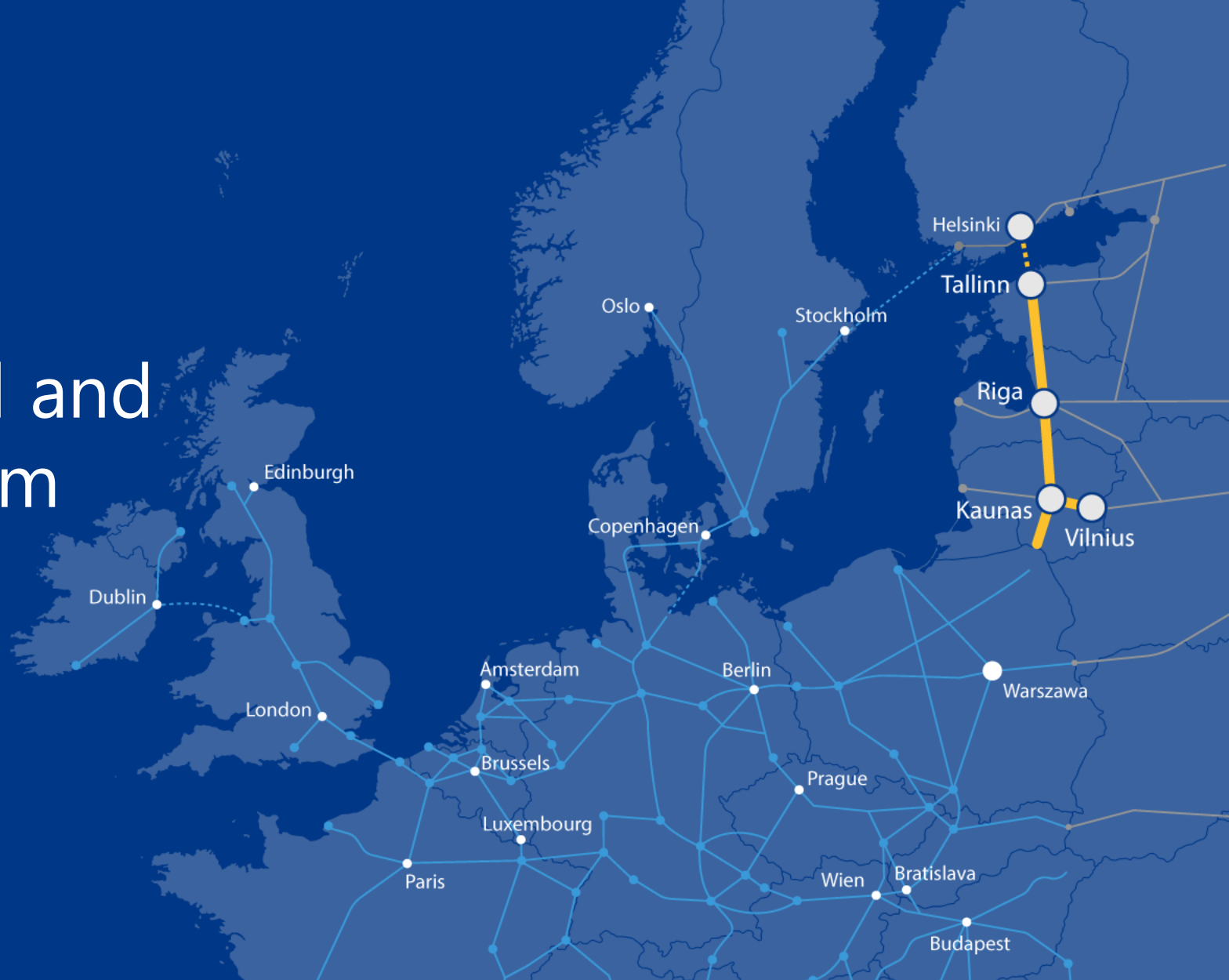




Control-Command and Signaling subsystem deployment

**Antanas Šnirpūnas, Power Supply Team Leader,
RB Rail AS**

September 2023



