

Network for Greening the Financial System
Technical document

Progress report on the Guide for Supervisors

October 2021



Joint foreword



Frank Elderson
Chair of the NGFS



Goh Gek Choo
Chair of the workstream on
“Micro-prudential and Supervision”

The latest report by the United Nations Intergovernmental Panel on Climate Change is sobering. Global warming has already reached 1.1 degrees Celsius above pre-industrial levels, the warmest in 125,000 years. We have less than ten years to cut emissions by nearly half and less than thirty years to reach net zero, in order to keep global warming to within 1.5 degrees Celsius above pre-industrial levels and contain its negative impacts on our society, economy, and – eventually – the financial system.

NGFS members are acutely aware of the urgency we face in managing tomorrow’s risk today. Since the launch of the NGFS Guide for Supervisors in May 2020, NGFS members have doubled down on our micro-prudential and supervisory efforts, magnified by the expansion in NGFS membership. All these were accomplished in an unusual past year when the worldwide pandemic crisis created unprecedented challenges and stretched supervisory resources in an unprecedented manner.

The progress made by NGFS members in integrating climate-related and environmental risks in their supervisory frameworks has in turn accelerated actions by financial institutions within their jurisdictions. It is clear that NGFS supervisors have and will continue to play a strong stewardship role in mainstreaming the management and monitoring of such risks. The earlier we can move sustainable financial practices into the mainstream, the earlier we will have a global financial system that is resilient to these risks.

This Progress Report focuses on providing additional guidance to supervisors through 12 Focus Areas by building on the earlier five Recommendations of the 2020 Guide for Supervisors. These 12 Focus Areas, ranging from supervisory scope, organisational set-up, risk assessment and quantification, supervisory expectations, engagement of supervised entities to disclosure requirements, were identified from a consolidation of the latest global supervisory practices. Supported by concrete case studies, the Focus Areas seek to highlight the wide range of good practices amongst NGFS supervisors and support them in their ambition to go further and faster, in a manner consistent with their domestic legal and regulatory frameworks.

We cannot afford to stand still. We need to be at the forefront. A multi-year capacity building programme is being rolled out for NGFS members, starting with a series of webinars to disseminate this Progress Report. Continuous upskilling of supervisory knowledge is necessary to effect robust risk management practices and to account for our evolving understanding of climate-related and environmental risks. This capacity building programme will support global efforts on this front, namely the Climate Training Alliance coordinated under the COP26 agenda. For our next phase of work, NGFS members have identified risks from biodiversity loss, and more generally environmental risks, as one of the areas which warrant further supervisory understanding and attention.

We greatly appreciate the commitment and dedication of all those who have contributed to this report, for their efforts and technical expertise. Our special thanks go to Banco Central do Brasil and Carine Moreira de Almeida Bastos for leading the work on this Progress Report, as well as to the NGFS Secretariat. The global nature of these risks requires coordinated global effort. It is only through collective actions that we will be successful in securing a sustainable financial system and a sustainable future.

Table of Contents

Foreword	2
Executive summary	6
1. Introduction	11
2. Supervisory scope, strategy and organisational framework	13
2.1 Focus Area 1: Use adequate definitions of climate-related and environmental risks	14
2.2 Focus Area 2: Incorporate climate-related and environmental risks into supervisory strategies	15
2.3 Focus Area 3: Incorporate climate-related and environmental risks into organisational structure	19
2.4 Focus Area 4: Build capacity through awareness raising and expertise development	21
3. Risk transmission and assessment	24
3.1 Focus Area 5: Develop clear understanding of sources of climate-related and environmental risks	26
3.2 Focus Area 6: Understand the transmission channels from climate-related and environmental risks to the economy and financial system	29
3.3 Focus Area 7: Assess financial exposures arising from climate-related and environmental risks through quantitative and qualitative approaches	32
3.4 Focus Area 8: Assess potential loss and impacts using forward looking methodologies	40
4. Development and implementation of supervisory expectations	43
4.1 Focus Area 9: Develop supervisory expectations, factoring key aspects including governance, business strategy, risk management, scenario analysis and disclosure	45
4.2 Focus Area 10: Engage supervised entities on the implementation of supervisory expectations	52
4.3 Focus Area 11: Integrate climate-related and environmental risks into supervisory frameworks and processes	54

