EUROPEAN CENTRAL BANK

EUROSYSTEM

Climate Change and Financial System Stability

Navigating today's challenges and tomorrow's opportunities

Conference at National Bank of the Republic of North Macedonia
24-25 November 2025

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Overview

1. Surveillance

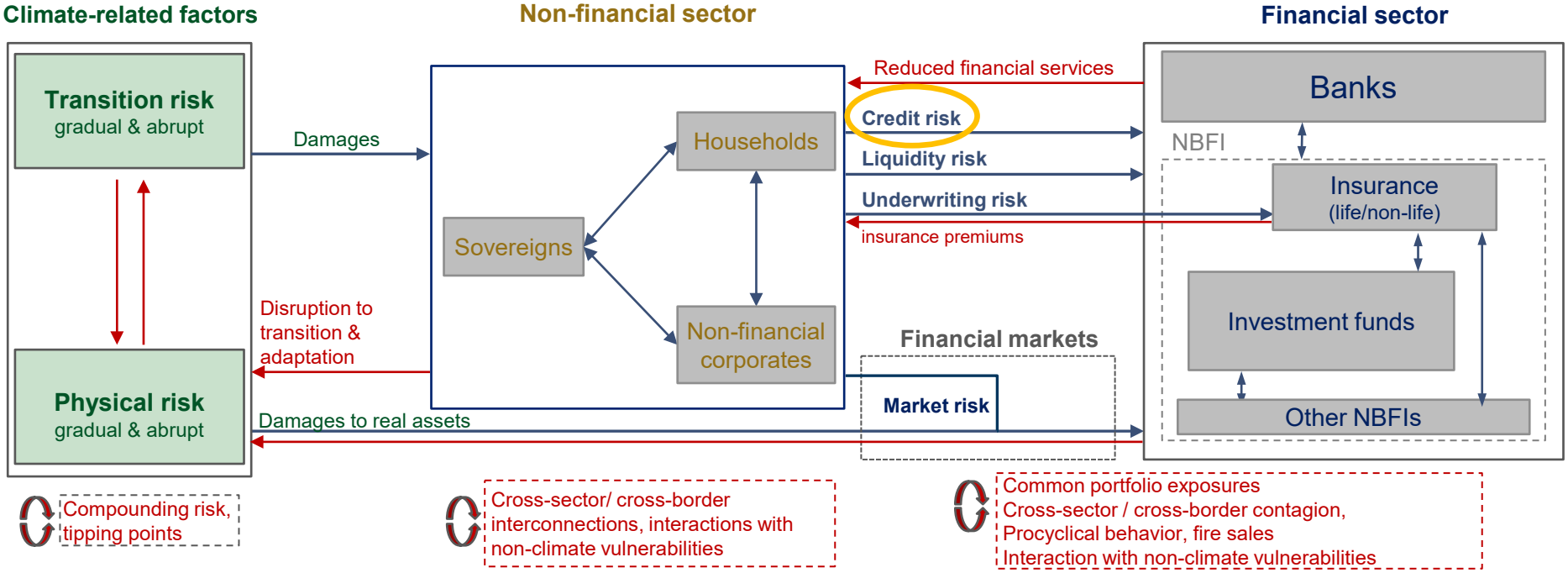
- Framework
- Transition risk
- Physical risk

