Developing the future Air Traffic Management System

F. GUILLERMET

Chief Programme Officer

founding members

EUROPEAN COMMISSION

EUROCONTROL

INTRODUCTION

AIR TRAFFIC MANAGEMENT IN EUROPE

THE CHALLENGE OF GROWTH

SESAR, A PUBLIC PRIVATE PARTNERSHIP

ENGINEERING THE FUTURE SYSTEM

Lessons Learnt


AIR TRAFFIC MANAGEMENT IN EUROPE
A COMPLEX SYSTEM

SESAR
JOINT UNDERTAKING

Air Traffic Management is a set of services aiming primarily at ensuring the safety of the flights

SESAR
JOINT UNDERTAKING

Those services are provided by various ATM systems (people, process, technology) that separate aircraft, prevent collisions, organise and expedite the flows of traffic, and provide information.

SESAR
JOINT UNDERTAKING

In Europe those services are provided by more than 30 Providers, employing about 20000 controllers in 80 Control Centers, on 500 Airports, and managing daily 30000 flights

SESAR
JOINT UNDERTAKING

In the US those services are provided by 1 Provider, employing about 14000 controllers in 18 Control Centers, on 250 Airports, and managing daily 60000 flights

TRAFFIC MANAGEMENT - AIRBORNE

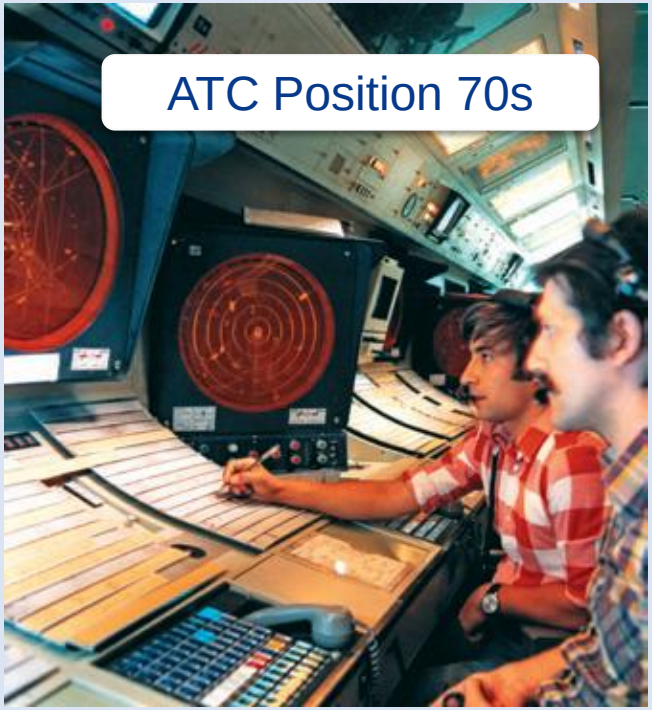
Cockpit 70s (B747)

- 3-4 Pilots & Navigation crew
- Analogic display
- Mechanical aircraft steering
- VHF Radio
- Autopilot

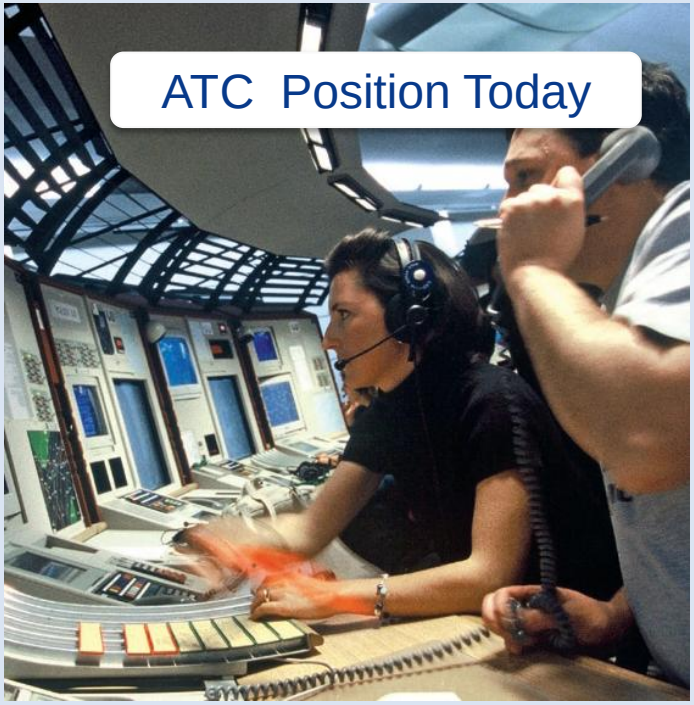
Cockpit Today (A380)

- 2 Pilots crew
- Digital & Head-Up Displays
- Fly by Wire & Single Cockpit Approach
- Satellite communication and data link
- Collision detection and avoidance systems
- Flight Management System

TRAFFIC MANAGEMENT - GROUND



- 2 Air Traffic Controllers
- Analogic display
- Paper strips
- Phone coordination
- VHF Radio Clearance
- National radar feed
- National Flow Management



- 2 Air Traffic Controllers
- Digital display
- Paper or electronic strips
- Phone coordination
- VHF Radio Clearance
- National radar feed
- European Flow Management

