Network for Greening the Financial System

Conceptual Note

Interactions between Climate Scenario Analysis and Transition Plans

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NGFS

Central Banks and Supervisors Network for Greening the Financial System

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Foreword – Interactions between climate scenario analysis and transition plans

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Climate change presents unprecedented challenges and risks to global economies and financial systems. Amid growing physical and transition risks central banks and supervisors play a vital role in ensuring the resilience and stability of the financial system. In this context, forward-looking tools that enable financial institutions to anticipate and manage climate-related risks are increasingly important.

Among these tools, climate scenario analysis and transition plans have emerged as key instruments. Climate scenario analysis allows institutions to explore various plausible climate futures and assess their implications for strategy and risk management. Transition plans translate financial institutions' strategies into concrete actions and milestones. This enables them to monitor and manage climate-related financial risks, including those linked to the green transition. The effective interaction between scenario analysis and transition plans is essential to build credible, robust strategies that enhance financial institutions' resilience in the face of climate change.

While the NGFS recognizes the emerging and exploratory nature of this topic, we hope that this note helps advance our understanding of how climate scenario analysis and transition planning can complement and inform each other. It offers actionable insights that can help financial institutions to better integrate these processes, thereby strengthening their ability to manage climate risks and seize transition opportunities.

As the science and practice continue to evolve, we encourage the central banking and supervisory community to engage with these developments, fostering collaboration and sharing insights. Together, we can support the shift towards a more stable and sustainable financial system equipped to meet the challenges of the climate transition.

This note is published together with another note on climate target setting and transition plans. Through these publications, we hope to contribute to the practical implementation of transition plans and their use by supervisors. We are convinced that these analyses will shed light on these issues, and help the central banking and supervisory community to make progress on the subject. These notes conclude an initial cycle of NGFS reports on transition plans that began in 2023, which have helped to explore the challenges of these plans from a micro-prudential perspective and to understand the context in which these plans are developed.

We are grateful for the commitment of the workstream members who contributed to this report, as well as the valuable engagement of other stakeholders who have shared their expertise, insights, and practices. We express our heartfelt thanks to the co-leads of these reports for their leadership and dedication.

Executive Summary

The NGFS Stocktake published in May 2023 noted that the use of scenarios could be relevant in transition planning and the development of transition plans[1]. Financial institutions are increasingly recognising climate scenario analysis to be a key tool for assessing climate risk. This includes using scenario analysis to help align their transition strategies with broader global climate goals as well as to improve risk management.

Both climate scenario analysis and transition plans are forward-looking tools that can be used to support the assessment of climate risk and the transition towards the goals of the Paris Agreement. They identify and assess climate impacts on a financial institution's business in the short, medium, and long term. They also inform future actions and mitigants that improve a financial institution's strategic resilience in the transition to net-zero and the changing climate environment in which they operate.

This document sets out initial analysis of the interaction between climate scenario analysis and transition planning. It provides high-level recommendations on how the commonalities and synergies can be leveraged to further inform and complement each other.

The concepts discussed in this paper are still at a nascent stage of development. The content of this paper is therefore predominantly exploratory in nature and emphasises the need for continued analysis to deepen insights and advance practical development of these interlinkages.

In particular, we explore interactions with regards to:

1. **How climate scenario analysis could inform transition planning (e.g. in strategy setting or risk management);**
2. **How transition plans could inform climate scenario analysis (e.g. how transition planning information could feed back into the design of scenario analysis).**

As part of this analysis, the NGFS performed a desktop review to see to what extent the interaction was already explored in the existing literature. NGFS also collaborated with the Global Association of Risk Professionals (GARP) to conduct roundtables with a range of financial institutions to gain insights into how financial institutions are applying scenarios in practice. In particular, the benefits and limitations of using climate scenario analysis in transition planning and of using of transition plans to inform climate scenario analysis were discussed.

Commonalities between climate scenario analysis and transition planning

There are a number of commonalities and interactions between climate scenario analysis and transition planning that merit further exploration:

- **Forward-looking tools:** Both processes are forward-looking tools that identify and assess impacts of climate change on a financial institution's business and can inform future actions.
- **Data inputs, monitoring and reporting:** Both processes are likely to use similar science-based data and metrics inputs (e.g. outputs of climate models, emissions metrics).
- **Assumptions and methodologies:** Both processes require consistent and credible assumptions and methodologies (e.g. on the external developments or time horizons used), for both assessment of risk and setting of decarbonisation targets.

Findings on how climate scenario analysis could inform transition planning

Climate scenario analysis can provide a view of the potential risks and opportunities that may affect a financial institution's business strategy and operations. Climate scenario analysis can therefore inform transition planning in several different ways:

- **A financial institution's transition planning should follow a coherent narrative and should include both intermediate milestones and longer-term targets.** The narrative, targets, and corresponding actions could align to transition pathways stemming from one or a set of reference scenarios.
- **Financial institutions' transition plans should reflect an assessment against a range of potential outcomes.** They should also consider appropriate combination

1 NGFS (2023), Stocktake on Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities.

of mitigative and adaptive measures to facilitate its transition. This ensures that the sensitivity of future performance and the robustness of financial institutions´ business capabilities are explored under different climate-change outcomes and policy pathways, and that appropriate future actions are designed in response.

- **Financial institutions may use climate scenario analysis outputs to identify pockets of vulnerabilities and test their own forward-looking business strategy and investment decisions.** Certain scenarios can contribute to risk assessments and highlight particularly vulnerable areas, helping financial institutions prepare for future changes that may be needed to the risk management framework.

Findings on how transition plans could inform climate scenario analysis

Fewer concrete findings currently exist on the use of transition plans as inputs to scenarios as market practices are still developing. Two key overarching themes have been identified.

- **Using corporate clients' transition plans could enhance financial institutions' climate scenario analysis and transition planning processes.** By assessing the transition plans produced by their clients, financial institutions could retrieve granular information on their clients' transition strategies, including relevant metrics such as corporates' time-bound emissions targets. Such granular and context-specific information could be embedded in the design of financial institutions' own scenario analysis and transition planning processes.
- **Financial institutions' own transition plans could represent an input to their climate scenario analysis.** Financial institutions could use existing approaches for dynamic balance-sheet modelling and apply information on the prospective evolution of their portfolios as informed by their transition plans. This information could be incorporated into financial institutions´ scenario analysis as an additional input on top of the reference scenarios, to help test the financial institutions´ strategies. Doing so would help assess emerging risks and opportunities along transition trajectories consistent with the scenarios used.

Recommendations

Given the nascency of current practices in this area, the NGFS has developed high-level recommendations that financial institutions can consider as they continue to develop their climate scenario analysis and transition planning practices. These recommendations focus on areas where the identified interactions and benefits are relatively simple to implement or could add the most value to financial institutions' risk management practices and wider transition and business strategy.

Recommendation 1: Develop a single, integrated data management framework and underlying data architecture across both climate scenario analysis and transition planning processes. Both climate scenario analysis and transition planning processes are likely to use similar, forward-looking data inputs that would benefit from a single, integrated framework to improve and optimise data collection and processing. This would also help increase data consistency and resolve data challenges more efficiently. Systems to manage and aggregate this data should include transition planning metrics and should support the reporting of outcomes from scenario analysis.

Recommendation 2: Implement an overarching framework across a financial institution's organisational structure that integrates both climate scenario analysis and transition planning processes. This would help financial institutions leverage any identified commonalities and interactions between climate scenario analysis and transition planning processes and ensure consistency of their application. It will also help coordinate and align both processes at an operational level where appropriate, including facilitating feedback loops (i.e. *via* common governance processes, information sharing, review cycles etc.).