**Co-funded by
the European Union**

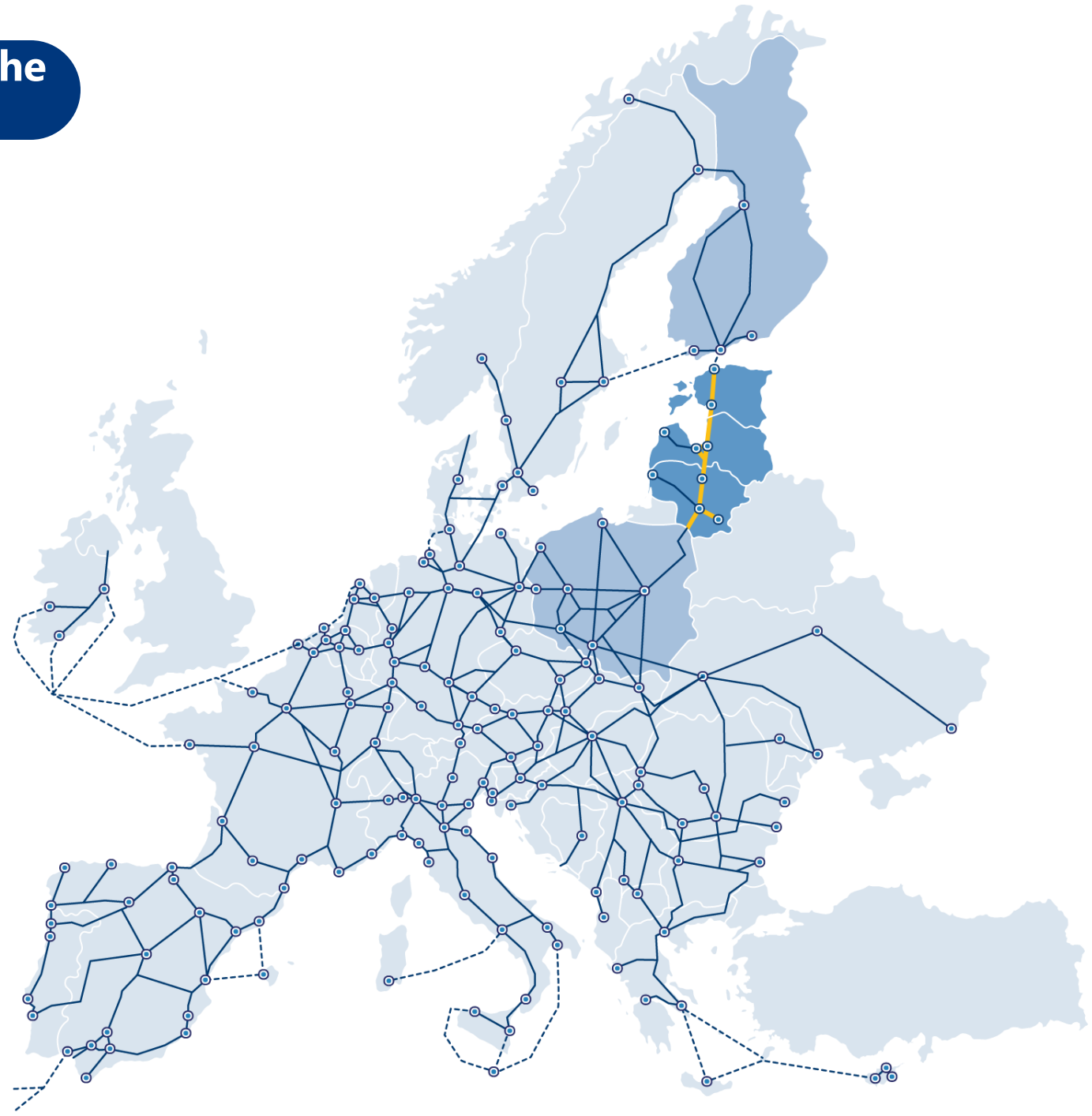
About Rail Baltica



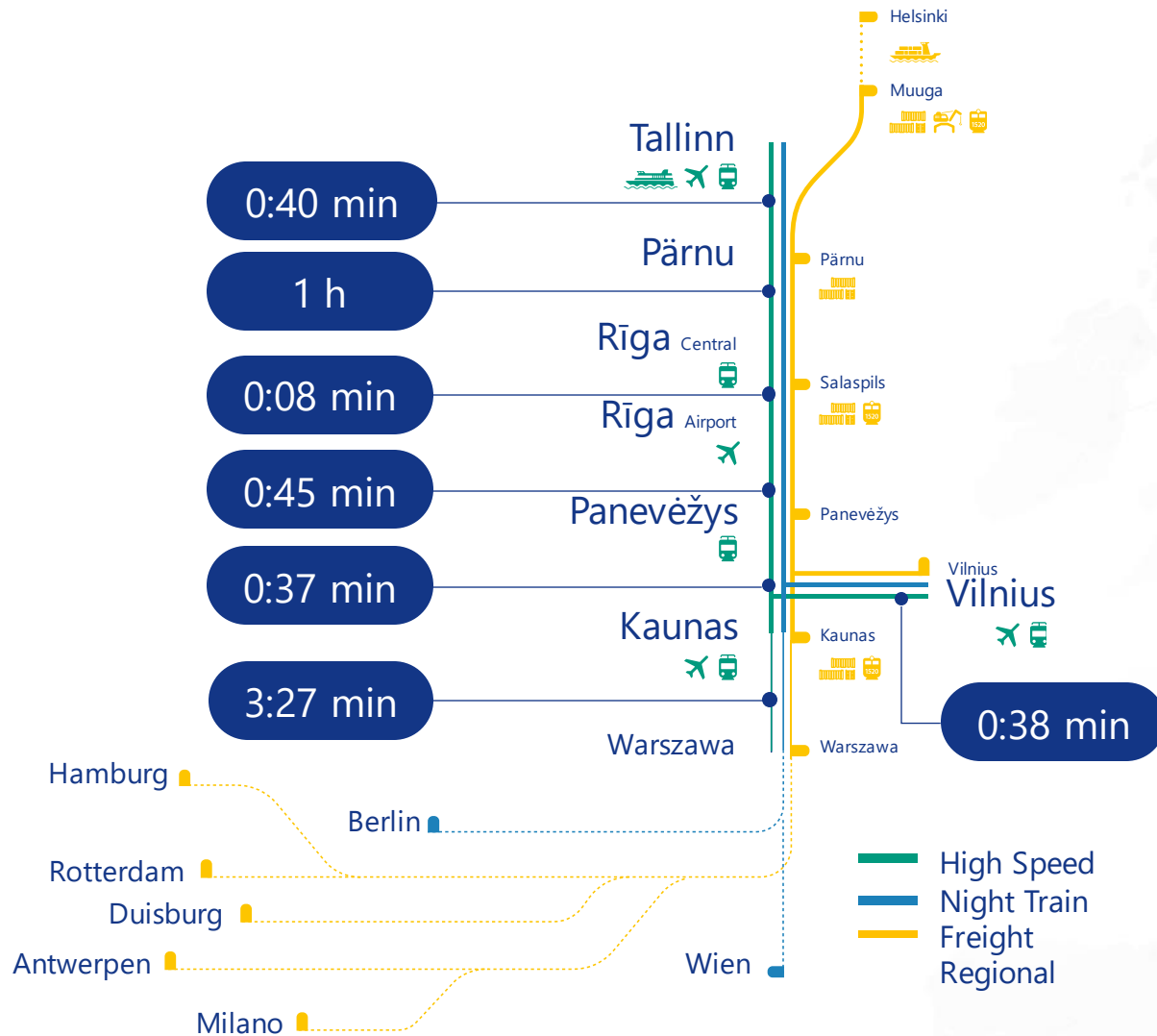
Rail Baltica: geopolitical obligation for the EU added value

