



FRMCS Deployment 2026 Questionnaire Results

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European FRMCS Deployment Group



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1. Introduction



European FRMCS Deployment Group

FRMCS Deployment Group

Provide advice and recommendations to the High-Level Deployment Group and sector on the best way to deploy FRMCS (business driven: cost efficient, simple, fast)

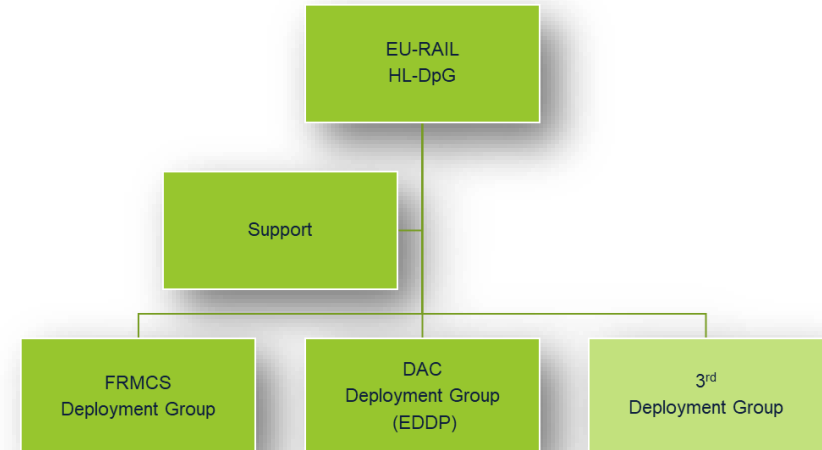
Deliverables

- Analyse (current) Infra, rolling stock, industry and workshop capacity for (fast, easy and cost effective) deployment. Estimate necessary capacities
 - Support to accelerate and simplify authorisation,
 - Perform cost analyses, model and risk assessments
 - Develop toolbox with diverse migration scenario's (greenfield and brownfield situations)
 - Provide dedicated cross-border (installation) alignment analyses and public-private mobile network interface analyses. Give recommendations
 - Alignment with other major Rail programmes (ERTMS, DAC, ...) and stakeholders
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- Implementation programmes are and stay responsibility of RUs/IMs/lessors and Member States (inclusive financing).
 - In alignment with: UIC development programme; MORANE2 test programme; ERA EECT process; ETSI standardisation, Stakeholder Alignment Meeting

EU-Rail FRMCS Deployment Group

FRMCS Deployment Group

- The group is composed as follows:
 - The Management Group which coordinates the activities
 - Working Group 1, technical deployment aspects (Cross-border, antenna placement, ...)
 - Working Group 2, financial and legal aspects (Cost model, authorisation process, ...)
 - Working Group 3, deployment and migration scenario's (Different deployment scenarios, capacity, ...)
- Members from 37 companies/associations



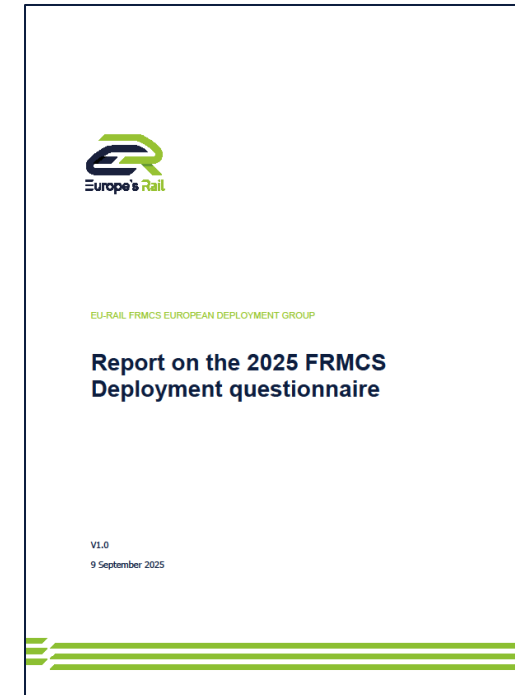
Governance as from July 2026

FRMCS Deployment survey 2026

FRMCS Deployment Group

- EU-RAIL FRMCS Deployment Group conducted a second survey to gather more detailed sector information to support the advice and to further increase awareness in the sector and Member States
- With the support of several associations, the questionnaire has been distributed to:
 - Infrastructure Managers
 - Railway Undertakings
 - Trackside Providers,
 - Onboard Providers,
 - National Safety Authorities - NSA's
 - Notified Bodies - NoBo's (new)
 - Mobile network Operators - MNO's (new)

