Towards a reliable, efficient, future proof and integrated European railway network

Europe's Rail

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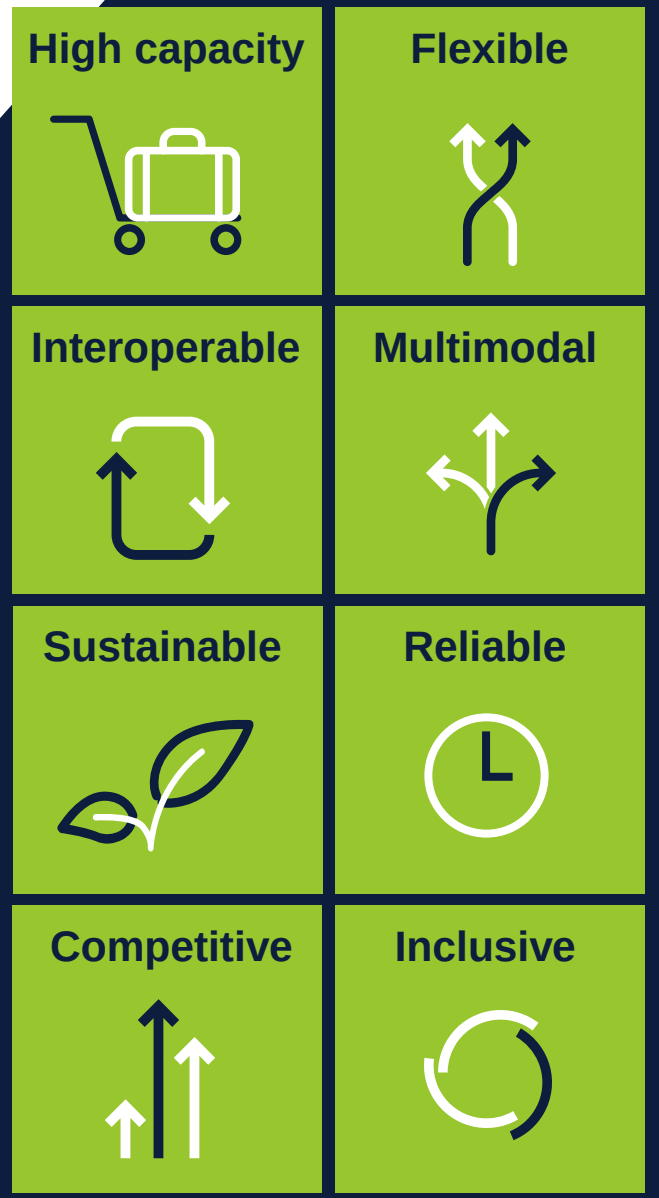
Executive Director

