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A Finmeccanica Company

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## **Tecnologie prioritarie per l'Aeronautica Bergamo, Alenia Aermacchi**

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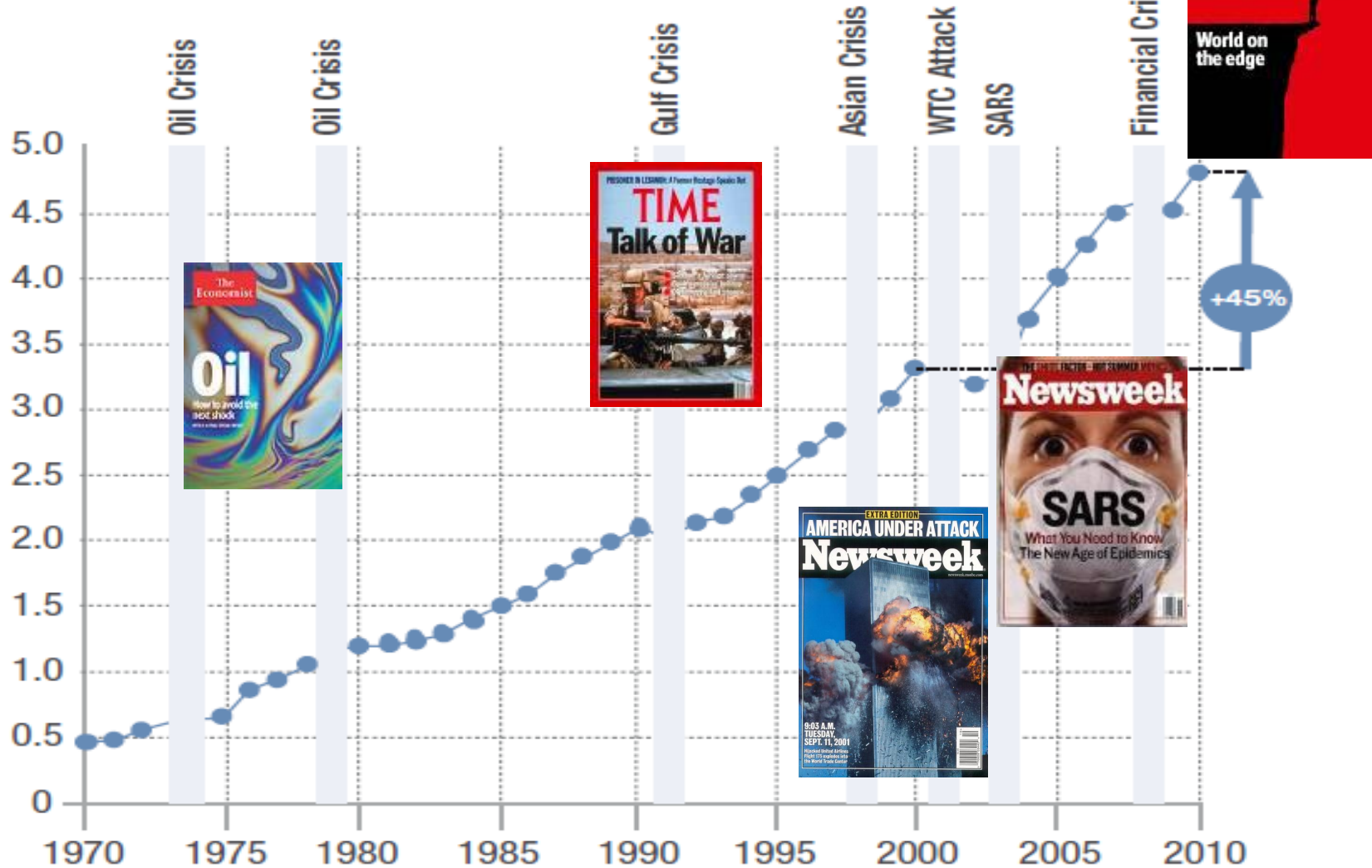
**Salvatore Grimaldi**



## Profilo di settore

Global relevance events & Legislation change

World annual traffic (RPKs - trillions)



