CER
The Voice of European Railways

Position Paper

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Carbon avoidance, domestic crediting and international carbon credits

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Summary

Rail is Europe's most powerful transport carbon avoidance engine. Every year, EU rail prevents hundreds of millions of tonnes of CO_2 from entering the atmosphere – emissions that would otherwise have been produced by road vehicles and aircraft. By avoiding emissions, rail mitigates future climate change and the consequent economic damage, delivering an essential service to Europe that justifies structured financial recognition.

While rail bears the costs of the carbon market through electricity pricing, the resulting financial flows largely bypass the sector, despite the principle that market revenues should be directed toward activities delivering the greatest emission avoidance per euro invested — a benchmark where rail leads by a substantial margin. The carbon avoidance delivered by rail at infrastructure and rolling stock level must therefore be acknowledged as a basis for directing financial returns from EU carbon markets back to the rail system.

In a broader climate action perspective, rewarding carbon avoidance should be given a more prominent role. As European decision makers consider introducing new flexibilities into the EU Climate Law to meet the 2040 target, the Commission should prioritise establishing a domestic carbon avoidance accounting framework before expanding the use of international credits.

CER calls on the Commission to explicitly integrate rail's carbon avoidance contribution into the EU's nationally determined contribution (NDC) framework. Requiring Member States to direct earmarked ETS revenues toward the rail infrastructure and rolling stock investments delivering carbon avoidance will ensure that climate finance remains within Europe, is governed by harmonised EU data, and delivers verifiable benefits to EU citizens.

1. Railway position on international carbon credits

CER acknowledges the European Commission's position that up to 5% of the EU's 2040 climate target reductions may be met through high-quality international carbon credits. This limited and conditional role can be accepted provided that international credits remain strictly supplementary to domestic action and are never used as a substitute for structural domestic decarbonisation, including the modal shift to rail that is Europe's most cost-effective emission reduction pathway.

The EU's primary obligation is to build the domestic infrastructure and systems that structurally reduce emissions at home, rather than financing mitigation elsewhere. For transport – which accounts for approximately 26% of EU greenhouse gas emissions – that domestic obligation means investing at scale in the mode that avoids the most carbon per euro. Establishing a robust domestic carbon avoidance framework is the precondition for any coherent position on international credits.

2. Principles for international carbon credits

CER proposes the following principles for any international carbon credits recognised within EU climate policy:

- **Supplementarity**: International credits may only be used on top of, and after demonstrating, ambitious domestic emission reductions. They must not displace structural domestic decarbonisation, modal shift to rail, or the carbon avoidance investments described in this paper.
- **Permanence**: Only credits representing permanent emission reductions or removals should qualify. Credits from activities with material reversal risk must be excluded unless backed by robust buffer mechanisms and ex-post monitoring.
- **Corresponding adjustments mandatory**: All internationally transferred mitigation outcomes (ITMOs) used toward EU targets must carry corresponding host-country adjustments under Article 6.2, strictly preventing double-counting against nationally determined contributions (NDCs).
- **No Clean Development Mechanism (CDM) legacy credits without full re-methodology**: Pre-2021 CDM credits transitioning to the Paris Agreement Crediting Mechanism (PACM) under legacy methodologies must not qualify for EU recognition until fully reviewed and re-approved under updated Article 6.4 standards. The failures of the CDM (inflated baselines, contested additionality, suppressed EUA prices) must not be repeated under PACM.
- **Full public transparency for all bilateral agreements**: Project baselines and verification reports for all bilateral agreements under Article 6.2 of the Paris Agreement must be publicly accessible through a centralised EU registry with standardised project-level information. Annual independent audits must be published. Transparency provisions must align with the EU climate governance framework and NECPs.
- **Domestic commitment first**: While the Paris Agreement allows international carbon credits to address residual emissions, the EU's 5% cap confirms they must not substitute structural domestic action. However, the EU currently lacks the positive counterpart to this limit: a clear, quantified commitment in NDCs for domestic carbon avoidance measures such as investments in rail infrastructure and rolling stock.

CER calls on the Commission to explicitly integrate rail's carbon avoidance contribution into the EU's NDC framework. This would transform discretionary allocation of ETS

revenues and other funding to rail into a binding legal and political commitment, ensuring the EU prioritises the transport system investments that avoid the most emissions per euro, as opposed to relying on unproven or higher-cost technological removals.