Europe's Rail

Vision

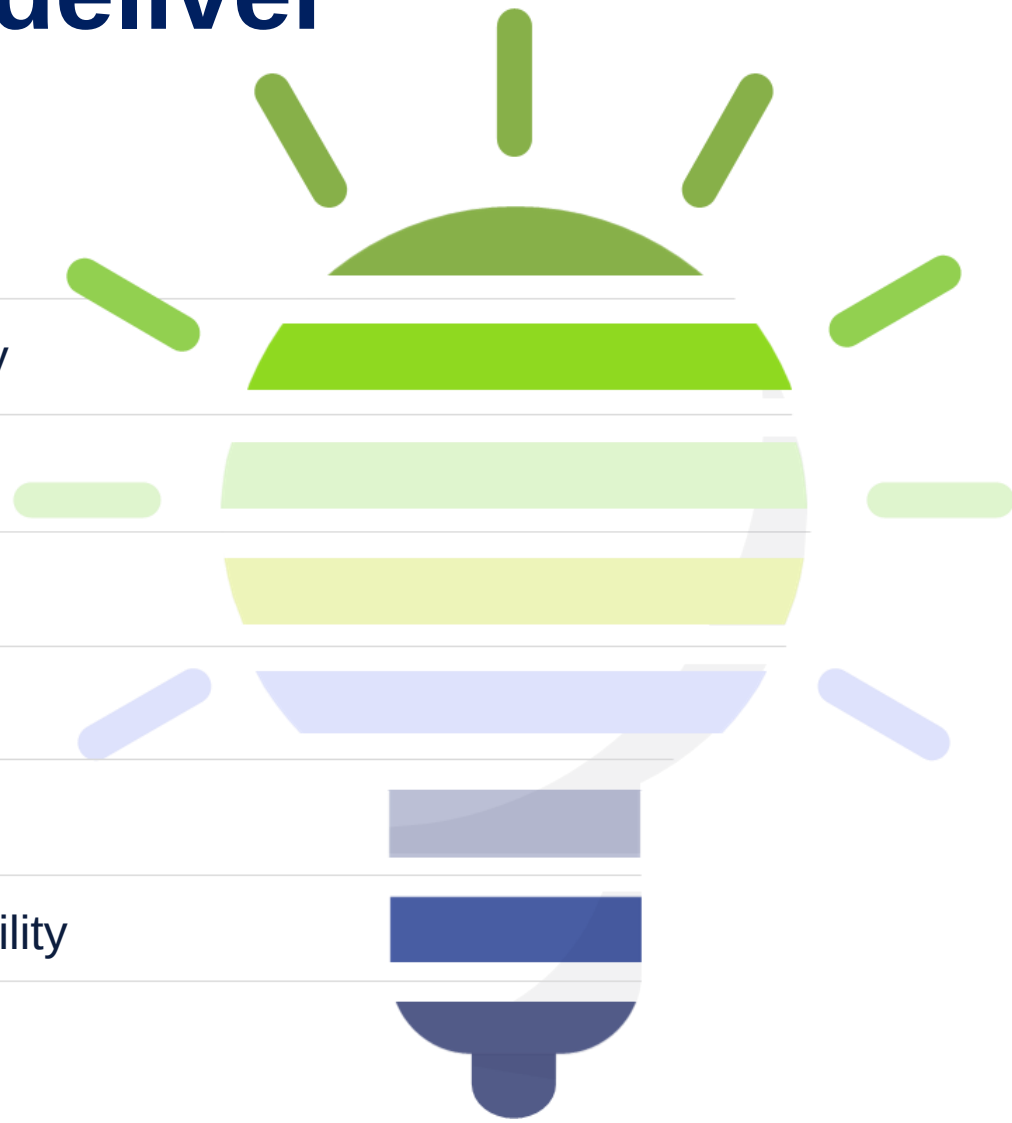
To deliver a **fully integrated European railway network for citizens and cargo.**

