ERA study on rail traction energy measurement and consumption data exchange

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EUROPEAN UNION AGENCY FOR RAILWAYS

European Commission

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Study objective

The European Commission request:

- Evaluate the state-of-play of on-ground Data Collecting Systems (DCS), as defined in TSI ENE Article 9, point 4 of Commission Implementing Regulation (EU) 2018/868
- Assess issues affecting energy metering in railways:
  - Problems for implementers of DCS on-ground, Energy Metering System (EMS) on-board
  - National rules or IM requirements impacting interoperability and free choice of energy supplier
  - Problems for metering data exchange and settlement
  - Technical and authorisations hurdles
- Provide a list of recommendations on identified challenges

Study AS-03 methodology

The project ran from January to December 2025 :

- Desk research
- A large web survey of RUs, IMs, NSAs, MS, train manufacturers, EMS/DCS suppliers, vehicle lessors, NoBo, DeBo. >80 detailed replies, summary of results at the Eress Forum
- 38 bilateral interviews with excellent EU covergae, attendance to UIC and ERJU System Pillar Task 1 workshops
- Collaboration as advisor with Eress, UIC, SP Task 1 and CEN/Cenelec given parallel workstreams
- Assessment of 180+ comments to the draft final report
- Workshop on the draft final report on 10 December 2025
- ERA independent analysis and drafting of recommendations
- Final report published in March 2026