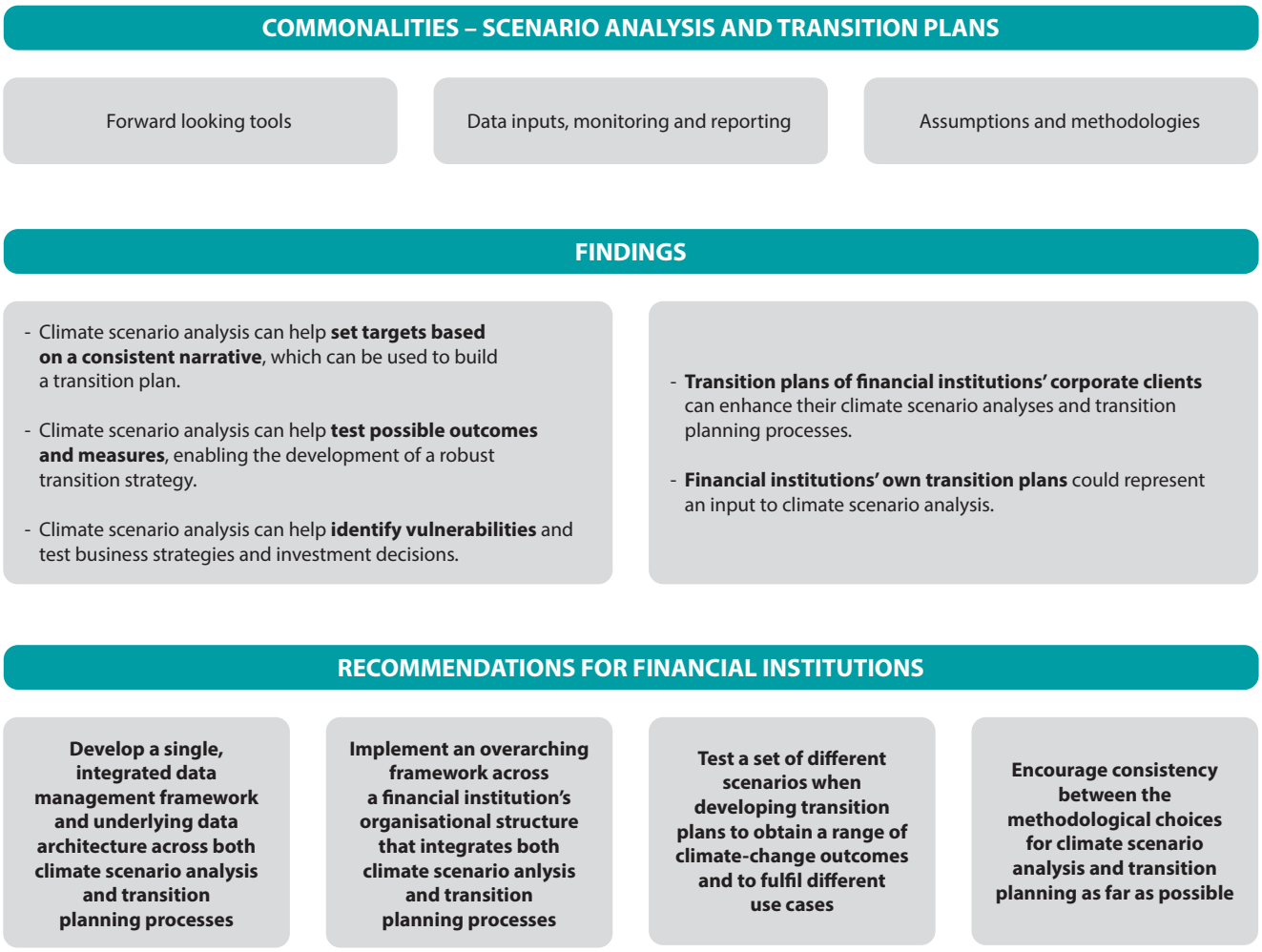
Recommendation 3: Test a range of different scenarios when developing transition plans to obtain a range of climate-change outcomes and to fulfil different use cases. Different scenarios that vary in calibration and design should be used. For risk management, scenarios assessing more extreme outcomes on a shorter horizon may be more appropriate, whereas strategy setting and business model

resilience may be better informed by scenarios over a longer time horizon. Additionally, using the outputs from more than one scenario could help capture a range of potential options and reflect inherent uncertainties.

Recommendation 4: Encourage consistency between the methodological choices for climate scenario analysis and transition planning. As far as possible, this should include consistency between data, underlying assumptions, methodologies, use cases, time horizons and other general concepts, such as portfolios in scope and base year. Where financial institutions choose to apply different definitions and concepts across the two processes, there should be transparent rationale with a clear understanding of the differences and impact on outputs.

The concepts explored in this note are still in an early phase of development. As understanding and practice continue to evolve, financial institutions, financial sector regulators and other relevant bodies should be encouraged to further study and explore the commonalities, interactions and synergies between climate scenario analysis and transition planning processes. Where recommendations link to the design and application of best practice, there is a role for regulators, policymakers and standard setters to continue advancing the conceptual understanding and practical development of these tools, processes and related guidance. These bodies could also support further work to engage with financial institutions to better understand leading practices, the pace of evolution and to streamline findings to provide industry guidance.

Figure 1 **Summary of the key interactions between financial institutions' climate scenario analysis and transition plans**



1. Introduction

The NGFS has sought to further explore the interaction between financial institutions' forward-looking climate scenario analysis and transition planning processes.

The NGFS has been studying the role and content of transition plans in enabling the financial system to mobilise capital and manage climate-related financial risks and their relevance to micro-prudential supervision. Transition plans are key tools for an orderly economy-wide transition, and the NGFS's continued work on this topic supports its core mandate to strengthen the resilience of the financial system to climate change risks and supporting the transition to a sustainable global economy[2]. The 2023 NGFS Stocktake Report on *"Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities"*[3] noted the important role transition plans and transition planning can play in financial institutions' risk management and strategy setting, including the link to meeting specific climate targets. The importance of climate scenario analysis as a key forward looking tool to assess climate-change impacts and define transition strategies is also widely recognised in other literature[4] and the relevant frameworks such as ISSB and GFANZ[5].

This report is part of the sequence of deep dives on cross-cutting and foundational topics relating to transition plans which has been conducted by the NGFS. It seeks to explore the relevance of climate scenario analysis undertaken by financial institutions in developing transition plans and the interaction of two processes. The NGFS seeks to explore the possible interactions between transition plans and climate scenario analysis with regards to both:

1. **How climate scenario analysis could inform transition planning** (e.g. in strategy setting or risk management); and
2. **How transition plans could inform climate scenario analysis** (e.g. how transition planning information could feed back into the design of scenario analysis).

The note explores the concepts at a high-level, reflecting the novelty of the topics under discussion. It emphasises the need for ongoing work and continued stakeholder engagement to deepen insights and advance practical development of best practice. Some prior knowledge of climate scenario analysis and transition planning processes would be helpful to inform the reader's full understanding of the concepts discussed in this note. Additionally, terms used in this technical note, including *"transition planning"*, *"transition plans"*, *"scenarios"*, *"climate scenario analysis"* and *"stress tests"*, are defined in Annex 1.

As a first step, the NGFS conducted a desktop review of existing guidance and literature[6] on the interaction between transition plans and climate scenario analysis. This included the current landscape of guidance for setting forward-looking metrics, considerations in international standards and frameworks, existing conceptual synergies identified, and the impact with regards to different use cases (i.e., for strategy or risk management purposes).

As a second step, the NGFS – in collaboration with the Global Association of Risk Professionals (GARP) – conducted roundtables with a range of financial institutions to gain insights into current practices. The roundtables sought to understand how financial institutions are applying scenarios in practice, the benefits, and limitations of using climate scenario analysis in transition planning and how transition plans may be used to inform climate scenario analysis.

2 NGFS (2023), NGFS Charter.

3 NGFS (2023), Stocktake on Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities.

4 BCBS (2024), The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks.

5 See, for example, ISSB IFRS S2 standard, point 22 or GFANZ report on transition plans.

6 The list of existing guidance and literature is presented in Annex 2.

Based on these findings, the NGFS has developed recommendations to support financial institutions' internal approach to climate risk management and planning. Where interactions between climate scenario analysis and transition planning have been recognised, any associated commonalities could be further leveraged by financial institutions. The findings and recommendations in this paper are intended to support financial institutions' in linking their forward-looking tools and processes in a way that can improve the viability of financial institutions' climate-related strategies and their management of climate-related risks.

2. Current landscape

Current guidance and literature indicate that there are interactions between climate scenario analysis and transition planning/plans, particularly as forward-looking tools.

The NGFS conducted a desktop review of the current guidance on setting forward-looking metrics and the existing literature on transition plans and climate scenario analysis. These findings are summarised below.

Many financial institutions already use model-based scenarios[7] such as the International Energy Agency (IEA) Net Zero 2050 (NZ), the One Earth Climate Model (OECM) and the Network for Greening the Financial System (NGFS) scenarios[8]. These scenarios can help financial institutions align their transition plans with broader/global climate goals and improve their internal risk management. They can help identify vulnerabilities in institutions' portfolios and business models such as exposures to high-risk sectors and regions exposed to increasingly frequent extreme weather events. However, scenarios also have known limitations for their use in climate-related financial analysis (e.g. data availability, methodology standardisation, comparability across institutions, nascency of climate science understanding and inherent uncertainty related to the occurrence of climate changes)[9, 10].

The use of climate scenario analysis as an input into credible transition planning/plans is explicitly noted in most available guidance assessed for this note. Climate scenario analysis can provide valuable inputs on vulnerabilities and sensitivities into transition planning/plans as both:

- **A tool for strategic planning** and for communicating to stakeholders the actions to be implemented over time – at both strategic and operational levels – to meet climate targets;
- **A tool to support the management of all financial-related risks** associated with the transition, including actions required to proactively manage and mitigate future climate-related risks.

