



EASA
European Aviation Safety Agency



Funded by the European Union and implemented by the
European Aviation Safety Agency

European ATM Master Plan & Architecture

From Strategic View to Timed Deployment



Paul Bosman,
Head of Aviation Cooperation
and Strategies, EUROCONTROL

Your safety is our mission.

An agency of the European Union 



4 questions you should be able to answer



Why do we need a Master Plan?



What will you find in it?



How does it work?



Where can I find it?





Exercise





How many levels does the ATM Master Plan have?

- A. 1
- B. 2
- C. 3
- D. 4



How many versions of the ATM Master Plan document have been published so far?

- A. 1
- B. 2
- C. 3
- D. 4



How often is the Master Plan level 1 document updated?

- A. Every year
- B. Every two years
- C. Every three years
- D. Every five years



4 questions you should be able to answer



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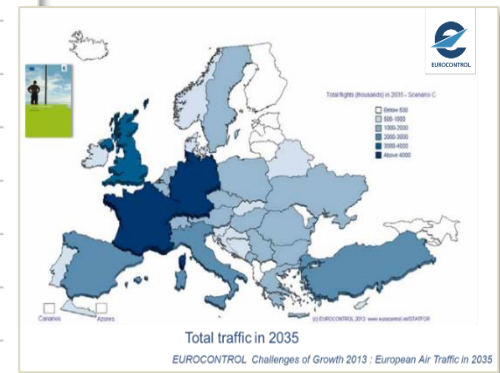
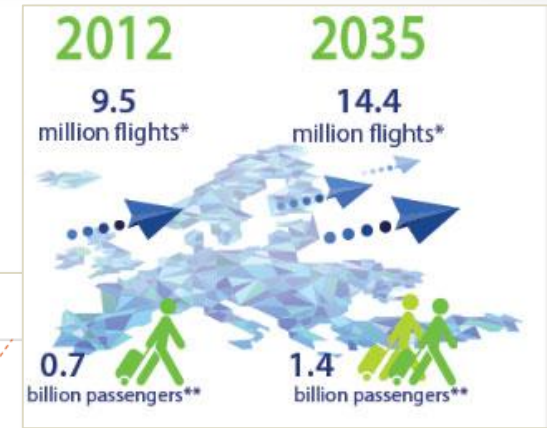
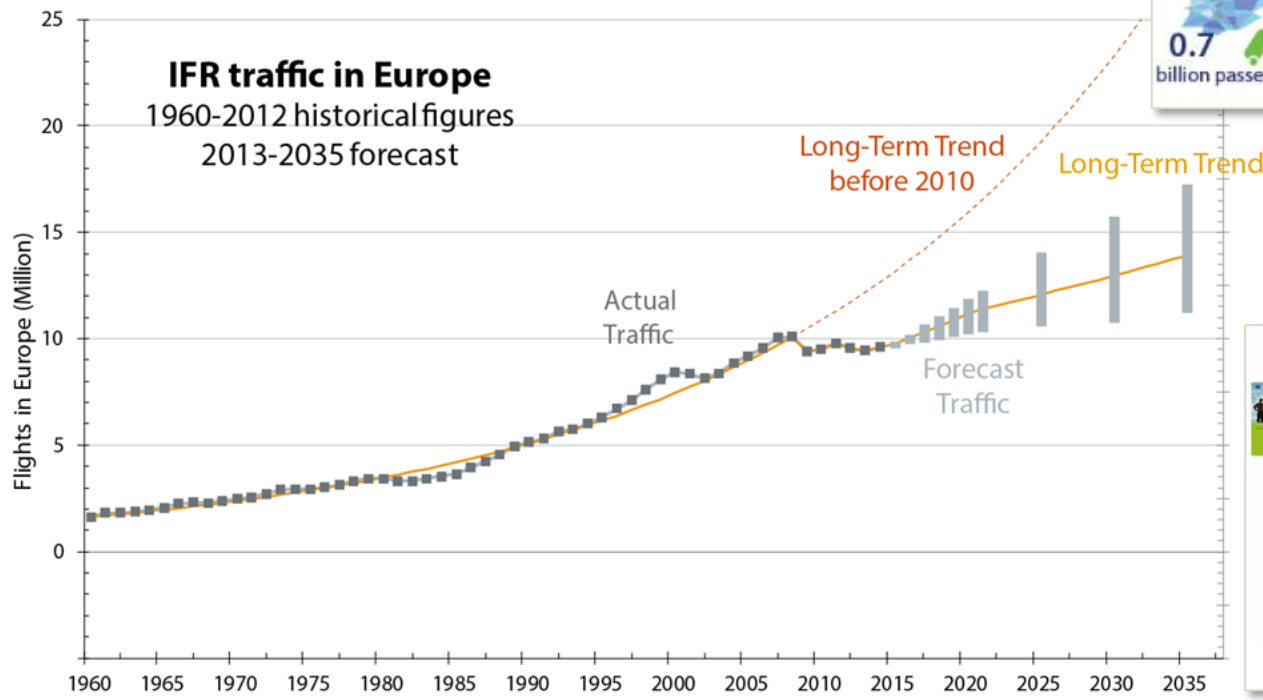




Performance requires change



*More Traffic
User Needs
Less Costs
& Safer*





Increasing efficiency and European competitiveness through a Single European Sky





Benefits for EU companies and citizens



ANSPS

- Deliver a better quality of service at a lower unit cost for airspace users
- Seamlessly interoperate with service providers across the network



Suppliers and manufacturers

- Gain access to the market
- Develop their products in an innovative and competitive environment
- Have confidence that the user requirements are met



Air traffic controllers, pilots and engineers

- Have tools and systems that are built to their needs
- Ability to operate in an increasingly complex environment



Regulators and standardisation bodies

- Build their activities based on validated solutions agreed across the European ATM stakeholder community



Airport operators

- Have access to more integrated systems and data sharing
- Greater predictability and more efficient operations



Air Passengers

- Benefit from shorter and more reliable journeys, lower costs and enhanced safety.



Airspace Users (civilian & military)

- Operate closer to their business or mission needs, while reducing fuel costs, service charges and reducing impact on the environment



Scientific Community

- Use scientific knowledge to challenge the status-quo
- Deliver the results needed for the achievement of the Single European Sky initiative



A History of European ATM R&D cooperation

■ PHARE (1994-1999)

■ 4th Framework Programme

- 1st time ATM is included
- European ATM research initiatives in EC FP

■ 5th Framework Programme

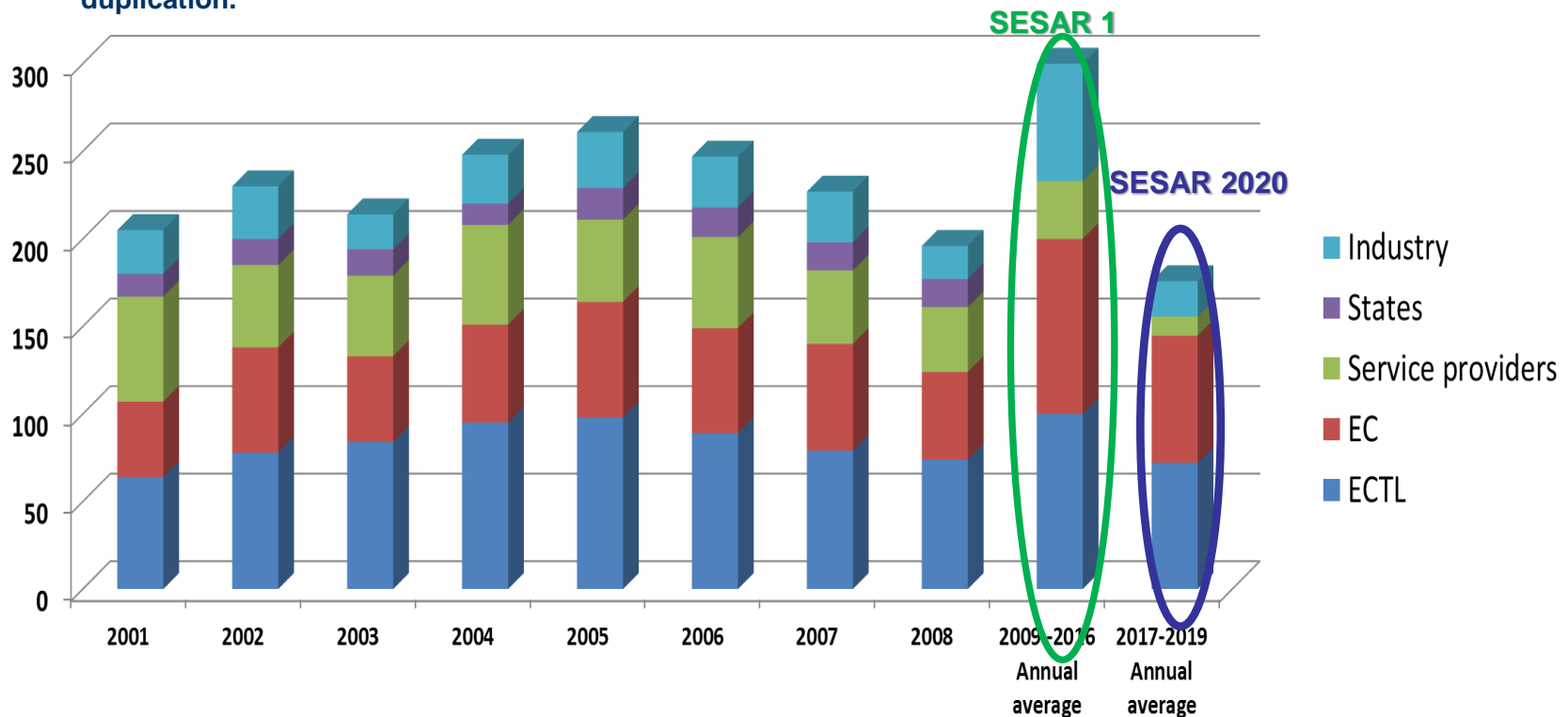
- Programme Board (ECTL, DG RTD & DG TREN) to co-ordinate respective work programmes and avoid duplication.