- Part of the North Sea - Baltic Sea TEN-T corridor
- Part of the Baltic Sea - Black Sea - Aegean Sea TEN-T corridor*
- The basis for a new economic and security corridor in the Baltic region and the European Union
- Key element of connection of Ukraine and Moldova to Baltic Sea ports

*According to 5/12/2022 General Agreement of the TTE Minister's Council



Basis for a new economic corridor, and military mobility



870 km greenfield railway infrastructure



1435 mm Double track



ERTMS Level 2 + FRMCS



Electrified 2x25kV AC



Maximum length of freight trains: 1050m



Axle load 25t



SE-C (Swedish) loading gauge



Design speed:
249 km/h for passenger trains
120 km/h for freight trains

Rail Baltica progress in 2023

Design & Planning

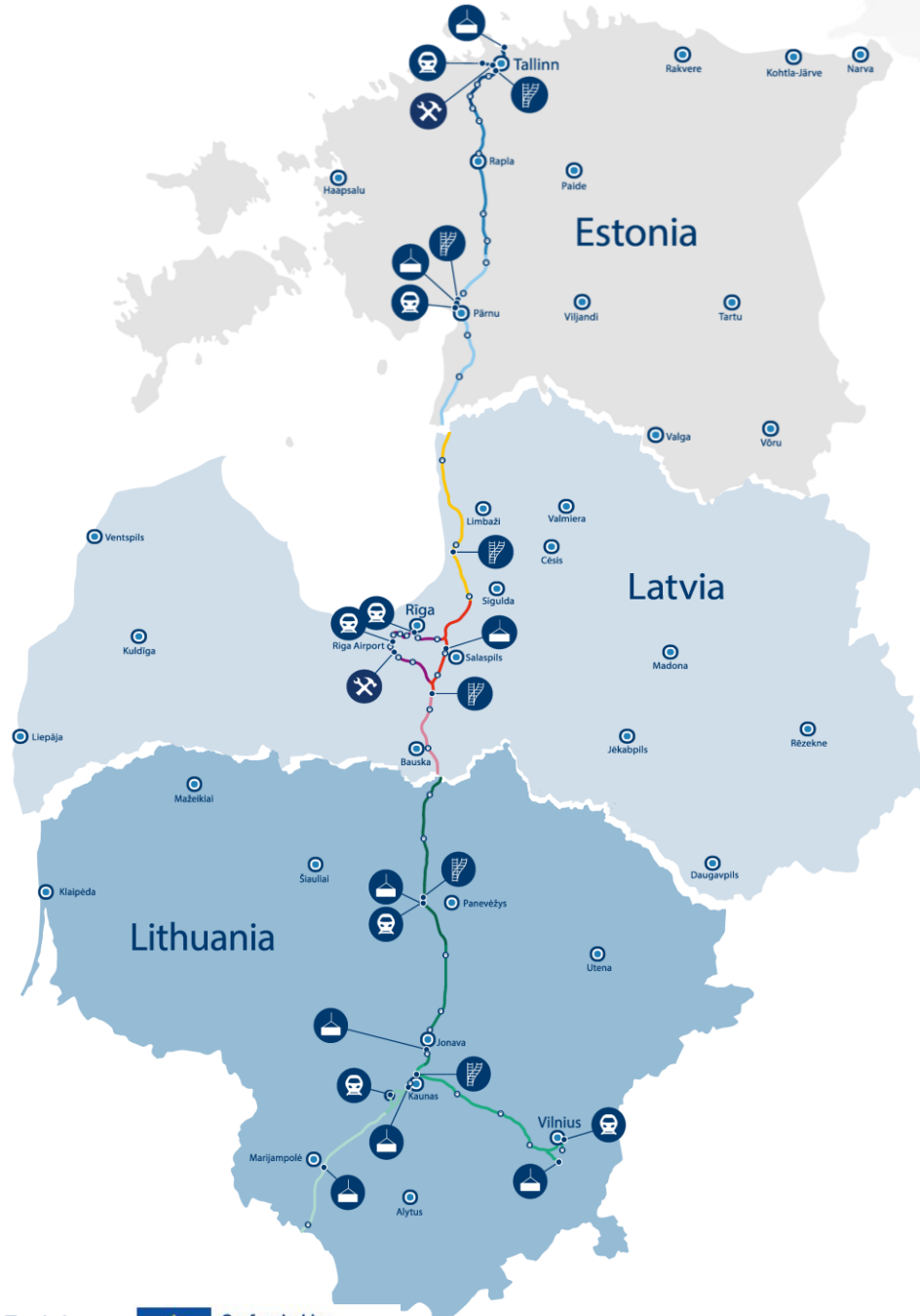
- Design works advanced on more than 640km
- Alignment for Kaunas – Lithuanian/Polish border chosen, also on section Kaunas – Vilnius, design works to commence in 2023
- Synchronizing schedule with Poland

Construction

- First phase works progressing in all three countries (stations, bridges, viaducts, animal passages, etc.)
- Main line construction procurements ongoing in Lithuania, Latvia and now - also in Estonia
- Consolidated materials procurements progressing
- Preparing logistic plan

