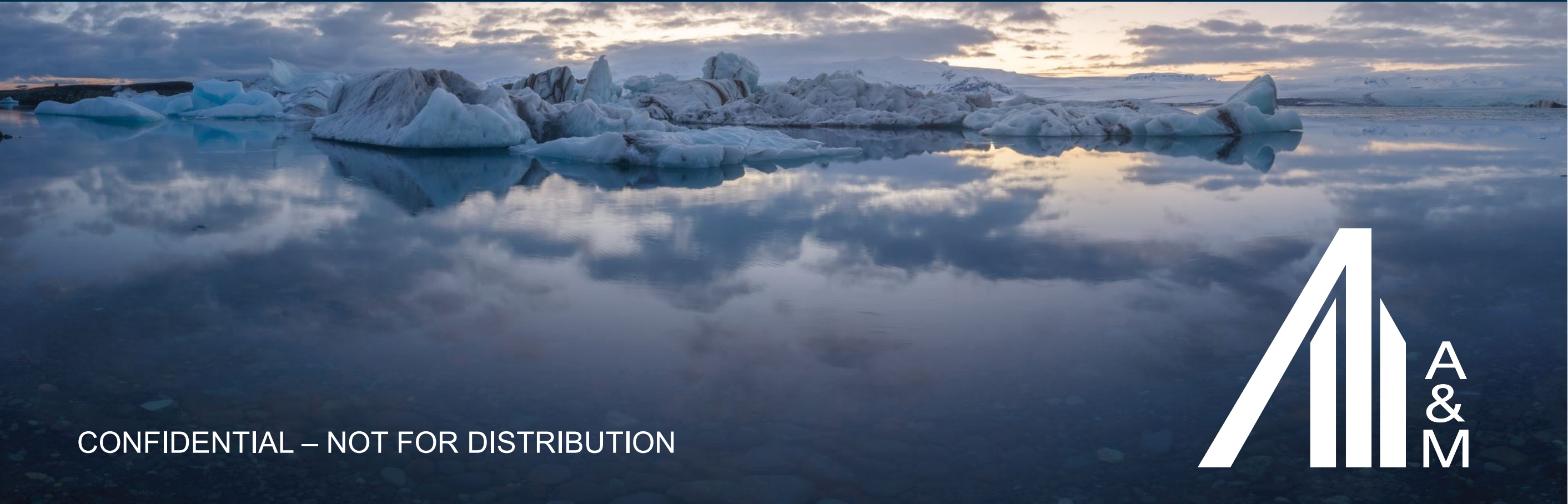


Resultados del Stress Test Climático del ECB

Webminar
September 2022



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2022 ECB Climate Stress Test introduced many new requirements such as financed emission data, transition risk and physical modeling and long term dynamic balance sheets.



- **Module 1:** Qualitative assessment of **climate risk stress-testing framework**
- **Module 2:** Stock-take on: (i) **sustainability** of banks' **income** and; (ii) **financed GHG emissions**
- **Module 3: Bottom-up** stress test loss **projections** (subset of sample)



- Transition risks** based on NGFS¹⁾ scenarios:
- identify short-term tail risks (3 years)
 - analyse long-term transition paths (30 years)
- Physical risks** for Europe:
- flood risk (1 year)
 - drought and heat risk (1 year)

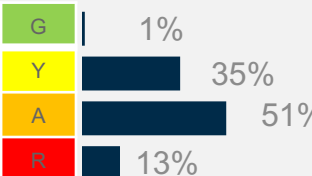


- **Climate risk stress-testing capabilities**
- **Peer benchmark** of profitability-vulnerability and GHG emissions
- Impact from **credit risk, market risk, operational / reputational risk** based on qualitative assessment
- **Benchmark vulnerabilities** to transitional and physical risks

SREP integration

<https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220708~565c38d18a.en.html>

First ECB Climate Stress Test delivered manageable results for the banking sector but also highlighted many climate risk management challenges going forward.

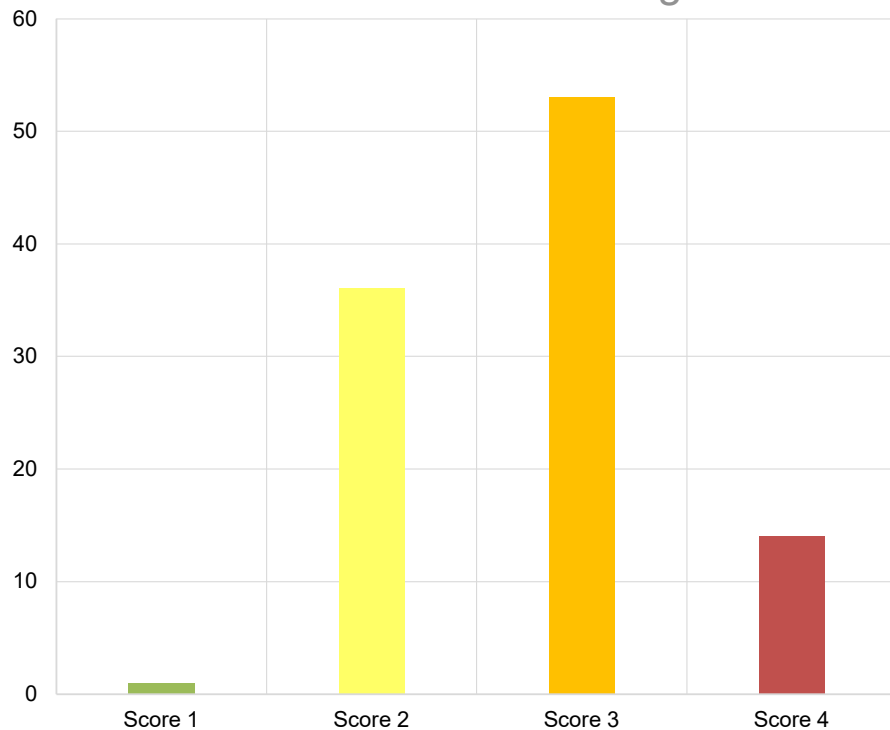
1	Stress test overall scorecard ¹ displays considerable gaps	 <p>G 1% Y 35% A 51% R 13%</p>	<ul style="list-style-type: none"> > Of the 104 banks, 1 scored green, 36 yellow, 53 amber and 14 red. Of the 41 banks that did module 3, 70% amber and 25% red > Main issues include data availability and modeling techniques and lack of integration of climate risk into ICAAP and strategy.
2	Quantitative loss impact is manageable	<p>€70Bn vs. €308Bn</p>	<ul style="list-style-type: none"> > €70Bn aggregate short term transition losses for top 41 banks compare to €308Bn credit losses on Capital Stress Test 2021. > Delta driven by smaller bank sample, exposure coverage (1/3 of total), more benign scenarios and data/modeling limitations
3	Wide range of outcomes leads to high modeling uncertainty	<p>x10 times</p>	<ul style="list-style-type: none"> > Variety of data and modeling techniques drives high dispersion of stress test results (x10 low to high impairment rate range) > This dispersion is also observed when comparing scope emissions data for the same corporate counterparty.
4	Learning nature of exercise will limit capital impact		<ul style="list-style-type: none"> > Main goals include contribution to the overall SREP, joint learning exercise, foster data/modeling improvements from banks and support upcoming thematic reviews. > Exercise will not have a direct quantitative on capital, but instead an indirect impact through qualitative assessment during the SREP process.
5	Banks will now focus on climate as a business opportunity		<ul style="list-style-type: none"> > Bank sustainability strategies will evolve from regulatory compliance (stress tests and climate risk expectations) and net zero target setting to a wide array of initiatives to capitalize on the climate transition business opportunity. > Plans for next stress test remain unclear but ECB pressure on climate to increase

¹The colored scoring combines qualitative and quantitative assessments of banks' submissions across the three modules of the exercise.

Overall Climate Stress Test Scorecard¹ displays considerable gaps bank climate risk and stress test capabilities

Highlights

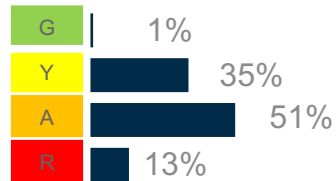
Banks' global score



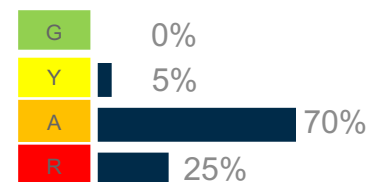
Scoring



104 Banks



41 Banks



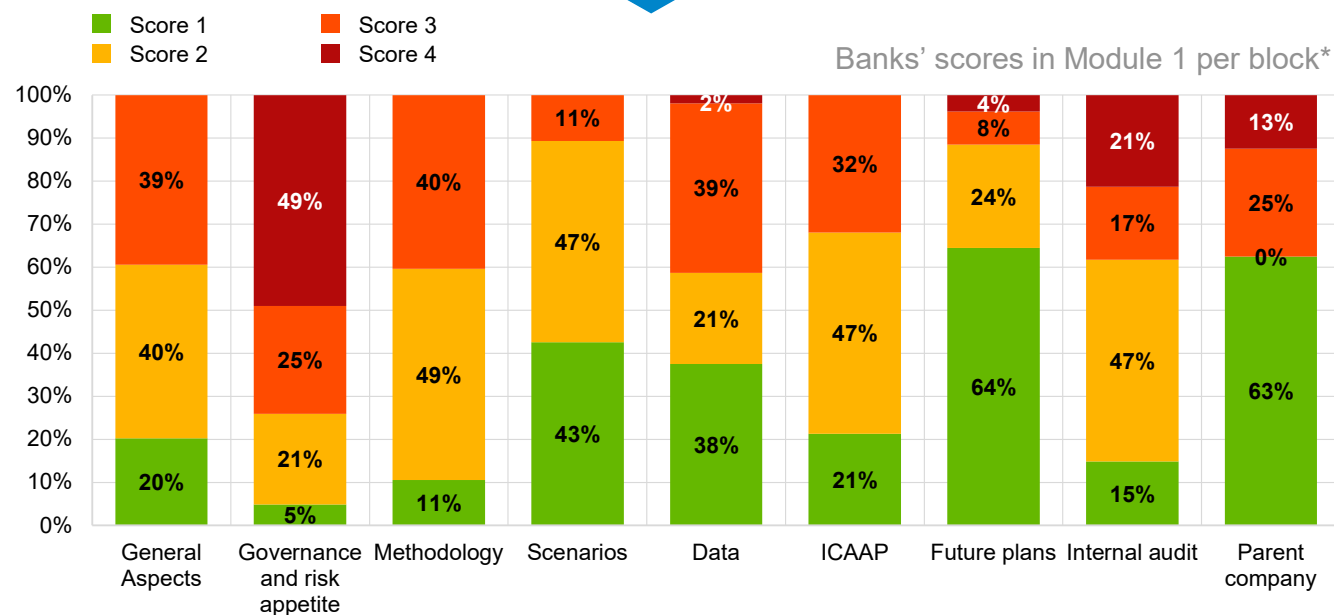
Bank Response Priorities

- Overall, despite notable progress and banks' ability to provide meaningful input to the exercise, and even considering the "learning" nature of the exercise, the large majority of banks revealed considerable deficiencies.
 - Gaps are greater** for 41 banks that executed all 3 modules of the exercise
 - Comparison of quantitative results needs to be **taken with caution** given disparity of portfolios and business models covered coupled with emerging nature of climate risk data and modeling techniques
- Going forward, banks need to improve their climate stress-testing frameworks and be mindful of the overall associated impacts. **Integration** in business strategy, target setting, risk management and performance will be critical.

¹The colored scoring combines qualitative and quantitative assessments of banks' submissions across the three modules of the exercise.

