



# Risk and Regulatory Outlook 2022

Rising tides: Climate risk stress tests and its implications for banks across Southeast Asia

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# Coming to terms with climate risks: What it means for stress tests in banks across Southeast Asia

## Overview

With increased institutional awareness of climate change and financial market momentum to channel capital towards climate change adaptation and mitigation, regulators globally and in Southeast Asia have issued guidance to banks to build capacity for integration of environmental, social and governance (ESG) or environmental assessments in risk management.

These requirements also include incorporating climate change or environmental assumptions into stress test scenarios. Numerous regulators have either overseen exploratory climate risk assessments or set out broad guidelines of climate risk stress tests to be conducted in the near term.

In October 2021, the European Central Bank (ECB) released the methodology for a supervisory climate risk stress test (CST) for participating banks, requiring credit risk projections, quantification of exposures to greenhouse gas (GHG) intensive industries, and reporting financed GHG emissions<sup>1</sup>. Its requirements will be covered in the latter part of this article.

It is likely that regulators across Southeast Asia will prescribe or seek to assess similar metrics. Regional banks should be prepared to adapt existing stress testing capabilities to meet the demands for data and credit risk modelling. Proactive benchmarking against the ECB CST enables a more efficient and higher quality response to this new type of stress test.

## Expectations for banks across Southeast Asia

Regulators in Southeast Asia have moved in tandem with global regulators to engage banks in assessing environmental or climate-related changes on their business.

In terms of concrete and detailed instructions to consider climate change or environmental risks within stress test and scenario analysis, the overall status in the region is still non-prescriptive or in consultation. This lags behind the ECB, UK's Prudential Regulation Authority, and the Hong Kong Monetary Authority, where pilot climate risk stress test exercises have either been implemented or will be rolled out in 2022<sup>2</sup>.

In 2020, the Monetary Authority of Singapore (MAS) and Bangko Sentral ng Pilipinas announced frameworks or guidelines for banks to embed environmental-related considerations within their operating or risk management activities<sup>3</sup>. Bank Negara Malaysia's (BNM) recent December 2021 Exposure Draft on Climate Risk Management and Scenario Analysis for industry consultation follows the 2021 climate-change and principle based taxonomy identifying activities considered "green"<sup>4</sup>.

The Bank of Thailand also recently announced climate risk as a new risk type to be considered in local internal capital adequacy assessment processes (ICAAP). Meanwhile, MAS has indicated that stress tests under a range of climate scenarios will be conducted by end 2022<sup>5</sup>.

In response to the common need for a set of pathways to envisage climate risk effects on the financial system, the Network for Greening the Financial System (NGFS) publishes scenarios that include country-specific macroeconomic forecasts and financial variables<sup>6</sup>. They can be categorised as below:



1. Orderly scenarios assume early rollout of climate policies that result in lower physical and transition risks.



2. Disorderly scenarios see delayed and divergent action taken, with higher transition risks compared to orderly scenarios.



