European Rail Infrastructure Managers EIM

March 2026

EIM Position Paper

Investing in Climate-Resilient Rail Infrastructure under the Next EU MFF: The cost of inaction is no longer affordable

Executive Summary

Europe's rail infrastructure managers are no longer anticipating climate change. They are managing it daily. From the Valencia floods that paralysed East of Spain's network, to Portugal's severed Lisbon–Porto corridor, to accelerating damage across Belgium, the Netherlands, and the Nordic countries, extreme weather has become the new operating reality. Southern Europe has acted as an early warning of the climate risks that are now spreading northwards across the continent.

The cost of inaction is clear. On flood risk to European railway networks, current estimates of expected damages amount to €581 million per year, projected to rise by 255% at 1.5°C warming and 310% at 3°C under high-emissions scenarios[1]. Evidence shows that every euro invested in resilience today returns €6 in avoided losses[2].

The Draghi, Letta, and Niinistö Reports, the 2025 Preparedness Union Strategy and the Competitiveness Compass all point in the same direction. What is missing is the financial commitment to match the political ambition.

EIM calls on the European Parliament, the Council and the Commission to make climate adaptation of rail infrastructure a dedicated funding priority in the next Multiannual Financial Framework. Concretely, EIM requests that the post-2027 MFF:

- closes the rail adaptation funding gap with adequate resources;
- addresses the increasing frequency and severity of extreme climate events by ensuring adequate financial instruments to manage rising adaptation costs and higher risk for infrastructure managers;
- shifts from reactive repair to proactive resilience by funding anticipatory investment in resilient infrastructure and early warning systems;
- encourages climate-proofing under EU rail co-financing;
- reforms cost-benefit frameworks to capture the full value of avoided losses and co-benefits and;
- supports shared tools and harmonised climate data for infrastructure managers across Member States.

With adequate funding and vision, we can build the climate-resilient European railway network that the next generation of citizens, businesses and communities will depend on.

---

1 Bubeck, "Global warming to increase flood risk on European railways", Climatic Change, 155, pp. 19–36. https://doi.org/10.1007/s10584-019-02434-5. To note that study dates from 2019 and uses pre-2019 climate projections — the actual figures today may be higher given updated climate models

2 JRC PESETA IV - Climate change impacts and adaptation in Europe, Joint Research Centre. https://joint-research-centre.ec.europa.eu/projects-and-activities/peseta-climate-change-projects/jrc-peseta-iv_en

Introduction

Rail infrastructure is the backbone of transport across Europe. It underpins the daily mobility of millions of citizens, the movement of goods through the Single Market, and the connectivity that holds regions and Member States together. It is also, increasingly, a critical enabler of European security: the EU's military mobility agenda depends on a rail network capable of moving personnel and equipment rapidly and reliably across borders at all times. A climate event that severs a key rail corridor does not only strand passengers and freight, it creates a gap in Europe's capacity to respond to crises, whether civilian or military. Rail is the most energy-efficient land transport mode and essential to achieving the EU's climate, connectivity, and strategic autonomy objectives. Yet, without decisive financial engagement to make this critical infrastructure resilient, climate change threatens to erode both past investments and future ambitions for the European railway network. This urgency is also reflected in the Commission's upcoming proposal on a framework for climate resilience and risk management, which promotes a "resilience by design" approach to better protect new investments from climate-related events and underscores the need for clear funding.[3]

EIM, representing Europe's independent rail infrastructure managers, urges the European Parliament and the Council to treat climate adaptation of rail infrastructure as a strategic investment priority in the next EU Multiannual Financial Framework. The evidence leaves no room for hesitation: every euro spent on prevention saves multiples in emergency repair, lost connectivity, and economic disruption.

The reality of climate change on the ground

Europe's rail infrastructure managers are no longer debating whether climate change will affect their networks. They are managing its consequences every day and absorbing costs that were unimaginable a decade ago. EIM members are at the sharp end of Europe's climate emergency.

In Spain, in October 2024, ADIF saw the entire Valencia rail network come to a standstill when the exceptional DANA floods severely damaged over 232 km of rail links, including two high speed tunnels, and forced freight traffic onto a 300 km detour despite rapid emergency response and restoration efforts by the infrastructure manager. Following this event, rail authorities and ADIF have assessed the review of drainage standards, asset vulnerability mapping and emergency response protocols, illustrating how extreme events are already reshaping infrastructure management practices.