2. Stress-testing

Framework for climate-related risks and vulnerabilities

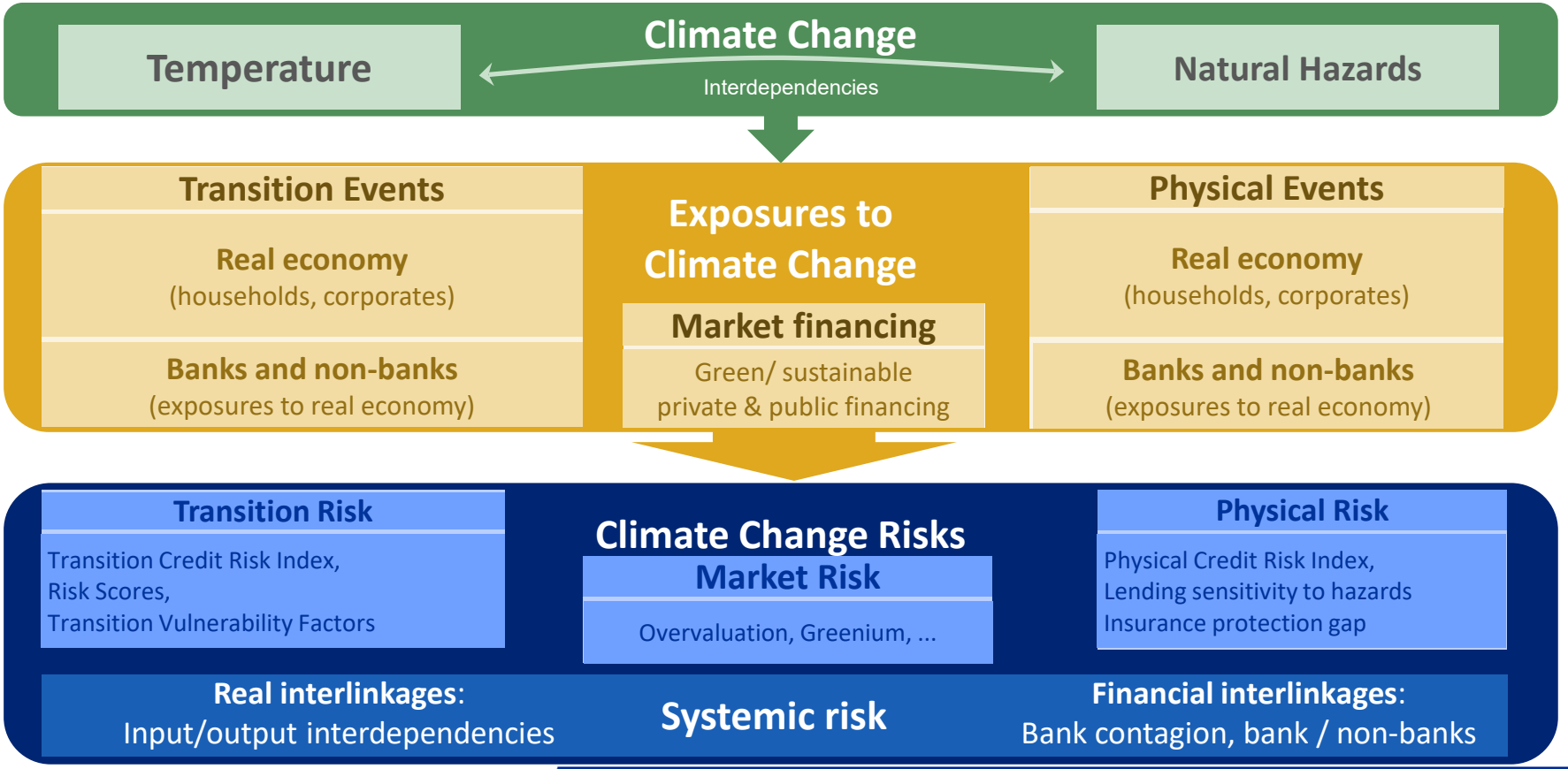
Transmission channels

Feedback and amplification effects



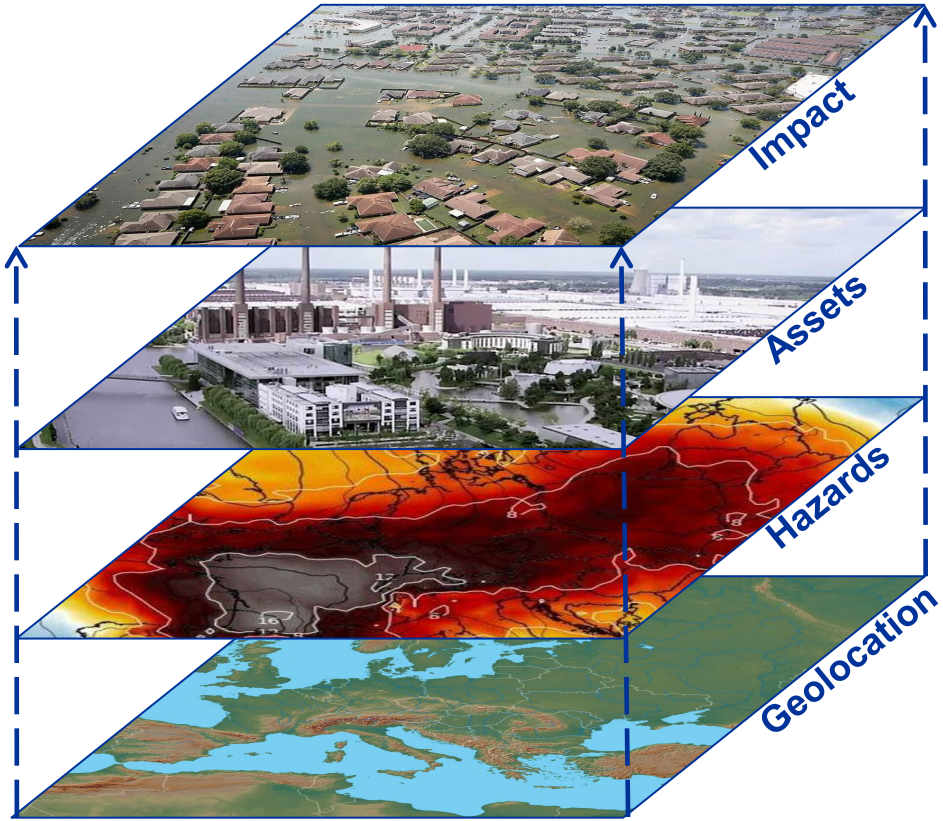
Source: Financial Stability Board.

Surveillance framework for climate-related financial stability risks



Source: ECB/ESRB Project Team (2023).

Data requirements and improvement needs



1. Tapping multiple large data sources

- **Geolocation**
- **Hazards** ⇒ physical risk
- **Emissions** ⇒ transition risk
- **Asset value** (financial)
- **Impact** (supervisory data)

2. Further data improvements needed