Study findings, situation till December 2025

Open discussion

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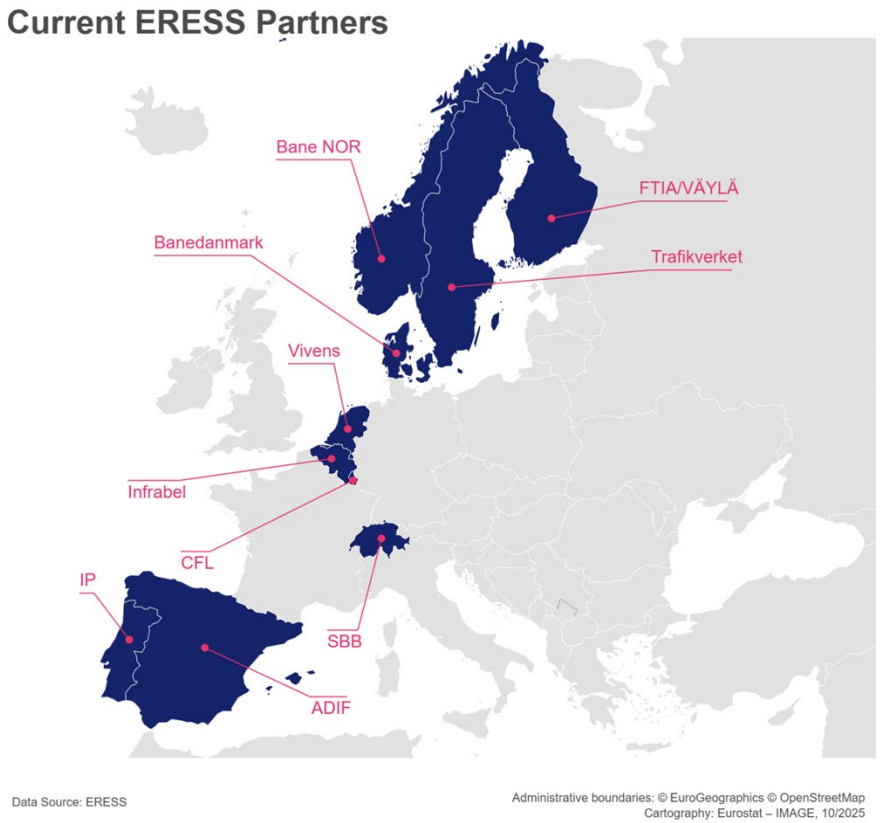
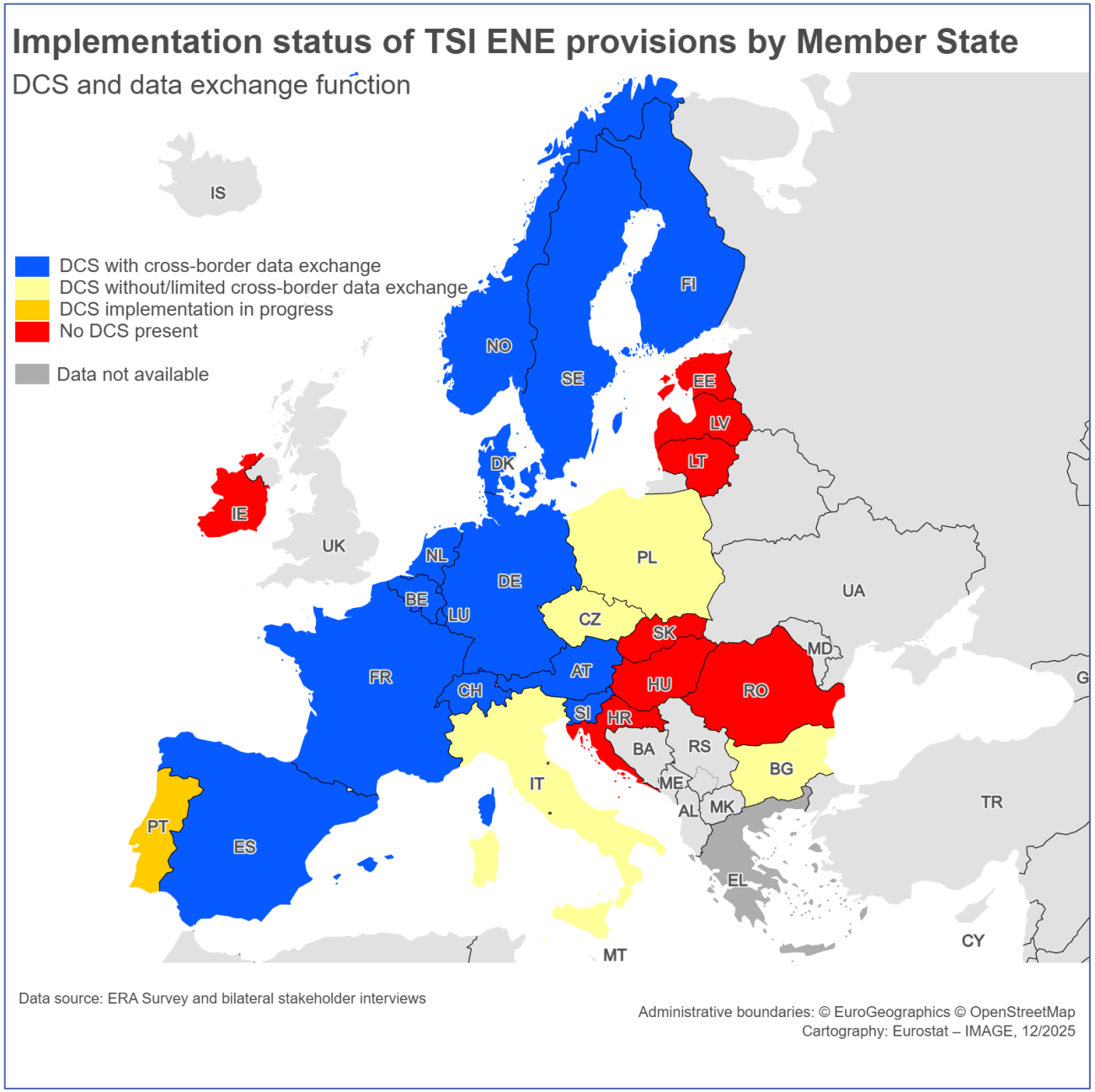
Study key findings: state-of-play of on-ground DCS, as defined in TSI ENE