In Portugal, in January 2026, IP (Infraestruturas de Portugal) was forced to suspend all rail services between Lisbon and Porto for five consecutive days as storms Kristin, Leonardo, and Marta flooded the network, severing the country's main transport artery and its cross-border links to Spain[4]. The impacts of these extreme events have been prolonged well beyond the storms themselves, with sections of the Beira Baixa Line and the Oeste Line remaining closed for more than six months, illustrating the growing vulnerability of rail infrastructure to increasingly severe climate hazards.

In France, over the past several years, SNCF Réseau reports that weather events have become the single largest cause of network disruptions, accounting for 19% of all travel time lost and ahead of any other factor. SNCF Réseau has identified 14 distinct climate hazards threatening its 28,000 km network and has launched a

[3] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14770-European-climate-resilience-and-risk-management-integrated-framework_en

[4] https://www.railtech.com/all/2026/02/05/flooding-disrupts-rail-in-portugal-five-days-of-no-trains-between-lisbon-and-porto/

comprehensive vulnerability mapping programme; an effort that underscores the scale of the challenge facing even the most proactive infrastructure managers when funding remains insufficient[5].

In Belgium, in 2021, floods were described as the worst disaster ever experienced on the Belgian railways, affecting Infrabel and all rail operators. Kilometres of trackbed had to be rebuilt, four bridges and several kilometres of overhead lines reconstructed, at a total repair cost approaching €60 million. Century-old embankments, never designed for such water loads, became dangerously unstable[6].

In the Netherlands, in 2023, 2024 and 2025, flooding from both rainfall and rising sea and river levels represents the most threatening climate risk[7]. In that year, the number of major rail disruptions exceeded the legally permitted threshold for the first time, with climate change cited among the contributing factors. ProRail has warned that significantly more investment is needed and has already identified tens of thousands of electrical relay boxes along the tracks that must be raised to avoid flood damage[8] .

In Poland, in 2024, the flood in the southern part of the country caused significant damage to the railway infrastructure. PLK S.A. estimated the damage for €220 million[9]. All cross-border rail services between Poland and Czechia were suspended for an extended period, directly affecting connectivity along the TEN-T network. Key nodes such as Kłodzko and Głuchołazy sustained particularly severe damage, requiring months of reconstruction. The gap between estimated damage of €220 million and repair expenditure of €25 million illustrates precisely the adaptation funding shortfall that the next MFF must address. As a country on NATO's eastern flank, where rail corridors are critical for military mobility, the vulnerability exposed by this single flood event carries implications well beyond transport.

In Sweden, extreme rainfall events in 2023 and 2025 caused severe disruptions to railway operations. Trafikverket continuously works to mitigate these risks through prevention activities, systematic identification of climate-related vulnerabilities and support to research. The latter shows that climate hazards account for 5–10% of total infrastructure failures, yet are responsible for up to 60% of service interruption events - a disproportionate impact that will only intensify as temperatures rise and precipitation patterns become more extreme[10].

In Norway, in 2023, Bane NOR's "InfraStatus 2023" report identified at least 5,000 drainage culverts needing urgent replacement to cope with intensifying rainfall. Storm Hans (August 2023) caused the collapse of a railway bridge on the Dovre line and forced the closure of Norway's main rail corridors for days[11].

---

5 See data on weather-related disruptions cited in MINES ParisTech (2024), "Destination: climate-resilient rail infrastructure." https://blog-isige.minesparis.psl.eu/2024/11/20/destination-climate-resilient-rail-infrastructure/
See also "Developing a Risk Assessment Methodology for Analyzing the Resilience of Railway Assets to Climate Change" (MINERVE Project), in Transport Transitions, Springer. https://doi.org/10.1007/978-3-032-04774-8_11

6 The lessons Infrabel learned from the flood: 'We had never expected the rail embankments to become so unstable'", RailTech. https://www.railfreight.com/railfreight/2022/04/11/the-lessons-infrabel-learned-from-the-flood-we-had-never-expected-the-rail-embankments-to-become-so-unstable/. See also: Grobben, P. "How will climate change affect rail?", Railway Technology / Future Rail, March 2024. https://www.railway-technology.com/features/how-will-climate-change-affect-rail/

7 Dutch Brief (2026), "The Netherlands Is Not Ready for Extreme Rain" (covering OVV report) https://www.dutchbrief.com/p/the-netherlands-is-not-ready-for-extreme-rain

8 ProRail / Peusens, R. "How does ProRail deal with extreme weather conditions?", Global Railway Review. https://www.globalrailwayreview.com/article/140279/prorail-dealing-with-extreme-weather-conditions/. See also "ProRail sounds the alarm about €20 billion rail funding backlog in the Netherlands." https://www.railtech.com/all/2025/12/10/dutch-im-prorail-sounds-alarm-over-state-of-infrastructure/

