FROM INNOVATION TO SOLUTION

SESAR EDUCATIONAL WORKSHOP

ATC GLOBAL BEIJING

17 September 2014

SESAR
JOINT UNDERTAKING

founding members

EUROPEAN UNION   EUROCONTROL

FROM INNOVATION TO SOLUTION

SESAR RESEARCH & INNOVATION PROGRAMME

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SESAR Joint Undertaking

founding members

EUROPEAN UNION   EUROCONTROL

Why SESAR?

- European ATM - Essential component in air transport system (worth €8.4 billion/year*)

58.000 Employees*	**17.200** Air Traffic Controllers*	**11.5** million km² of airspace*	**63** En route centres*

- Complex infrastructure = Inefficiencies

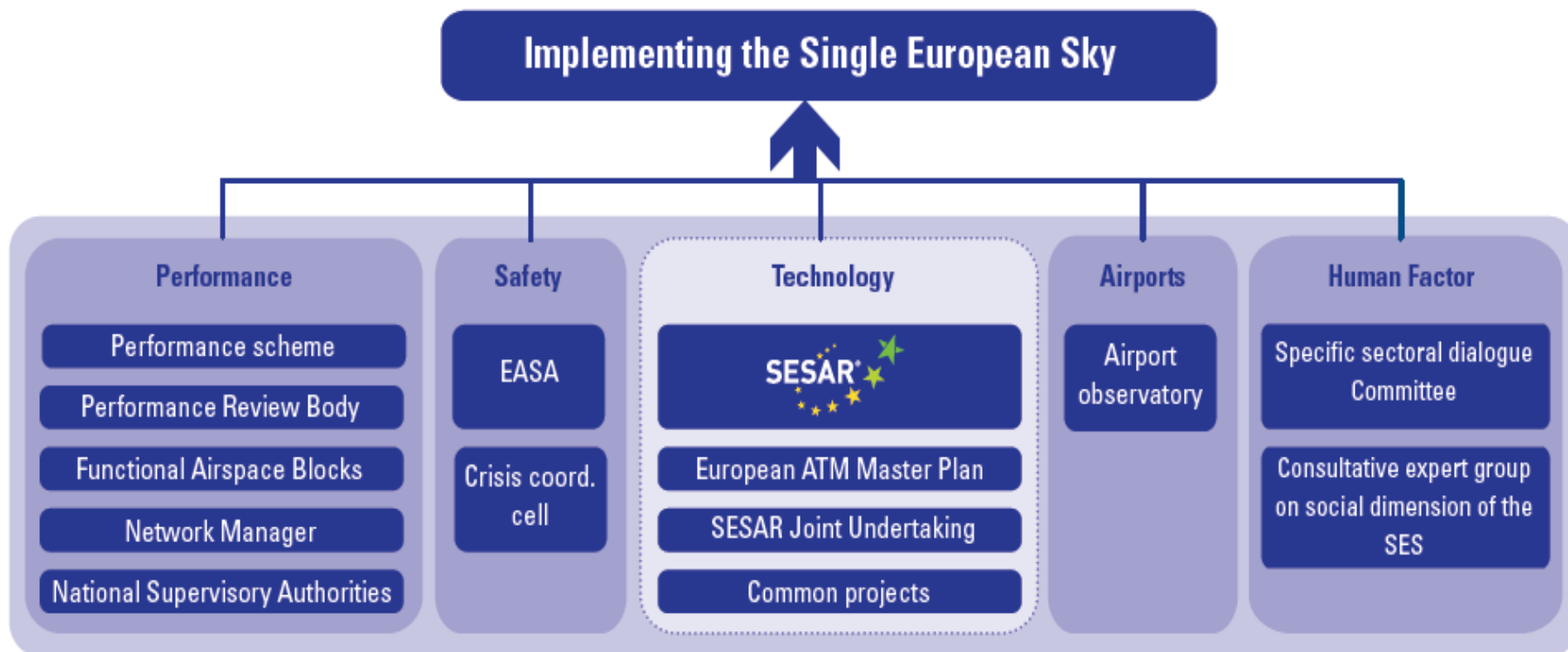In 2010 en-route flights were delayed by an estimated **19.4 million minutes.**