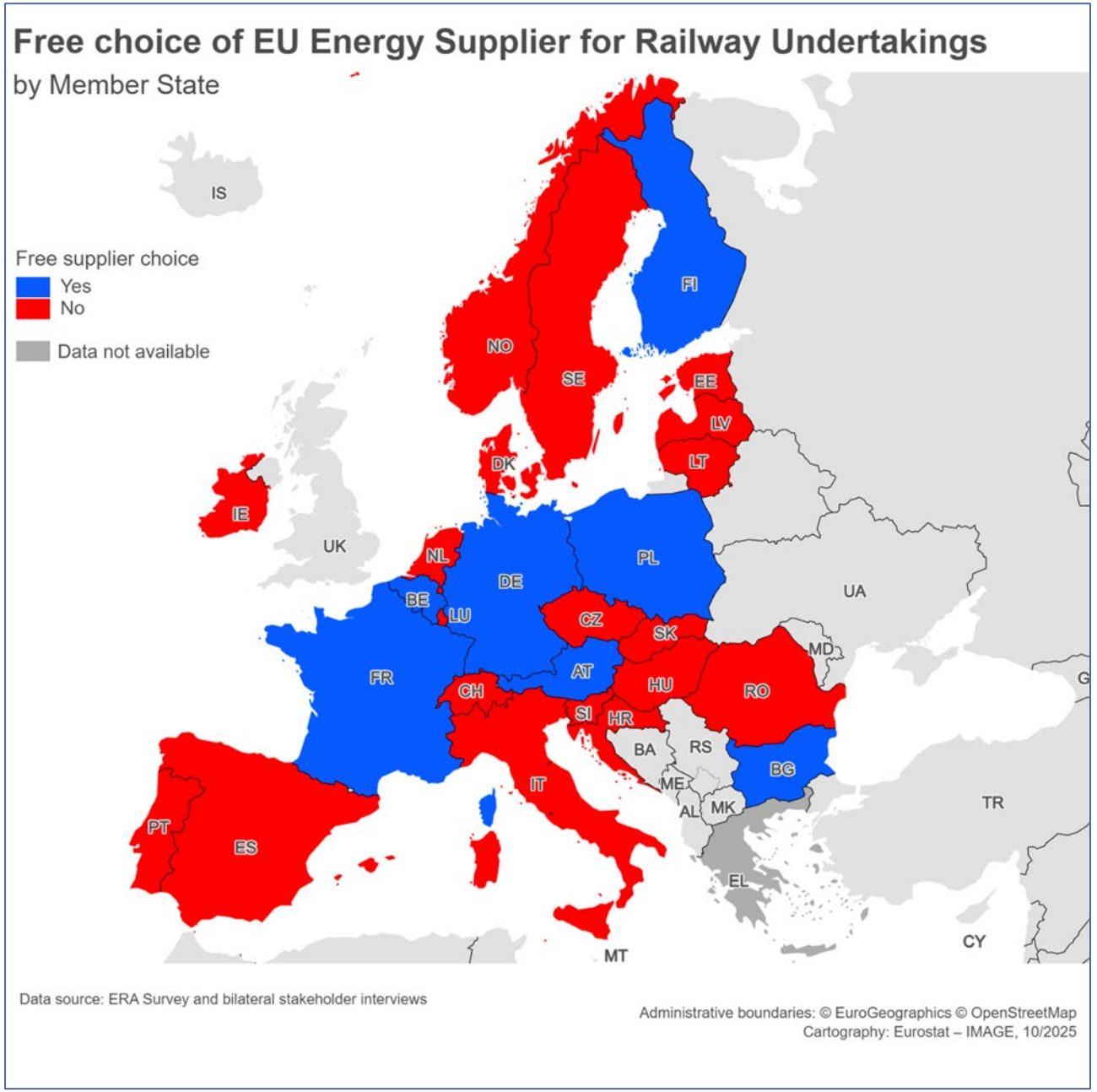
- DCS are implemented by IMs except in FR, DE, PL
- Some IMs share DCS or exchange function through Eress





