



# Innovation, harmonization, and deployment – Europe's Rail Joint Undertaking modernizing European rail



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# What is EU-Rail Joint Undertaking?

- The EU-Rail Joint Undertaking is a public private partnership established established by the [Council Regulation \(EU\) No 2021/2085](#) of 19 November 2021 establishing the Joint Undertakings under Horizon Europe – (“Single Basic Act”/SBA) under the Horizon Europe programme (2020-2027).
- Building on the achievements of its predecessor, the Shift2Rail Joint Undertaking, EU-Rail aims to accelerate research and development in innovative technologies and operational solutions supporting the fulfilment of EU policies and objectives relevant for the railway sector and supporting the competitiveness of the rail sector and the European rail supply industry.
- To do so, EU-Rail provides funding mainly in the form of grants to indirect actions which are selected following open, transparent and competitive Calls for Proposals.



# Mission & Vision

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

**Rail Research and Innovation** to make Rail the everyday mobility.





# Objectives



## General

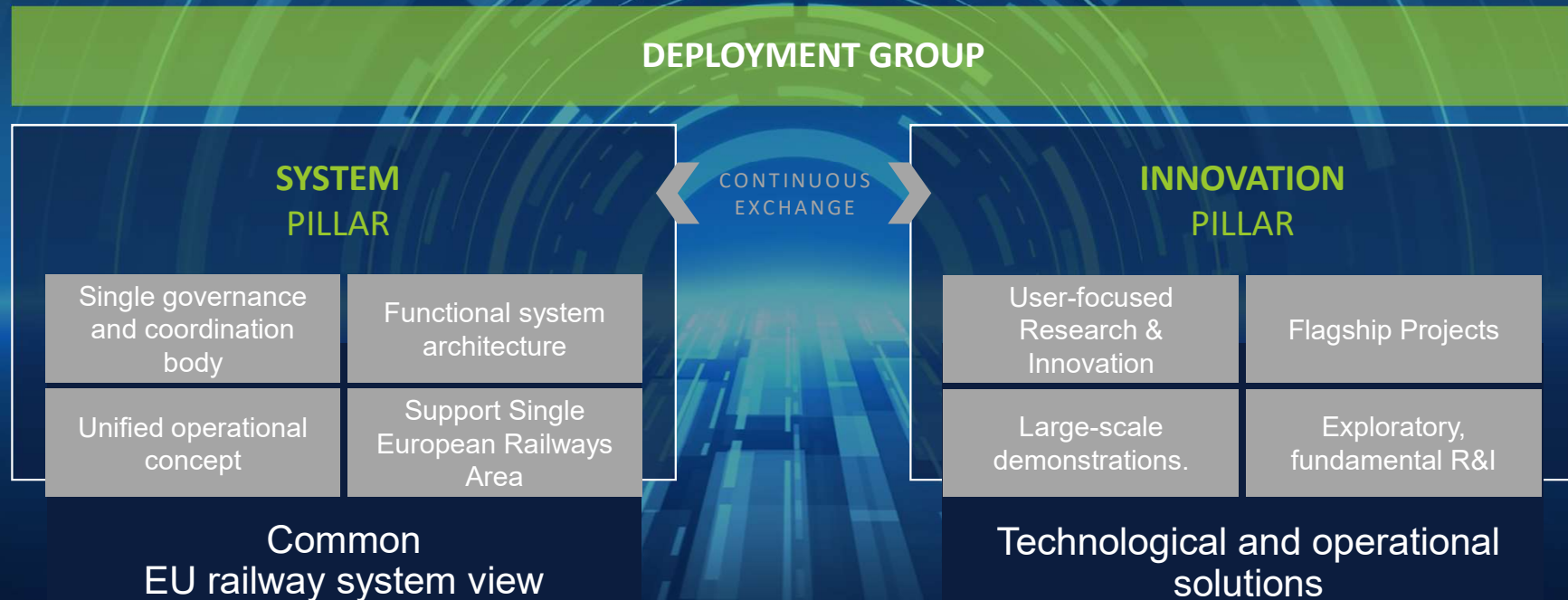
- Single European Railway Area
- Transition to integrate European rail system into the wider mobility system
- Strong European rail industry

