



Global Credit Data and the United Nations
Environment Programme Finance Initiative

User Guide and Survey Template

This document is designed to be used as a resource for key definitions and terminology used in this survey, as well as a PDF version of the survey to refer to as respondents complete the survey.

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Survey Information

- The survey will be conducted via a multiple-choice format, with additional written responses where necessary to capture detailed insights.
- Your Bank's unique Survey URL allows you to access the survey platform.
- Only 1 survey submission is allowed per participant bank.
- You can save your progress and return later to complete the survey, allowing time to consult with other teams and provide accurate responses.
- While you may use the "**Navigation Menu**" to move forward throughout the survey, please note that there is no direct option to return to a previous section. If you need to review or modify any previous responses, you will need to navigate back step by step using the "**Previous**" button.
- GCD team may follow up to clarify specific answers after submission.
- Please refer to the Survey Guide for any definitions and clarifications.
- The survey will be open for responses until **end of December**.

Important Note:

This survey follows a **give-to-get** principle. Detailed results for each section will only be provided to banks that contribute input to those specific sections. Therefore, we encourage **full participation** as possible, across all relevant sections to gain the most value from the survey.

Survey terms and conditions:

Agreement

By submitting the survey, you agree to participate in the survey conducted by GCD and UNEP FI, and consent to the use of the provided information for research, publication and analysis purposes. The data will be anonymized, aggregated, and handled in accordance with our privacy policy and GCD Data pool regulations.

<https://globalcreditdata.org/privacy-policy/>

Please do not share this document externally.

Introduction and Scope

This survey is designed to assess how banks are integrating forward looking climate-related risks (short, medium, long term) into their credit risk management frameworks. The survey seeks to gather detailed information on banks' approaches to climate-related credit risk assessments, including underlying maturity, and the integration of various risk factors such as transition risks, physical risks, and ESG scores into this assessment framework. By examining the methodologies, data sources, scenarios, and quantitative impacts across different exposure classes and sectors, this survey aims to provide a comprehensive understanding of the current state of climate risk integration to credit risk within the banking sector. The insights gained are aimed at helping banks identify best practices, enhance their risk management strategies, and strengthen their resilience in the face of evolving climate risks.

Part 1: Climate-Related Credit Risk Assessment and Integration: Covers how the bank assesses and integrates climate-related risks into credit risk models, along with a review of internal risk assessments and materiality assessment.

Part 2: Transition Risk: Explores risks related to the transition to a low-carbon economy

Part 3: Physical Risk: Focuses on physical risks, and their impact on the bank's portfolios.

Part 4: Climate related Collateral Value Adjustments

Part 5: Exposure Class and Sector Specific: Examines climate risks across different exposure classes and sectors

Part 6: Scenario Analysis: Explores how the bank uses scenario analysis to model climate-related risks

Part 7: ESG Scores: Looks at how ESG scores are calculated and integrated into credit risk assessments.

Part 8: Data and IT: Explores the bank's data management and IT infrastructure for supporting climate risk assessments.

Part 9: Integration of Other ESG Risks

Part 10: Quantitative Impact: Looks at the financial impact of climate risks on key metrics such as Expected Credit Loss (ECL), Risk-Weighted Assets (RWA), and Economic Capital (ECAP).

Bank Information:

Q1. Name of your institution

Q2. Name the country your institution is headquartered in.

Q3. Select the region your institution is located in.

- United States
- Canada
- United Kingdom
- Europe (excluding United Kingdom)
- APAC (Asia-Pacific)
- Latin America and the Caribbean
- Africa
- MENA (Middle East and North Africa)
- Other (please specify)

Q4. Select the regions your institution operates in. Please select all that apply.

- United States
- Canada
- United Kingdom
- Europe (excluding United Kingdom)
- APAC (Asia-Pacific)
- Latin America and the Caribbean
- Africa
- MENA (Middle East and North Africa)
- Other (please specify)

Q5. Is your bank globally, regionally or single country active?

-Globally

-Regionally

-Single Country

Q6. Select the size (total assets under management (in USD)) of your institution.

- \$100 billion and above
- \$20 billion to less than \$100 billion
- \$5 billion to less than \$20 billion
- Below \$5 billion

Q7. Select the type of your institution.

- Universal Bank
- Commercial Bank
- Retail Bank
- Development Bank
- Other (please specify)

Survey Part 1A: Assessment of Climate-Related Credit Risk

Section overview:

This section covers a set of questions designed to gain an overall understanding of a bank's climate-related credit risk assessment, including understanding types of assessments conducted and the scope of those assessments in terms of both sectors and exposure classes.

Q1. Select the objectives that are relevant for your bank's climate-related credit risk assessment. Please select all that apply.

- Development of awareness on climate change and climate risk and build climate risk assessment capabilities
- Understand the potential exposures to climate risk
- Define mitigation strategies
- Identify data gaps and methodological limitations
- Support disclosures of climate-related risks
- Understand how to adjust business models in response to different scenarios
- Consider changes in governance to manage future climate risks
- Other (please specify)

Q2. When did you begin conducting expert judgement and or data driven based climate-related credit risk assessment?

	Expert Judgement Based	Data Driven
More than 5 years ago		
3-4 years ago		
Last 1-2 years ago		
Within the past 12 months		
Have not started yet		

Definitions:

Expert Judgement based: This would be more qualitative assessment

Data driven assessment: This would be more quantitative

If "Have not started yet" selected in Q2, answer Q2a:

Q2a. Please explain and provide further information on your current climate-related credit risk assessment plans.

Q3. Which of the following exposure classes are you assessing climate risk for? Please select all that apply.

- Retail SMEs (Small and Medium-sized Enterprises)
- Non-retail SMEs
- Large Corporates
- Households (Consumer lending)
- Banks and Non-Bank Financial Institutions (NBFIs)
- Sovereigns
- Commercial Real Estate
- Residential Real Estate
- Project finance
- Aircraft finance
- Shipping Finance
- Commodity Finance
- Others (please specify)

Definitions:

Retail SMEs (Small and Medium-sized Enterprises): This includes exposures to small and medium-sized enterprises that meet specific criteria to be classified as retail exposures. Loans are extended to small businesses and managed as retail exposures they are eligible for retail treatment provided the total exposure of the banking group to a small business borrower (on a consolidated basis where applicable) is less than €1 million

Non-retail SMEs: This refers to SME exposures that do not meet the criteria to be classified as retail exposures. These are defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than €50 million

Large Corporates: This includes exposures to companies and businesses that do not fall under retail or SME categories. These are defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is equal or greater than €50 million

Households (Consumer lending): Exposures to individuals and households – such as revolving credits and lines of credit (eg credit cards, overdrafts, or retail facilities secured by financial instruments) as well as personal term loans and leases (eg instalment loans, auto loans and leases, student and educational loans, personal finance, or other exposures with similar characteristics).

Banks and Non Bank Financial Institutions (NBFIs): Exposures to banks and other financial institutions such as banks investment firms, insurance companies and asset managers.

Sovereigns: Exposures to national governments, and central banks and similar sovereign entities.

Commercial Real Estate: Exposure to non-residential property used for business or land that can generate income, including multi-family real estate, office space, retail space, industrial real estate and mixed-use space.

Residential Real Estate: Exposures to real property, land or a building, used for residential purposes.

Project finance: This includes exposures to specialized lending project finance (PF). PF is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. Project finance may take the form of financing of the construction of a new power plant, a petrochemical complex or an oil refinery, or refinancing of an existing project, with or without improvements. [Basel Framework, CRE 30.9]

Aircraft finance: Method of funding the acquisition of physical assets (aircraft) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lender. The asset class does not include any general financing of aircraft companies or loans to corporates or individuals secured by a aircraft. [Basel Framework, CRE 30.11]

Shipping Finance: Method of funding the acquisition of physical assets (ships) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lender. The asset class does not include any general financing of shipping companies or loans to corporates or individuals secured by a ship. [Basel Framework, CRE 30.11]

Commodity Finance: Structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (eg crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay the exposure. [Basel Framework, CRE 30.12]

Others: This can include various other exposures that do not fall into the specified categories above.

Q4. Which of the following sectors are currently included in your physical and transition risk-related credit risk assessment? Please select all that apply.

Note: Sectors in the options are selected due to climate impact and not an exhaustive list of all granular sector groups. Please indicate in 'Others' if you have any other sector groupings that you include.

Sector	Physical Risk	Transition Risk
Agriculture, forestry and fishing		

Oil & Gas		
Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber		
Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper		
Mining of coal and lignite, metal ores and other mining and quarrying		
Electricity and energy supply		
Water supply, sewerage, waste management and remediation activities		
Wholesale and retail trade		
Transportation and storage		
Real estate activities and construction		
Others please specify		

Definitions:

Where to Use this Mapping

This guidance is intended to be used when completing the GCD and UNEP FI survey, specifically in sections that require categorizing industry sectors. It ensures that banks are aligned with the recognized industry classification systems: NACE (mostly used in Europe) and NAICS (used in North America).

Survey Sector Group	NACE Codes	NAICS codes
Agriculture, forestry and fishing	Agriculture, forestry and fishing (NACE sector – A) o Includes crop and animal production, forestry	Agriculture, forestry and fishing (NAICS 2022 codes: 111, 112, 113, 114, 115)
Oil & Gas	Oil and Gas (NACE sector – B6 , C19.2, D35.2, H49.5) - Includes extraction of crude petroleum and natural gas, manufacture of refined petroleum products, manufacture of gas; distribution of gaseous fuels through mains/transportation of oil and gas through pipelines	Oil and Gas (NAICS 2022 codes: 211,213111, 213112, 213118, 2212, 324, 486)
Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber	Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber (NACE sector – C20, 21, 22 23, 24, 25)	Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber (NAICS 2022 codes: 325, 326, 327, 331, 332)

Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper	Manufacture of furniture (C31), electronics (C26), electrical equipment (C27) and machinery (C28), food (C10), beverages (C11) and tobacco (C12), motor vehicles and other transport vehicles (C29, C30), textiles, wood and paper (NACE sector - C13, C16, C17)	Manufacture - other (NAICS 2022 codes: 311, 312, 313, 314, 321, 322, 333, 334, 335, 336, 337, 339)
Mining of coal and lignite, metal ores and other mining and quarrying	Mining of coal and lignite, metal ores and other mining and quarrying (NACE sector – B5, B7, B8)	Mining of coal and lignite, metal ores and other mining and quarrying (NAICS 2022 codes:212, 213113, 213114,213115)
Electricity and energy supply	Electricity and energy supply (includes electric power generation, transmission and distribution) (NACE sector – D35.1)	Electricity and energy supply (includes electric power generation, transmission and distribution) (NAICS 2022 codes: 2211)
Water supply, sewerage, waste management and remediation activities	Water supply, sewerage, waste management and remediation activities (NACE sector – E)	Water supply, sewerage, waste management and remediation activities (NAICS 2022 codes 2213, 562)
Wholesale and retail trade	Wholesale and retail trade (NACE sector – G)	Wholesale and retail trade (NAICS 2022 codes: 423, 424, 425, 441, 442, 443, 444, 445,449, 451, 452, 453, 454, 455, 456, 457 458, 459)
Transportation and storage	Transportation and storage (include water transportation, air transportation, land transportation, storage and post) (NACE sector – H except H49.5)	Transportation and storage (NAICS 2022 codes: 481, 482, 483, 484, 485, 487)
Real estate activities and construction	Real estate activities and construction (NACE sector F and L) Includes buying and selling of own real estate, renting and operating of own or leased real estate, real estate activities on a fee or contract basis and construction of buildings, civil engineering, demolition and site preparation, building completion and finishing)	Real estate activities and construction (NAICS 2022 codes: 236, 237, 238, 531)
Others	Other (other NACE codes)	Other (other NAICS codes)

Q5. Which portfolios are you modelling as part of your climate-related credit risk assessment?
Please select all that apply.

- All Wholesale
- Wholesale but specific sectors (such as Transportation, Real estate, Power Generation...)
- Mortgages (Commercial and Residential Real Estate)
- All retail
- Others (please specify)

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Q6. Which one of the following approaches are you using for your climate-related credit risk assessment for below exposure classes?

Definitions:

- Bottom-up approach: Analyzing individual assets or sectors or borrowers to understand specific climate risks. Example: Assessing the flood risk for each property in a real estate portfolio.
- Top-down approach: Evaluating climate risk at a macro level, such as the overall impact on the economy, industry, portfolios and sub-portfolios. Example: Using national climate models to predict the economic impact of climate change across industry sectors, to portfolio of bank loans
- Combination of both bottom-up and top-down approaches: Integrating detailed asset-level analysis with broader economic assessments to get a comprehensive view of climate risk. Example: Combining property-level flood risk assessments with national economic impact models to gauge overall exposure.
- None: Currently, not using any specific approach for climate risk assessment.

	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real Estate	Project finance
Bottom-up approach						
Top-down approach						
Combination of both bottom-up and top-down						
None						

Q7. Which of the following methodological tools are being used by your institution to assess climate risks for each of the exposure classes in the table:

	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real Estate	Project finance
Scorecards	<ol style="list-style-type: none"> 1. in house 2. through external support 3. in combination 					

	of inhouse and external					
	4. Not used					
	5. Not Applicable					
Heatmapping						
Scenario analysis						
Internal climate stress tests						
Supervisory climate stress tests						
Internal risk models						
Statistical analysis						
Data modeling						
External risk models (e.g., third-party tools or services)						
Qualitative assessments (e.g., expert judgment, internal discussions)						
Not currently assessing climate risk						

Other (please specify)

Definitions:

Scorecards: Scorecards quantify risk by assigning weighted scores to various risk factors using a predefined set of criteria to assign scores, enabling a structured and comparative evaluation of existing and potential risks.