Study key findings: third party access for RUs in the energy supply market

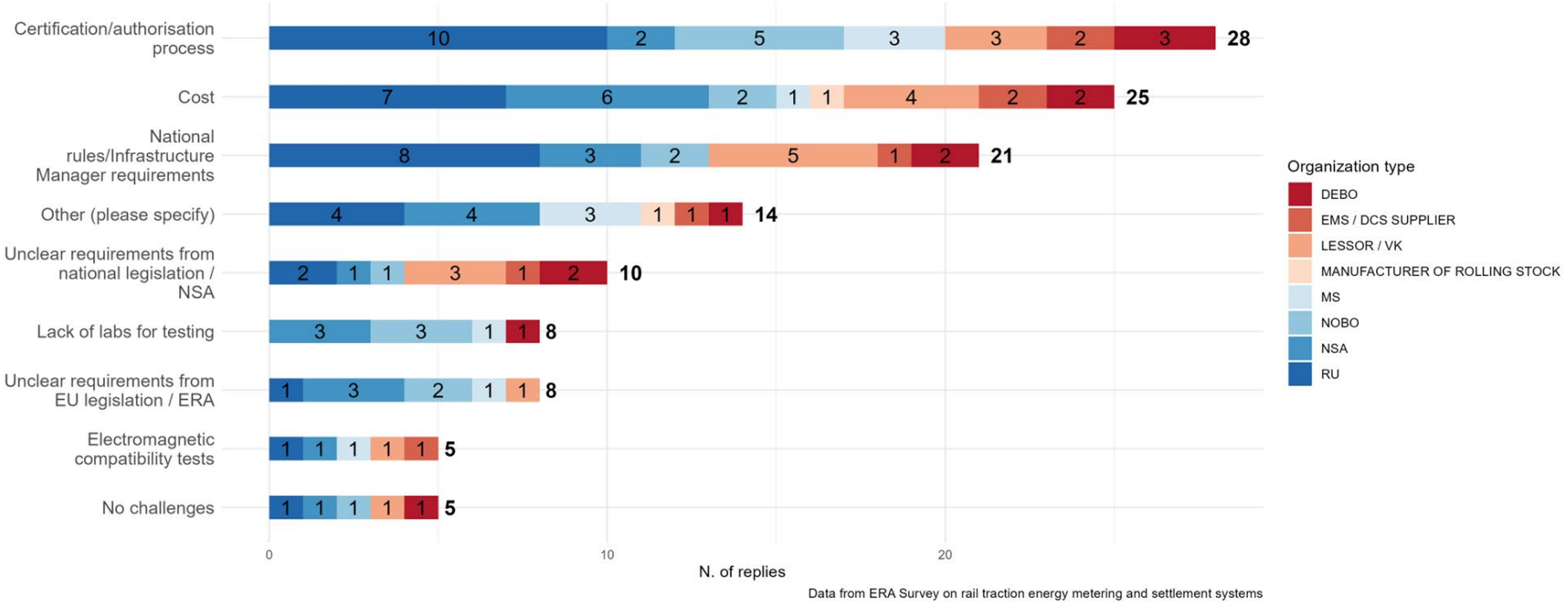
- In some MS national law mandates the IM being the sole energy provider for RUs
- In some MS, RUs can choose their energy supplier only for domestic trains
- In NL since 2008 the purchasing group Vivens by Prorail and all RUs is in use. Free choice of supplier as of 2028
- In BE no RU opted for an alternative to Infrabel's supply
- In IT traction energy is considered cheap for the DC network as it is subsidised by government for historical reasons