5. Supervisory expectations with regard to disclosures	61
5.1 Main challenges relating to climate-related and environmental disclosures	62
5.2 Ongoing activities by international standard setting bodies and supervisors' approaches to climate-related and environmental disclosures	64
5.3 Focus Area 12: Promote comparable, consistent and reliable climate-related and environmental disclosures, including by considering aligning with commonly accepted baseline frameworks or standards and future international reporting standards	70
6. Looking forward	72
Acknowledgements	74
List of tables and boxes	75

Origin of the NGFS



8 central banks and supervisors established a Network of Central Banks and Supervisors for Greening the Financial System.



As of October 2021, the NGFS consists of

95 Members 16 Observers representing 5 continents.



The NGFS is a coalition of the willing.

It is a voluntary, consensus-based forum whose purpose is to share best practices, contribute to the development of climate and environment-related risk management in the financial sector and mobilise mainstream finance to support the transition toward a sustainable economy.



The NGFS issues recommendations

which are not binding but are aimed at inspiring all central banks and supervisors and relevant stakeholders to take the necessary measures to foster a greener financial system.



Executive summary

This Progress Report assesses the progress made by supervisors in integrating climate-related and environmental risks into their supervisory frameworks, and identifies 12 Focus Areas to better assist supervisors in this endeavour. These 12 Focus Areas are built on the five recommendations set out in the NGFS Guide for Supervisors ('NGFS Guide') published in May 2020.

Based on a survey of NGFS members conducted in early 2021, supervisors¹ have made noticeable progress, particularly on integrating climate-related risks into their work, though progress on the broader concept of environmental risks is slower. The key progress made on the NGFS Guide recommendations since 2019 are as summarised below:

- **Most supervisors have progressed in developing a clear strategy, establishing an internal organisation and allocating adequate resources to address climate-related risks (94%)** and, to a lesser extent, environmental risks (**recommendation 2**). This significant development will allow supervisors to make greater progress in implementing the other recommendations in the future, as they will act as the foundations to further embed climate-related and environmental risks into day-to-day supervisory activities and tools.
- **Similarly, most supervisors (64%) have already implemented or are in the process of implementing climate-related risks assessments,** and work is underway in a number of jurisdictions to develop analytical tools, models (both quantitative and qualitative) and key risk indicators to monitor the transmission of physical and/or transition risks (**recommendation 1**).
- **78% of supervisors have included climate-related risks in their supervisory activities in one form or another, with many of them having engaged with financial institutions under their supervision to better understand their climate-related risks exposures (recommendation 3).** On the other hand, the understanding and measurement of environmental risks more broadly are still at a nascent stage.

