





de Portugal



#EUYearofRail



INNOVATION AND TECHNICAL CHALLENGES OF THE EUROPEAN TRANSPORT SYSTEM

The role of suppliers and the European Strategy

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SFM '21 | Lisbon | November 10-12, 2021



The role of suppliers and the European Strategy



UNIFE Mission

Fromoting Rail Market Growth for Sustainable Mobility

01	02	03	04
Promoting European policies and programmes favourable to rail	Working towards an interoperable and efficient European railway system	Ensuring European Rail Supply Industry leadership through advanced research, innovation and quality	Providing UNIFE Members with strategic and operational knowledge



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How UNIFE Works



I. EU Standardisation & Harmonisation

Collaborating with the European Union Agency for Railways on the definition of rail regulations (including the Technical Pillar of the Fourth Railway Package) and Technical Specifications for Interoperability (TSIs)

- Supplying expertise for European and International Standardisation Bodies (e.g. CEN/CENELEC, ISO)
- Contributing to the development of the Single European Rail Area

III. European Rail Research

- Coordinating EU-funded research projects
- Playing an active role in ERRAC the European Rail Research Advisory Council
- Cooperating with the Shift2Rail Joint Undertaking and contributing to the follow-up of its activities
- Shaping the future of rail research & innovation in Europe

II. Public Affairs

- Advocating policies that increase the global competitiveness of the European Rail Supply Industry
- Supporting modal shift policies that give priority to rail
- Encouraging investment in rail projects
- Promoting rail transport as the best solution to meet social challenges of the future

IV. IRIS Certification®

The globally recognised rail quality management system

- Enables efficient business processes and leads to substantial quality improvements and cost reduction throughout the supply-chain
- More than 2100 IRIS Certification® certificates issued worldwide



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Our members and Associate Members

	ALSTOM	ALTPRO	ArcelorMittal	Ardanuy		Constellium	Ontinental S ContiTech		Artiste Spalibace of Progress S&A & Danyster Concests	FOGTEC	- FRRUSCHER	FREQUENTIS	funkwerk))	GD§	HITACHI ABS	Hitachi Rail STS			ındra
ASTRA	A)(TONE	B	BELAM Solution	blue	EKE	elcowire rail [∰]	ELMA	ELPA			GESTE MOBILITY & SAFETY	GHH-RADSATZ	CHAT. Eunmi - Hetall - Technik	GREENBRIER	ISKRATEL		Kalinofi	K atise	KNORR-BREMSE
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European rail R&I – Why?



The European

Green Deal

von der Leyen Commission

Decarbonisation of Transport

Key role of rail

The European

Climate Law

Day 2

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- \succ Enshrine the climate-neutrality principle into Law.
- > Set binding requirements for national governments and industries.
- \succ Strengthen intermediate 2030-climate targets.





55% **GHG** emission reduction

40% share of energy from renewable sources





Up to 41% reduction of final energy consumption



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healthy

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#MobilityStrategy

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Doubling of high speed rail traffic

Tripling of high speed rail traffic **Doubling of rail freight trafic**

Large-scale deployment of automated mobility



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To achieve the Rail Sector Vision



Autonomous train operations

Rail vehicles, infrastructure (including stations) and command and control systems are fully digitalised and networked components of the "internet of things." Each element is also endowed with local artificial intelligence which gives it the ability to perform goal-oriented tasks with a high degree of autonomy.

Intelligent assets lifecycle management: whole-life asset approach

In 2050, rail transport in Europe is the backbone of an intermodal

"Mobility as a Service" within cities and beyond, for both

passengers and goods, meeting the needs of customers, EU

citizens and society. The suppliers and service organisations

of the European rail industry are recognised as the world's

thought leaders for railway products and services.

The rail sector generates significantly more value from fewer physical assets by maximising their productive utilisation over their whole lifecycle, significantly reducing the total cost of ownership.