Railway subsystems development

- ENE subsystem 870km design & build procurement ongoing
- CCS subsystem procurement design & built ongoing
- Interface agreements with Polish railway network under preparation
- Engagement with EU and UIC partners on FRMCS standardisation ongoing



Project delivery team

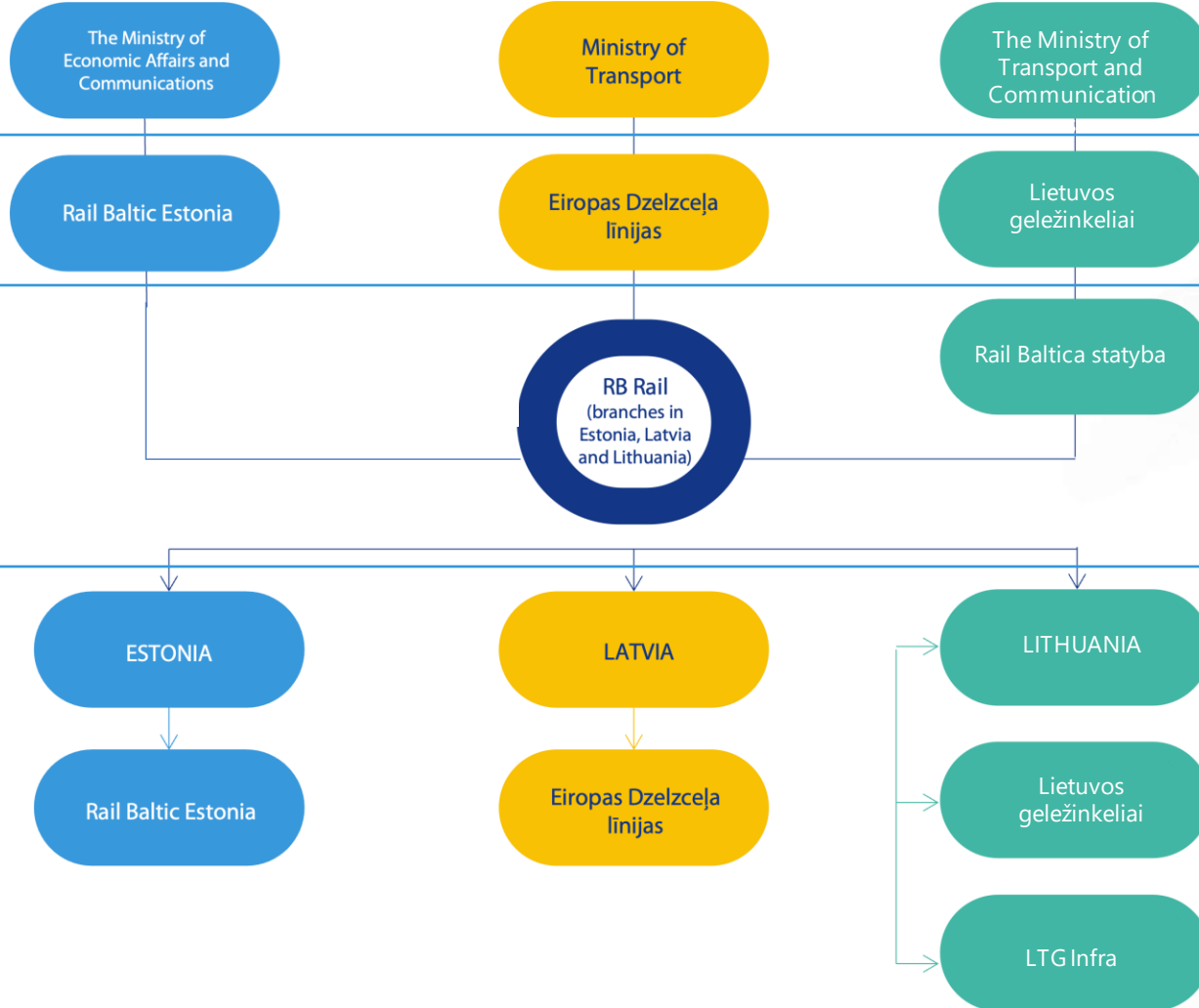
Beneficiaries

RB Rail shareholders

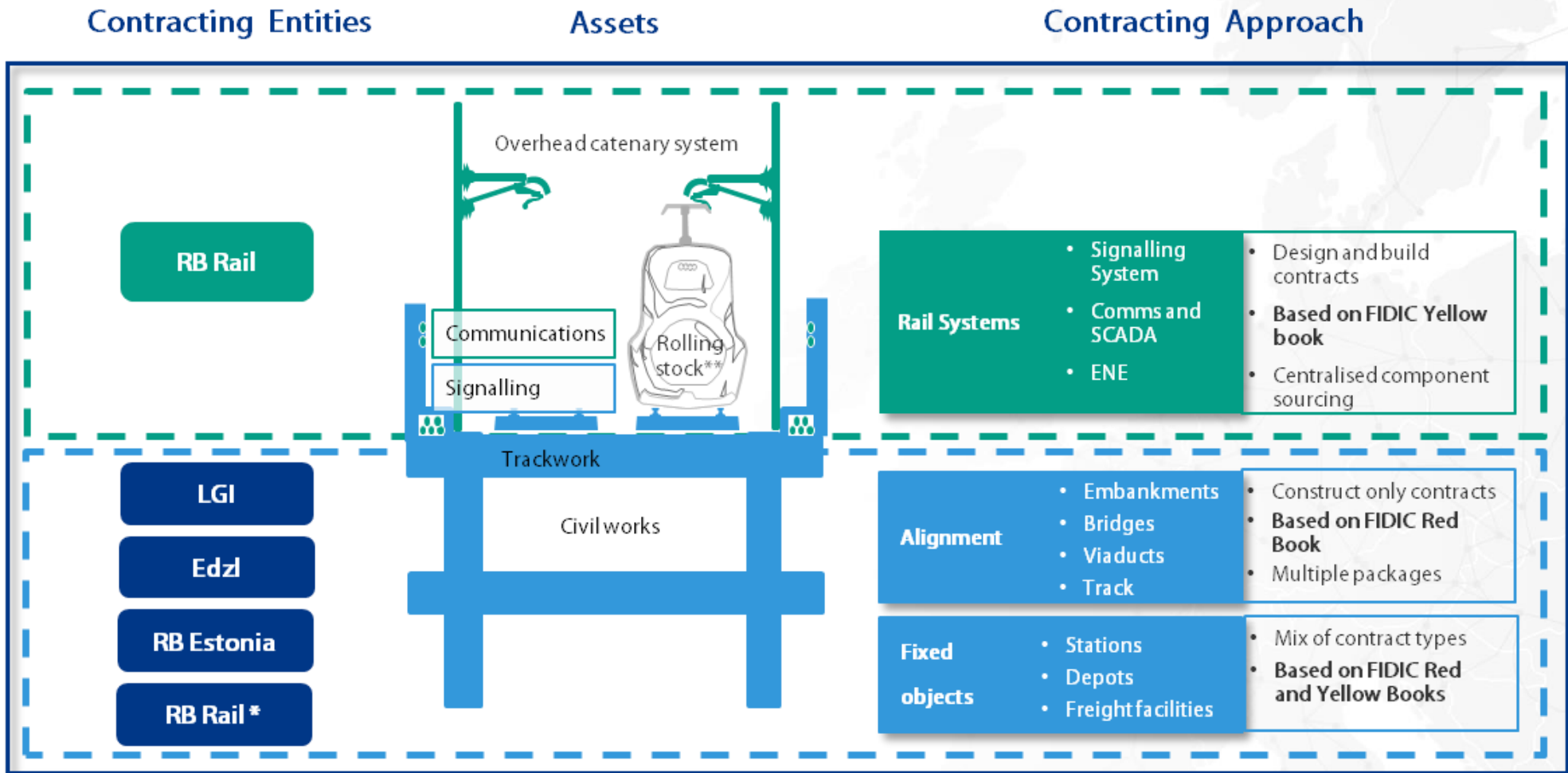
Central coordinator

National implementers

- **Standartisation**
- **Support**
- **Compliance**



Contracting overview



* RB Rail is responsible for cross border elements of alignment ** Rolling stock procurement is not part of the project scope

Procurement types



RB Rail

- Studies
- Design
- Common Standards
- Commercialisation
- Marketing & Branding



Consolidated

- **Sub-systems (CCS, ENE)**