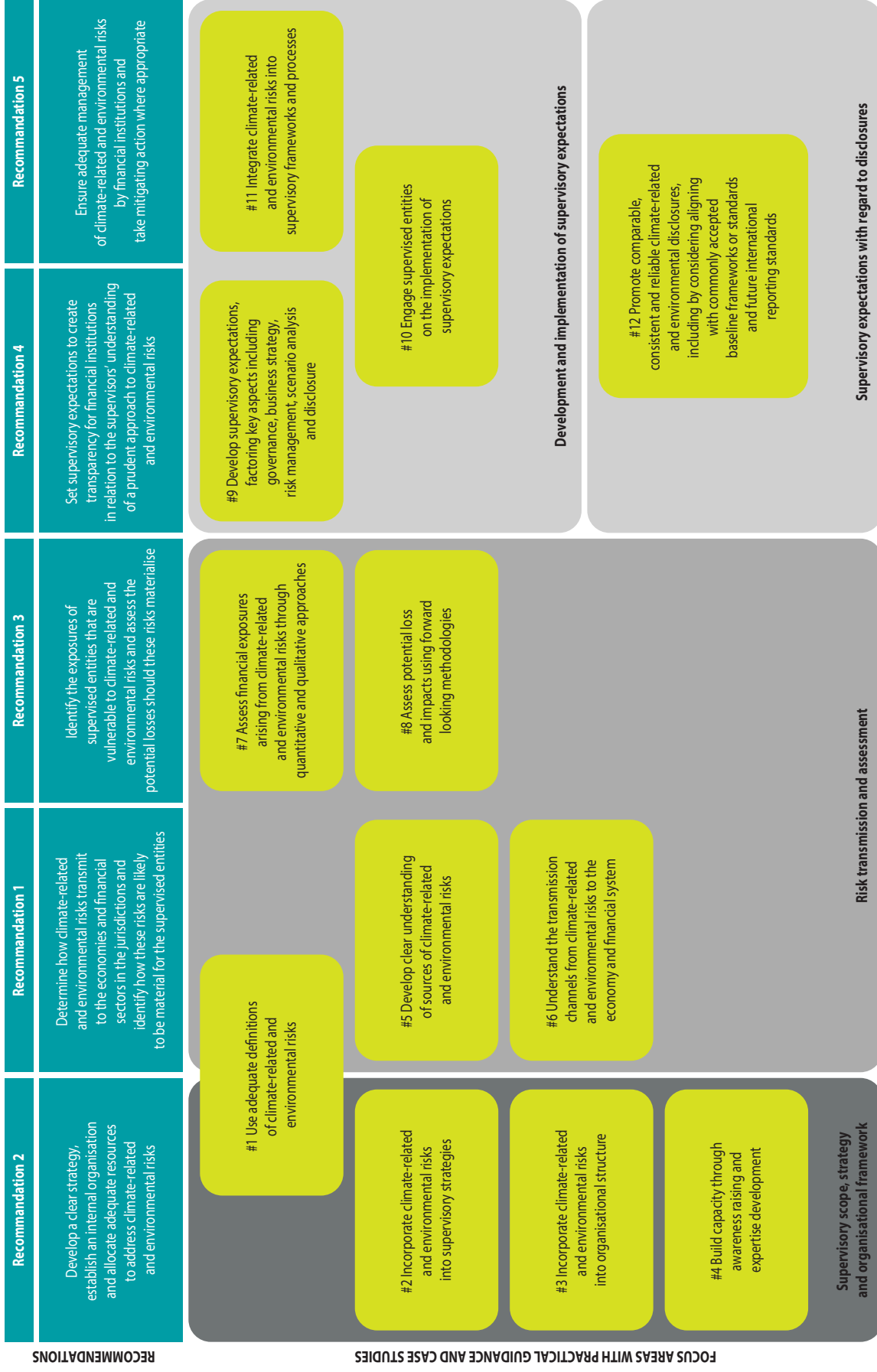
- **Progress made by supervisors in terms of setting supervisory expectations for climate-related and environmental risk management has significantly accelerated since 2019, with 83% having developed or developing supervisory expectations for climate-related risks** and 59% for environmental risks (**recommendation 4**). Nevertheless, supervisors have made less headway in effectively integrating these risks into their set of formal and binding supervisory tools, although most of them report ongoing actions or plans to do so (**recommendation 5**).

Building on this strong momentum, this Progress Report identifies 12 Focus Areas for supervisors as they look to integrate climate-related and environmental risks within their supervisory frameworks. These are supported by practical guidance and case studies, providing actionable tools for supervisors at varying stages of progress in incorporating climate-related and environmental risks into supervisory scope, strategy and organisational framework, risk identification and assessment, and the setting of supervisory expectations – including on disclosures – and their enforcement. The Progress Report also provides a deeper dive into a few identified areas that were covered in less detail in the NGFS Guide, especially environmental risks and disclosure.

Depending on progress made and domestic needs, a supervisor can choose to dive deeper into selected Focus Areas, learn from the experience of others and decide whether to adopt or adapt the good practices accordingly.

¹ The supervisors referred to here are members of the NGFS who provided a response to the survey used for drafting this Progress Report. There were 83 NGFS members at the time, including 64 micro-prudential supervisors. 50 responses were received that involved 45 NGFS members with a micro-prudential mandate (70% of NGFS supervisors), with two additional micro-prudential supervisors formally joining the NGFS after having responded to the survey (see Box 1 for more details on the survey).