9 Amount communicated by PKP PLK S.A. to EIM

10 Swedish Accident Investigation Authority (2023), "Derailment of SJ train no 50562 between Iggesund and Hudiksvall." https://shk.se/engelska/the-swedish-accident-investigation-authority/search-investigation/rail/2023-11-23-derailment-of-sj-train-no-50562-between-iggesund-and-hudiksvall. See also "The impacts of weather on railway infrastructure in Sweden", International Journal of Sustainable Transportation. https://doi.org/10.1080/23789689.2024.2340371

11 Bane NOR report: https://www.banenor.no/contentassets/d48f63806b0a4987b8d7bb32681ca01b/infrastatus-2023.pdf ; see also Rail Market "Bane NOR calls for upgrades of infrastructure." https://railmarket.com/news/infrastructure/20614-bane-nor-growing-demand-

These events exceeded historical design parameters and highlight the accelerating nature of climate risks affecting rail infrastructure across Europe.

These are not exceptional events. They are the new operating reality for European rail infrastructure managers from the Mediterranean to the Arctic, and the trend is accelerating.

The financial figures that should drive the political decision

As confirmed by the recent European Environment Agency's briefing *"Making agriculture, energy and transport climate resilient"*, the EU experienced average annual economic losses of €40–50 billion from extreme weather between 2021 and 2024, the five costliest years on record. Cumulative losses since 1980 have reached €822 billion, and these figures capture direct damage only[12].

For the transport sector as a whole, the Agency recalls studies that estimate that adaptation requires investment of **€7–20 billion annually until 2050**, depending on the climate scenario. However, current committed funding stands at a mere **€3.4–3.9 billion per year**, leaving an annual gap of up to **€16 billion**. Under a high-emissions trajectory, the cost of adaptation roughly doubles for every additional degree of global warming. Delay does not defer the bill. It inflates it[13].

For rail, the arithmetic is especially stark. Current flood risk to European railway networks is estimated at **€581 million per year** in expected annual damage, projected to rise by **255% at 1.5°C warming and 310% at 3°C**[14]. These figures, based on pre-2019 climate projections, are likely to be significant underestimates given the acceleration of extreme weather events.

But the true cost to Europe's economy goes far beyond infrastructure repair. Every major rail disruption degrades the reliability that industry depends on for just-in-time supply chains, diverts freight onto congested roads (increasing logistics costs, delivery times, and carbon emissions) and erodes the attractiveness of rail as a competitive alternative to road and air.

When businesses and citizens cannot count on the rail network, European industrial competitiveness is at stake.

Yet the return on timely investment in the resilience of rail critical infrastructure is compelling, and the cost of failing to invest is measured not only in repair bills but in lost competitiveness. The JRC's PESETA IV study shows that adapting to flood risk delivers **€6 in benefits for every €1 invested**: a return ratio that encompasses not only avoided physical damage to infrastructure and property, but also preserved economic activity, reduced emergency response costs, and the continuity of essential services that citizens and businesses depend on[15].

---

for-railway-maintenance. See also "Norwegian steel truss rail bridge collapses as Storm Hans wreaks havoc"; https://www.newcivilengineer.com/latest/norwegian-steel-truss-rail-bridge-as-storm-hans-wreaks-havoc-for-nation-16-08-2023/ and "Extreme weather causes major damage to Norwegian rail network." https://www.railjournal.com/infrastructure/extreme-weather-causes-major-damage-to-norwegian-rail-network/

[12] EEA (January 2026), https://www.eea.europa.eu/en/analysis/publications/costs-and-benefits-of-adaptation-actions-in-europe . See also EEA (2025) https://www.eea.europa.eu/en/analysis/indicators/economic-losses-from-climate-related

[13] see also Neumann, T. et al. (2026), Knowledge development and application concerning costs of adaptation compared to the costs of inaction, Ecologic Institute. https://www.ecologic.eu/20040

[14] Bubeck, "Global warming to increase flood risk on European railways", Climatic Change, 155, pp. 19–36. https://doi.org/10.1007/s10584-019-02434-5

[15] JRC PESETA IV - Climate change impacts and adaptation in Europe, Joint Research Centre. https://joint-research-centre.ec.europa.eu/projects-and-activities/peseta-climate-change-projects/jrc-peseta-iv_en

For legislators weighing competing demands on the next MFF, few investment categories offer comparable returns with such a direct link to both economic resilience and public safety.

The Alignment with Europe's strategic direction

EIM believes that this is not a sectoral request. It responds directly to the strategic priorities that Europe's own leaders have identified.