On average, each flight was **49 km** longer than direct flights.**

Estimated costs of airspace fragmentation amounts to **€4 billion a year.**

* Source: Eurocontrol - **Source: European Commission

SES、SESAR、绩效方案及目标和绩效间的关系

SESAR Profile

Name: SESAR Research and Innovation Programme

Established: 2007

Occupation: Researching and developing technologies and operations to fast track ATM modernisation

Co-founded by: Eurocontrol and European Union

Managed by: SESAR Joint Undertaking

Members: 15 and 13 associate partners

Companies involved: 110 in +20 countries

People involved: 3,000 ATM experts

Projects: 300+ projects

Budget: EUR 3.6 bio until 2024

Unique public-private partnership

With all actors required to change ATM

图1 欧洲ATM总体规划层级

Executive View

管理视图

Planning View

计划视图

Implementation View

实施视图

SESAR in three steps

STEP ONE: Time-based operations 基于时间的运营

STEP TWO: Trajectory-based operations 基于航迹的运营

STEP THREE: Performance-based operations 基于绩效的运营
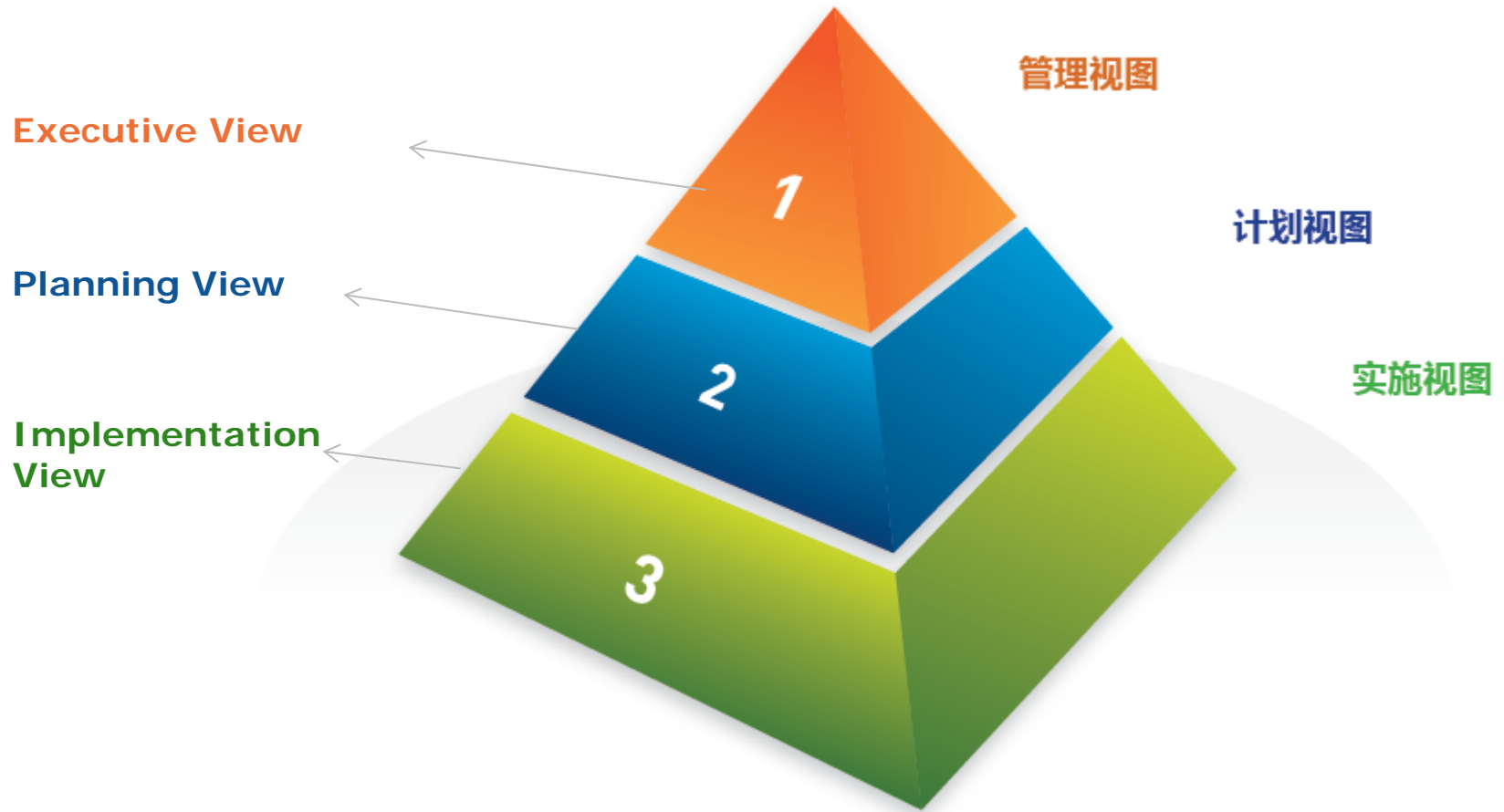
By the end of **STEP ONE**, the SESAR Programme aims to have contributed the following:

A **27%** increase in Europe's airspace capacity

A **40%** reduction in accident risk per flight hour - corresponding to the safety need associated with the anticipated traffic growth
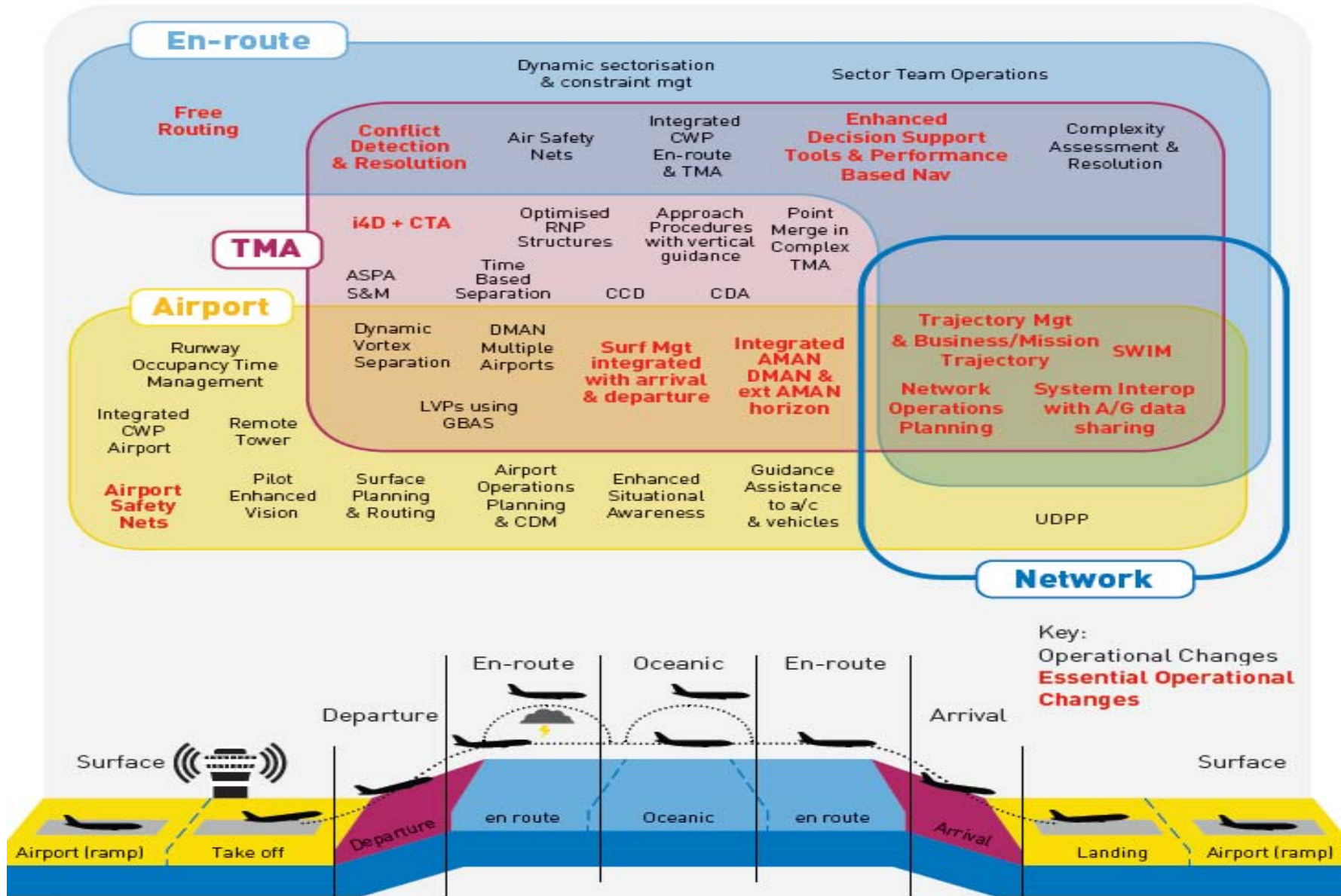
A **2.8%** reduction per flight in environmental impact