Mapping of the recommendations from the NGFS Guide with the Focus Areas and chapters of this Progress Report



Supervisory scope, strategy and organisational framework

Focus Area 1: Use adequate definitions of climate-related and environmental risks

Adopting clear definitions of climate-related and environmental risks, taking into account applicable regulations, standards, and common definitions, may help supervisors set out a clear scope for supervision and allow them to determine the relevant material risk factors for their supervised entities.

Focus Area 2: Incorporate climate-related and environmental risks into supervisory strategies

Case Studies: Boxes 2 (p.16), 3 (p.17), 4 (p.18), 5 (p.19) and 26 (p.56)

Prudential and/or financial stability mandates already allow supervisors to incorporate climate-related and environmental risks in the scope of their supervisory activities, to the extent that they are financial risks and relate to traditional risk categories. Defining supervisory strategies that include clear objectives, with measurable actions and specific timelines, and leverage the inputs of external stakeholders will be beneficial in the successful incorporation of these risks into supervisory approaches.

Focus Area 3: Incorporate climate-related and environmental risks into organisational structure

Case Studies: Boxes 6 (p.20) and 9 (p.23)

Supervisors have various possibilities to embed climate-related and environmental risks into their organisation, through dedicated structures and relevant operational models. Key success factors include commitment from top and senior management of the organisation and dedicated, adequate resources to ensure strategy translates into concrete actions, as well as cooperation with external stakeholders.

Focus Area 4: Build capacity through awareness raising and expertise development

Case Studies: Boxes 7 (p.21), 8 (p.22) and 9 (p.23)

Capacity building initiatives are crucial to raising awareness and developing expertise in climate-related and environmental risks and to supporting supervisory strategies and objectives. This includes up-skilling initiatives through engagement and cooperation with internal and external stakeholders, such as the industry and other supervisors.

Risk transmission and assessment

Focus Area 5: Develop clear understanding of sources of climate-related and environmental risks

Case Studies: Boxes 10 (p.27), 11 (p.29) and 12 (p.31)

While climate-related risks are commonly understood as a source of financial risk, a clearer understanding of other sources of environmental risks would enable supervisors to identify activities associated with material environmental risks and focus their supervisory efforts. As different jurisdictions experience different sources of climate-related and environmental risks, it is also important for supervisors to work with a broad range of stakeholders, including their supervised entities, to determine which sources of risks are relevant and material.

Focus Area 6: Understand the transmission channels from climate-related and environmental risks to the economy and financial system

Case Studies: Table 1 (p.30), Box 12 (p.31)

Supervisors are encouraged to leverage improvements in the understanding of transmission channels for climate-related physical and transition risks. While research on transmission channels in relation to broader environmental risks is still at a nascent stage, supervisors may nevertheless factor in recent developments in mapping sectoral dependencies on nature and assessing threats associated with the loss and degradation of biodiversity and ecosystems.

Focus Area 7: Assess financial exposures arising from climate-related and environmental risks through quantitative and qualitative approaches

Case Studies: Table 2 (p.34), Boxes 13 (p.33), 14 (p.36), 15 (p.37) and 16 (p.38)

Depending on the availability of data, supervisors may consider using a combination of qualitative and quantitative tools to assess their supervised entities' exposures to climate-related and environmental risks. This supports supervisory planning and informs subsequent engagement and dialogue with supervised entities. Further progress on bridging data gaps will help enhance risk assessment approaches.

Focus Area 8: Assess potential loss and impacts using forward looking methodologies

Case Studies: Table 2 (p.34), Boxes 12 (p.31), 17 (p.40) and 18 (p.42)

Supervisors may consider complementing quantitative risk exposure and impact analysis with scenario analysis, stress testing and sensitivity analysis, which enable more forward looking assessment of these risks. Climate-related forward looking methodologies are currently faced with some challenges and limitations, relating for example to time horizon and data availability. Nonetheless, they are useful tools to create awareness about the prudent management of these risks, inform supervisory planning and review, and assess the magnitude of the challenges posed by these risks to the economic and financial system along with the need to adjust the business models of financial institutions. Expanding such tools to other environmental risks would be the next step.