3. Inconsistent implementation of climate policies cause irreversible global warming impacts.

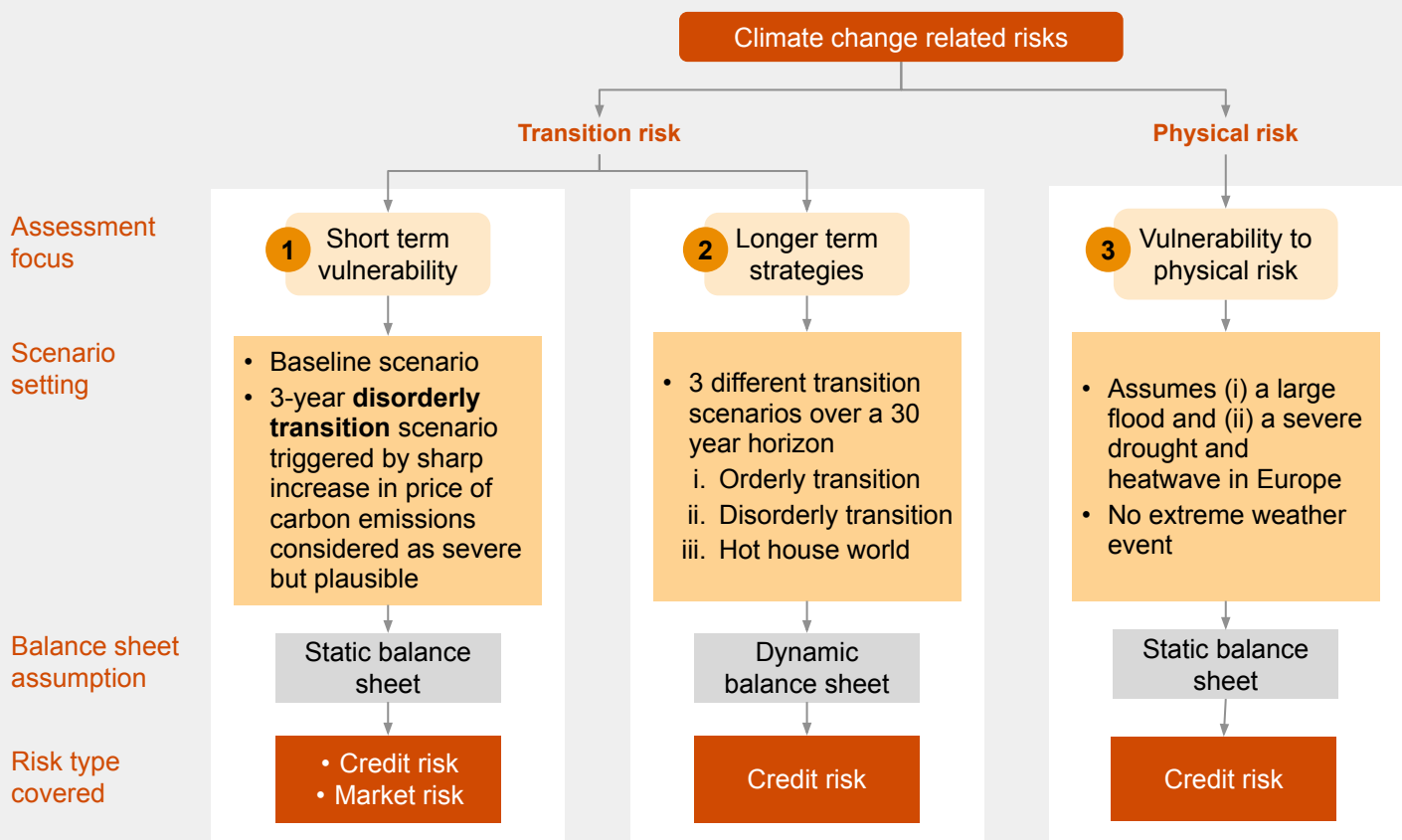
1. European Central Bank, "[In the spotlight: 2022 supervisory climate stress test](#)", 2021  
2. Hong Kong Monetary Authority "[HKMA publishes the results of the pilot climate risk stress test](#)", 2021; Bank of England "[Key elements of the 2021 Biennial Exploratory Scenario: Financial risks from climate change](#)", 2021  
3. Monetary Authority of Singapore "[Guidelines on Environmental Risk Management for Banks](#)", 2020; Bangko Sentral ng Pilipinas "[BSP Calls for Continued Collaboration on Sustainable Finance](#)", 2021  
4. Bank Negara Malaysia, "[Exposure Draft on Climate Risk Management and Scenario Analysis](#)", 2021.  
5. MAS, "[Being the Change We Want to See: A Sustainable Future](#)", 2021  
6. NGFS, "[NGFS Climate Scenarios for central banks and supervisors](#)", 2021

## ECB's Climate Risk Stress Test (CST)

While regulators across Southeast Asia have yet to define the scope, parameters, and methodology components of climate risk stress tests, the European Central Bank (ECB) has announced that a CST is to be conducted by Significant Institutes in Q2 2022 based on the NGFS scenarios. This CST can be an opportunity for a benchmark as it provides

regulators and banks insights into industry best practices in relation to climate risk stress tests and emissions data coverage.

There are **three main components** to the ECB CST, covering both transition and physical risks from climate change:



## 1 Climate risk stress test capacity questionnaire

Banks are required to provide an overview of their current practices and future plans for stress testing through a qualitative questionnaire, covering climate risk stress testing framework, modelling, and its integration into risk appetite and business strategy.

## 2 Climate risk metrics

This component aims to provide a proxy measure of a bank's income sensitivity to transition risk, its exposure to carbon-intensive sectors, and sustainability of its existing bank model.

Banks first classify non-financial corporate exposures against an ECB-provided list of 22 NACE<sup>7</sup> industrial sectors that are considered greenhouse gas (GHG) intensive, covering manufacturing, energy supply, transport, construction, land use, agriculture. Subsequently, the two following metrics are submitted:

- **Interest, fee, and commission income** from in-scope exposures from the 22 sectors above indicate a bank's income from GHG intensive industries and transition risk.
- **Financed GHG emissions** from the top 15 largest non-SME non-financial obligors by each of the 22 sectors accounted by ratio of GHG emissions to average obligor revenue indicate climate risk in a bank's portfolio.

7. NACE is a statistical classification of economic activities in the European Community. Its uniform use within all member states is legislated at the European Union (EU) level.