- **Granularity of exposures**
  e.g. floods, location of economic losses

- **Data quality and disclosures:**
  - Need for mandatory disclosures with double materiality principle
  - Quality assurance to improve data consistency

Overview

1. Surveillance

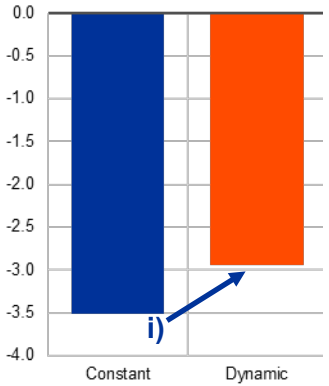
2. Stress-testing

- Basis: 2025 EU-wide stress test (ECB, EBA, ESRB)
- MaSTER: Broadening EU-wide stress-test methodology
- Integrating climate-related risks (based on NGFS NDCs scenario)

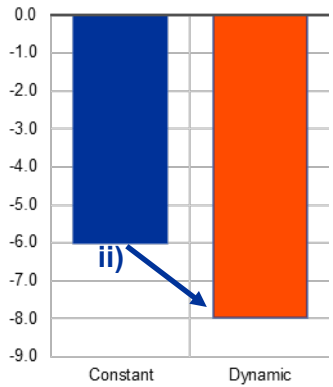
Dynamic balance sheets: Banks' deleveraging provides slight capital relief with negative impact on GDP