Supervisory expectations and enforcement

Focus Area 9: Develop supervisory expectations, factoring key aspects including governance, business strategy, risk management, scenario analysis and disclosure

Case Studies: Table 3 (p.46), Boxes 19 (p.48), 20 (p.50), 21 (p.51) and 22 (p.52)

While developing their own expectations in line with domestic needs, supervisors may consider referencing the supervisory expectations and/or guidance published by their peers, which show a degree of similarity on key aspects, as well as engaging financial institutions and adopting a

risk proportionate and gradual approach. They may also consider how climate-related and environmental risks can be assessed as part of the existing regulatory framework and principles (e.g. Basel Core Principles and Insurance Core Principles), as common international standards and guidelines are being developed.

Focus Area 10: Engage supervised entities on the implementation of supervisory expectations

Case Studies: Boxes 23 (p.53), 24 (p.54) and 25 (p.55)

Supervisors need to assess the implementation of supervisory expectations by financial institutions to gauge and track progress, and, where needed, set appropriate mitigating actions. In particular, developing supervisory assessment programmes with an adequate level of granularity is useful in promoting a common approach to managing risks among institutions. This is an iterative process, whereby supervisors may identify good practices applied by supervised entities and incorporate them into supervisory expectations and dialogue.

Focus Area 11: Integrate climate-related and environmental risks into supervisory frameworks and processes

Case Studies: Table 2 (p.34), Boxes 20 (p.50), 22 (p.52), 23 (p.53), 26 (p.56), 27 (p.57), 28 (p.59) and 29 (p.60)

Supervisors may participate in ongoing work at international and supranational level that can help them better integrate these risks into the different aspects of their supervisory frameworks. These aspects include the formal supervisory review process, in areas such as business model, risk strategy and appetite, governance, risk management, risks to solvency and risks to liquidity and funding, as well as the use of qualitative and quantitative mitigation tools. At this point, further discussion and analytical work among supervisors and with other stakeholders is required when considering Pillar 1 treatment and stress testing for Pillar 2 capital requirements, due to limited adequate/reliable data, nascent methodologies and a lack of common definitions, classifications and taxonomies and evidence of risk differentials between 'green' and 'non-green' assets. Other Pillar 2 processes such as ICAAP and ORSA may be useful as starting points to incorporate these risks.

Supervisory expectations with regard to disclosures

Focus Area 12: Promote comparable, consistent and reliable climate-related and environmental disclosures, including by considering aligning with commonly accepted baseline frameworks or standards and future international reporting standards

Case Studies: Boxes 30 (p.67), 31 (p.67), 32 (p.68), 33 (p.69) and 34 (p.70)

Supervisors are expected to contribute to mitigating fragmentation and improving the consistency, comparability, and reliability of climate-related and environmental disclosures. Supervisors can ensure the consistency of their supervisory expectations regarding disclosure with commonly accepted baseline frameworks or standards, and in future, align their supervisory expectations with a common global baseline of sustainability reporting standards, or foster interoperability between such baseline standards and their jurisdiction-specific expectations. It will also be useful for supervisors to consider the development of a set of core, calculable and widely applicable metrics on climate-related and environmental issues to ensure

availability, granularity, consistency and comparability. There may be a need to adopt a pragmatic step-wise approach, considering the level of capacity, data availability and progress around measurement methodologies.

Looking forward

Further work is still necessary, as supervisors look to fully embed climate-related and other environmental risks in their supervisory frameworks. Common challenges cited include data gaps, lack of harmonised methodologies and risk metrics, and insufficient internal capacity and resources. Coordination among supervisors, as well as with other stakeholders, has however been found helpful in responding to these hurdles. As such, work is underway within the NGFS across numerous areas, including to develop policy recommendations and initiatives to bridge data gaps, to build on the second iteration of the NGFS scenarios, to further understand risks posed by biodiversity loss, and importantly to launch a capacity building initiative for NGFS supervisors. **Through this Progress Report and upcoming NGFS initiatives, the NGFS can facilitate a continual uplift in supervisory capabilities and convergence of global supervisory practices.**

1. Introduction

In May 2020, the NGFS published its Guide for Supervisors ('NGFS Guide'), which included five recommendations to help supervisors integrate climate-related and environmental risks into their regular activities.

The NGFS Guide incorporated experiences shared by NGFS members with a supervisory mandate, based on a survey conducted in July 2019.