The **Draghi Report** explicitly recalls that climate adaptation requires "significant additional investment" and Europe's competitiveness depends on resilient infrastructure that keeps supply chains and the Single Market functioning[16]. The **Letta Report** demonstrates that genuine single-market integration requires seamless cross-border connectivity. Precisely what is lost when floods sever international rail corridors, as EIM members have repeatedly experienced[17]. The **Niinistö Report** frames climate resilience as a security imperative, calling for systematic protection of critical infrastructure; a call that resonates directly with the growing demands on rail infrastructure managers for military mobility and critical infrastructure protection under the Critical Entities Resilience (CER) Directive[18]. The 2024 floods in Poland, which severed cross-border rail links on NATO's eastern flank, demonstrated in practice how climate events can compromise not only transport connectivity but also Europe's capacity for rapid military deployment.

This direction is reflected in the Commission's call for evidence for the upcoming initiative on climate resilience and preparedness, which recognises that climate risks increasingly threaten core EU objectives and highlights the need for a coordinated European approach to protecting critical infrastructure and ensuring that investments are resilient to the climate risks they face. This reinforces the strategic importance of strengthening the resilience of critical cross-border infrastructure that underpins the functioning of the Single Market, Europe's competitiveness and its security.[19]

The Draghi, Letta and Niinistö Reports, as well as the European Commission's 2025 Preparedness Union Strategy[20], the Competitiveness Compass[21] and the forthcoming European climate resilience framework[22] all point in the same direction.

What is missing is the financial commitment to match the political ambition.

16 Draghi Report to the European Commission. https://commission.europa.eu/topics/competitiveness/draghi-report_en

17 Letta Report to the European Council. https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf

18 Niinistö Report to the European Commission. https://commission.europa.eu/topics/defence/safer-together-path-towards-fully-prepared-union_en (see ex: Executive Summary: "The increasing damage caused by extreme weather events is forcing Europeans to ask not only how climate change will affect future generations, but also what we need to prepare for today.")

19 'Have Your Say' European climate resilience and risk management: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14770-European-climate-resilience-and-risk-management-integrated-framework_en

20 https://commission.europa.eu/topics/preparedness_en

21 https://commission.europa.eu/topics/competitiveness/competitiveness-compass_en

22 https://climate.ec.europa.eu/eu-action/adaptation-and-resilience-climate-change/european-climate-resilience-and-risk-management-integrated-framework_en

The EIM request for the next Multiannual Financial Framework

EIM calls on the policymakers in the Commission, the European Parliament and the Council who are negotiating the next Multiannual Financial Framework to ensure adequate financing for the adaptation of rail infrastructure to climate change.

Infrastructure managers cannot close the adaptation gap alone. National budgets are constrained and the scale of the challenge is European.

EIM calls for action on 5 priorities:

1. ***Close the rail transport adaptation funding gap in the next MFF.***

The EEA has quantified the shortfall. Ring-fenced, dedicated funding for climate adaptation of transport infrastructure - with rail as a priority - must be a central feature of the post-2027 financial framework. The amounts currently committed are a fraction of what is needed, and every year of underinvestment increases future costs. In addition to direct budgetary allocations, the next MFF should actively promote blended finance mechanisms to leverage private capital for climate resilience investments. Many adaptation measures in rail infrastructure generate measurable long-term savings and reduced risk exposure, making them suitable for innovative financial structures combining EU grants, EIB financing, national contributions and private investment.

2. ***Shift the paradigm of EU funding instruments from reactive repair to proactive resilience.***

The current model, where infrastructure managers absorb damage, apply for emergency funds and rebuild to pre-disaster standards, is economically irrational and operationally unsustainable. While existing EU funding frameworks already integrate climate adaptation considerations, greater availability and flexibility of funding instruments are needed to support anticipatory investment in railway resilience, as well as a review of funding requirements considering the increasing severity of climate impacts. This includes upgraded drainage systems, reinforced embankments and bridges, improved vegetation management, advanced monitoring and early warning systems. The experience of EIM members shows that lines rebuilt after flood damage without enhanced resilience standards are simply waiting to be damaged again. This is also reflected in the forthcoming initiative on a framework for climate resilience and risk management, which promotes a “resilience by design” approach to ensure that infrastructure investments are prepared for the climate risks they will face over their lifetime.

Shifting towards proactive resilience requires complementing conventional grey engineering measures with solutions that work with natural systems. In addition to reinforced structures and drainage upgrades, the next MFF should actively promote the deployment of nature-based solutions (NbS) as a core component of infrastructure resilience strategies. Restored floodplains, wetland buffers, reforested slopes, green embankments and sustainable drainage systems can reduce flood peaks, stabilise soils, prevent erosion and mitigate overheating along rail corridor, including biodiversity enhancement, improved water retention and carbon sequestration. Treating nature-based solutions as strategic infrastructure investments — rather than environmental add-ons — would strengthen long-term resilience while aligning adaptation and mitigation objectives.