- Dynamic balance sheet analysis shows that
  i) banks' deleveraging improves CET1 ratio, but
  ii) lowers credit supply and deepens GDP contraction

Decrease in CET1 capital ratio with constant and dynamic balance sheets
(percent)



Impact on real GDP with constant and dynamic balance sheets
(deviation from starting point)

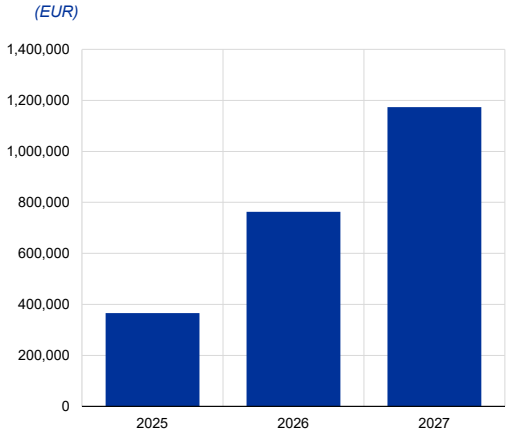


***Sources**: EU-wide Stress Test and ECB calculations. **Notes:** The impact on CET1 ratio and real GDP is quantified using the BEAST with differing modelling and policy assumptions.*

Transition climate risks imply that banks with higher exposures to energy-intensive sectors face greater losses

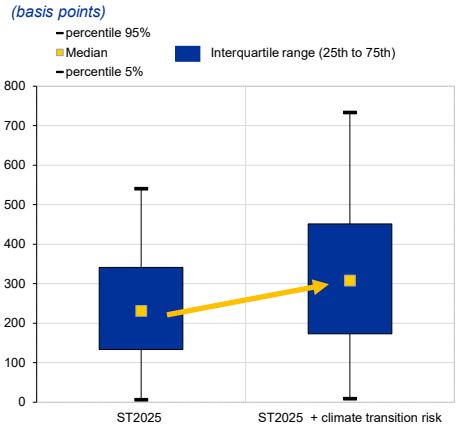
- NGFS Nationally Determined Contributions (NDCs) scenario implies a decrease in emissions financed through green investments, but implies higher indebtedness and lower profitability of firms
- Additional CET1 impact in the adverse scenario heterogeneous amounting to ~74 bps on average

Cumulative green investments: firm averages



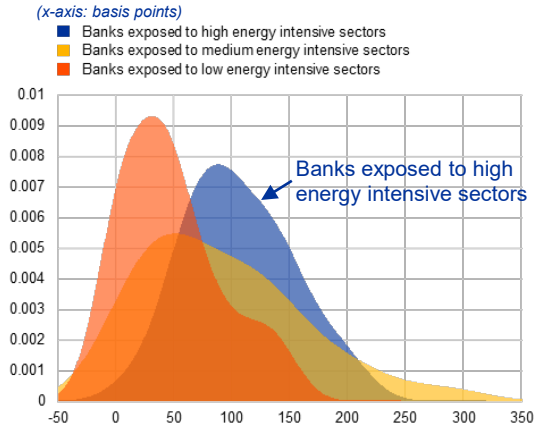
Sources: *Macroprudential Stress Test Extension Report (MaSTER).* ***Notes***: *Chart shows the average cumulative green investments for EU firms over the stress test horizon 2024-2027 in euros.*

NFC loan losses EBA ST with additional climate transition risk



Sources: ***Sources***: *Macroprudential Stress Test Extension Report (MaSTER).* ***Notes*** *Chart shows the distribution of NFC credit risk losses under the EBA adverse scenario with the additional transition risk shocks*

CET1 impact - additional NFC loan losses due to climate transition risk in the adverse scenario