## Specific

- a) Integrated European railway network
- b) Sustainable and resilient rail system
- c) Unified operational concept and a functional, safe, and secure system architecture
- d) Competitive green rail freight
- e) Demonstration projects
- f) Strong and globally competitive European rail industry
- g) Synergies with other EU policies, programmes, initiatives, instruments, or funds



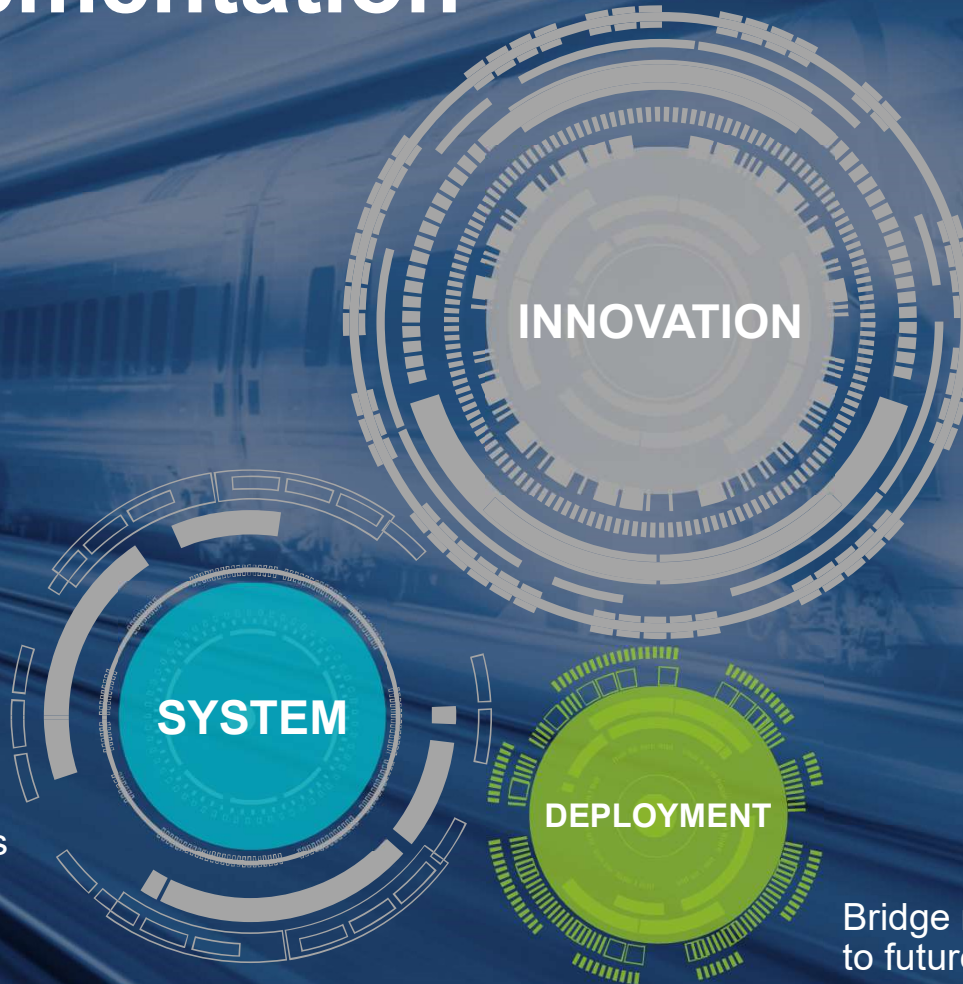
# One integrated R&I Programme based on a **system view**





# Implementation

- Ensure the functional system architecture
- Input to standards and regulations
- migration considerations