■ 6th Framework Programme

- Worked towards Joint Programming
- Collaborative research

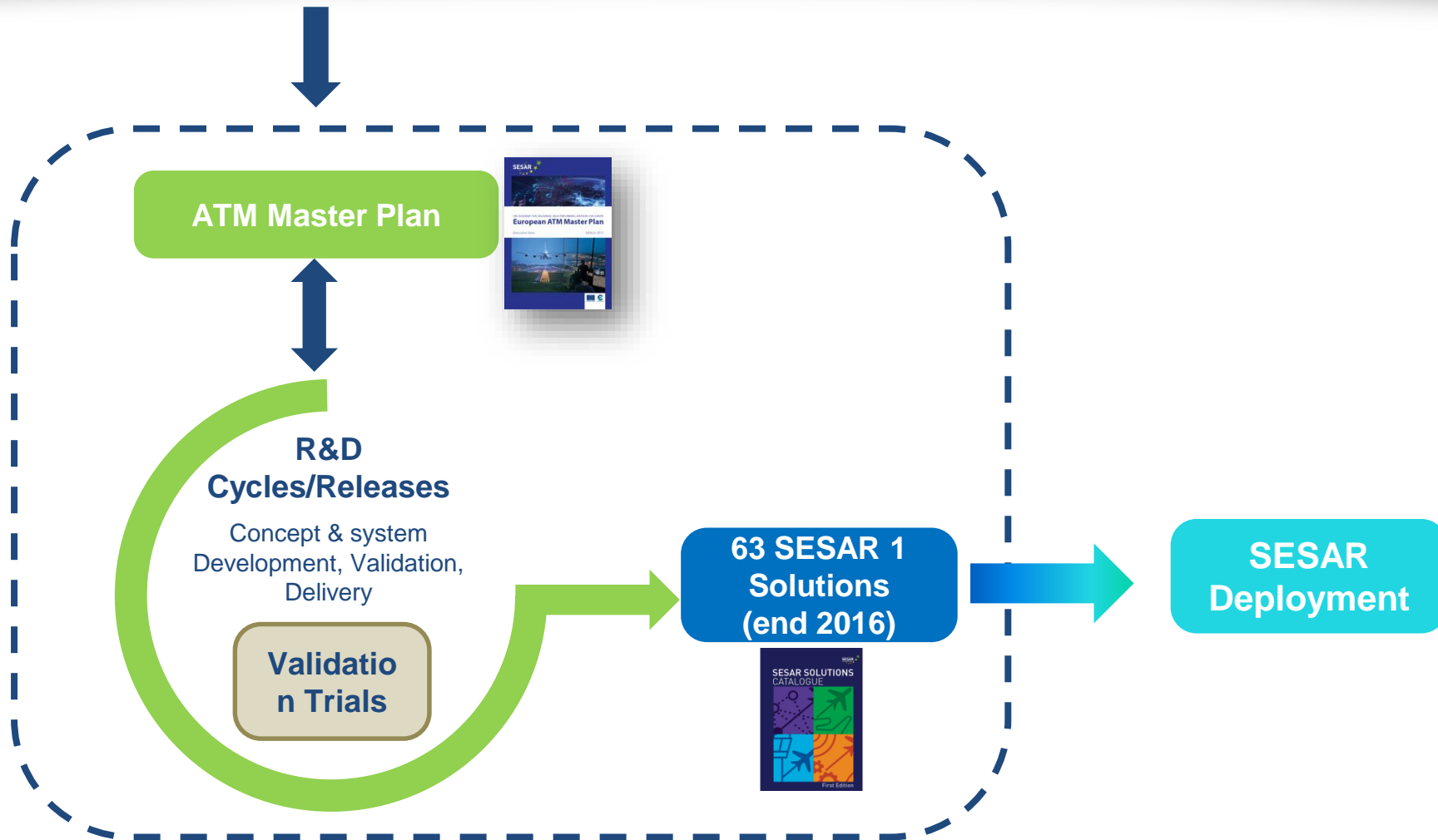
■ SESAR Joint Undertaking

- Co-funded by EC and EUROCONTROL
- all key aviation actors included in a single programme
- Closing the gap between R&D and Deployment





From R&D to Deployment





European ATM Master Plan

Performance

Changes

Choices

One Direction



Reference for:



R&D

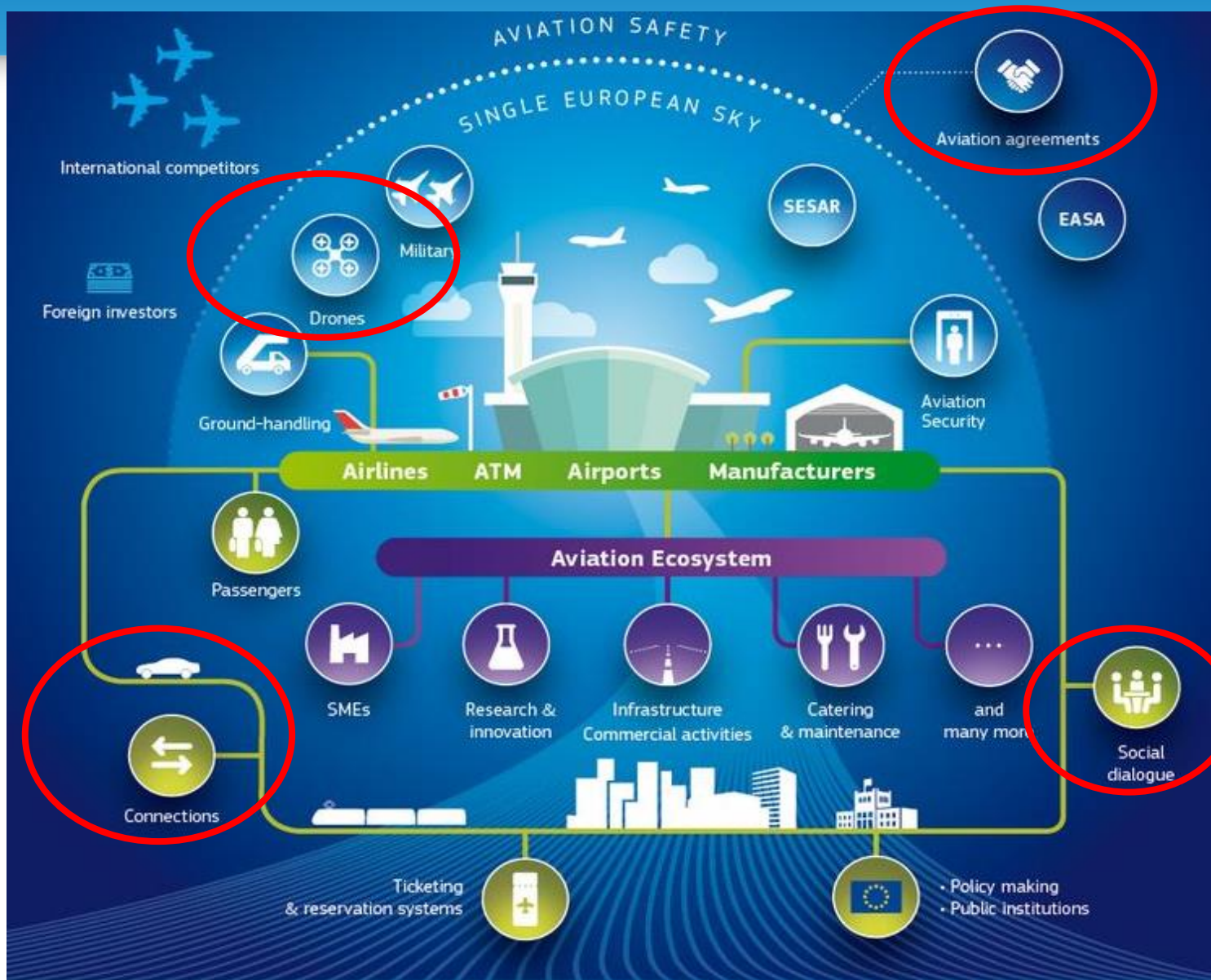
SESAR 1
SESAR 2020

Deployment

Common Projects
Local Projects



Air Transport in Europe





Global landscape



Global Air Navigation Plan

Other Regions



Exercise





So, why do we need an ATM Master Plan?

- A. To streamline European ATM investments
- B. To avoid fragmentation and duplication in R&D
- C. To deliver Solutions that meet our future performance needs
- D. To clearly position Europe's ATM in the worldwide context
- ✓ E. All of them



4 questions you should be able to answer



Why do we need a Master Plan?



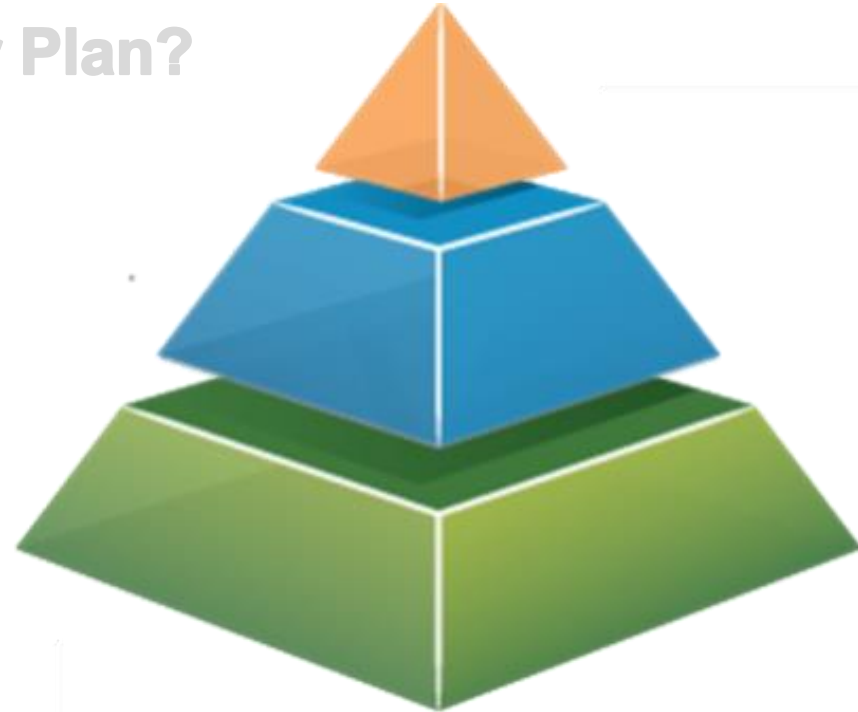
What will you find in it?



How does it work?



Where can I find it?