Module 1: Main gaps under Governance & Risk Appetite, Methodology and Data

Highlights



- 59% of banks have not integrated climate risk into their ST framework.** From those with a ST framework in place, (a) governance remains an issue, with lack of independence between development and validation (b) 40% do not consider ST outcomes when defining their business strategy, (c) 60% do not disclose or intent to disclose any climate-related result under Pillar III, and (d) 40% do not include Internal Audit in their climate framework.
- Only 22% of sample apply or consider applying dynamic balance sheet and only 24% include liability and reputational risks in their climate framework.**

Bank Response Priorities

- Continue to improve climate stress test (CST) framework**
 - Supplement **data sources** for counterparty information (emission, climate strategy/targets, asset location, etc.)
 - Sensitivity and scenario analysis** including **several transmission channels by asset class**
 - Dynamic balance sheet** approach for both transition and physical risks
 - Inclusion of **all relevant risks** (e.g., liability and reputational)
- Implement independent validation** for climate risk modeling
- Integrate climate risk framework**
 - Integrated CST framework into **ICAAP** (50-100bps add-ons)
 - Integrated results into **business strategy**
 - Integrated results into **loan granting process and end-to-end credit risk management process**
- Rethink bank's long-term strategy by sector and net zero strategy based on the CST results**

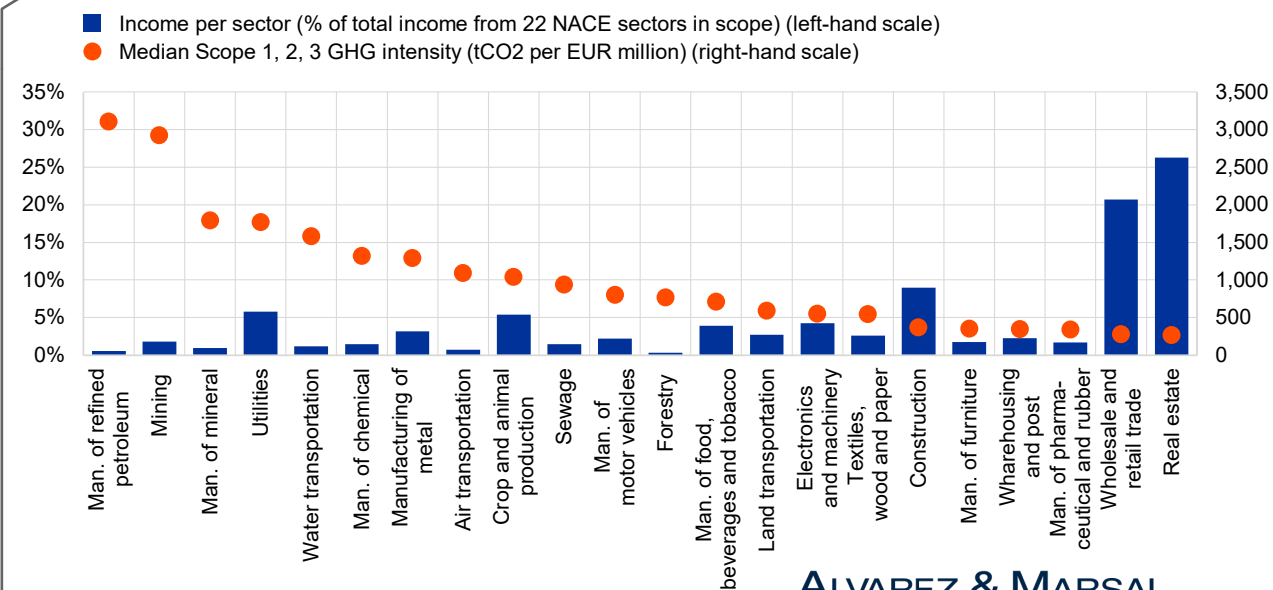
Module 2: Widespread use of proxy data for Scope 1, 2 and 3 emissions and EPCs, with major dispersion per counterparty and per sector

Highlights

- **Banks have heavily use proxies to complete key data points for Scope 1, 2 and 3 emissions and EPCs.** Proxies accounted for more than 80% of scope 3 data.
- **Material dispersion of reported GHG intensity**, even for the same counterparty.
- On EPC, **17% of collateral was not allocated to any EPC label**, and 65% of banks used proxies to calculate EPC rating, approach **not enough robust** in most cases given the nature and number of assumptions made.
- **65% of the banks' income** was derived from business belonging **to the 22 carbon-intensive sectors** (54% of the EU GVA). Custodians and asset managers, along with G-SIBs), were rather less reliant on income from GHG-emitting sectors.
- Top GHG-emitting sectors are **mining and quarrying, manufacture of coke and refined petroleum products, manufacture of non-metallic products, electricity, gas and steam.** The **largest share of income correspond to low-intensive sectors** such as construction, wholesale, retail trade and real estate activities.
- **G-SIBs and universal banks** hold the largest share of exposures to the seven most carbon-intensive sectors.

Bank Response Priorities

- **Improve data quality issues** (income, scope 1, 2 and 3 emissions data and EPC information) and introduce data quality scorecards and controls
- Include Metric 1 and Metric 2 into **bank's risks appetite** and **net zero target KPI setting**
- **Develop/access transition plans with clients** to improve emission data and visibility of client net zero targets and strategies

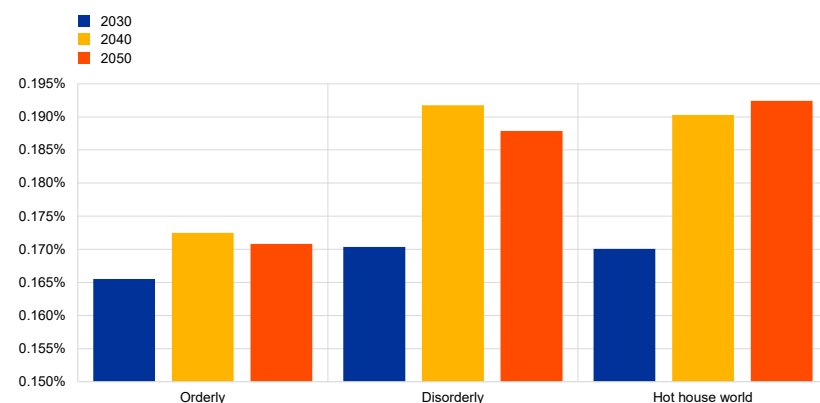


Module 3 – Transition Risk: Manageable projected loan losses due to benign macro scenarios, limited exposure coverage and limitations in data/modeling capabilities

Highlights

- **€70Bn losses from short-term exercises** (3-y disorderly transition + 2 physical risk scenarios) underestimate risk due to bank sample, exposure coverage, scenario, data/modeling limitations and no supervisory overlays. Credit risk losses on Capital ST'21 accounted for €308Bn. ST **disorderly** scenario projects losses **73bps higher than baseline**.
- Main impacted sectors are refined **petroleum products, mining, minerals and land transportation**, which experience cumulative loan losses of more than 200 basis points, largely affected by the carbon price short-term shock.
- **Long term results** show lower loan losses in the orderly scenario than in disorderly or hot house world. Modest losses are a result of mild scenarios and projected reduction in exposures to brown sectors. **Weaknesses in bank's data and modeling capabilities** affect the accuracy of these results

Projected loan losses per decade in the long-term scenarios
(% of performing exposures in each decade)



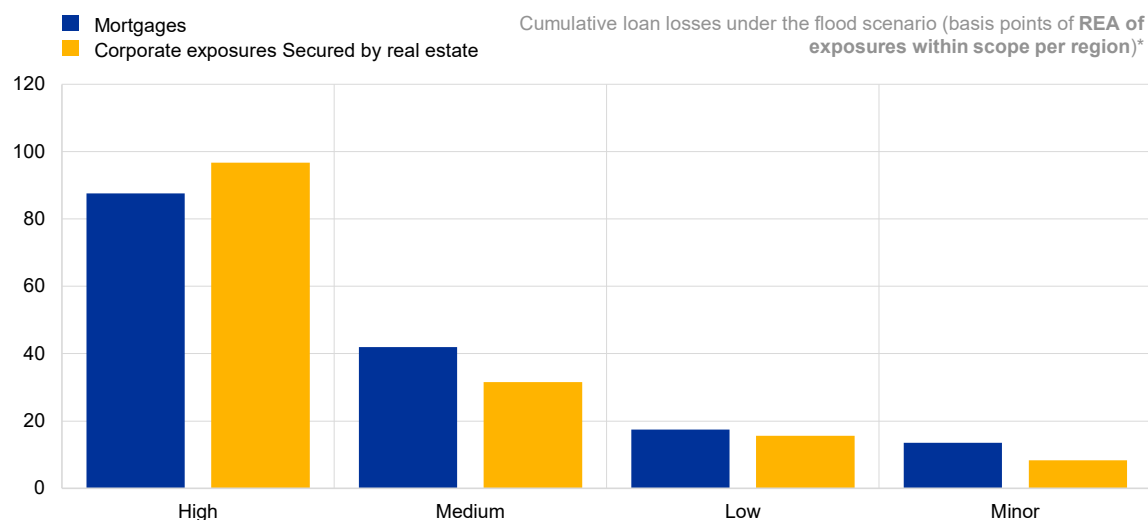
Bank Response Priorities

- Improve **short term transition risk** modeling
 - **Direct and indirect transmission channels** of climate variables
 - **Assess outliers** in climate risk parameters
 - Develop **bottom-up analysis for large counterparties** based on specific company's strategies and transition paths, combining results with the **top-down** approach
- Align long term **balance sheet strategies to net zero targets by sector and scenario**
 - Analyze **cost/benefit** of applying different balance sheet strategies **by sector and geography**
 - Improve **asset location risk of clients** under hot house world scenario

Module 3 – Physical Risk: Impacts of drought & heat and flood scenarios are very idiosyncratic depending on industry concentrations and location of real estate collateral.

Highlights

- Banks with material footprint in **mining, construction or agricultural activities, are highly impacted by the drought and heat scenario**. This shock is especially relevant in **regions more vulnerable to high temperatures**. Most banks did not incorporate **insurance coverage or public natural disaster relief schemes** into their projections, which may lead to an **overestimation of the total losses**.
- **Most banks report low allocation of exposures to high flood-risks areas** (exposures to high or medium only accounted for 31%). Those high or medium risk exposures represented **31% of the exposure but 50% of total losses**. Like in drought and heat shock, **less than 25% included insurance coverage or public natural disaster relief schemes** into their projections.



Bank Response Priorities

- Improve physical risk modeling and supporting data infrastructure
 - **Loss rates and assumptions** per scenario type
 - **Location data of corporate assets** to permit physical risk assessment
 - Expand range **physical risk scenarios** to other events such as fire
 - Extend **time horizon** of physical risk scenarios
 - **Automate calculations** using granular exposure location data