- Raw Materials and Key Components
- Cross-border Track Sections



Supervised nationally

- Track Construction
- Major Engineering Structures
- Local Facilities (including terminals)

Control-Command and Signalling subsystem: **Scope**



870 km of main line double track
 7 international stations
 23 regional stops/15 halts

Single design concept across 3 Baltic states resulting in scale and maintenance economies, limited number of interfaces

Sustainability and Life-Cycle Cost requirements

“State-of-the-art and further” by early adopting the latest evolutions of CCS standardization and initiatives (game changers from Shift2Rail and industry innovations (ATO functionalities, etc.)

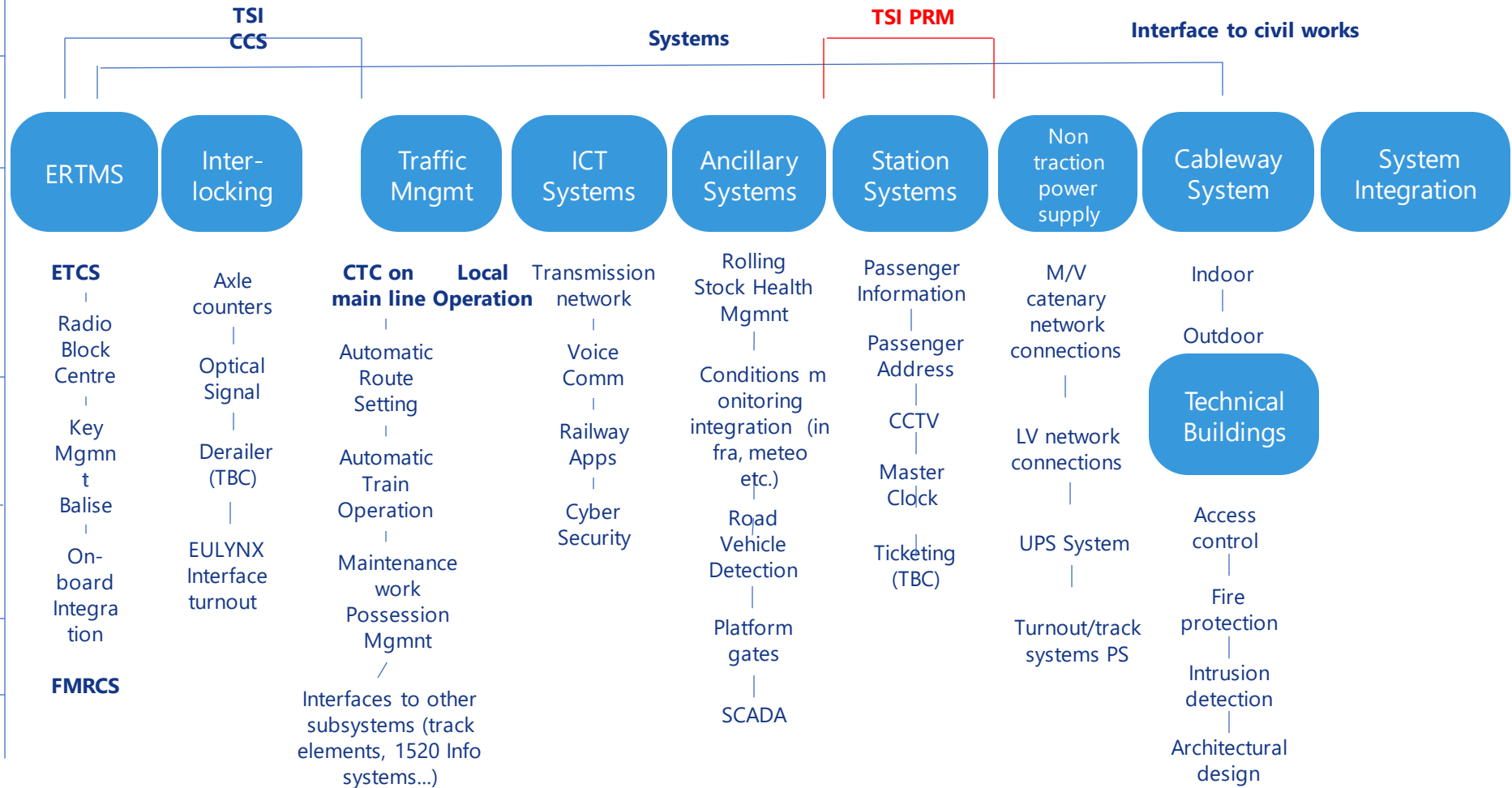
Advanced coordination functions for intermodal operation with 1520 mm railways