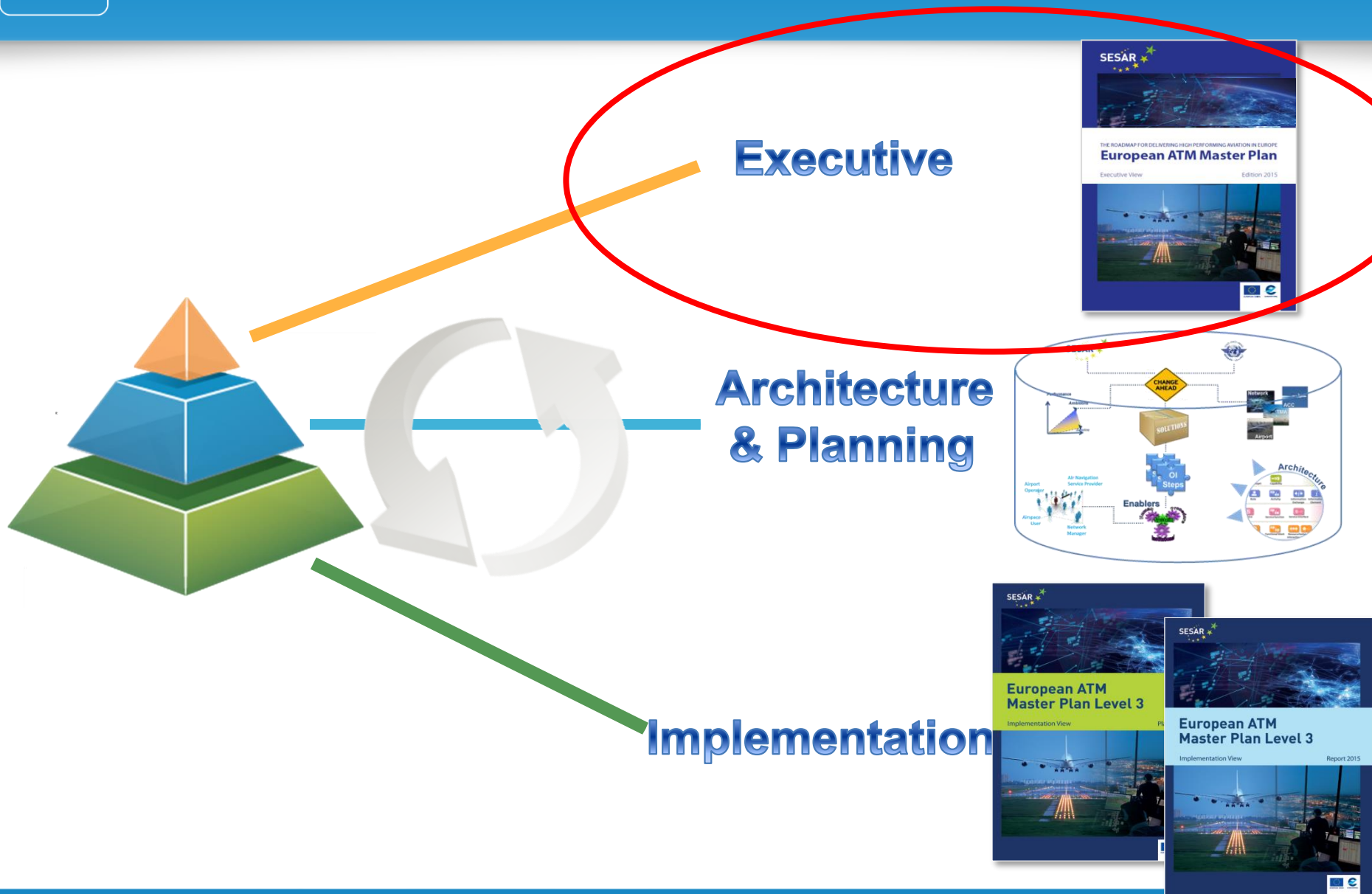


The emerged part of the iceberg





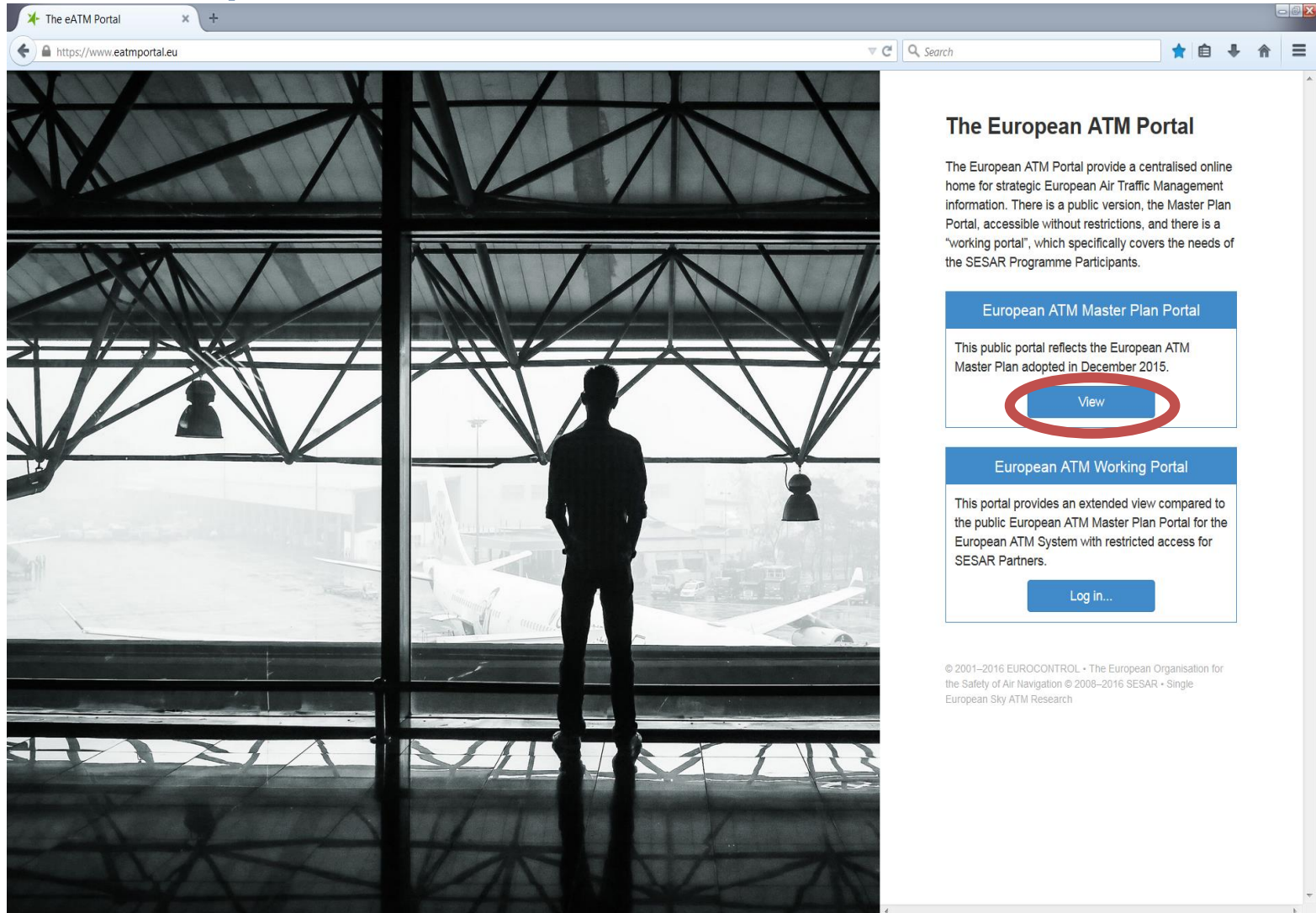
The ATM Master Plan : three levels





Access the Master Plan via the ATM Portal

<https://www.eatmportal.eu>



The screenshot shows a web browser window with the address bar displaying <https://www.eatmportal.eu>. The page title is "The eATM Portal". The main content area is divided into two sections. The top section is titled "The European ATM Portal" and contains a paragraph: "The European ATM Portal provide a centralised online home for strategic European Air Traffic Management information. There is a public version, the Master Plan Portal, accessible without restrictions, and there is a "working portal", which specifically covers the needs of the SESAR Programme Participants." Below this text are two blue buttons: "View" and "Log in...". The "View" button is circled in red. The bottom section is titled "European ATM Working Portal" and contains a paragraph: "This portal provides an extended view compared to the public European ATM Master Plan Portal for the European ATM System with restricted access for SESAR Partners." Below this text is a blue button labeled "Log in...". At the bottom of the page, there is a copyright notice: "© 2001–2016 EUROCONTROL - The European Organisation for the Safety of Air Navigation © 2008–2016 SESAR - Single European Sky ATM Research".

The European ATM Portal

The European ATM Portal provide a centralised online home for strategic European Air Traffic Management information. There is a public version, the Master Plan Portal, accessible without restrictions, and there is a "working portal", which specifically covers the needs of the SESAR Programme Participants.

European ATM Master Plan Portal

This public portal reflects the European ATM Master Plan adopted in December 2015.

[View](#)

European ATM Working Portal

This portal provides an extended view compared to the public European ATM Master Plan Portal for the European ATM System with restricted access for SESAR Partners.

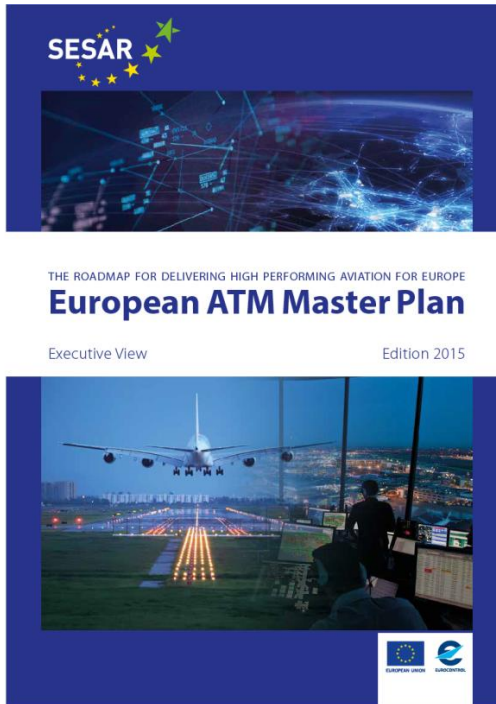
[Log in...](#)

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What is the European ATM Master Plan?

The roadmap driving the modernisation of the European ATM system



- Level 1: Not just a paper exercise
- Connecting R&D with deployment
- Defining a Vision 2035+ and highlighting ways to achieve it
- Driving at top level all EU funding priorities for both ATM development and deployment



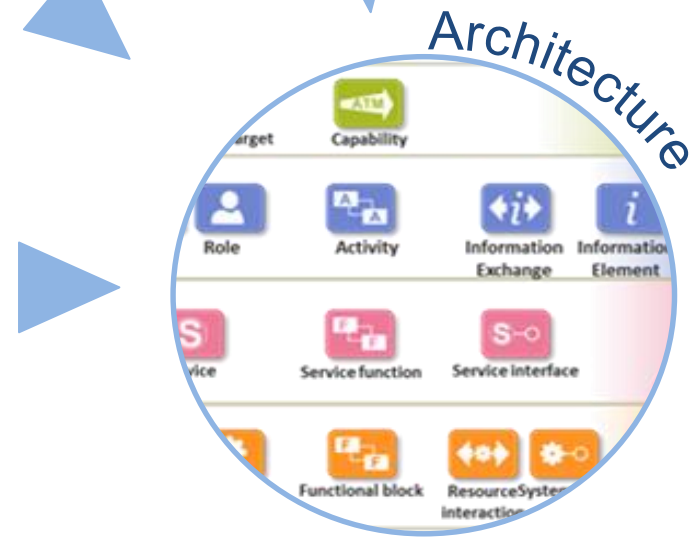
Some blocks of the MP



Operational

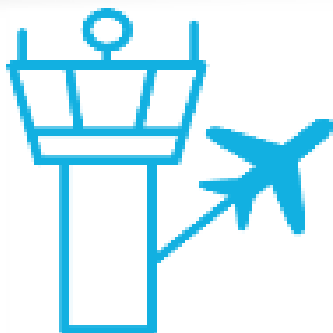


Technical



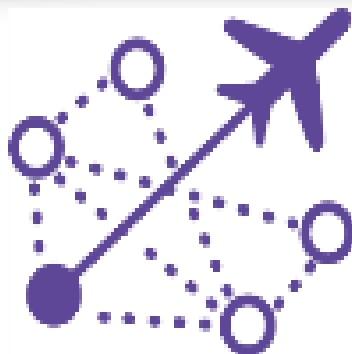


Four Key Areas - Associated solutions



High Performing Airport Operations

e.g. LVP using GBAS,
integrated surface
management, incl. safety
nets...



Optimised ATM Network Services

e.g. UDPP, Management of
dynamic airspace
configuration...



Advanced Air Traffic Services

e.g. AMAN / DMAN
integration,
Sector team operations...



Enabling Aviation Infrastructure

e.g. CNS rationalisation, 4D, Mission trajectory...