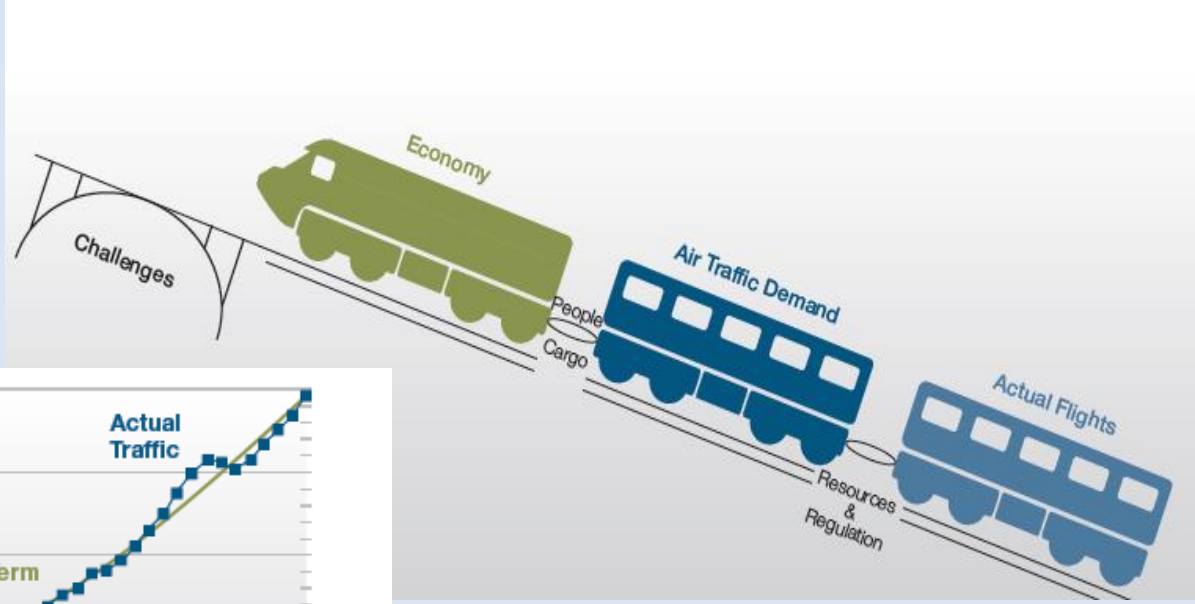
TRAFFIC MANAGEMENT

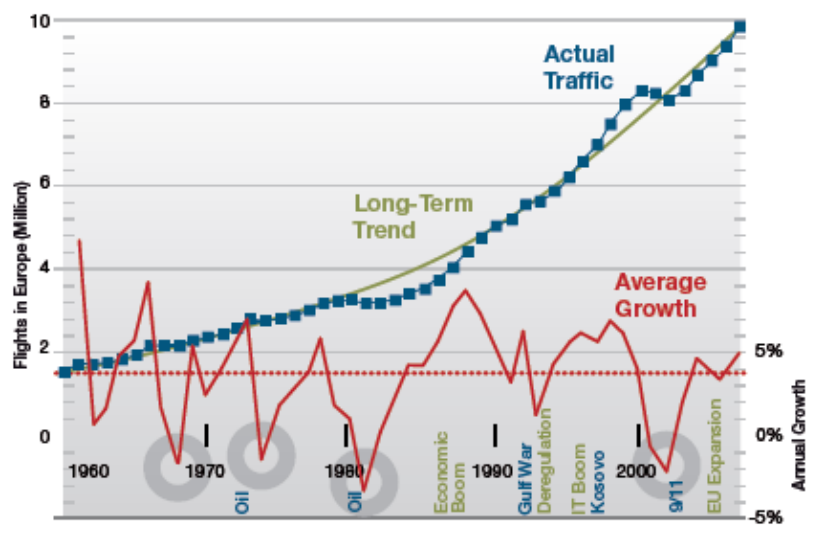
MAIN CHARACTERISTICS:

- 1970s Technologies
- High Fragmentation, poor interoperability
- Rather low level of automation


THE CHALLENGE
OF GROWTH
solutions
business plan

THE AIR TRANSPORT GROWING DEMAND





By 2030 Air Traffic will double in Europe

THE “DO NOTHING” SCENARIO

- Flight delays would go beyond 30 minutes/flight in western Europe leading to flights cancelation and missed connection
- 11% of total airlines demand would not be accommodated at all
- CO_2 emission per flight would increase due to longer routes and flight level constraints
- The relative proportion of ATM cost per flight would increase, jeopardising the Airlines productivity gains
- Any trade-off with the above would have a potential negative impact on Safety

SOCIETAL NEEDS

❑**Capacity:** **Air Traffic to double by 2030**
"The right to fly in modern societies"

"Air transport contributes to 2-3% of the GDP"

❑**Safety:** **Improvements linked to growth**
"No trade-off with Safety, no accident"

❑**Environment:** **Growth must be 'green'**
"Air transport's contribution to 3% of CO_2 emissions"

❑**Economics:** **Cost reduction**

"ATM costs represent 8-10% of airlines direct operating costs"

"The cost of ATM per flight remains steady while traffic increases"

"Close to 70% of Service Provider costs is manpower"

THE PROBLEM STATEMENT

Traffic growth cannot be sustained through the current fragmented air navigation services organisation and ageing ATM technologies

A new Air Traffic Management System is required, for the benefit of all
airlines, airports, aircraft manufacturers, air navigation service providers, military, public authorities, passengers & citizens

But none of the Air Transport actors can change things by himself!

THE EUROPEAN ANSWER

- The Governments of the 27 European States all signed up for the Single European Sky policy
- The Single European Sky ATM Research programme is the technological pillar of the Single European Sky
- Managed by a Public Private Partnership (SESAR Joint Undertaking), the programme is aiming at developping and validating in 8 years the technologies and procedures of the future ATM System

SESAR
JOINT UNDERTAKING


SESAR JOINT
UNDERTAKING

A Public Private Partnership at European scale

HOW DOES IT WORK?