Heatmapping: Heatmapping visually represents risk levels across different areas or factors using colour coded grids, helping to identify and prioritize high-risk areas and industries for further analysis.

Scenario Analysis: A forward-looking tool to assess the resiliency of a bank’s business model and strategy using a range of plausible climate-related pathways for determining the potential impact of climate-related risk drivers. For example, scenario analysis could either imply a temperature rise scenario or a shock scenario but would include the use of multiple scenarios (e.g. 2-3 scenarios for comparison)

Internal Climate Stress Testing: Internal climate stress testing evaluates an organisation's resilience to climate-related risks by simulating adverse scenarios internally to assess potential impacts on operations and financial stability.

Supervisory climate stress testing: Supervisory climate stress testing is conducted by regulatory authorities to assess the broader financial system's vulnerability to climate-related risks, ensuring that institutions are prepared for potential climate impacts.

Internal risk models: Internal risk models are custom-built tools within an organisation that use proprietary data and assumptions to predict potential risks within portfolios and assess their impact on the business.

Statistical analysis: Statistical analysis involves analysing historical data and identifying patterns, trends, and correlations, to forecast and quantify risk.

Data modelling: Data modeling involves creating quantitative models to simulate outcomes based on a wide range of inputs, such as algorithms, and climate, financial, and economic data. It's used to generate insights about climate risks under specific conditions.

External risk models (e.g., third-party tools or services): External risk models utilise third-party tools or services to assess risks, leveraging external data, methodologies, and expertise to provide an independent perspective on potential threats.

Qualitative assessments (e.g., expert judgment, internal discussions): Qualitative assessments rely on expert judgement, internal discussions and non-quantitative methods of evaluating risks.

Q8. Select from the listed challenges for conducting climate risk analysis below based on your institution's plans to address the given challenges. Please select all that apply.

	We have plans to address this challenge	We are dependent on third-party developments for this challenge	We do not have plans yet to address this challenge
Limited data availability and data gaps			
Data reliability and quality of available data			
Forward looking nature of climate risk			
Resource and time limitation to build in-house capacity			
Lack of technical expertise			
Modelling ability, including complexity of the analysis			
Lack of standardisation in methodologies across the finance sector			
Limitations of climate scenarios available for use			
Integration with existing risk management framework			
Cost implications			
Lack of a methodology to map climate risk drivers to financial risk drivers including an assessment of its impact on financial ratios of companies			
Lack of regulatory guidance			
Lack of Scorecards			
Other (please specify)			

Definitions:

Limited data availability and data gaps: Limited availability of detailed and granular data. also add i.e. Reluctance to ask customers for GHG emission data

Data reliability: Available climate data can lack in quality. Furthermore, methodologies for collecting data can vary, effecting its reliability.

Forward looking nature of climate risk: To differentiate the problem of having the historical and current data from the relevance of this data for the analysis of future risks.

Resource and time limitation to build in-house capacity: Conducting climate-related risk assessments requires a large amount of time and resources. For some teams involved in the

process, they are only able to contribute their efforts part-time. Climate-related risk assessment also requires institutions to build new competencies.

Lack of technical expertise: The need to build robust climate risk models or integrate climate risk into existing models and interpreting the results requires specialised knowledge.

Modelling ability, including complexity of the analysis: Climate risk modelling can be complex with the need to integrate a wide range of variables and the long-term and non-linear nature of climate risks.

Lack of standardisation in methodologies across the finance sector: Financial institutions are incorporating various methodologies to assess climate risks resulting in a lack of standardisation.

Limitations of climate scenarios available for use: Climate scenarios have a range of limitations including limited granularity for regions and sectors. Furthermore, commonly used scenarios are developed by using Integrated Assessment Models (IAMs) that were not initially developed for financial use and include limitations such as their cost optimization assumptions.

Integration with existing risk management framework: Existing systems may not be designed to handle large amounts of climate-related data, scenarios, time horizons, etc. This requires updates to current processes.

Cost implications: For example, data collection, building models and working with third-party vendors can involve significant costs.

Lack of a methodology to map climate risk drivers to financial risk drivers including an analysis of its impact on financial ratios of companies: Limited guidance and a widely accepted methodology for mapping climate risk drivers into financial risk drivers.

Lack of regulatory guidance: Some banks may face limited support from regulators on how to conduct a climate-related risk assessment, in terms of guidance on data sources and collections, scenario use, methodology for translating climate risks into financial risks and how to incorporate climate risks into current risk management frameworks.

Lack of Scorecards: This challenge refers to the lack of scorecards that incorporate climate-related risks, such as physical risks (e.g., flooding, wildfires) and transition risks (e.g., regulatory changes). These scorecards are essential for assessing the impact of such risks on a borrower's ability to repay

Q9. Do you use any margin of conservatism based on expert judgement to correct climate data deficiencies?

- Extensive
- Moderate
- Minimal
- None

If selected "extensive", "moderate" or "minimal" in Q9, answer Q9a:

Q9a. At which steps in the climate risk analysis process is expert judgement applied.

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Results of climate-related credit risk assessments

This section examines the outputs of an institution's climate-related credit risk assessments. The questions aim to understand how these results are being used for various use cases and understand their reliability.

Q10. How (statistically) accurate do you find the **results** of your climate-related credit risk assessment, taking into considerations the limitations and gaps and the overall approach (for example data limitations, modelling approaches, and assumptions related to future climate change)?

	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real estate	Project finance
A) Completely						
B) Somewhat						
C) Neutral						
D) Low						
E) Not Applicable						

Q11. For each use case mentioned below, please select the description which best describes how you are using the results of the climate risk assessment?

Use Cases	Yes, currently using the results due to regulatory compliance	Yes, currently using the results but it is not mandatory	Not using the results but plan to do so	Not using the results and do not plan to do so	Not using and still under discussion internally whether or not to use
Key Risk Indicators					
Concentration/risk limits					
Business plans at asset class level					
Strategy planning					
Climate risk reporting (internal reporting, public financial reporting, regulatory reporting)					
Client relationship and product plans					
Credit Decisioning					

IFRS 9 or CECL Provisions					
Regulatory Capital					
Economic Capital including ICAAP					
Pricing					
Other					

Definitions:

Key Risk Indicators: Quantitative metrics used to monitor the exposure and potential impact of climate risks on portfolios.

Concentration/Risk Limits: Limits set to avoid excessive exposure to climate-sensitive sectors or geographic areas.

Business Plans at Asset Class Level: Detailed strategies developed at the level of specific asset classes taking into consideration potential climate risks.

Strategy Planning: The process to integrate climate risks into long-term strategic planning.

Climate Risk Reporting (Internal Reporting, Public Financial Reporting, Regulatory Reporting): Reporting practices that involve disclosing climate risks to different stakeholders.

Client Relationship and Product Plans: Strategies used to engage clients in managing climate risks and developing sustainable financial products.

Credit Decisioning: The process of assessing how climate risks impact the creditworthiness of borrowers and incorporating those risks into lending decisions.

IFRS 9 or CECL Provisions: Consideration of climate risks in these provisions, such as the impact of climate risk on PDs.

Regulatory Capital: The amount of capital banks are required to hold to guard against losses, as determined by regulators. For example, the need to hold additional capital for portfolios exposed to potential climate risks.

Economic Capital Including ICAAP: The amount of capital estimated to cover risks, which can include climate risks.

Pricing: Factoring climate risks into the pricing of loans, insurance products, and other financial services.

Q12. Have you used the results of climate risk assessment to inform any of the following practices as part of client engagement?¹ Select all that apply.

- Reduce limits or exposure to facilities of the client
- Reduce the loan tenor of the facility
- Adjust the pricing of the loan of the client
- Adjust client credit ratings
- Ask clients to implement action plans which are time-bound to manage climate risks
- Change product lines and associated pricing
- Exit the client relationship Seek insurance / request client to seek insurance
- We currently do not use the results
- Other (please specify)

If selected “We currently do not use the results” in Q12, answer Q12a:

Q12a. Please specify why.

¹ Options are provided from
<https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.thematicreviewcercompendiumgoodpractices112022~b474fb8ed0.en.pdf>

Survey Part 1B: Integration of Credit Risk Modelling Processes

The questions in this section focus on understanding the modelling approaches banks have undertaken and the approaches used by banks to integrate climate factors into traditional credit risk models.

Q1. What types of modelling approaches/models are you using for climate-related credit risk assessment? Please select all that apply.

- Integrated assessment models
- Climate-driven cat risk modelling
- Narrative driven quantitative macro modelling
- Combination of existing models with newly developed climate risk models to capture both indirect (existing models) and direct transmission channels (newly developed models)
- Sectoral models
- Counterparty level models
- Counterparty and asset class level models
- Other (please specify)

Q2. Are you incorporating climate risk into your **regulatory and economic capital estimates and provisions**? Please select all that apply.

	Regulatory capital estimates	Economic capital estimates	Provisions
Yes, in Probability of Default (PD)			
Yes, in Loss Given Default (LGD)			
Yes, in Exposure at Default (EAD)			
Yes, in Expected Credit Loss (ECL)			
Yes, in Risk-Weighted Assets (RWA)			
No, we are not incorporating climate risk.			

Other (please specify).

Q3. How do you incorporate climate risk assessments into your Probability of Default (PD)? Please select all that apply.

- Adjusting existing PD models to include climate risk factors

- Overriding by adjusting existing PD model outcomes
- Developing separate climate risk adjustment models for PD
- Using stress testing results to inform PD adjustments at portfolio or obligor level
- Qualitative adjustments of **existing** PD models based on expert judgment
- Qualitative adjustments of PD model **outcomes** based on expert judgement
- External models for incorporating climate risk into PD.
- Calibration of the PD model to incorporate climate risk
- Adjusting the rank ordering of obligors based on climate risk factors (without changing absolute PD values)
- Incorporating margin of conservatism to address data or methodological deficiencies related to climate risk
- Modifying long-run PDs (or downturn)
- Not currently incorporating climate risk into credit risk measurements
- Other (please specify)

Definitions:

Adjusting existing PD models to include climate risk factors. Example: Adding variables like carbon emissions or exposure to physical climate risks into the PD model.

Overriding by adjusting existing PD model outcomes. Example: After running the PD model, manually adjusting the PD for companies highly exposed to climate transition risks.

Developing separate climate risk adjustment models for PD. Example: Creating a standalone climate risk model that generates climate-adjusted PDs, separate from the main PD model.

Using stress testing results to inform PD adjustments at portfolio or obligor level. Example: Incorporating results from climate stress tests to adjust PDs for specific portfolios or individual borrowers, like adjusting for companies in flood-prone regions.

Qualitative adjustments of **existing** PD models based on expert judgment: In this approach, the structure or parameters of the existing PD models are modified using expert judgment before the PD is calculated. The adjustments are applied directly to the model itself based on perceived risks. Example: adjusting the inputs in the PD model to reflect a higher default probability for real estate loans, even before running the model.

Qualitative adjustments of PD model **outcomes** based on expert judgement: In this approach, the PD model is first run to generate default probabilities. After the PDs are calculated, experts review the results and make adjustments based on their understanding of risks. Example: After the PD model calculates default probabilities for various sectors, experts might increase the PDs for coal mining companies due to the heightened risk of regulatory changes or extreme weather events affecting operations.

External models for incorporating climate risk into PD. Example: Incorporation of data from an external climate risk model provided by a third-party vendor. The external model adjusts PD by

linking climate risk exposure to potential revenue loss, operation costs and insurance premiums. The external model adds an additional PD on top of the baseline.

Calibration of the PD model to incorporate climate risk. Example: Adjusting the calibration of the PD model to reflect forward-looking climate risks, such as increased default probability for high-carbon industries.

Adjusting the rank ordering of obligors based on climate risk factors (without changing absolute PD values) Example: Reordering borrowers within a risk category based on climate risk exposure, e.g., ranking renewable energy companies higher than fossil fuel companies without changing the PD itself.

Incorporating margin of conservatism to address data or methodological deficiencies related to climate risk: Example: When climate risk data is lacking to assess the impact of flood risk on a real estate firm, the bank applies a margin of conservatism to the company's probability of default (calculated based on standard financial metrics), based on potential damage and decline in property value, increasing the PD value.

Modifying long-run PDs (or downturn): Example: Initially calculating a long-run PD based on historical financial performance and adjusting/modifying the PD by conducting climate scenario analysis to understand the long-term potential impact of climate risk on a company (e.g. decline in profitability and rising operational costs). A bank can consider downturn or severe scenarios to apply downturn adjustments to the PD, reflecting a worst-case scenario.

Q4. How do you incorporate climate risk assessments into your Loss Given Default (LGD)? Please select all that apply.

- Please select all that apply Adjusting existing LGD models to include climate risk factors
- Overriding by adjusting existing LGD model outcomes
- Developing separate climate risk adjustment models for LGD
- Using stress testing results to inform LGD adjustments at portfolio or obligor/facility level
- Qualitative adjustments of existing LGD models based on expert judgment
- Qualitative adjustments of LGD model outcomes based on expert judgement
- External models for incorporating climate risk into LGD
- Calibration of the LGD model to incorporate climate risk
- Incorporating margin of conservatism to address data or methodological deficiencies related to climate risk
- Modifying long-run LGDs (or downturn)
- Not currently incorporating climate risk into credit risk measurements
- Other (please specify)

Q5. Are you incorporating climate risk factors into your IFRS 9 or CECL estimates?

