Towards climate-related indicators

Stakeholder Seminar

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Overview

1. Introduction

Introduction

- In line with Governing Council action plan, ESCB committed to produce climate-related statistical indicators to be able to follow trends at aggregate level.

- Published indicators cover:

  - Experimental indicators on issuances and holdings of sustainable debt securities

  - Analytical indicators on carbon emissions financed by the financial sector loan and securities portfolios

  - Analytical indicators on physical risks associated with financial sector loan and securities portfolios

- Indicators are to inform monetary policy making, provide reference for financial stability analyses and support public understanding

- Where possible, data from public/ESCB data collections; methodology made transparent

- New experimental and analytical indicators, like all similar data, come with significant limitations, to be used and analysed with care

- Project work in progress and contribution to ongoing discussion

2. Sustainable finance

Experimental indicators

Experimental indicators on sustainable finance

Indicators constructed based on ESCB data sources: Centralised Securities Data Base (CSDB), CSDB Securities Issues Statistics (CSEC) and Securities Holdings Statistics (SHS)

Time-series information on outstanding amounts and financial transactions related to the issuances and holdings of sustainable debt securities

Indicators provide views on both, the funding needs of sustainable projects and the demand for these debt securities as investment opportunities

Indicators are sufficiently reliable for use. However, when using the data, analysts should be particularly conscious of the methodological decision to currently include all degrees of assurance in the definition of sustainable debt securities, including self-labelled securities

Experimental indicators on sustainable finance

Issuances	Holdings
EA / EU issuances of sustainable debt securities by sustainability classification	EA holdings of sustainable debt securities by sustainability classification broken down by issuing counterparty area (euro area, EU, rest of the world)
Breakdowns by issuer sector and individual EA country for green debt securities	Breakdowns by holder sector and individual EA country for green debt securities
EA net issuances of green debt securities	EA net acquisitions of green debt securities
✓ **Sustainability classification: Green, Social, Sustainability, Sustainability-linked** ✓ **All assurance levels are considered** ✓ **No restriction on underlying standards**	
Part of CSEC dataset Face, nominal and market value; monthly frequency at t+10; from Q4-2020 onwards	*Part of SHSS dataset* Face and market value; quarterly frequency at around t+2 months; from Q1-2021 onwards

Issuances and holdings of sustainable debt securities in the euro area
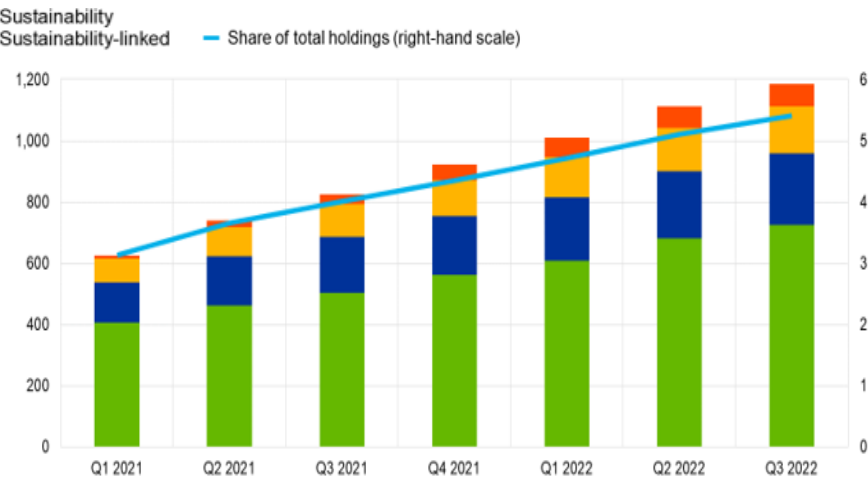