#1

Set clear common

OBJECTIVES

THE SESAR GOALS

European Aviation **Current state**

- Traffic is increasing
- Basic technologies are obsolete
- European airspace cannot be further divided
- Operations conducted by national borders

Goals of the SESAR Programme

- Enabling EU skies to handle **3 times more traffic**
- **Improving safety** by a factor of 10
- **Reducing** the **environmental impact** per flight by 10%
- **Cutting ATM costs** by 50%

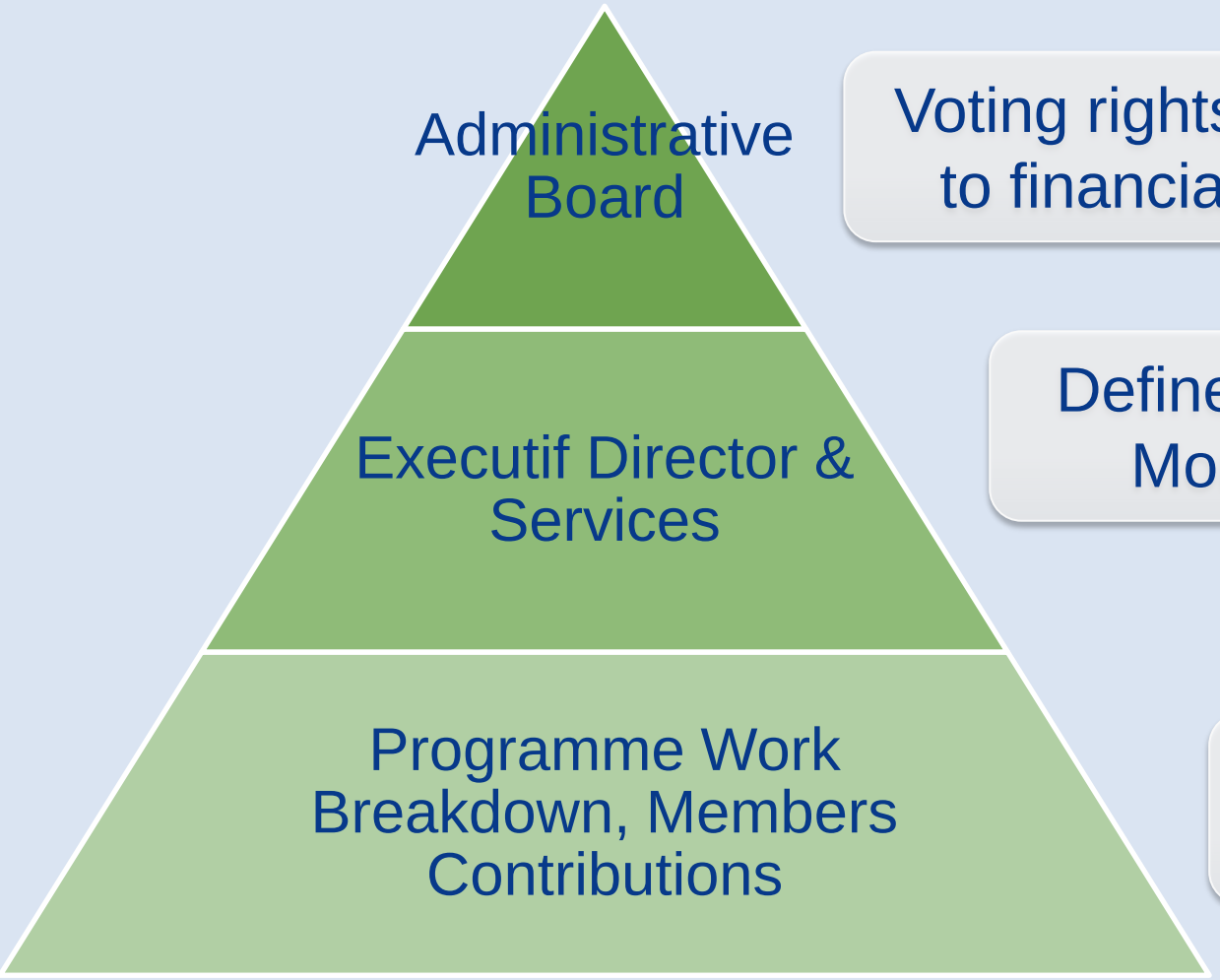
PERFORMANCE BASED APPROACH