Fewer concrete findings currently exist on the use of transition plans as inputs to scenarios as market practices are still developing. Broadly though, we can extrapolate that:

- **Clients' transition plans could help inform the design of financial institutions' own scenario analysis.** This is particularly the case where clients' plans are of high-quality and available for a representative share of a financial institution's portfolio. Credible data and information from clients' transition plans may then inform a longer-term perspective on the trajectory of the portfolio to be integrated into a financial institution's climate scenario analysis and strategic planning (e.g. metrics calculation and target setting).

Dynamic balance sheet modelling approaches could help further inform and test the development of a financial institution's future transition plan and strategy. The expected evolution of a financial institution's portfolio over time, according to its own transition plan/strategy, could be considered as an input back into future iterations of its internal climate scenario analysis. This would enable financial institutions to further explore the outcomes of different portfolio strategies under various scenarios.

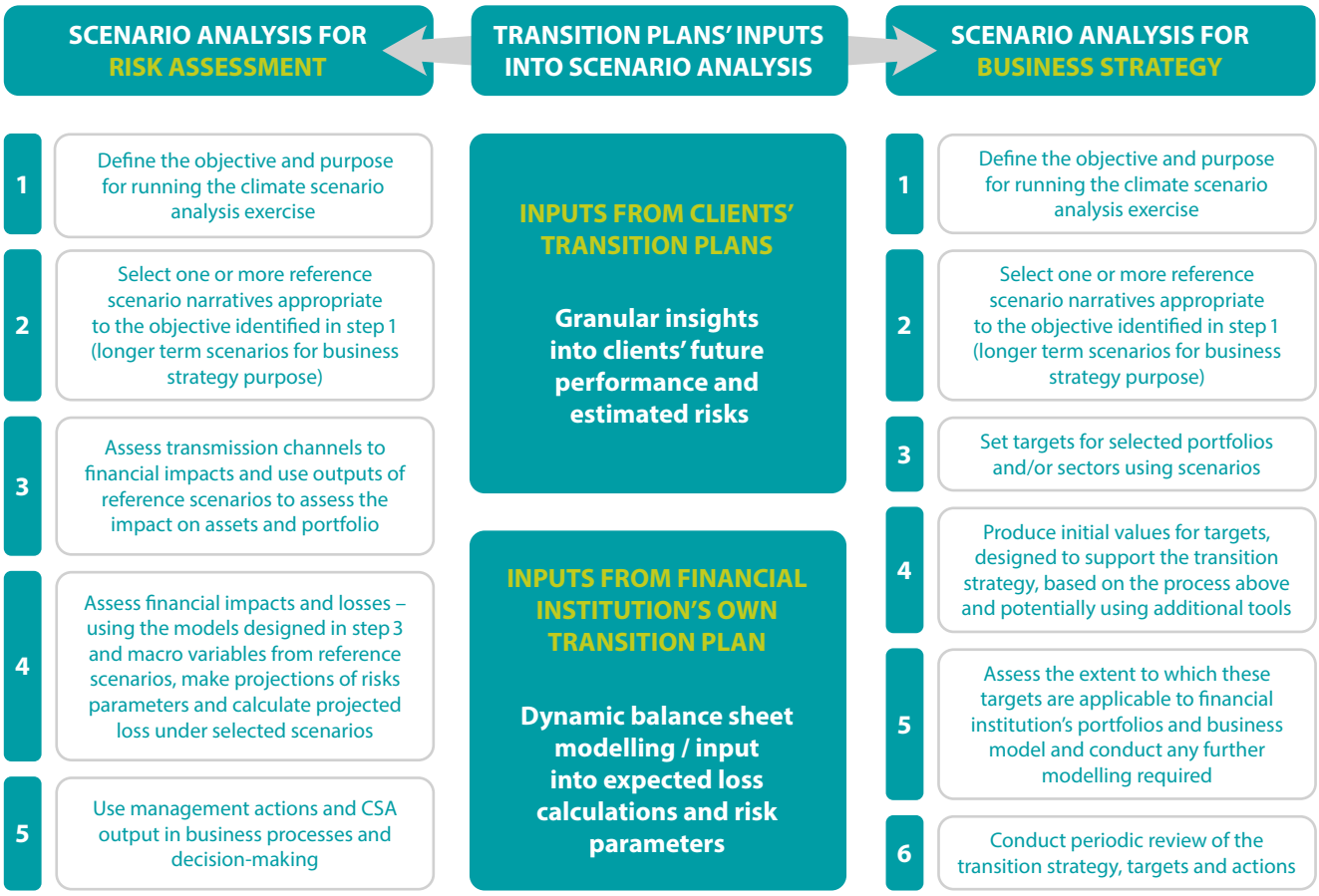
7 Scenario analysis is increasingly recognised as a key tool for climate-related risks, see e.g. IFRS (2023), S2 Climate-related Disclosures, EBA (2025), Guidelines on the management of ESG risks, EBA (2025), Public consultation on the Guidelines on Environmental, Social and Governance scenario analysis or e.g., Task Force on Climate-related Financial Disclosures (2021), Guidance on Metrics, Targets and Transition Plans. A number of large companies are already using scenario analysis to assess the impact of climate related risks or opportunities, see e.g., Task Force on Climate-related Financial Disclosures "Guidance on Metrics, Targets, and Transition Plans". The same report also speaks about the role of climate scenario analysis in target setting and the development of transition plans.

8 Net Zero Emissions by 2050 Scenario (NZE) – Global Energy and Climate Model – Analysis – IEA; One Earth Climate Model: Sectoral Pathways to Net-Zero Emissions – United Nations Environment – Finance Initiative (unepfi.org); and ngfs.net/ngfs-scenarios-portal/.

9 The BCBS has work underway in relation to climate scenario analysis by a dedicated workstream to support and improve banks' use of scenarios – BCBS (2024), The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks.

10 More on limitations and main areas where users may need to adapt the intensity of the scenarios can be found NGFS (2024), NGFS scenarios: Purpose, use cases and guidance on where institutional adaptations are required.

Figure 2 **Below provides illustrative, high-level examples of how financial institutions may apply climate scenario analysis for risk assessment and business strategy and the broader link to transition plans** (see Annex 3 for further explanation of each step)



A 2025 report published by the Financial Stability Board (FSB) examines the relevance of firms' climate transition plans for financial stability[11] from a macro prudential angle. It finds that transition plans and climate scenario analysis can interact with each other, potentially enhancing the understanding of how climate-related financial risks could affect the financial system. It reports that transition plans may inform climate scenario exercises by providing details on designing scenario narratives, the transmission and amplification of shocks, and helping to calibrate climate shocks. Additionally, by identifying material transmission and amplification channels, climate scenario analysis could help financial institutions develop transition plans that are comprehensive and robust.

11 FSB (2025), The Relevance of Transition plans for Financial Stability.

3. Commonalities between climate scenario analysis and transition planning

Climate scenario analysis and transition planning/plans are both forward-looking tools. As such, they have a number of commonalities which can be leveraged to further inform and complement each other.

These commonalities are set out in Table 1 below.

Table 1 **Commonalities between financial institutions' climate scenario analysis and transition planning/plans**

Aspect	Commonalities
Forward-looking tools	Both climate scenario analysis and transition planning are forward-looking tools that identify and assess climate impacts on a financial institution's business in the short, medium, and long term, to inform future actions that ensure a financial institution's strategic resilience in the transition to net-zero and the availability of investment and funding.
Data inputs, monitoring and reporting	Both climate scenario analysis and transition planning require data, metrics and reporting systems to be designed and set up in a way that enables transparency and accountability. For transition planning processes in particular, the use of appropriate data, metrics and reporting is also required in order to assess progress. Climate scenario analysis and transition planning processes are also likely to use similar science-based inputs (e.g. outputs from climate models, economic forecasts, and emissions data). This is important to ensure the credibility of climate scenario analysis outputs and for setting realistic transition targets. Metrics used for these processes might include greenhouse gas emissions, energy consumption, portfolio alignment metrics and financial funding and performance indicators. Reporting frameworks could involve regular disclosures and compliance with international standards.
Assumptions and methodologies	Both climate scenario analysis and transition planning require consistent and credible assumptions (e.g. on the external developments or time horizons used) for both assessment of risk and setting of decarbonisation targets. Financial institutions may employ different methodologies or bespoke overlays/judgements onto existing reference scenarios (e.g. scenarios provided by IEA/NGFS), to develop their own internal narratives, including on the underlying assumptions, which would serve as inputs for climate scenario analysis. In addition, transition planning methodologies should use consistent and credible underlying assumptions to create actionable transition plans.