Issuances

Holdings

(Left-hand scale: EUR billions, outstanding amounts; at face value; right-hand scale: percentages)
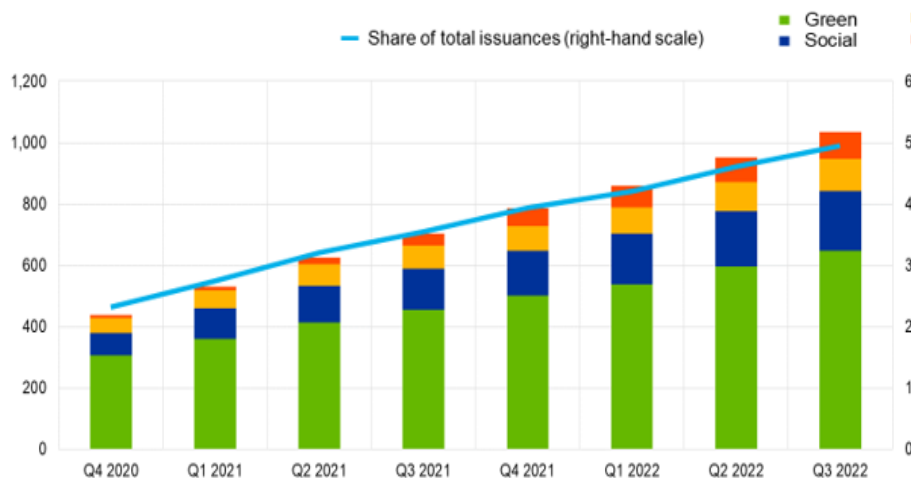
Source: CSDB
The share of total issuances represents the amount of all sustainable securities as a share of the outstanding amounts of all debt securities issued in the euro area.
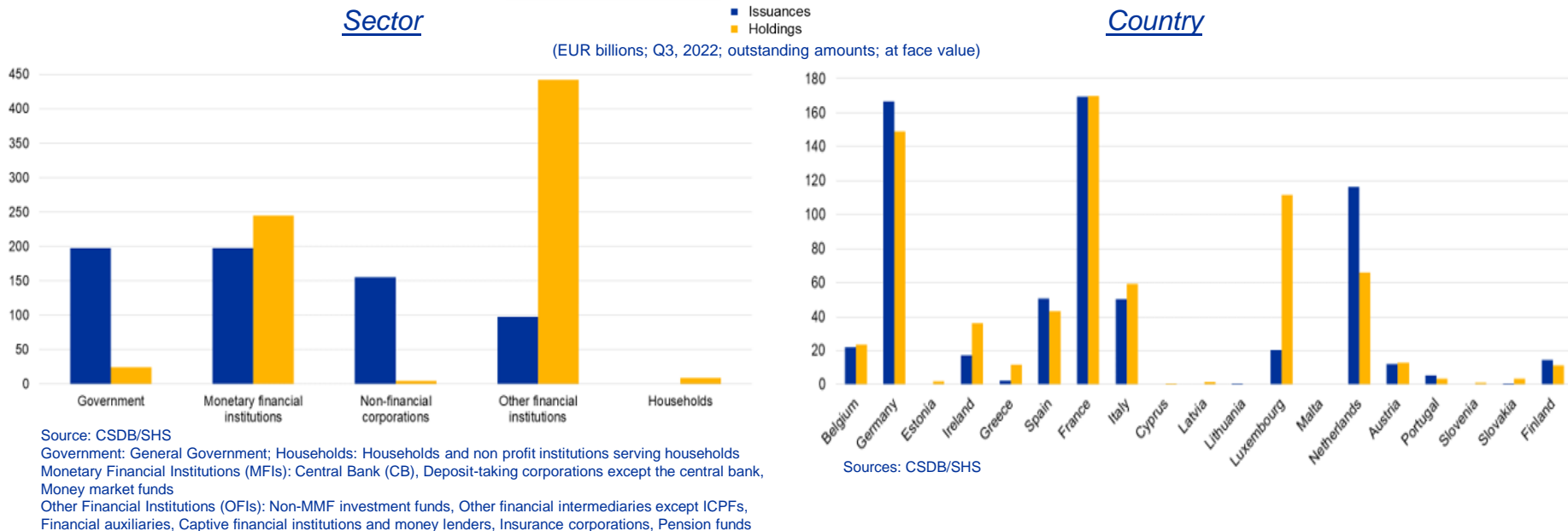
Source: CSDB/SHS
The share of total holdings represents the amount of all sustainable securities as a share of the holding amounts of all debt securities in the euro area.