Proactive resilience must also address the growing urbanisation of areas adjacent to the railway network. Uncontrolled construction development along railway lines and corridors, including the sealing of permeable

surfaces, the narrowing of natural drainage channels and the encroachment on buffer zones, degrades the surrounding environment and significantly undermines the ability of rail infrastructure to withstand extreme weather events.

Proactive resilience must also include scaled-up technological innovation to reinforce resilience before, during and after extreme weather climate events. Advanced early warning systems, real-time monitoring, remote sensing, digital twins, predictive maintenance tools and AI-based risks modelling can enable infrastructure managers to anticipate disruptions, protect critical assets, manage traffic dynamically during crises and accelerate recovery afterwards. Embedding these technological capabilities within EU funding instruments would ensure that resilience is not only structural, but also operational and systemic.

As climate risks, geographical characteristics and infrastructure profiles vary between Member States, costs benchmarks will need to be reviewed and adjusted accordingly to ensure that adaptations measures are adequately financed.

3. Encourage climate-proofing in all EU rail investment.

Every euro spent on TEN-T completion, ERTMS deployment, capacity enhancement, or military mobility must integrate climate resilience by design. Climate resilience funding under the next MFF should not be limited exclusively to the core and comprehensive TEN-T network. Climate risks do not stop at TEN-T borders. Secondary and regional rail links often serve as critical diversionary routes in times of disruption and are essential for territorial cohesion, regional and rural development, military mobility redundancy and supply chain continuity. Building new infrastructure to yesterday's climate specifications creates tomorrow's vulnerabilities. This should be a binding condition of EU co-financing.

EU funding and financial instruments under the next MFF should be better articulated and mutually reinforcing across all phases of a project planning, design, construction, operation, maintenance and post-event recovery. Resilience should be embedded from the earliest stages of project appraisal and systematically upgraded during reconstruction. This requires stronger coordination between the different EU funding instruments.

4. Reform cost-benefit frameworks to reflect the full value of resilience.

Current EU investment appraisal methods systematically undervalue adaptation by ignoring co-benefits. Accounting for avoided losses, mitigation synergies, and broader socio-economic dividends (as the EEA's "triple dividend" framework demonstrates[23]) would correct this bias and unlock investment that is justified on any rational assessment.

5. *Support EU investments in shared tools, harmonised data and knowledge for infrastructure managers.*

Climate risk assessment, adaptation planning, and resilience monitoring require expertise and resources that many rail infrastructure managers, particularly smaller ones, lack. The EU should support the development of harmonised European risk assessment methodologies, shared climate data platforms, and structured exchange

[23] The "triple dividend of resilience" is a conceptual framework developed by the European Environment Agency (EEA) to make the economic and policy case for investing in climate adaptation before disasters strike, rather than paying for damage after the fact. It argues that well-designed adaptation investments don't just reduce losses but generate three distinct layers of benefit simultaneously. First dividend: Avoided losses. Second dividend: Co-benefits for mitigation. Third dividend: Wider socio-economic benefits.

of best practices among rail infrastructure managers, building on the work already undertaken by individual infrastructure managers.

A call to invest before the next flood

The window for cost-effective action is narrowing with every extreme weather season. The evidence reflects the lived experience of rail infrastructure managers across Europe who are repairing, rebuilding and restoring their networks at increasing cost and frequency. The EEA's data confirms what they know first-hand: prevention costs a fraction of reconstruction, and the returns on resilience investment are substantial and proven.

The next Multiannual Financial Framework will define Europe's investment priorities for a decade in which climate impacts on infrastructure are set to intensify significantly. The choices made now will determine whether Europe's rail network - the most sustainable transport mode on the continent and a cornerstone of the Green Deal, the Single Market, and European strategic autonomy - is strengthened to meet that challenge or left to deteriorate under climate stress at a far greater eventual cost.

EIM therefore urges the European Parliament, the Council, and the Commission to seize this opportunity and ensure that the next Multiannual Financial Framework allocates dedicated, adequate funding for climate adaptation of rail infrastructure commensurate with the scale of the challenge identified by the European Environment Agency. This is an investment in Europe's future mobility, competitiveness, security, and quality of life.

EIM and its members stand ready to contribute with their operational expertise, share the lessons learned across their networks and work in close partnership with EU institutions and Member States to translate these priorities into effective actions.

With adequate funding we can build the climate-resilient European railway network that the next generation of citizens, businesses, and communities will depend on.