Protecting the environment and the energy supply

Society recognises that rail is the backbone of sustainable mobility and transportation. Rail is the standard mode of transport in urban areas, at a national level, and for distances up to 1000 km. In these areas it is the most energy-efficient mode of passenger and freight transport. Rail decouples environmental harm from

Ensuring safety and security







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To keep our European leadership and competitiveness at worldwide level!

- The world leadership of the export-oriented rail industry is also due to its Research & Innovation capacities
- Innovation is in the DNA of the European rail supply industry, which currently invests 3.6% of its annual turnover in R&I and has developed innovations such as high-speed trains, ERTMS (European Rail Traffic Management Systems), and automated metro systems





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European rail R&I – How?



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Shift2Ra

The Shift2Rail Joint Undertaking – lessons learned

- First Public-Private Partnership for rail Research & Innovation (R&I) under Horizon 2020
- Unprecedented joint effort of all the stakeholders of the European rail sector to invest together in Research and Innovation → Risk sharing in a pre-competitive development phase
- Technical feasibility proven at higher TRL
- **Critical mass**: The involvement of the majority of the sector including all types of stakeholders reduces the market risk of innovation
- Strategic approach: Defines and deploys a consistent long-term strategy for the sector
- Solid and stable long-term program aligned with the common strategy for the sector



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Europe's Rail Joint Undertaking – A new approach (1/2)

High cost Legacy systems & Interaction with other modes Performance & capacity Climate change Competitiveness Policy objectives • facilitate research and innovation schwibes related to rail and intermodel to rail and intermodel. • Deliver a sustainable and resilient rail system • Oeliver a sustainable and resilient rail system • Deliver a sustainable and resilient rail system • Deriver a sustainable and rasiling system	K	ey interconnected chall	enges in rail transport			
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 Policy objectives Facilitate research and innovation activities related to rail and intermodal transport services Deliver a sustainable and resilient rail system Control and signating system strong and globally competitive European rail industry Policy objectives An integrated European railway network by design Develop demonstration projects Develop demonstration projects Develop a unified operational concept and a functional system architecture for integrated European rail industry Enable, promote and exploit synergies within the Union Meas of focus Meas of focus Sustainable & Digital Assets Competitive digital green rail freight Smart solution for low usage lines 	Performance & capacity	Climate chan	ge Competiti	veness		
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	Competitive digital green r	ail freight	Smart solution for view	r low usage lines		
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Input Iron the Drait Master Plan published on 29 October 202 i

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Europe's Rail Joint Undertaking – A new approach (2/2)

Budget: 1,2 bn€ (600M€ EU Funding)

25 Candidates Founding Members

Innovation Pillar

- Steering R&I activities
- Focusing on key R&I areas (e.g. ATO, Digitalisation, Freight)
- Programme based on the ERRAC Strategic Research and Innovation Agenda

Impacts expected:

- More flexibility and punctuality for passengers / freight
- Improved performance and capacity
- Reduced costs & quicker roll-out
- More sustainable transport

- System Pillar
 - Definition of the European Rail System Architecture
 - Srtong focus on the CCS subsystem
 - Deliver & maintain CCS standards and migration roadmap
- Harmonised approach to evolution and greater adaptability
- Reinforced role for rail in European transport and mobility
- Improved EU rail supply industry competitiveness



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Europe's Rail Joint Undertaking – UNIFE's expectations

Innovation Pillar

- Continuity with Shift2Rail activities (e.g. ATO, FRMCS, Asset Management, DAC...) and address new ones (e.g. Digital Twin)
- Maintain and reinforce the cooperation between the rail stakeholders → Key Success Factor
- Definition of clear roles and responsibilities between the members of Europe's Rail to deliver its technical programme
- Develop new solutions/technologies that will allow both the accomplishment of the Single European Rail Area but also keep the European industrial leadership at worldwile level
- Implementing a flexible and agile working process

System Pillar

- Sectorial approach
- > Deliver a top-level European rail system architecture
- Deliver a a more detailed CCS architecture with a level of granularity approved both by the railways, IMs and suppliers.
- Achieve a broad acceptance of the deliverables by the rail sector
- Support rail sector Common Business Objectives
- Harmonisation of the operational rules
- Being the unique coordinated body for the definition of operational concept(s) and functional system architecture
- Bring predictability to the sector (TSI and standard input plan)