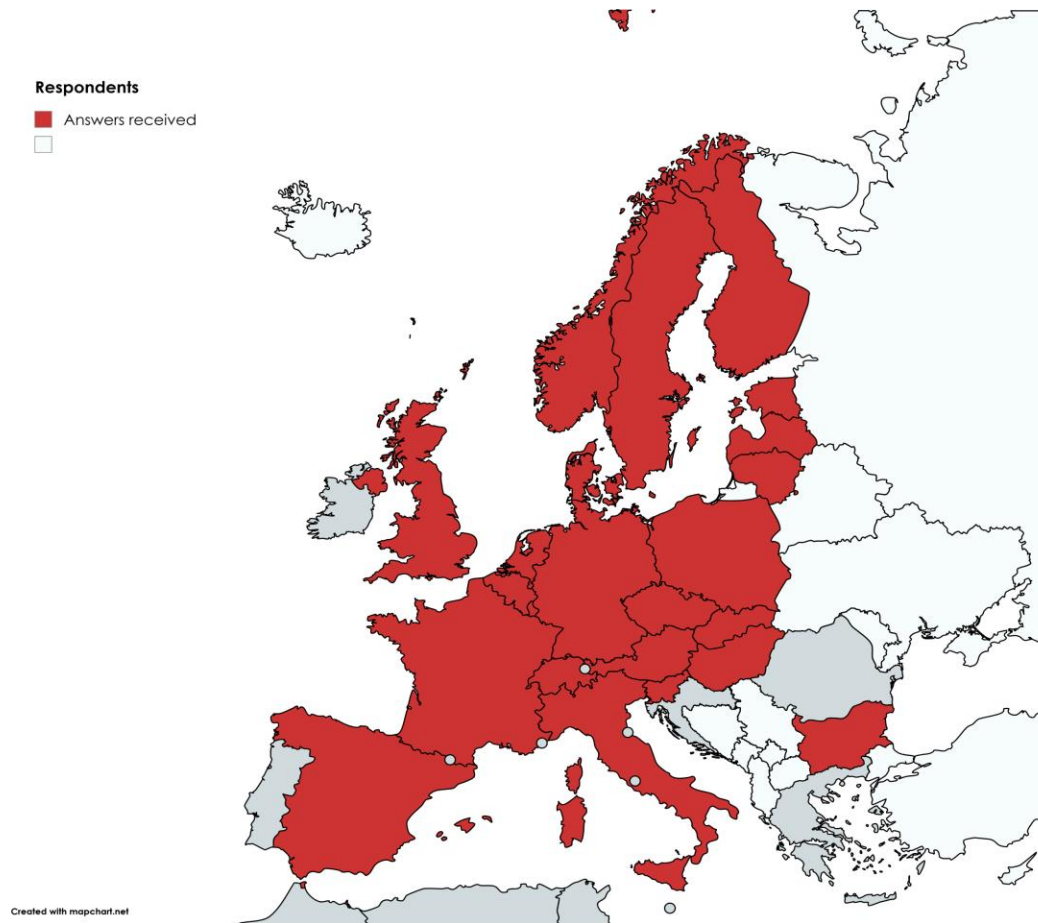
The responses show increasing maturity in the knowledge of the FRMCS deployment. We move from awareness to involvement.



FRMCS Deployment Group

- Under the supervision of Working Group 3 (WG 3), and with the support of WG 1 and WG 2, a questionnaire has been prepared.
- To create more knowledge and awareness in the sector for the upcoming transformation
- Get fact-based information for analyses and advices to sector and ERA
- Gain more detailed information for the deliverables in the different working groups

FRMCS Deployment Group



- 81 respondents (vs 67 for 1st questionnaire)
- 23 Countries
- 20 Infrastructure Managers (22 countries)
- 27 Railway Undertakings / lessors (13 countries)
- 8 NSAs
- 3 NBOs
- 6 Onboard Providers
- 7 Trackside Providers
- 10 MNOs (5 countries)

Use of the questionnaire material

FRMCS Deployment Group

Thanks to the big number of respondents and to the valuable comments added in the answers, the questionnaire will be used to propose additional advice to the Recommendation #6 of the ERA Technical Opinion but will also enable further discussions with key stakeholders on actions that could be taken to ease the deployment of FRMCS in Europe.