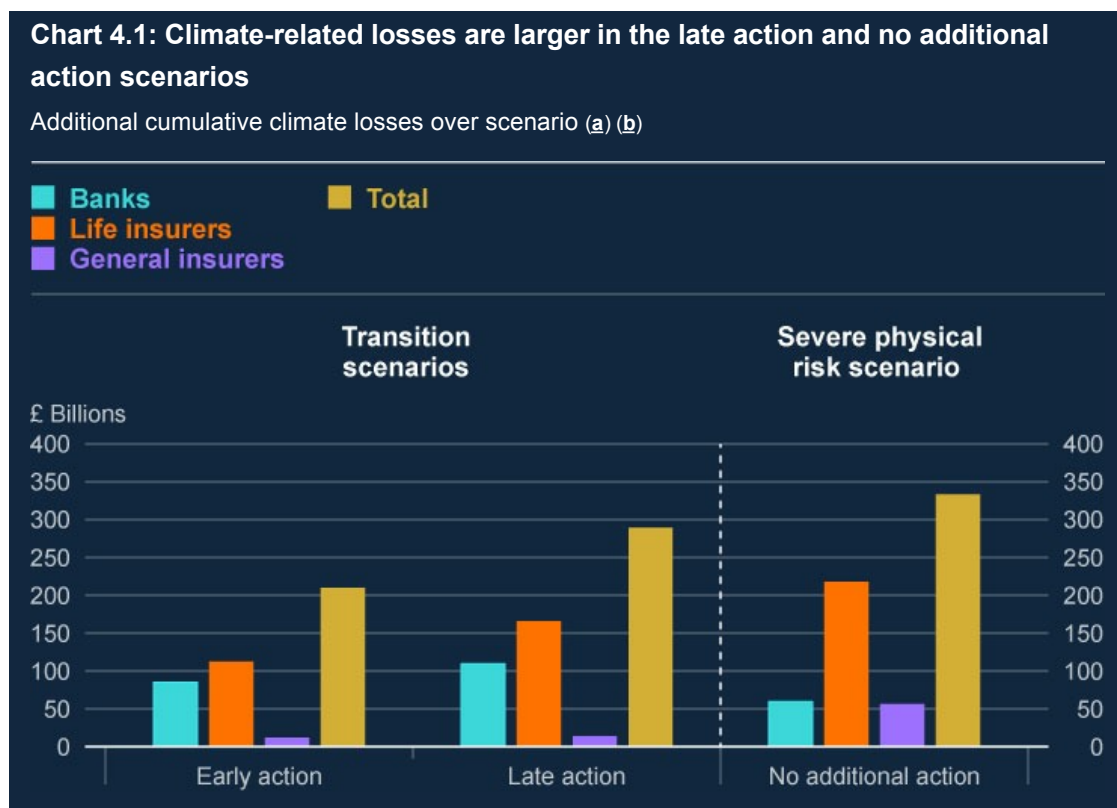
ECB CST vs. UK CBES – Main Differences



UK CBES 2021



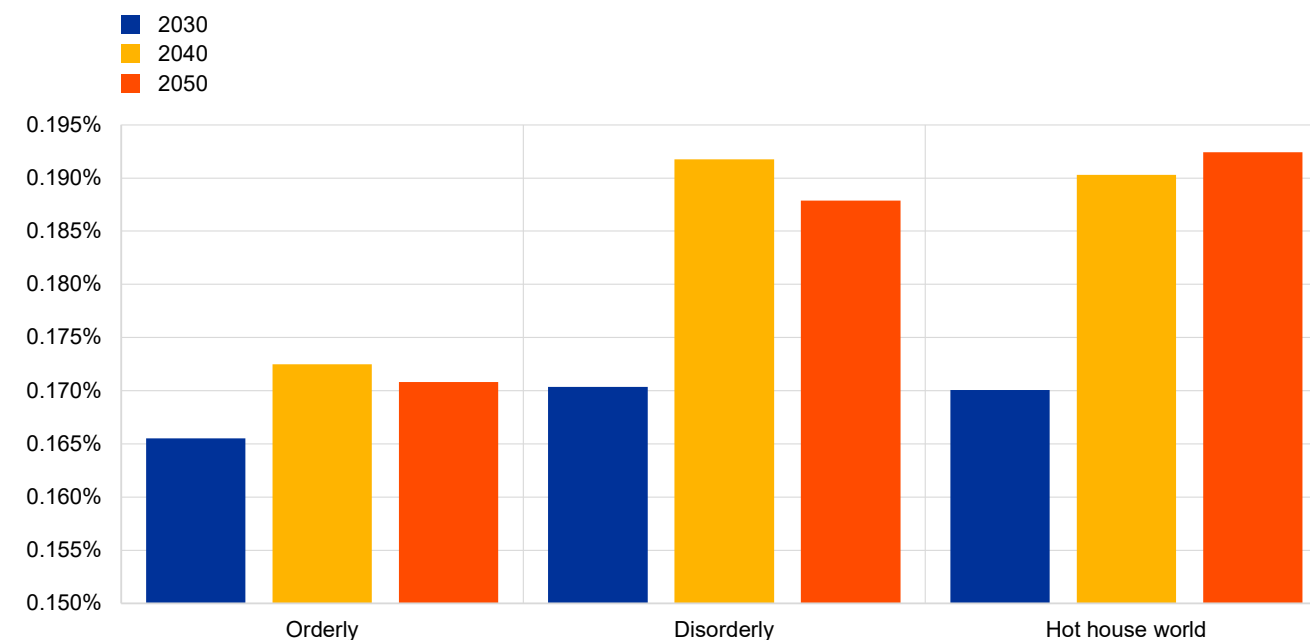
ECB CST 2022



- Projected bank credit losses were greatest in the Late Action scenario, with loss rates more than doubling as a result of climate risks. That is equivalent to an extra c.£110 billion of losses over 30 years, of which around 40% is realised during the first five years of transition. These losses compare to 3-year credit impairments of £90bn in the 2021 Solvency Stress Test.

Projected loan losses per decade in the long-term scenarios

(% of performing exposures in each decade)



- Projected loan losses under the orderly scenario are lower than those both under a disorderly transition scenario and under a scenario with no transition policies
- Banks reported €70bn of aggregate losses under the 3 short-term exercises
 - €53bn losses reported under the short-term disorderly transition scenario
 - €17bn losses reported under the short-term physical risk scenarios (drought & heat risk and flood risk)

What is next? E_{SG} as a business opportunity

“ For banks to be able to gauge their exposure to climate risks in the future, it will therefore be important for them to enhance their customer engagement to gain insights into their clients’ transition plans.

ECB Perspective

“ Sustainable bank strategies are moving from regulatory compliance to a wide range of initiatives designed to capitalize on the ESG business opportunity

A&M Perspective

€13 Trillion 2030 (37% of total assets)

Bank Sustainable Finance Target top 25 European and US banks

€295 Bn

ESG Revenue Opportunity Pool (10% revenue uplift)

GREEN PACE

The winning formula, four attributes that will define the winners in sustainability.

GREEN P_{roducts}



A_{lignment to Net Zero}



C_{lient Orientation and Insights}



E_{xecution of Transition Plans}



Appendix 1

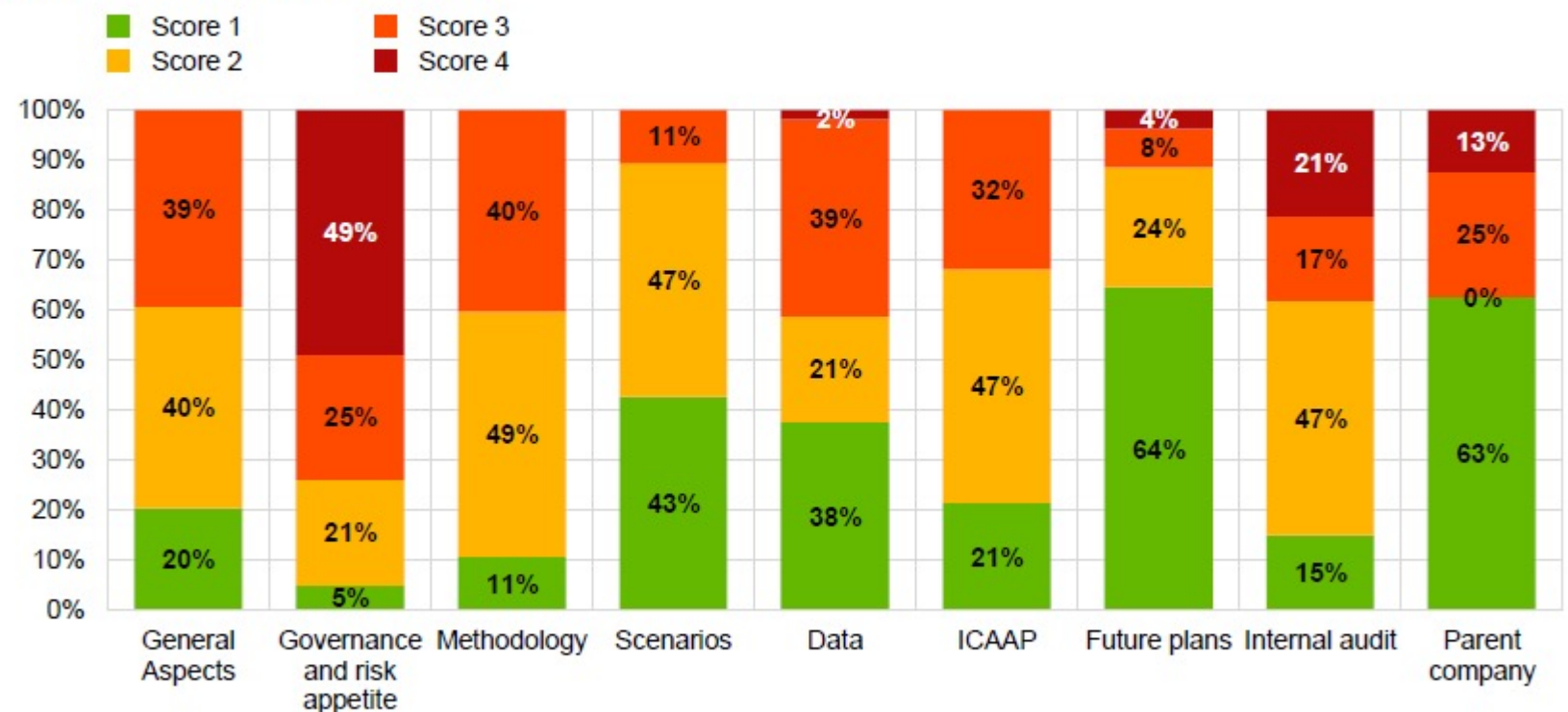
ECB CRST Results in Detail

MODULE 1: Main gaps under Governance and Risk Appetite, Data & Methodology

Preparedness across key components of climate risk stress-testing frameworks

Banks' scores in Module 1 per block

(percentage share of participating banks)



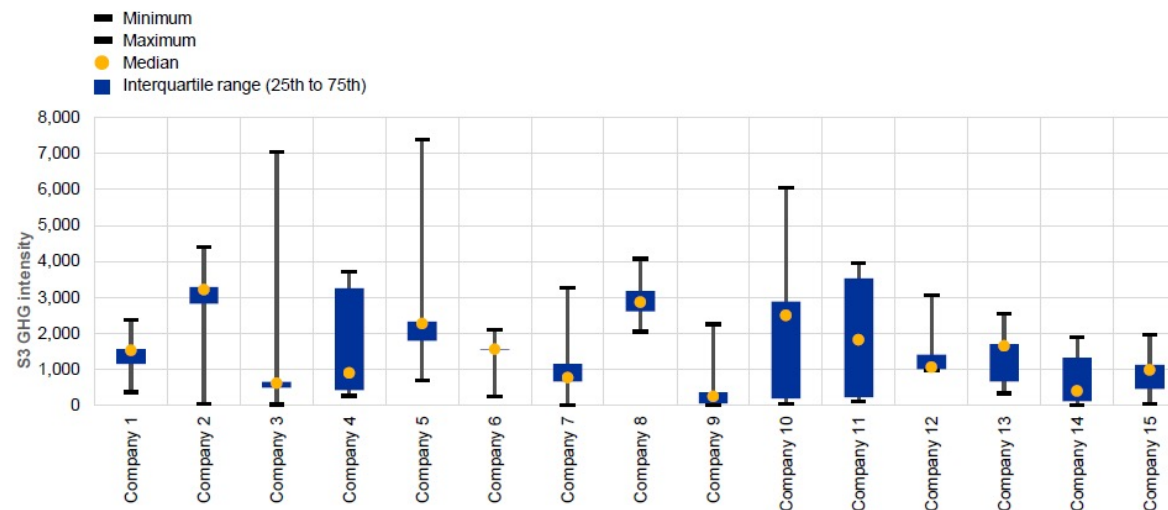
Sources: Bank submissions and ECB calculations.

- Most material gaps are found under **Governance and Risk Appetite, Data & Methodology**.
- **59% of banks have not integrated climate risk into their ST framework.** From those banks with a ST framework in place:
 - Governance remains an issue, with lack of independence between development and validation
 - Around 40% do not consider climate stress test outcomes when implementing their business strategy
 - 60% do not currently disclose or intend to disclose climate ST results under Pillar III
 - 40% do not currently involve the internal audit function in reviewing the framework.
- A large share of banks **do not use climate risk ST outcomes to inform their business strategies**.
- Only **22%** of the banks apply or are considering applying a **dynamic balance sheet approach** for both transition and physical risk.
- Only **24%** include **liability and reputational risks** in the climate-testing framework.

MODULE 2: Overall, banks have made widespread use of proxy data for Scope 1, 2 and 3 emissions and EPCs, with major dispersion per counterparty and per sector

Dispersion of reported Scope 3 GHG intensity per counterparty

(1000t CO₂/EUR million)

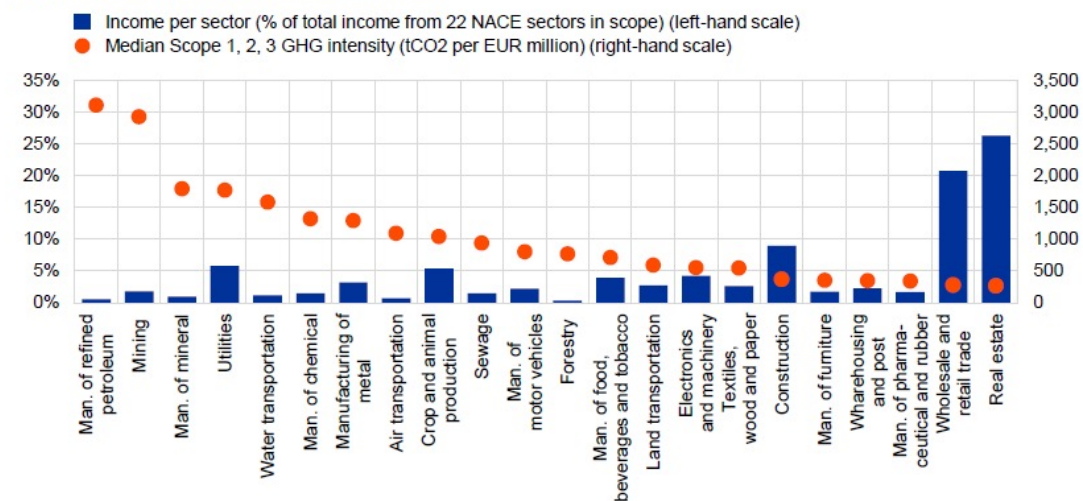


Sources: Bank submissions and ECB calculations.