- Yes
- No
- Not Applicable

- Not sure

If selected "yes" in Q5, answer Q5a:

Q5a. How are you incorporating climate risk factors into your IFRS 9 or CECL estimates? Please select all that apply.

- In-model adjustment of PD, LGD and Macro factors
- Evidence-based Overlay covering PD, LGD and Macro factors (Post-model adjustment)
- Umbrella overlays covering PD, LGD and Macro factors (Post-model adjustment) (i.e., broad, generalized adjustments applied across multiple models)
- Expert judgement on post-model adjustment
- Other (please specify)

If selected "yes" in Q5, answer Q5b (optional):

Q5b. Only for IFRS9: Do you allocate clients to Stage 2 due to climate risk?

Explanation: Under IFRS 9, clients move to Stage 2 if their credit risk has increased significantly. Indicate whether climate risk triggers the movement of clients into Stage 2.

- No, we calculate aggregate add-ons to provisions due to climate risk.(i.e., we apply overall adjustments to provisions but do not stage individual clients based on climate risk.)
- Yes, we identify clients for Stage 2 primarily based on rating overlays.(i.e., we adjust credit ratings based on climate factors, leading to Stage 2 classification.)
- Other (please specify)

Q6. Are you incorporating climate risk factors into your IRB model?

- Yes
- No
- Not sure

If selected "yes" in Q6, answer Q6a:

Q6a. How are you incorporating climate risk factors into your IRB modelling? Please select all that apply.

- In-model adjustment of PD, LGD and Macro factors
- Evidence-based Overlay covering PD, LGD and Macro factors (Post-model adjustment)
- Umbrella overlays covering PD, LGD and Macro factors (Post-model adjustment) (i.e., broad, generalized adjustments applied across multiple models)
- Expert judgement on post-model adjustment
- Other (please specify)

Q7. Have you integrated climate-related factors into your rank ordering models (e.g., credit ratings or scorecards)?

Explanation: This refers to whether and how climate risks (such as physical and transition risks) are considered in your existing models for credit ratings or scoring, either through adjustments (overlays) or newly developed models based on historical data.

- No, climate factors have not been included in our models.
- Yes, we have integrated climate factors using overlays.
- Yes, we have developed new scoring or rating models based on historical climate data.
- Other (please specify)

Q8. Which models are you using to assess the potential impact of climate risks on PD (Probability of Default) and LGD (Loss Given Default)? Please select all that apply.

Please indicate which models you use for each metric.

Model Type	PD	LGD
Merton Model	<input type="checkbox"/>	<input type="checkbox"/>
Adjustments to Internal Credit Rating Models	<input type="checkbox"/>	<input type="checkbox"/>
Machine Learning Models	<input type="checkbox"/>	<input type="checkbox"/>
Regression Models	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>
Not applicable (please specify)	<input type="checkbox"/>	<input type="checkbox"/>

Q9. How do you use the information from client's (this can include large corporates and SMEs) transition plans in your climate-related PD modelling? Please select all that apply.

- Estimate the financial impact of implementing the transition plan, such as changes in costs
- Evaluate the impact of the transition plan on client revenue
- Adjust the parameters of the PD model based on the transition plan
- Information used post modelling to engage with clients on their exposure to the outputs of the assessment
- Information used post modelling to track a client's progress for climate risk management
- We currently do not use information from clients' transition plans
- Other (please specify)

Definition:

Client transition plans: A client transition plan is a set of goals, actions, and accountability mechanisms a banks client sets to align their business activities with a pathway for net-zero GHG emissions that delivers real-economy emissions reductions in line with achieving global net zero.

If selected “Adjust the parameters of the PD model based on the transition plan” in Q9, answer Q9a:

Q9a. Please specify how you are adjusting the parameters of the PD model. (For example, sector-specific risks, operational and financial risk metrics, ESG ratings...)

Q10. Which of the following validation practices are used within your climate modelling? Please select all that apply

- Evaluation of conceptual soundness
- Ongoing monitoring, including process verification
- Data Validation
- Benchmarking
- Outcome analysis, including back-testing.
- Ensuring model completeness
- Vendor model alignment
- Expert judgement
- Historical data analysis
- Documentation and reporting
- Other (please specify)

Q11. What are the uncertainties associated with the models you use for climate risk assessment? Please select all that apply

- Sensitive to market volatility
- Subjective adjustments may introduce bias and inconsistency
- Data quality and availability
- Model transparency
- Potential overfitting
- Sensitive to model assumptions
- Challenges in capturing the long-term nature of climate risks
- Limited sustainability expertise
- Other (please specify)

Q12. Do you assess the impact of alternative assumptions and methodologies on the final modelled measures?

- Yes
- No
- Other (please specify)

Definition:

Alternative assumptions and methodologies: Consideration of more than one approach to integrate climate risk into credit modelling

If selected “yes” in Q12, answer Q12a:

Q12a. How do you assess the impact of alternative assumptions and methodologies on the final modelled measures?

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Materiality Assessment

Section overview:

Methodologies for assessing the materiality of physical and transition risks.

Q13. What time horizons are you using for your risk assessment for the following climate risk type?
Please select all that apply.

Time horizon	Physical risk	Transition risk
0-3 years		
3-10 years		
10-20 years		
20-30 years		
50-100 years		

Q13a. For each of the time horizon selected, please specify where you are using (i.e, stress testing, PD, LGD modelling,etc.)

Q14. Which of the following practices have you incorporated for your materiality assessment?²
Please select all that apply.

- Map out a spectrum of climate risk drivers to identify transmission channels
- Risk assessment methods to assess the materiality of exposures
- Set materiality thresholds and follow-up actions
- Materiality is not yet incorporated
- Other (please specify)

Q15. Which of the following processes have you conducted for a materiality assessment?³ Please select all that apply.

The question focuses on understanding which risk assessment methods banks are using to determine materiality of physical and transition risk drivers.

- Exposure analysis
- Sensitivity analysis
- Business continuity analysis
- Collateral analysis

² Options are from

<https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.thematicreviewcercompendiumgoodpractices112022~b474fb8ed0.en.pdf>

³ Options are from

<https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.thematicreviewcercompendiumgoodpractices112022~b474fb8ed0.en.pdf>

- Country analysis
- Qualitative scenario analysis
- Quantitative scenario analysis
- Portfolio alignment
- Not applicable
- Other (please specify)

Q16. Have you taken any of the follow-up actions as a response to identified areas of material climate risks?⁴ Please select all that apply.

- Update to risk inventory based on climate risk drivers identified

Example: Mapping of the various climate risk drivers, their transmission channels and theoretical impact on prudential risk categories.

- Inform policies and strategies

Example: Deciding to reduce exposure to certain climate-sensitive activities, client types or sectors and/or increase exposure to climate-resilient ones.

- Recalibrate sector limits in risk appetite statement / credit underwriting principles

Example: For sectors that are sensitive to physical and/or transition risks, the institution deploys haircuts to the institutions' exposure at default sector limits

- Re-assessment of risk coverage in stress testing
- Allocate economic capital or capital buffers as part of the banks pillar 2 framework to manage material climate risk drivers

Example: Institutions allocate economic capital specifically to the management of material transition and physical risk drivers. In the various cases, economic capital allocated typically based on the outcome climate-related scenario analyses (e.g. NGFS scenarios, business continuity scenarios). In some cases, institutions have decided to reflect climate risks as part of the management buffer.

- We have not taken any follow-up actions as a response
- Not applicable
- Other (Please specify)

⁴ Options are provided from <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.thematicreviewcercompendiumgoodpractices112022~b474fb8ed0.en.pdf>

Survey Part 2: Transition Risk

The questions in the section focus on understanding the methodologies used banks to assess transition risks (as part of their credit risk assessment), understanding the transition risk drivers used and the key assumptions incorporated.

Q1. Which of the following transition risk metrics does your institution use for given use cases (e.g. risk appetite, underwriting criteria, pricing, climate risk reporting, IFRS 9 or CECL provisions) to assess credit risk related to transition risks? Please select all that apply.

Description: Transition risk metrics that assess the exposure of your credit risk counterparties to risks associated with transitioning to a low-carbon economy. These risks include policy and legal risk, technology risk, market risk, and reputational risk.

Metric	Risk Appetite	Underwriting Criteria	Pricing	Climate Risk Reporting	IFRS 9 or CECL Provisions	Not used
Scope 1 emissions of a company						
Scope 2 emissions of a company						
Scope 3 emissions of a company						
Financed emissions						
Emissions Per Unit Revenue of a company						
Emissions Per Unit of Output of a company (e.g. kWh, tonne of steel, etc)						
Revenue At Risk						
Assets at risk of being stranded						
Total energy consumption of a company						
Energy consumption mix of a company (green vs brown)						
Net Asset Value Exposure to Different Energy Sources						
Percent of portfolio revenue generated from green / brown technology						
Percentage investment into BAU brown vs new green						
Emission reduction targets and progress						
Absolute investment in low-carbon technologies						
Comparison of investment in low-carbon technologies to other investments						

Fossil fuel exposure						
Transition Value at Risk						
Transition risk score in the real estate portfolio (exposures weighted average EPC ratings) for the Commercial and Residential real estate						
Distribution of share of EPC buckets per country						
Distribution of actual vs estimated EPC						

Other metrics and or use cases (please specify)

Transition risk metrics definitions

Emissions from a Company: This metric refers to the total amount of greenhouse gases (GHGs) emitted directly by a company (Scope 1), indirectly from purchased electricity (Scope 2), and indirectly from the company's value chain (Scope 3). This helps in assessing a company's overall carbon footprint and its contribution to climate change.

Financed Emissions: Financed emissions are the GHG emissions associated with the assets and projects a financial institution finances or invests in.

Emissions Per Unit Revenue: This is the ratio of total emissions (usually Scope 1 and 2) to the revenue generated by a company.

Revenue At Risk: Revenue at risk quantifies the proportion of a company's revenue that could be impacted by climate-related transition risks, such as policy changes, market shifts, or reputation damage.

Assets at Risk of Being Stranded: This metric identifies assets that could lose value or become obsolete due to the transition to a low-carbon economy (e.g., fossil fuel reserves that might not be extracted).

Net Asset Value Exposure to Different Energy Sources: This measures the proportion of a company net asset value (NAV) that is tied to various energy sources (e.g., coal, oil, renewables).

Percent of Portfolio Revenue Generated from Green/Brown Technology: This metric shows the percentage of revenue in a portfolio generated from technologies considered green (e.g., renewable energy) versus brown (e.g., fossil fuels). It primarily refers to the operational revenue generated by the companies or assets in the bank's portfolio from their business activities in either green or brown technologies.

Percentage investment into BAU brown vs new green: the proportion of total investment made by a company into traditional, carbon-intensive industries (brown) versus sustainable, low-carbon technologies (green).

Emission Reduction Targets and Progress: This tracks a company's or portfolio's goals for reducing emissions and the progress made towards those targets over time.

Absolute investment in low-carbon technologies: The total capital or percentage of funds allocated to technologies that contribute to reducing carbon emissions by a company

Comparison of investment in low-carbon technologies to other investments: the relative proportion of funds allocated to low-carbon technologies compared to other types of investments made by a company.

Fossil Fuel Exposure: The extent to which a company's operations or a portfolio's investments are tied to fossil fuels (e.g., coal, oil, gas).

Transition Value at Risk: A financial metric used by a financial institution, estimating the potential loss in portfolio value due to transition risks (e.g., policy changes, technological advancements).

Transition Risk Score in Real Estate Portfolio (EPC Ratings): This score is based on the weighted average of Energy Performance Certificate (EPC) ratings across a real estate portfolio, reflecting the energy efficiency and potential transition risks.

Distribution of Share of EPC Buckets per Country: The proportion of properties in different EPC rating categories (A-G) within a real estate portfolio, broken down by country.

Distribution of Actual vs. Estimated EPC: Compares the real EPC ratings of properties against their estimated values.

Q2. Which balance sheet metrics (e.g., Revenue, Debt, Total Assets, Total Liabilities, Profitability) do you consider to be most impacted by transition risk?

Q3. Select the following approaches you use to collect scope 3 data for your clients. Please select all that apply.

- Using reported emissions data from clients
- Estimating emissions through activity data
- Estimating emissions using industry averages
- Estimating emissions using public emission factors
- Use of input-output models
- Machine learning
- Modelling approaches such as linear regression, median, production-based models, etc.
- Not currently collecting client's scope 3 data
- Other (please specify)

Definition:

Scope 3 Data: Scope 3 data refers to indirect greenhouse gas (GHG) emissions resulting from a company's value chain, including activities such as supplier operations, product use, and waste disposal.

Q4. Do you use PCAF (Partnership for Carbon Accounting Financials) methodology in your emission calculations?

Explanation: PCAF (Partnership for Carbon Accounting Financials) methodology is an approach to measure and disclose the greenhouse gas (GHG) emissions

- Yes

- No
- Unsure

If selected "yes" in Q4, answer Q4a.

Q4a. Please provide your best estimate for the percentage of each portfolio where you are able to measure Scope 3 financed emissions according to the PCAF data quality scale. If you are unable to report an estimate percentage for any of the asset classes, you may leave it blank.

Each column should sum to 100%.

