

CLIMATE RISK STRESS TESTS

Key challenges for supervisory & internal stress tests

Stress testing is considered as a key tool to understand the impacts of climate change on the banks' risk management and business strategy. It is then essential for financial institutions to improve their stress testing capabilities.

Climate change is one of the major challenges of the upcoming decades. Many industries, especially those with a high carbon footprint, are expected to experience structural shifts in their business model. Transitioning to a low-carbon economy entails risks and opportunities to institutions. **The banking sector**, acting as one of the principal actors of the global economy **is at the forefront of these structural changes**.

There is a growing consensus that **climate risks are an important source of financial risks** and that their impact may result in significant economic and financial losses. Evidence also suggests that climate risks can be observed through traditional risk categories. Therefore, **integrating climate-related risks into bank's traditional risk management frameworks** has been a central topic for supervisors and the banking industry.



ST as a key analytical tool



- Traditional risk management approaches are unsuitable for measuring climate-related risks.
- Due to the forward-looking nature and flexibility, supervisors and financial institutions have turned to stress tests to quantify the potential financial impacts of risks arising from climate change.



ST as part of strategic processes



As stated in its guide on climate-related risks (Nov/20), the ECB is expecting that material climate-related risks will be integrated when:

- Institutions conduct stress testing as part of the normative perspective of the ICAAP
- Institutions design scenarios for testing recovery options according to the BRRD



Increasing regulatory ST exercises



- Several authorities (e.g. DNB, BdF/ACPR, BoE/PRA) have launched ST for banks to:
 - Understand the risks and vulnerabilities to which regulated banks are exposed under different climate risk scenarios
 - Incentivize banks to develop appropriate risk models and governance around climate-related risks and identify data gaps
- More exercises are planned for the near future (for ex. EBA/ECB ST exercise in 2022).



Methodological challenges



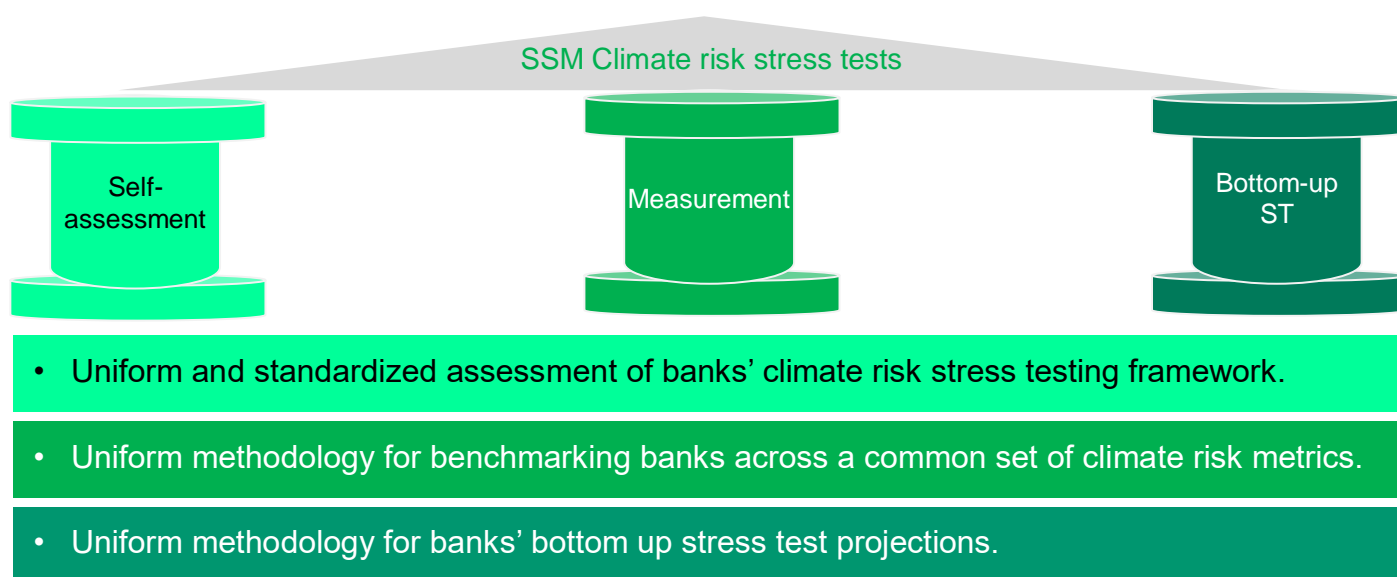
- Uncertainty on the time horizon, future trajectory and severity of climate risks.
- Difficulties in translating climate variables into economic and financial impacts, as well as into risk measures.
- Risks are expected to materialise over much longer time horizons than those used in traditional ST exercises.
- More granular exposure data is required, ideally by sector and region. However, these data may be very difficult to obtain.

