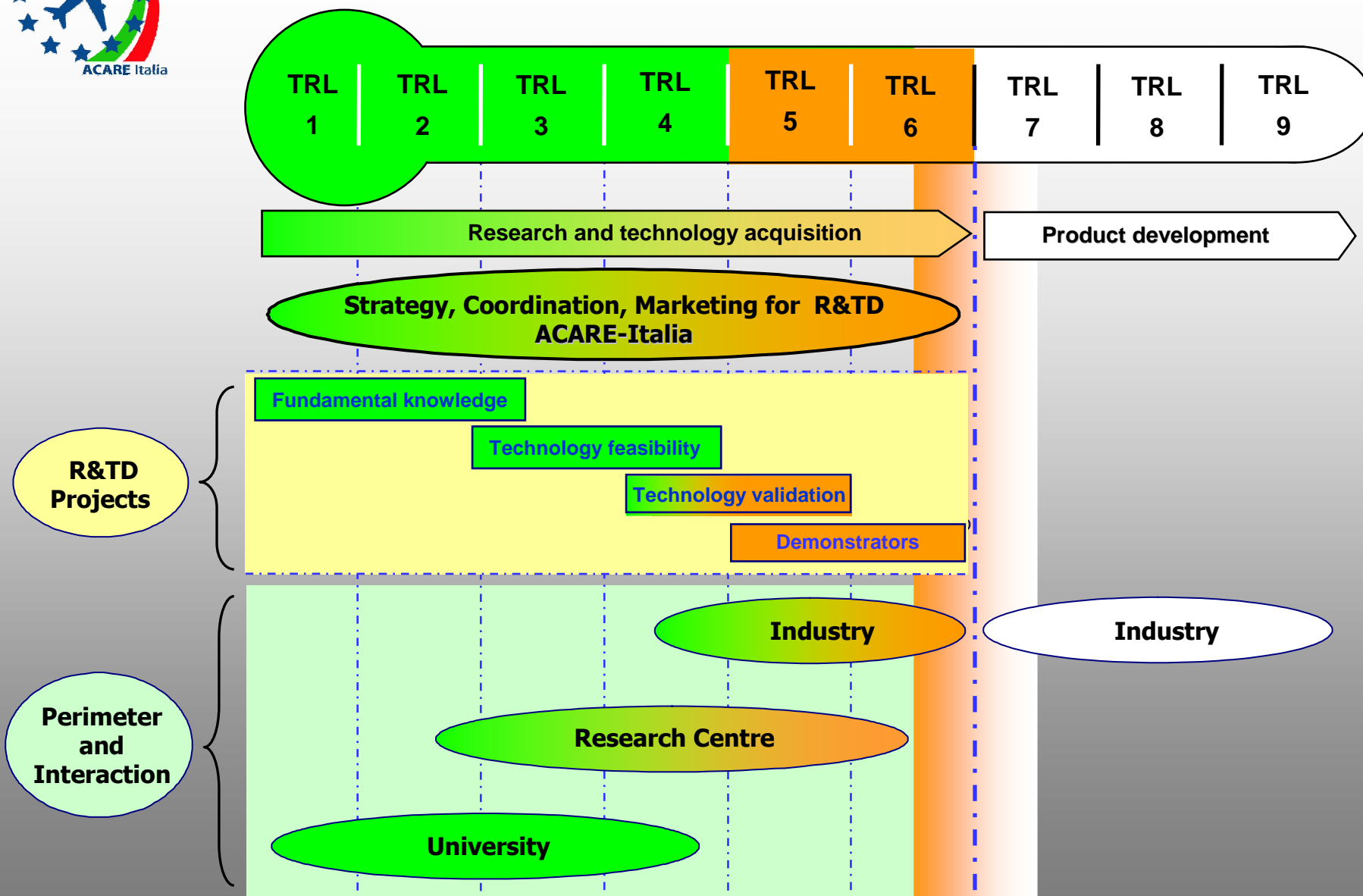| Facilities and Infrastructures | Education | Funding | Time Frame of Actions |

Expected Benefits

Italian SRA

| TRL 1 | TRL 2 | TRL 3 | TRL 4 | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9 |

Research and technology acquisition

Product development

Strategy, Coordination, Marketing for R&TD ACARE-Italia

R&TD Projects

Fundamental knowledge

Technology feasibility

Technology validation

Demonstrators

Perimeter and Interaction

Industry

Industry

Research Centre

University

Italian SRA: Enabling Technologies

Adoption of
ACARE Taxonomy

Sector leading developments

Mapping to SRA

Relevance to
Technological Objectives

National Technological Solutions

Taxonomy Area and Domain	Technology from SRA-2	Classification EU *	Technology for SRA-Italy	Classification It	Impact**			Technical Objectives					ATS Sector		
					2010	2015	2020	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	ATM	Airport	Aircraft
1. Flight physics															
101 Computational Fluid Dynamics	Optimised airframe design for high L/D cruise and low thrust approach	P	ZZZZ												X
			YYYY	K											

Italian SRA

Research Intensity to achieve Specific Objectives	FIXED WING	ROTORCRAFT	PROPULSION	ON BOARD SYSTEMS AND COMM.	ATM
FLIGHT PHYSICS	High	High			
AEROSTRUCTURES	High	High			
PROPULSION	Medium	Medium	High		
AVIONCS, SYSTEMS and EQUIPMENTS	High	High	Low	High	High
FLIGHT MECHANICS	Medium	High		Medium	Medium
INTEGRATED DESIGN AND VALIDATION	High	High	High	Low	High
ATM	Low	Low		High	High
AIRPORTS		Low		Medium	High
HUMAN FACTORS	Medium	Low			Medium
INNOVATIVE CONCEPTS AND SCENARIOS	High	Medium	High		High
DUAL APPLICATIONS	High	High	Medium	High	

Legend:
- Green = Low
- Yellow = Medium
- Red = High

Italian SRA

EXPECTED BENEFITS (Example for one Sector)

	CHALLENGES					
SPECIFIC OBJECTIVES	**COMPETITIVENESS**	**ENVIRONMENT**	**SAFETY**	**ATS EFFICIENCY**	**SECURITY**	**DUAL APPLICATIONS**
Integrated design of rotors and mechanical systems	✸		✸			✸
New design criteria and integrated production of innovative materials	✸	✸				
Innovative Configurations	✸			✸	✸	✸
Reduction of environmental impact		✸		✸		✸
Integration of on board systems and innovative avionics			✸	✸	✸	✸
Integration of VTOL in civil air traffic management	✸			✸		✸

Italian SRA

ENABLING CONDITIONS

- **Disseminate the national strategy for aeronautics.**

- **Optimise the use of resources.**

- **Create a system of infrastructures.**

- **Create a new generation of researchers through a proactive interaction with National Universities.**

- **Invest into R&TD to increase competitiveness.**

CONCLUSIONS

- **ACARE-Italia has adopted the European approach and is turning SRAs into actions.**

- **National "VISION" and "SRA" have been prepared to allow the coordination of the Italian R&TD efforts accordingly to the European scenario.**

- **In the Italian SRA a technology Roadmap and the enabling conditions are delivered.**

- **National workshops to disseminate European and National SRAs are being promoted.**