3. Railway's carbon avoidance is an unrecognised asset

Rail is the only mass transport mode already operating with low-carbon characteristics. The railway sector represented by the Community of Railway and Infrastructure Companies (CER) fully supports a robust EU Emissions Trading System (ETS) as a central instrument to drive economy-wide decarbonisation. With average emissions of 33 g CO_2 per passenger-kilometre and 24 g CO_2 per tonne-kilometre for freight[1] – primarily reflecting the upstream carbon of electricity production, already fully priced within ETS 1 – electrified rail emits between five and ten times less than the road and aviation modes it competes with. This is not a potential future achievement. It is the current, measurable reality of over 80% of EU rail operations today.

Carbon avoidance is the verified GHG reduction achieved when a higher-emission activity is displaced by a lower-emission one. When a passenger chooses high-speed rail over a short-haul flight, 80–95% of the associated emissions are avoided. When a tonne of freight moves by rail instead of road, approximately five times less CO_2 is produced. This net avoidance is substantial, independently verifiable, and currently receives no EU financial reward.

The aggregate scale is transformative. A European high-speed rail network built to the rail sector's 2050-scenario ambition could avoid up to 5 billion tonnes of CO_2 by 2070, even after accounting for the embedded emissions of construction. Valued at projected ETS prices of €95–120/tonne, those avoided emissions represent over €500 billion in carbon value[2]. The deployment of Digital Automatic Coupling across EU freight rail would avoid 140 million tonnes of CO_2 over 30 years, worth approximately €16.8 billion at current carbon prices. These are not theoretical projections.

As the European Economic and Social Committee (EESC) has noted, carbon avoidance is insufficiently supported at EU level. The current EU carbon accounting framework rewards sectors for reducing their own direct emissions but has no mechanism to recognise or reward the structural prevention of emissions in other sectors. Rail bears the costs of the carbon market through electricity pricing while the financial flows generated by that market largely bypass the rail system. This reinforces market distortions relative to road transport, which still does not fully pay for the environmental, health, and congestion externalities it causes. **Reinvesting ETS revenues into rail is therefore not a subsidy, but a retroactive correction of the level playing field.**

4. Carbon avoidance must become a key metric for climate finance

CER's position focuses on economic efficiency, not subsidies, and holds that **carbon market revenues should be directed toward the activities that deliver the greatest emission avoidance per euro invested**.

This principle must be applied at system level: not only to infrastructure, but equally to rolling stock renewal, electrification of non-electrified lines, digitalisation, capacity

[1] European Environment Agency (EEA), GHG Intensity of Transport – Efficiency Indicators. Rail and Waterborne Transport. Available at: https://www.eea.europa.eu/publications/rail-and-waterborne-transport.
[2] CER Essay Series (January 2026), 'Leveraging the EU Emissions Trading System to Fund Railway Projects: An Economic Perspective', Bocconi University / CER. Based on: Ricardo et al. (2023), 'Smart and Affordable Rail Service in the EU: a socio-economic and environmental study for High Speed in 2030 and 2050'.

enhancement and operational efficiency. Rail's carbon avoidance is generated by the whole system. A new high-speed line that operates with ageing, energy-intensive rolling stock, or a modernised fleet running on an unreliable network, delivers a fraction of its potential avoidance. Carbon market financial returns must be tied to whole-system performance, not allocated only to capital construction.

Member State	ETS revenues (€m)	Rail / sustainable transport investment supported by ETS revenues	Share to rail
Poland	3,192.6	Railway infrastructure: €893.9m; interregional rail: €437.8m; reduced VAT on rail/bus tickets: €373.9m	53%
Estonia	254.6	Rail Baltic project: €136.4m; local public transport: €22.4m	62%
Ireland	138.8	Public transport investment (incl. rail): €102.3m	74%
Czech Republic	605.0	Railway junction modernisation: €131.9m; railway modernisation: €128.8m	43%
Austria	313.1	ETS revenues act as catalytic co-financing lever for Brenner Base Tunnel and rail infrastructure under the Bundesbahngesetz (€1,264.1m total incl. annuity subsidies)	Catalytic*
Finland	417.9	Public transport development: €86.4m	21%
Slovenia	108.0	Rail transport and cycle paths: €24.6m	23%
Hungary	584.6	MÁV rail freight energy support: €22.8m	4%

* Austria: ETS revenues serve as a catalytic lever within a larger national funding vehicle, unlocking multiples of their face value in rail investment – illustrating the leverage potential of carbon market finance when applied strategically to rail.