- Overall, banks have heavily use proxies to complete key data points for Scope 1, 2 and 3 emissions and EPCs. Proxies accounted for more than 80% of Scope 3 data and 65% of the EPC rating information.
- Material dispersion of reported GHG intensity, even for the same counterparty. Left graph shows dispersion of reported Scope 3GHG intensity per counterparty.
- On EPC, 17% of collateral was not allocated to any EPC label, and 65% of banks used proxies to calculate EPC rating, approach not enough robust in most cases given the nature and number of assumptions made.

Interest income and fee and commission income per sector from 22 carbon-intensive industries and median of the Scope 1, 2 and 3 GHG intensity

(percentage share; tCO₂ per EUR million of revenue)



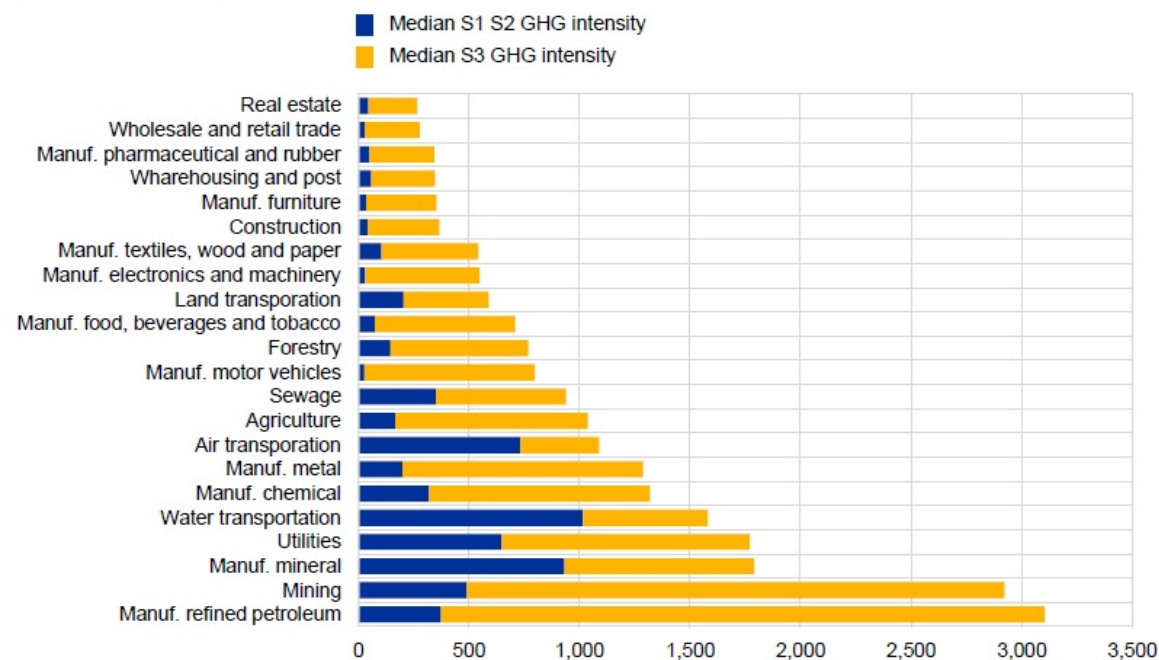
Sources: Bank submissions and ECB calculations.

- The 22 industries selected represent around 54% of the EU economy in terms of gross value added. It represents more than 60% of the sample banks' interest income.
- The largest share of income correspond to low-intensive sectors such as construction, wholesale, retail trade and real estate activities.
- Top GHG-emitting sectors are mining and quarrying, manufacture of coke and refined petroleum products, manufacture of non-metallic products, electricity, gas and steam.

MODULE 2: Data shows material differences in GHG intensity by sector and across banks' business models

Median Scope 1+2 and 3 emission intensity per sector

(tCO₂ per EUR million)



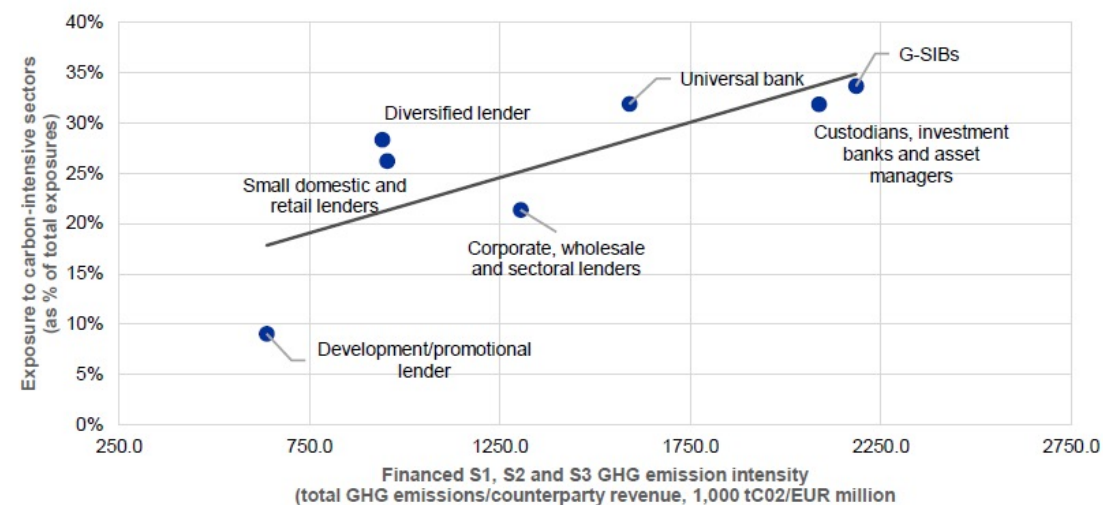
Sources: Bank submissions and ECB calculations.

Note: The figures represent the median GHG emission intensity (Scope 1+2 and Scope 3 respectively) of companies reported by all participating banks across the 22 sectors.

- Top GHG-emitting sectors are **mining and quarrying, manufacture of coke and refined petroleum products, manufacture of non-metallic products, electricity, gas and steam.**
- Collecting Scope 3 data is essential as it is the dominant scope **by carbon intensity** (see S3 GHG intensity).

Business model differentiation by carbon intensity of the corporate portfolio (x-axis) and exposures to seven most carbon-intensive sectors (y-axis)

(Module 2 metric 2; tCO₂ per EUR million)



Sources: Bank submissions and ECB calculations.

Notes: The x-axis describes the median exposure-weighted average of the GHG emission intensity (Scope 1, 2 and 3) of counterparties reported by banks per business model. The y-axis describes the median share of exposures to the top seven most GHG-intensive sectors in the total exposures reported by banks per business model. The top seven most GHG-emitting sectors are mining and quarrying (B05-B09) and manufacture of coke and refined petroleum products (C19), followed by manufacture of non-metallic products (C23, e.g. cement), electricity, gas, steam and air conditioning supply (D35), water transportation (H50), manufacture of chemical products (C20) and manufacture of metal products (C24-C25).

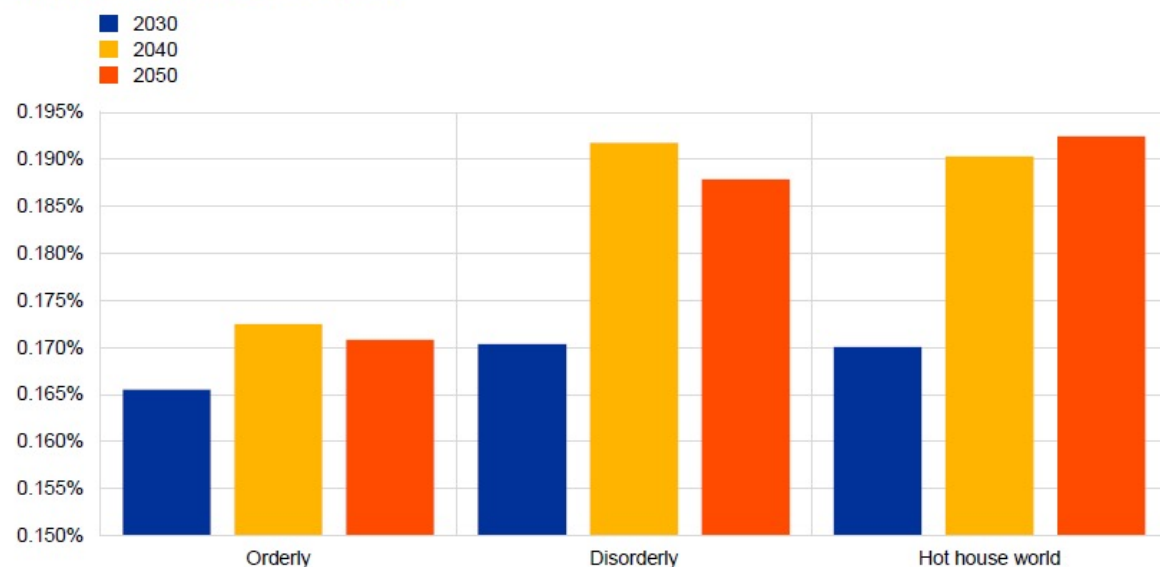
- By emission intensity (measured as weighted average of the GHG emission intensity based on Scope 1, 2 and 3 emissions), results show material differences across business models: **G-SIBs and universal banks** hold the largest share of exposures to the seven most carbon-intensive sectors.

MODULE 3: Modest projected loan losses in short and long terms due to benign macro scenarios, projected exposures reduction and limitations in data/modeling capabilities

Projected loan losses under the orderly scenario are lower than those both under a disorderly transition scenario and under a scenario with no transition policies (Hot house world)

Projected loan losses per decade in the long-term scenarios

(% of performing exposures in each decade)



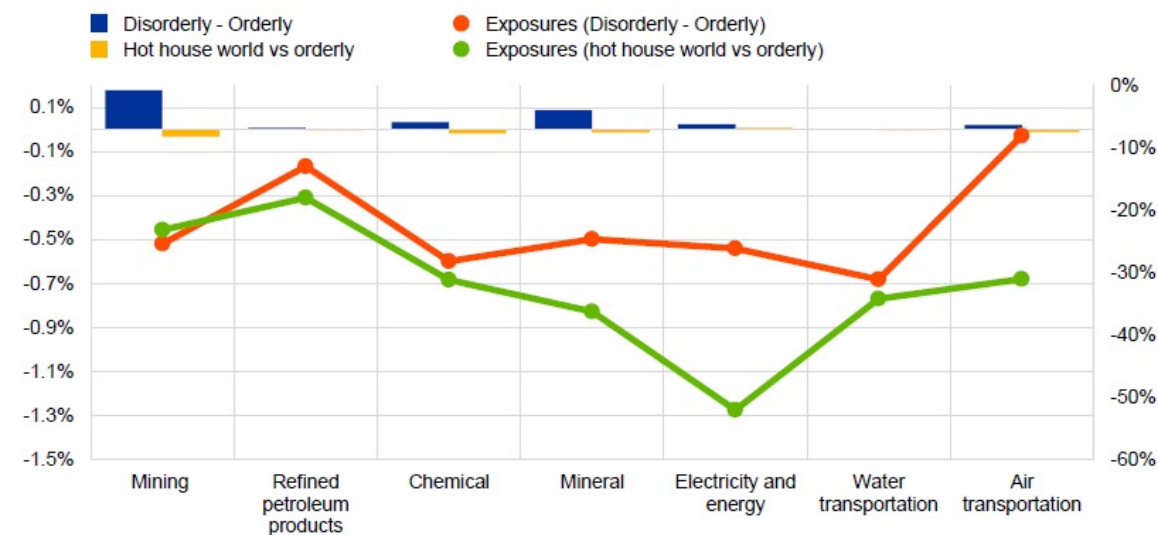
Sources: Bank submissions and ECB calculations.