4. How climate scenarios and climate scenario analysis could inform transition planning

4.1 Types of scenarios

A range of scenarios should be used by a financial institution in developing its transition plan.

Financial institutions' transition plans should reflect their assessment against a range of potential outcomes and consider an appropriate combination of mitigative and adaptive measures to facilitate their transition. The application of multiple scenarios ensures that a financial institution's sensitivity of future performance and the robustness of its business capabilities are explored under different climate-change outcomes and policy and innovation pathways. It also allows for appropriate future actions to be designed in response to the spectrum of outcomes. Examples of long-term climate scenarios that financial institutions might use are:

1. **Orderly scenarios** that assume climate policies are introduced early and become gradually more stringent. Both physical and transition risks are relatively subdued. NGFS's "Net Zero 2050", "Below 2° C", and the IEA's "Announced Pledges"[12] scenarios are examples of this type.
2. **Disorderly scenarios** that explore higher transition risk due to policies being delayed or divergent across countries and sectors. The NGFS's "Delayed Transition" scenario is an example of such a disorderly scenario.
3. **Hot house world scenarios** that assume that some climate policies are implemented in some jurisdictions, but globally efforts are insufficient to halt significant global warming. These scenarios result in severe physical risk including irreversible impacts like sea-level rise. Nationally Determined Contributions (NDCs) and Current Policies scenarios developed by the NGFS are considered hot house world scenarios.
4. **Too little, too late scenarios** that assume that a late and uncoordinated transition fails to limit physical risks. This could imply elevated transition risks in some countries and high physical risks in all countries due to the overall ineffectiveness of the transition.

In addition to its existing long-term scenarios, the NGFS has developed scenarios with shorter time horizons of three to five years[13]. These short-term scenarios seek to overcome limitations in macroeconomic and financial risk analysis stemming from the focus on long-term climate-economy relationships. The use of such scenarios could be beneficial for financial institutions as the shorter time horizons could allow for the construction of a more realistic baseline in climate scenario analysis, the inclusion of adverse near-term shocks and a sounder use of constant balance sheet or loan portfolio assumptions[14].

Using a broader range of scenarios allows climate scenario analysis to generate insights into a financial institution's future performance and resilience, which can serve multiple purposes and offer a range of valuable inputs into transition planning/plans.

4.2 Benefits of using climate scenario analysis to develop and adapt transition planning

There are several ways in which climate scenario analysis might inform and input into transition planning processes and development of transition plans.

Climate scenario analysis provides an assessment of a financial institution's future performance and resilience. This improved understanding of the potential impacts to their business model enables financial institutions to make more informed strategic decisions to navigate climate risk and the transition. This includes better identification of opportunities and a reduction in losses.

12 IEA scenarios were never explicitly mapped to the NGFS scenarios' framework. The assignment to this category should be understood in a broad sense and does not imply full compatibility of assumptions.

13 NGFS (2025), Short-term Climate Scenarios for central banks and supervisors. The NGFS short-term scenarios are the first publicly available tool offering a dedicated framework to analyse the potential near-term impacts of climate policies and climate change on financial stability and economic resilience.

14 NGFS (2023), Conceptual note on short-term climate scenarios; NGFS (2025), Short-term Scenarios – Technical Documentation.

This information is a valuable input into transition planning as it helps:

- **Building a coherent narrative for transition:** By exploring and understanding the variation and uncertainty of future performance, climate scenario analysis can be used to develop and justify the narrative that supports the assumptions, strategic rationale and drivers of transition plans. It also helps to articulate the assumptions and dependencies as well as the sensitivity to certain outcomes, events and market uncertainties.
- **Providing clear transition strategies:** Financial institutions can use climate scenario analysis to explore the business resilience of key material and at-risk economic assets and geographies under different transition pathways. Based on this understanding, financial institutions can also develop optimal business strategies by mapping their transition activities to different future outcomes.
- **Setting credible targets and quantifying metrics:** Detailed climate scenario analysis can inform realistic climate-related targets, including setting interim GHG emissions reduction and net zero milestones (see focus on section 4.3).
- **Identify risk and opportunities related to individual clients:** Different decarbonisation pathways can be applied to observe the financial impact of decarbonisation on financial institutions' clients, using, for example clients' CAPEX and production plans. This can help financial institutions adjust their lending strategies, i.e. by developing adequate products to meet client needs or by setting exposure limits.
- **Scenarios can test the robustness of risk appetite statements:** The use of different scenarios in climate scenario analysis (both more likely and adverse scenarios), could help a financial institution assesses of its existing transition plan in relation to its current risk appetite statement under different circumstances and over both shorter and longer time horizons. This also allows the adequacy and appropriateness of the risk appetite statement to be assessed.

In many cases, financial institutions will combine the activities outlined above to fully leverage the benefits of climate scenario analysis. For example, they might perform an analysis of their clients' transition plans and use this information to verify that their own strategy or risk appetite statement is robust and appropriately set.

4.3 Focus on using climate scenario analysis to set sectoral targets and develop transition strategies

A financial institution's transition planning should follow a coherent narrative. It should include both intermediate milestones and longer-term targets. The narrative and targets could align to pathways stemming from a single or set of scenarios.

Financial institutions' targets should be grounded in climate change science, e.g. benchmarked against pathways stemming from relevant reference scenarios, which implies that underlying assumptions of these scenarios should be consistent with their transition plans. Currently, the most common targets set are decarbonisation targets expressed in terms of GHG emissions or intensity. Usually, a benchmark pathway is required for setting both the GHG target and for the assessment of the enterprise's alignment with its targets. The derivation of the benchmark pathway could be based on one or more reference scenarios, or by using additional tools. Where sector-specific developments are required for sectoral analysis, reference scenarios might not provide the necessary information on the right level of granularity. For example, in the Net Zero Emission (NZE) 2050 scenario, the IEA has outlined how CO_2 emissions in key energy-intensive sectors need to evolve over time to achieve the net zero objective worldwide by 2050. The Sectoral Decarbonization Approach (SDA), developed by the Science Based Targets Initiative, uses one of the IEA's scenarios as a starting point to provide a detailed methodology and concrete tools that should help companies determine their trajectory compared to the sector intensity pathways. It has subsequently emerged as one of the most widely used approaches among institutions. Additionally, some financial institutions might use sectoral pathways developed for the specific jurisdiction where they are active. For example, the Climate Change Authority (Australia) has identified the potential technology transition and emissions pathways in six sectors that best support Australia's transition to net zero emissions by 2050[15].

15 Climate Change Authority, Sector Pathways Review.

At this point in time, financial institutions predominantly use climate scenario analysis only for decarbonisation targets and for a limited part of their activities and portfolios. These also tend to be focused on sectors rather than for the whole enterprise. Financial institutions tend to set decarbonisation targets only for the business lines and clients where they have data that is both available and credible. They may also only set targets where they have most impact, for example, setting emission targets primarily for high-emitting sectors. Insurance companies generally find it easier to set decarbonisation targets for the asset side of their business, such as investment portfolios, compared to the liabilities side, where relevant and credible data is often lacking.

There can be differences in how firms use the same reference scenarios[16] as well as significant differences in the derivation of benchmark pathways and, subsequently, the definition of transition targets, e.g. in the form of sectoral emission intensities, or reduction paths for exposures to certain borrowers, which may vary greatly depending on the respective sector. Divergences are expected and can be largely explained by differences in methodology, assumptions and in terms of choice and use of a climate mitigation scenario[17].

4.4 Focus on using climate scenario analysis to identify, assess and manage risks

Scenarios can be specifically chosen to support the identification and assessment of new risks that may emerge over time.

Financial institutions may use climate scenario analysis outputs to identify pockets of vulnerabilities and test their own forward-looking business strategy and investment decisions. For example, asset portfolio holdings belonging to some specific sectors may go out of favour for investors in the future because they may become negatively impacted by policy shifts or technological changes related to climate change. Certain scenarios (e.g. disorderly transition scenarios) can highlight such risks and help financial institutions prepare for future business changes that may be needed as mitigants. Similarly, hot house world scenarios can help identify parts of portfolios that are particularly vulnerable to weather hazards and assess what the potential losses could be if hazards occur. Similarly, climate scenario analysis over shorter time horizons could be particularly suitable for detecting potential portfolio weaknesses and developing appropriate risk management responses.

The outputs of climate scenario analysis risk assessments should therefore inform the design of financial institutions' transition planning, to ensure that the associated business strategy and risk management are properly implemented and remain sound. Climate scenario analysis can help financial institutions understand the risks they are exposed to from their strategy and risk appetite and assess whether they have effective risk management processes in place[18]. For example, appropriate climate-related key risk indicators, in line also with the institution's business model and transition strategy, could be used to inform institutions' risk appetites. Financial institutions could also define metrics and procedures to monitor, assess and manage climate-related risks connected to their portfolios and planned activities. The key performance indicators (KPIs) set as part of transition planning (e.g. emission-based sensitivities) should be aligned consistently with the business and risk strategy in credit businesses and anchored there as verifiable targets.