Following up on the NGFS Guide, this report ('Progress Report') assesses the progress that supervisors made in integrating these risks, using the five recommendations as a reference. The Progress Report is based on a new survey conducted in early 2021¹ (see **Box 1**).

NGFS members affirm the continued relevance of the five recommendations of the NGFS Guide, and do not see a need to revise these recommendations at this juncture. Members are continuing to work on implementing these recommendations, building upon the noticeable progress made, especially on climate-related risks. While the survey results show progress on all recommendations, especially the development of supervisory strategies and expectations, much progress is still required to fully embed climate-related and other environmental risks into supervisory frameworks and binding supervisory tools.

The Progress Report focuses on providing updated and granular guidance structured around 12 Focus Areas and supported by case studies, drawing from the actions that supervisors have taken to implement the five recommendations of the NGFS Guide. Importantly, by showcasing a range of good practices by supervisors across jurisdictions, the Progress Report features practical examples of how supervisors at different stages of progress are translating the recommendations into meaningful actions.

Additional guidance is needed in particular to address some of the challenges reported by NGFS members, which include data adequacy and environmental risk assessment methodologies. Building on the results of the survey, the Progress Report identifies challenges to a wider adoption of the recommendations. This notwithstanding,

there are a range of actions that supervisors can already take to further embed climate-related and environmental risks into their supervisory framework, as illustrated by the examples and guidance provided in the Progress Report. Global collaboration, within the NGFS, the standard setting bodies and at the Financial Stability Board, is also underway to more comprehensively address these challenges, and these efforts are referenced in this report.

The Progress Report provides a deeper dive into a few identified areas, especially environmental risks and disclosure. As work appears to be less advanced for environmental risks in general compared to climate-related risks, the Progress Report gives special treatment to those risks, while still providing useful updates on climate-related risk methodologies. To reflect the increased diversity of NGFS members, it also includes additional elements on insurance supervision and other financial sectors, in addition to banking supervision. Based on another NGFS survey conducted in October 2020² (see **Box 1**), the Progress Report also expands guidance on disclosure, which many supervisors consider crucial for bridging data gaps.

The Progress Report is structured as follows. Each chapter describes the survey results, providing details on the progress made by members in implementing the NGFS recommendations and common challenges faced. Thereafter, each chapter covers one or several Focus Areas, highlighting practical examples and good practices to support implementation and help members remove existing barriers and impediments. Chapter 2 addresses how supervisors have been embedding climate-related and environmental risks into their supervisory strategies and organisational structures, looking in particular at the challenges of lack of internal capacity and coordination. **Chapter 3** covers how supervisors identify the sources and transmission channels of climate-related and environmental risks and determine financial exposures, potential losses and impacts, with additional details provided on environmental risk sources and transmission channels as well as data challenges. **Chapter 4** elaborates on expectations that have been issued and how supervisors are embedding climate-related and environmental risk management within their supervisory activities and toolkit. **Chapter 5** dives deeper in the topic of disclosure, identifying

1 Referred to as 'the survey' in all chapters but Chapter 5.

2 Referred to as 'the survey' in Chapter 5.

key areas for supervisors' consideration with regard to their expectations on this specific area. **As the journey towards embedding climate-related and environmental risks**

in regular supervisory activities continues, Chapter 6 highlights initiatives underway within and outside the NGFS that will help supervisors accelerate this progress.

Box 1

Methodology of NGFS surveys

The **survey on the implementation of the recommendations in the NGFS Guide** was conducted by the NGFS among its members in the first quarter of 2021. It included closed-ended questions, requesting respondents to self-assess the extent to which they have implemented the five recommendations of the NGFS Guide and the progress they have made since 2019, when the first survey used for the Guide was conducted.¹ The responses seek to differentiate between climate-related risks and environmental risks more broadly, where appropriate.²

A total of 50 responses were received and analysed, representing 53 NGFS members, including 70% of NGFS supervisors,³ and echoing the rise in NGFS membership (there were 34 responses in 2019). They represent 47 jurisdictions, including two supranational ones (European Union – EU, and Eurozone). Responses came from all continents, with a slight majority of European members (56%, with 42% of respondents in the EU). All responses but three involve micro-prudential supervisors (two respondents are standard-setters and one is a macro-prudential authority, with no micro-prudential mandate strictly speaking).⁴ Most respondents are also involved in macro-prudential supervision and many of them can set standards or adopt regulations for the sector(s) they supervise. Almost all respondents cover the banking sector (96%), while more than half cover the insurance sector (56%). Some respondents are also in charge of one or several other sectors (e.g. capital markets, pension funds).