- **Orderly scenario will lead to much lower losses** compared to a disorderly or hot house scenario.
- **Disorderly scenario projects much lower losses vs. capital ST'21** due to several reasons: different scope, benign macro indirect scenario, data/modeling limitations from banks and no supervisory overlays.
- **Weaknesses in bank's data and modeling capabilities** affect accuracy

Banks project decreasing exposures to most carbon-emitting sectors, which mitigates to some extent the cumulated loan losses under the disorderly and hothouse world scenarios

Cumulative loan losses in the period 2030-2050 (LHS) and exposure changes (RHS) in the long-term scenarios to 2050

(% of performing exposures)



Sources: Bank submissions and ECB calculations.

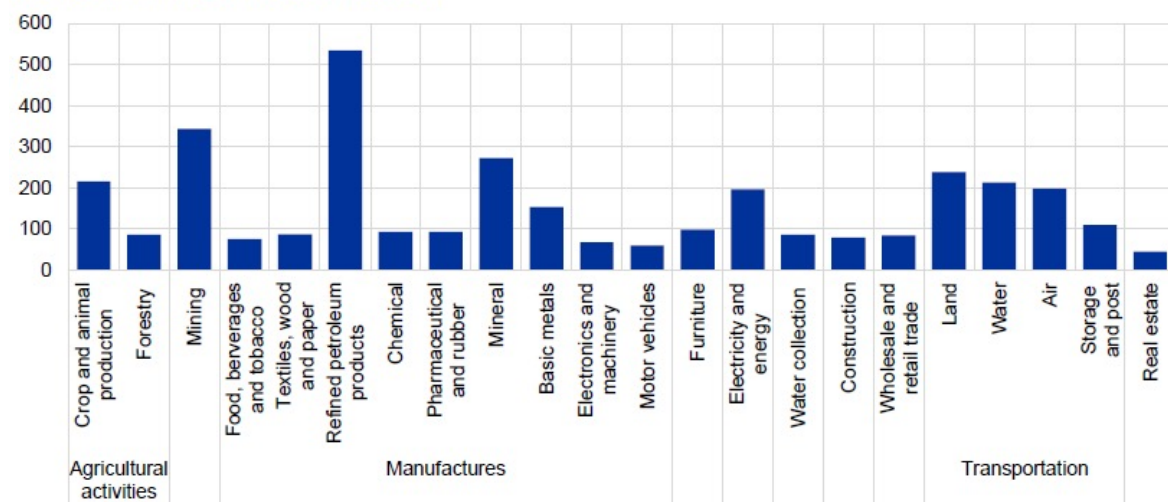
- **Most banks do not report significantly different balance sheet projections** across the three long-term transition scenarios. And those who project a dynamic balance sheets **materially reduces their exposure in brown sectors** (see above graph by sector) **without a clear strategy in place.**

MODULE 3: Certain sectors accumulate most of the losses in the short-term. In the long-term, only high-level mitigations objectives and little sensitivity across scenarios.

Losses from 22 GHG-intensive sectors increase significantly in a short-term disorderly transition scenario

Cumulative loan losses in the short-term disorderly vs baseline scenario by 2024

(basis points of the REA of exposures in scope)

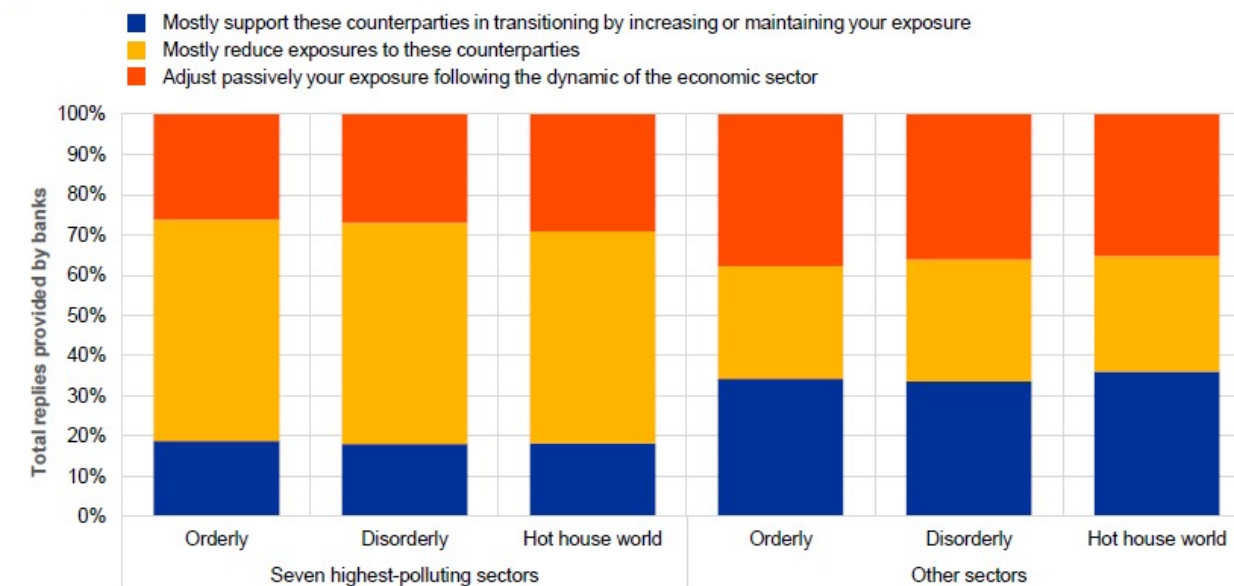


Sources: Bank submissions and ECB calculations.
Note: REA stands for risk exposure amount.

- Under the short-term disorderly transition scenario, banks show an increase in **cumulated impairments of 73 basis points vs. baseline.**
- Main impacted sectors are refined **petroleum products, mining, minerals and land transportation**, which experience cumulated loan losses of more than 200 basis points, largely affected by the carbon price short-term shock.

Institutions' long-term strategies

(percentage growth between 2021 and 2050)



Sources: Bank submissions and ECB calculations.

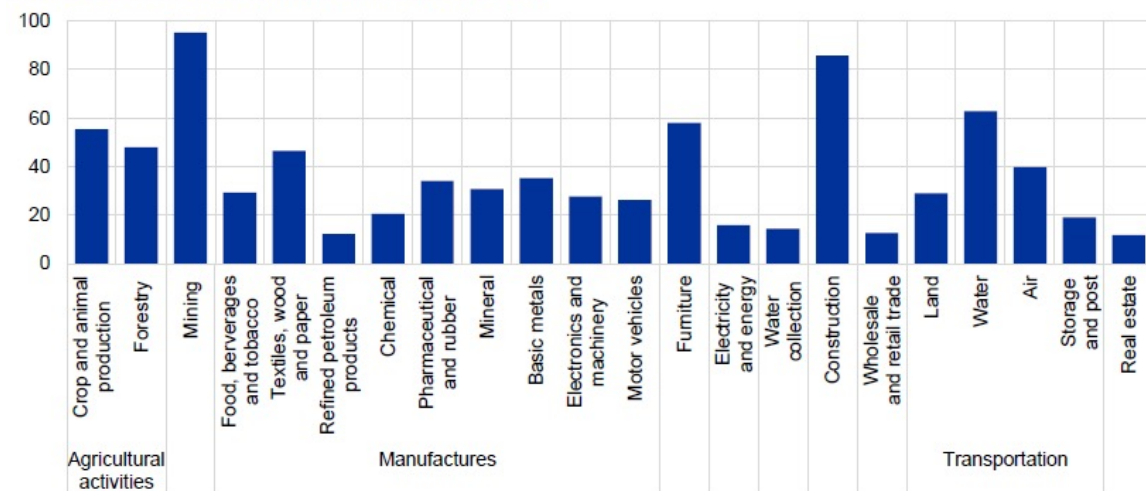
- Most banks (**67%**) provided **quantitative information on green bond acquisition**, but only **15%** provided such information at **sector level**.
- 59% of banks described significant actions** as part of their corporate balance sheet, but most of them (**61%**) **do not cover concrete targets**.
- Regarding **key indicators**, only one-third of banks provided information at global level, while just a **5% provided information at sector level**.
- While many banks indicated a reduction of exposures to the most GHG-emitting sectors in the long term, banks showed **little sensitivity across scenarios**.

MODULE 3: Banks with material footprint in mining, construction or agricultural activities, are highly impacted by physical risks' shocks

Accumulated loan losses under the drought and heat scenario

Loan losses in the drought and heat vs baseline scenario

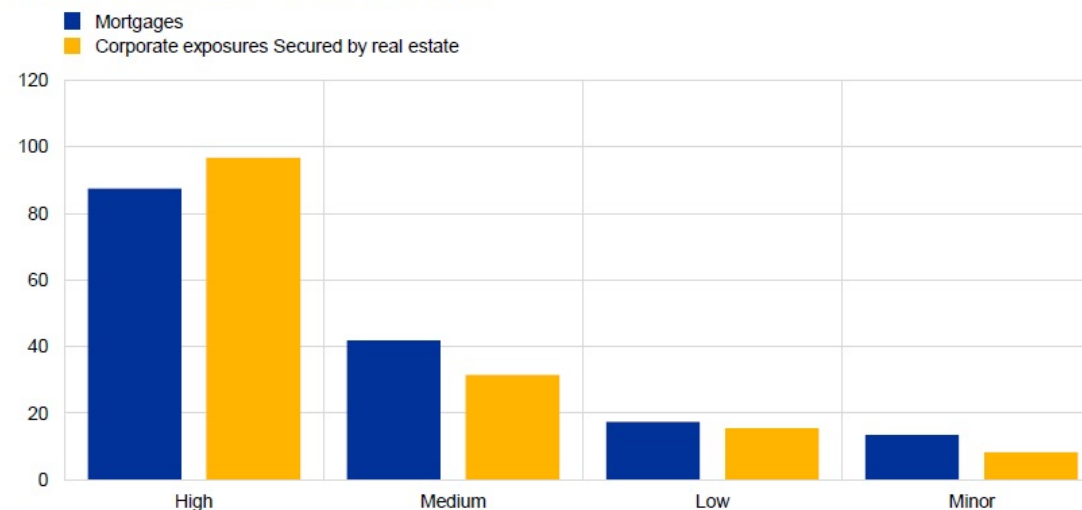
(basis points of the REA of exposures within scope per sector)



Sources: Bank submissions and ECB calculations.
Note: REA stands for risk exposure amount.

b) Cumulative loan losses under the flood scenario

(basis points of REA of exposures within scope per region)



Sources: Bank submissions and ECB calculations.
Note: REA stands for risk exposure amount.



- Banks with material footprint in **mining, construction or agricultural activities, are highly impacted by physical risks' shocks.**
- This shock is especially relevant in **regions more vulnerable to high temperatures.**
- Most banks did not incorporate **insurance coverage or public natural disaster relief schemes** into their projections, which may lead to an **overestimation of the total losses.**

- **Most banks report low allocation of exposures to high flood-risks areas** (exposures to high or medium only accounted for 31%).
- Those high or medium risk exposures **represented 31% of the exposure but 50% of total losses.**
- Like in drought and heat shock, **less than 25% included insurance coverage or public natural disaster relief schemes** into their projections.