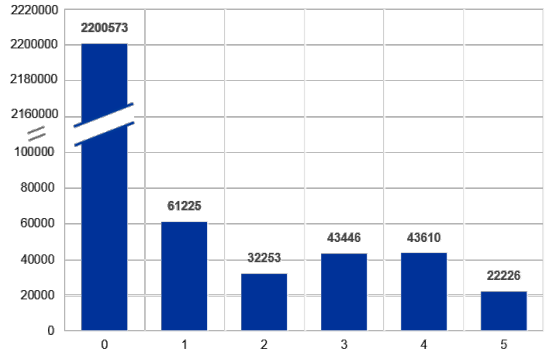
Sources: ***Sources***: *Macroprudential Stress Test Extension Report (MaSTER).* ***Notes***: *Chart shows a kernel density of the distribution of the incremental loan losses for banks due to transition risk on NFCs under the EBA adverse scenario, categorized by exposure to sectors with different energy intensity.*

The impact from floods on corporate loan losses is assessed by integrating macro- and local effects

- Most firms have low physical risk, but over 22,000 are in the highest-risk category (score 5) and, in affected municipalities, 6.4% firms with the highest climate risk score are assumed to be impacted
- Capital depletion rises under the combined scenarios increase by ~77 bps

Firms' distribution of exposure to physical risk

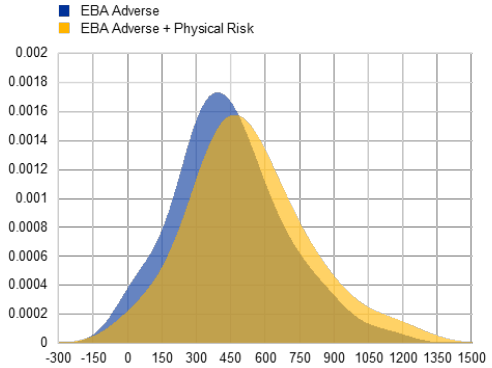
(y-axis: number of firms, x-axis: physical risk score)



Sources: *Macroprudential Stress Test Extension Report (MaSTER).*
Notes: *The histogram refers to firms reported in AnaCredit by at least one bank in the sample of the 2025EU-wide stress test in December 2024. The physical risk score refers to river flooding and is based on the Representative Concentration Pathway 4.5 scenario by the Intergovernmental Panel on Climate Change for the period 2021–2050 and is calculated at the borrower level. 0 means low risk, 5 very high risk.*

Distribution of banks' credit risk losses under different scenarios

(basis points)



Sources: *Macroprudential Stress Test Extension Report (MaSTER).*
Notes: *Kernel density estimate plot visualising the distribution of impairments in basis points across banks.*

Referenced publications

Surveillance

(1) "Assessment of Climate-related Vulnerabilities Analytical framework and toolkit" CVD report, FSB, January 2025)

(2) "Climate change-related statistical indicators" (ECB SSC, 2024)

(3) "Towards macroprudential frameworks for managing climate risk" (ECB/ESRB, 2023)

"Chartbook for monitoring financial stability impacts of climate" (ECB/ESRB, 2023)

"2022 climate risk stress test" (ECB SSM, 2022)

Climate stress-testing

(1) "Integrating climate risk into the 2025 EU-wide stress test: the effects of climate risks for firms" (ECB, 2025)

Macroprudential Stress Test Extension Report (MaSTER) : "Beyond the single bank: macroprudential insights from the 2025 EU-wide stress test and its extensions" (ECB, 2025)

(2) "The Road to Paris: stress testing the transition towards a net-zero economy" (ECB, 2023)

(3) "Designing a macroprudential capital buffer for climate-related risks" (ECB WP 2943, 2024)

Other aspects of climate-related risk

(1) "Risks from misalignment of banks' financing with the EU climate objectives" (ECB SSM, 2024)

(2) "Climate change and sovereign risk" as part of the Financial Stability Review (ECB, May 2023)

(3) "Policy options to reduce the climate insurance protection gap Discussion Paper" (ECB and EIOPA, April, 2023)