Key findings

- Sustainable debt securities issued by EA have *more than doubled in the last two years*,
- Green and social bonds account for majority of market;
- Relevance of these instruments in overall debt securities market remains minor

- Continuous growth in EA holdings of sustainable debt securities;
- EA investors seem to prefer sustainable debt securities issued in the euro area;
- Overall remain a minor portfolio

Issues and holdings of green debt securities by sector and individual euro area country

Sector

Legend: ■ Issuances ■ Holdings

(EUR billions; Q3, 2022; outstanding amounts; at face value)

Source: CSDB/SHS
Government: General Government; Households: Households and non profit institutions serving households
Monetary Financial Institutions (MFIs): Central Bank (CB), Deposit-taking corporations except the central bank, Money market funds
Other Financial Institutions (OFIs): Non-MMF investment funds, Other financial intermediaries except ICPFs, Financial auxiliaries, Captive financial institutions and money lenders, Insurance corporations, Pension funds

Country

Sources: CSDB/SHS

Key findings	
• Government, MFIs and NFCs leading *issuing sectors* of green debt securities in EA (*comparable market shares)*; • OFIs (mostly investment funds) are main *investors* in green debt securities, followed by MFIs, including NCBs; • Households invest on green debt securities only indirectly via investment funds	• FR and DE are top issuers and holders of green debt securities in EA (more than half of the market); • NL is third-largest issuer and LU third-largest holder; • Remaining EA countries represent a small share; • Some countries have only residually or not yet entered the market

3. Carbon emissions

Analytical indicators

Carbon emission indicators link financing and corporate emissions

Indicators constructed based on ESCB NFC loans and securities holding databases and climate data

Estimate emissions financed through loans, debt securities and listed shares for direct (scope 1) and indirect emissions from energy purchase (scope 2)
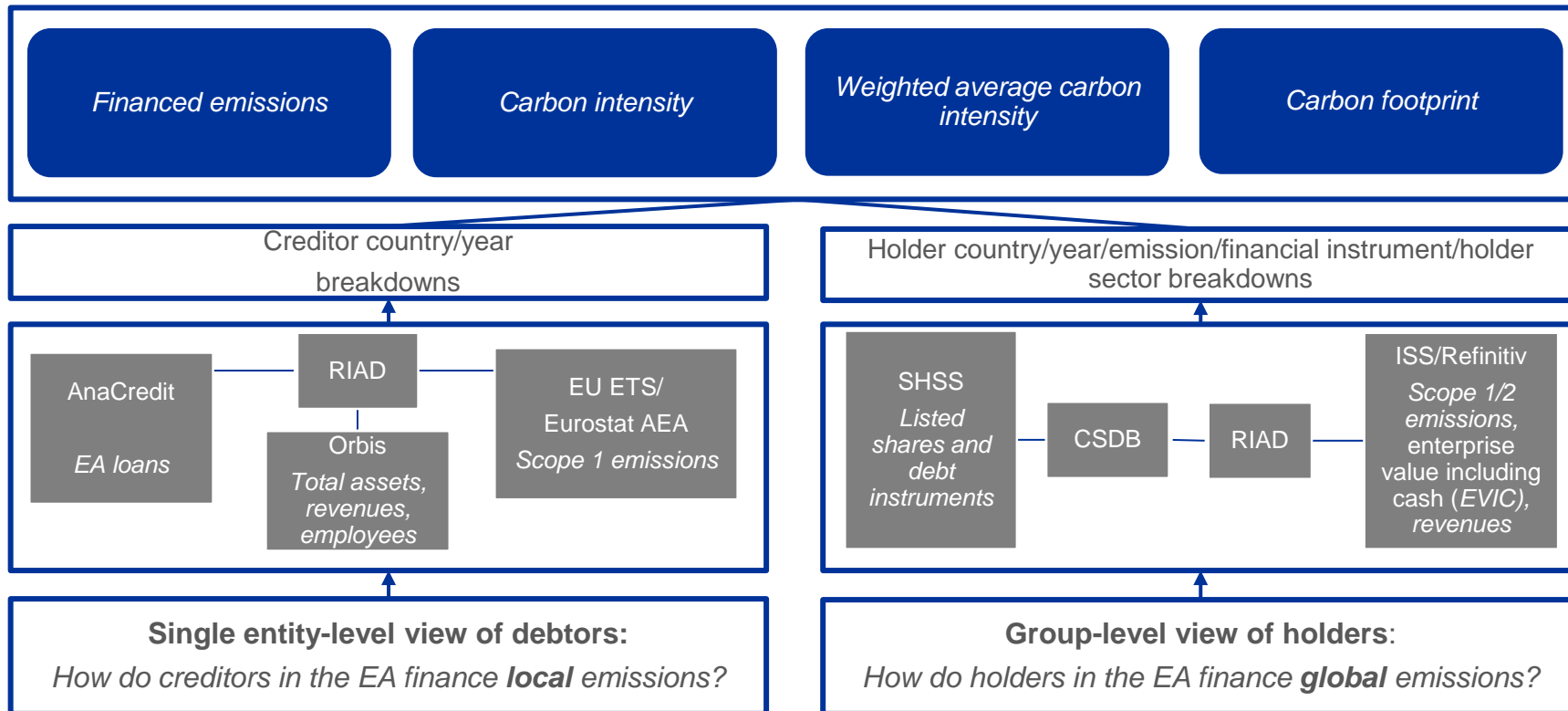
Indicators provide view on capital flows to transitioning economic activities and associated exposure to transition risks