Changes



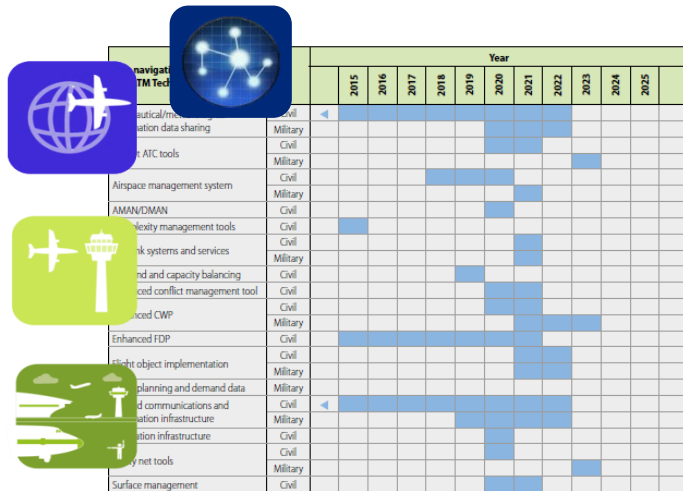
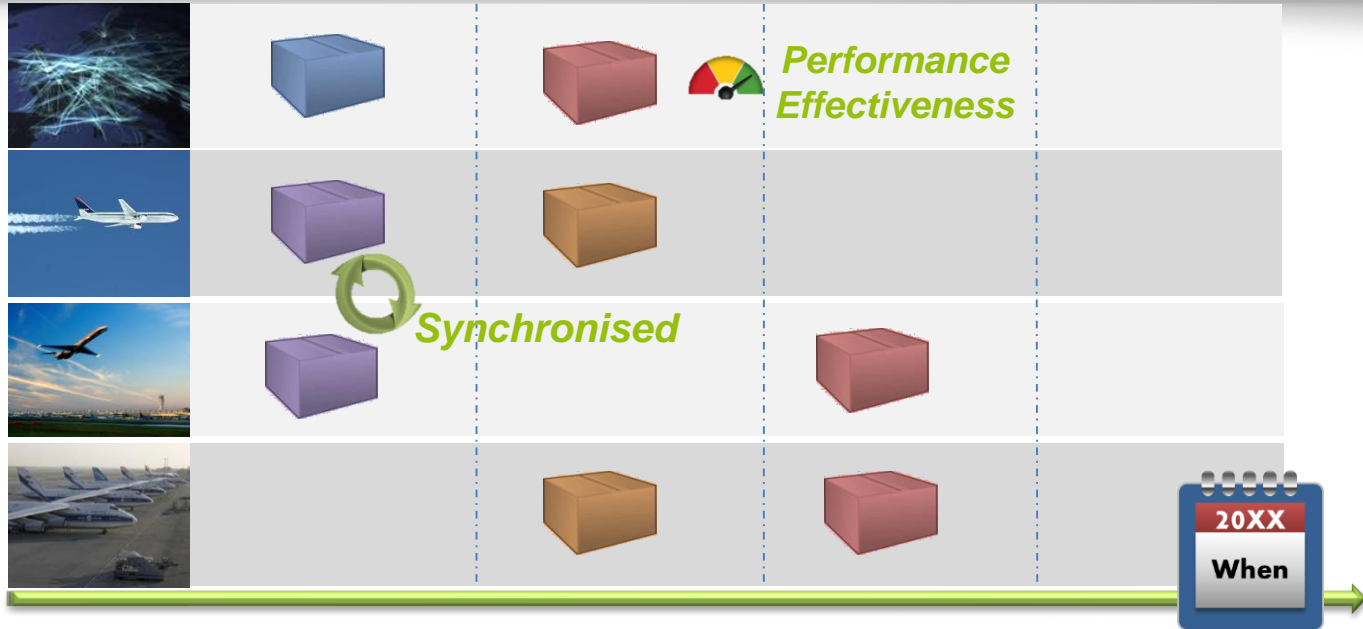


Deployment Scenarios

Performance



Where



e.g. Roadmap per stakeholder (Civil & Military)





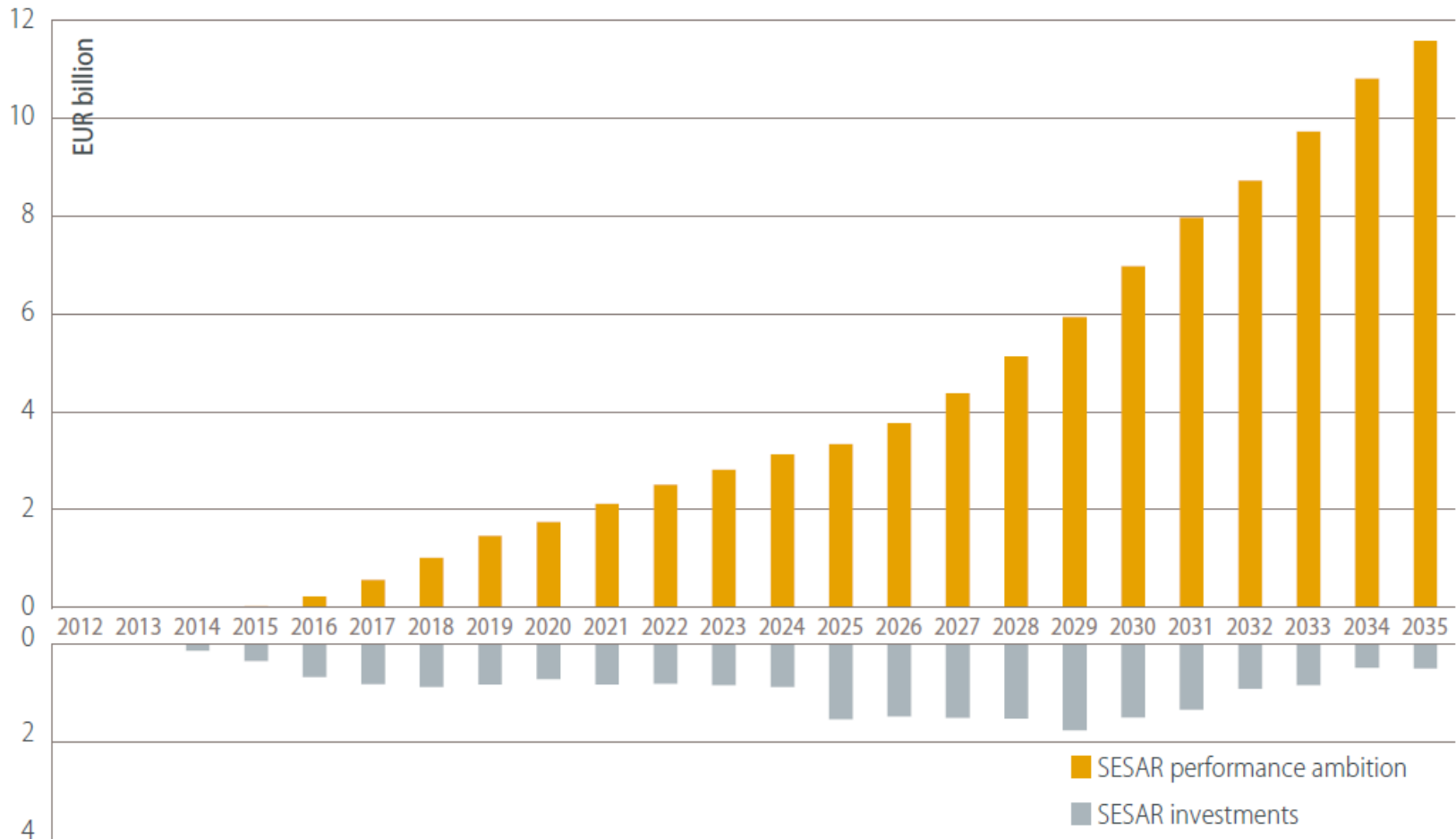
Stakeholders roadmap

Technology Changes

CNS
roadmap



Overall Business Case

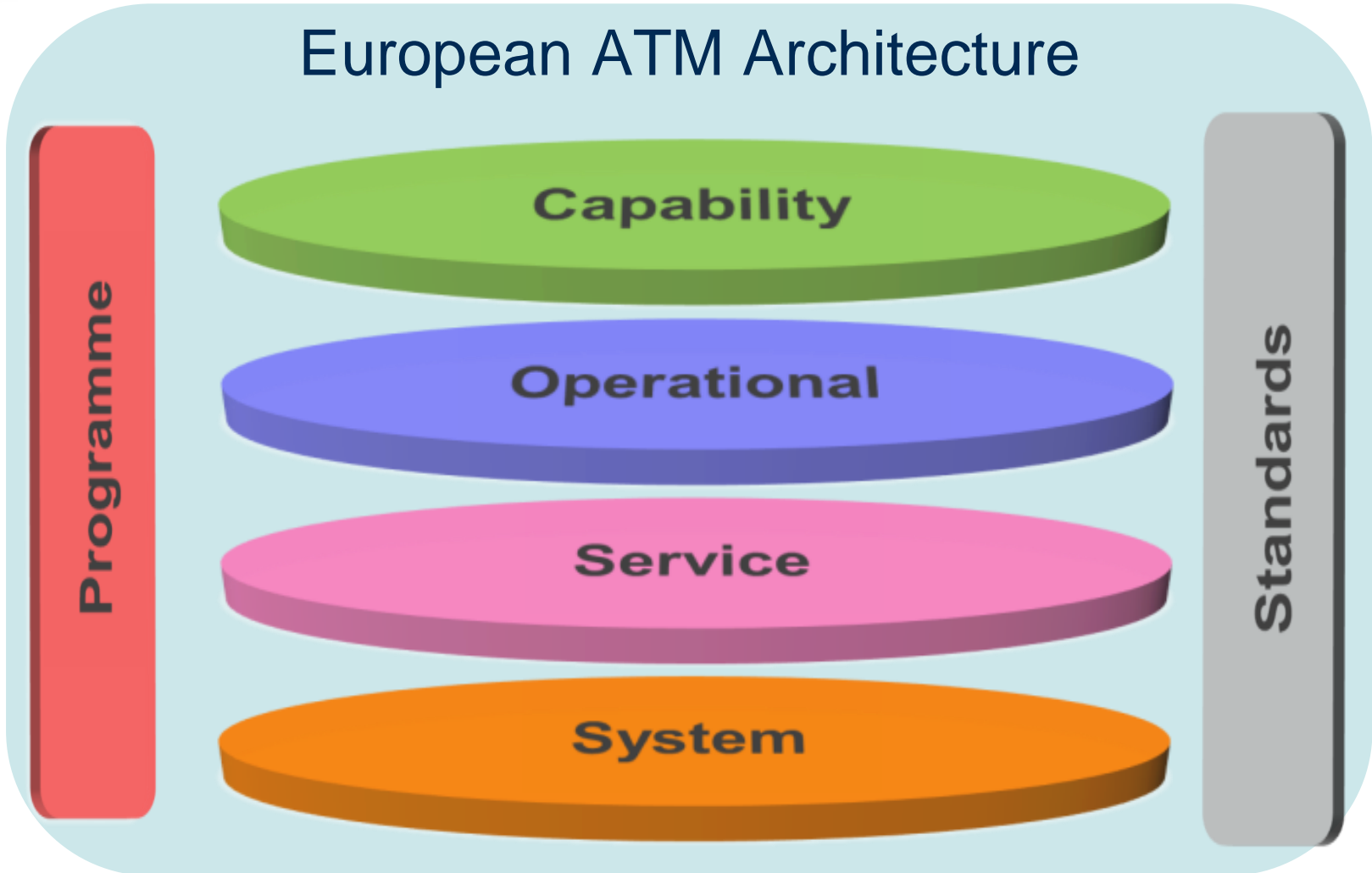


Undiscounted values. Equals performance ambition minus investment ambition levels including RP2, PCP, SESAR 1 and SESAR 2020. Does not take into account financing and restructuring costs. Optimised ATM infrastructure deployment option. Deployment long tail mainly driven by air users and military