Context: Scope 3 emissions refer to indirect emissions in a company's value chain. The PCAF data quality scale ranks the quality of data from direct measurements to broad estimates. PCAF defines a system of data scoring that ranks a dataset from one to five, with one representing the highest quality data, and 5 the lowest quality. Scores 4 and 5 represent estimated emissions based on financial data, which is assessed as lower quality than emissions calculated by portfolio companies using the GHG Protocol Corporate Accounting and Reporting Standard. The latter will result in a score 2, or 1, if verified by a third party.

PCAF Asset Classes	Listed Equity and Corporate Bonds	Business Loans and Unlisted Equity	Commercial Real Estate	Mortgages (Residential Real Estate)	Project Finance	Motor Vehicle Loans	Sovereign Debt
Score 1 (Highest quality)	Value selection 0 to 100%(column should sum 100%)						
Score 2							
Score 3							
Score 4							
Score 5 (Lowest quality)							

PCAF Asset Classes Included:

Listed Equity and Corporate Bonds:

This asset class includes all on-balance sheet listed corporate bonds and all on-balance sheet listed equity that are traded on a market and are for general corporate purposes

Business Loans and Unlisted Equity:

Includes loans to both large corporations and SMEs, as well as private equity investments.

This category encompasses the broader range of corporate financing activities.

This asset class comprises business loans and equity investments in private companies, also referred to as unlisted equity.

Business loans include all on-balance sheet loans and lines of credit to businesses, nonprofits, and any other structure of organization that are not traded on a market and are for general corporate purposes

Unlisted equity includes all on-balance sheet equity investments to businesses, nonprofits, and any other structure of organization that are not traded on a market and are for general corporate purposes

Commercial Real Estate:

This asset class includes on-balance sheet loans for specific corporate purposes, namely the purchase and refinance of commercial real estate (CRE), and on balance sheet investments in CRE when the financial institution has no operational control over the property.

This definition implies that the property is used for commercial purposes, such as retail, hotels, office space, industrial, or large multifamily rentals. In all cases, the owner of the building uses the property to conduct income-generating activities.

Mortgages:

This asset class includes on-balance sheet loans for specific consumer purposes - namely the purchase and refinance of residential property, including individual homes and multi-family housing with a small number of units. This definition implies that the property is used only for residential purposes and not for commercial activities.

Project Finance:

This asset class includes all on-balance sheet loans or equities to projects or activities that are designated for specific purposes, i.e., with known use of proceeds as defined by the GHG Protocol. The financing is designated for a defined activity or set of activities, such as the construction and operation of a gas-fired power plant, a wind or solar project, or energy efficiency projects.

Motor Vehicle Loans:

This asset class refers to on-balance sheet loans and lines of credit to businesses and consumers for specific (corporate or consumer) purposes - namely the finance one or several motor vehicles

Sovereign Debt:

This asset class includes sovereign bonds and sovereign loans of all maturities issued in domestic or foreign currencies. Both sovereign loans and bonds lead to the transfer of funds to the country, which in turn creates a debt obligation to be repaid by the borrowing country.

Third-party related

Q5. For which of the following transition risk drivers are you using the support of third-party vendors and specify whether the third-party vendor is used to gather climate science data or to translate data to integrate credit risk measurements.

Transition Risk Drivers	Types of third-party vendor use
Climate-related policies and regulation	Options: A) Use third party vendor to collect climate data B) Use third party vendor to translate data to integrate credit risk measurements C)Both A and B D) We do not use third party vendors E) Other Please specify
Changes in technology	
Consumer preferences	
Legal risks	
Reputational risks	

Policy and Legal Risk

Q6. Which forward-looking transition risk indicators are you using to assess Legal Risks? Please select all that apply.

- Compliance breach likelihood
- Potential legal impact of future regulation
- Not Applicable/ We do not assess legal risks
- Other (please specify)

Q6a. Please specify underlying key assumptions and methodologies you use for each indicator selected.

Q7. Which forward-looking transition risk indicators are you using to assess policy risks? Please select all that apply.

- Government policies and changes to policy
- Carbon pricing scenarios
- Regulatory change forecasts
- Climate policy alignment
Fiscal policy (example tax incentives and capital investment allowances)
- Not Applicable/ We do not assess policy risks
- Other (please specify)

Q7a. Please specify underlying key assumptions and methodologies you use for each indicator selected.

Technology Risk

Q8. Which forward-looking transition risk indicators are you using to assess Technology Risks? Please select all that apply.

- Emerging new technologies
- Innovation adoption rates
- R&D investment in green tech
- Technological obsolescence risk
- Technology learning curves
- Not Applicable/ We do not assess technology risks
- Other (please specify)

Q8a. Please specify underlying key assumptions and methodologies you use for each indicator selected.

Market Trends

Q9. Which forward-looking transition risk indicators are you using to assess market risks (e.g. change in consumer preferences and shift in market due to a transition to a low-carbon economy)? Please select all that apply.

- Market demand, consumer behaviour shifts
- Green investment trends
- Commodity price volatility
Carbon prices and Carbon Border Adjustment Mechanism (CBAM)
- Not Applicable/ We do not assess risks related to market changes
- Other (please specify)

Q9a. Please specify underlying key assumptions and methodologies you use for each indicator selected.

Reputational Risk

Q10. Which forward-looking transition risk indicators are you using to assess Reputational Risks? Please select all that apply

- Stakeholder perception indices
- Media sentiment analysis
- Brand value impact from climate issues
- Wallet shares and league tables
- Not Applicable/ We do not assess reputational risks

- Other (please specify)

Q10a. Please specify underlying key assumptions and methodologies you use for each indicator selected.

Survey Part 3: Physical Risk

Section overview:

The questions in the section focus on understanding the methodologies used banks to assess physical risks, understanding the physical risk drivers used and the key assumptions incorporated.

Q1. Which physical risks are modelled by your institution? Please select all that apply

- Temperature rise and heat stress
- Drought and water stress
- Sea-level rise
- Rise in precipitation
- Cyclones, typhoons and hurricanes
- Rise in wind speed and tornadoes
- Flooding
- Wildfires and bushfires
- Permafrost melting
- Other (please specify)
- Have not modelled physical risk yet*

* **Note:** If you select "Have not modelled physical risk yet," you will automatically skip the Physical Risk section.

Q2. Which of the following **physical risk metrics** are being used for given use cases (risk appetite, underwriting criteria, pricing, climate risk reporting, IFRS 9 or CECL provisions) by your institution to assess physical risk related credit risk? Please select all that apply.

Metric	Risk Appetite	Underwriting Criteria	Pricing	Climate Risk Reporting	IFRS 9 or CECL Provisions	Not Used
Percentage of portfolio exposed areas with direct asset level physical risks						
Percentage of portfolio exposed to insured losses due to climate events						

Percentage of at-risk properties in real estate						
Frequency and duration of business operation interruptions due to extreme climate events						
Impact from supply chain disruption						
Ratings of asset resilience to physical climate risks						
Implied temperature rise						
Extreme weather event frequency and severity metrics						
Physical Value at Risk						
Distribution of portfolio per physical risk hazard and severity of physical risks						
Impact of change in market expectation of future climate change on asset valuation						

Other (please specify other metrics or use cases)

Physical Risk Metrics

Percentage of Portfolio Exposed to Areas with Direct Asset-Level Physical Risks: The proportion of assets in a portfolio located in regions susceptible to physical climate risks (e.g., floods, hurricanes).

Percentage of Portfolio Exposed to Insured Losses Due to Climate Events: The percentage of assets in a portfolio that could suffer insured losses from climate-related events.

Percentage of At-Risk Properties in Real Estate: The share of real estate properties in a portfolio that are at risk due to climate-related events.

Frequency and Duration of Business Operation Interruptions Due to Extreme Climate Events: Tracks how often and for how long business operations are disrupted by extreme climate events.

Impact from Supply Chain Disruption: Measures the financial or operational impact on a company due to disruptions in its supply chain caused by climate events.

Ratings of Asset Resilience to Physical Climate Risks: Scores or ratings that assess the ability of assets to withstand physical climate risks.

Implied Temperature Rise: The estimated increase in global average temperature associated with the current or projected emissions of a company or portfolio.

Extreme Weather Event Frequency and Severity Metrics: Data on how often and how severely extreme weather events occur, affecting assets in a portfolio.

Physical Value at Risk: A financial estimate of potential losses in asset value due to physical climate risks.

Distribution of Portfolio per Physical Risk Hazard and Severity of Physical Risks: A breakdown of a portfolio’s exposure to different types of physical climate risks (e.g., floods, heatwaves) and their severity.

Q3. Please select the physical risk elements that are being incorporated into your risk assessment. Please select all that apply

Note: Direct impacts are termed first-order physical hazards, and the wider impacts are term second-order risks

- First order impact: Direct damage to property and assets
- Second order impact: Indirect impacts caused by deteriorating macro environment or damage to local infrastructure
- Other (please specify)

Q4. Select the transmission channels being used to model first order and second order impact. Please select all that apply.

Transmission Channel	First Order Impact (select all that apply)	Second Order Impact(select all that apply)
Infrastructure damage and outage		
Impacts on regional supply chains		
Impacts on global supply chains		
Increased political unrest		
Climate migration		
Financial stability risks		
Labour productivity		
Increased insurance costs		
Market value decline in assets		
Other (please specify)		

Q5. Select the physical hazard types being used to model first order and second order risks. Please select all that apply.

Please note that Q1 asks the types of physical hazards that are being directly modelled as part of your credit risk assessment. Q5 aims to understand how banks incorporate first order and second order risks by providing a subset of physical hazard types to examine whether banks are modelling these as first order or second order. Certain responses in Q5 may overlap with responses from Q1.

Physical hazard types	First Order Risks (select all that apply)	Second Order Risks (select all that apply)
Impact from climate tipping points		
Water scarcity		
Increased frequency and severity of extreme weather events		
Rising sea levels		
Changes in precipitation patterns		
Heatwaves and increased temperatures		
Changes in ocean currents and temperature		
Changes in biodiversity		

Definitions:

Physical hazard types for first order risks: Direct and immediate hazards posed by climate-related events that can lead to damage or disruption.

Physical hazard types for second order risks: Indirect hazards that emerge as a result of first-order hazards. They often involve complex interactions and can manifest over time, leading to broader risks.

Q6. Which balance sheet metrics (e.g., Revenue, Debt, Total Assets, Total Liabilities, Profitability) do you consider to be affected by physical risk?

Q7. What are the underlying assumptions and methodologies used by you for calculating credit risk driven by acute physical risk?

(For example, integration of data on cyclones from the NGFS Phase 4 current policies scenario with country-level projections till 2050)

Q8. What are the underlying assumptions and methodologies used by for calculating credit risk driven by chronic physical risk?

(For example, use of projections by the IPCC on sea-level rise, integrated with projections by National Oceanic and Atmospheric Administration/European Space Agency/etc.)

Q9. For which of the following physical risk types are you using the support of third-party vendors and specify whether the third-party vendor is used to gather climate science data or to translate data to integrate credit risk measurements.

Options:

- A) Use third party vendor to collect climate data
- B) Use third party vendor to translate data to integrate credit risk measurements
- C) Both A and B
- D) We do not use third party vendors
- E) Other Please specify

Physical Risk Types	Types of third-party vendor use
Temperature rise and heat stress	
Drought and water stress	
Sea-level rise	
Rise in precipitation	
Cyclones, typhoons and hurricanes	
Rise in wind speed and tornadoes	
Flooding	
Wildfires and bushfires	
Permafrost melting	
Other (please specify)	

Q10. Which of the following are used for constructing damage functions? Please select all that apply.

- Logistic regression models
- Generalised linear models
- Historical damage data analysis (analysing historical data of past events and their impact on similar assets)
- Damage scoring systems (categorise damage into different scores based on historical data and expert judgement, e.g 0 is no damage and 5 is total loss)
- Engineering models (e.g. hydraulic models for flood damage on structures)
- Stochastic event models
- Hazard-specific catastrophe model (e.g. wind damage models or storm surge models)
- Vulnerability assessment model
- Insurance claim model
- Financial loss models (e.g. business interruption and replacement cost)

- Expert judgement
- Other

Definitions:

Damage function estimate the relationship between the occurrence and severity of hazards (e.g., floods, hurricanes, heatwaves) and their potential economic impacts on assets or financial portfolios.

- Logistic Regression Models: A statistical method that estimates the probability of damage occurring based on factors like asset characteristics and hazard intensity.
- Generalised Linear Models (GLMs): Linear-based regression models that relate the expected value of damage to hazard intensity.
- Historical Damage Data Analysis: Analyzing past climate events and their impact on similar assets to estimate future damage based on observed patterns.
- Damage Scoring Systems: A method that categorizes damage into predefined levels or scores, such as from 0 (no damage) to 5 (total loss).
- Engineering Models: Technical models, like hydraulic or structural simulations, used to assess how specific hazards impact the physical integrity of assets.
- Stochastic Event Models: Models used to estimate the probability of various outcomes.
- Hazard-Specific Catastrophe Models: Models designed for specific hazards (e.g., wind, storm surge), using historical data and scientific modeling to estimate the damage caused by extreme events.
- Vulnerability Assessment Model: A model that evaluates the sensitivity of assets or regions to specific hazards.
- Insurance Claim Model: A model built from historical insurance claim data to estimate the likelihood and severity of damage claims following a climate event.
- Financial Loss Models: Models that assess the economic impact of damage, including direct costs like replacement and repair, as well as indirect losses such as business interruption.
- Expert Judgement: Qualitative assessments from experts to estimate potential damage based on their expertise.