SSM CLIMATE RISK STRESS TESTS 2022

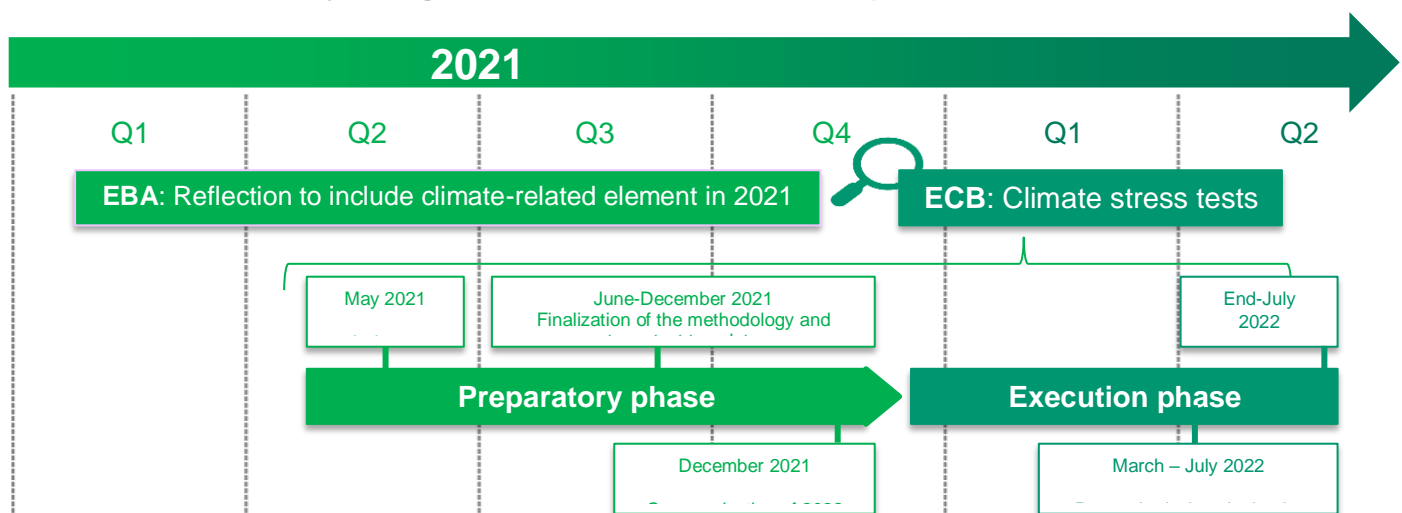
High-level overview



SSM Climate risk stress test cover three modules to test banks' capabilities to assess climate risk. This exercise is made up of three complementary pillars described below, the main results of which are intended to be incorporated into the SREP 2022.



The current agenda regarding SSM Climerisk is described below as the second half of 2021 focus on implementation and industry dialogue as the launch of exercise is planned for Q1 2022.



SSM CLIMATE RISK STRESS TESTS 2022

Preliminary thoughts on Modules 1 and 2



MODULE 1

Qualitative

Overview of the institution's end-to-end climate risk stress test framework, management & modelling practices.

+75 closed end questions*

General climate risk ST

Climate risk ST governance & risk appetite

Integration into business strategy

Climate ST methodology

ST scenarios

Data availability & sources

ICAAP

Future plans (enhancements)

Internal Audit involvement

Parent company

Bottom-up projections

*Follow the EBA Guidelines on institutions' stress testing, Section 6.5 of the ECB Guide on climate-related and environmental risks and the EBA report on environmental, social and governance (ESG) risks.

MODULE 2

Two Climate Metrics Calculation

Insights into the exposure of banks' income to transition risk and their exposure to carbon-intensive industries.

Metric 1

Interest, fee & commission from GHG intensive industries

Ref Period: from 01/01 to 31/12/2021

Scope:

Non-financial corporates

Coverage:

At least 80% of gross interest, fee and commission income

In line with **FINREP**

Split between max 5 countries (10 if threshold is not achieved with 5)

Aggregation:

Per EU country/sector (NACE) or aggregation for non-FI/sector (NACE)

Metric 2

Financed GHG emissions (Scope 1, Scope 2, Scope 3**)

Scope:

Non-financial non SME corporates

Coverage:

Minimum of 20 counterparties/sector

Computation:

Weighted average carbon intensity with corporate exposures in line with CRR articles and corporate revenues (3Y average)

Aggregation:

+ Explanatory note

**Based on counterparty's reporting or from data provider.

Our analysis

To this stage, climate stress testing framework remain at an embryonic stage in many institutions.