SERA Implementation Increase Rail Market Share Increase the Competitiveness of the European Rail Supply Industry Attract new Talents and Skills



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European rail R&I – Ensure the digital transformation of rail transport



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unife

UNIFE Vision Paper

Digital Trends in the Rail Sector

UNIFE - The European Rail Supply Industry Associatio

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UNIFE's 1st Vision Paper

April 2019

on Digitalisation

15 April 2019



UNIFE's vision on rail's digitalisation - Data as the engine for rail's digital transformation



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Cybersecurity in railways – new UNIFE's position paper

► Need to harmonise cybersecurity across Europe and within Europe's rail sector





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European rail R&I – Deployment of innovation vs financing opportunities



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ERTMS, a successful global standard



Over the years, ERTMS has become, *de facto*, a **global standard** that is continuously seeing new countries adopting it despite being originally conceived as merely a European standard in rail traffic management.

Based on UNIFE statistics, today ERTMS is deployed across **100,000 km of contracted track** in more than **51 countries** and is equipped, or slated to be, on more than **16,000 vehicles**.

Notably, the number of vehicles equipped (or to be equipped) globally has increased **by 144%** between 2010 and 2020. During the same period, the number of ERTMS-contracted tracks (in kilometers) in the world rose **by 164%**.



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ERTMS main key benefits

Improved safety for the rail system

for the Passengers, Freight Operators, Train Operators, Infrastructure Managers and all rail sector personnel



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ture
40%

Lower production costs

one proven, harmonised system is easier to install, maintain and manufacture making railway systems more competitive

Increased capacity

on existing lines and a greater ability to respond to growing transport demands: as a continuous communication-based signalling system, ERTMS reduces the headway between trains "enabling" up to 30% more capacity on currently existing infrastructure and if associated with other infrastructure improvement, up to 40%



Reduced contract lead times

due to the significant reduction of process engineering preparation





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EU Recovery and Resilience Facility (RRF) – National Recovery Plans

- As of 5 November, 22 Plans fully approved by Commission & Council
- €500 billon requested in the 25 Plans submitted (out of the total €672.5 billion Recovery & Resilience Facility (RRF))
- More loans can be requested by Member States until August 2023
- €55 billion aprox. of identified rail investments (including urban rail transport)
- **11%** of funding requested under RRF goes for rail
- €51 billion already disbursed (of the total RRF requested)





Recovery and Resiliency Facility funds will be a driving element of Europe's decarbonisation drive. Recognising that fact, Member States have elected to direct approximately **11%** of the RRF total requested funding for rail



Italy has requested this money to revamp its next generation of rail mobility. Their National Recovery Plan calls for €13 billion for high speed infrastructure and another €2.9 for ERTMS

Spain's National Recovery Plan seeks to **revitalise infrastructure** along its Atlantic and Mediterranean corridors, as well as commuter lines. Investments are also outlined for **freight**. The Romanian Plan includes over €3 billion for electrification and modernization of the network including ERTMS deployment, €400 million for rolling stock and €600 million for metro systems infrastructure The French plans directs

investments for

infrastructure

modernisaton for

transport in lle-de-

freight. the

tram fleet

France and national

modernisation of the

national and regional

will be used on public

lines. Additionally, funds



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Portugal National Recovery Plan: 853 million for rail

- Expansion of the Lisbon Metro Network Red Line to Alcântara (3.7 km out of which 3,3 km in tunnel and 0,4 km in viaduct) → €304 million
- Expansion of the Porto Metro Network Casa da Música-Santo Ovídio (new line of 6.7 km) → €299 million
- Light Rail Transit Odivelas-Loures (12 km new transit line) → €250 million

"Lisbon signs **€554m** (with RRF funding) agreement to fund metro expansion projects", 5 October 2021, <u>IRJ</u>



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Thank you for your attention

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