Q11. Have you taken into account tipping points for assessing physical risk?

- Yes, comprehensively: We have fully integrated tipping points into our physical risk assessments.
- Yes, partially: We have considered tipping points in some aspects of our assessments.
- No, but planning to: We are planning to integrate tipping points into our future assessments.
- No, not currently considered: Tipping points are not currently included in our physical risk assessments.
- Unsure

If selected “Yes, comprehensively” or “yes partially” in Q11, answer Q11a:

Q11a. Which of the following methods do you use to include tipping points in your risk assessment?
Please select all that apply.

- Assessing the impact of small incremental increases in warming (e.g. 0.05C) on portfolios
- Incorporating climate tipping point modules into climate scenario analysis
- Reverse climate stress test
- Expert Judgement
- Other (please specify)

Q12. Are you considering compound risks. If yes, describe how.

- Yes
- No

Definition:

Compound risk is where two or more climate risk drivers (physical or transition risk drivers) affect each other to increase the overall severity of risk.⁵

If selected “yes”, provide further details below.

⁵ <https://www.carbonbrief.org/guest-post-how-to-assess-the-multiple-interacting-risks-of-climate-change/>

Survey Part 4: Climate related Collateral Value Adjustments

Climate risks, such as physical risks (e.g., flooding, storms) and transition risks (e.g., regulatory changes, carbon pricing), can affect the long-term value of collateral assets, especially in sectors like real estate and transportation. It is essential to understand how these risks are being factored into collateral valuations.

Adjusting Collateral Values for Physical Risk

Q1. Are you adjusting current collateral values (appraisals) to account for future physical risks?

- Yes, we are considering future physical risks
- Not currently, but we are working on it
- No, we are not considering future physical risks at this time

If selected "Yes" or "Working on it" in Q1, answer Q1a:

Q1a. To what extent are physical risks (e.g., floods, wildfires, storms) accounted for in your institution's collateral valuation process? Please select all that apply.

Explanation: Physical climate risks can impact the value and recovery rates of collateral (e.g., real estate, infrastructure) due to potential damage or increased insurance costs. Financial institutions may apply valuation haircuts or require internal/external valuers to incorporate these risks into their assessments.

- **Significant adjustments (haircuts) are applied to collateral valuations to account for physical risks**
Example: Properties located in flood-prone areas or regions vulnerable to wildfires receive substantial haircuts on their valuations to reflect the increased risk of damage.
- **Moderate adjustments are applied, but only for high-risk assets or regions**
Example: Valuers apply moderate reductions in value for properties in regions with moderate exposure to physical climate risks, such as coastal areas with rising sea levels.
- **Minimal or no adjustments are applied, but valuers are encouraged to consider physical risks in their assessments**
Example: No formal haircuts are applied, but internal or external valuers are encouraged to consider the property's exposure to climate risks as part of their valuation process.
- **Internal or external valuers are formally required to assess and incorporate physical risks into their valuations**
Example: Your institution's policies mandate that valuers incorporate climate-related risks such as storm damage or rising insurance premiums into their valuations.

- **No formal process is in place to adjust collateral valuations for physical risks**
Example: Collateral valuation processes do not yet formally account for climate-related physical risks.
- **Other (please specify)**

If selected "Yes" or "Working on it" in Q1, answer Q1b:

Q1b. How do you account for future discounted expected losses when adjusting collateral values due to physical risk?

Explanation: This refers to whether the appraised value of the collateral is reduced by the full amount of future expected losses or if a smaller reduction is applied to account for uncertainties or other considerations.

- We reduce collateral values by the full amount of future discounted expected losses. (i.e., the collateral value is fully reduced by the total sum of future expected losses over its life)
- We reduce collateral values by less than the full amount of future discounted expected losses. (i.e., we apply a smaller reduction, not the full sum of future expected losses)
- Other (please specify)

Adjusting Collateral Values for Transition Risk

Q2. Are you adjusting current collateral values (appraisals) to account for future transition risks?

- Yes
- Not currently, but we are working on it
- No, we are not considering future **transition** risks at this time.

Q2a. How do you account for future discounted expected losses when adjusting collateral values due to transition risk?

Explanation: This refers to whether the appraised value of the collateral is reduced by the full amount of future expected losses or if a smaller reduction is applied to account for uncertainties or other considerations.

- We reduce collateral values by the full amount of future discounted expected losses. (i.e., the collateral value is fully reduced by the total sum of future expected losses over its life)
- We reduce collateral values by less than the full amount of future discounted expected losses. (i.e., we apply a smaller reduction, not the full sum of future expected losses)
- Other (please specify)

If selected "Yes" or "Not currently, but we are working on it" in Q2, answer Q2b:

Q2b. To what extent are transition risks (e.g., regulatory changes, shifts to low-carbon technologies) accounted for in your institution's collateral valuation process? Please select all that apply

Definition: Transition risks related to climate change, such as regulatory mandates or market shifts toward low-carbon technologies, can reduce the value of collateral in high-emission sectors. Financial institutions may apply haircuts or challenge internal/external valuers to consider these risks.

- Significant adjustments (haircuts) are applied to collateral valuations to account for transition risks

Example: Collateral such as factories or transportation infrastructure tied to fossil fuel production or carbon-intensive industries receives significant haircuts to reflect transition risks like carbon pricing or regulations phasing out high-emission technologies.

- Moderate adjustments are applied to high-carbon or high-emission assets, based on industry or regulatory exposure

Example: Properties or assets in industries heavily exposed to carbon taxes or regulations (e.g., oil and gas, coal mining) receive moderate valuation haircuts.

- Minimal or no adjustments are applied, but valuers are encouraged to consider transition risks

Example: No formal reductions in value are applied, but internal/external valuers are encouraged to assess the impact of potential regulatory changes (e.g., carbon pricing) on the value of the collateral.

- Internal or external valuers are formally required to assess and incorporate transition risks into their valuations

Example: Valuers are mandated to adjust valuations for assets exposed to transition risks, such as commercial properties that require retrofitting to meet new energy efficiency standards.

- No formal process is in place to adjust collateral valuations for transition risks

Example: Collateral valuation processes do not yet formally account for transition risks, such as regulatory changes or market shifts toward low-carbon alternatives.

- Other (please specify)

Survey Part 5: Exposure Class and Sector Specific

Sector overview: This section focuses on methodologies used by banks to assess climate-related credit risk for specific sectors.

Q1. Select which of the following practices are being used for sectoral models for **transition** risk related credit risk. Please select all that apply.

List of sectors to selected by user:

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction

	Sectors that are selected by user
Adaptation of currently used macroeconomic models	
Creation of new macroeconomic models with enhanced granularity and variables	
Creation of new models which include climate related variables (e.g. carbon price, GHG emissions) on PDs	
Incorporation of external models to estimate the impact of direct transmission channels	
Use of Climate Stress Testing	
Scenario Analysis	
Cross-Sectoral Analysis	
Use of External Data Sources (satellite data, climate models, and third-party assessments)	

Q2. Select which of the following practices are being used for sectoral models for **physical** risk related credit risk. Please select all that apply.

List of sectors to selected by user:

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper

- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction

	Sectors that are selected by user
Adaptation of currently used macroeconomic models	
Creation of new macroeconomic models with enhanced granularity and variables	
Creation of new models which include climate related variables (e.g. carbon price, GHG emissions) on PDs	
Incorporation of external models to estimate the impact of direct transmission channels	
Use of Climate Stress Testing	
Scenario Analysis	
Cross-Sectoral Analysis	
Use of External Data Sources (satellite data, climate models, and third-party assessments)	

Q3. For which of the following sectors are you using the support of third party vendors and specify whether the third party vendor is used to gather climate science data or to translate data to integrate credit risk measurements. Please select all that apply.

List of sectors to selected by user:

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction

	Sectors that are selected by user
Physical risk	
Transition risk	

Q4. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Transportation and Storage sector**? Please select all that apply.

- Vehicle sales (composition of ICE and EV vehicles)
- Fuel cost
- Fuel mix (carbon intensive versus less-carbon intensive alternatives)
- Fuel efficiency of vehicles
- Compliance with new regulation and related costs
- Research and development
- Infrastructure vulnerabilities
- Supply chains and logistics
- Insurance costs
- Other (please specify)

Q5. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Oil and Gas** sector? Please select all that apply.

- Impact of new regulation on costs and operations
- Potential for stranded assets
- Advancements in alternative green energy sources (e.g. renewables)
- Market demand and change in consumer preferences
- Labour productivity
- Other (please specify)

Q6. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Mining of coal and lignite, metal ores and other mining and quarrying** sector? Please select all that apply.

- Commodity price volatility
- Energy consumption
- Market demand
- Compliance to new regulations
- Operational vulnerability to extreme weather events
- Water need and availability
- Other

Q7. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Electricity and Energy Supply sector**? Please select all that apply.

- Energy source mix
- Compliance with new regulations related to emissions and fossil fuels and renewable energy mandates
- Financial implications of decommissioning of power plants
- Grid integration and storage capacity

- Operational efficiency of power plants
- Grid efficiency and losses
- Research and technological development
- Cost and availability of critical materials
- Temperature sensitivity of power plants
- Water consumption for power generation
- Other (please specify)

Q8. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Agriculture, Forestry and Fishing sector**? Please select all that apply.

- Agricultural yield
- Yield sensitivity
- Crop mix
- Crop adaptability
- Water availability
- Water use and efficiency
- Growing season length
- Available technologies and resiliency practices/innovation
- Supply chains
- Agricultural demand
- Other (please specify)

Q9. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **Manufacturing of minerals, chemicals, basic metals, pharmaceutical and rubber sector**? Please select all that apply.

- Regulatory compliance due to environmental impact of operations
- Market demand
- Market volatility
- Supply chain dependencies
- Technological advancements
- Other (please specify)

Q10. Are you considering feedback loops such as cross-sector spillover and macroeconomic feedback?

- Yes
- No
- Not sure
- Not applicable

Definition: An interaction in which a perturbation in one climate quantity causes a change in a second and the change in the second quantity ultimately leads to an additional change in the first.⁶

If selected "yes" in Q10, answer Q10a.

Q10a. Please specify.

Real Estate Activities and Construction Related

*Please skip this section if you currently do not assess climate-related credit risk for the real estate activities and construction related sector.

Q11. What are the underlying factors included in the assumptions and methodology for assessing climate-related credit risks for the **real estate activities and construction sector**? Please select all that apply.

- Property value trends
- Insurance costs
- Compliance costs for new regulation and building codes
- Building resilience
- Property vulnerability to physical risks
- Energy efficiency and carbon footprint of buildings
- Other

Property value trends

Example: Assumptions regarding how climate risks (e.g., flooding, extreme weather) may impact property values over time.

Insurance costs

Example: Rising insurance premiums due to increased physical risks (e.g., flood, fire) for properties in vulnerable areas.

Compliance costs for new regulation and building codes

Example: Costs associated with meeting new environmental standards, energy efficiency requirements, or climate resilience building codes.

Building resilience

Example: The degree to which a property is designed or retrofitted to withstand climate-related risks (e.g., storms, heatwaves).

⁶ <https://www.bis.org/bcbs/publ/d518.pdf>

Property vulnerability to physical risks

Example: The location and condition of properties in areas prone to flooding, sea level rise, or other extreme climate events.

Energy efficiency and carbon footprint of buildings: Example: the energy performance of properties, their carbon emissions, and the impact on market value and attractiveness for tenants or buyers.

Q12. What are the metrics considered for real estate? Please select all that apply.

- Geolocation
- Energy certificate
- Property Value
- Environmental Risks
- Building Age and Condition
- Property archetype
- Energy performance score in kwh/m² of collateral
- Other (please specify)

Q13. What energy efficiency measurements do you use for real estate? Please select all that apply.

- Energy Performance Certificate (EPC)
- Energy efficiency performance
- Internal energy efficiency proxy measures
- Not applicable
- Other (please specify)

Energy Performance Certificate (EPC): A standardized certification issued for properties that rates the building's energy efficiency on a scale, typically from A (most efficient) to G (least efficient). This is widely used across various countries to assess real estate energy performance.

Energy Efficiency Performance: This refers to quantitative metrics or standards your bank uses to measure the overall energy consumption or energy efficiency of a property portfolio. These could include specific energy usage targets (e.g., kilowatt-hours per square meter) or similar performance-based criteria.

Internal Energy Efficiency Proxy Measures: These are non-standardized, internal methods or proxies your bank may use to approximate the energy efficiency of a real estate portfolio, in cases where official certifications or direct measurements may not be available.

Other: Any additional or alternative measures your bank uses to assess energy efficiency that do not fit into the above categories. Please specify.

Q14. Do you take into consideration if properties will be insured (such as insurance and/or government relief schemes) or not in the future as part of your climate-related credit risk assessment?

- Yes
- No

- Not sure
- Other (please specify)

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Survey Part 6: Scenario Analysis

Section overview: This section focuses on banks' scenario analysis, including common scenarios used, methodologies for scenario expansions and key variables used.

Methodology for modelling parameters (PD, LGD)

Q1. When calculating add-ons to current parameters (e.g., Probability of Default (PD), Loss Given Default (LGD), Expected Loss (EL)), are you considering the impact of:

Please select all that apply.

- A gap between two scenarios
- A single scenario
- Other (please specify)

Definition of gap: Change in a variable between two scenarios

If "A gap between two scenarios" option is selected in Q1, answer Q1a:

Q1a. If you use the gap between scenarios, which scenarios do you consider for the calculation? Please select all that apply.