Concentration of equipment in Systems Equipment Locations (around block posts)

Zero copper cables on open line

Usage of local renewable power supply

CCS Subsystem Breakdown Structure



Global Project Scope

All CCS subsystem for Rail Baltica Global Project infrastructure in Estonia, Latvia and Lithuania, plus the interface with Poland with PKP-PLK. The geographical scope includes Rail Baltica main line including all Local Facilities of Rail Baltica Global Project.

- ✓ Scope includes all 1520 mm infrastructure which is crossed at grade by Rail Baltica 1435 mm tracks, including notably all 1520 mm Interlocking, Signaling, Train Protection, TMS and ICT systems at locations where 1435 mm and 1520 mm gauge tracks shall cross each other at one level.
- ✓ The Employer is appointed as central purchasing body for procurement of studies, plans and design for Rail Baltica Global Project, which include organization of the entire CCS subsystem deployment across Estonia, Latvia and Lithuania.
- ✓ The Employer is appointed to conclude contracts and supervise the execution of the concluded contracts on behalf of Rail Baltica Global project Beneficiaries and Implementing Bodies for the CCS subsystem scope.

ETCS deployment on Rail Baltica

Global Project Scope

All the necessary railway Systems and their interfaces which are needed for Rail Baltica Global Project operation and maintenance except ENE, MEP in local facilities and administrative management ICT.

Geographical Scope

Entire RB corridor in Baltic states (incl. options).

Deployment Process Scope

- ✓ **Preparatory phase:** Concept Design, Radio coverage concept design, Procurement documentation, support during procurement process;
- ✓ **Works implementation phase:** FIDIC Engineer for Design review and approval, manufacturing and construction supervision, acceptance & DNP
- ✓ **Project Management Office scope:** management of contract, planning, scope, requirements, costs, technical compliance, quality, risks, changes, resources, communication, stakeholders and interfaces

ETCS deployment on Rail Baltica

Uniform operation for the whole Rail Baltica

- ✓ One unique set of National Values
- ✓ One set of Engineering Rules
- ✓ One set of Operating Rules

ETCS coexistence on Rail Baltica and adjacent 1520 networks is possible

Register ETCS variables with ERA ERA_ERTMS_04001, 'Assignment of Values to ETCS Variables'



1520 / 1435 CCS interfaces
& interoperability
questions

1435/1520 interfaces

Located where gauge crossings and gauntleted tracks cannot be avoided

Kaunas, Palemonas and Vilnius stations; Kaunas tunnel

Freight intermodal terminals Muuga, Salaspils, Paneriai, Parnu

Complex to be handled at operational, technical and validation levels

1. RB Rail preliminary study of operational and safety aspects
2. Definition of requirements, scenarios and timelines for implementation
3. Detailed analysis and specifications (CCS Engineer – review NSA & ERA)
4. Development, validation and deployment by CCS Contractor