Appendix 2

UK vs. ECB Climate Stress Test

ECB CST vs. UK CBES – Main Differences (1 of 2)

	 UK – CBES 2021	 ECB – CST 2022
Scope	<ul style="list-style-type: none"> 7 UK Banks and building societies (covering 70% of UK banking lending to UK households and businesses), as well as large insurers 	<ul style="list-style-type: none"> 104 significant institutions. 41 of them including bottom-up projections
Objectives	<ul style="list-style-type: none"> Assist participants in enhancing their management of climate-related financial risks; size the financial exposures and the financial system to climate-related risks; understand the challenges in business models; gauge the implications for the provision of financial services 	<ul style="list-style-type: none"> Contribute to overall SREP process; joint learning exercise from banks and supervisors; make more information available; prepare banks for upcoming regulatory changes; leverage on ECB's stress testing approach; support other banking supervision initiatives
Scenarios & Exercise	<ul style="list-style-type: none"> Scenarios: Early Action and Late Action linked to a net-zero 2050 target, and No Additional Action exploring physical risks from climate change Exercise: (1) 30 year loss projections under the three scenarios for transition risk and physical risk (2) responses to a qualitative questionnaire and (3) management actions by scenario 	<ul style="list-style-type: none"> Scenarios: Orderly and Disorderly linked to a net-zero 2050 target, and Hot House World exploring physical risks from climate change Exercise: (1) questionnaire with 78 questions covering 11 areas; (2) climate metrics benchmarking and (3) bottom-up stress test including 3-year and 30-year transition risk, market risk and 1-year physical risks
Main Impacts	<ul style="list-style-type: none"> Qualitative findings for climate risk management Loss rates in the LA scenario were >2X as a result of climate risks – equivalent to an extra c.£110 billion of transition risk losses during 30 year horizon 	<ul style="list-style-type: none"> Qualitative findings with focus on Governance and Risk Appetite, Data & Methodology. €70Bn from short-term exercises (3-y disorderly transition + 2 physical risk scenarios)
Next Steps	<ul style="list-style-type: none"> Will not be used to set capital requirements related to climate risk. PRA/ BoE undertaking further analysis to determine possible changes on design, use, or calibration of the regulatory capital frameworks Findings will feed into the FPC's thinking around financial stability policy issues related to climate risk 	<ul style="list-style-type: none"> Exercise will not have a direct quantitative on capital, but instead an indirect impact through qualitative assessment during the SREP process together with the ECB thematic review Focus will be on business model, internal governance and risk management

ECB CST vs. UK CBES – Main Differences (2 of 2)

	 UK CBES 2021	 ECB CST 2022								
Most impacted scenario	Late action scenario with loss rates more than doubling the contrafactual scenario as result of climate risk.	Disorderly scenario with delayed but abrupt phasing-in of climate-related transition policies tends to produce the highest cumulated losses.								
Main drivers	Carbon prices are the main driver of the transition - in both transition scenarios (Late Action and Early Action)	Carbon prices are the main driver of the transition								
Corporates, affected sectors	<p>The more impacted industries in the transition scenarios were:</p> <ol style="list-style-type: none"> 1. Mining (including extraction of petroleum and natural gas) 2. Manufacturing 3. Transport and wholesale 4. Retail trade <p>These sectors represent 14% of the banks' total corporate exposures. Under the NAA scenario a quarter of the provisions are registered by the sectors more exposed to physical risk</p>	<p>The most GHG emitting sectors were:</p> <table border="0"> <tr> <td>1. Mining</td> <td>5. Electricity and energy</td> </tr> <tr> <td>2. Refined petroleum</td> <td>6. Water transportation</td> </tr> <tr> <td>3. Chemical</td> <td>7. Air transportation</td> </tr> <tr> <td>4. Mineral</td> <td></td> </tr> </table> <p>These sectors represent 29% of non-financial corporate exposures related to 22 NACE sectors of the exercise.</p> <p>Under the hot house world scenario banks tend to show a reduction in the exposure to the most polluting sectors, which for the seven most GHG-emitting sectors results in lower cumulated loan losses than under the disorderly scenario</p>	1. Mining	5. Electricity and energy	2. Refined petroleum	6. Water transportation	3. Chemical	7. Air transportation	4. Mineral	
1. Mining	5. Electricity and energy									
2. Refined petroleum	6. Water transportation									
3. Chemical	7. Air transportation									
4. Mineral										
Mortgages impacts	<p>Mortgages losses are highest in the NAA scenario, they seem to relate with those areas heavily impacted by flooding.</p> <p>Losses are higher in Late action scenario than in the Early Action scenario, impairment rates are high for properties whose energy efficiency (EPC) ratings are in the lowest two brackets</p>	<p>Mortgages portfolios are not discussed under the Long-term transition risk projections results. In the short term transition risk test they display lower loss rates than corporate exposures. Least energy efficient EPC labels display higher loss rates.</p>								

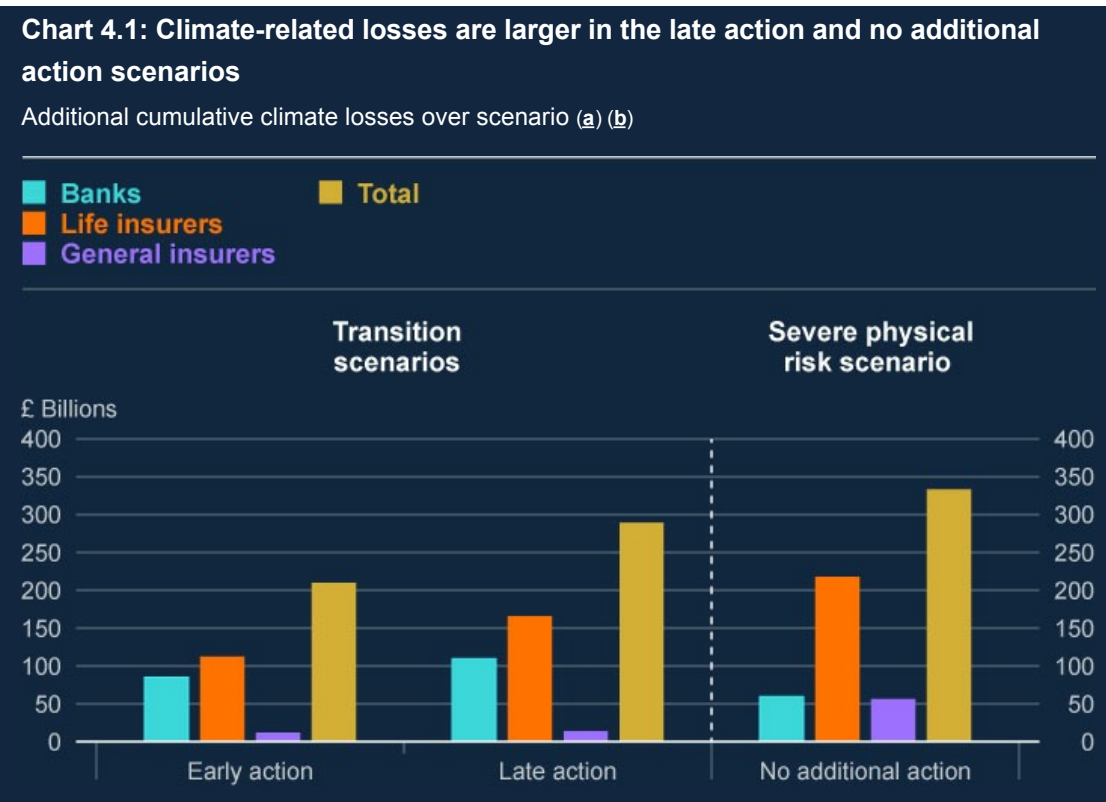
Orderly scenario losses are lower than disorderly and hot house scenarios in both tests. Loss amounts are not comparable due to different scope, timing horizon and methodology.



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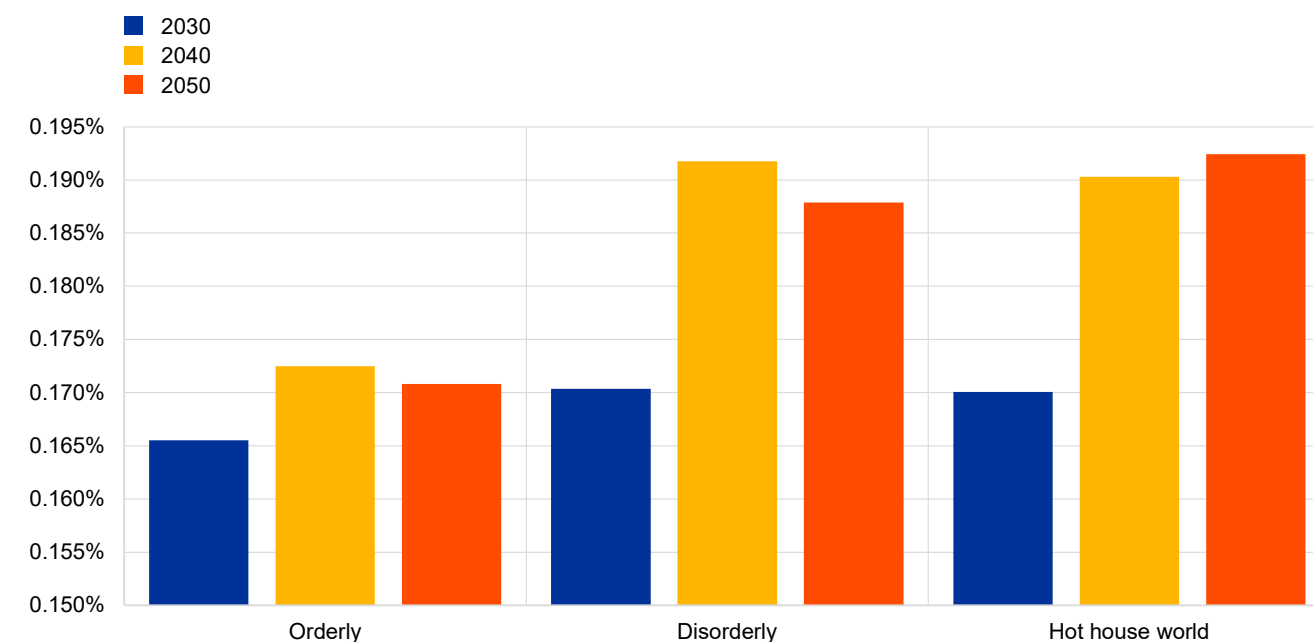
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- Projected bank credit losses were greatest in the Late Action scenario, with loss rates more than doubling as a result of climate risks. That is equivalent to an extra c.£110 billion of losses over 30 years, of which around 40% is realised during the first five years of transition. These losses compare to 3-year credit impairments of £90bn in the 2021 Solvency Stress Test.

Projected loan losses per decade in the long-term scenarios

(% of performing exposures in each decade)



- Projected loan losses under the orderly scenario are lower than those both under a disorderly transition scenario and under a scenario with no transition policies
- Banks reported €70bn of aggregate losses under the 3 short-term exercises
 - €53bn losses reported under the short-term disorderly transition scenario
 - €17bn losses reported under the short-term physical risk scenarios (drought & heat risk and flood risk)

Comparison of climate loss rates across asset classes are inconclusive due different time horizons used. Corporate exposures seem the most sensitive to climate shocks.



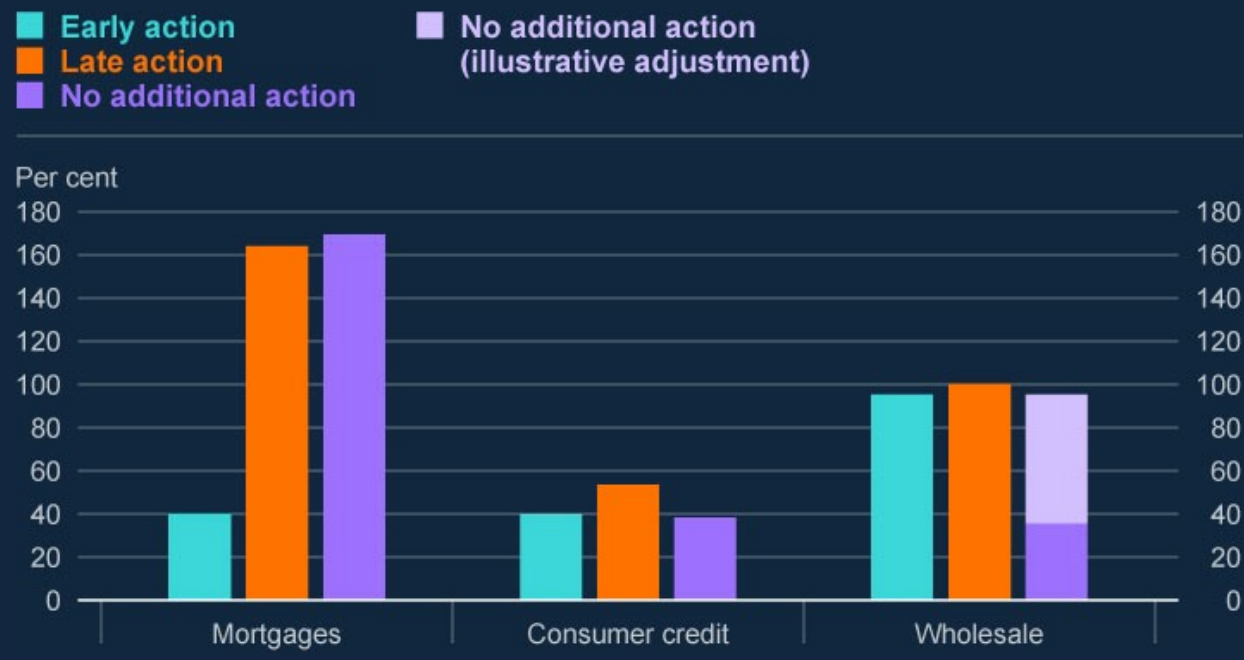
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Chart 4.3: Climate impacts are highest for banks' wholesale and mortgage portfolios

Banks' climate losses as a proportion of counterfactual losses (a) (b)