Disclaimer :

The information in this report is distracted from the responses to the questionnaire on FRMCS Deployment. EU Rail cannot be held responsible for the input given by the respondents.

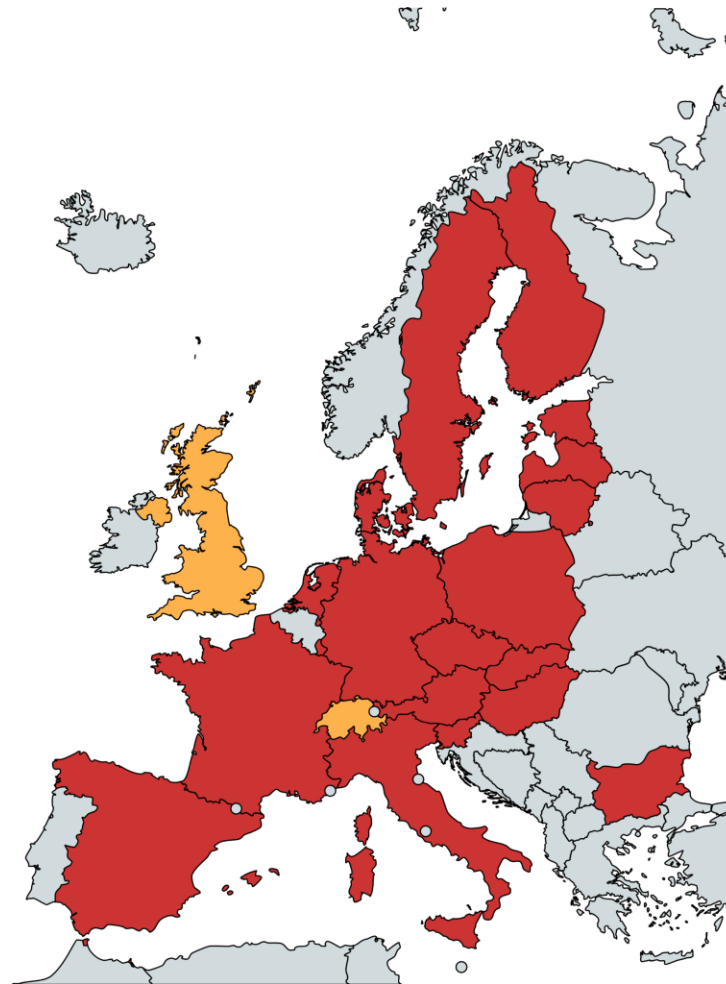
Answers To 2026 Questionnaire



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IM Respondents

- EC Members
- Non EC Members



- 20 IMs
- 22 Countries
- Only 6 IMs have (preliminary) funding plans.
- Start of deployment date varies from 2028 to 2040
- End of deployment date varies from 2032 to 2055. (peak 2035-2036)
- Use of MNO is expected and planned by a majority of IMs
- Currently, no procurement strategies available
- Modularity of system is highly supported

FRMCS Deployment Group

- Present systems nowadays: GSM-R (up to 100%), analogue radio, public networks and no radio coverage
- Limited number of vendors in use
- Current view on programmes/subsystems to be aligned with FRMCS: nearly only ETCS and ATO (and a bit monitoring systems)
- All foresee dual mode operations during migration: GSM-R/FRMCS,
- limited information and plans available on planned FRMCS spectrums for RMR and PMNO (except 900/1900 basis), up to 'full MNO spectrum'
- Only very few foresee or 900 or 1900 spectrum only