Source: ICAO, Airbus





*Globalization*

Low Cost Communication  
Low Cost Countries



**Competitive Scenario**



*New Comers*

Russia & Asia Growth  
Brazil Growth

Less Military Expenses  
Growing Operative Costs

Fast Technology Evolution  
Huge R&D Investment



**Panic?**

*Economic Crisis &  
Oil Price Growth*

*R&D Cost*

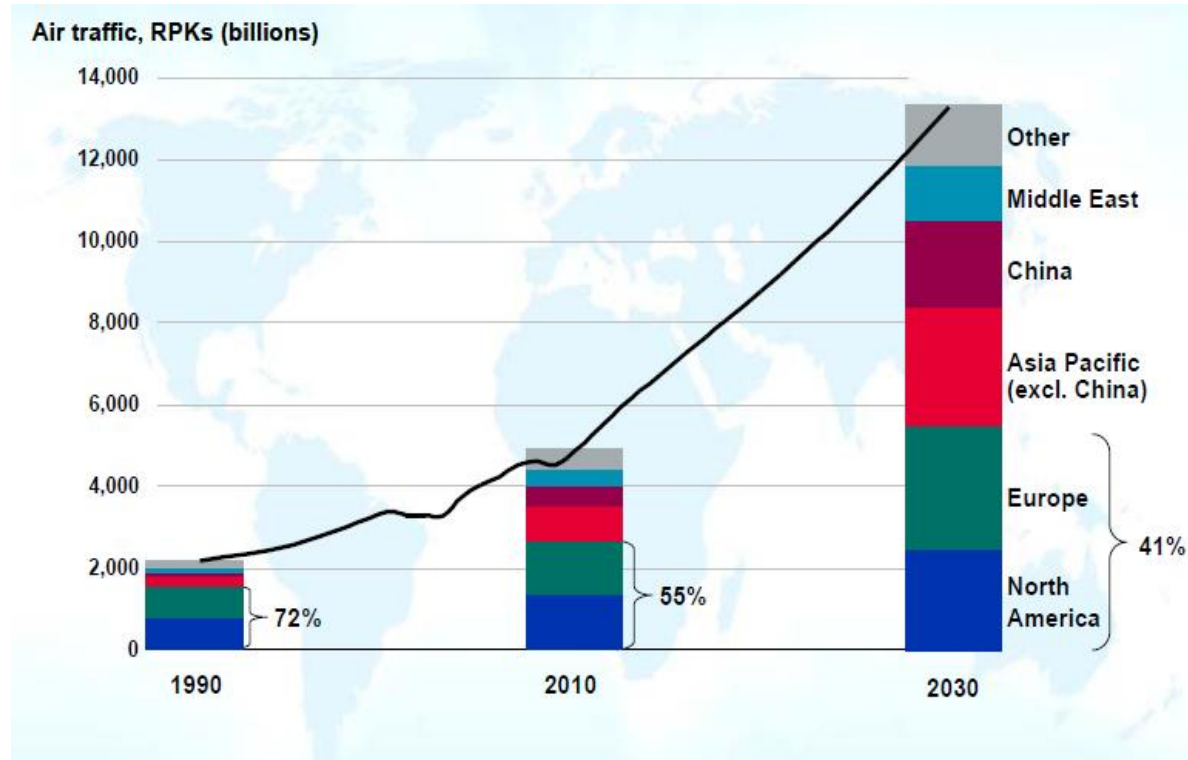


Civil Market Structure Evolution

# Civil Market: Air traffic shifts toward Far East

High GDP growth

High Population growth



New Airplanes 2011-30  
33.500



Military Scenario Evolution