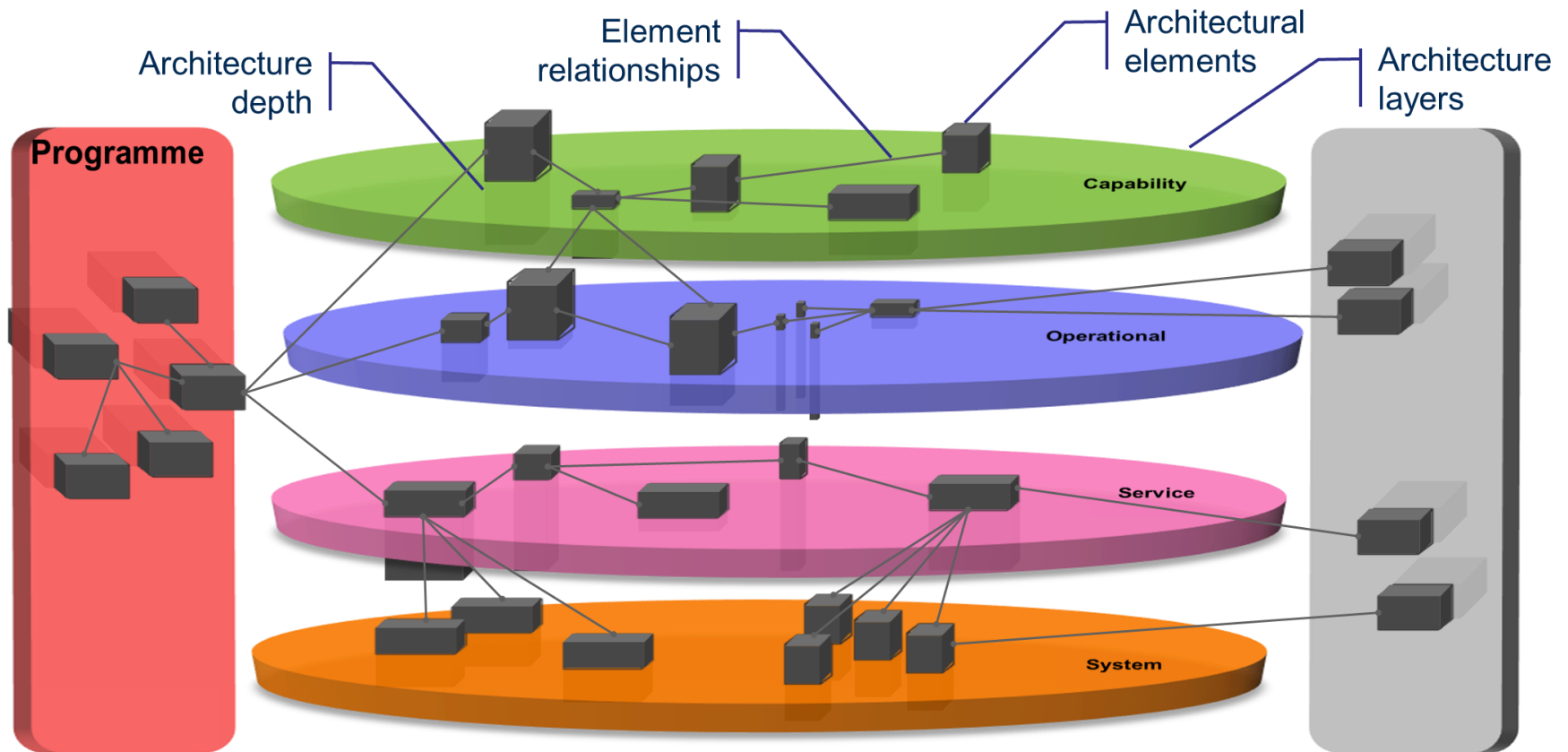


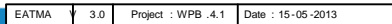
Changes are organised and described in





Architecture components

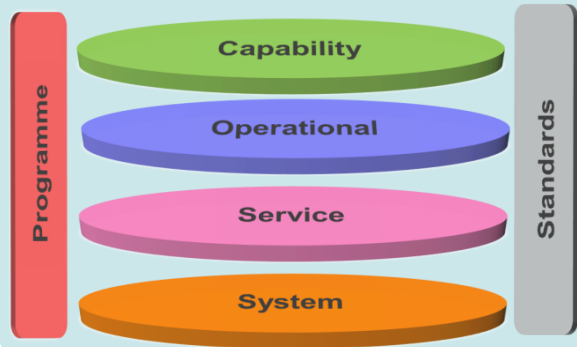






WHAT? More architecture details?

European ATM Architecture



[Full details for SESAR contributors on
https://www.eatmportal.eu/working](https://www.eatmportal.eu/working)

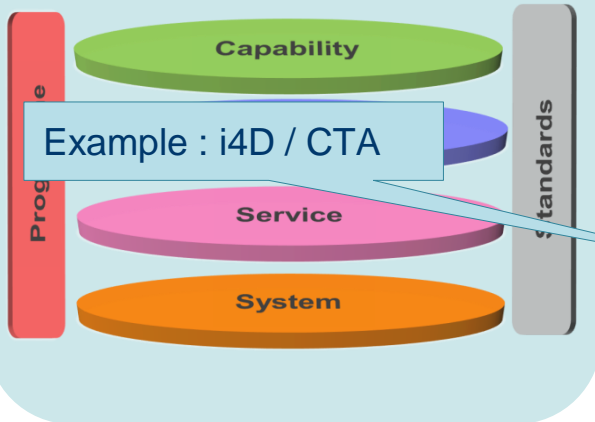
Key Architecture Elements





WHAT? How does it work? i4D/CTA concept

European ATM Architecture

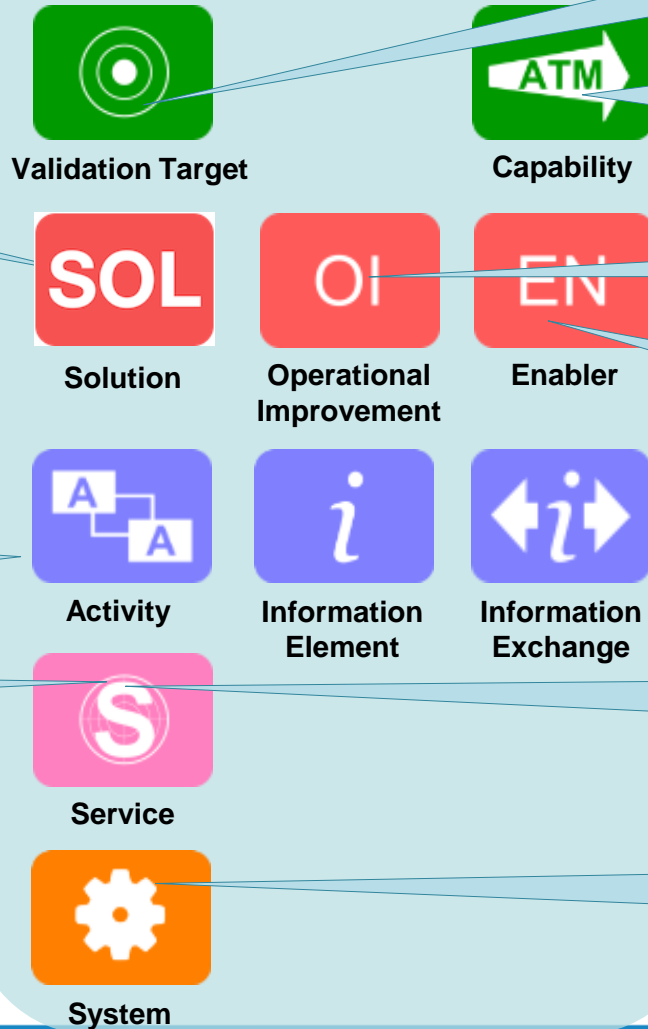


Negotiate & allocate
CTA
Update / Revise
Trajectory

Service Payload :
AIRM

XM/...(FIXM/ED133/
...)