Rail Research and Innovation to Make Rail the Everyday Mobility

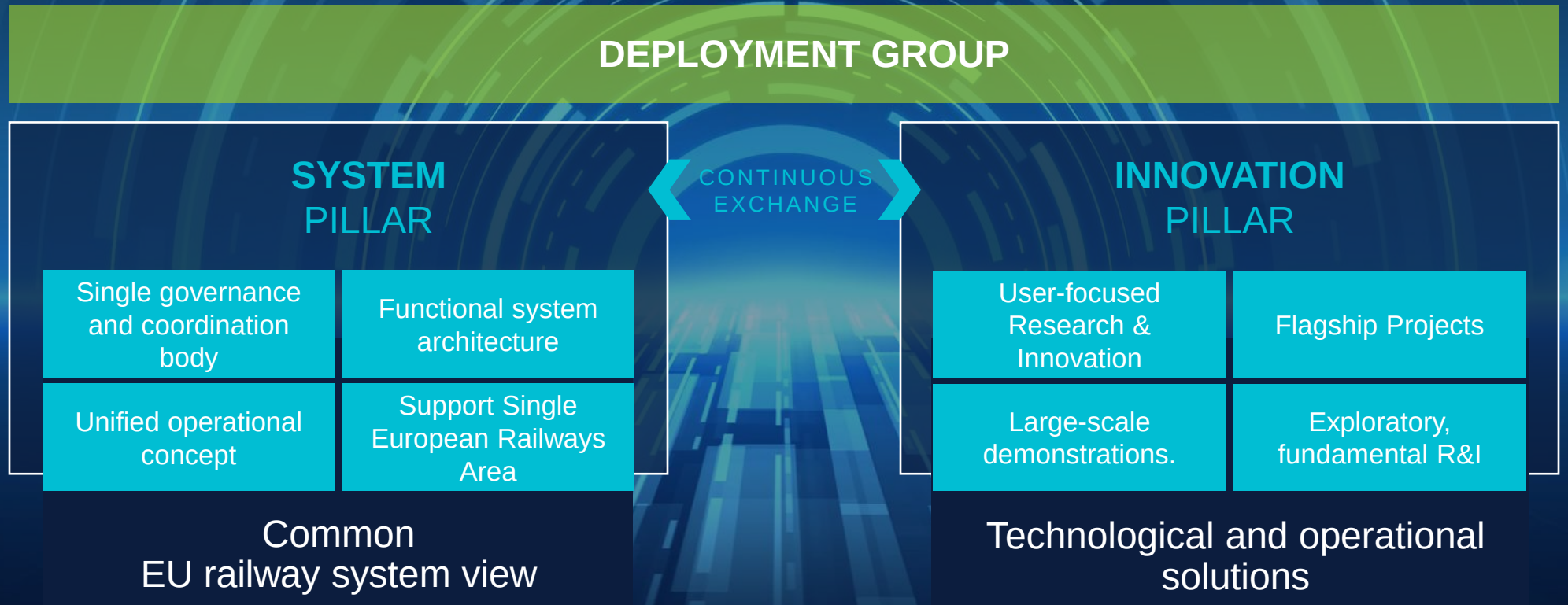


EU-Rail, a R&I integrated Programme and a cooperation to deliver

- Adapt to changing customer requirements
- More cost-efficient solutions and services compared to today
- Need for improved performance and capacity
- Addressing workforce shortage
- Climate change adaptation and environmental sustainability
- Increased competitiveness
- Interaction with other modes, make rail central to future mobility
- Addressing legacy systems and obsolesce