Furthermore, financial institutions should reflect on the results from their climate scenario analysis and transition planning processes in dialogue with their clients to assess the level of alignment between their clients' trajectories and the financial institution's own targets. To actively limit potential strategic and reputational risks in lending businesses, clients' transition plans should be sufficiently aligned with the financial institution's own sector-specific targets. A big discrepancy between these could imply that a financial institution's targets are not realistic or credible and thus require further analysis. Financial institutions might also then decide to intensify engagement with clients that are deviating the most. Furthermore, depending on the magnitude of the risk resulting from

16 ECB (2023), An examination of net-zero commitments by the world's largest banks.

17 OECD (2023), Climate change mitigation scenarios for financial sector target setting and alignment assessment.

18 NGFS (2023), Stocktake on Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities.

the misalignment with the institution's objectives, there could be further exploration of the extent to which risk information is incorporated adequately into business decisions such as lending rules and loan characteristics (including maturity, pricing and collateral requirements). In addition, the insights from such assessments could be incorporated into the early warning procedures within the credit business or risk classification procedures, such as credit scoring systems. They could also be used for monitoring the overall portfolio alignment.

4.5 Challenges related to usage of scenarios

There are known challenges that come with the use of multiple scenarios for multiple use cases, and inconsistencies may naturally arise.

Challenge 1: How to deal with the issues of consistency that arise from multiple use cases. Institutions use reference scenarios and climate scenario analysis for different purposes, e.g. developing narratives, setting targets, and testing transition plans**.** When defining the setting for climate scenario analysis, financial institutions face a challenge on how to adapt existing reference scenarios to meet their needs and capacities. The selection of individual scenarios would be aligned with the purpose that the financial institution intends to use the scenario(s) for. In this selection, consistency should be exercised across scenarios to the extent possible. Readily available and widely acknowledged solutions on how to exercise appropriate consistency do not currently exist.

Financial institutions are trying to approach these issues in various ways including by frontloading assumptions from longer term scenarios to shorter horizons.[19] For example, if a financial institution wants to stress-test the vulnerability of one particular portfolio to physical risk on a shorter horizon, it could study longer-term scenarios with a pronounced materialisation of physical risk (such as delayed transition or hot house world scenarios). They could then identify the relevant hazards and the way and severity of how they could materialise and simulate these events happening sooner, i.e., on a shorter horizon.

Challenge 2: How users define adequate narratives for transition and strategic planning. For example, what additional assumptions they need to develop and use on top of readily available reference scenarios. In the roundtable discussions, financial institutions highlighted the need to identify which scenario best reflects what they see as future developments and is best suited for them to develop their strategic narratives[20]. Providers of reference scenarios, such as the NGFS and IEA, do not in general attach probabilities to their scenarios. This is because scenarios involve exploring risks and opportunities in a range of hypothetical futures and thus cannot be regarded as forecasts. Hence, it is generally up to the users to select the appropriate reference scenarios and make some additional assumptions to define the narratives they consider most appropriate for setting business strategy. Financial institutions currently seem to be tackling this issue in different ways – some select Paris-aligned reference scenarios as the starting point for the purpose of transition planning (also due to the national policies in their jurisdictions). Others consider that 2° C scenarios are already unrealistic and stick to the "Current policies" scenario[21].

Challenge 3: How to map scenarios and output of climate scenario analysis to real economy. This is a very significant challenge. Financial institutions see this as a key exercise to help them assess the impact of developments described in the scenario on their portfolios, and coherently link the overall effect within the transition planning process. This mapping step is crucial, but far from simple. It requires significant internal analysis, also because it can be quite difficult to downscale reference scenarios to allow for an analysis of individual economic and financial assets or actors. For example, the outputs of the main climate scenarios

19 NGFS (2023), Conceptual note on short-term climate scenarios; NGFS (2025), Short-term Scenarios – Technical Documentation.

20 When considering the likelihood of a particular scenario in relation to the global temperature increase, one should be aware that the outcome of particular scenario might be an interval of values rather than a single number. IEA (2021), Scenario trajectories and temperature outcomes, World Energy Outlook 2021.

21 The probabilities of various climate scenarios materialising are challenging to ascertain also because the perceived credibility of climate policies influences risk assessments and investment decisions (Battiston *et al.* 2023). For instance, if investors lack confidence in the introduction of robust climate policies, they are unlikely to adjust their risk evaluations for both high-carbon and low-carbon firms, resulting in underinvestment in low-carbon technologies while favouring fossil fuel investments. This misalignment can exacerbate transition risks.

underlying models do not follow standard economic classifications such as NACE or GICS, which are normally used by the financial sector[22]. Furthermore, when analysing the impact on financial asset classes and portfolio segments such as sovereign bonds, infrastructure, real estate and small enterprises, it would be optimal to consider pathways that account for local and regional economic development needs, priorities and resource constraints which drive country- or regional-specific emission budgets[23]. An additional part of the challenge comes from the disconnected and varied approaches to sustainability matters within institutions and the differences among portfolios.

Other challenges: How to appropriately derive sector-specific benchmarks for emission sensitivities. These include: limited availability and plausibility of emissions data at the level of individual firms (especially for smaller borrowers); limited applicability of scenarios used for financial institution's portfolios (i.e. to derive benchmarks for an institution's credit portfolio); uncertainty about the range of benchmarks (which may depend on the scenarios used); and difficulties allocating borrowers to a sectoral benchmark, e.g. in the case of holding companies.

22 Some works have already been done to map climate scenarios' outputs to NACE categories (e.g.: The NACE – CPRS – IAM mapping: A tool to support climate risk analysis of financial portfolio using NGFS scenarios. by Stefano Battiston, Irene Monasterolo, Bas van Ruijven, Volker Krey: SSRN.

23 OECD (2023), Climate change mitigation scenarios for financial sector target setting and alignment assessment.

5. How transition plans could inform climate scenario analysis

5.1 Clients' transition plans as an input to financial institutions' climate scenario analysis and transition planning

Climate scenario analysis can be used to embed information from clients' transition plans into financial institutions' own transition strategies, decarbonisation targets and risk management practices. Several financial institutions already inform their own transition planning process based on their clients' decarbonisation pathways and exposure to climate risks[24]. The information from clients' transition plans can be used in multiple ways if they are available for a representative part of the portfolio and are appropriately credible.

Target setting and strategic planning: Financial institutions could perform climate scenario analysis which combines reference scenarios and their clients' decarbonisation pathways to define more accurately their own decarbonisation trajectories and the associated strategic planning. Complementing the narrative of the different scenarios with their clients' actual forward-looking data, e.g. GHG emission targets, reduces the need to use assumptions, and hence uncertainty in transition planning. It can also potentially help a financial institution to adjust its strategy and any envisaged actions. For example, some institutions provide more favourable funding to companies that have robust transition plans, and some develop customer-tailored products.

Risk analysis and risk management: Similarly, when performing climate scenario analysis as a part of a risk assessment, transition plans may provide financial institutions with the relevant information to better assess how the risk profile and profitability of clients and investees evolves under adverse sectoral dynamics. It can therefore support a more accurate definition of risk limits and risk appetite over different time horizons consistent with the financial institution's own strategic objectives. For example, an analysis combining transition trajectories from both scenarios and clients' transition plans could be a key tool for measuring the size of misalignment risks both at sectoral and single-entity level.

However, several well-documented issues, primarily concerning data availability and credibility, limit the effectiveness of using data from financial institutions' clients' transition plans as inputs for climate scenario analysis and transition planning[25]. Despite the common effort that private and public actors have been devoting over the past years to closing climate-related data gaps[26], the extent to which financial institutions could inform their climate scenario analysis with information retrieved from their clients' transition plans is still limited and needs to be carefully assessed. As highlighted in the previous NGFS report, *"Connecting Transition Plans: Financial and non-financial firms"*, financial institutions may face limited access to relevant information for significant parts of their portfolios that are materially exposed to climate-related financial risks. Moreover, the available information might also be of low quality or not take the likelihood of successful implementation into account. Using clients' transition plans that are poorly designed with poor reliability could lead financial institutions to being either excessively cautious or overly optimistic and risk potential "greenwashing".