Module 1 pushes institutions to assess the maturity of their climate stress testing framework through a self-assessment in order:

- to educate each bank up to the top management to the climate change issue
- to push each bank to define an action plan beyond the regulatory exercise and to work for the integration of climatic stress tests into bank's management processes

Module 2 will allow to assess exposure of banks' income to transition risk and their exposure to carbon-intensive industries. This exercise will require substantive work in terms of data collection and analysis. Information relating to level 3 emissions will surely be hard to find. More generally, a certain number of shortcuts and proxies will surely be necessary for the good success of the exercise.

SSM CLIMATE RISK STRESS TESTS 2022

Preliminary thoughts on Module 3



MODULE 3

Bottom-up Stress Test Projections

	Transition Risk	Physical Risk
Exposures	Global	EU Countries
Scenario (projections)	ST stress (baseline / stress-disorderly)	Drought & heat risk (baseline / stress)
	LT Paths (orderly, disorderly, hot-house)	Flood risk (baseline / stress)
Horizon	ST-3Y (2022-2024)	1Y(2022) for both scenarios
	LT-30Y (2030, 2040, 2050)	
Credit Risk	YES (Corporate loans incl. SME, CRE) + Mortgages	Drought & heat: Corporate Loans (incl. SME) Flood: Mortgages + CRE loans
Market Risk	YES for ST only (bonds + stocks issued by non-financial corporates)	NO
Operational Risk***	YES (conduct, physical and reputational risk events)	

***No direct connection with above mentioned scenarios.

Transition Risk – Short Term – Impact on Credit & Market exposures

Exercise inspired by NGFS disorderly scenario. In this scenario policy measures to reduce carbon emissions are delayed. For governments to still achieve the Paris Agreement targets, a sharp and unexpected increase in the price of carbon is needed.

Transition Risk – Long Term – Impact on Credit exposures

The three transition risk scenarios are based on the NGFS three representative scenarios (orderly, disorderly, hot house world). Released by NGFS in June 2021.

Physical Risk (Heat risk) – Short Term – Impact on Credit exposures

In the drought and heat scenario, the entire EU is hit by a heatwave in 2022 which hampers economic activity and results in output losses for vulnerable industries.

Physical Risk (Flood risk) – Short Term – Impact on Credit exposures

In the flood scenario, the EU is hit by a severe flood which causes damage in a certain fraction of the areas at risk. The exercise focuses on mortgage exposure to households as well as the part of a bank's exposure to firms that is secured by real estate.

Operational and reputational risk due to climate-related and environmental events

In line with the ECB's supervisory methodology and EBA SREP guidelines, operational and reputational risks are treated separately in the 2022 SSM climate risk stress test methodology.

Our analysis

Climate risk bottom-up stress tests are also at very early stage in most of financial institutions due to the lack of data available but also the longer than usual horizon period of this exercise.

Module 3 is the quantitative component of this stress test exercise and is presented as an exercise built in the same spirit as the EBA stress tests.

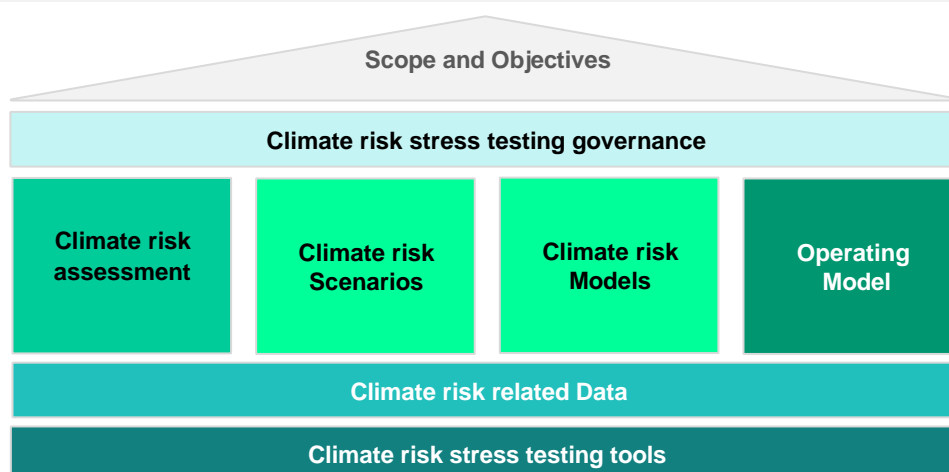
Nevertheless, it includes many challenges to adapt the already existing models and calculation processes. Indeed, the notion of dynamic balance sheet and the 2050 horizon for the long-term transition scenario represents a real operational challenge. In addition, the granularity of the sectoral breakdown will represent an additional difficulty in the exercise.