Single R&I Programme of EUR 1.2 billion for a system impact



On what EU-Rail is built upon

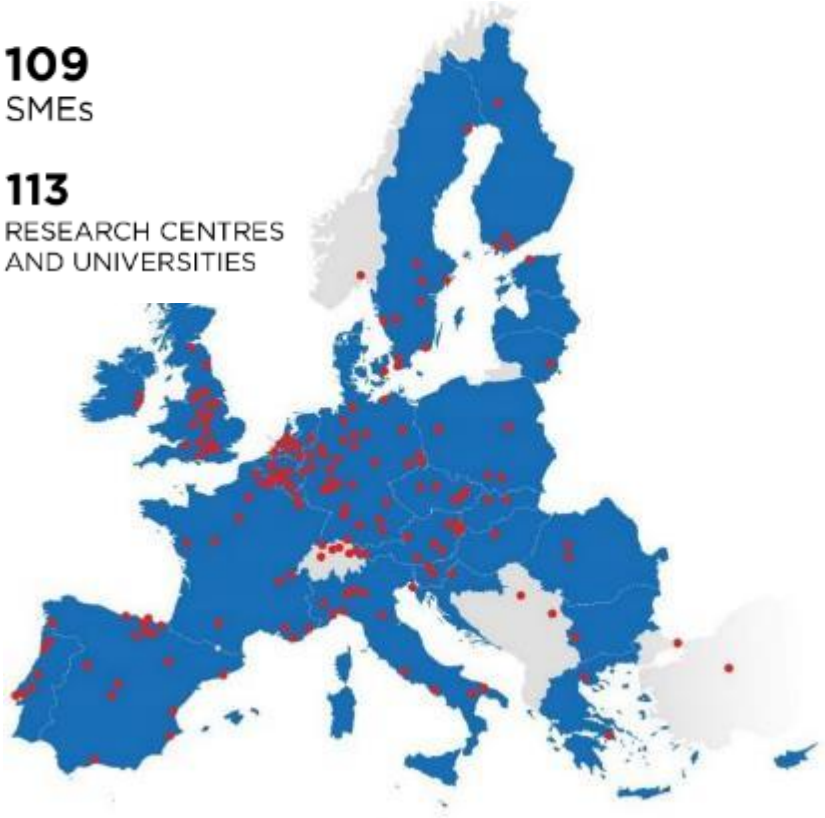
28 MEMBERS

412 PARTICIPANTS

29 COUNTRIES

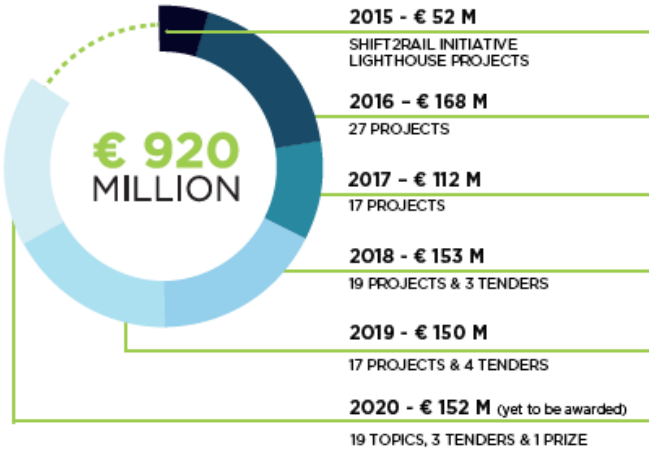
109 SMEs

113 RESEARCH CENTRES AND UNIVERSITIES



- Shift2Rail Programme finalized, with main results (achieving higher TRLs) disseminated in S2R Catalogue of Solutions.
- The work performed in Shift2Rail increased the TRL of the innovations needed to create a SERA in a harmonised way across countries.
  - ✓ 695 prototype testing activities with an average TRL of 5/6
  - ✓ 72 new products launched into the market
  - ✓ 20-41%* reduction in LCC
  - ✓ 58-96%* increase in capacity
  - ✓ 39-57%* improvement in reliability and punctuality

** depending on the rail segment of application*



Founding Members

EU-Rail Multi-Annual Work Programme

Network management planning and control & Mobility Management in a multimodal environment

Network management planning and control (new processes and automation for decision support) & rail management in a multimodal environment (real-time demand-driven operations, including demand from other transport modes)

Digital & Automated up to Autonomous Train Operations

Digital “Automated & Autonomous” Train Operations building upon the next gen Automatic Train Control based on ERTMS + enhancements on TCMS for integration at the on-board level

Intelligent & Integrated asset management

Knowledge from the digital transformation will feed back into the design, construction, manufacturing as well as into operation and maintenance processes.

A sustainable and green rail system

Innovative solutions and services based on leading edge technologies to minimize the overall energy consumption and environmental impact of the railway system

Digital Enablers

Provide Digital Twins Design toolbox for design as well as for validation, verification and test + a Federated dataspace where all digital elements of the system can play together in a coherent and interoperable way

Innovation on new approaches for guided transport modes

Explore non-traditional and emerging flexible and/or high-speed guided transport systems, as well as to create opportunities for innovators to bring forward ideas for shaping those future systems

Regional rail services / Innovative rail services to revitalise capillary lines

Decreasing cost while offering a high quality of service and operational safety + increase customer satisfaction and attractiveness

Sustainable Competitive Digital Green Rail Freight Services

Digitalization and automation of operational functions (e.g. DAC) and processes as well as increasing the efficiency of the immaterial (information/data) layer of transport in logistic