MEETING SOCIETY'S GOALS

#2

Define the

GOVERNANCE

LEAN, SUBSIDIARITY AND ACCOUNTABILITY



Voting rights proportionate to financial contribution

Define Strategy, Procure, Monitor and Control

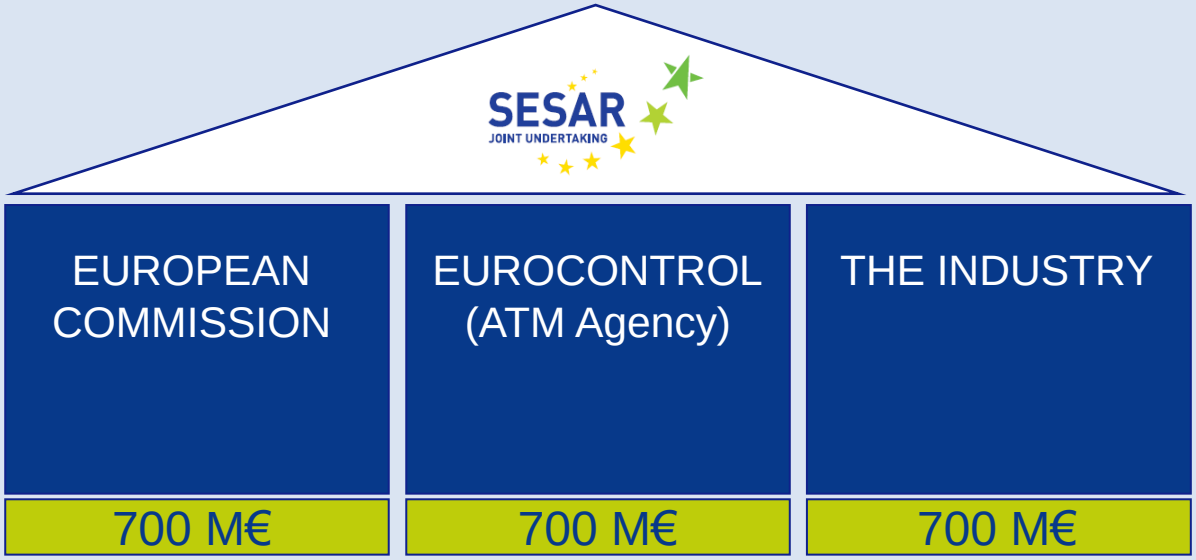
Manage and Execute

#3

Agree the

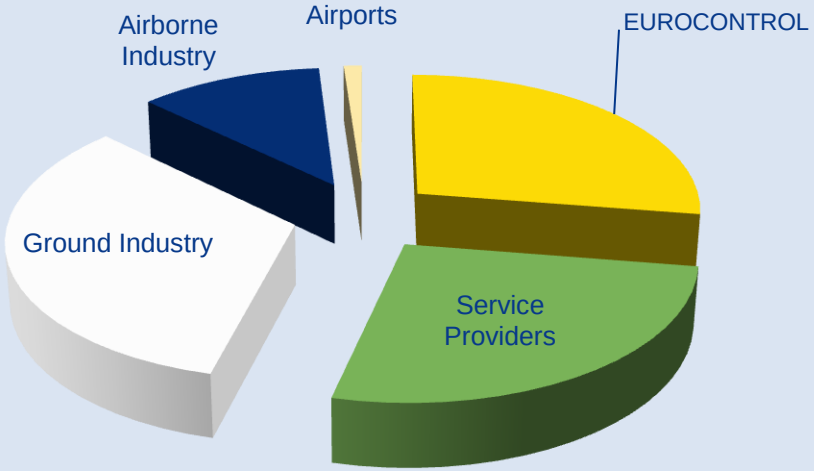
FINANCING

PUBLIC AND PRIVATE FUNDING

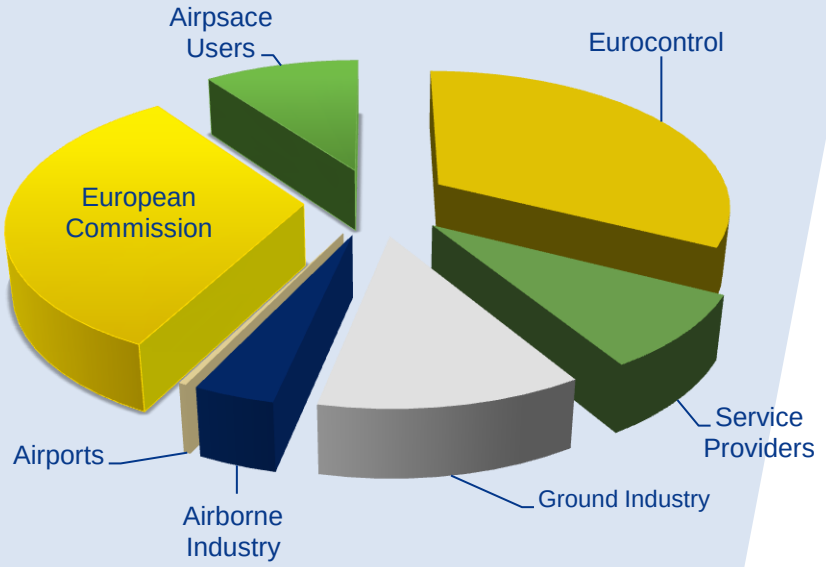


- **Budget: € 2.1 billion (over 8 years)**
- **Innovation from private sector**
- **Public financial stability & enforcement power**