Data comes with many limitations, in particular for cross country comparisons-published as analytical indicators: limited coverage, lack of price and exchange rate adjustment, omission of Scope 3 emissions

Indicators constructed bottom up using micro data

Financed emissions	Carbon intensity	Weighted average carbon intensity	Carbon footprint

Creditor country/year breakdowns

Holder country/year/emission/financial instrument/holder sector breakdowns

AnaCredit

EA loans

RIAD

Orbis
Total assets, revenues, employees

EU ETS/ Eurostat AEA
Scope 1 emissions

SHSS
Listed shares and debt instruments

CSDB

RIAD

ISS/Refinitiv
Scope 1/2 emissions, enterprise value including cash (EVIC), revenues

Single entity-level view of debtors:

*How do creditors in the EA finance **local** emissions?*

Group-level view of holders:

*How do holders in the EA finance **global** emissions?*

Financed emission indicator links *absolute* emissions and capital flows

Measure	Financed emissions: Tons of GHG emissions financed by euro area financial institutions
Key finding	Most euro area financial institutions' funding of global emissions occurs via investment funds
Link to other indicators	• *Efficiency* considerations: Carbon Intensity • *Exposure* considerations: Carbon Footprint, Weighted Average Carbon Intensity
Caveats	• Coverage • Price and exchange rate adjustment • Composition changes over time