# Military Market: Paradigm Change

**Conventional Warfare**

**Irregular Warfare**

**ISR**

**Urban Warfare**

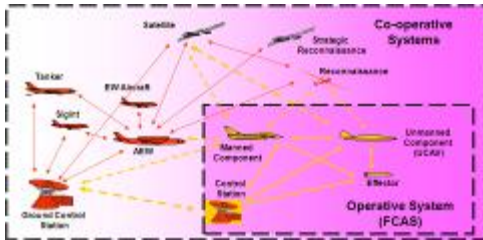
**Police**

**Humanitarian**

**Border Control**

*New Mission Profile*

*Dual Roles*



**Robust Comms (C4ISR)**

**Interoperability**

**Flexible Logistics**

**Less Units  
More Unit Value**

**Affordability**

*New Paradigm*

**High National Deficits**

**Budget Defense  
Reduction**

# Military Market: Paradigm Change

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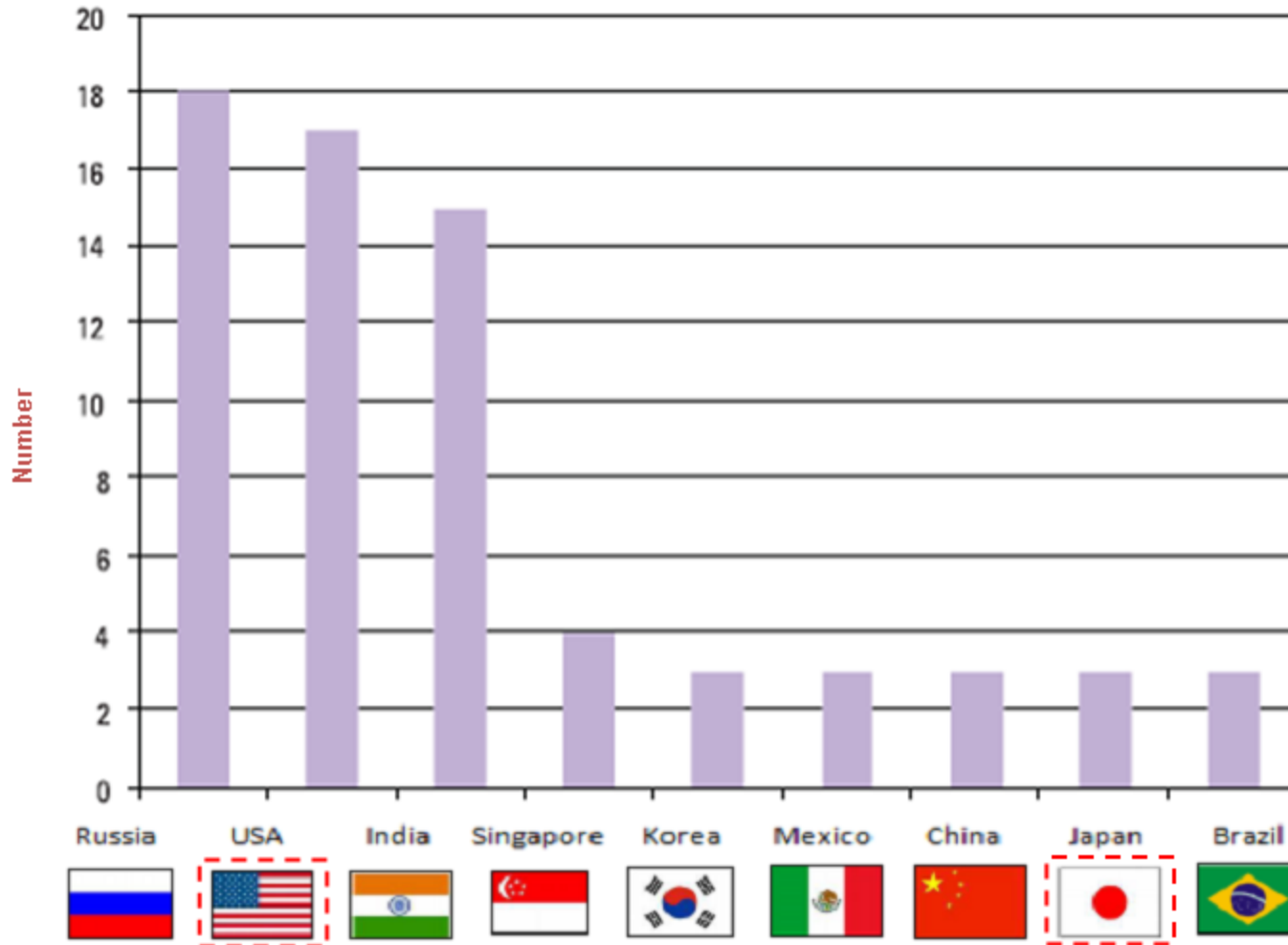
*New Paradigm*

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## Industrial Structure Evolution