16 MEMBRES PARTICIPATE TO THE PROGRAMME AND TO ITS MANAGEMENT



R&D BUDGET ALLOCATION



ADMINISTRATIVE BOARD

#4

Seal the membership through

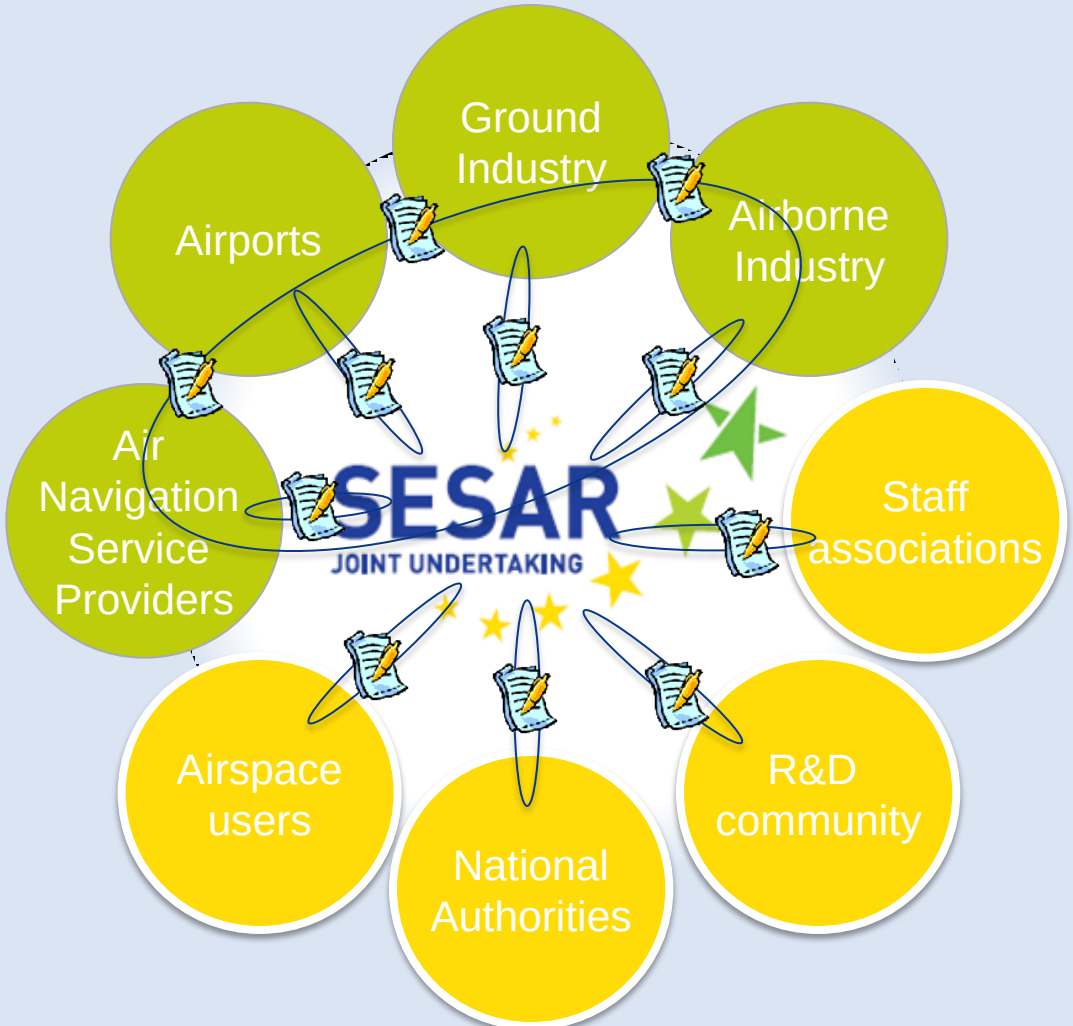
CONTRACTUAL AGREEMENTS

MUTUAL AND MULTILATERAL AGREEMENTS

- Rights and Obligations
- Liabilities
- Escalation
- Intellectual Property Rights
- Termination
- Programme Management

SESAR INVOLVES ALL ACTORS

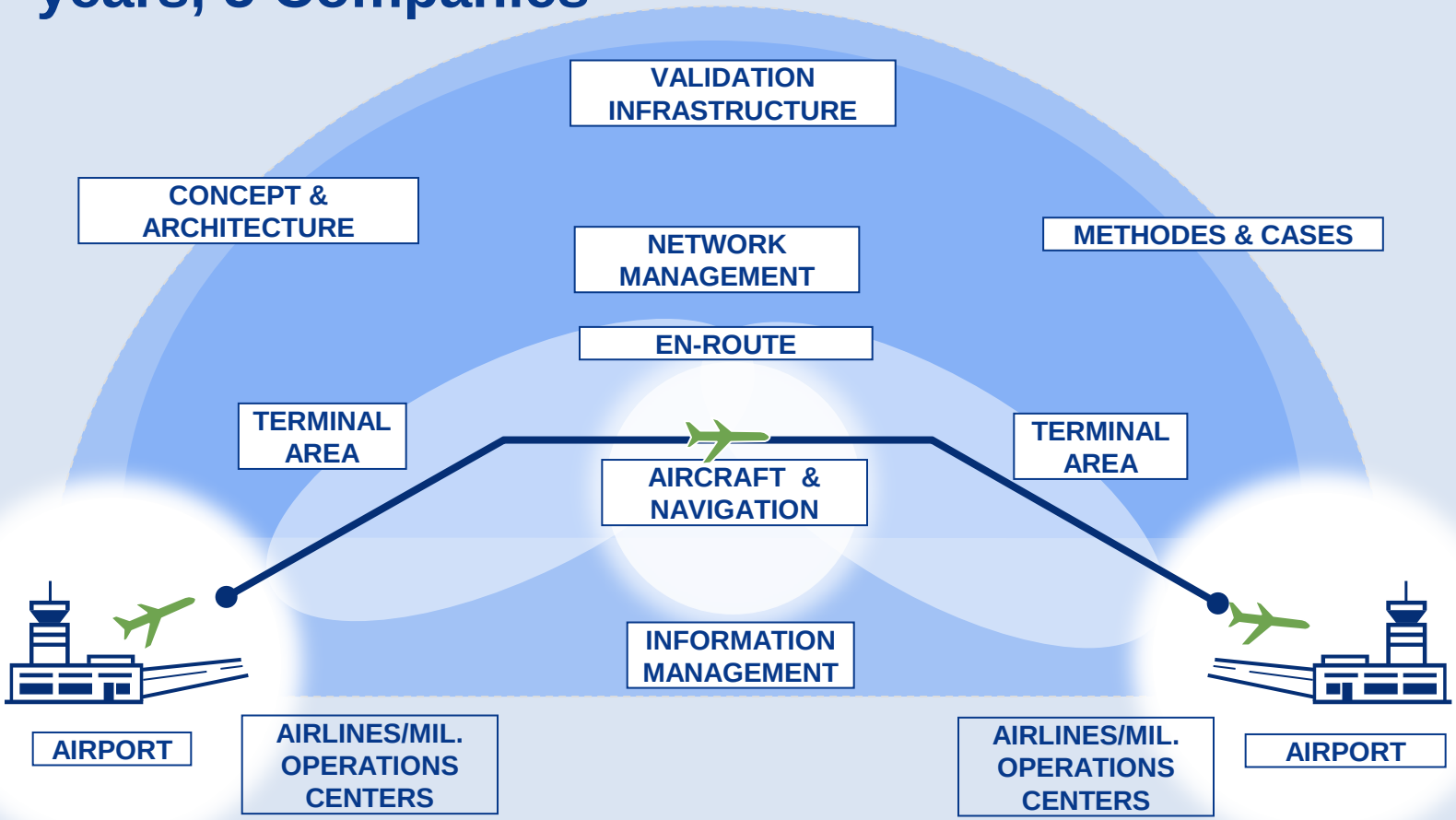
A Multi-Stakeholders approach at the heart of our way of working