Direct and indirect emissions financed by financial institutions

(left-hand scale: million tons CO2; right-hand scale: percentage of total financing volume covered, 2018-2020 averages)
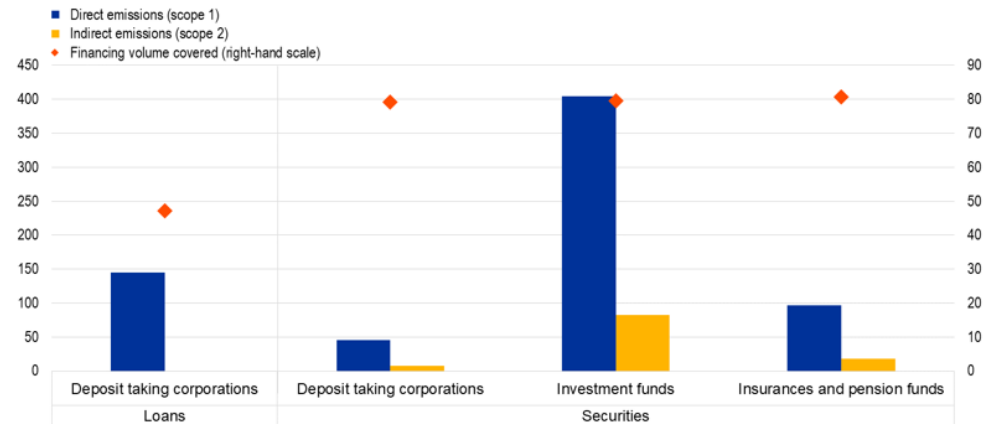
Source: Staff calculations based on AnaCredit, Securities Holding Statistics (SHSS), Institutional Shareholder Services (ISS), Refinitiv, EU Emission Trading System (EU ETS), Eurostat Air Emission Accounts (AEA) and Orbis by Bureau van Dijk.
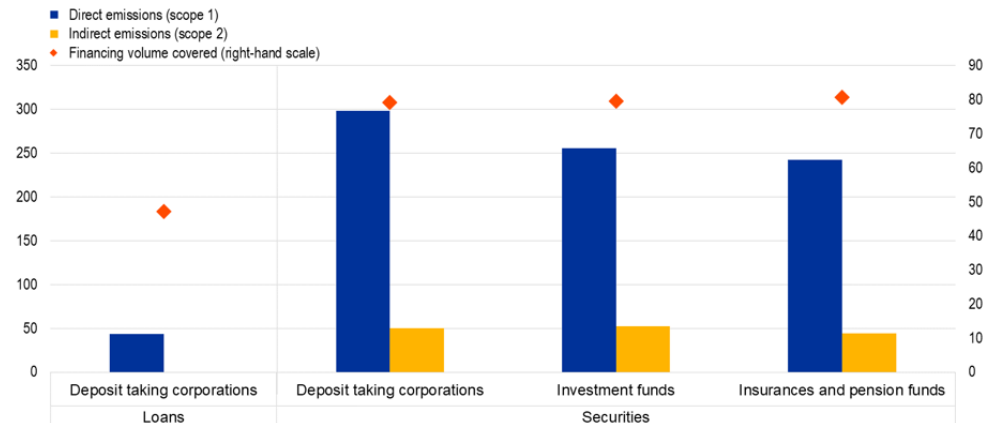Notes: Securities include listed shares and debt securities and are computed at group level. Loans are computed at single entity level. Deposit-taking corporations do not include central banks. Total emissions financed refer to the financing volume covered only and will be higher once coverage is increased. Accuracy is also affected by price and exchange rate effects. Consult the methodology report for more details.

Banking sector: highest exposures and most carbon-intense financing

Measure	Carbon Intensity: tons of GHG emissions per million EUR of revenue
Key finding	In relation to their firms' revenues, banks finance the most polluting economic activities
Link to other indicators	• *Total* emission considerations: Financed Emissions • *Exposure* considerations: Carbon Footprint, Weighted Average Carbon Intensity
Caveats	• Coverage • Price and exchange rate adjustment • Composition changes over time

Emission intensity for direct and indirect emission broken down by financial institutions

(left-hand scale: tons of CO2 emissions per million EUR of revenue; right-hand scale: percentage of total financing volume covered, 2018-2020 averages)

Source: Staff calculations based on AnaCredit, Securities Holding Statistics (SHSS), Institutional Shareholder Services (ISS), Refinitiv, EU Emission Trading System (EU ETS), Eurostat Air Emission Accounts (AEA) and Orbis by Bureau van Dijk.
Notes: Securities include listed shares and debt securities and are computed at group level. Loans are computed at single entity level. Deposit-taking corporations do not include central banks. Underlying emissions refer to the financing volume covered only and will be higher once coverage is increased. Accuracy is also affected by price and exchange rate effects. Consult the methodology report for more details.

4. Physical risks

Analytical indicators

Physical risks indicators link financial institution portfolio to natural hazards

Physical risks can be transmitted to the financial system through both **macroeconomic** and **microeconomic** impacts, including impacts on corporates, households, sovereigns or other financial institutions.

Bottom-up geospatial approach on company level for calculations of seven acute natural hazards based on **public** data sources.

Estimates the potential and expected exposure of financial portfolios to physical risks such as flooding, storms, water stress, wildfire, landslides or subsidence.

The indicators have several caveats that should be taken into account for their interpretation: Company assets are not always localisable, disregard of protection measures, insurances and collateral, compound events.
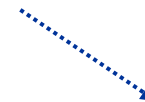
Hazards