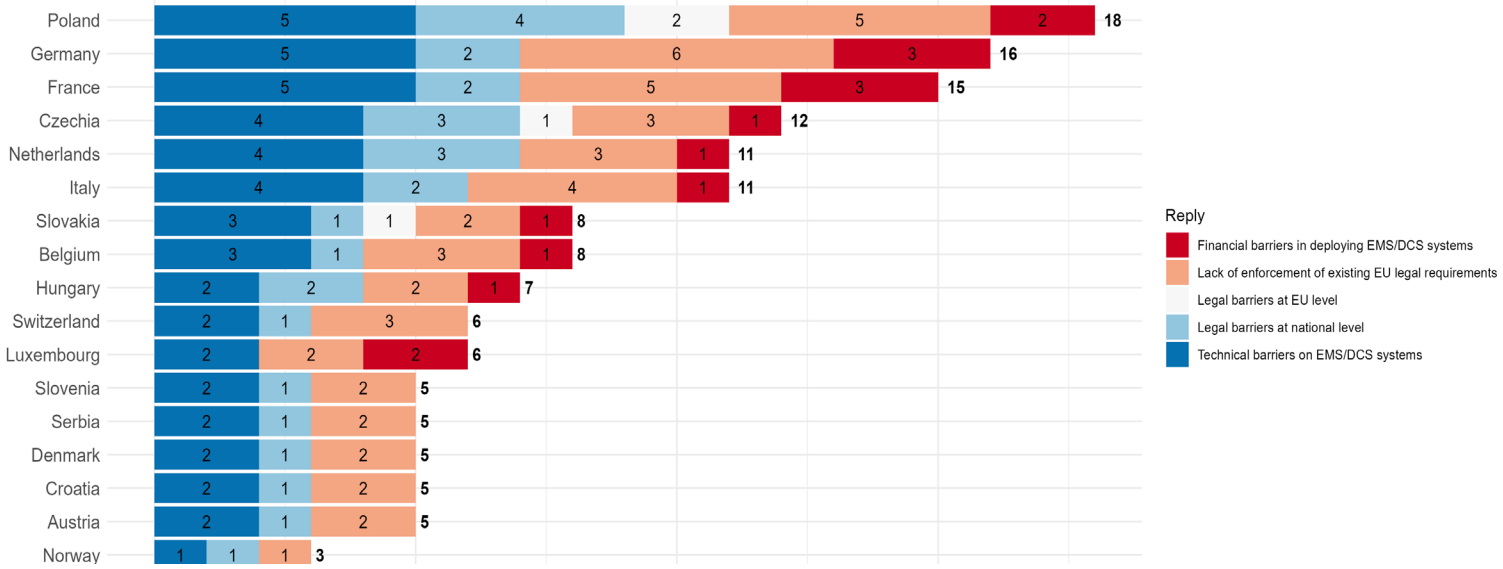
Study key findings: different issues affecting energy metering

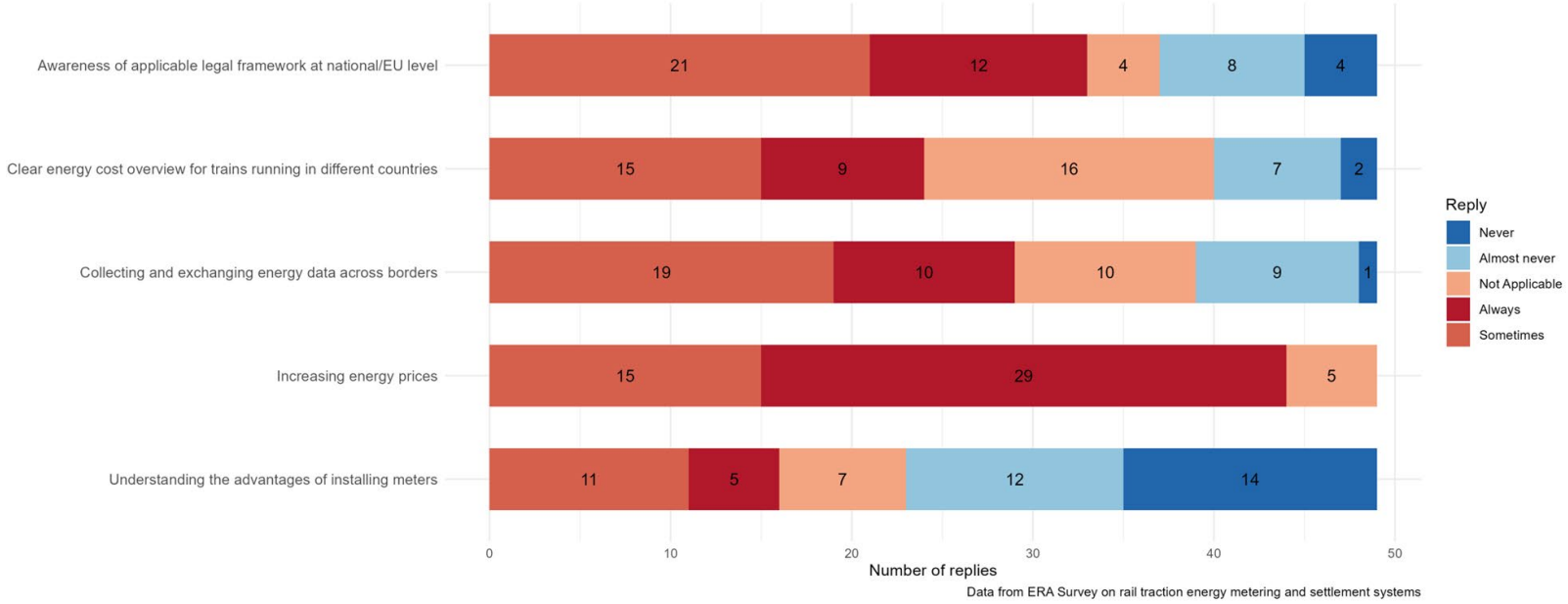
- Data quality and data sharing corporate policies affecting the ability of exchange function to match consumption with actual tractive vehicle operators
- Difficult EMS certification/authorisation, different IMs/DCS requiring own calibration, certifications, seals, installation, cybersecurity requirements etc to accept data from whatever compliant EMS