ENGINEERING THE FUTURE SYSTEM

A PROGRAMME ORGANISED AROUND FLIGHT PHASES

- Activities Managed by Members (WP, projects...)
- More than 300 projects, typical Project: 7-10M€, 4 years, 5 Companies



FROM 0 TO 200 PROJECTS IN 1 YEAR

SIGNATURE OF AGREEMENTS MAY2009

03/06/09 Programme Launch Event

July 2009

400 contributors

20 projects launched

Septembre

Airline Operators join the Programme

December

1200 Contributors

May 2010

1500 Contributors

200 projects launched

Oct. 2010

2000+ Contributors

260 projects launched

First deliverables

300 projects, 2000 contributors

HOW DOES IT WORK?

#5

Show

LEADERSHIP

Our Vision

"By 2012 we have created the change in European ATM that demonstrates our ability to **deliver benefits** to the Air Transport community"

OBJECTIVES 2012

2 **10,000 flights**, are **SESAR labelled**

1 Initial 4D **trajectory** is **validated in an operational environment** supported by satellite-based technology

3 80% of SESAR projects have **tested** their output **in a real life environment**

#6

Have the right

PEOPLE

SUCCESS CRITERIA

Deliver tangible contributions to solutions (technology, procedures…), on time, on budget, and in line with end users expectations

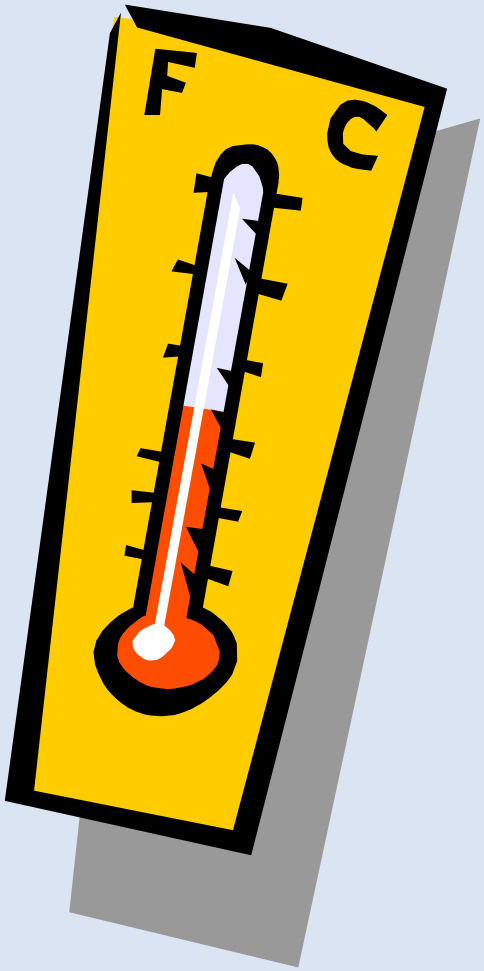
THE ROLE OF THE PROJECTS TEAMS IS ESSENTIAL

#7

Get the

FACTS

FACTS SPEAK BY THEMSELVES



MESURE MATURITY LEVEL

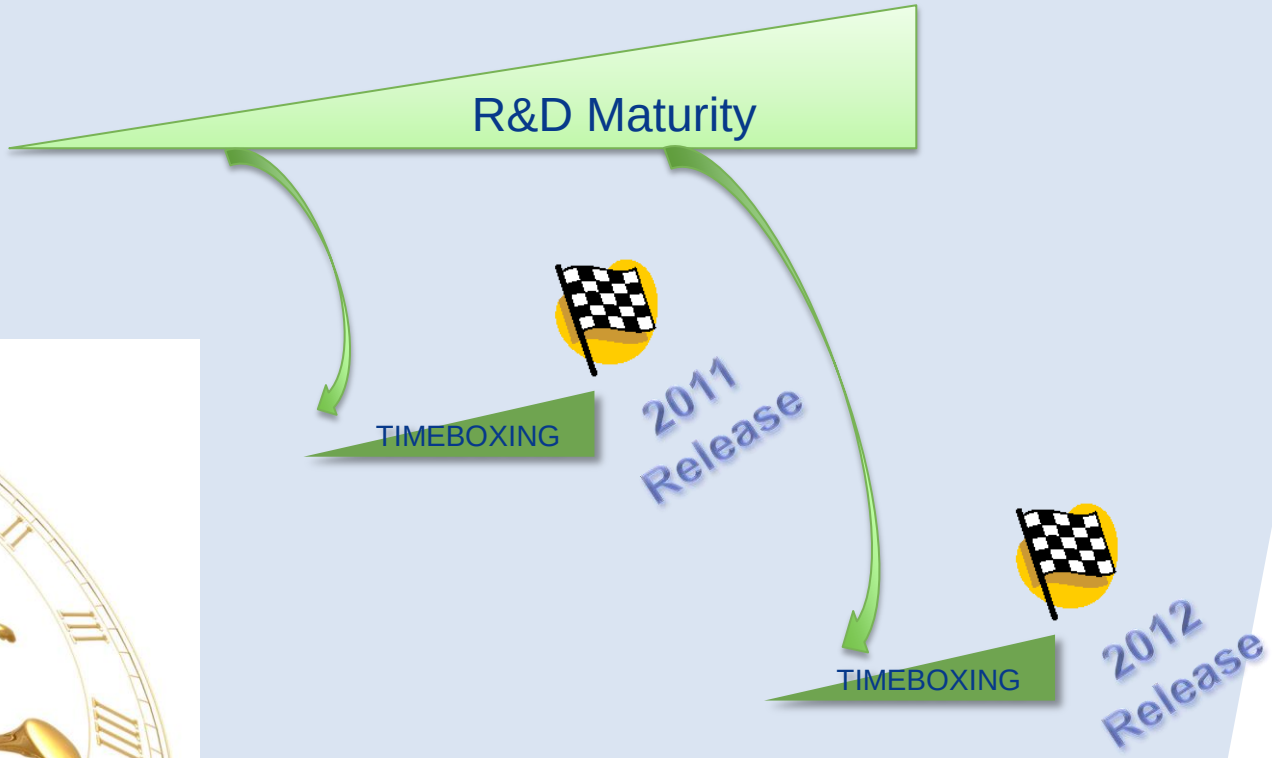
- ❑Proof of Concept
- ❑Prototyping
- ❑Validation
- ❑Ready for industrialisation