The data confirms that where Member States direct ETS revenues to rail, the model works; yet Hungary allocating 4% against Ireland's 74% illustrates why discretion must be replaced by a binding minimum allocation. A Member State facing fiscal pressures will redirect ETS revenues to general budget relief unless bound by a common minimum obligation. **CER calls on the Commission to ensure that the 2026 ETS Directive turns this discretionary good practice into a binding requirement, mandating that at least 25% of transport-related ETS revenues be allocated to the rail system across all Member States, covering infrastructure, rolling stock and operations.**

To guarantee the long-term scalability of carbon avoidance, the legislation should further specify that at least half of this ring-fenced allocation must be dedicated to rail infrastructure development, electrification, and maintenance, as the physical network constitutes the indispensable foundation upon which all other rail decarbonisation efforts are built. This level reflects rail's high abatement potential: shifting passengers and freight from road and air to rail delivers some of the largest and most cost-effective emission cuts in EU transport, so a fair share of carbon pricing revenues should be reinvested into the mode that achieves those cuts.

The carbon avoidance argument does not stop at ETS revenues. The same economic logic justifies directing carbon-related financial flows from multiple instruments toward rail:

- **Modernisation Fund:** Of €19.1 billion disbursed since 2021, less than 3% reached rail, while €4.2–6.8 billion flowed to fossil gas and waste incineration. The Fund must be prohibited from financing fossil infrastructure and redirected toward zero-emission rail technologies, with carbon avoidance performance as the primary eligibility criterion.
- **Innovation Fund:** A dedicated rail envelope of at least €2 billion should be foreseen for 2026–2030, with a focus on hydrogen and battery-electric traction for non-electrified lines, Digital Automatic Coupling, and ERTMS deployment – all technologies with large, verifiable carbon avoidance impact at system level.
- **Social Climate Fund and ETS 2:** From 2028, ETS 2 will extend carbon pricing to road transport fuels. To mitigate the impact on vulnerable households and better protect them in general against fuel price volatility, the related Social Climate Fund should be used to invest in low-carbon public transport, including rail, so citizens have a viable alternative to costly private car ownership.
- **Connecting Europe Facility and EU Taxonomy:** Carbon avoidance performance indicators should be incorporated into CEF project selection criteria and EU Taxonomy technical screening criteria for sustainable transport, ensuring that private capital flows are directed toward projects with the highest structural decarbonisation value.

CER calls on the Commission to develop **carbon avoidance as a recognised metric within EU climate finance**, starting with ETS revenue allocation at Member State level where the legal architecture already exists, and progressively extending to other instruments as methodology matures.

CER recognises that translating carbon avoidance from a measurable quantity into a structured financial mechanism raises genuine challenges – both methodological and legal. Establishing robust baseline scenarios, attributing avoidance to specific projects or services, and preventing double-counting are technically demanding. Moreover, under the revised EU Climate Law, emission reduction targets and associated financial obligations operate at Member State level, not at corporate level; corporate-level offsetting mechanisms are not currently provided for, precisely because of the risk of abuse. CER's primary ask is therefore not a new tradeable credit market, but a **reform of how Member States are required to allocate the ETS revenues they already receive** – using quantified carbon avoidance performance as the governing criterion. This is a public finance allocation argument, grounded in existing EU architecture, and does not depend on creating new market instruments.

5. Book-and-Claim to monetise carbon avoidance for corporate buyers

Beyond mandatory public revenue allocation, rail's carbon avoidance could generate voluntary private revenue streams through a book-and-claim (B&C) mechanism. Under B&C, a corporate buyer purchases a certificate representing the environmental attributes of a low-emission transport service, independently of the physical journey. The buyer can then claim the associated emission reduction in its corporate sustainability reporting — even if the physical transport was arranged by another party. This model already operates for sustainable aviation fuel and renewable electricity. The ITF's 2026 Corporate Partnership Board report 'Can Book and Claim Support Low-Emission Transport?' identifies B&C as a potentially significant mechanism for advancing low-emission transport procurement, and there is a strong underlying case for rail: its avoidance credentials are large and independently verifiable using established tonne-kilometre and emission-intensity data.

However, CER acknowledges that a number of specific design challenges must be resolved before a credible B&C framework for rail can be proposed:

- **Scope 3 overlaps:** A company already shipping by rail reports the resulting lower emissions directly within its Scope 3 footprint under CSRD/ESRS E1. Because this climate benefit is already captured, it remains unclear what additional value a separate certificate would confer upon the buyer or generate for the operator.
- **Chain of custody:** Once the environmental attribute is separated from the physical journey, a rigorous tracking framework is needed to prevent double counting between the transport operator and the certificate buyer.
- **Baseline methodologies**: To calculate how much CO_2 railways avoided, you need to establish what mode of transport would otherwise have been used. For an individual journey, this is difficult to verify with certainty.