What are the key challenges to install/retrofit EMS on-board to comply with latest LOC&PAS TSI?



Study key findings: different local issues affecting energy metering





- TSI ENE not applied everywhere, DCS still not present in some MS
- Different barriers, low knowledge of legal requirements and data frameworks for energy metering
- Uncertainty regarding the applicability of other EU legislation affecting potentially EMS and billing of grid fees

Study key findings: focus on Germany

- Long tradition of rail traction energy metering and peculiar corporate structure of DB Energie being an energy generator, supplier, DSO, DCS part of DB Group;
- DB Energie subject to regulatory oversight by the energy chamber of the Bundesnetzagentur (BNA) and EU energy sector legislation
- Several rulings by the Federal Court of Justice about grid fees approvals and market and regulatory position of DB Energie as DSO vs DB InfraGo as rail IM and overhead catenary provider
- BNA decision in 2022 to implement from July 2026 a new reporting scheme for rail vehicle owners/keepers. Purposes:
  - Shifting of matching duty of EMS data from DB Energie to vehicle owners/keepers to ensure billing to the actual RU operating a vehicle
  - Reduced mistakes and liability from incorrect billing based on current more manual data submissions and data matching
  - More responsibility of lessors or keepers in case of missing data for correct billing
- New scheme perceived as heavy by lessors/keepers

Study Recommendations

Recommendations	Perceived position of rail sector stakeholders	Follow-up actions
1. Consider enforcing ENE TSI's existing requirements	Full Support	• On-going enforcement follow-up following EC procedures
2. Make use of mandatory train composition messages data flow from RUs to IMs applicable in rail telematics	Full support	• Commission Regulation (EU) No 2026/253 (Telematics TSI) adopted February 2026 • Rail sector to implement • Regulatory bodies to oversee
3. Improve dissemination and knowledge sharing on traction energy metering	Full support	• Eress Forum • ERA study workshop and communication • Availability for other dissemination
4. Analyse the opportunity to amend Table B.1 in Appendix B to ENE TSI	Mixed views on NoBo's involvement	• Change request for processing amendments of ENE TSI in ERA processes

Study Recommendations

Recommendations	Perceived position of rail sector stakeholders	Follow-up actions
5. Analyse the opportunity to extend the scope of application of ENE TSI into the data exchange function and settlement processes	Full Support	• Change request for processing amendments of ENE TSI in ERA processes
6. Explore the costs and benefits of one DCS and settlement system at the EU level.	Mixed views	• Analysis of options for ENE TSI revision following ERA processes • Consideration of R&D need for a reference DCS for testing purposes
7. Analyse the opportunity to amend TSI LOC & PAS by making EMS an interoperability constituent.	Mixed views	• Analysis of options within TSI revision following ERA processes
8. Analyse and potentially clarify the applicability of Directive (EU) 2014/32/EU on measurement instruments (MID) to EMS.	Full Support	• Internal analysis following EC procedures

Study Recommendations

Recommendations	Perceived position of rail sector stakeholders	Follow-up actions
9. Consider the potential need to analyse the legal status of IMs and energy supply with regard to traction current infrastructure and services in Member States	Full Support	• Internal analysis following EC procedures
10. Analyse the status of EMS and DCS in respect of EU cybersecurity legislation.	Full Support	• On-going analysis within TSI revision following ERA processes
11. Consider R&D on EMS telecommunications	Mixed views	• Dedicated provisions considered within FRMCS specifications