Europe's Rail

Objectives of 2024 and achievements:
EU-Rail after 2 years

26
MEMBERS

361
PARTICIPANTS

58
SMEs

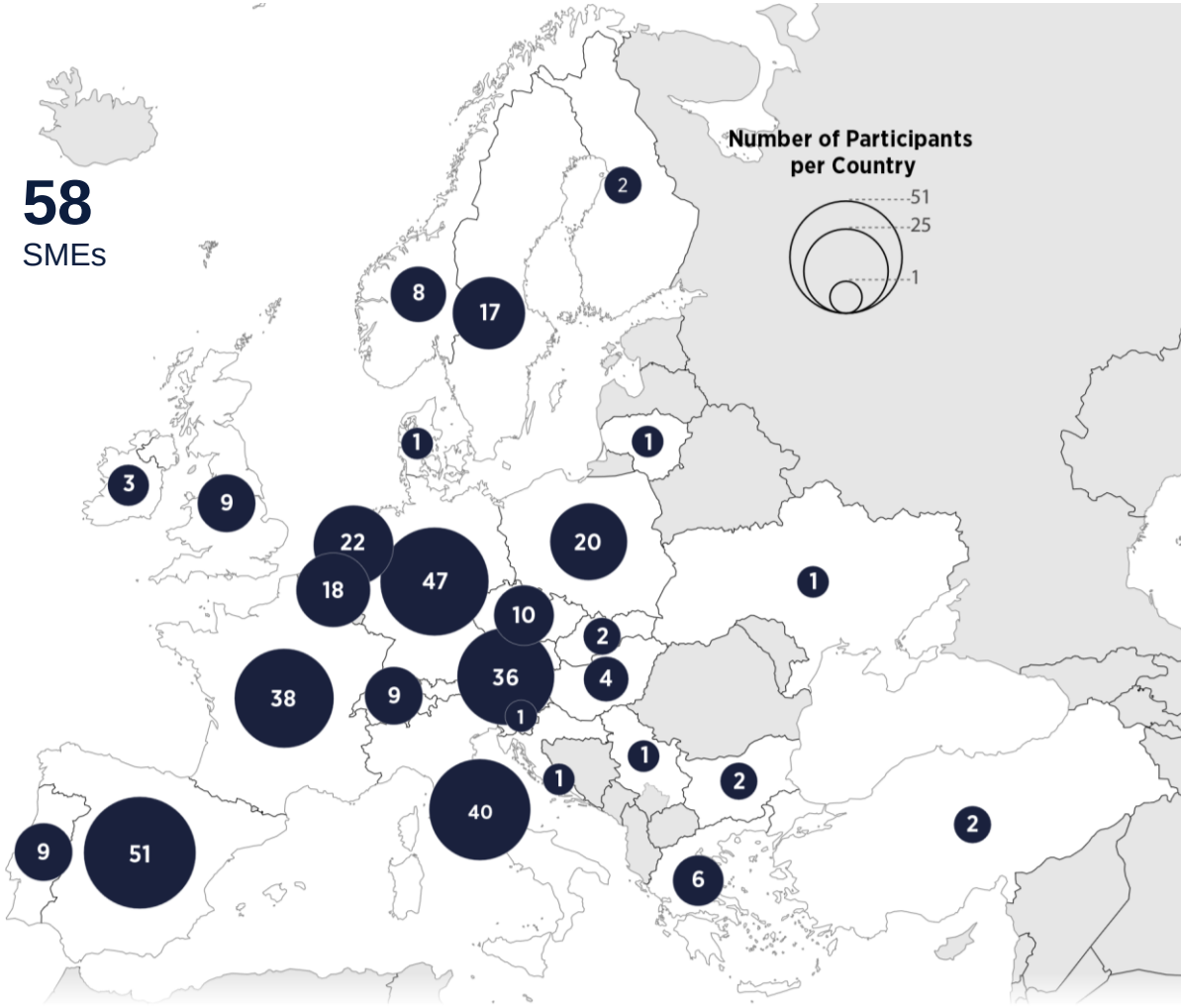
27
COUNTRIES

27
RESEARCH CENTERS
& UNIVERSITIES

2022 - € 566.7 M
14 Projects & 2 Tenders

2023 - € 44 M
7 Projects & 24 Tenders

2024 - € 31.9 M
3 Projects & 8 Tenders



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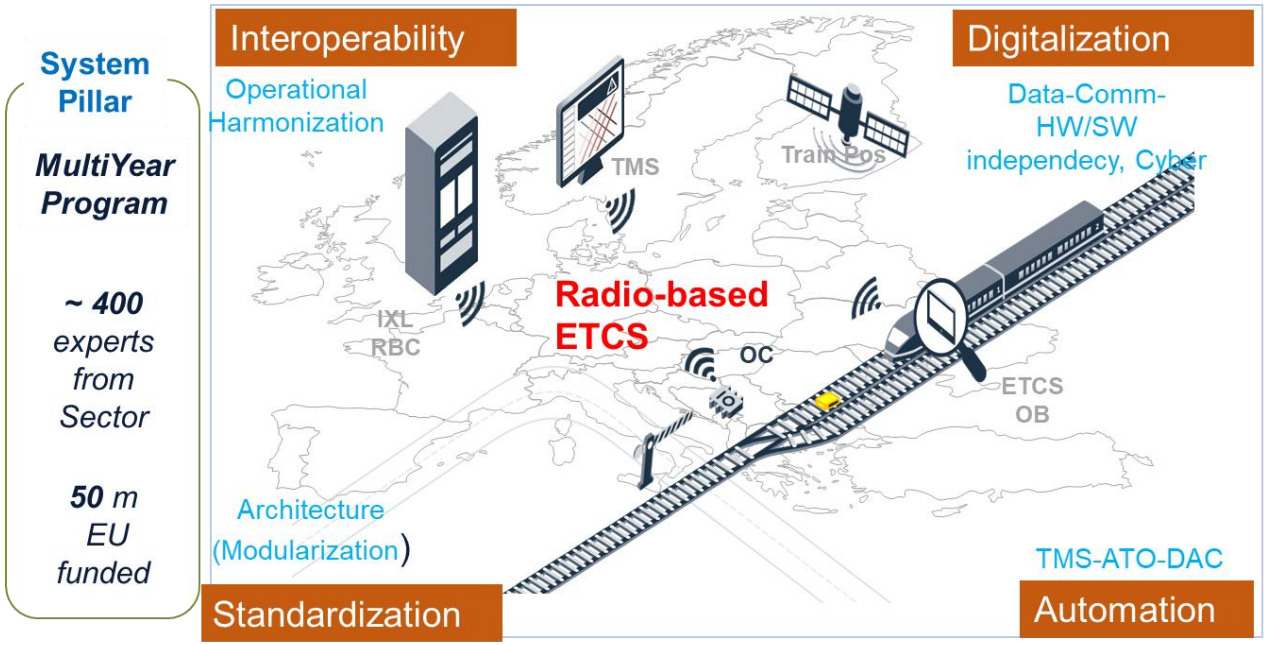
Cartography: Eurostat – IMAGE, 11/2024