- Orderly transition – Hot House World
- Disorderly transition – Hot House World
- Other (please specify)

If "A single scenario" option is selected in Q1, answer Q1b:

Q1b. Which scenario do you use if considering only a single scenario in your modelling approach? Please select all that apply.

- Orderly transition
- Disorderly transition
- Hot House World
- Other (please specify)

Q2. Which of the following climate scenario types do you use for your climate-related credit risk assessment for each Transition and Physical Risk? Please select all that apply.

	Transition Risk	Physical Risk
Internally developed scenarios		
NGFS reference scenarios		

Regulatory Climate Stress Test scenarios which are based on NGFS scenarios		
Regulatory Climate Stress Test scenarios which aren't based on NGFS scenarios		
Other publicly available scenarios		
We do not conduct scenario analysis for this climate risk type		

Other, please specify

If “Regulatory Climate Stress Test scenarios which are based on NGFS scenarios” is selected in Q2, answer Q2a:

Q2a. Which of the following NGFS scenarios are regulatory climate stress testing scenarios based on? Please select all that apply.

- Current policies
- Nationally Determined Contributions (NDCs)
- Net Zero 2050
- Divergent Net Zero (discontinued)
- Below 2C
- Low Demand
- Delayed Transition
- Fragmented World

If “NGFS reference scenarios” is selected in Q2, answer Q2b

Q2b. Which of the following NGFS scenarios do you use? Please select all that apply.

- Current policies
- Nationally Determined Contributions (NDCs)
- Net Zero 2050
- Divergent Net Zero (discontinued)
- Below 2C
- Low Demand
- Delayed Transition
- Fragmented World

Definitions:

Net Zero 2050 is an ambitious scenario that limits global warming to 1.5 °C through stringent

climate policies and innovation, reaching net zero CO₂ emissions around 2050. Some jurisdictions such as the US, EU and Japan reach net zero for all greenhouse gases by this point.

The Low Demand scenario assumes that significant behavioral changes, reducing energy demand, mitigate the pressure on the economic system to reach global net zero CO₂ emissions around 2050.

Below 2 °C gradually increases the stringency of climate policies, giving a 67 % chance of limiting global warming to below 2 °C.

Delayed Transition assumes global annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2 °C. Negative emissions are limited.

Nationally Determined Contributions (NDCs) includes all pledged policies even if not yet implemented.

Current Policies assumes that only currently implemented policies are preserved, leading to high physical risks.

The Fragmented World scenario assumes delayed and divergent climate policy ambition globally, leading to elevated transition risks in some countries and high physical risks everywhere due to the overall ineffectiveness of the transition.

If “NGFS reference scenarios” is selected in Q2, answer Q2c:

Q2c. For the NGFS scenarios selected, specify which model type for the scenarios were used. Please select all that apply.

- Downscaling[GCAM 6.0 NGFS]
- Downscaling[MESSAGEix-GLOBIOM 1.1-M-R12]
- Downscaling[REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (95th-high)]
- Downscaling[REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (median)]
- Downscaling[REMIND-MAgPIE 3.2-4.6]
- GCAM 6.0 NGFS
- MESSAGEix-GLOBIOM 1.1-M-R12
- NiGEM NGFS v1.23.2[Climate Analytics]
- NiGEM NGFS v1.23.2[GCAM 6.0 NGFS]
- NiGEM NGFS v1.23.2[MESSAGEix-GLOBIOM 1.1-M-R12]
- NiGEM NGFS v1.23.2[REMIND-MAgPIE 3.2-4.6]
- REMIND-MAgPIE 3.2-4.6
- REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (95th-high)
- REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (median)

Definitions:

Downscaling [GCAM 6.0 NGFS]

Downscaling with input data from GCAM 6.0 NGFS. The downscaling tool aims at providing a range of pathways at the country level based on different criteria, to explore the feasibility space of low-

carbon scenarios. Details on the downscaling algorithm can be found here:

<https://pure.iiasa.ac.at/id/eprint/17501/>.

Downscaling [MESSAGEix-GLOBIOM 1.1-M-R12]

Downscaling with input data from MESSAGEix-GLOBIOM 1.1-M-R12. The downscaling tool aims at providing a range of pathways at the country level based on different criteria, to explore the feasibility space of low-carbon scenarios. Details on the downscaling algorithm can be found here:

<https://pure.iiasa.ac.at/id/eprint/17501/>

Downscaling REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (95th-high)

Downscaling with input data from REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (95th-high). The downscaling tool aims at providing a range of pathways at the country level based on different criteria, to explore the feasibility space of low-carbon scenarios. Details on the downscaling algorithm can be found here:

<https://pure.iiasa.ac.at/id/eprint/17501/><https://pure.iiasa.ac.at/id/eprint/17501/>

Downscaling[REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (median)]

Downscaling with input data from REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (median). The downscaling tool aims at providing a range of pathways at the country level based on different criteria, to explore the feasibility space of low-carbon scenarios. Details on the downscaling algorithm can be found here:

<https://pure.iiasa.ac.at/id/eprint/17501/><https://pure.iiasa.ac.at/id/eprint/17501/>

Downscaling[REMIND-MAgPIE 3.2-4.6]

Downscaling with input data from MESSAGEix-GLOBIOM 1.1-M-R12. The downscaling tool aims at providing a range of pathways at the country level based on different criteria, to explore the feasibility space of low-carbon scenarios. Details on the downscaling algorithm can be found here:

<https://pure.iiasa.ac.at/id/eprint/17501/><https://pure.iiasa.ac.at/id/eprint/17501/>

GCAM 6.0 NGFS

GCAM is a global integrated assessment model that represents the behaviour of, and complex interactions between five systems: the energy system, water, agriculture and land use, the economy, and the climate.

MESSAGEix-GLOBIOM 1.1-M-R12

MESSAGEix-GLOBIOM is an integrated assessment framework designed to assess the transformation of the energy and land systems vis-a-vis the challenges of climate change and other sustainability issues. It consists of the energy model MESSAGE, the land use model GLOBIOM, the air pollution and GHG model GAINS, the aggregated macro-economic model MACRO and the simple climate model MAGICC.

'R12' indicates the 12-region resolution separating China as a single region in addition to the previous R11 model. 'M' means that this model variant endogenises key bulk material supply industries: steel, cement, chemical, and aluminium.

NiGEM NGFS v1.23.2[Climate Analytics]

NiGEM model with input data from Climate Analytics.

NiGEM NGFS v1.23.2[GCAM 6.0 NGFS]

NiGEM model with input data from GCAM 6.0 NGFS.

NiGEM NGFS v1.23.2[MESSAGEix-GLOBIOM 1.1-M-R12]

NiGEM model with input data from MESSAGEix-GLOBIOM 1.1-M-R12.

NiGEM NGFS v1.23.2[REMIND-MAgPIE 3.2-4.6]

NiGEM model with input data from REMIND-MAgPIE 3.2-4.6.

REMIND-MAgPIE 3.2-4.6

REMIND: (Regionalized model of investment and development) is a global multi-regional model incorporating the economy, the climate system and a detailed representation of the energy sector. It allows analysing technology options and policy proposals for climate mitigation, and models regional energy investments and interregional trade in goods, energy carriers and emissions allowances.

MAgPIE: (Model of Agricultural Production and its Impact on the Environment) is a global land use allocation model. MAgPIE derives future projections of spatial land use patterns, yields and regional costs of agricultural production.

REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (95th-high)

REMIND model considers high level of physical damages corresponding to the high damage specification of Kalkuhl and Wenz and the 95th-percentile projected increase in global mean temperature (GMT-P95).

REMIND-MAgPIE 3.2-4.6 IntegratedPhysicalDamages (median)

REMIND model considers medium level of physical damages corresponding to the medium damage specification of Kalkuhl and Wenz and the median projected increase in global mean temperature (GMT-MED).

If “Internally developed scenarios” is selected, in Q2, answer Q2d:

Q2d. Provide details on your internally developed climate risk scenarios.

Q3. How do you perform scenario expansion? Please select all that apply.

- Engaging with a third party for greater geographical granularity
- Engaging with a third party for greater sectoral granularity
- Engaging with a third party for greater incremental transition variable types
- Leverage internal teams to provide greater geographical granularity
- Leverage internal teams to provide greater sectoral granularity
- Leverage internal teams to provide incremental variable types
- Other (please specify)

Q4. Provide details on how your institution adapts scenarios to a more granular level and meets region specific requirements. Please outline the changes that have been made to the scenarios, including attributes/features unique to your institution that are incorporated in the scenarios, and the challenges you faced.

Use case:

Physical or Transition Risk:

Scenario:

Please outline the changes that have been made to the scenarios:
attributes/features (e.g. scenario enhancements and extrapolation):

Q5. Are you aggregating climate scenarios with broader economic and geopolitical scenarios?

- Yes
- No
- Not sure

If “yes” is selected in Q5, answer Q5a:

Q5a. How are you aggregating climate scenarios with broader economic and geopolitical scenarios?

Q6. Specify the **transition risk** variables that you included for scenario analysis for each exposure classes. Please select all that apply.

Climate transition variables	Large Corporates	Non-Retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real estate	Project finance
Carbon price						

GHG emissions						
Emissions intensity						
Investment in green technologies, energy efficiency						
Water consumption						
Waste (including recycling)						
Energy consumption						
Energy mix						
Energy prices						
Electricity demand						
Electricity prices						
Energy Performance Certificate (EPC) labels						
Energy efficiency performance						
Commodity Price						
Building Type						
Building Size						
Retrofit						

Others (please specify)

Q7. Specify the **physical risk** variables that you included for scenario analysis for each exposure classes. Please select all that apply.

	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real estate	Project finance
Climate physical variables						
Temperature						
GHG emissions						
Frequency of physical hazard						
Severity of physical hazard						
Longevity						
Agricultural productivity						

Others (please specify)

Q8. Specify the **macroeconomic** variables that you included for scenario analysis for each exposure classes. Please select all that apply.

Macroeconomic variables	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real estate	Residential Real estate	Project finance
Interest rate						

Unemployment rate						
Inflation/price index						
GDP growth						
Investment						
Real disposable income						
Exchange rate						
Sovereign bond yield						
Income distribution						
National income						
Gross Value Added (GVA) growth						
RRE price shock						
CRE price shock						
Labour productivity						
Others (please specify)						

Others (please specify)

Q9. What is the reporting frequency of the scenario projections? Please select all that apply.

- Quarterly
- Annual
- 5-year
- 10-year
- Other (please specify)

Q10. Do you perform general back testing of credit risk models for climate risk assessments?

- Yes, we regularly perform back testing
- Yes, we occasionally perform back testing
- No, but we plan to incorporate back testing in the future
- No, we do not perform back testing
- Other (please specify)

If selected 'yes' in Q10, answer Q10a:

Q10a. If selected yes, please share the practices you have incorporated to conduct back test.

Survey Part 7: ESG Scores

Section overview: This section focuses on understanding the current approaches undertaken by banks for ESG scoring. This may be referred to by different names depending on your institution, such as an Environmental and Social (E&S) assessment score, impact score, or sustainability score. Regardless of the terminology, this section refers to an internal/external methodology used to assess a client's Environmental, Social, and Governance (ESG) performance or risk profile.

*** Note: If you select "No, we do not use ESG scoring methodologies" you will automatically skip the ESG Scoring section.**

Q1. Do you have an internal ESG scoring methodology?

- Yes, we have a fully developed internal ESG scoring methodology
- Yes, we are currently developing an internal ESG scoring methodology
- Yes, we have a mix of internal and external ESG scoring methodology
- No, we use external ESG scores
- No, we do not use ESG scoring methodologies
- Other (please specify)

If "Yes, we have a mix of internal and external ESG scoring methodology" or "No, we use external ESG scores" is selected in Q1, answer Q1a:

Q1a. If you use external ESG scoring methodologies, which providers do you rely on?

Q2. Does your internal ESG scoring methodology include the following? Please select all that apply.

Context: ESG scores used to quantify both the risk and impact of exposures based on outside-in (financial materiality) and inside-out (sustainability impact) perspectives.

	Yes	No
Assessing the impact materiality (Inside-out)		
Assessing the financial materiality of ESG factors on your exposures (outside-in)		

Definitions:

Impact Materiality (Inside-out): The **inside-out perspective** assesses how the bank's exposures impact ESG factors, such as the environment (through carbon emissions) or society (through labor practices). In this context, an ESG score evaluates how much impact the bank's investments or loans have on the environment or society. For example, a higher ESG score might reflect that a company has strong sustainability practices, making it a more attractive investment from an ESG standpoint.

Financial Materiality (Outside-in): The **outside-in perspective** assesses how **ESG factors** (like climate change, regulatory changes, or social instability) impact the financial performance of the assets or exposures in the bank's portfolio. In this context, an ESG score helps **quantify** how vulnerable an investment, loan, or exposure is to external ESG factors. For example, a low ESG score could indicate that a company is poorly equipped to handle upcoming regulations on carbon emissions, increasing its credit risk.

Q3. How are you using ESG scores in your current risk framework? Please select all that apply.