Private Members contribution, at least  
**€615 million**

EU contribution, up to  
**€615 million**

## Flagship Area 1-6:

Call 2022 (50% of R&I)  
Call 2025/2026 (30%)  
Call 2027: activities until 2031  
(technical work ending at least a year  
before, targeting two years before)

+

Launching **Exploratory calls** for  
proposal or **tenders** on a regular  
basis

Bridge research and innovation  
to future coordinated deployment



# 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*

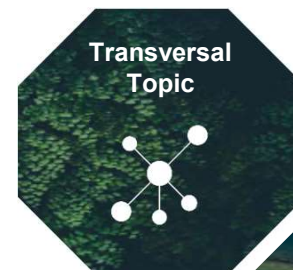
Digital “Automated & Autonomous” Train Operations building upon the next gen Automatic Train Control based on ERTMS + enhancements on TCMS for integration at the on-board level

## *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



## *+ Exploratory Research and other activities*



## *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



# **Case study: Digital Automated Coupler**



# Our main focus:

## *Fulfilling the preconditions for DAC deployment*



## Zoom-in: Preconditions 1 - 3



01

Single European  
DAC System

DAC-Technology and DAC-operations/ functionalities are **clearly defined and harmonised**



02

Proven  
Technology

The **technology** meets all essential requirements (incl. RAMS) and is proven through large demonstrations (incl. Pioneer Trains)



03

Proven Operational  
Functionality

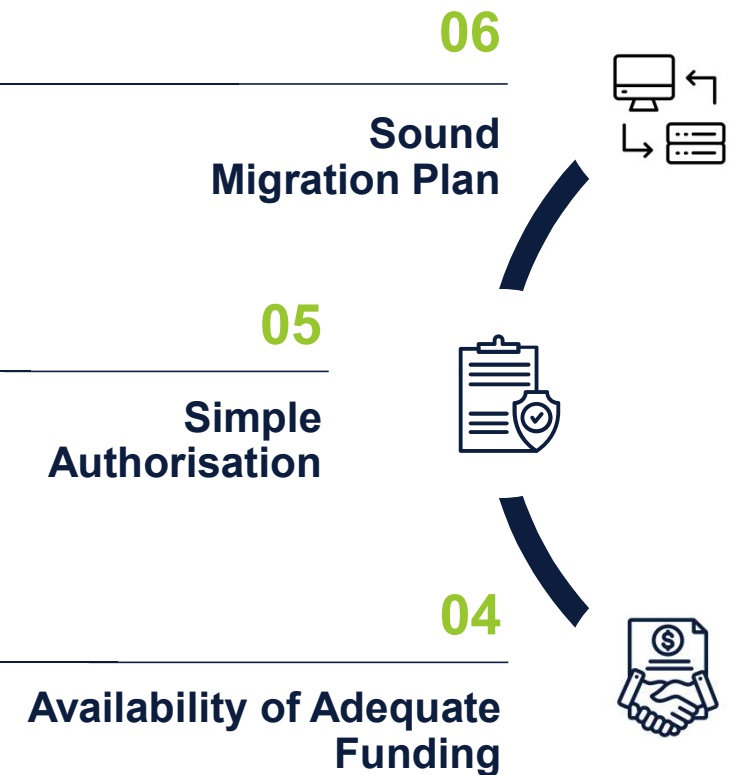
The **operational functionalities/use cases** bring the expected benefits - proven through large demonstrations