Geolocation
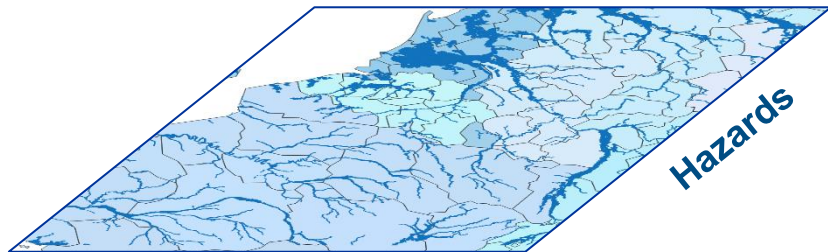
Hazard data in geospatial format eg. flooding
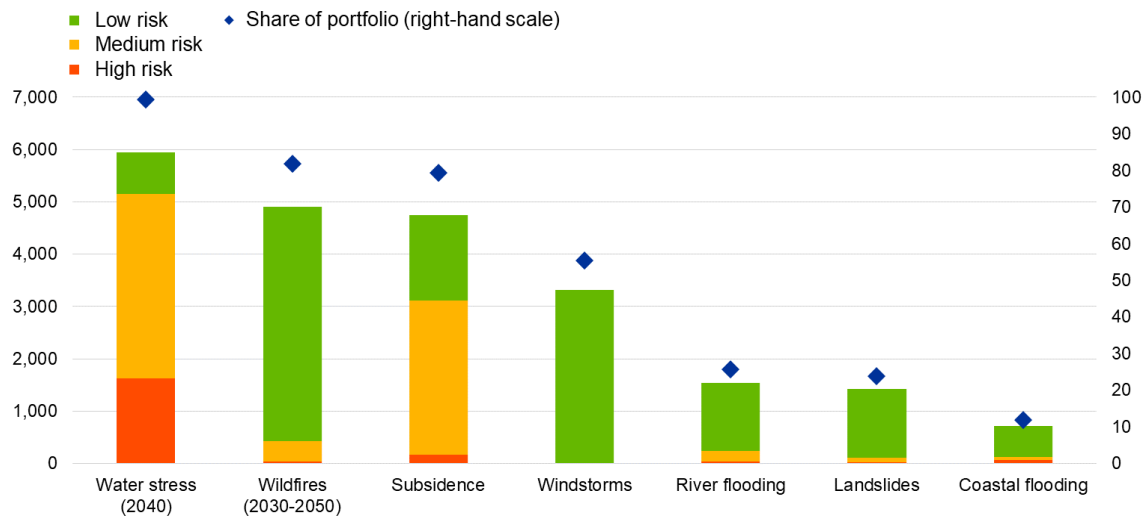
Geo-coordinates of ~ 12 mio RIAD companies

AnaCredit

SHS-S

Hazard-specific Risk Scores for financial portfolio exposure

Measure	Hazard-specific risk scores: Indicate the percentage of the portfolio that is associated with a specific risk class from no risk to high risk.
Key finding	For most of the hazards assessed, a very large share of the potential risk exposure is allocated into the lowest risk category.
Link to other indicators	Complements the PEAR indicators by splitting exposures into risk level categories.
Caveats	• Not comparable across hazards • Does not provide information on the intensity or actual damage.

(Euro area, left-hand scale: EUR billions; right-hand scale: percentage of portfolio)

Legend:
- Low risk (green)
- Medium risk (yellow)
- High risk (orange)
- ◆ Share of portfolio (right-hand scale)

Categories: Water stress (2040), Wildfires (2030-2050), Subsidence, Windstorms, River flooding, Landslides, Coastal flooding

Source: ESCB calculations based on data from analytical credit datasets AnaCredit, Securities Holding Statistics (SHS), Joint Research Centre (JRC), Copernicus, World Resource Institute (WRI) and NASA.
Notes: Risk scores are not comparable across hazard types because the scores rely on different methodologies and sources: water stress (scores derived from WRI based on the ratio between water demand and water supply), wildfires (scores from own calculations based on expected area burned), subsidence (scores from JRC based on the percentage of clay and sand in the soil), windstorms (scores from own calculations based on expected windspeed at return periods of 10, 50, 100 and 500 years), river and coastal flooding (scores from own calculations based on expected water depth of flooding in return periods of 10, 50, 100 and 500 years), landslides (scores from the JRC and adapted according to the return periods of 10, 50, 100 and 500 years). Indicators for water stress and wildfires are based on projected data for 2040 and 2030-2050 respectively. Protection measures, insurance and collateral are not taken into account. AnaCredit and SHS data are for December 2020.