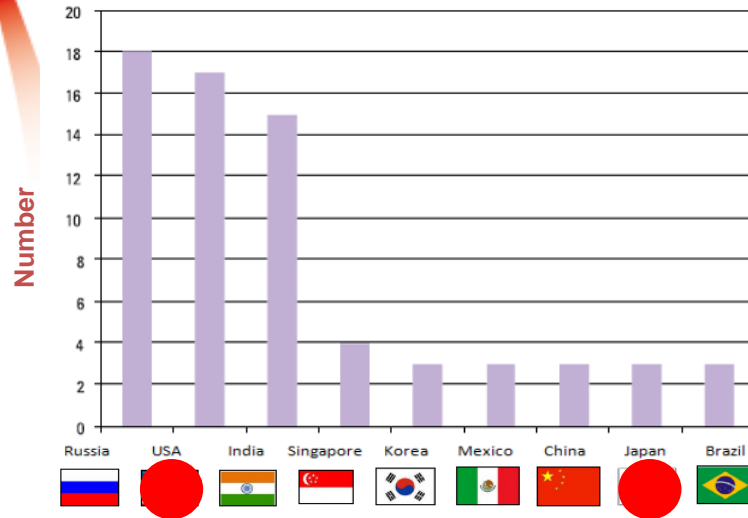
## Major R&D and Engineering Investment 1990-2009\*\*



\* Includes joint ventures and organic investments for 121 largest OEMs; excludes acquisitions  
 \*\* 2009 data is as at 31 August 2009

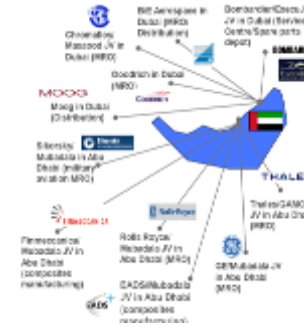
Source: AeroStrategy

## Major R&D and Engineering Investment 1990-2009\*\*



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\*\* 2009 data is as at 31 August 2009

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**Newcomers strengths**

**High Industrial Growth**  
(Manufacturing, R&D, Know How)

**High Internal Market**

**Strong Financial Capability**

**Strong Political Support**

**Low Labor Cost**

**R&D, Know How and Manufacturing as offset for western aircrafts**

**High Risk for low technology intensive & traditional tech. based activities**

**Maintain the Technology & Innovation gap open**

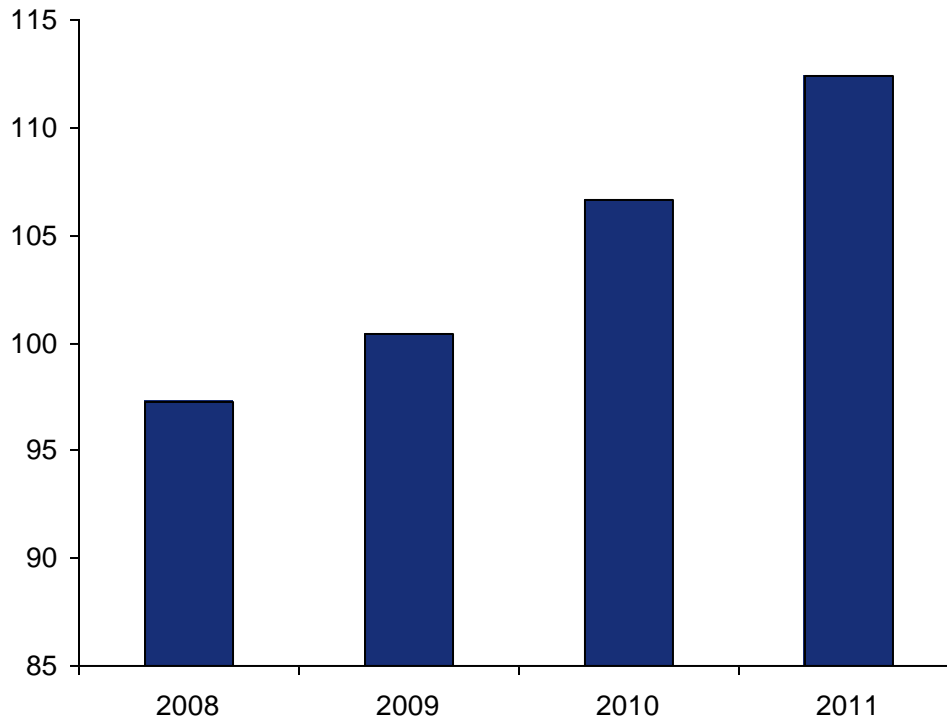
**Review the Business model (and related Technology & Innovation)**



