



Receipt

POLICY BRIEF

# Storytelling critical infrastructure risks



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## Main messages

- Infrastructure is the cornerstone of societal progress, enabling economic growth, public health, safety, and environmental protection. Disruption to critical infrastructure can have far-reaching implications for EU security and the well-being of its citizens.
- Conventional climate risk assessments are not designed to address the complexities of critical infrastructure and their system interdependencies. Climate risk storylines can effectively illustrate the progression and propagation of risks.
- The risk assessment compelled by the EU legislations enhances the scope of climate risk assessments, offering potential improvements for financial and strategic evaluations. However, it also presents challenges in ensuring consistency and compatibility across assessments.



## Setting

Critical infrastructure is vital for society, and any disruption to its essential services can exacerbate the effects of climate risks. Conversely, resilient infrastructure can mitigate these effects. Resilient infrastructure is crucial for both domestic and international security, safety, and risk management strategies.

The EU invests in transport, energy, and digital networks, boosting market cohesion, supporting green and digital shifts, and ensuring access to essential services within its borders. The trans-European infrastructure networks (TENs) build interconnection and accessibility across EU regions, enhance cross-border cooperation, promote employment, and support environmental and sustainable goals.

The 2021-established EU Global Gateway is the EU's blueprint for global connectivity, addressing investment deficits and amplifying the EU's global role. The strategy emphasizes sustainable development, climate action, and competitiveness, focusing on investments in infrastructure like fibre-optics, transport routes, and power lines.

The 2022 Directive on Critical Entities Resilience (CER) emphasizes the management of critical infrastructure by designated entities. These entities must be equipped to manage incidents that could disrupt essential services. Critical entities include those managing infrastructure systems or providing essential services whose disruption could jeopardize societal functioning. The Directive sets a framework addressing the resilience of critical entities against various hazards, including natural and intentional incidents. This broad view covers sectors like energy, transport, finance, health, water, digital, administration, space, and food. The increased interconnectedness between these sectors stems from cross-border service networks.



## Insights from RECEIPT

The RECEIPT storyline analysed coastal flood impacts on critical infrastructure, considering risk factors like sea level rise, infrastructure growth, for varying adaptation levels<sup>1</sup>. The economic impacts of flooding were estimated under various assumptions, including the expansion and retrofitting of coastal infrastructure. The storylines constructed in this way can differentiate the extent to which future changes in coastal floods are driven by climate change or coastal development and adaptation. Furthermore, a unique spatial dataset was created<sup>2</sup> by harmonizing global critical infrastructure data into a single database. The dataset is complemented by a Critical Infrastructure Spatial Index (CISI) that measures the global spatial density of critical infrastructure. An overview of the impacts and recovery progress of large-scale critical infrastructure systems in Germany, Belgium, and the Netherlands following the extreme precipitation and flooding in July 2021<sup>3</sup>. The results highlight damage and destruction of infrastructure assets, including bridges, sewage systems, schools, and hospitals, which creates significant impacts often not captured in existing large-scale risk assessments.

1. Koks et al., 'The Impacts of Coastal Flooding and Sea Level Rise on Critical Infrastructure'.

2. Nirandjan et al., 'A Spatially-Explicit Harmonized Global Dataset of Critical Infrastructure'.

3. Koks et al., 'Brief Communication: Critical Infrastructure Impacts of the 2021 Mid-July Western European Flood Event'.



## Recommendations

The Directive on Critical Entities Resilience mandates risk assessments for entities managing infrastructure systems deemed critical. However, it offers limited guidance on structuring these assessments, particularly regarding their ripple effects, and ensuring comparable results across Europe. While the storyline approach holds promise, critical entities must base their analyses on national or regional disaster and climate risk assessments. These often employ simplified and qualitative methods when addressing critical infrastructure. The confidential nature of risk identification and assessment related to critical infrastructure complicates harmonization and public scrutiny. In this situation, guidance on conducting climate risk assessments can be provided through tailored showcases and hypothetical examples, without specific contextual references.

Climate risk storylines can be used to direct critical infrastructure investments, allocating resources to projects aligned with projected climate risks and yielding optimal returns in resilience and long-term functionality to ensure the safeguarding of critical infrastructure.