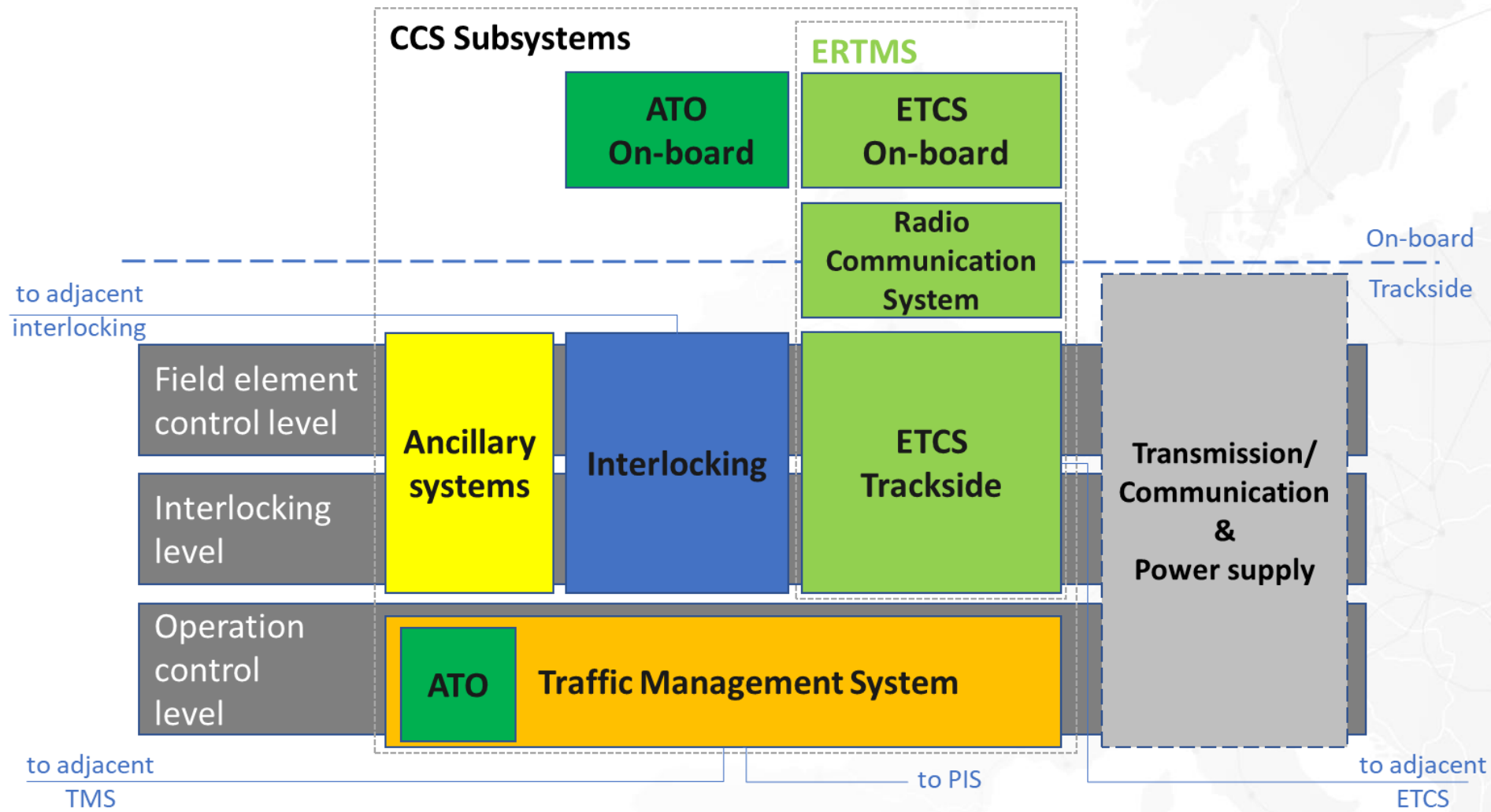
1435/1520 interoperability

- ✓ Specific Origin-Destination where gauge changing trains may provide improved passengers service (Vilnius – Klaipėda, Riga – Klaipėda...). Gauge changing facility is conceptually designed in Panevėžys station.
- ✓ 1520 IMs are developing ERTMS deployment for 1520 infrastructures. Necessity of coordination between the 3 Baltic 1520 IMs to maintain interoperability between networks. (development of common specifications, STM module...).
- ✓ Possibility of a common FRMCS systems shared by all IMs of Baltic states.
- ✓ Forum of discussion: RB CCS Technical Working Group.

Rail Baltica CCS Subsystem: Analysis



Reference architecture


















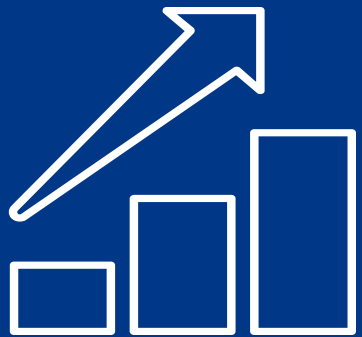
Input used for the CCS Deployment Strategy

The main input used for the preparation of the CCS Deployment strategy are:

- ✓ Rail Baltica CCS subsystems procurement and deployment strategy - Final report” - developed by Ramboll on November 2020
- ✓ Results from Supplier Market Research
- ✓ Rail Baltica Delivery Strategy “Pan Baltic 2030” provided by Rail Baltica on 22/11/2022
- ✓ The required technical input coming from the CCS Concept Design
- ✓ The information collect by ERA and NSAs regarding the track side approval process and building permit process

Key market trends for CCS

Description of drivers		Impact on market	
		1-3 years	4-10 years
Regulations 	Increasingly moving back to rail with the aim of reducing the environmental impact		
Digitalisation 	The impact of digitalisation has meant the creation of new value and services. This can particularly be seen in the emergence of an increasing number of small sub-suppliers.		
Market consolidation 	A consolidation of the market will make it more difficult for new/smaller players to establish themselves in the ETCS market. However, it is difficult to foresee how market consolidations will influence the market		
Automation 	Reduces the operating costs, increases reliability, and optimises energy consumption. In the short term, this will benefit autonomous vehicles, but till technology matures, the impact will be limited		
5G networks 	High bandwidth, low latency, and massive connections. Faster connectivity and increased data exchange enable real-time analysis of data in the cloud.		