Consequently, CER calls on the Commission to include rail explicitly in its ongoing work on transport B&C frameworks, addressing these chain-of-custody, double-counting and baseline methodology challenges as a strict precondition for any regulatory action. CER stands ready to engage constructively in this process, on the basis that a well-designed B&C mechanism can complement public revenue earmarking without compromising rail's identity as the backbone of sustainable European mobility.

6. Governance

The credibility of carbon avoidance as a basis for financial returns – and of any carbon crediting framework – depends entirely on the quality of its governance. CER calls on the Commission to establish a governance architecture that is independent, harmonised, transparent and aligned with existing EU regulatory frameworks.

- **Independent verification bodies:** The EU should establish a centralised system for accrediting and allocating verification bodies that are fully independent of project developers and operators. Verifiers should be selected through an EU-managed mechanism and financed from a common source – specifically EU ETS revenues – to cut the conflict of interest created when project developers pay their own verifiers. This should apply to domestic crediting, B&C certificates, and any international credits recognised by the EU.
- **Harmonised EU-wide monitoring, reporting and verification (MRV) framework:** A robust MRV system should be based on standardised methodologies and transparent, publicly available data sources such as Eurostat and the EEA. For rail, this means harmonised modal emission-intensity factors, standardised baseline scenarios for modal shift, and EU-wide transport statistics as the core data foundation. Crucially, verification should include ex-post monitoring of emission avoidance over time – rather than relying solely on ex-ante validation – to ensure long-term environmental integrity at system level. Such monitoring can be flexibly implemented using an appropriate combination of actual usage data (such as passenger or tonne-kilometres) and targeted mechanisms like representative user surveys, ensuring the methodology remains adaptable while accurately capturing realised modal shift.
- **Centralised public registry:** a publicly accessible EU registry should record standardised project-level information, such as baselines, methodologies, verification reports and issued credits or certificates. Annual public reporting and independent audits should be mandatory. Transparent accounting of domestic carbon avoidance should rely

on harmonised EU methodologies and publicly available data to ensure comparability and scientific robustness across Member States.

- **Alignment with EU climate governance:** Transparency provisions should align with National Energy and Climate Plans (NECPs) and enable effective oversight by the European Commission, ensuring consistency with EU climate targets and comparability across Member States.
- **Robust baselines and reference scenarios for avoidance:** Carbon avoidance methodologies should be clearly defined, based on conservative dynamic baselines and robust reference scenarios. For rail, emission reductions depend on modal shift dynamics and must be quantified with high methodological rigour.

7. Conclusion

The Commission should prioritise establishing a domestic carbon avoidance accounting framework before expanding the use of international credits. Operating at the Member State level, consistent with the architecture of the revised EU Climate Law, this framework would rely on transparent domestic registries to quantify the hundreds of millions of tonnes of CO_2 avoided annually by the European rail system. Consequently, Member States would be required to direct ETS revenues proportionally toward the infrastructure and rolling stock investments delivering that avoidance. This ensures that climate finance remains within Europe, is governed by harmonised EU data, and delivers verifiable benefits to EU citizens – without requiring complex corporate-level credit or offset mechanisms that currently lack a basis in EU law.

CER notes with interest the Commission's work on crediting negative emissions. CER supports the development of high-integrity frameworks for carbon removal credits, provided these complement rather than substitute structural emission prevention. In this context, the sequencing of climate action is of critical importance. Avoiding an emission – by ensuring it never enters the atmosphere in the first place through a modal shift to rail – is structurally more cost-effective than removing it ex post through industrial Carbon Dioxide Removal (CDR). The EU's most cost-optimal climate strategy therefore prioritises maximum structural carbon avoidance, treating carbon removal as the tool of last resort for emissions that are genuinely unavoidable. Rail investment is the primary vehicle for that avoidance in transport. Crediting negative emissions and rewarding carbon avoidance are complementary objectives and should be designed together within the EU carbon market architecture, with avoidance recognised as the primary and most cost-effective mitigation measure.

About CER
The Community of European Railway and Infrastructure Companies (CER) brings together railway undertakings, their national associations as well as infrastructure managers and vehicle leasing companies. The diverse and comprehensive membership made up of long-established bodies, new entrants and both private and public enterprises, covers the large majority of the rail infrastructure network, rail freight business and rail passenger operations in EU, EFTA and EU accession countries. CER represents the interests of its members towards EU policy makers and transport stakeholders, advocating rail as the backbone of a resilient, competitive, and sustainable transport system in Europe. For more information, visit www.cer.be or follow us on social media.

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