L'Industria aeronautica Europea ed Italiana

**112,4b€ ricavi\***

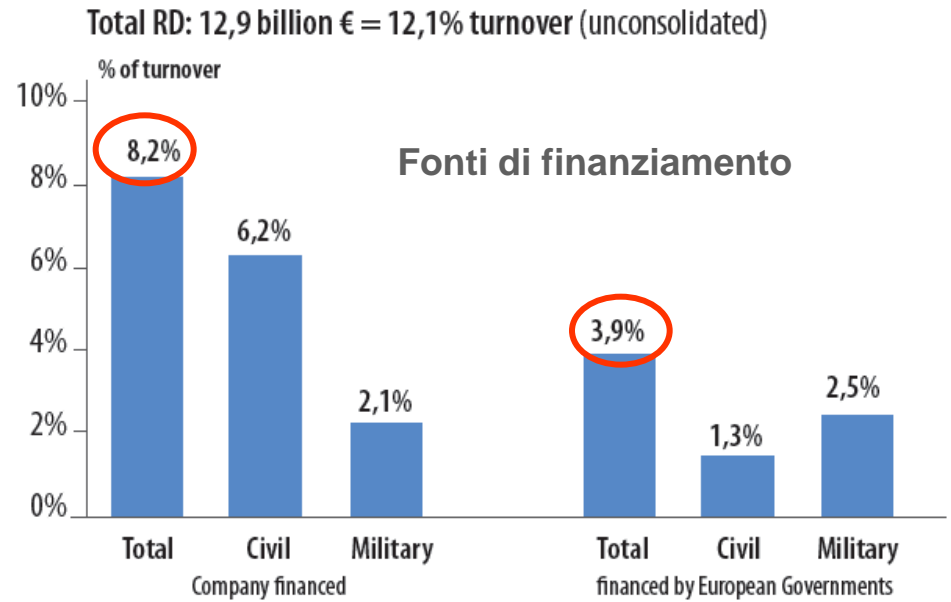
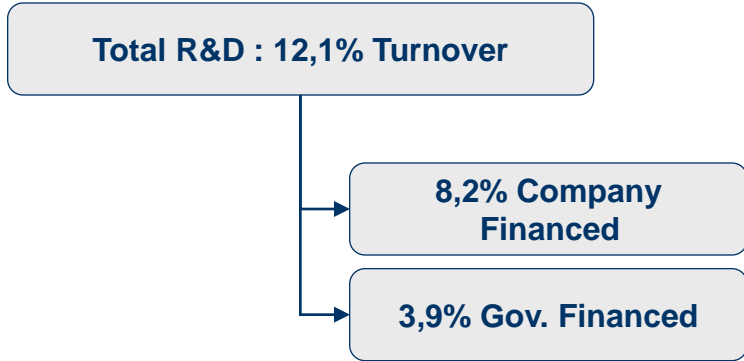
**~500.000 persone impiegate in attività dirette**



Revenue Aeronautics (Civil+Military)