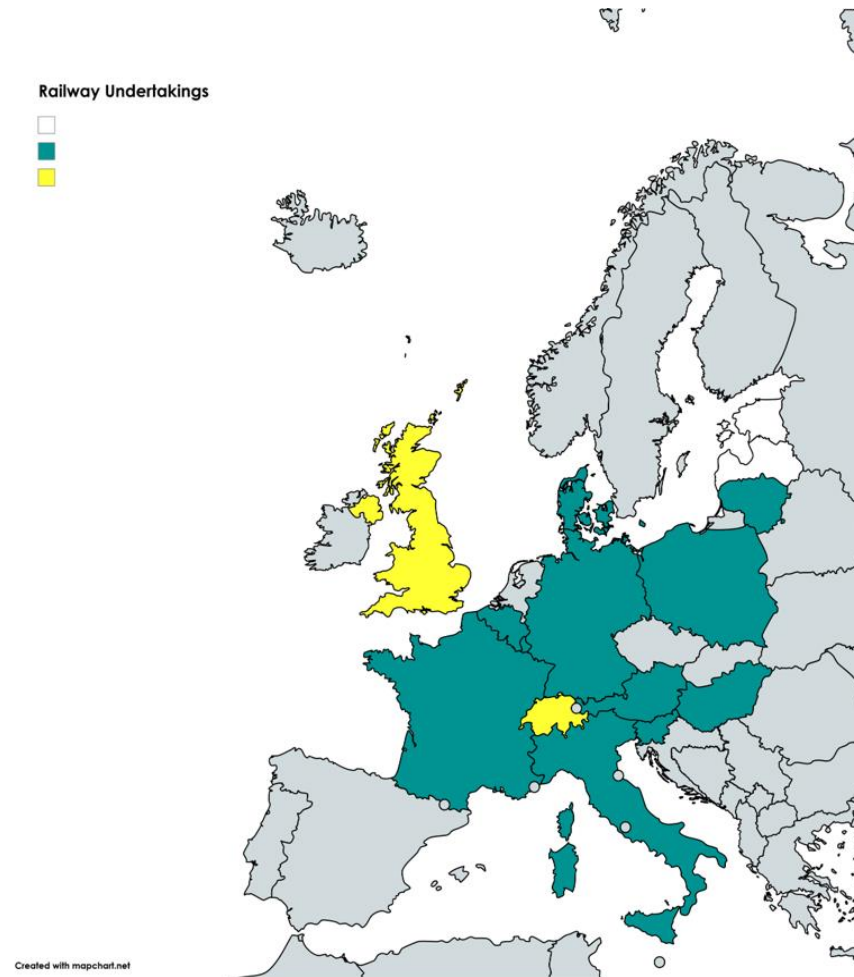
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- Future expectations on functionalities. Primary is focus on GSM-R replacements. Mentioned for later remote shunting, AI in areas of network configuration, planning and operation, 6G, satellite
- Limited strategies on procurement – dedicated (multivendor) tenders for RAN, core, sites, towers, etc.
- Very few IMs started preparation works on planning, testing, POC, trials, experimental lines
- Various answers on border crossing ideas, many unknown...
- Hardly any activities started on knowledge building or competence development

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- Trackside suppliers consider that MORANE-2 tests will be sufficient to validate their architecture. As their products are software based, the availability of the equipment may not be a concern. However, the interoperability of the systems will have to be tested even after the end of the MORANE-2 tests. Question is how to be managed?
- The 3GPP layer structure is a must and shall be respected by the providers.
- Software updates are seen as a way for swift deployment (Stable hardware but need for software update).
- Concern about cybersecurity updates and quick authorization process to deal with it.
- MNO is seen as a must have but collaboration with the MNOs is necessary to define the specificities of each network.
- The FRMCS V3 will evolve in the future with new functionalities based on new technologies.
- The high demand for some components by the AI business may increase the FRMCS deployment costs (RAM (Memory component) as an example).

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- 27 RUs - Lessors
- 13 Countries
- Half of the trainsets will not be equipped with ETCS before end of life
- Authorization process is seen as a burden
- Nearly no funding plans
- No (strong) RFQ, procurement or industrial plans, wait for TSI
- Support of train manufacturers is highly expected for engineering, homologation activities and workshop capacity
- ETCS upgrades (SV3.0) wait until further clarity
- 2035 deployment ready is considered as unrealistic
- Stable hardware expected

Railway Undertakings / lessors

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- Total numbers vehicles of the respondents 17.000
- Couple ETCS and FRMCS modification. Driven by out of service costs. Most yes, risks in planning, availability specs
- Both one-step and two-steps modifications – depending economical assessment, stable specs and planning/capacity possibilities
- No insights in prioritising areas or corridors to expedite deployment
- If possible retrofitting together with main maintenance (6 yr interval)
- Limited current vendors
- Cost analyses and input included in WG2 work
- Support modularity for easier maintenance and easier updates
- Expectations to future, improved efficiency and performance, security, futureproof, safety
- Both IM and RU effects on control room still unknown

Onboard providers

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- Product availability is expected 6 to 12 months after TSI release.
- No production capacity concern foreseen assuming components will be available (for example 5G Chipsets).
- The product authorization process is considered unclear. Consequently, the OB suppliers cannot commit to an authorization lead-time.
- The lack of orders is placing some of the suppliers in a difficult position as they are investing in the development of equipment that may not be marketed before 2030.
- Modularity is expected to enable cheaper evolution of the systems (Both for corrections and new technologies). The respect of the 3GPP three-layer architecture.