Closing remarks

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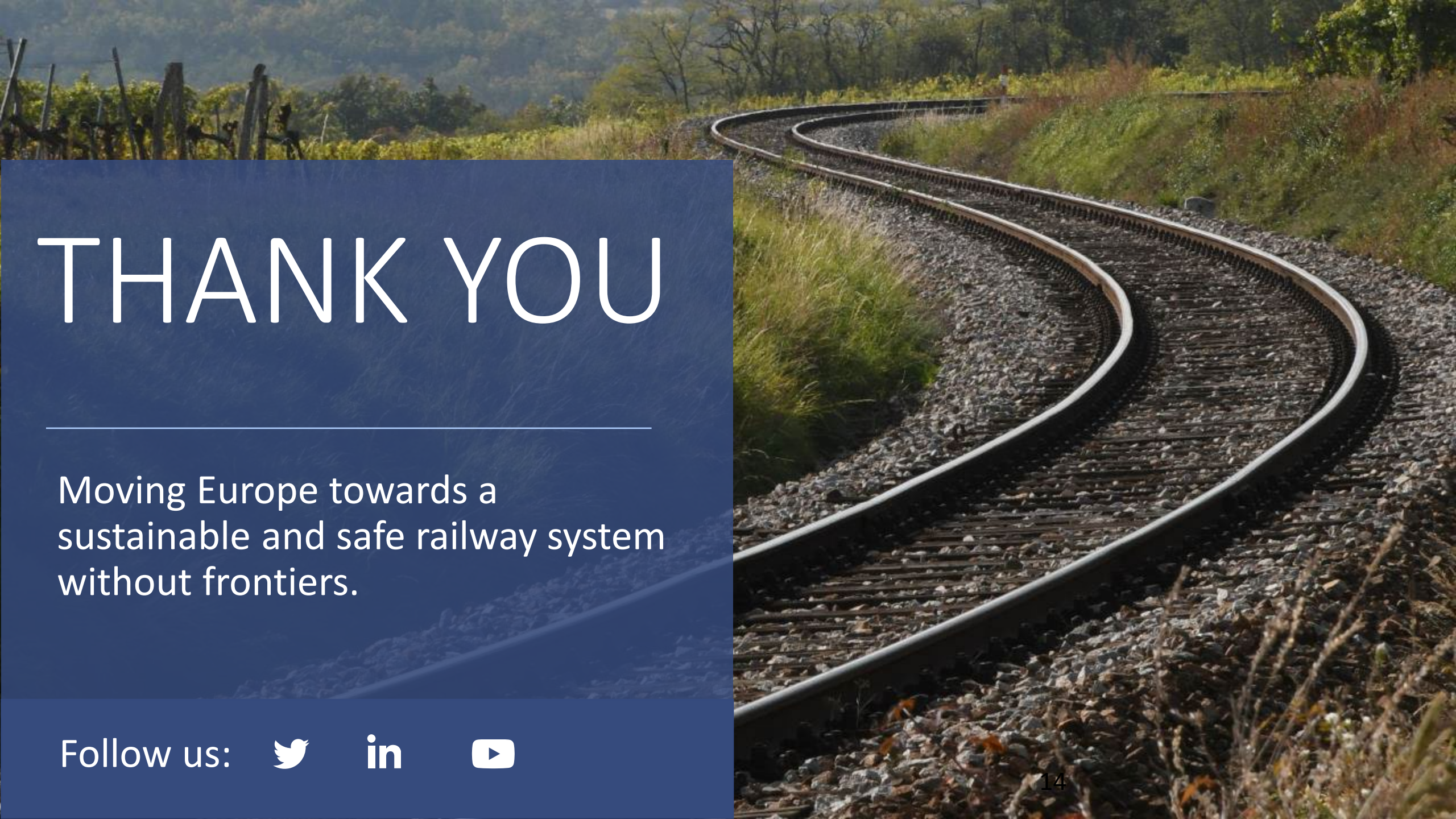

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