### 3 Bottom-up climate risk stress test projections

The ECB Climate Risk Stress Test exercise requires modelling frameworks that account for changes in both near and long term impacts of transition risks on expected credit losses (ECL), asset prices, internal business plans, and the short term impacts of an extreme manifestation of physical risk.

- **Assess near term vulnerability with 3-year NGFS disorderly transition scenario impact**

A baseline scenario and 3-year disorderly transition scenario that sees a sharp USD100 increase in price of carbon emissions are applied on in-scope credit risk exposures based on the capital requirements regulation (CRR) and market risk exposures of all trading book corporate bond and equities. Both credit and market risk exposures are to be classified based on the 22 NACE GHG intensive sectors.

Banks are required to consider the impacts of stressed macroeconomic variables and asset price shocks. Main transmission channels for credit risk parameters (loss given default or LGD, lifetime ECL%, stage 1, 2 and 3 transition rates etc.) are through decreased profitability and deteriorating creditworthiness of obligors. Meanwhile, trading book fair value bond and equity exposures are hit from the carbon price shock through different risk drivers, including equity, credit spread, interest rates, commodities, FX movements.

- **Understand bank's strategy for credit exposures over 30-year horizon**

Banks are expected to outline their business strategy, corporate and mortgage exposures at ten-year intervals over a 30-year timespan across three different transition scenarios largely based on the NGFS scenarios: i) orderly transition, ii) disorderly transition, and iii) hot-house world.

The challenge of this component is in providing and substantiating strategic decisions over the change in exposures (for instance, reallocation from brown to green industries, mix in energy performance of mortgage exposures), and performing credit risk projections of these decisions, to assess resilience and adaptability of business models based on the dynamic balance sheet.

#### Dynamic balance sheet development



Forecasted changes in balance sheet metrics, e.g., sectors where exposures see increased or decreased lending, energy efficiency of real estate collaterals, are to be classified as either growth or reallocation decisions.

Plausibility of balance sheet projections should be qualified with reference to bank-specific strategy and business environment assumptions.

#### High-level credit risk projection



Banks are required to classify balance sheet projections into performing or non-performing, and provide estimates for point-in-time probability of default (PD), point-in-time LGD, provisions for performing and non-performing exposures.

Estimates should be conservative to reflect a view on long-term losses. Supplementary substantiation in the form of adaptation plans of large counterparties (if any) can be provided.

- **Assess physical risk vulnerability through hypothetical severe acute weather events against base scenario**

Under a hypothetical drought and heatwave, the ECB expects dampened economic activity and output losses for vulnerable sectors such as farming, tourism, energy production and forecasts value-added losses for each EU country by production chains relevant to the 22 GHG intensive sectors. Meanwhile, a severe flood is expected to affect collateral values, impacting a bank's EU-domiciled mortgage portfolio and exposures secured by real estate. ECB will provide a flood stress map for banks to apply location-specific price shocks.

Banks are required to estimate one-year credit risk parameters as with the near-term transition risk exercise under a static balance sheet.

## Regional uniqueness

The key aims of the ECB's CST are to measure the degree to which existing banking business models are dependent on GHG intensive industries, gain a measure of financed GHG emissions, and to model exposures vulnerable to physical and transition risks. While it is expected that these aims will be shared by regulators across Southeast Asia, there are likely to be differences in the risk profiles of banks in the region against the EU's Significant Institutes.

- **Larger role of extractive and agricultural sectors produce different GHG profiles:** As extractive and agricultural sectors still play a larger role in Southeast Asia economies compared to the EU region, it is expected that the GHG intensity profile will differ regionally in certain regards, possibly in terms of Scope 1 and Scope 3 emissions.
- **Collateral impact from potentially stranded oil and gas assets:** Given the importance of oil and gas exports to the region, it is also likely that the risk of stranded assets in the form of refineries and storage terminals would affect collateral values negatively under scenarios with high transition risk. Production switches over time from petroleum to natural gas may lead to positive impacts on stress test results, and reduce the risk of stranded assets.
- **A relatively higher proportion of household mortgages** in the largest banking groups in South East Asia compared to their EU counterparts would emphasise the results of any physical risk stress component.
- **Different kinds of acute weather events in South East Asia** with typhoons, earthquakes, flooding; and the chronic issue of sea level rise. Climate risk stress tests in the South East Asia context may well see hypothetical once-in-hundred-year floods inundating agriculture heartlands and cities, or severe storms and typhoons damaging infrastructure.



## The way forward for banks

Given the regulatory trend of including climate change related scenarios or assumptions into supervisory stress tests, banks that have already, or will begin to put in place the following measures, will be in a better position to address the challenges of a climate risk stress test.