National Safety Authorities (8 respondents)

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FRMCS Deployment Group

- Different understandings of the role of NSAs in the authorization process
- Some NSA mention they are not aware of the authorization process specific to FRMCS especially as some countries did not deploy GSM-R.
- Availability of skilled resources is a concern for some of the respondents.

Notified Bodies (3 respondents)

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- Too few respondents to have a clear picture.
- However, the concern of skilled resources is raised.

MNOs (10 Respondents)

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- Respondents are very interested in supporting the FRMCS Deployment
- There are possibilities for them to comply with FRMCS specificities, but this must be discussed based on a Service Level Agreement.
- The proposed benefits of using P-MNO are :
 - Decrease the need for investment,
 - Fast deployment thanks to the use of existing infrastructure.

Analysis and Key Findings



Generic observations

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- More respondents (81 vs 67: grow in industry answers and new MNO's)
- First Questionnaire was used to gain more awareness
- In this questionnaire we see more detailed answers and knowledge on the upcoming transformation
- Some plans now occur on deployment and financing, but a majority of respondent do not have funding plans
- Responses from small to large companies
- Many respondents wait for next steps on outcome UIC programme, MORANE2 and TSI process

Key findings – Infrastructure Managers

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- Only two Infrastructure Managers intend to use RMR only for Deployment.
- MNO is expected by a vast majority of respondents both on the IM side and on the trackside providers' side.
- Half of the Infrastructure Managers intend to start deployment before 2032. Risk of lack of engineering resources flagged and to be investigated.
- There is little chance an Infrastructure Manager will have completed a full deployment (Full network with Voice+ETCS) before 2035.
- Several IM intend to use GSM-R after 2040.
- Limited preparational works and tests, waiting for outcomes tsi and tests. Preliminary talks started with industry and suppliers

Key findings – Railway Undertakings / lessors

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- Half of the trainsets that will be equipped with FRMCS will not be equipped with ETCS during its lifetime.
- Big RUs have initiated industrial capacity estimation. Smaller ones rely on subcontracting.
- Most of the RUs will request support from the train manufacturers. Overall capacity should be investigated.
- Some RUs wish to install ETCS at the same time they install FRMCS. This raises the question of ETCS onboard equipment at relevant dates.
- Funding of the deployment is a big question mark.
- There is a strong demand for fast and easy authorization process.

Key findings – Industry

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- No concerns about industrial capacity to produce the equipment assuming components will be available (FRMCS Chipsets, RAM, ...).
- Test and validation capacity maybe slow down the availability of certified systems.
- Authorization process is a burden. Fast authorization process for bug fixing and cybersecurity threats is expected.

Summary & What's next



FRMCS Deployment survey 2026

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FRMCS Deployment Group

- 81 Respondents from 23 countries.
- Main findings :
 - Very strong interest in MNO from Infrastructure Managers and industry.
 - Half of the trainsets that will be equipped with FRMCS will not be equipped with ETCS during its lifetime.
 - Funding is still not solved.
 - Authorization is a burden. Fast authorization process is expected for Voice only trains and for error correction (including cybersecurity threats).
 - Deployment industrial capacity needs to be investigated.

FRMCS Deployment survey 2026 – What's next ?

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FRMCS Deployment Group

- EU-RAIL FRMCS Deployment Group will release a second edition of the Questionnaire Report in November 2026.
- The answers will be used as inputs to the EU-RAIL Work Groups.
- The anonymised data will also be used and dispatched to relevant organization to strengthen the decision process.
- The Second version of the Advice to ERA (Based on the 2024 ERA Technical Opinion Recommendation #6) will use the answers.
- Dedicated questions are welcome. Deep-dive sessions can be organised on demand.

Questions ?

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Next Webinar

FRMCS Deployment Group

Next EU-RAIL Deployment Group is planned on the 17th of November 2026

- Cost Drivers of FRMCS Deployment : Overview of Cost Modeling Tool

[Link for subscription : Cost Drivers of FRMCS Migration: Overview and Cost Modeling Tool - Europe's Rail](#)

Europe's Rail Members