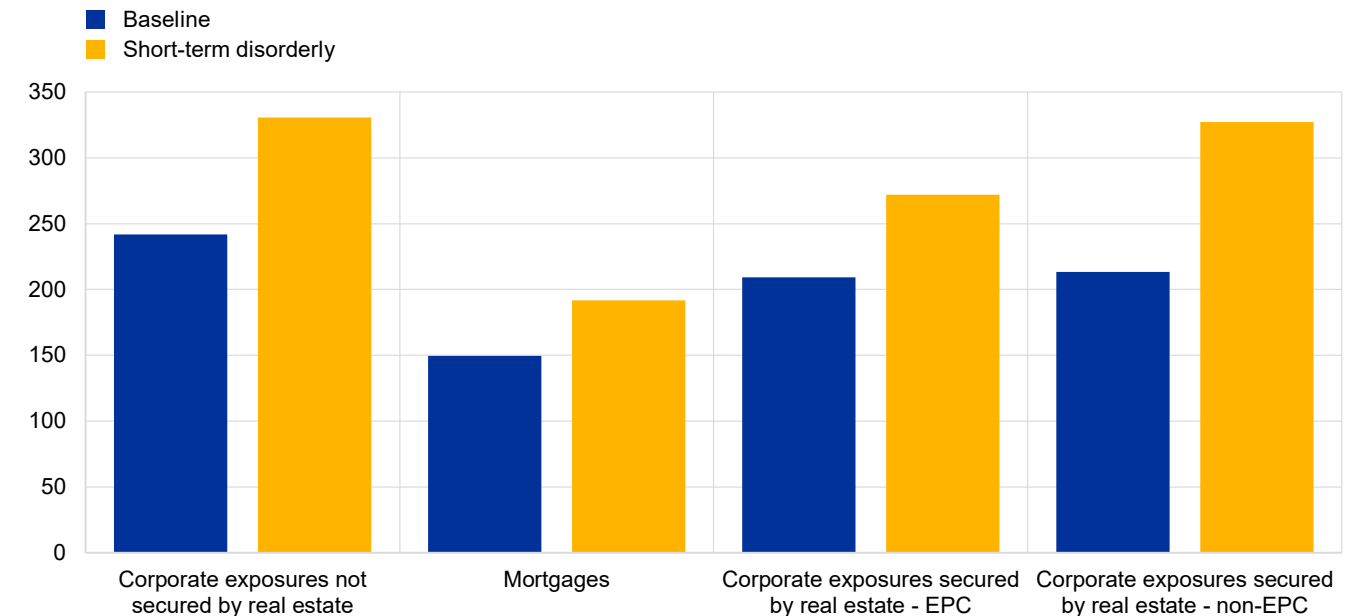


- Corporate losses increase substantially as a result of the impact of higher carbon prices. By contrast, mortgage losses are relatively muted in the early action scenario but increase substantially in the late action scenario as a result of rising unemployment together and falling house prices.

Impairment losses are highest for corporate exposures not secured by real estate in the short-term disorderly scenario

Cumulative loan losses in the short-term disorderly vs baseline scenario by 2024

(basis points of the REA of exposures in scope)



- The highest impact is observed for corporate exposures not secured by real estate and those secured by real estate but not within the scope of the EPC in the disorderly scenario

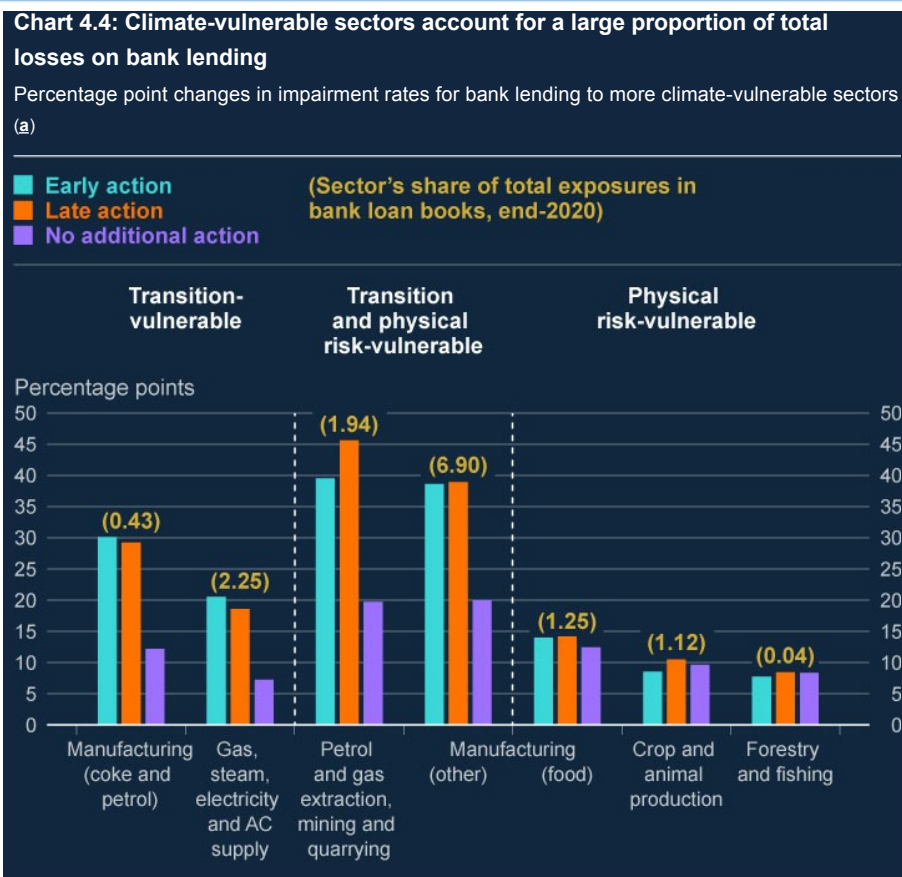
Both climate stress test provide insightful benchmarks of climate risk associated to high emitting sectors.



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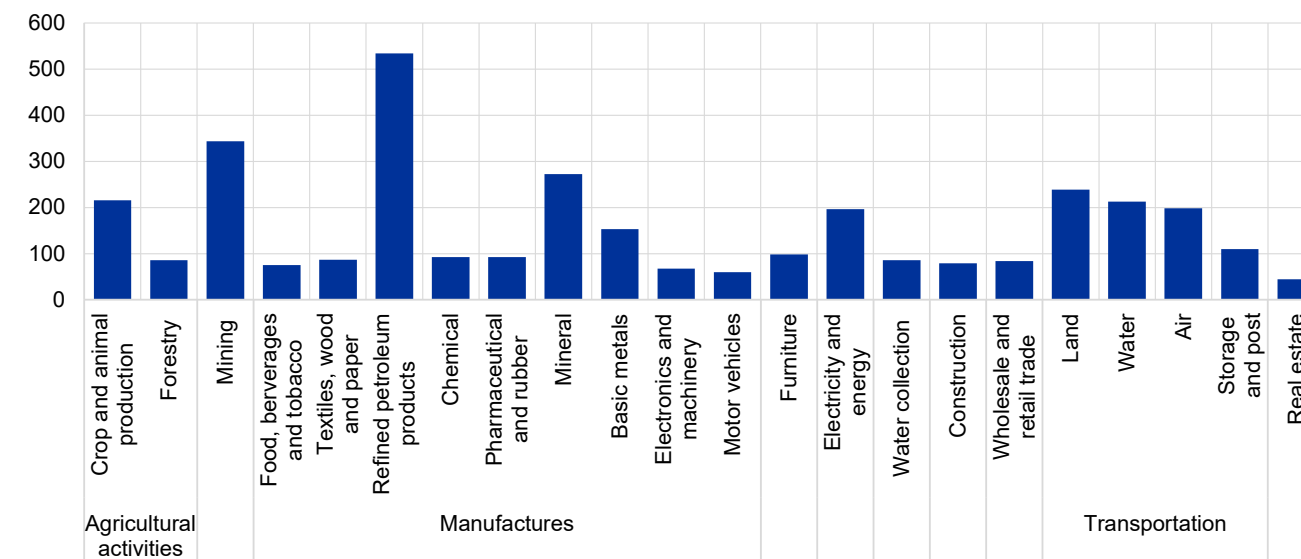


- Unsurprisingly, some of the most carbon-intensive industrial sectors, and those most exposed to physical risks, account for a disproportionate share of projected corporate credit losses.

Losses from 22 GHG-intensive sectors increase significantly in a short-term disorderly transition scenario

Cumulative loan losses in the short-term disorderly vs baseline scenario by 2024

(basis points of the REA of exposures in scope)



- The increase is mainly driven by the most carbon-emitting sectors, such as refined petroleum products, mining, minerals and land transportation, which experience cumulated loan losses of more than 200 basis points, reflecting the steep increase in carbon prices required to reach a net zero economy within a short time horizon

They also provide insightful exposure reduction benchmarks by sector indicating the speed at which banks are transitioning to net zero for their financed emissions.

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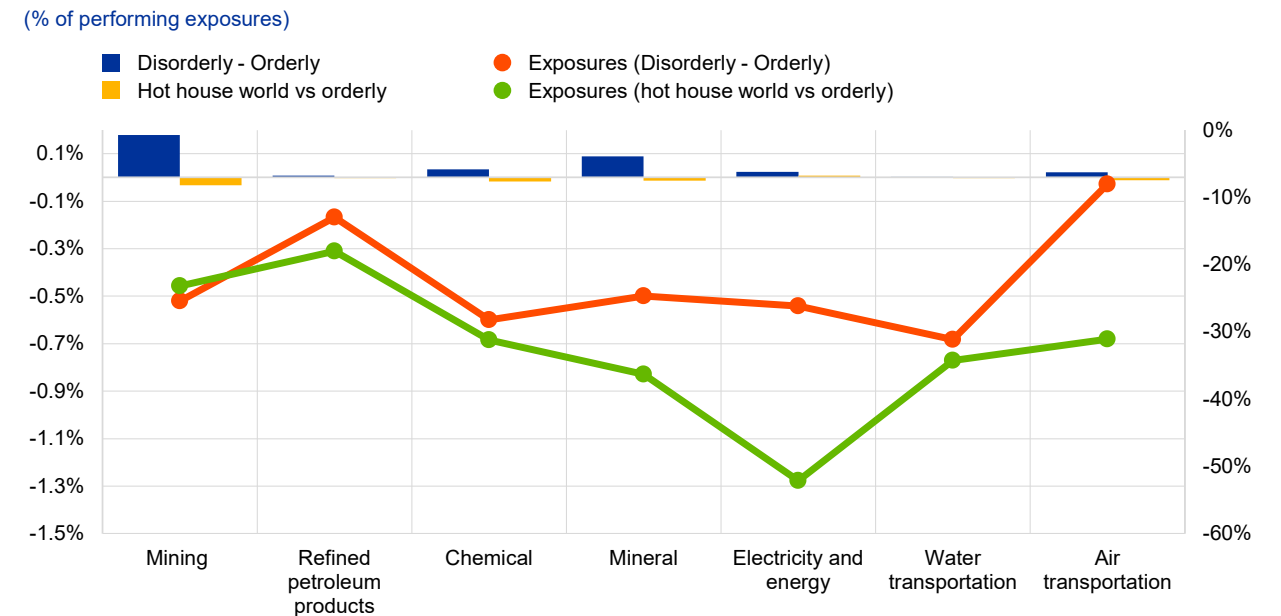


- In response to the scenarios, banks planned to reduce lending to some of the most carbon-intensive corporate sectors, in line with existing commitments to reach net-zero financed emissions by 2050.

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Banks project decreasing exposures to most carbon-emitting sectors, which mitigates to some extent the cumulated loan losses under the disorderly and hothouse world scenarios

Cumulative loan losses in the period 2030-2050 (LHS) and exposure changes (RHS) in the long-term scenarios to 2050



- The assumed exposure reduction is particularly pronounced under the Hot house world scenario (e.g. a 50% decline compared with the orderly scenario for the electricity and energy sector), which for the seven most GHG-emitting sectors results in lower cumulated loan losses than under the disorderly scenario.

Both climate stress test provide insightful benchmarks of climate risk associated to mortgage EPC labels.