System Pillar

In the second year of the SP, the model based system engineering approach was fully established. The first design concepts and specification results were approved and published (see right)



General
- ✓ The first version of the Standardisation and TSI Input Plan (STIP) was published

PRAMS/Security
- ✓ The guidelines for implementing cybersecurity in rail were published (draft)
- ✓ System Concept and PRAMS plan
- ✓ CBM RAMS rules

Task 1, Railway system
- ✓ As-is operationally architecture on prioritised capabilities
- ✓ Energy report on energy saving measures

Task 2, Operational
- ✓ Operational capabilities

Task 2, Traffic CS
- ✓ Operational analysis (CONEMP) and System Analysis (FRS)
- ✓ A proposal for the target trackside architecture was developed, based on ETCS L2 without line signals

Task 2, Train CS
- ✓ Onboard architecture (logical and physical)

Task 2, Trackside assets
- ✓ The EULYNX Baseline 4 Release 3 specification were published jointly with the System Pillar

Task 2, Transversal
- ✓ The CCS/TMS data model was published
- ✓ CCS/TMS diagnosis and configuration concepts

Task 3, TMS/CMS
- ✓ 5 variants for European TMS were proposed and analysed
- ✓ System concept and system architecture

Task 4, DAC/FDFTO
- ✓ Harmonised operation procedures

Task 5, HERD
- ✓ 2 use cases for harmonised diagnostics were analysed

❖ Main expected outcomes for 2025:
- ❑ European Operational rulebook
- ❑ Design decision for Traffic CS system concept (→ Extended mirror group workshop in February)
- ❑ Onboard CCS (Train interfaces, modularity, basic ASTP)
- ❑ Finalise Trackside asset specifications
- ❑ CCS/TMS Data Model fully derived from extended ERA-ontology

Deployment Group report

- Formal decision taken by DG MOVE (C(2024) 8368 final, 29.11.2024) approving the composition of the Deployment Group of the Europe's Rail Joint Undertaking)
- 3 informal meetings in 2024
- Open group
  - Decision on new candidates twice a year. Interest from the sector to join
- First High Level Deployment Group in February 2025
  - Formalisation RoP, communication plan and rules to appoint subgroups

ADIF
AERRL / Nexrail
AERRL
ALE
Alstom
CAF
CER
DB
EIM
EIM / SNCF-Réseau
FSI
Hitachi Rail
Knorr-Bremse
Norwegian Railway Directorate
ÖBB
Siemens
SNCF
SRG
Thales
TrafikVerket
UIC
UNIFE
Voestalpine Railway Systems
ERA
DG MOVE
EU-RAIL

FRMCS Deployment Subgroup

Remits (1 / 2)

- Status: approved
- Deployment Group as only place to discuss European FRMCS deployment
- Focus on activities based on UIC program, test and demonstration activities

1.
Overview of the **status** of railway telecommunications in Europe, encompassing current retrofit and investment plans (National Implementation Plans expected to be delivered by the Member States mid-2024 as key input)

2.
Estimation of necessary capacities in industry, operators, contractors, and network operators → plan for operational implementation

3.
Perform **financial analyses** on OPEX and CAPEX costs, funding, and financing (CBA) analyses of the migration scenarios

4.
Examination of need for **EU-wide coordination** of deployment incl. scope (deliverables), standardisation of operational procedures, and implementing technical harmonisation

FRMCS Deployment Subgroup

Remits (2 / 2)

5.
Authorisation and **regulatory frameworks**, incl. assessing how vehicles/tracks with FRMCS will be authorised quickly and if the regulatory framework needs to be modified

6.
Investigate **cross-border issues** and **private-public interfaces** (e.g. international MNO's, IM interfaces)

7.
Define possible **migration scenarios.** The technical layer and the legal, economic and political layer should be considered.

8.
Risk assessment on pace, availability, capacity of consultants/designers/contractors, technology, national priorities

9.
Ensure **alignment with other rail transformation programs** such as ERTMS, DAC, and ATO.

10.
Make recommendations in order to ensure both smooth migration and operational disturbance reduction

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