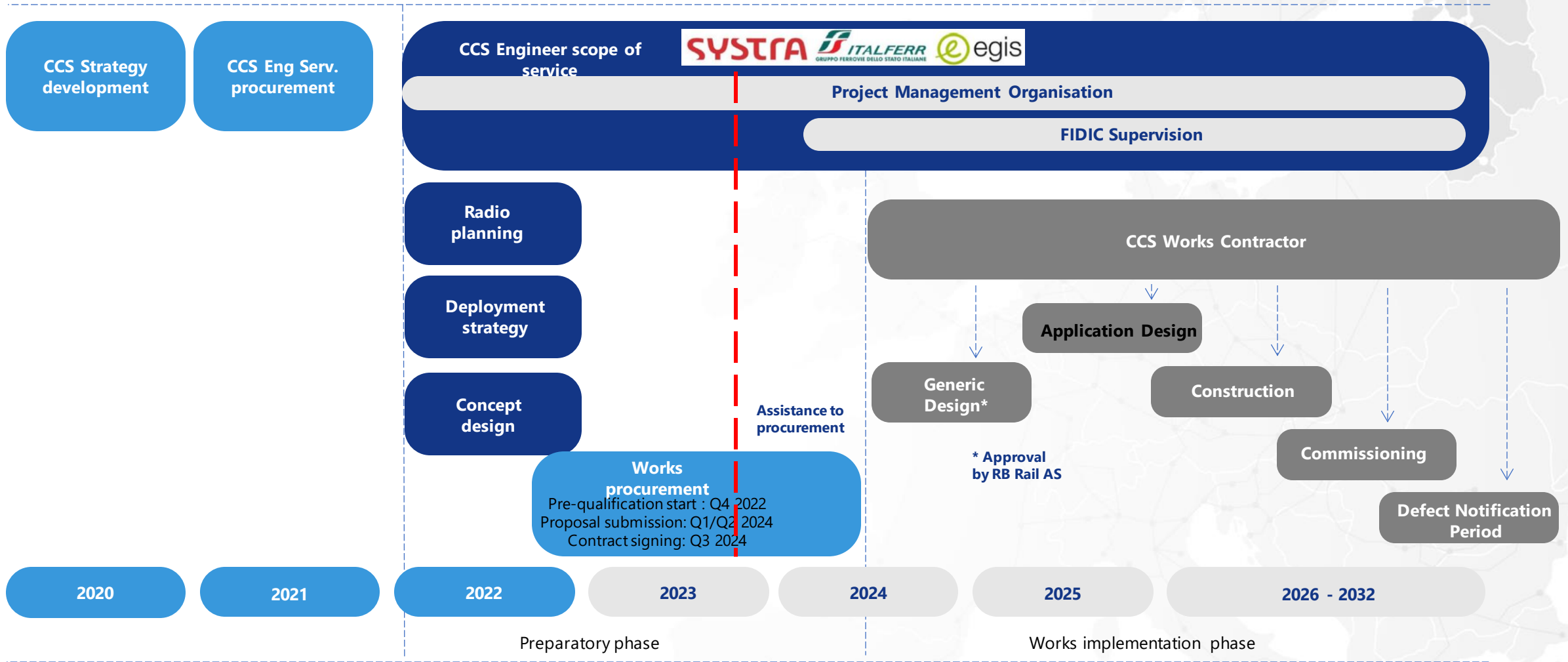


CCS
Deployment
status



Rail Baltica CCS deployment timeline

RB Rail AS



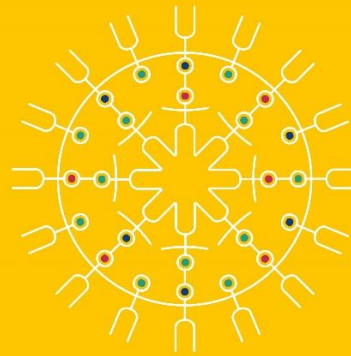


OUR VISION

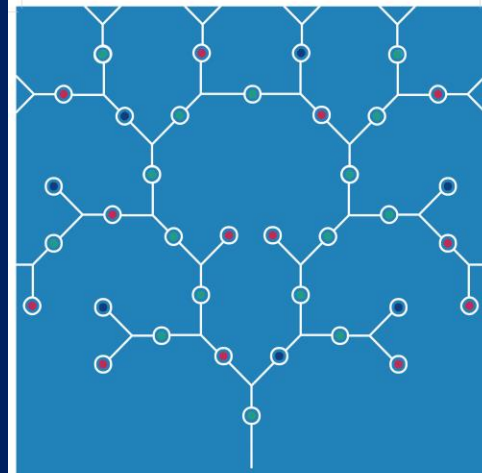
**Connected Baltics in a
connected Europe**

OUR MISSION

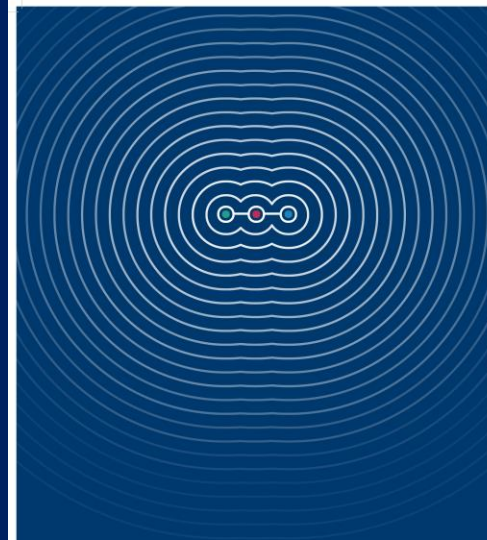
**We are delivering a seamless mobility for
people, goods and services to accelerate
social and economic development in the
Baltics and beyond**



WE VALUE PEOPLE



WE VALUE PROFESSIONALISM



WE VALUE PURPOSE

Thank you!