## Zoom-in: Preconditions 4-6

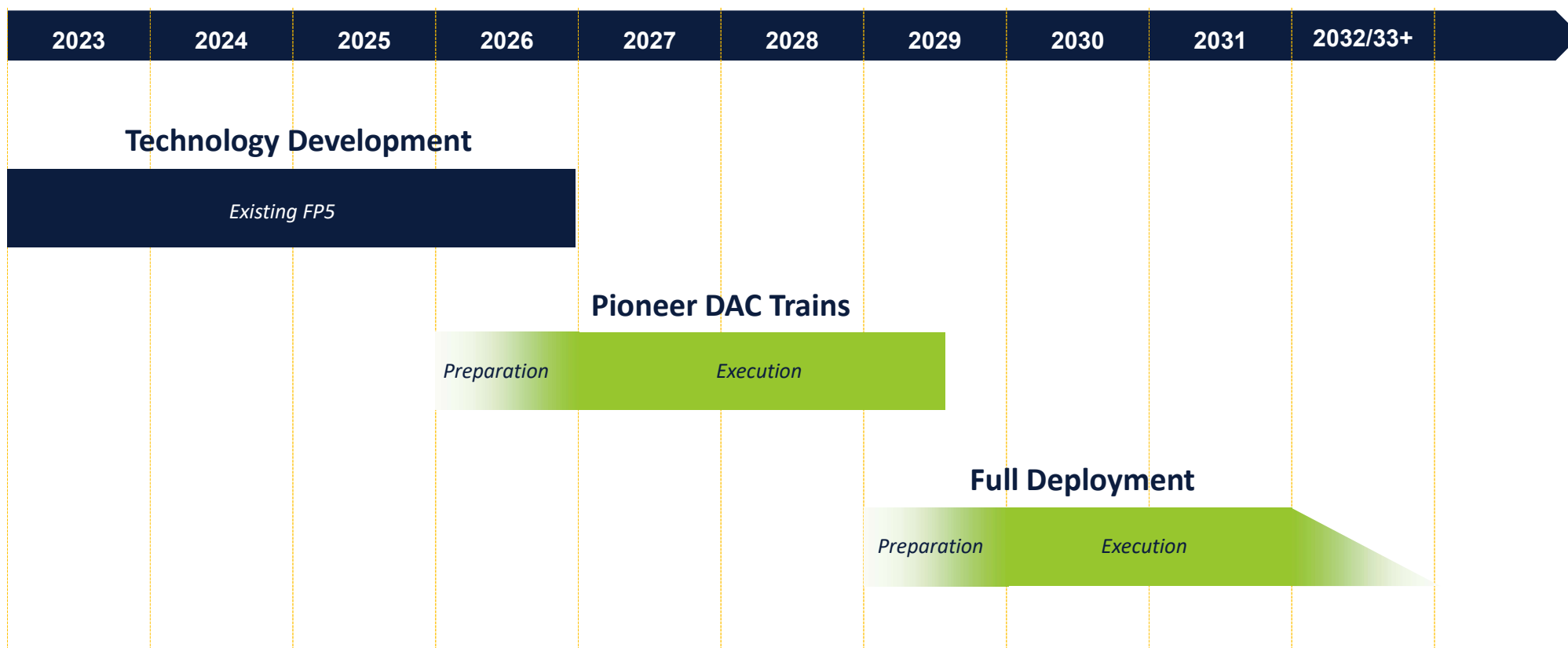
A **sound migration plan** is set, guaranteeing simultaneous deployment in Europe (funding programs, established production capacities, staff training, infrastructure and IT adaptations)

Development of an **efficient & suitable authorisation** process & requirements  
Preparing TSI drafts for the EC

Positive **CBA incl. adequate funding program** (EU and MS) are made available and guaranteed