Key Architecture Elements



Cost effectiveness/Fuel
Eff.
Predictability

Traffic Situation
Awareness
Traj Exec & Monitoring
Traj Revision & Update

OI - XYZ

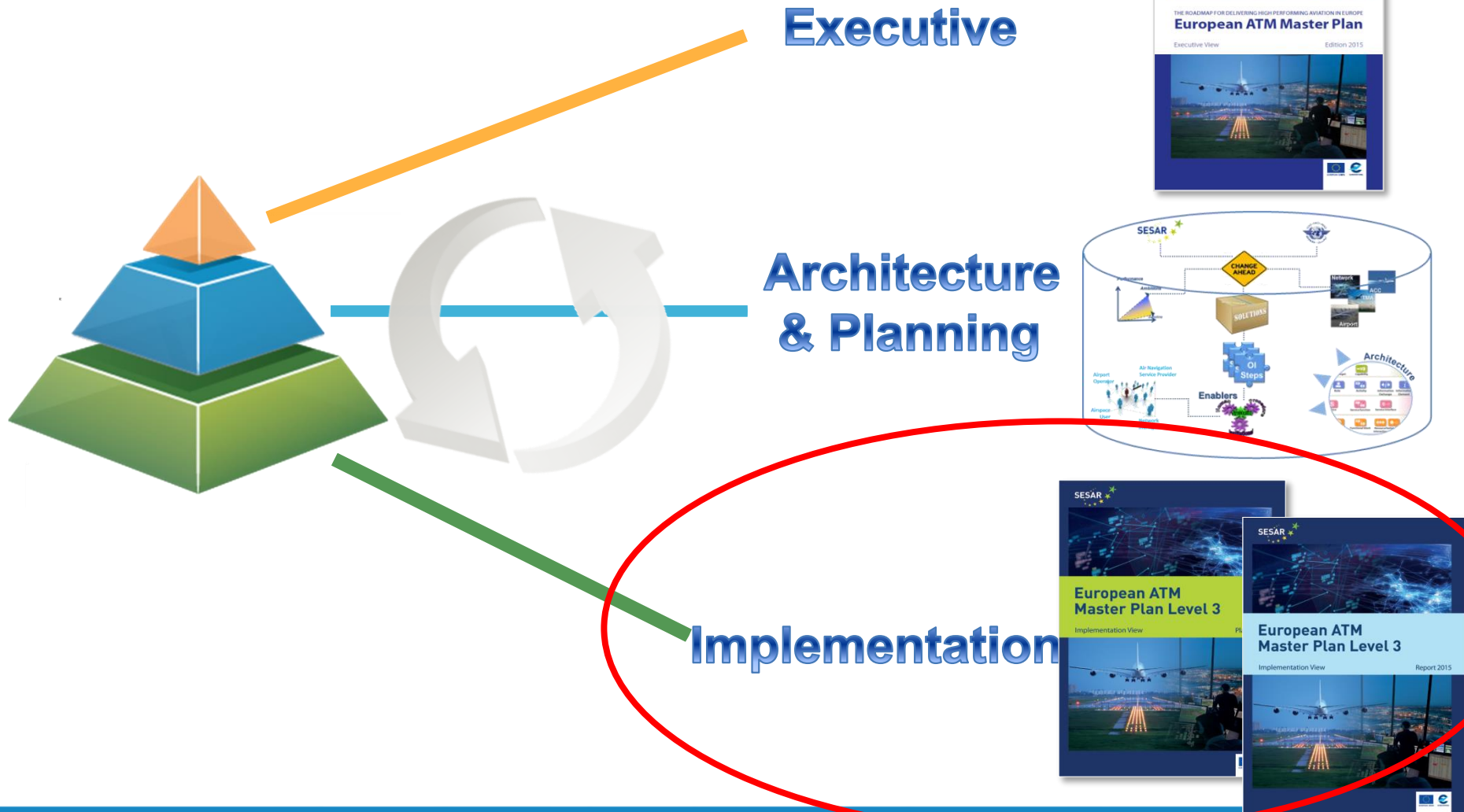
EN - xyz

Report Aircraft ETA
MinMax
Report Aircraft Trajectory

Aircraft SYS
En_route/APP ATC SYS

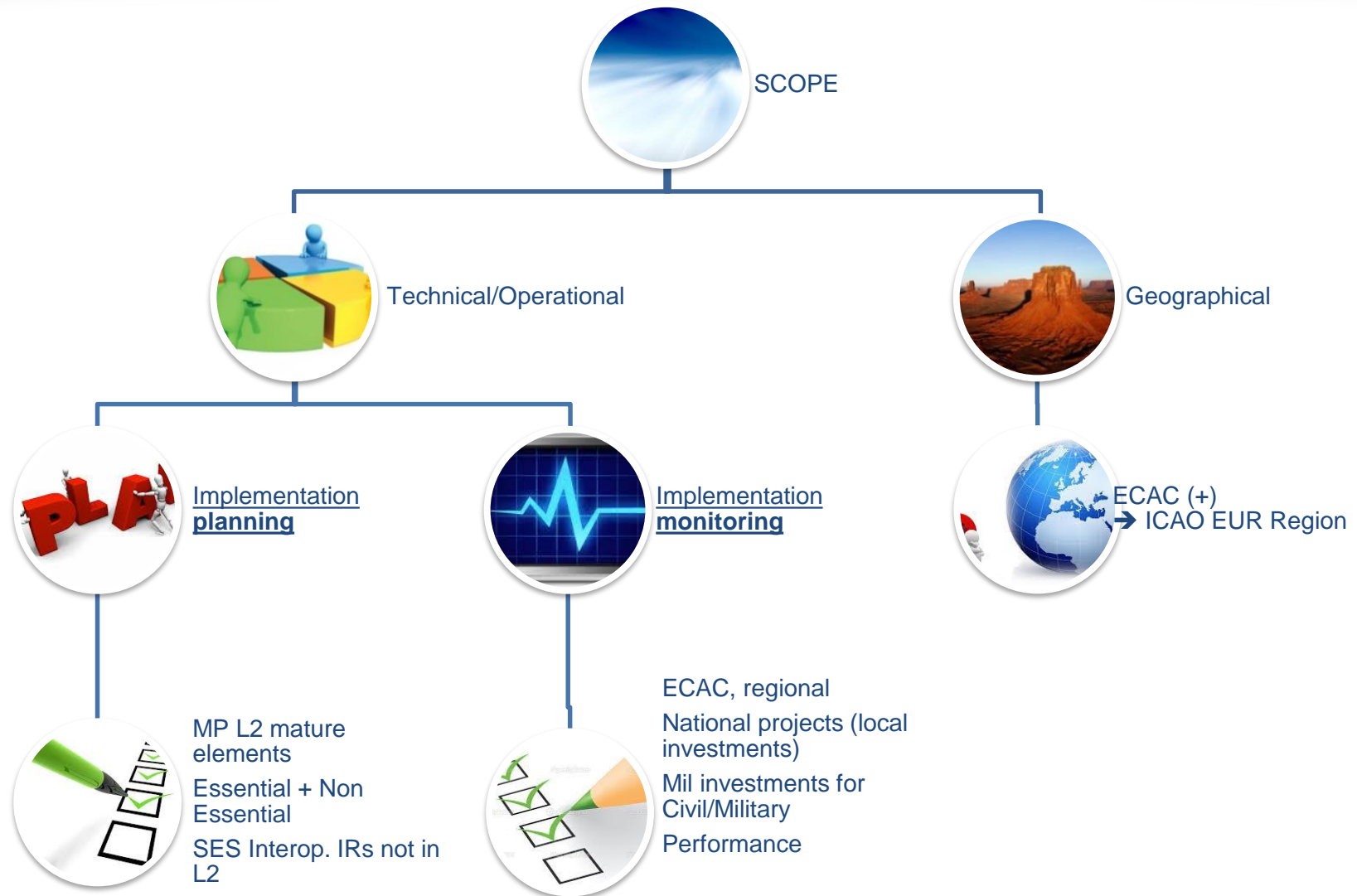


The ATM Master Plan : three levels



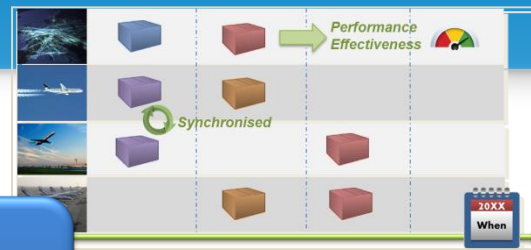


MP Level3 Plan and Report





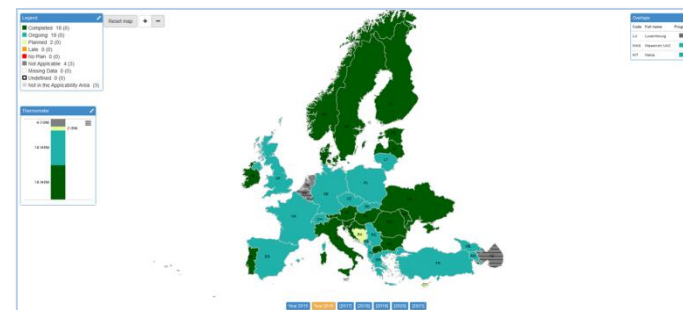
Deployment Planning and Reporting



Deployment Scenarios

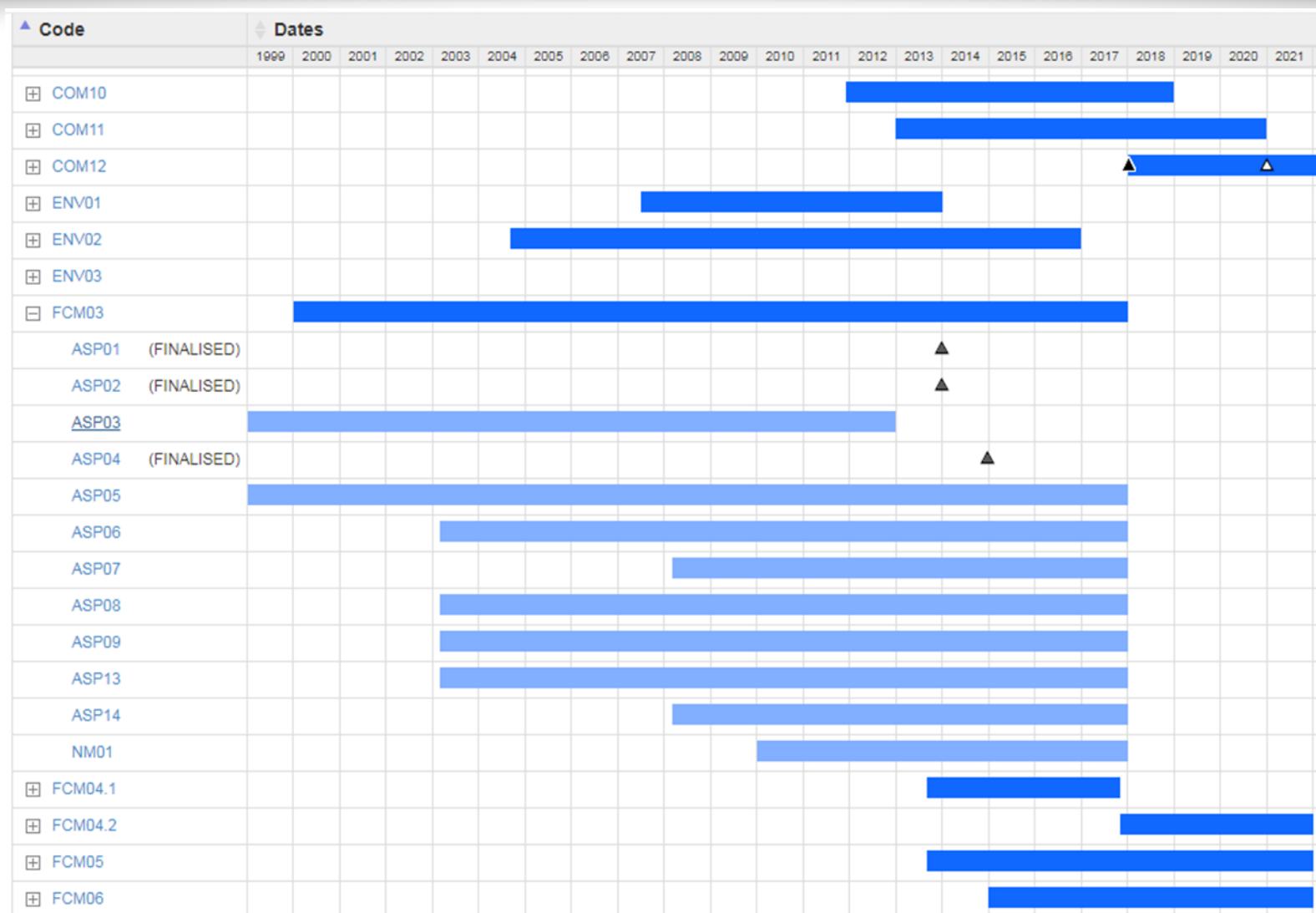
Planning & Reporting:
MP Level 3

Local Planning & Monitoring:
LSSIP





Level 3 Plan







Exercise





So, what will I not find in the Level 1 document?

- A. Implementation Objectives
- ✓ B. Deployment Scenarios
- C. Business View
- D. New standardisation and regulatory needs



Which of the following elements is not directly linked to a SESAR Solution?

- A. SESAR Project
- B. Operational Improvement Step
- C. Validation Target (= Measure)
- ✓ D. Information Exchange



How many layers does the European ATM Architecture have?

A. 3

✓ B. 6

C. 9

D. It depends on your perspective



How many countries had completed in 2016 the implementation of 'Arrival Management extended to en-route airspace (ATC15.2)'?

- ✓ A. 1
- B. 2
- C. 5
- D. 12



4 questions you should be able to answer



Why do we need a Master Plan?



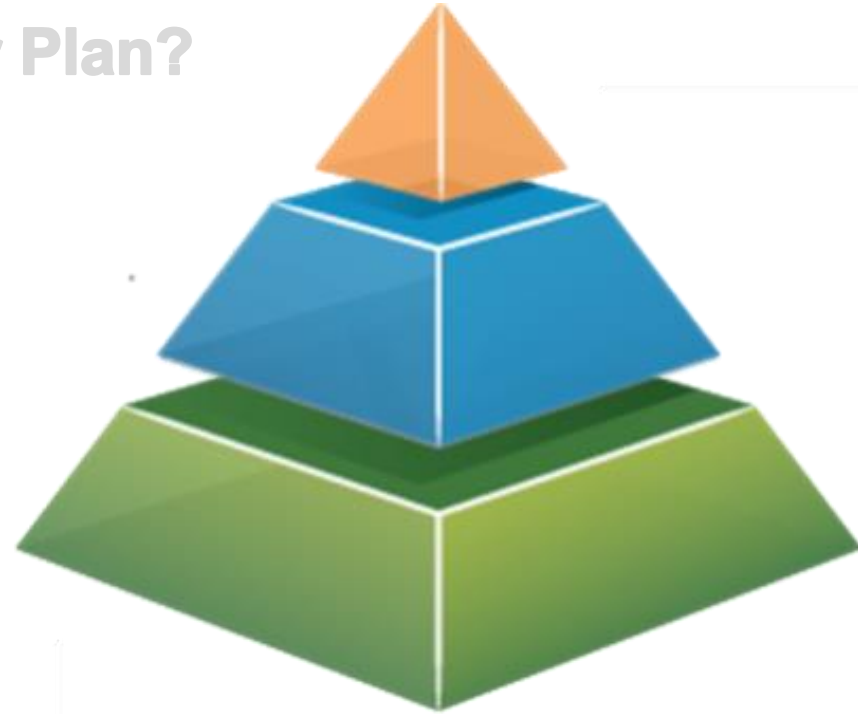
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Where can I find it?