A **6%** reduction in cost per flight
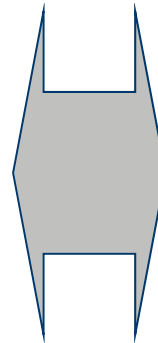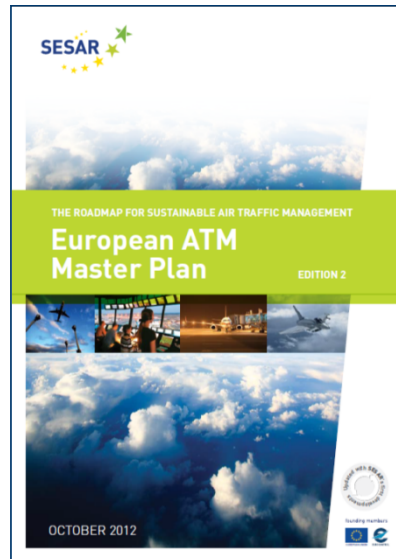
Globally concurrent and complementary

Same philosophy

- Need to improve ATM performance
- Through harmonisation of systems, procedures
  - And regulations
- Through deployment of a series of step changes
- Aim at the Global ATM Operational Concept

Mutual impact,
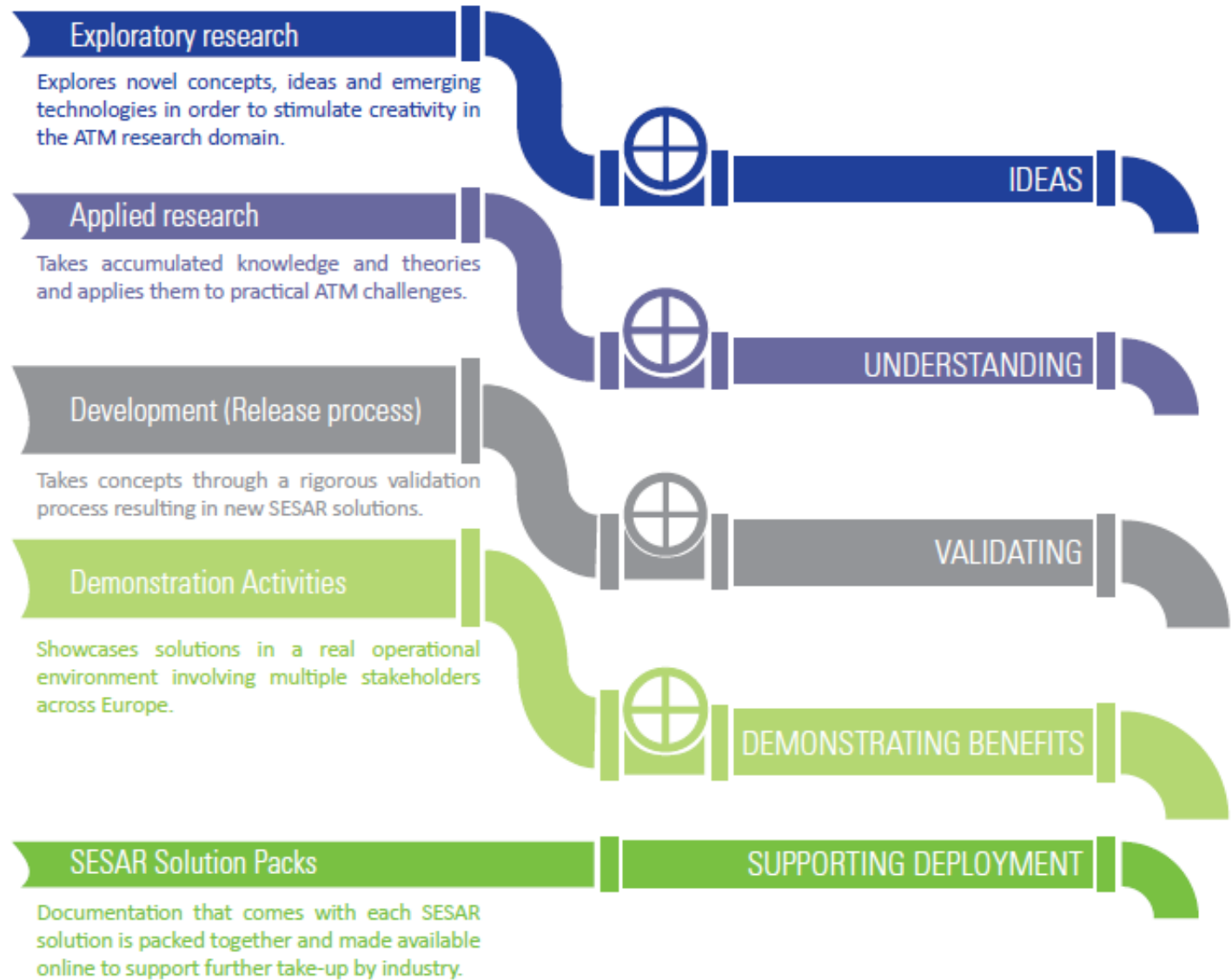## Global ⟷ European

- From concept definition to operations
- For timely and useful standards

How SESAR works

Innovation pipeline

Exploratory research
Explores novel concepts, ideas and emerging technologies in order to stimulate creativity in the ATM research domain.

IDEAS

Applied research
Takes accumulated knowledge and theories and applies them to practical ATM challenges.

UNDERSTANDING

Development (Release process)
Takes concepts through a rigorous validation process resulting in new SESAR solutions.

VALIDATING

Demonstration Activities
Showcases solutions in a real operational environment involving multiple stakeholders across Europe.

DEMONSTRATING BENEFITS

SESAR Solution Packs
Documentation that comes with each SESAR solution is packed together and made available online to support further take-up by industry.

SUPPORTING DEPLOYMENT

Towards deployment

Deployment Phase

Implement results of development to meet performance targets

Development Phase

Develop new standards, operational procedures and technologies

Definition phase

Create European ATM Master Plan

2005-2008

2008........

2013.....

Agreements Signature MAY 2009

06/2009 Launch

07/2009

400 contributors

20 projects

09/2009 Airlines on board

03/2010

1,500 contributors