- **Build data capabilities for climate and environmental data:** Apart from data repositories to store starting point values for relevant credit risk metrics, banks should explore sources of historical and forecasted climate data relevant to their location, as well as GHG emissions and carbon pricing data, for modelling purposes. Systematic exposure classification by industry, granular sectoral identification, locations of key supply chain facilities for corporate obligors and real estate collaterals will streamline exposure quantification and scoping.
- **Collaborate with clients for high quality ESG disclosures:** While banks can consider commercially available ESG ratings and data providers for coverage of large-cap obligors, there are opportunities for banks to engage with clients through questionnaires to collect information related to Scope 1, 2 and 3 emissions and adaptation plans. Information collected could be used to inform climate risk management and resource allocation decisions.
- **Strategic stance on sustainable financing:** A financial institution that has a clear sustainability business roadmap can better articulate ambitions and context regarding existing GHG financing and demonstrate a coherent response to stress test requirements.
- **Integrate climate risk horizontally across existing risk management frameworks:** Formal inclusion into existing frameworks for market, credit, liquidity, and operational risk types allow efficient identification and assessments of climate risk impacts across well-established risk types and ongoing exposures.



## The way forward for banks (cont'd)

- **Upskill risk management resources on climate risk fundamentals:** Banks are able to form stronger responses to regulatory demands by encouraging risk management teams to view climate risk as a new driver that impacts traditional risk types, and developing a holistic mindset to integrate environmental perspectives to portfolio risk. Banks can also build new sustainability and climate risk positions or formally introduce them as additional mandates.
- **Update existing governance processes to cover climate risk as a new risk type:** This involves updating existing model risk management guidelines and stress testing analytical frameworks to consider the prevalence or impact of climate risk in a proportionate manner for relevant stress test models and risk metrics. Having the requisite climate and environmental science knowledge to validate related assumptions and predictions can also be considered.
- **Using climate risk stress test results to inform portfolio strategy:** Identifying products and portfolios that are significantly more vulnerable under various climate scenarios can help inform business decisions. Whether to pivot away from high-risk sectors and businesses, or adding another lens to assess new launches, climate risk stress testing capabilities can be set up in a more versatile manner to support business users.

## Operational considerations

Here are several practical steps that banks can implement to set up a climate risk stress test production run:

- Assess current exposures and establish a data pipeline that enables accurate views of existing portfolios
- Reach out to their largest counterparties to obtain GHG emissions information and climate change adaptation plans
- Build linkages and transmission channels of climate risk in loss forecasting models or framework
- Review existing stress test models' assumptions to assess if they remain applicable and suitable under macroeconomic forecasts and time horizons from the climate risk scenarios
- Consider collating a set of scenario narratives tailored to the bank's business environment and use qualitative assessments as a starting point
- Enhance reporting infrastructure to incorporate additional granularity and disclosures related to climate and sustainability risks

## Conclusion

As the goal of building a sustainable global economy and limiting emissions to halt global warming becomes more central in the coming years, climate risk is expected to be a mainstay of future stress testing exercises. The methodological and data challenges surrounding an effective climate risk impact assessment on banking exposures are complex, however regulators will expect institutions to model financial impacts and perform scenario analysis for climate risk in the near term.

As climate and environmental risks will become more stringent over time, early investments and efforts to build capacity, develop tools and get to grips with climate risk beyond high-level assessments will be integral in responding to regulatory requirements.



Proactively adapting local capabilities to global regulatory developments will allow banks across Southeast Asia to stay at the forefront of a rapidly changing regulatory and risk management environment.

**Andrew Chan**

PwC South East Asia's Sustainability and Climate Change Leader



#RiskandRegs

# Contacts



**Andrew Chan**

PwC South East Asia's  
Sustainability and Climate  
Change Leader  
+60 (3) 2173 0348  
andrew.wk.chan@pwc.com



**Antonie Jagga**

Risk Consulting Leader,  
South East Asia Consulting  
PwC Singapore  
+65 9667 5825  
antonie.jagga@pwc.com



**Elaine Ng**

Financial Services Leader  
PwC Malaysia  
+6 (03) 2173 1164  
yee.ling.ng@pwc.com



**Parul Munshi**

PwC South East Asia ESG  
Campaign Leader  
+65 9660 5011  
parul.v.munshi@pwc.com



**Su Areewronges**

Partner  
PwC Thailand  
+66 (0) 2844 1000  
su.a.areewronges@pwc.com



**Veronica Bartolome**

Consulting Principal  
PwC Philippines  
+63 (2) 8459 3238  
veronica.r.bartolome@pwc.com



**John Dovaston**

Partner  
PwC Indonesia  
+63 (2) 8459 3238  
john.j.dovaston@pwc.com



**Dinh Hong Hanh**

Partner  
PwC Vietnam  
+84 904 178 556  
dinh.hong.hanh@pwc.com



**Dickson Wong**

Director  
PwC Singapore  
+65 8299 9721  
dickson.wong@pwc.com



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