Interconnected activities- different cycles





Master Plan Maintenance: Consensual scoping and prioritisation

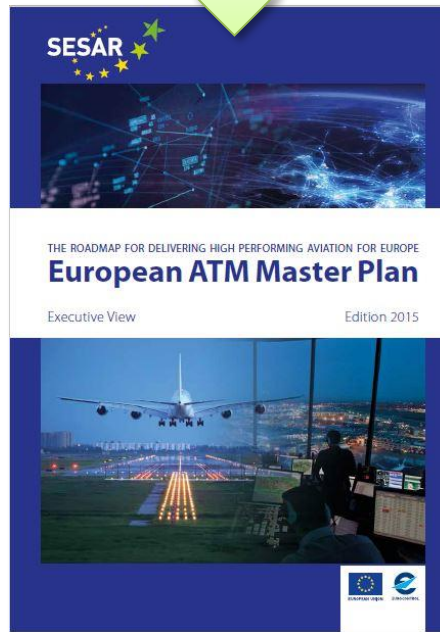
*Air Navigation
Service Providers*



Military



*Ground & aerospace
manufacturing*



*European
Commission*



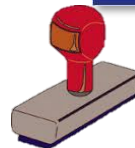
*Airspace
Users*



*Network
Manager*



*Airport
Operators*

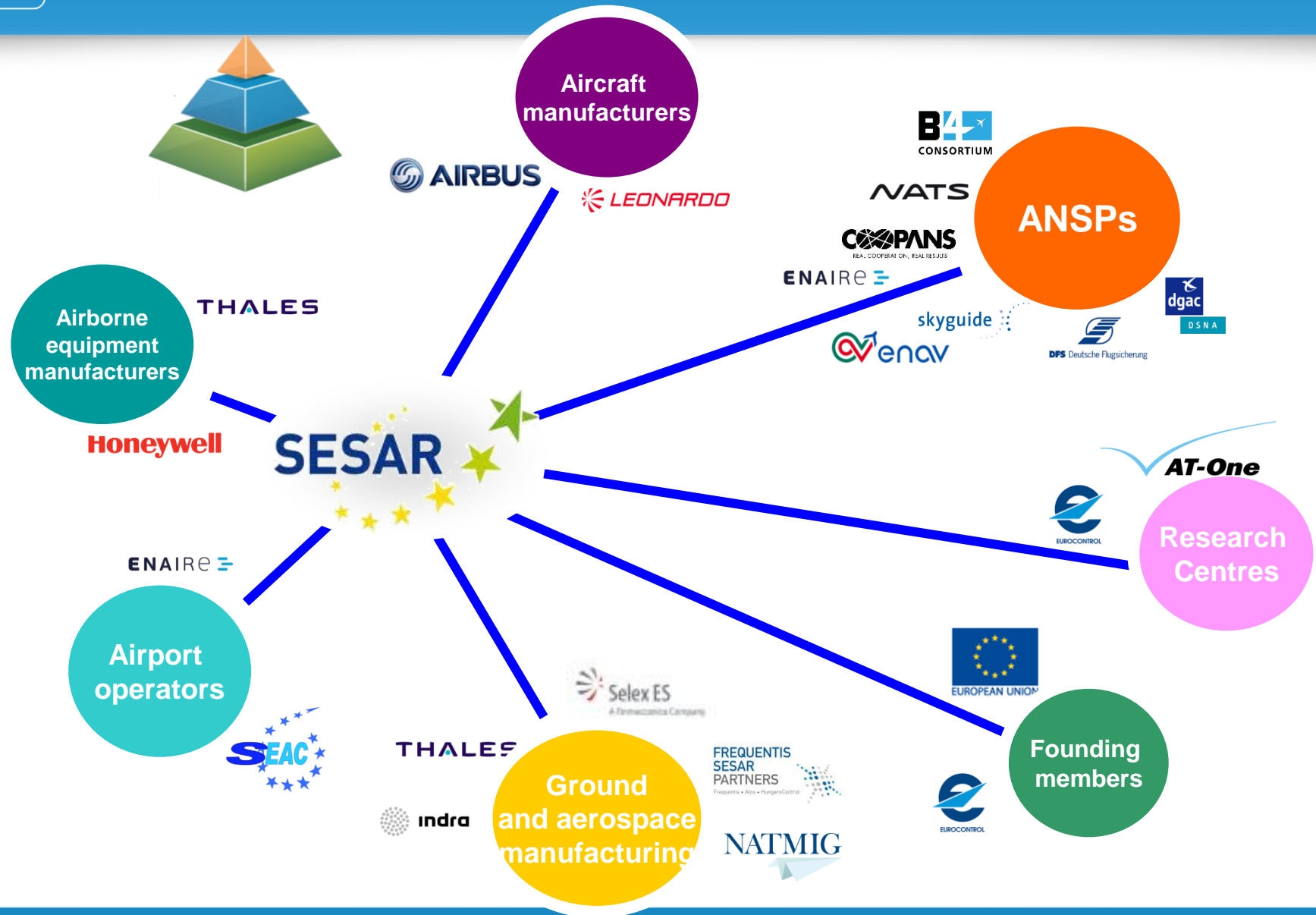


Performance

Business Case



Most ATM actors are contributors





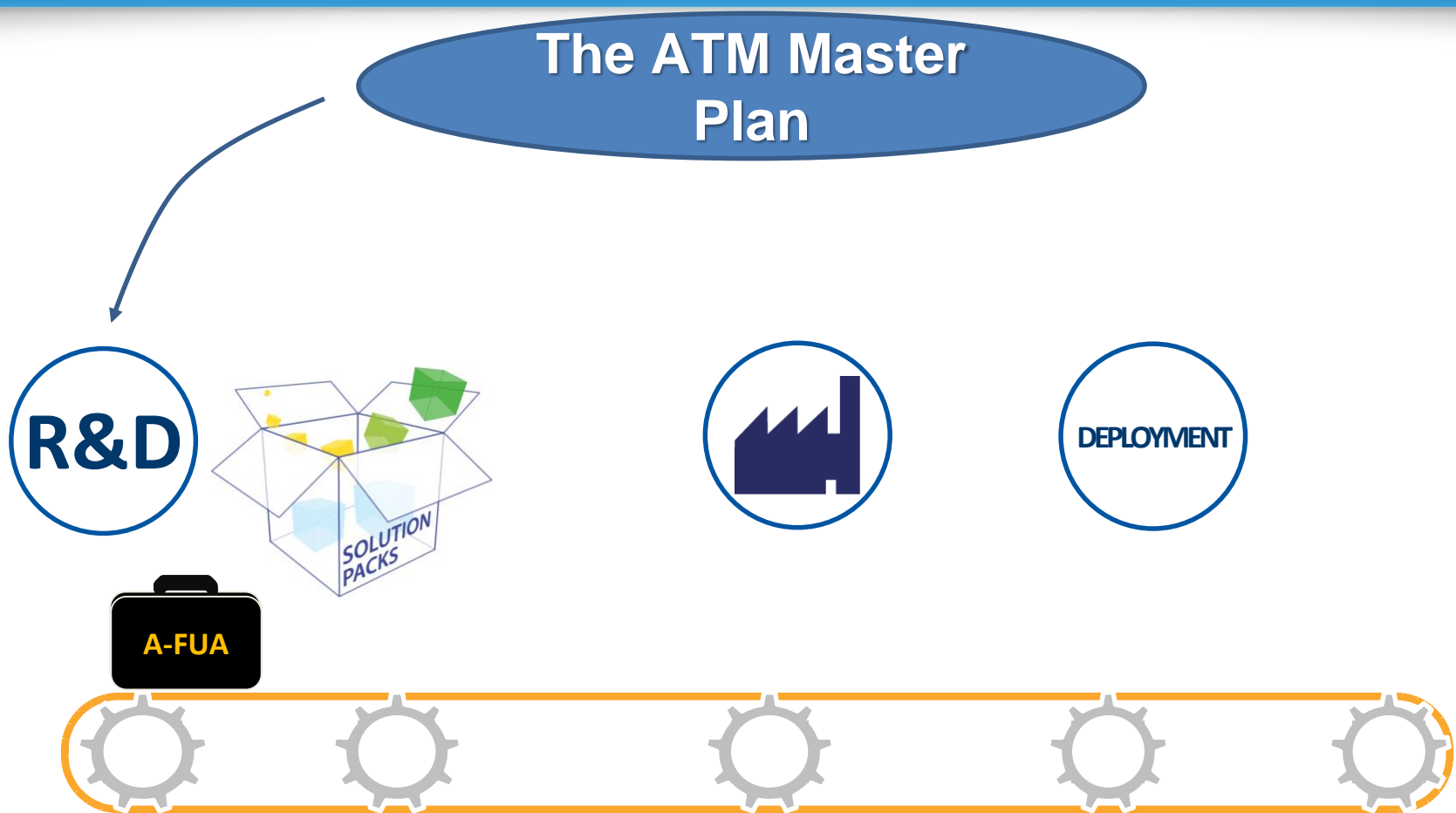
Main processes

Related to Operating Environments





A brief view on the solution lifecycle





Combining vision and concrete delivery

The Master Plan organises the priorities for the future

DEVELOPMENT

Future SESAR Solutions in 4 Key areas, e.g.:



UDPP, Mgt of dynamic airspace configuration...



AMAN / DMAN integration, Sector team operations...



LVP using GBAS, integrated surface management, incl. safety nets...



CNS rationalisation, 4D, Mission trajectory...

Stimulate innovative ideas to address performance challenges and deliver
Vision

DEPLOYMENT

▪ Coordinated & synchronised

1. Focus on optimisation of deployment at strategic level
2. Added value compared to “business as usual”
3. investing towards more efficient infrastructure

▪ Local, e.g. remote towers

▪ Next mature & performing solutions, e.g.

- ✓ multi-sector planning,
- ✓ slot swapping...

Performance-driven and pragmatic approach



Exercise





How often does the ATM Master Plan level 1 document get updated?

- A. Every year
- B. Every two years
- ✓ C. Every three years
- D. Every five years



How does the Master Planning Process work?

- A. By building consensus
- B. Starting from the performance needs
- C. Considering feasible deployment scenarios
- D. Considering the Business view for all stakeholder categories
- ✓ E. By doing all the above



How do SESAR solutions get Deployed?

- A. Only by projects organised and financed by individual stakeholders.
- B. Only by Common Projects, defined in EU regulations, and coordinated by the SESAR Deployment Manager with EC financial contributions.
- C. Through projects that are coordinated by the SESAR Joint Undertaking.
- ✓ D. Both 1. and 2. are possible.



4 questions you should be able to answer



Why do we need a Master Plan?