#8

Create

TENSION

OBJECTIVES HAVE TO BECOME TANGIBLE



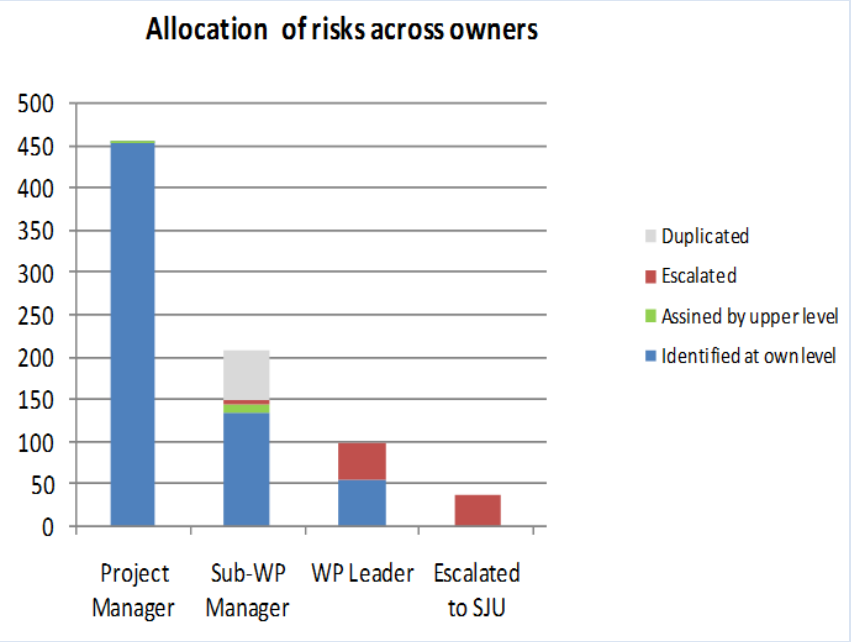
#9

Ensure proper

RISK MANAGEMENT

at all levels

SESAR ENTERPRISE RISK MANAGEMENT



- Definition of Maturity Targets

Likelihood				
	Lev. 4			2
	Lev. 3		1	7
	Lev. 2		12	3
	Lev. 1		1	1
		Lev. 1	Lev. 2	Lev. 3	Lev. 4
		Severity			