© Alk



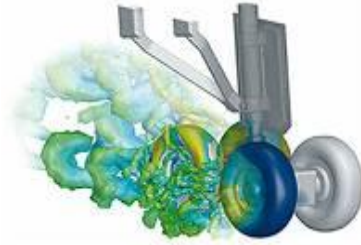


Source: ASD

# La realtà industriale italiana per l'aeronautica



**Tactical Transport**



**General System**



**Regional**



**Helicopter**



**Engine**

**L'industria aeronautica italiana  
rappresenta l'8% di quella europea\***

**Aerostructures  
& Nacelles**



**Fighter, Trainer  
& UAV**



**Air Traffic Mgmt**



**Avionic Equipment**



**Business & General Aviation**



**Gruppo di Lavoro**

**Competenze industriali del Gruppo di Lavoro**

**CS Centro Sviluppo Materiali S.p.A.**  
Research & Development for your competitiveness



**AgustaWestland**

**AleniaAermacchi**

**Avio**  
propulsione aerospaziale

**SELEX ELSAG**

**SELEX GALILEO**

**SELEX Sistemi Integrati**



Research Centers

System Integrators

Aerostructure

Engine

Avionic Equipment

Air Traffic Management

Engine Materials & Components

Materials

Aerospace

Fixed Wing

Helicopter



## Le Tecnologie Prioritarie

## Nuovi Materiali



## Riduzione dell'impatto ambientale



## Simulazione per la progettazione integrata



## Autonomia Operativa



## Avionica Avanzata e HMI



## Sistema ATM avanzato



**Advisory Council for Aeronautics Research in Europe (ACARE)**, è composto da rappresentanti di tutti gli stakeholder europei del sistema del trasporto aereo



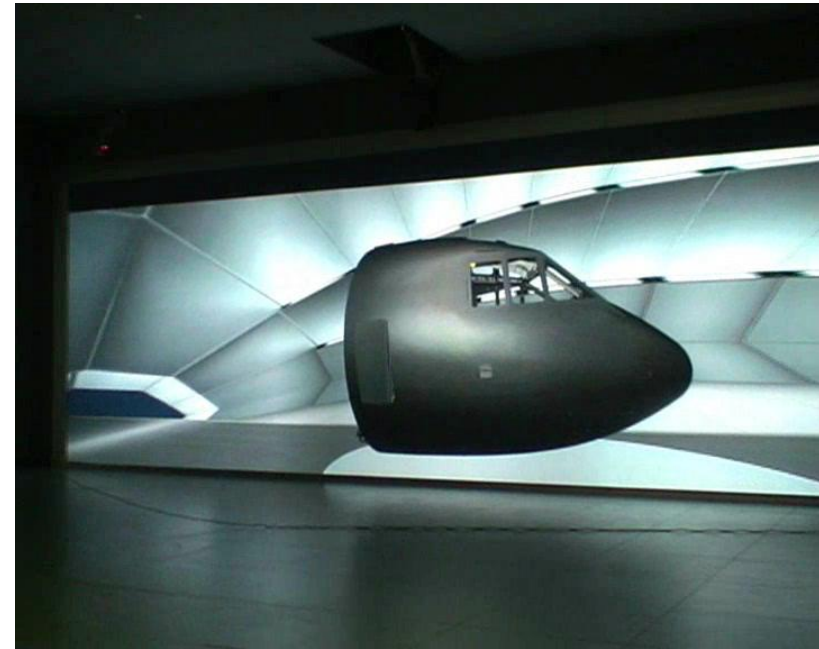
**Advisory Council for Aeronautics Research IT (ACARE)**, è composto da rappresentanti dagli stakeholder italiani del sistema del trasporto aereo

## Virtualizzazione, prototipizzazione virtuale ed ottimizzazione multidisciplinare del velivolo

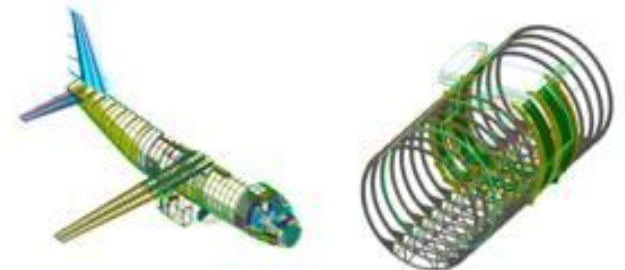
- Virtual Product
- Virtual Engineering & Testing
- Virtual Manufacturing
- Virtual Utilization