Physical risk analysis Part II

Vulnerability — Degree of damage expected at different intensities of a hazard, including mitigation approaches

Exposure — Total value of physical assets exposed to hazards

Hazards — Hazard data in geospatial format eg. flooding

Geolocation — Geo-coordinates of ~ 12 mio RIAD companies

Normalized Exposure at Risk (NEAR)

Measure	NEAR shows the % of the financial portfolio at risk that is annually expected to be affected by hazard events.
Key finding	Higher expected damage associated with river flooding than with coastal flooding or windstorms. Services most affected reflecting its high share in the economy.
Link to other indicators	In contrast to risk scores, the risk intensity is used to estimate the economic vulnerability related to a certain hazard.
Caveats	• Only available for three hazards • Damage costs available only on country level.

Euro area, left-hand scale: EUR billions; right-hand scale: percentage of portfolio
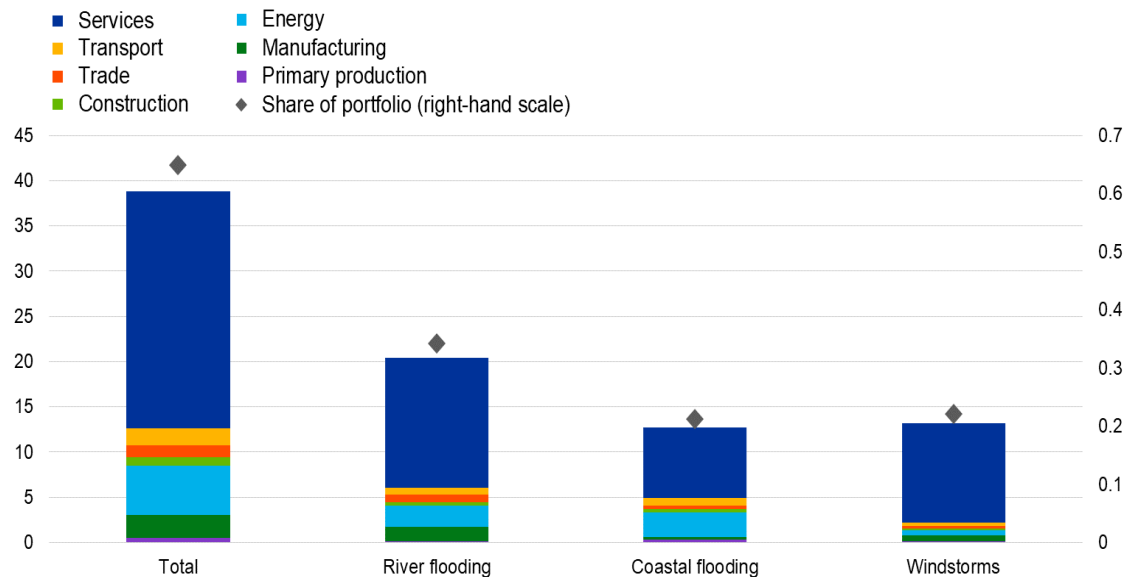
- Services
- Transport
- Trade
- Construction
- Energy
- Manufacturing
- Primary production
- Share of portfolio (right-hand scale)

Source: ESCB calculations based on data from analytical credit datasets AnaCredit, Securities Holding Statistics (SHS), Joint Research centre (JRC), Copernicus and Orbis by Bureau van Dijk
Notes: Information in this chart is based on expected annual damages caused to physical company assets by each hazard. Protection measures, insurance and collateral are not taken into account. AnaCredit and SHS data are for December 2020.

5. Conclusion

Conclusion

Climate-related indicators are necessary to understand the risks associated with climate change for the financial sector, as well as the financing needs for the transition

Our approach and data add value as both data sources and methodology are fully transparent and results are internationally comparable

These initial indicators come with limitations – like all similar data at this point in time - but already provide relevant insights

The data will become more accurate and relevant as the methodology evolves and more data sources are integrated

Development of climate indicators in cooperation with user needs:
We seek your feedback and would like to improve the indicators with your input!

Where to find the data and how to reach us

- *Report*
- *Technical annex*

Indicator-specific areas for download:
- *Sustainable finance indicators*
- *Carbon emission indicators*
- *Physical risk indicators*

Contact us at: statistics @ecb.europa.eu

Discussion, Q&A

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