The absence of internationally agreed standards for corporate transition plans also makes the available information highly heterogeneous, thus making comparisons difficult. Heterogeneity may arise from factors such as the varying jurisdictions in which clients operate, as well as differences in the methodologies and data formats used. The lack of standardisation in transition plans currently presents significant challenges for aggregating data at the portfolio level. Having harmonised standards in place could therefore support financial institutions when collecting information relating to the sustainability profile of their

24 NGFS (2024), Connecting Transition Plans: Financial and non-financial firms.

25 TPT (2024), Opportunities and challenges relating to the use of private sector transition plans in emerging markets and developing economies.

26 NGFS (2022), Final report on bridging data gaps. The NGFS has identifed three building blocks to bridge data gaps under disclosures, taxonomies and alignment approaches, and metrics. The NGFS is also working on enhancing the accessibility of climate-related metrics through initiatives like the Data Directory, a publicly available catalogue of available climate-related metrics and data sources based on specific stakeholder use case.

clients and investees[27], especially since the relevance of transition plans of non-financial corporates is expected to increase over the coming years. As a first step towards addressing these issues, in June 2024, the IFRS Foundation started hosting the **Transition Plan Taskforce (TPT)'s** disclosure material on its Sustainability Knowledge Hub and announced that it will assume responsibility for the TPT's disclosure framework and related guidance[28].

5.2 Financial institutions' own transition plans as an input into climate scenario analysis

Financial institutions' own transition plans could be used as an input into the development of more complex climate scenario analysis which includes dynamic modelling[29].

Dynamic balance sheet modelling could be used to test a financial institution's transition strategy and its risk response under different scenarios, especially over longer time horizons[30]. Although these types of dynamic exercises are relatively new and market practices are still developing, their potential has been clearly recognised[31]. As explained in a 2024 BCBS discussion paper, *"The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks"*[32], dynamic balance sheet assumptions allow banks to assess the effects of possible adjustments to their strategies. A dynamic balance sheet approach can also incorporate a financial institution's reaction function to risk manifestation, which can illuminate possible risk management actions[33]. For example, the amortisation profile of the credit portfolio could be included in climate scenario analysis to reflect the institution's climate-related lending strategy, enabling it to test the extent to which the portfolio is on or off track to meet end targets. If the case divergence is considered too big (i.e. different scenarios lead to significantly different amortization paths for the same credit portfolio), transition planning and strategy could be adjusted and the portfolio evolution could be dynamically simulated in climate scenario analysis again[34].

The dynamic balance sheet approach could be particularly appropriate when assessing strategy and business model resilience over a longer time horizon. This is because significant changes in the composition of portfolios could take effect only over a longer period. In addition, strategies modifying capital allocation across sectors and regions may serve as an input to climate scenario analysis to understand how these change the overall exposure to risk under different scenarios. It should be noted that the usual uncertainties and data and methodological challenges are further exacerbated when moving from static to dynamic balance sheets modelling. This is because dynamic modelling introduces an additional level of complexity and dependency on the assumptions regarding a financial institution's portfolio evolution.

27 Such information could include clients and investees' current and projected Scope 1, Scope 2 and – where considered to be material – Scope 3 GHG emissions, time-bound targets for emissions reduction and progress metrics, investment and production plans to enable business or production transition (e.g. share of CAPEX or OPEX representing investments reducing GHG emissions), as well as exposure of their assets to physical risks and investment in adaptation.

28 At regional level, the EU Corporate Sustainability Reporting Directive (CSRD) and EBA Guidelines on the management of ESG risks present an example of standardisation. CSRD is currently under revision, in January 2025, the Commission adopted a package of proposals to simplify EU rules and boost competitiveness. Among other things, the package proposes to apply the CSRD only to the largest companies (those with more than 1,000 employees and either a turnover above EUR 50 million or a balance sheet total above EUR 25 million. This means that the number of companies in scope will be reduced by about 80%).

29 i.e. Dynamic balance sheet modelling assumes that the size, composition or risk profile of a bank's balance sheet are allowed to vary over the stress test horizon. Static balance sheet assumes that the size, composition and risk profile of a bank's balance sheet are invariant throughout the stress testing time horizon. FSI (2018), Stress-testing banks – a comparative analysis.

30 FSB (2022), Climate Scenario Analysis by Jurisdictions.

31 ECB (2021), ECB economy-wide climate stress test.

32 BCBS (2024), The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks.

33 See, for example, Fit-for-55 exercise where dynamic balance sheet approach was explored for the euro area banking sector.

34 Credit Portfolio Alignment: An application of the PACTA methodology by Katowice Banks in partnership with 2DII.

6. Recommendations

This section provides a high-level set of recommendations for financial institutions to consider as they develop their climate scenario analysis and transition planning practices.

These recommendations focus on areas where the identified interactions and benefits are relatively simple to implement or could add the most value to risk management practices and wider transition and business strategy. Given the nascency of current practices in this area, financial institutions should consider these recommendations as a starting point and complement them with their own internal analysis and adapt them according to their own unique business models and processes.

Recommendation 1: Develop a single, integrated data management framework and underlying data architecture across both climate scenario analysis and transition planning processes.

Climate scenario analysis and transition plans are likely to use similar, forward-looking data inputs. In line with the international standards for effective climate risk management set out in the Basel Committee on Banking Supervision (BCBS) principles[35] and International Association of Insurance Supervisors (IAIS) guidance[36], financial institutions should have systems in place to collect, manage and aggregate such climate data as part of their overall data governance and IT infrastructure.

Where possible, financial institutions should explore implementing a joint underlying data architecture, including internet-based platforms, data-sharing tools (e.g. dashboards), effective data transfer channels, and centralised data management systems.

This infrastructure could be built in stages, starting with the simpler data and information and eventually being upgraded over time as both internal and external conditions improve. For example, the current lack of standardisation might impose challenges when it comes to collecting clients´ transition data, but this could potentially be overcome in the future by further harmonisation of reporting standards and the introduction of advanced technologies.

A joint underlying data architecture could utilise internet-based platforms, data-sharing tools, and adequate data services to ensure real-time access to relevant information for all stakeholders. Information that both climate scenario analysis and transition planning processes might use could be stored digitally in a single, integrated framework. This would facilitate their coherent use across both processes. The information stored could include both external information (e.g. economic forecasts) and standard portfolio data (e.g. client exposures), as well as more complex information (e.g. client climate-related transition data, such as energy consumption, energy mix and emission targets).

Benefits of an integrated architecture include:

- **Optimising data collection and processing and automating a range of processes** by providing the initial quantitative input to relevant departments. For example, combining data from various sources to support complex exercises such as climate scenario analysis, transition plan updates or monitoring of portfolio decarbonisation progress;
- **Consistent use of external data** (e.g. outputs of climate models or economic forecasts);
- **Supporting shared climate-related metrics** (e.g. emissions) between different processes to ensure consistency in the methodology used to calculate these indicators. Dashboards for these metrics could also potentially be introduced;
- **Improve data quality and consistency** and resolve data challenges more efficiently;
- **Facilitate the collection and use of the granular information and metrics from the transition plans of financial institutions´ clients**;

35 BCBS (2022), Principles for the effective management and supervision of climate-related financial risks.

36 IAIS (2025), Application Paper on the supervision of climate-related risks in the insurance sector.

- **Support consistent reporting** of climate scenario analysis outcomes and transition planning metrics to provide a comprehensive view of climate risk management and progress achieved;
- **A reduction in operating costs** for financial institutions could materialise as a result in the longer term.

Recommendation 2: Implement an overarching framework across a financial institution's organisational structure that integrates both transition planning and climate scenario analysis processes.

A single framework across a financial institution's organisational structure that provides an umbrella structure for all sustainability processes, including risk functions, would help fully integrate the consistent application and consideration of sustainability processes enterprise wide. Such a framework could be established by introducing group-wide climate change forums or ESG committees throughout the organisational structure on different levels of seniority. These forums/committees could initially start at the more operational level, consisting mainly of experts from various areas, for example from risk and strategy focussed departments. At the higher level this could also include senior management and members of the board. This framework could then support the necessary linkage between transition planning and climate scenario analysis.

Benefits of such a framework include:

- **Help establish an efficient regular review cycle that will support and enable a feedback loop.** This will ensure that both processes inform each other as they develop and as climate risks and conditions evolve;
- **Improved decision-making** (e.g. through a firm-wide committee and general governance controls with appropriate policies and procedures). This could help reduce the risk of un-coordinated transition planning processes across business units and help define strategic, firm-wide transition targets and planning in a consistent and meaningful way;
- **Increased transparency of the methodologies and assumptions used in both processes**. This would also enable better transparency of how insights from climate scenario analysis are translated into actionable steps within transition planning (e.g. capital allocation, portfolio rebalancing). Related to this, financial institutions should be able to demonstrate a strong understanding of the uncertainties inherent in transition planning processes[37]. They should also demonstrate clear and transparent processes, good governance, and consistent integration of different scenarios employed in transition planning processes.