OUR SERVICE OFFER

Climate-related risk stress testing



Our service offer covers the key building blocks of a climate risk stress testing framework.



- Identify the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning
- Define the key assumptions and targets regarding bank's medium- and long-term view regarding the average increase of global temperature (1,5°,2°...)

- Board's oversight of climate-related risks stress tests and formal/ frequent challenge of approaches and results (Board engagement)
- Articulated role for Climate risk stress tests in the three lines of defense model and Model risk mgt

- Explore and understand how various combinations of climate-related risks, both transition and physical risks, may affect bank's businesses, strategies, and financial performance over time.

- Scenario designing process linked to Material risk identification and notably exposures to climate risks
- Scenario design integrates Risk (credit risk, market risk) and P&L perspectives
- Design and implementation of risks methodologies considered transition and/or physical risks

- SME support to implement "Bottom-up" and "top-down" balanced and automated processes fully linked to business and risk mgmt.
- Bring smart PMO team to foster collaboration across teams and provides overall coordination and content challenge
- Sustainable resource quantum and skills

- Support to design and implement climate risk data model addressing group, subsidiary, divisional, needs
- Providing formal data quality assessment and assurance framework
- Alignment with other needs (BCBS239, IFRS9, COREP, etc.)

- All climate risk scenario-based processes (business, internal, regulatory) within the same infrastructure (robust, inter-connected solutions)
- Component based infrastructure (i.e. modular by risk type) with adequate interfaces across each solution

CREDENTIALS

Sample of credentials related to climate-related risk management and stress testing



Described below are a sample of our credentials within the largest French banks in terms of climate risk management, climate stress tests and regulatory stress tests.

Definition of a roadmap for implementing a climate-related risk management framework



- Impact analysis of ECB Guide on climate-related and environmental risks.
- Lead of methodological workshops with various stakeholders of the institution to analyse the existing framework.
- Establishment of areas for improvement in line with regulatory guidelines and market best practices.
- Development of the roadmap in line with supervisory expectations.

Integration of climate-related risks in the risk identification process



- Application of a link matrix between the traditional risk categories and climate risk drivers (physical and transition).
- Implementation work with a view to constructing an initial mapping of climate risks.
- Proposition of a preliminary version of a Carbon Asset Risk assessment framework.

Assistance in the implementation of the EBA/ECB EU-wide stress test exercise



- Interpretation of the modules of the ST methodology (credit risk, market risk...) in relation with the bank's risk profile and structure.
- Support in the data collection process, using the different bank's reports (FINREP, COREP, STE...).
- In-depth analysis of the templates required for the exercise.
- Preparation of the templates, explanatory notes and analysis of the results.
-

Definition of methodologies to quantify climate-related risks under the ICAAP process and Risk appetite framework



- Analysis of methodologies developed by the industry to quantify transition and physical risks.
- Proposal of the methodology envisaged to integrate transition and physical risk scenarios into the stress testing exercise under the ICAAP's normative perspective.
- Analysis of regulatory climate risk stress testing methodologies.
- Proposal of metrics related to the greatest carbon exposures and calibration of tolerance thresholds (very preliminary version) Introduction of the Green weighting factor to enrich the calibration of the tolerance thresholds associated with credit RWAs

ACCELERATION TOOLS

Sample of tools related to
climate-related risk management and stress testing



Leveraging on its experience, Avantage Reply has developed flexible and easy-to-use tools to support its clients to design/upgrade climate risk management or climate risk stress testing frameworks

Climate risk Self-assessment tools

Self-assessment tools for financial institutions to evaluate their capabilities in climate-related risk management and climate-related risk stress tests

Climate risk scenario analysis

Tactical tools to assess the potential impact of climate risk on credit risk portfolios and market positions through multiples climate scenarios. Assess bank's exposure and sensitivity to carbon risk or physical events

Climate risk scoring tool

Green weighting factor/scoring tool to determine the rating to each counterparty of the portfolios depending on its climate adaptation and mitigation strategy and its sensibility to key environments impacts (e.g. pollution, waste...)

Flexible Risk ID tool

Integrating climate risks dimension in a defined material risk identification assessment tool through the inclusion of climate risk as a risk driver of traditional risk categories or through a carbon assessment risk assessment

Flexible Pillar 2 modeling tools

Extension of already existing Pillar 2 modeling tools (credit risk, concentration risk, operational risk) to include climate risk dimension

Flexible credit and operational risks stress testing tools

Extension of already existing credit risk and operational risk stress testing tools (default risk, concentration risk, operational risk) to include climate risk dimension

