

A climate resilient railway for Europe's future

Ethem Pekin, Head of economic policy and sustainability

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- Rail is both solution to climate change and increasingly vulnerable to it
 - Backbone of EU Green Deal (90% emissions reduction target)
 - Critical for Single Market, supply chains, territorial cohesion
- BUT: Extreme weather already disrupting operations across Europe
- The EU is now designing its climate resilience framework — this is the moment to ensure that rail is properly addressed as a system-critical sector with specific needs

Climate impacts are already systemic

€2 billion damage
to EU rail
infrastructure in
2024–2025

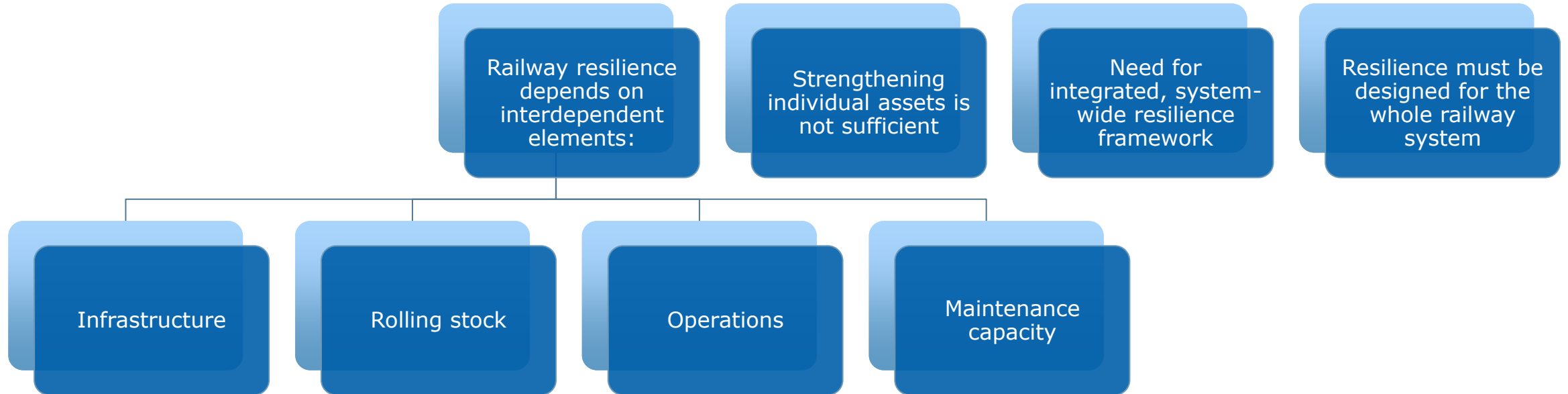


- 13,400+ extreme weather events affecting rail (2005–2024)
- 70% of infrastructure managers report increasing impacts
- Weather-related delays = loss equivalent to 1–3 full years of service (EU-wide)
- Major national damages: Germany (~€1.4bn), Greece (~€450m), Spain (~€212m)
- Climate risk is already reducing system performance and capacity

Why rail is structurally vulnerable

- Impacts no longer isolated:
 - Affect entire corridors and networks
- Operational consequences:
 - Capacity reductions
 - Reliability issues
 - Longer recovery times
- Not limited to infrastructure:
 - Affects rolling stock, operations, maintenance, personnel
- Climate risk is a system-wide challenge, not an asset-level issue

A system-wide approach is required



The cross-border dimension (critical weakness)



Rail is inherently cross-border and network-based



Fragmented national approaches



Different risk assessment methodologies



Weak interfaces between networks



Reduced reliability of international traffic



Without coordination, cross-border corridors remain the weakest link

Gap – climate data and planning

- Heavy reliance on historical data
- Fragmented national assumptions
- Shift to forward-looking climate scenarios
- Use of:
 - Harmonised Copernicus projections
 - Multiple climate models
- Create a single European baseline for planning
 - Enables coherent cross-border infrastructure design
 - Reduces inconsistencies and inefficiencies

Delivering resilience: policy priorities

- Resilience-by-design
 - Integrate resilience from the outset
 - Based on clear, rail-specific standards
- Focus on existing network (brownfield assets)
 - Legacy infrastructure = highest vulnerability
 - Retrofitting is complex and costly
- Targeted public support & adequate co-financing
- Current permitting slows adaptation- Need streamlined, predictable processes

- Without resilience, rail cannot deliver decarbonisation
- Rail is critical infrastructure and ensures:
 - Mobility
 - Supply chains
 - Social and economic continuity
- EU framework must deliver:
 - System-wide approach
 - Common climate data baseline
 - Resilience-by-design
 - Dedicated funding for existing assets

For further information:

Ethem Pekin

Head of economic policy and sustainability

Tel: +32 496 599 316

E-mail: ethem.pekin@cer.be

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