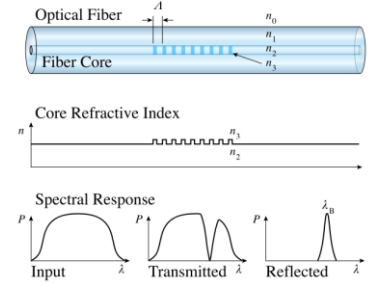
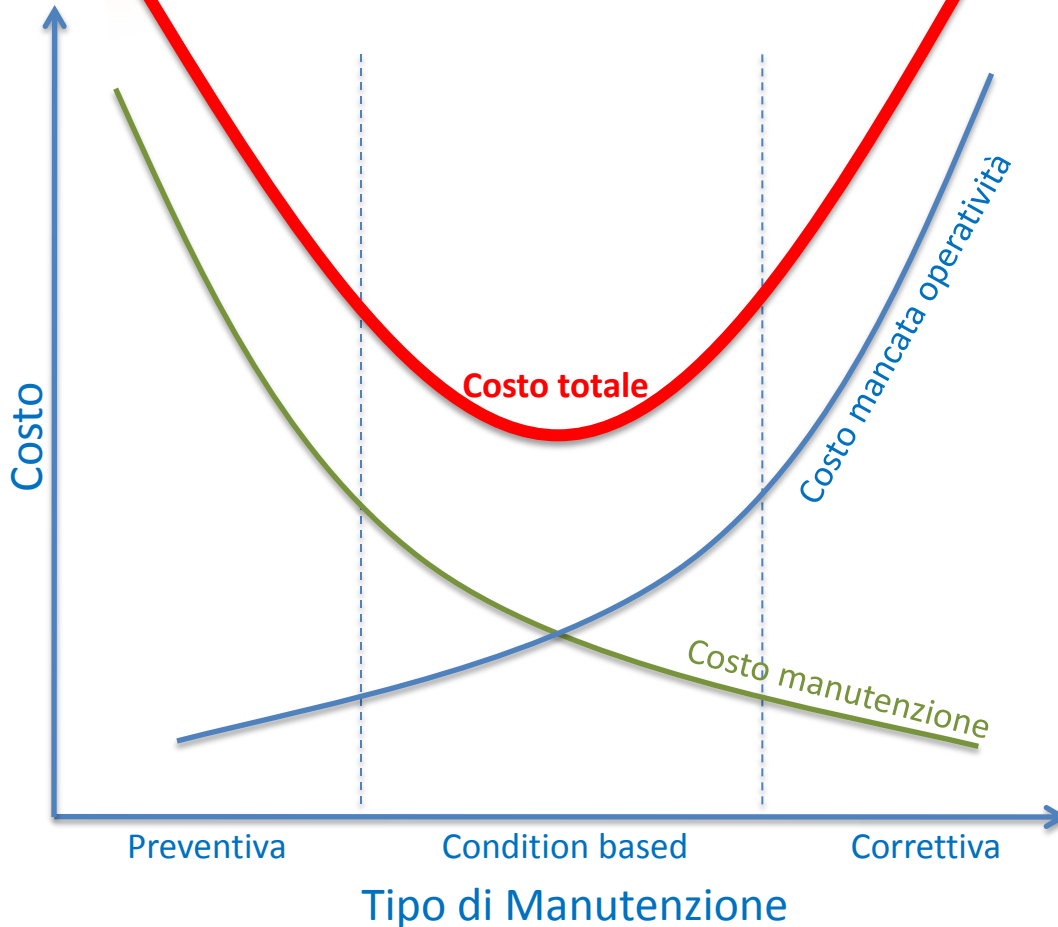
## Metodologie di simulazione e ottimizzazione multidisciplinare per lo sviluppo di propulsori innovativi

- Progettazione multidisciplinare ottimizzata
  - Virtual Testing & Certification
  - Virtual Manufacturing
- Stima fonti di incertezza e minimizzazione impatto



## Sistemi di simulazione e virtualizzazione per sviluppo, validazione e qualificazione integrate





**Advisory Generation**

**Prognostic Assessment**

**Health Assessment**

**State Detection**

**Data Manipulation**

**Data acquisition**



Un ringraziamento particolare ai membri del Gruppo di Lavoro:

- Marcello Amato - CIRA
- Alessandro Garibbo – Selex Elsag
- Michele Di Foggia – EMA
- Enzo Giaquinto – Selex SI
- Marco Falzetti - CSM
- Michele Arra – Agusta Westland
- Paolo Trinchieri – Avio
- Giovanni Cocca - Selex Galileo
- Simone Vezzù – Veneto Nanotech
- Antonella Rizzo – Enea
- Aniello Cozzolino – Piaggio Aeroindustries
  
- Coordinatore: Salvatore Grimaldi – Alenia Aermacchi

***Grazie per l'attenzione***

***It is possible to fly without motors, but not without knowledge and skill.***

*Wilbur Wright*

**Salvatore Grimaldi**  
**Innovation and R&D Strategy**

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