300 projects

Today

3000+ contributors

68 validation exercises

17 SESAR Solutions

SESAR results so far (1)

- **68 validation exercises** completed with results published indicating cost-efficiency, environmental and safety benefits
- **20 new validation exercises** underway

- **17 SESAR Solutions** (building blocks for deployment planning):
    - Moving from Airspace to 4D trajectory Management
    - Traffic Synchronization
    - Network Collaborative Management and DCB
    - Airport Integration and Throughput
    - SWIM
    - Conflict Management and Automation

Download SESAR Solution Packs
www.sesarju.eu

SESAR Demonstration Activities

2015
15 large scale demonstrations to be launched

- 🟢 Environmental for transatlantic flights (AIRE)
- ⭐ SESAR Solutions Demonstrations
- ⭐ RPAS demonstrations

Source: Google Maps, SJU analysis, simplified for clarity reasons

SESAR: 2020 VISION

Delivering best-in-class, globally interoperable and high-performing Air Transport for Airspace Users and Citizens

- Enabling the delivery of safe, cost-efficient and environmentally responsible Air Vehicle & ATM operations, systems and services

High Performing Airport Operations

Capacity, Safety, Environment, Efficient, Effective, Networked

Optimised ATM Network Services

Collaboration, Balancing Demand & Capacity, Environment, Efficiency

Advanced Air Traffic Services

Synchronisation, Capacity, Safety, Environment, Cost

Enabling the Aviation Infrastructure

- Providing shared technical services across the aviation domain
- Communications, positioning, navigation, timing and SWIM information

Thank you for your attention

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