- Integrating ESG scores into overall credit risk assessment scorecards which in turn is linked to credit risk ratings
- ESG scores are independent of credit risk scorecards, with the two scorecards being merged at the PD modelling stage
- Using ESG scores for sector-specific risk analysis
- Informing investment decisions and portfolio management
- Enhancing compliance and regulatory reporting
- Guiding corporate strategy and policy-making
- ESG scores are not currently used in our risk framework
- Other (please specify)

Q4. Are ESG scores integrated into your credit ratings?

- Yes, fully integrated
- Yes, partially integrated
- No, but we plan to integrate them in the future
- No, we do not integrate ESG scores into credit ratings
- Other (please specify)

Q5. Is the (internal or external) ESG score you use designed specifically for credit risk decisioning, i.e. are the weights calibrated to measure the impact of the factors considered into the creditworthiness of the client?

- Yes, the ESG score was specifically designed for credit risk decisioning, with calibrated weights for creditworthiness.
- No, we use a general-purpose ESG score but apply internal adjustments to reflect its impact on credit risk.
- No, the ESG score is a general-purpose score not specifically calibrated for credit risk decisioning.
- We don't use ESG scores in our credit risk decisioning.
- Other (please specify)

Q6. Do you use AI/ML when assessing ESG scores (e.g., using machine learning algorithms to analyze large datasets for ESG factors)?

- Yes, we use AI/ML **extensively** in ESG score assessments
- Yes, we use AI/ML to **some extent** in ESG score assessments

- No, but we plan to use AI/ML in the future
- No, we do not use AI/ML in ESG score assessments
- Other (please specify)

Q7. Do you aggregate E, S and G factor in your ESG score, or do you have different scores for each component?

- Aggregate E, S, and G factors into a single ESG score
- Separate scores for each component (E, S, and G)
- Not currently scoring ESG factors
- Other (please specify)

If “Aggregate E, S, and G factors into a single ESG score” is selected in Q7, then answer Q7a:

Q7a. If you aggregate E, S, and G factors into a single ESG score, please specify the weighting for each component:

- Environmental (E): ____%
- Social (S): ____%
- Governance (G): ____%

Please provide an explanation.

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Survey Part 8: Data and IT

This section covers questions on data types, sources and processing at the higher level for climate-related credit risk assessment. Though some questions might overlap with questions in other sections, the questions in this section are designed to capture a wider view on data and IT procedures at banks.

Q1. Select the following data sources that you use for climate risk assessments? Please select all that apply

	Transition Risk	Physical Risk
A) External data providers (e.g., third-party datasets)		
B) Public data (e.g., open-source data portals, government or regulatory databases)		
C) Client questionnaires and surveys		
D) Company disclosures (e.g., financial reports, sustainability reports)		
E) Internal data (e.g., transaction records, internal assessments)		
F) Industry benchmarks and studies		
G) Climate models and scientific research		
H) Satellite and remote sensing data (e.g. meteorological/weather datasets, geospatial technologies)		
I) Collaborative data sharing within industry groups		
J) Country policies and pledges		
K) Artificial intelligence		
L) Not currently using any specific data sources		

Other (please specify)

Q2. How are you collecting data for the below exposure classes? Please select all that apply.

	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real estate	Project finance
In-house, directly from client						
In-house through the use of proxies and estimations						
Buying from a company						
Open-source platforms						

Public climate risk disclosures						
---------------------------------	--	--	--	--	--	--

Other (please specify)

If “buying from a company” is selected in Q2, then answer Q2a:

Q2a. Please specify which data providers are used.

Q3. Select the level of granularity of the data used for the exposure classes listed. Please select all that apply.

Level of granularity of data	Large Corporates	Non-retail SMEs	Retail SMEs	Commercial Real Estate	Residential Real estate	Project finance
Country level						
District level						
Latitude/longitude level						
Postal/zip code level						
Address data						

If “Country level” or “District level” is selected in Q3, then answer Q3a:

Q3a. In cases where you use data at the aggregated (country, district) level, do you perform further data-adjustments to that aggregated level to increase the level of granularity?

- Yes (please specify)
- No
- Not sure

Q4. What changes in procedures has your institution implemented to collect climate-related data from clients? Please select all that apply.

- Introduction of new questionnaires or surveys
- Implementation of new software or technology for data collection
- Training of staff to collect and assess climate-related data
- Requests for additional reporting requirements from clients
- Other (please specify)

Q5. What information do you gather from client's climate risk disclosures (when available) that are used in your credit risk analysis? Please select all that apply.

Explanation: Clients can include both corporates and SMEs.

- Type of clients' activities and operations

Example: Sector, industry, and specific business activities and assets that may be exposed to climate risks.

- Governance structure

Example: How the client's governance addresses climate-related risks and opportunities (e.g., board oversight).

- Location of operations

Example: Geographic locations where the client operates, particularly in regions vulnerable to physical climate risks (e.g., flood zones).

- Emissions data

Example: Scope 1, 2, and 3 greenhouse gas emissions data, or other relevant carbon metrics.

- Client commitments and decarbonisation targets

Example: Client's pledges or targets related to emissions reductions and transitioning to a low-carbon economy.

- Relevant climate risks identified

Example: Physical, transition, or regulatory climate risks that the client has disclosed as part of its risk management framework.

- Information on potential financial exposure

Example: Potential financial exposure to identified climate risks (e.g., capital at risk, assets in vulnerable areas).

- Existence/inexistence of in force catastrophe & business interruption insurance

Example: Whether the client has insurance coverage to mitigate losses from climate-related catastrophes or business interruptions.

- We do not gather information from client's climate risk disclosures
- Other (please specify)

Q6. What internal processes and IT infrastructure have you had to update or implement to integrate climate data for risk assessment? Please select all that apply.

- Implement big data technologies to analyze climate datasets (e.g., Hadoop, Spark)
- Update data warehousing or storage solutions to manage large volumes of climate data datasets (e.g., MongoDB, Amazon S3)
- Implement APIs or integrate with third-party platforms to incorporate climate data into risk assessment systems datasets (e.g., Bloomberg, CDP)
- Implement audit trails and data governance for climate data
- Other (please specify)

Q7. Do you use proxy climate data in any of your internally developed methodologies to measure climate related credit risk?

- Yes
- No
- Other (please specify)

If “yes” is selected in Q7, then answer Q7a:

Q7a. What are your practices to ensure the quality of the proxy climate data?

Please describe your practices related to accuracy, completeness, timeliness, adaptability, integrity, consistency, and traceability/auditability. In line with regulatory standards and frameworks, like BCBS 239, enhancing risk data aggregation and risk reporting practices in banks.

Survey Part 9: Integration of ESG Risks Beyond Climate

This section looks at the broader state of the integration of sustainability risks, beyond climate, in credit risk assessment. The set of questions in this section are designed to help understand if and how banks are assessing nature, pollution and social risk.

Q1. Do you also consider other environmental risks beyond climate in your credit risk assessments? Please select all that apply

- Yes, we consider nature risk, for example biodiversity
- Yes, we consider pollution risk (for example, plastic pollution and air pollution)
- Yes, we consider social and/or human rights risks (labor practices, community impact, just transition)
- No, we only focus on climate-related risks
- Other (please specify)

If “Yes, we consider nature risk, for example biodiversity loss” is chosen in Q1, then answer Q1a:

Q1a. If you are assessing nature-related credit risk, please select one of the following statements which describe your approach.

- We have integrated nature-related risks into our existing credit risk assessment framework
- We have a separate risk assessment process specifically for nature-related risks
- We are in the process of developing a framework to assess nature-related risks
- We do not have a structured approach to assessing nature-related risks
- Other (please specify)

If “Yes, we consider nature risk, for example biodiversity loss” is chosen in Q1, then answer Q1b:

Q1b. What types of nature-related risks are most relevant to your credit risk assessment? Select all that apply.

- Biodiversity loss
- Decline in ecosystem services (e.g., pollination, marine fisheries and tropical forests) Water stress
- Nature policy levers
- Other (please specify)

If “Yes, we consider nature risk, for example biodiversity loss” is chosen in Q1, then answer Q1c:

Q1c. Select the sectors for which you have begun assessing nature-related credit risk. Please select all that apply

- Agriculture, forestry and fishing

- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction
- Other

If “Yes, we consider nature risk, for example biodiversity loss” is chosen in Q1, then answer Q1d:

Q1d. What are the main challenges you face in integrating nature-related risks into your credit risk assessment? Select all that apply.

- Lack of data and metrics
- Difficulty in quantifying financial impact
- Limited internal capacity and expertise
- Low prioritisation compared to climate risks
- Regulatory uncertainty or lack of guidance
- Other (please specify)

If “Yes, we consider pollution risk (for example, plastic pollution and air pollution)” is chosen in Q1, then answer Q1e:

Q1e. If you are assessing pollution related credit risk, please select one of the following statements which describe your approach.

- We have integrated pollution-related risks into our existing credit risk assessment framework
- We have a separate risk assessment process specifically for pollution-related risks
- We are in the process of developing a framework to assess pollution-related risks
- We do not have a structured approach to assessing pollution-related risks
- Other (please specify)

If “Yes, we consider pollution risk (for example, plastic pollution and air pollution)” is chosen in Q1, then answer Q1f:

Q1f. What types of pollution-related risks are most relevant to your credit risk assessment? Select all that apply.

- Air pollution (e.g., emissions, particulate matter)
- Water pollution (e.g., industrial discharge, agricultural runoff)
- Soil contamination (e.g., hazardous waste, chemical spills)

- Plastic pollution (e.g., production, disposal, marine pollution)
- Toxic substances/ Chemical pollution (e.g., chemical use, heavy metals)
- Other (please specify)

If “Yes, we consider pollution risk (for example, plastic pollution and air pollution)” is chosen in Q1, then answer Q1g:

Q1g. Select the sectors for which you have begun assessing pollution-related credit risk. Please select all that apply.

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction
- Other (please specify)

If “Yes, we consider pollution risk (for example, plastic pollution and air pollution)” is chosen in Q1, then answer Q1h:

Q1h. What are the main challenges you face in integrating pollution-related risks into your credit risk assessment? Select all that apply.

- Lack of data and metrics
- Difficulty in quantifying financial impact
- Limited internal capacity and expertise
- Low prioritisation compared to climate risks
- Regulatory uncertainty or lack of guidance
- Other (please specify)

If “Yes, we consider social and/or human rights risks (labor practices, community impact, just transition)” is chosen in Q1, then answer Q1i:

Q1i. If you are assessing social and/or human rights related credit risk, please select one of the following statements which describe your approach.

- We have integrated social and/or human rights related risks into our existing credit risk assessment framework
- We have a separate risk assessment process specifically for social and/or human rights related risks
- We are in the process of developing a framework to assess social and/or human rights related risks
- We do not have a structured approach to assessing social and/or human rights related risks
- Other (please specify)

If “Yes, we consider social and/or human rights risks (labor practices, community impact, just transition)” is chosen in Q1, then answer Q1j:

Q1j. Select the sectors for which you have begun assessing social and/or human rights-related credit risk. Please select all that apply.

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction
- Other (please specify)

If “Yes, we consider social and/or human rights risks (labor practices, community impact, just transition)” is chosen in Q1, then answer Q1k:

Q1k. What are the main challenges you face in integrating social and/or human rights related risks into your credit risk assessment? Select all that apply.

- Lack of data and metrics
- Difficulty in quantifying financial impact
- Limited internal capacity and expertise
- Low prioritisation compared to climate risks
- Regulatory uncertainty or lack of guidance
- Other (please specify)

Survey Part 10: Quantitative Impact

Quantitative portion of the survey looking at the financial impact of climate risks on key metrics such as Expected Credit Loss (ECL), Risk-Weighted Assets (RWA), and Economic Capital (ECAP).

Impact on ECL

Per Credit Portfolio

Please provide an estimate of the **climate-risk related ECL adjustments** as a percentage of the Total ECL, for each category.

(Use N/A instead of 0% where specific climate-risk adjustments are not considered)

N/A – not assessed

0% - assessed, but equal to zero

<0%

(0%-2.5%]

(2.5%, 5%]

(5%, 10%]

(10%, 15%]

(15%, 20%]

(20%, 30%]

>30%

- Use 2023 year-end reporting date
- Provide separate estimates for **physical risk** and **transition risk** where available. If your institution cannot provide a split, please report a combined estimate.
- Business-As-Usual (BAU) is calculated **without explicit inclusion** of climate risks
- % Change in ECL: $((\text{Climate Risk adjusted ECL} - \text{BAU ECL}) / \text{BAU ECL}) * 100$
- Indicate whether the provided estimate is based on actual data or a proxy estimate.

Q1. What is the estimated percentage impact on **ECL** that you apply to your Business-As-Usual (BAU) ECL (due to specific climate-risk related adjustments **per credit portfolio**)?

Portfolio	% Change in ECL Due to Physical Risk	% Change in ECL Due to Transition Risk	% Change in ECL (Combined Physical and Transition risk)	Actual or Proxy Estimate
Large Corporates	Options: N/A – not assessed 0% - assessed, but equal to zero <0%			Actual or Proxy Estimate

	(0%-2.5%] (2.5%, 5%] (5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%			
Non-retail SMEs				
Retail SMEs				Actual or Proxy Estimate
Commercial Real Estate				Actual or Proxy Estimate
Residential Real estate				Actual or Proxy Estimate
Project finance				Actual or Proxy Estimate

Q1a. Any comments on the above results?

Per Sector

Q2. What is the **estimated percentage impact on ECL** that you apply to your Business-As-Usual (BAU) ECL due to specific **climate-risk related** adjustments **per sector of economic activity**?