Overall, an overarching sustainability framework should help leverage any identified commonalities, interactions and synergies between climate scenario analysis and transition planning processes. It would help ensure the overall consistency of application and help coordinate both processes, aligning them at an operational level where appropriate (e.g. through general information sharing and a regular checkpoint on significant updates or improvements). Internal governance frameworks should also encourage the use of climate scenario analysis when defining, setting, and adjusting financial institutions' short- and long-term transition planning targets. These metrics may help institutions quantify and track their exposure to climate risks and opportunities over time.

Recommendation 3: Test a range of different scenarios when developing transition plan, to obtain a range of climate-change outcomes and to fulfil different use cases.

A range of different scenarios should be considered when developing transition plans. Climate scenario analysis can play an important role in both strategic planning and the management of climate-related financial risks within financial institutions[38], but evidence shows that no single scenario can fulfil all use cases. Even within the same entity, different use cases will require different scenarios which would need to differ in calibration and design. Risk management tends to look at extreme outcomes over a shorter time horizon. Strategy setting could be informed

37 The NGFS recognises that any longer-term and/or forward-looking data contains an inherent level of uncertainty, but this should not be a barrier to financial institutions developing transition plans and applying forward-looking scenario analysis. In particular, uncertainty is an inherent aspect of transition planning and transition plans, independent also from the underlying scenarios, which are usually intentionally designed without probabilities assigned.

38 BCBS (2024), The role of climate scenario analysis in strengthening the management and supervision of climate-related financial risks.

by what the institutions see as the "most likely" scenario, as defined by users, for their internal modelling requirements, covering a longer time horizon. Additionally, financial sector users of scenarios can consider the possibility of using more than one scenario as inputs in order to capture a range of potential options and to reflect inherent uncertainties.

When selecting the appropriate range of scenarios to set their transition strategy and to assess risks, financial institutions should ensure that they are actively considering the range of alternative scenarios available. Financial institutions should also bear in mind that different use cases might require a different calibration and design of a chosen scenario. The selection of scenarios used should be based on a good understanding of the limitations, be overlaid with the financial institution's own internal expertise and judgement where appropriate, and remain mindful of comparability and legal requirements where these exist.

Recommendation 4: Encourage consistency between climate scenario analysis and transition planning methodological choices where relevant.

The use of climate scenario analysis as an input into transition planning and vice versa implicitly requires overall consistency in methodological choices. The internal governance frameworks should foster consistency between climate scenario analysis and transition planning and plans, where relevant. Consistency should be reflected in several areas:

- **Underlying assumptions and methodologies, where applicable:** To the greatest extent possible, financial institutions should seek to ensure coherency and consistency of the assumptions used in climate scenario analysis. This includes, for example, assumptions about technological change, demographics, climate impacts and macroeconomic factors, which should demonstrate internal consistency within and across scenarios and models[39]. These assumptions should also then be consistent with those used in the transition planning process. For example, when assessing the exposure of a corporate client to transition risk in a specific scenario, as part of transition planning, the assumptions on technological shifts should be consistent with those used in scenario analysis, and so should macroeconomic factors and climate developments.
- **Use cases and selection of scenarios:** Where a financial institution uses more adverse scenarios to identify vulnerabilities of particular clients and portfolios and/or their overall business strategy, these scenarios should be consistent with those used for other risk assessment processes, e.g. in the Internal Capital Adequacy Assessment Process (ICAAP) or when defining and testing the robustness of risk appetite.
- **Time horizons:** The time horizon of a selected scenario should be appropriate for the purpose that the output of the climate scenario analysis will be used for, e.g. time horizons for the purpose of strategy setting might be longer than those used in risk management exercises.
- **General concepts:** Consistency in the basic concepts used in both climate scenario analysis and transition planning should be applied. These include the scope of consolidation, the range of portfolios in scope, the base year used to determine progress and the methodology for calculating GHG emissions. Any concepts used should be defined and used in a similar or identical way across both processes. (This would be supported by a well-developed underlying data architecture, per Recommendation 1 above). Where financial institutions choose to apply different definitions for concepts across the two processes, they should clearly explain the reasons for this and what the differences are.

There are situations where a high level of consistency and alignment between the two processes, as described above, cannot be achieved. In these cases, financial institutions could transparently explain why they opted for different concepts, assumptions, or methodologies. For example, financial institutions engaging in cross-border activities may face a variety of different timelines and pathways that reflect the range of national policies and pathways that different jurisdictions have chosen to achieve the goals of the Paris Agreement. In this case, transition plans could not account for every single difference and achieve perfect alignment. However, financial institutions should be able to clearly state how different climate policies,

39 The climate scenario analysis suite, including scenario design, risk analysis, modelling and overall exercise design should be internally coherent, both within the climate scenarios themselves and across the process used to translate scenarios into results. Assumptions about technological change, demographics, climate impacts and macroeconomic factors should demonstrate internal consistency within and across scenarios and models. Particular attention should be given to coherence of economic and financial variables derived from climate-related risk drivers, including the incorporation of technological shifts and scientific evidence on climate change as they become more clearly articulated.

targets and timelines have been considered during the transition planning process to maintain transparency and credibility.

Next Steps

The concepts explored in this note are still in an early phase of development. As understanding and practice continue to evolve, financial institutions, financial sector regulators and other relevant bodies, should be encouraged to further study and explore the commonalities and interactions between climate scenario analysis and transition planning processes.

Financial institutions:
Further insights into the commonalities and interlinkages between climate scenario analysis and transition planning processes will likely emerge as financial institutions continue to develop these processes and have been able to explore the recommendations and synergies in practice.

This progress will inform better identification and understanding of where synergies can be optimally leveraged according to different business models and business needs. This includes a better understanding of how the recommendations and synergies can: (i) complement existing entity structures and frameworks (e.g. data structures and governance frameworks); (ii) be implemented in practice into business processes (e.g. identification of potential investment/ financing/insurance opportunities) and (iii) be implemented into risk processes (e.g. how to meaningfully integrate decision-useful information) in a structured manner.

Financial sector regulators, policymakers, and standard setters:
For recommendations that link more broadly to the design and application of best practice climate scenario analysis and transition planning (such as Recommendations 3 and 4 above), there is also a role for regulators, policymakers and standard setters to continue advancing the conceptual understanding and practical development of these tools and processes and related guidance. For example, developing guidance for financial institutions on how to select the most appropriate reference scenarios for different use cases, how to supplement scenarios with additional assumptions to develop robust narratives for internal planning and modelling, and how to ensure consistency in the application of different scenarios (i.e. across the short-term scenarios used for risk management and long-term scenarios used for transition planning)[40].

These bodies can also play a key role in engaging with financial institutions to improve the emerging best practices and the evolving maturity of their capabilities. Over time, these bodies can also serve to distil these insights to develop practical guidance and illustrative examples that promote consistency and continuous improvement across the sector.

40 These questions will be especially relevant following the recent publication of the NGFS short term scenarios.

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Annex 1 – Definitions

Transition planning

Transition planning is the internal process undertaken by a firm to (i) develop a transition strategy to deliver climate targets that firms may voluntarily adopt or that are mandated by legislation or the appropriate authority, and/or (ii) prepare a long-term response to manage the risks associated with its internal strategic planning and risk management processes undertaken by a financial institution to prepare for undertaken by a firm to develop a transition strategy to deliver climate targets and/or manage the risks and potential changes in business models associated with the transition to a low-emission and climate-resilient economy.

Transition plan

Transition plans are key output of this process, intended for external audiences, such as investors, shareholders and regulators. Transition plans should reflect an entity's integrated approach to reducing its emissions (**climate mitigation**) and simultaneously adapting to the impacts of climate change (**climate adaptation**).

Scenarios

A scenario describes a path of development leading to a particular outcome. Scenarios are not intended to represent a full description of the future, but rather to highlight central elements of a possible future and to draw attention to the key factors that will drive future developments. They are hypothetical constructs; they are not forecasts or predictions nor are they sensitivity analyses. A key feature of scenarios is that they should challenge conventional wisdom about the future[41].

Climate scenarios refer to a plausible future climate that has been constructed for explicit use in investigating the potential consequences of anthropogenic climate change. Such climate scenarios should represent future conditions that account for both human-induced climate change and natural climate variability.

Some organisations, like the NGFS, provide **climate reference scenarios** that present a common starting point to explore the economic impacts and financial risks from climate change[42].

Climate scenario analysis

Climate scenario analysis is an exploratory exercise through which financial institutions can begin to size and manage the climate-related risks to which they are exposed. Scenarios are used as the starting point for climate scenario analysis. Climate scenario analysis can also serve as an input for use cases such as strategy development and climate-related financial disclosures. The results of some climate scenario analysis have led some firms to update their products, services and operational strategy. A key feature of the scenarios analysed is to explore alternatives that may alter the basis for "business-as-usual" assumptions.