-Cost effectiveness Goal
- Info Mgt
-Investment for deployment

- Access & Equity Goal

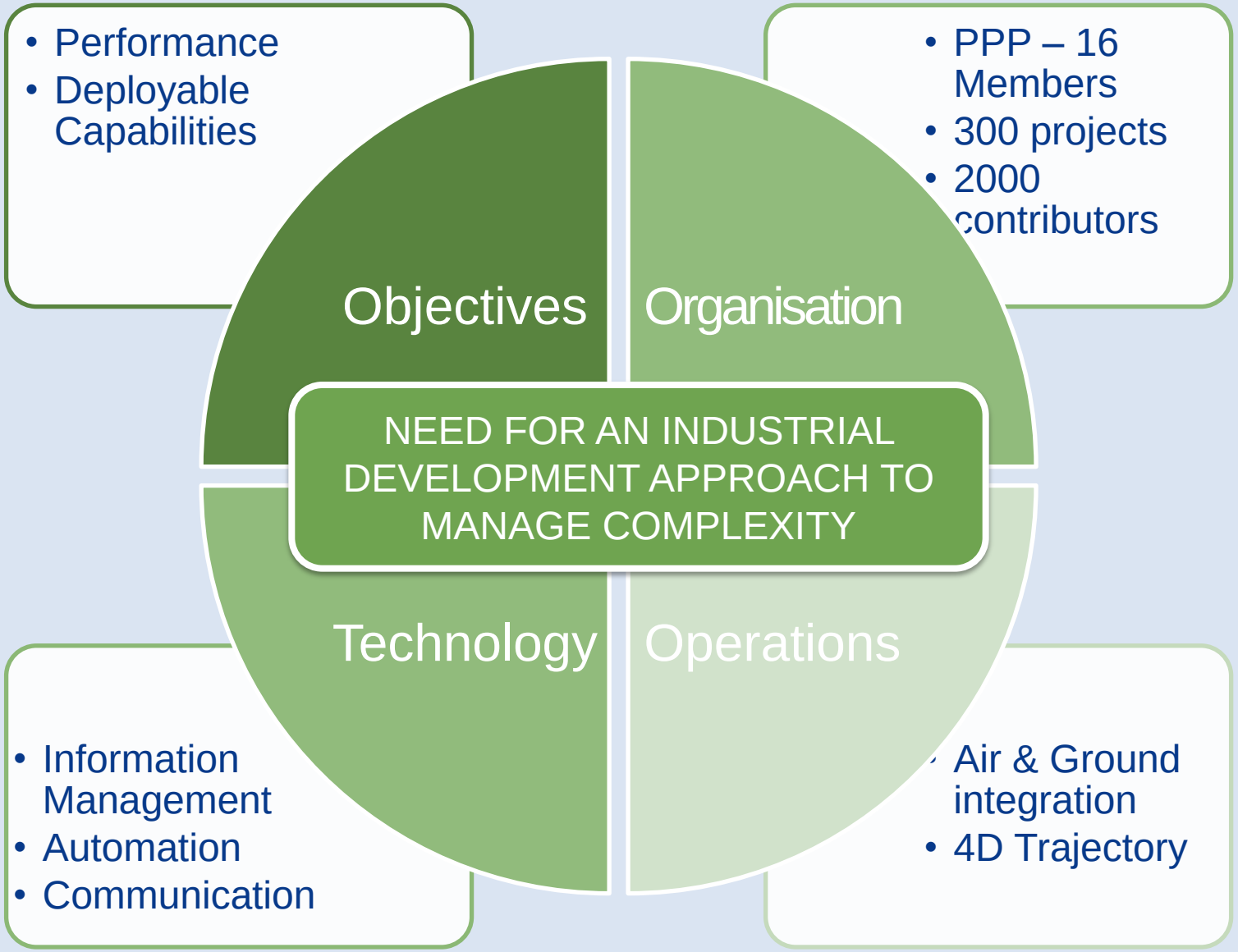
#10

Implement a common

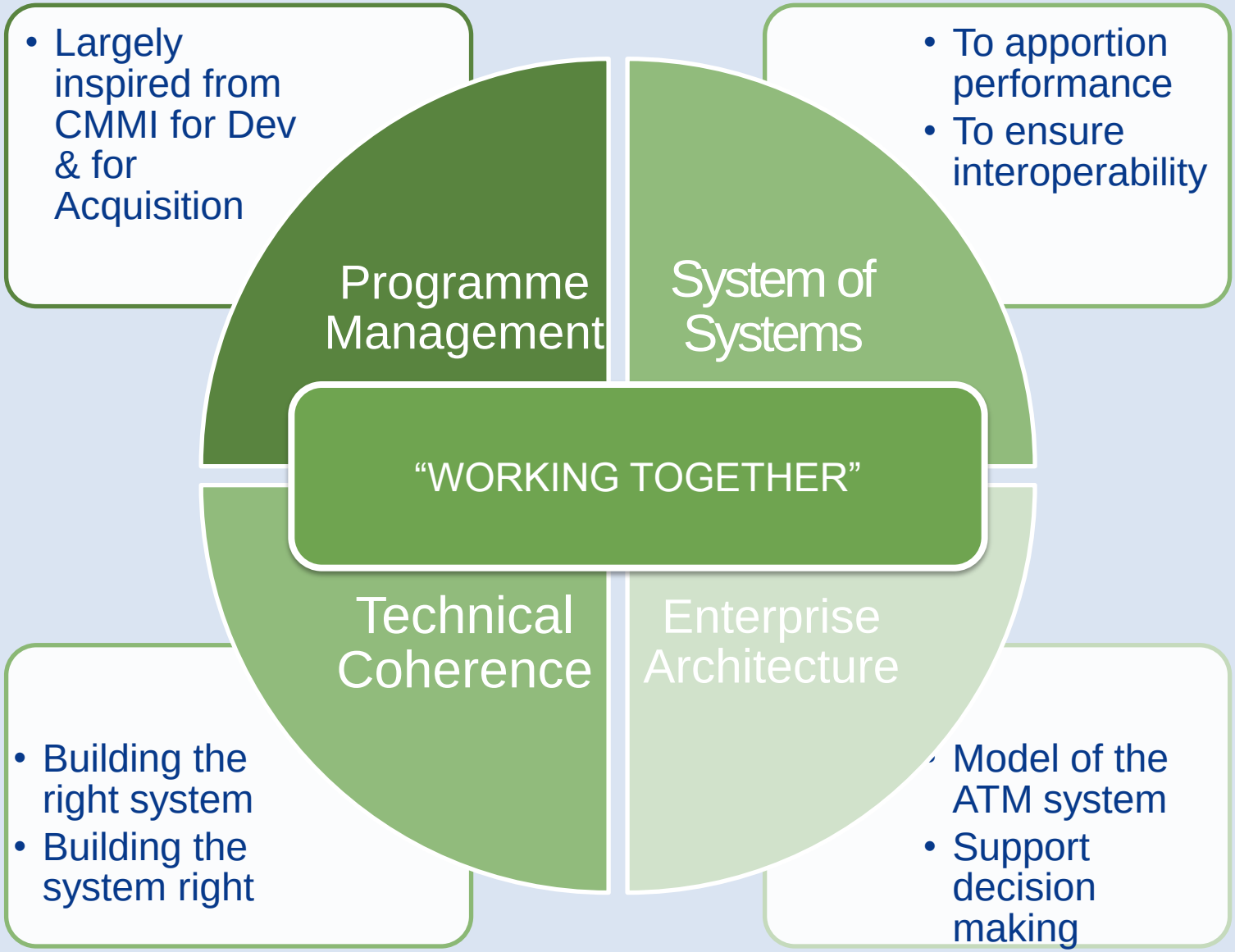
METHODOLOGY

to manage complexity

THE NEED FOR A STRONG METHODOLOGY



SESAR METHODOLOGY FRAMEWORK



KEY HIGHLIGHTS

OBJECTIVES

GOVERNANCE

FINANCING

CONTRACTUAL ARRANGEMENTS

LEADERSHIP

PEOPLE

FACTS

TENSION

RISK MANAGEMENT

METHODOLOGY


Thank you
for your attention
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