Select from the following sectors:

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction

Industry	% Change in ECL Due to Physical Risk	% Change in ECL Due to Transition Risk	% Change in ECL (Combined)	Actual or Proxy Estimate
Sectors that are selected	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%]			Actual or Proxy Estimate

	(5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%			
--	---	--	--	--

Q2a. Any comments on the above results?

Impact on RWA

Per Credit Portfolio

Please provide an estimate of the climate-risk related RWA adjustments as a percentage of the Total RWA, for each category.

(Use N/A instead of 0% where specific climate-risk adjustments are not considered)

N/A – not assessed

0% - assessed, but equal to zero

<0%

(0%-2.5%]

(2.5%, 5%]

(5%, 10%]

(10%, 15%]

(15%, 20%]

(20%, 30%]

>30%

- Use 2023 year end reporting date
- Provide separate estimates for **physical risk** and **transition risk** where available. If your institution cannot provide a split, please report a combined estimate.
- Business-As-Usual (BAU) is calculated **without explicit inclusion** of climate risks
- % Change in RWA: $((\text{Climate Risk adjusted RWA} - \text{BAU RWA}) / \text{BAU RWA}) * 100$
- Indicate whether the provided estimate is based on actual data or a proxy estimate.
- Please provide separate estimates for **Pillar 1** and **Pillar 2** impacts and, if available, split between **physical risk** and **transition risk**. If your institution cannot provide a split, please report a combined estimate.
- Context to add:
 - Pillar 1: RWA impact on minimum capital requirements estimated under Pillar 1 processes, i.e. due to climate risks included in the estimation of IRB PD, LGD and CCF risk parameters, and/or climate -risk-specific overrides.
 - Pillar 2: climate risk-specific add-ons to minimum capital requirements, where these add-ons are determined under Pillar 2 processes, e.g. internal capital adequacy assessment process (ICAAP) and stress testing.

Q3. Will you provide impact values for physical risk and transition risk **separately, or combined**?

- Physical risk and transition risk separately
- Combined

If “combined” is selected in Q3, then answer Q3a:

Q3a. What is the **estimated percentage impact on RWA** that you apply to your Business-As-Usual (BAU) RWA due to climate-risk related adjustments (both Transition Risk and Physical Risk combined) **per credit portfolio**.

Portfolio	% Change in RWA (Combined - Pillar 1)	% Change in RWA (Combined - Pillar 2)	Actual or Proxy Estimate
Large Corporates	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%] (5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%		Actual or Proxy Estimate
Non-retail SMEs			
Retail SMEs			Actual or Proxy Estimate
Commercial Real Estate			Actual or Proxy Estimate
Residential Real estate			Actual or Proxy Estimate
Project finance			Actual or Proxy Estimate

Q3a. Any comments on the above results?

If “Physical risk and transition risk separately” selected in Q3, then answer Q3b:

Q3b. What is the **estimated percentage impact on RWA** that you apply to your Business-As-Usual (BAU) RWA due to climate-risk related adjustments (Transition Risk and Physical Risk separately) **per credit portfolio.**

Portfolio	% Change in RWA Due to Physical Risk (Pillar 1)	% Change in RWA Due to Transition Risk (Pillar 1)	% Change in RWA Due to Physical Risk (Pillar 2)	% Change in RWA Due to Transition Risk (Pillar 2)	Actual or Proxy Estimate
Large Corporates	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%] (5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%				Actual or Proxy Estimate
Non-retail SMEs					
Retail SMEs					Actual or Proxy Estimate
Commercial Real Estate					Actual or Proxy Estimate
Residential Real estate					Actual or Proxy Estimate
Project finance					Actual or Proxy Estimate

Q3b. Any comments on the above results?

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Per Sector

If “combined” is selected, then answer the following:

Q4. Please select the industries that you will provide your RWA impact estimates for?

Select from the following sectors:

- Agriculture, forestry and fishing
- Oil & Gas
- Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber
- Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper
- Mining of coal and lignite, metal ores and other mining and quarrying
- Electricity and energy supply
- Water supply, sewerage, waste management and remediation activities
- Wholesale and retail trade
- Transportation and storage
- Real estate activities and construction

Q4a. What is the **estimated percentage impact on RWA** that you apply to your Business-As-Usual (BAU) RWA due to specific climate-risk related adjustments (both Transition Risk and Physical Risk combined) **per sector of economic activity**?

Industry	% Change in RWA (Combined - Pillar 1)	% Change in RWA (Combined - Pillar 2)	Actual or Proxy Estimate
Options: Sectors that are selected	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%] (5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%		

Q4b. Any comments on the above results?

If “Physical risk and transition risk separately” selected, then answer Q4c:

Q4c. What is the **estimated percentage impact on RWA** that you apply to your Business-As-Usual (BAU) RWA due to specific climate-risk related adjustments (Transition Risk and Physical Risk separately) **per sector of economic activity**?

Industry	% Change in RWA Due to Physical Risk (Pillar 1)	% Change in RWA Due to Transition Risk (Pillar 1)	% Change in RWA Due to Physical Risk (Pillar 2)	% Change in RWA Due to Transition Risk (Pillar 2)	Actual or Proxy Estimate
Options: Sectors that are selected	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%] (5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%				

Q4d. Any comments on the above results?

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Impact on Economic Capital (ECAP)

Per Credit Portfolio

Calculate the **% Change in ECAP** by comparing the amount of ECAP allocated to climate risks with the **Business-As-Usual (BAU)** ECAP (i.e., ECAP without climate risks)

Note: In some cases, institutions may incorporate the results of climate-related stress testing into both their **Economic Capital (ECAP)** and **Pillar 2 Regulatory Capital (REGCAP)** calculations. If this is the case for your institution, please consider that while this question focuses on **ECAP** (your institution's internal capital adequacy framework), the **Pillar 2 add-ons** driven by regulatory requirements or supervisory review may overlap with the ECAP assessments.

- Use 2023 year end reporting date
- Provide separate estimates for **physical risk** and **transition risk** where available. If your institution cannot provide a split, please report a combined estimate.
- Business-As-Usual (BAU) is calculated **without explicit inclusion** of climate risks
- % Change in ECAP: $((\text{Climate Risk adjusted ECAP} - \text{BAU ECAP}) / \text{BAU ECAP}) * 100$
- Indicate whether the provided estimate is based on actual data or a proxy estimate.

(Use N/A instead of 0% where specific climate-risk adjustments are not considered)

N/A – not assessed

0% - assessed, but equal to zero

<0%

(0%-2.5%]

(2.5%, 5%]

(5%, 10%]

(10%, 15%]

(15%, 20%]

(20%, 30%]

>30%

Q5. What is the estimated percentage impact on your **Economic Capital (ECAP)** allocated to **credit risk** due to climate-risk-related adjustments?

Credit Portfolio	% Change in ECAP Due to Physical Risk	% Change in ECAP Due to Transition Risk	% Change in ECAP (Combined Physical and Transition risk)	Actual or Proxy Estimate
Large Corporates	Options: N/A – not assessed 0% - assessed, but equal to zero <0% (0%-2.5%] (2.5%, 5%]			Actual or Proxy Estimate

	(5%, 10%] (10%, 15%] (15%, 20%] (20%, 30%] >30%			
Non-retail SMEs				
Retail SMEs				Actual or Proxy Estimate
Commercial Real Estate				Actual or Proxy Estimate
Residential Real estate				Actual or Proxy Estimate
Project finance				Actual or Proxy Estimate

Q5a. Any comments on the above results?

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Definitions:

GCD & UNEP FI Survey Industry Group Mapping Guidance

The GCD & UNEP FI Survey Industry Group Mapping Guidance provides a structured framework for aligning industry survey groups with the respective **Nomenclature des Activités Économiques dans la Communauté Européenne (NACE)** and **North American Industry Classification System (NAICS)** codes. This mapping is essential for ensuring consistency when categorizing industries across different reporting frameworks. The guidance serves as a reference tool for banks participating in this survey, helping to standardize responses and improve the comparability of data across jurisdictions.

Where to Use this Mapping

This guidance is intended to be used when completing the GCD and UNEP FI survey, specifically in sections that require categorizing industry sectors. It ensures that banks are aligned with the recognized industry classification systems: NACE (mostly used in Europe) and NAICS (used in North America).

Survey Sector Group	NACE Codes	NAICS codes
Agriculture, forestry and fishing	Agriculture, forestry and fishing (NACE sector – A) o Includes crop and animal production, forestry	Agriculture, forestry and fishing (NAICS 2022 codes: 111, 112, 113, 114, 115)
Oil & Gas	Oil and Gas (NACE sector – B6 , C19.2, D35.2, H49.5) - Includes extraction of crude petroleum and natural gas, manufacture of refined petroleum products, manufacture of gas; distribution of gaseous fuels through mains/transportation of oil and gas through pipelines	Oil and Gas (NAICS 2022 codes: 211,213111, 213112, 213118, 2212, 324, 486)
Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber	Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber (NACE sector – C20, 21, 22 23, 24, 25)	Manufacture of minerals, chemicals, basic metals, pharmaceutical and rubber (NAICS 2022 codes: 325, 326, 327, 331, 332)
Manufacture of furniture, electronics and machinery, food and beverages, motor vehicles, textiles, wood and paper	Manufacture of furniture (C31), electronics (C26), electrical equipment (C27) and machinery (C28), food (C10), beverages (C11) and tobacco (C12), motor vehicles and other transport vehicles (C29, C30), textiles, wood and paper (NACE sector - C13, C16, C17)	Manufacture - other (NAICS 2022 codes: 311, 312, 313, 314, 321, 322, 333, 334, 335, 336, 337, 339)
Mining of coal and lignite, metal ores and other mining and quarrying	Mining of coal and lignite, metal ores and other mining and quarrying (NACE sector – B5, B7, B8)	Mining of coal and lignite, metal ores and other mining and quarrying (NAICS 2022 codes:212, 213113, 213114,213115)

Electricity and energy supply	Electricity and energy supply (includes electric power generation, transmission and distribution) (NACE sector – D35.1)	Electricity and energy supply (includes electric power generation, transmission and distribution) (NAICS 2022 codes: 2211)
Water supply, sewerage, waste management and remediation activities	Water supply, sewerage, waste management and remediation activities (NACE sector – E)	Water supply, sewerage, waste management and remediation activities (NAICS 2022 codes 2213, 562)
Wholesale and retail trade	Wholesale and retail trade (NACE sector – G)	Wholesale and retail trade (NAICS 2022 codes: 423, 424, 425, 441, 442, 443, 444, 445, 449, 451, 452, 453, 454, 455, 456, 457 458, 459)
Transportation and storage	Transportation and storage (include water transportation, air transportation, land transportation, storage and post) (NACE sector – H except H49.5)	Transportation and storage (NAICS 2022 codes: 481, 482, 483, 484, 485, 487, 488, 491, 492, 493)
Real estate activities and construction	Real estate activities and construction (NACE sector F and L) Includes buying and selling of own real estate, renting and operating of own or leased real estate, real estate activities on a fee or contract basis and construction of buildings, civil engineering, demolition and site preparation, building completion and finishing)	Real estate activities and construction (NAICS 2022 codes: 236, 237, 238, 531)
Others	Other (other NACE codes)	Other (other NAICS codes)

High Impact Sectors – NACE Code

‘high impact climate sectors’ means the sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006 of the European Parliament and of the Council⁴

NACE Sections:

SECTION A — AGRICULTURE, FORESTRY AND FISHING

SECTION B — MINING AND QUARRYING

SECTION C — MANUFACTURING

SECTION D — ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY

SECTION E — WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES

SECTION F — CONSTRUCTION

SECTION G — WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND
MOTORCYCLES

SECTION H — TRANSPORTATION AND STORAGE

SECTION L — REAL ESTATE ACTIVITIES

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NACE sectors	Description
A	Agriculture, forestry and fishing
A01	Crop and animal production, hunting and related service activities
A02	Forestry and logging
A03	Fishing and aquaculture
B	Mining and quarrying
B05	Mining of coal and lignite
B06	Extraction of crude petroleum and natural gas
B07	Mining of metal ores
B08	Other mining and quarrying
B09	Mining support service activities
C	Manufacturing
C10	Manufacture of food products
C11	Manufacture of beverages
C12	Manufacture of tobacco products
C13	Manufacture of textiles
C14	Manufacture of wearing apparel
C15	Manufacture of leather and related products
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17	Manufacture of paper and paper products
C18	Printing and reproduction of recorded media
C19	Manufacture of coke and refined petroleum products
C20	Manufacture of chemicals and chemical products
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22	Manufacture of rubber and plastic products
C23	Manufacture of other non-metallic mineral products
C24	Manufacture of basic metals
C25	Manufacture of fabricated metal products, except machinery and equipment
C26	Manufacture of computer, electronic and optical products
C27	Manufacture of electrical equipment
C28	Manufacture of machinery and equipment n.e.c.
C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	Manufacture of other transport equipment

C31	Manufacture of furniture
C32	Other manufacturing
C33	Repair and installation of machinery and equipment
D	Electricity, gas, steam and air conditioning supply
D35.1	Electric power generation, transmission and distribution
D35.1.1	Production of electricity
D35.2	Manufacture of gas; distribution of gaseous fuels through mains
D35.3	Steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
F41	Construction of buildings
F42	Civil engineering
F43	Specialised construction activities
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
H49	Land transport and transport via pipelines
H50	Water transport
H51	Air transport
H52	Warehousing and support activities for transportation
H53	Postal and courier activities
L	Real estate activities