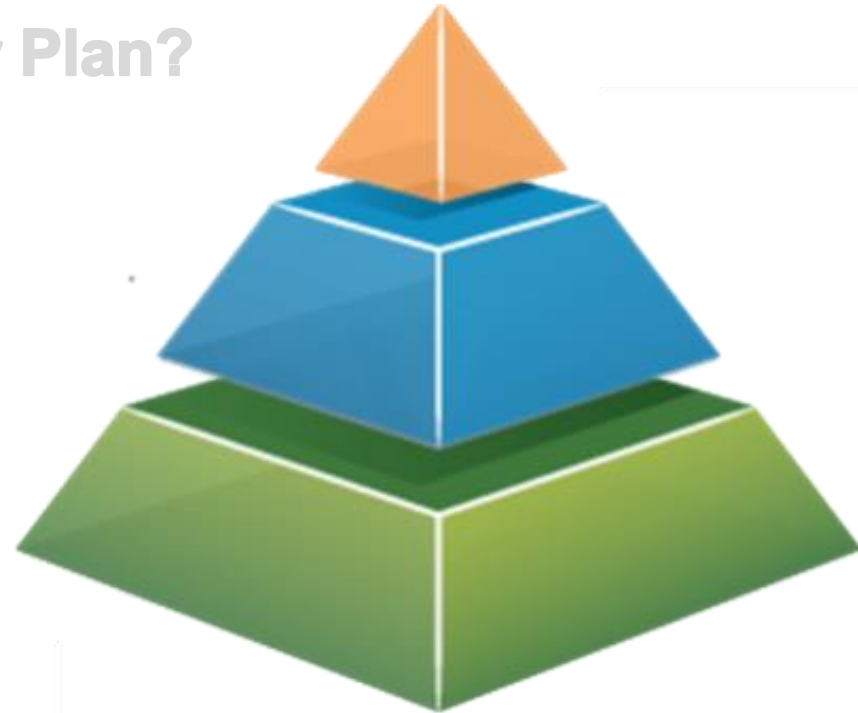
What will you find in it?



How does it work?



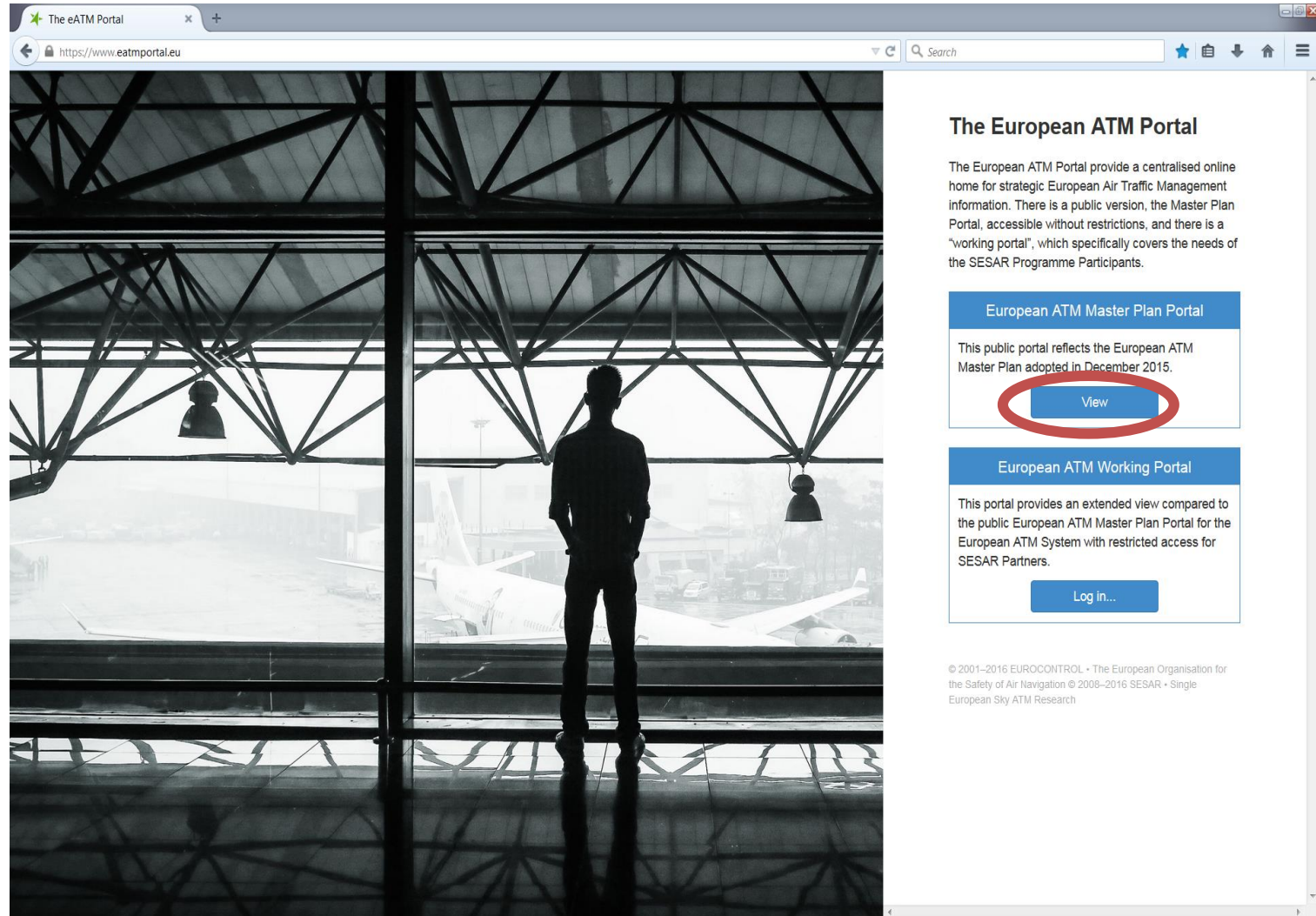
Where can I find it?





Access the Master Plan via the ATM Portal

<https://www.eatmportal.eu>





4 questions you should be able to answer

I

Why do we need a Master Plan?

II

What will you find in it?

III

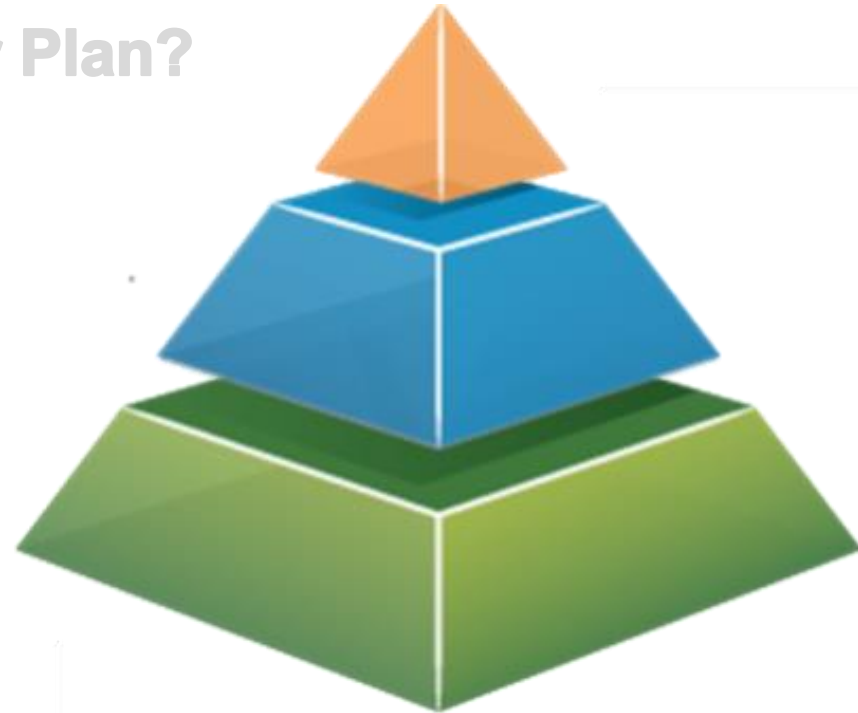
How does it work?

IV

Where can I find it?

V

A quick recap





One Plan - One Direction





Evolution in MP editions

Digitalising Europe's aviation infrastructure

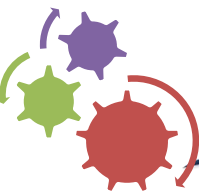
Solutions & Architecture focus

*Vision and Performance ambitions
Deployment Scenarios*

**Performance approach
Structured process
Realism**

*Structured and sustainable
Planning tool for R&D and Deployment*

R&D initial definition



2009

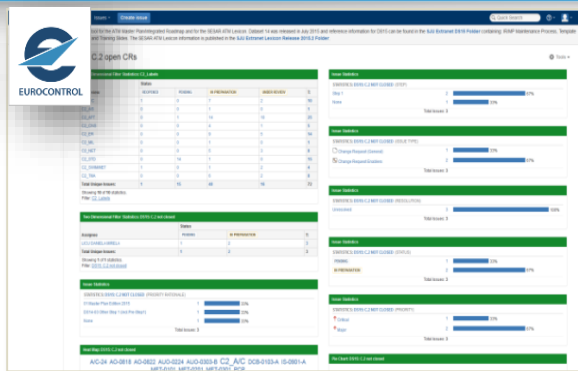
2012

2015

2019



Consensual and Transparent



Shared

Collaborative

Agreement

Structured



On-line access

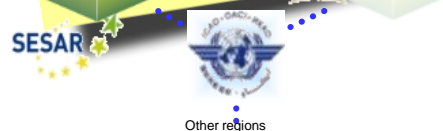
Transparency

Working environment

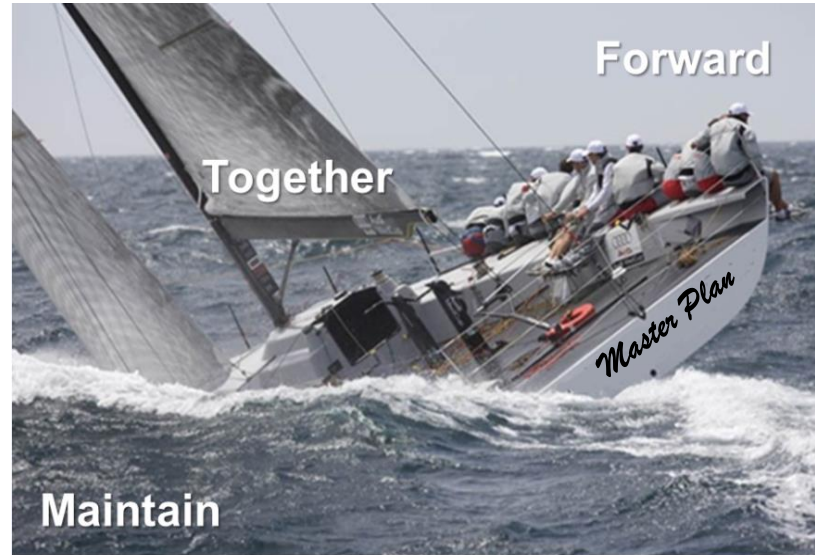




Performance Driven



Agreement & Engagement



Input to Common Projects

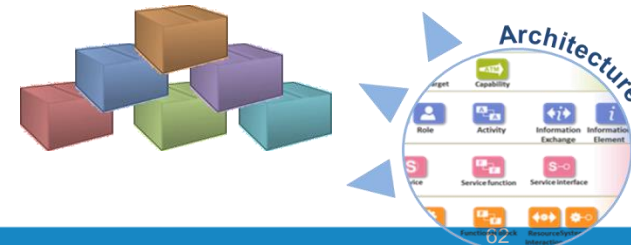


Essential
Operational



Operational and Technical Changes

Solutions & Architecture Oriented





EASA

European Aviation Safety Agency



ARISE⁺

Funded by the European Union and implemented by the
European Aviation Safety Agency



Thank You

Your safety is our mission.

An agency of the European Union