Stress tests

Scenario toolkits can therefore be adapted to conduct **stress tests**, which evaluate a financial institution's financial position under a severe but plausible scenario, with direct relevance for three-year to five-year horizons, which are more typical for monetary policymakers, business cycle planning and financial risk analyses. Apart from short-term horizons, that better fit the classic framework of stress tests, more long-term scenario analyses can also be performed, and this may be particularly relevant for climate scenario analysis, as the long-term horizon is the only one in which lack of action on the transition side may lead to higher physical risks[43].

41 TCFD (2017), The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities.

42 BIS (2022), Climate Risks: Scenario Analysis – NGFS Reference Climate Scenarios.

43 E.g. ACPR (2021), The main results of the 2020 climate pilot exercise, or Bank of England (2022), Results of the 2021 Climate Biennial Exploratory Scenario (CBES).

Science based targets

Targets adopted by companies to reduce GHG emissions are considered "science-based" if they are in line with the level of decarbonisation required to keep global temperature increase below 2° C compared to preindustrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)[44].

Sectoral Decarbonisation Approach, Sectoral (Benchmark) Pathways, Companies´ Pathways

The SDA translates greenhouse gas emission reduction targets made at the international level (e.g. under the 2015 UN Paris Agreement) into benchmarks against which the performance of individual companies can be compared[45]. The SDA is built on the principle of recognising that different sectors of the economy face different challenges arising from the low-carbon transition, including where emissions are concentrated in the value chain and how costly it is to reduce emissions. The SDA can be applied by taking the following steps:

- A global carbon budget is established, which is consistent with international emissions targets, for example keeping global warming below 2° C.
- The global carbon budget is allocated across time and to different regions and industrial sectors. This typically requires an integrated assessment model (IAM), and these models usually allocate emissions reductions by region and by sector according to where it is cheapest to reduce emissions and when.
- In order to compare companies of different sizes, sectoral emissions are normalised by a relevant measure of sectoral activity (e.g. physical production or economic activity). This results in **a benchmark pathway for emissions intensity in each sector**.
- Companies' historical emissions intensity is calculated, and their future emissions intensity is based on emissions targets they have set (this assumes companies meet their targets). Together, these establish emissions intensity pathways for companies.
- Companies' emissions intensity pathways are compared with each other and with the relevant sectoral benchmark pathway.

44 Science Based Targets (2015), Sectoral Decarbonization Approach (SDA): A method for setting corporate emission reduction targets in line with climate science.

45 Transition Pathway Initiative (2024), Carbon Performance assessment of international shipping: note on methodology. The Sectoral Decarbonisation Approach (SDA) was created by CDP, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF) in 2015.

Annex 2 – Literature Review Sources

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2.	OECD (2023), Assessing net-zero metrics for financial institutions
3.	TPI Framework GFANZ Framework UNEP-FI (2023), A Tool for Developing Credible Transition Plans: Public edition for asset owner pilot-testing UNEP-FI (2024), Assessing climate transition risks: methodologies and roles for financial institutions
4.	ACT initiative
5.	I4CE (2024), Prudential Transition Plans: what's next after the adoption of the capital requirement directive?
6.	Rocky Mountain Institute work (2022), PACTA for Banks Scenarios
7.	ECB (2024), Risks from misalignment of banks' financing with the EU climate objectives
8.	Aiello M.A. *et al.* (2024), Climate-related risks for Italy: an analysis based on the latest NGFS scenarios, Bank of Italy Working Paper No. 847
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10.	WBCSD (2023), Transition planning and climate scenario analysis: Food, Agriculture and Forest Products
11.	EIOPA (2020), Sensitivity analysis of climate-change related transition risks: EIOPA's first assessment
12.	ESRS E1 (2023), Climate reporting standard, includes transition plans and usage of scenarios
13.	TFCD, The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities
14.	EBA (2024), Guidelines on the management of ESG risks
15.	SBTi (2024), SBTi Corporate Net-Zero Standards
16.	MAS (2023), Consultation Paper on Proposed Guidelines on Transition Planning for Asset Managers
17.	FSB (2025), The Relevance of Transition Plans for Financial Stability
18.	NGFS (2024), NGFS Scenarios: Purpose, use cases and guidance on where institutional adaptations are required
19.	NGFS (2023), Conceptual note on short-term climate scenarios
20.	NGFS (2024), NGFS Short-term Climate Scenarios for central banks and supervisors

Annex 3 – Examples of how financial institutions use climate scenario

The diagram below builds on the illustrative, high-level examples set out in Figure 2 (see Section 2) of how financial institutions may apply climate scenario analysis for risk assessment and business strategy and the broader link to transition plans.

SCENARIO ANALYSIS FOR RISK ASSESSMENT

STEP 1 Define the objective and purpose for running the climate scenario analysis exercise

E.g. Risk identification and materiality assessment, stress-testing business model resilience and vulnerabilities, risk appetite limits, provisions, input to ICAAP and ILAAP.

STEP 2 Select one or more reference scenario narratives appropriate to the objective identified in step 1 (longer term scenarios for business strategy purpose)

E.g. Selecting severe but plausible outcomes such as a 'hot house world' for stressing vulnerabilities to physical risk; Selecting baseline scenario; Combining several scenarios as scope and granularity may vary from one refer scenario to another (country coverage).

STEP 3 Assess transmission channels to financial impacts and use outputs of reference scenarios to assess the impact on assets and portfolio

E.g. Modelling risk parameters such as probability of default (PD) and loss-given default (LGD). For asset-level financial risk analysis, 'off-the-shelf' macro-climate scenarios will likely require further calibration (e.g. adjustment of granularity, variables, time horizons). The impact of external factors on specific assets may also need to be assessed, for example, PDs of clients could be regressed against macro variables from reference scenarios.

STEP 4 Assess financial impacts and losses – using the models designed in step 3 and macro variables from reference scenarios, make projections of risks parameters and calculate projected loss under selected scenarios

*E.g. Expected loss (EL) can be calculated in different ways, but a typical example is EL = PD * LGD * Exposure.*

STEP 5 Use management actions and CSA output in business processes and decision-making

E.g. in line with reporting timelines for capital adequacy assessments. CSA toolkits should be subject to appropriate challenge and periodic review. FIs should conduct sensitivity analysis to understand the materiality of model choice and calibration and the limitations of any models used.

TRANSITION PLANS' INPUTS INTO SCENARIO ANALYSIS

CLIENTS' TRANSITION PLANS

They can provide granular insights into clients' future performance (see paras 2.2 and 5.1) and help FIs estimate projections of risk parameters.

E.g. additional PD modelling of clients' credible transition plans could help FI's assess and manage their exposure to climate-related risks.

FINANCIAL INSTITUTION'S OWN TRANSITION PLAN

They can feed back into scenario analysis processes (through dynamic balance sheet modelling or as an input into expected loss calculations and risk parameters).

E.g. exposure to certain clients might change depending on the FI's transition strategy. Any resultant impact on overall projected portfolio losses would help model the 'Exposure' component in the calculation of 'Expected Loss' (Step 4 risk management process).

SCENARIO ANALYSIS FOR BUSINESS STRATEGY

STEP 1 Define the objective and purpose for running the climate scenario analysis exercise

E.g. setting targets for selected portfolios, defining viable actions in line with these targets, and assessing their impact over relevant time horizons on future revenues and profitability.

STEP 2 Select one or more reference scenario narratives appropriate to the objective identified in step 1 (longer term scenarios for business strategy purpose)

E.g. selection of reference scenarios will depend on various factors (i.e. the extent to which targets are set for specific portfolios only and to meet net-zero targets more generally). Scenarios should be science-based and derived from authoritative sources (NGFS, IEA, IPCC).

STEP 3 Set targets for selected portfolios and/or sectors using scenarios

E.g. various types of targets could be set, such as targets related to particular sectors or as a form of portfolio alignment.

STEP 4 Produce initial values for targets, designed to support the transition strategy, based on the process above and potentially using additional tools

E.g. the SBTi framework adapts IEA scenario pathways (which are more macro-level) to be actionable for companies within a particular sector, taking into account factors such as technological feasibility, costs, and regional differences.

STEP 5 Assess the extent to which these targets are applicable to financial institution's portfolios and business model and conduct any further modelling required

E.g. further analysis of client transition plans or financial institution's own portfolio to render targets more feasible and better aligned to the business strategy. FI's own transition strategy/plans can be tested, for example, assessing the extent to which targets are realistic with regards to planned actions. Targets and actions can be adjusted where discrepancies arise according to the overall goal.

STEP 6 Conduct periodic review of the transition strategy, targets and actions


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