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Figure 4.6: Impairment rates were much higher for properties with the lowest potential EPC ratings

Aggregate impairment rates by current and estimated EPC ratings (EA) (a) (b)

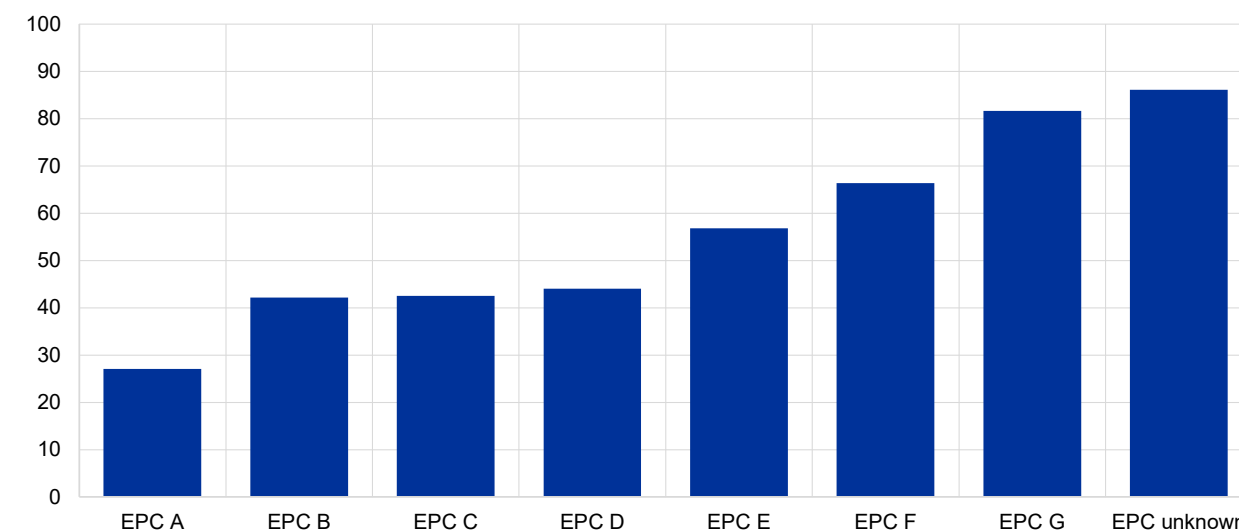
Potential EPC rating	Current EPC rating		
	A–C	D and E	F and G
A–C	1.4%	1.4%	1.9%
D and E		1.1%	1.6%
F and G			35.8%

- Projected total corporate loss rates from individual banks spanned a wide range, with the highest estimates typically being around twice as large as the lowest across scenarios.

Impairment losses for each EPC rating class higher in the short-term disorderly scenario than in the baseline

Cumulative loan losses in the short-term disorderly vs baseline scenario by 2024

(basis points of the REA of exposures in scope)



- While the overall exposure allocation to various EPC categories does not show significant concentration in any of them, as expected the increase in loan losses is most pronounced for the lower-rated and unknown categories

Dispersion of stress test outcomes are sign of large model/data proxy estimation risks and lack of industry standards as seen by wide range of impairment rates and emission data.



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Chart 4.5: Projected losses on shared counterparties spanned a wide range

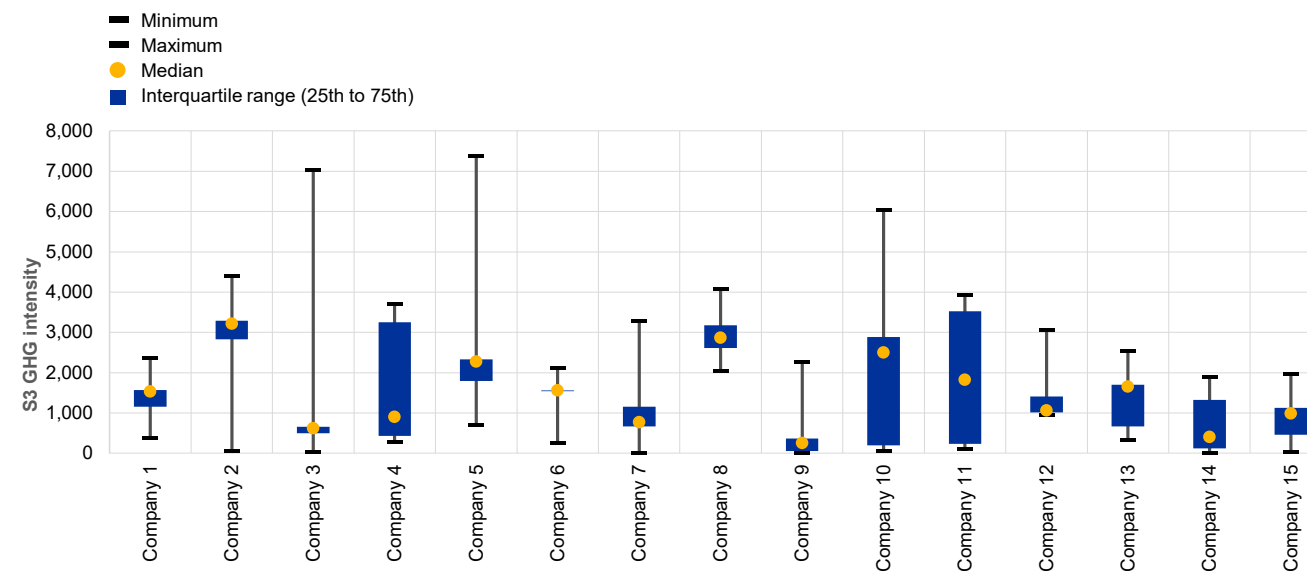
Change in impairment rate on banks' lending to shared corporate counterparties (a)



- Projected total corporate loss rates from individual banks spanned a wide range, with the highest estimates typically being around twice as large as the lowest across scenarios.

Dispersion of reported Scope 3 GHG intensity per counterparty

(1000t CO₂/EUR million)



- Estimating Scope 3 emissions using various proxy techniques leads to a high dispersion of the data reported (see Chart B). This dispersion is also observed when comparing the Scope emissions data from various data providers for the same corporate counterparties.

Both exercises introduce physical risk maps showing the heterogeneity flood risk and other physical risks within countries and across Europe.



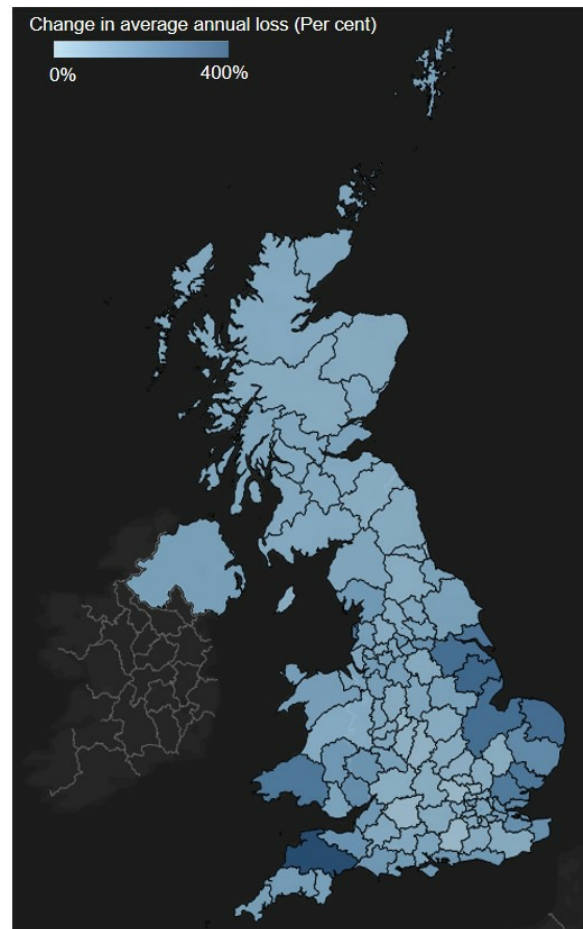
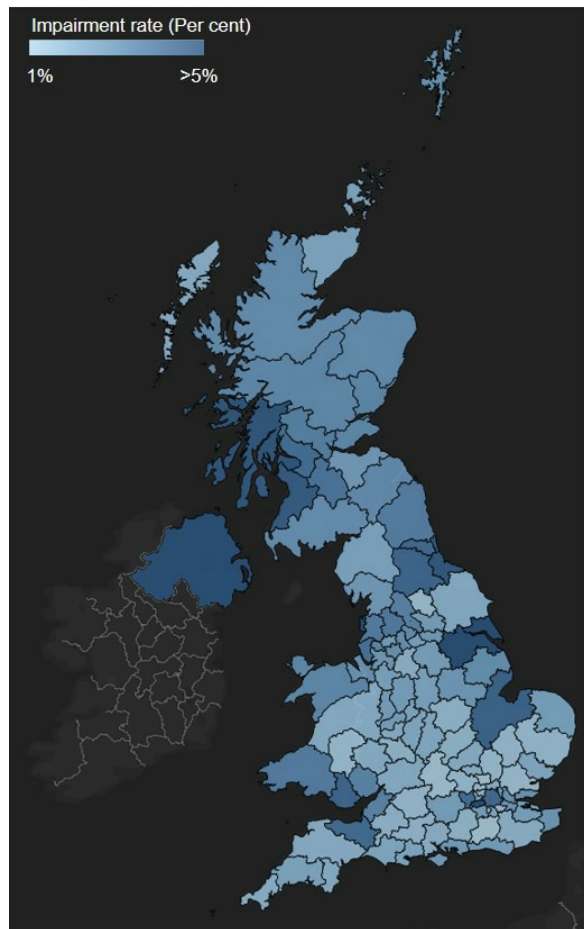
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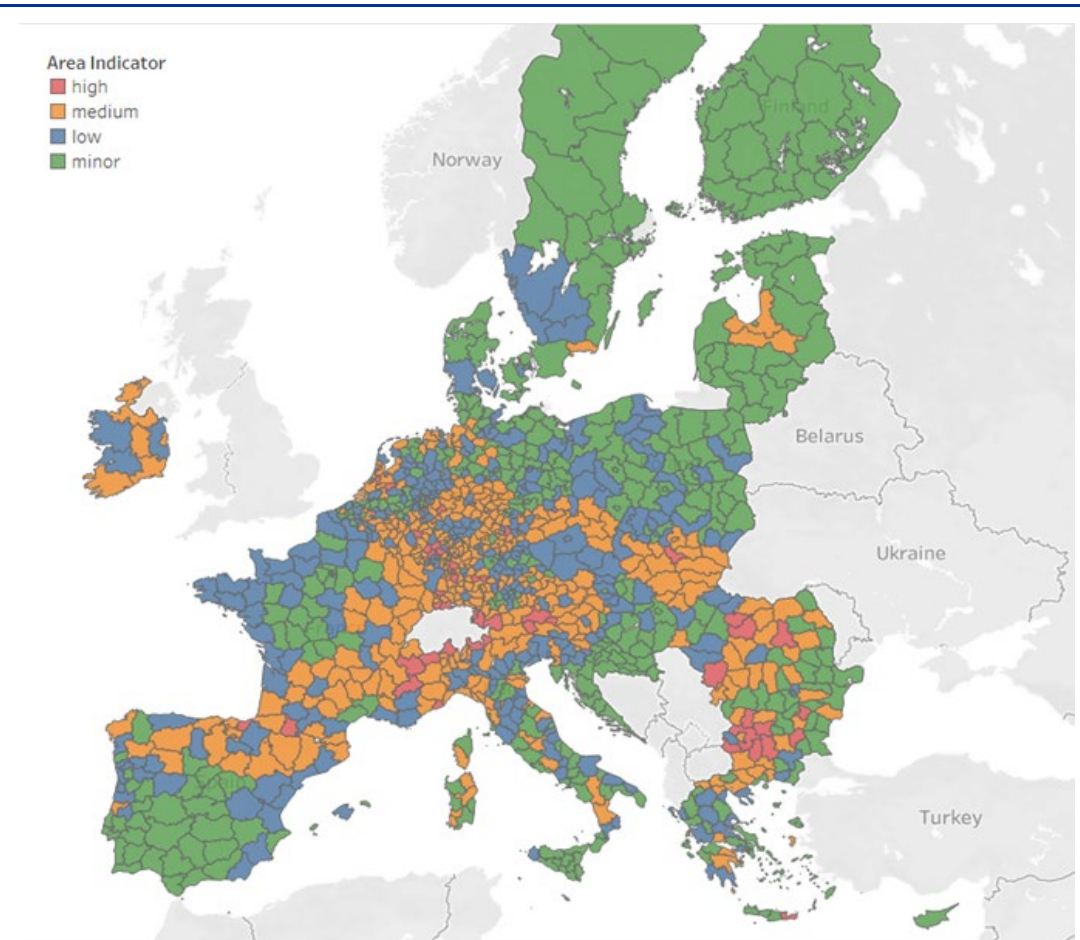
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Banks

General Insurers



Flood risk map



Alvarez & Marsal

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