# EDDP as a programme in 3 major phases





# Outlook on Technical Development

Q4 2024

2025

2026

2027

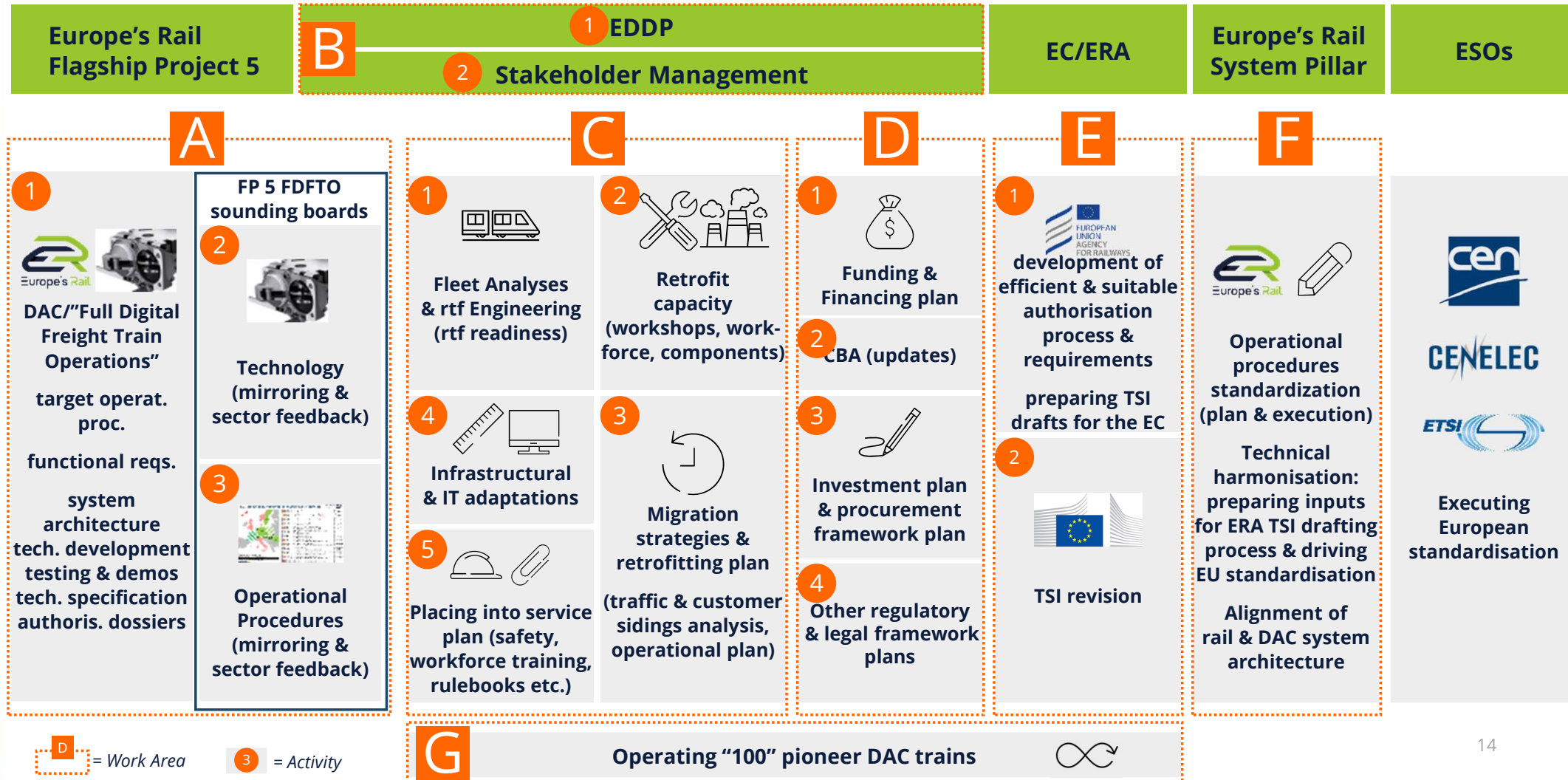
## TECHNICAL DEVELOPMENT

(DAC BASIC PACKAGE)

Responsible: FP5

- Completion of the Technology Development in EU-Rail FP5 (DAC BASIC PACKAGE)
- Ramping up demonstrator trains from EU-Rail FP5 (in Austria, Germany and Sweden, ...)
- Moving forward with standardization works (CEN, CENELEC, TSI, etc.)

# All DAC-related work areas and activities





# Achievements

## Train Test Lab



**Opening of the train  
test lab**



**Test for e-coupler  
assessment**



# Achievements

## Demo trains



**Installation and start of DAC  
commercial demo train in Sweden**



**Test with Powerline PLUS  
technology in Switzerland**



## Founding Members