With regard to the EU and Eurozone, 18 national jurisdictions submitted their own answers in addition to supranational authorities, with 15 respondents participating in the Eurozone's Single Supervisory Mechanism (SSM). In this context, many respondents refer to work undertaken at EU or SSM level, in addition to that carried out at national level. Whilst European harmonisation is ongoing in fields covered by EU law, some relevant aspects are dealt at national level. Thus, EU members have also reported different levels of progress.

The NGFS also conducted a **survey on climate-related and environmental disclosures** in the last quarter of 2020. It included closed- and open-ended questions to members on desired disclosures outcomes, work underway and potential obstacles. A total of 38 responses were received and analysed, representing 41 members. Respondents represent 36 jurisdictions from all continents, with a slight majority of responses attributed to European members (60%, with 42% respondents in the EU). Most respondents are micro-prudential supervisors, in banking, insurance and/or other financial sectors. Most respondents (79%) have a mandate limited to prudential disclosures by financial institutions, whereas a minority were also securities market regulators with a broader mandate to enforce public disclosure requirements by listed companies.

- 1 To track progress in a consistent manner, 2019 was used as a reference date for all respondents, whether they responded to the 2019 NGFS survey or not.
- 2 Respondents have various approaches with regards to climate-related and environmental risks. In most cases, climate-related risks are either seen as the main focus, with limited attention to environmental risks beyond climate-related ones, or as a subset of environmental risks, on which mainstreaming actions are usually more advanced, nonetheless. Respondents were therefore requested to distinguish between both risk categories, where appropriate.
- 3 At the time, the NGFS had 83 members, including 64 micro-prudential supervisors, and 45 of the latter responded to the survey. Two micro-prudential supervisors formally joined the NGFS after having responded to the survey. In addition, one NGFS member with no micro-prudential mandate submitted a response on behalf of the micro-prudential authority of its country, which is not formally an NGFS member. Respondents with no micro-prudential mandate include three central banks that submitted a joint answer with the supervisor of their country, two standard-setters and one macro-prudential authority.
- 4 These two standard-setters are not included in the figures presented in the relevant chapters, which focus on supervisors' actions, despite the actions they have been taking, while the latter authority is included only for Recommendations 1 and 2.

2. Supervisory scope, strategy and organisational framework

Focus Areas 1 to 4

- 1 – Use adequate definitions of climate-related and environmental risks
- 2 – Incorporate climate-related and environmental risks into supervisory strategies
- 3 – Incorporate climate-related and environmental risks into organisational structure
- 4 – Build capacity through awareness raising and expertise development

Key Takeaways

- Prudential and/or financial stability mandates already allow supervisors to incorporate climate-related and environmental risks in the scope of their supervisory activities, to the extent they are a source of financial risks and they relate to traditional risk categories. This includes integrating the risks into their supervisory strategies, such as through a roadmap to address climate-related and environmental risks.
- Most respondents have progressed in developing a clear strategy, establishing an internal organisation and allocating resources to address climate-related and environmental risks.
- A common challenge faced by supervisors is the lack of internal capacity and resources, with funding, headcount and lack of expertise cited as limiting factors.
- To focus supervisory resources, adopting clear definitions of climate-related and environmental risks, taking into account applicable regulations, standards, and common definitions, may help supervisors set out a clear scope for supervision and allow them to determine the relevant material risk factors for their supervised entities.
- Supervisors have various possibilities to embed climate-related and environmental risks into their organisation, through dedicated structures and relevant operational models. Key success factors include commitment from top and senior management of the organisation (such as leveraging on the sponsorship of a senior executive) and dedicated, adequate resources to ensure strategy translates into concrete actions.
- Capacity building initiatives are crucial to raising awareness and developing expertise in the field of climate-related and environmental risks and to supporting supervisory strategies and objectives. This includes up-skilling initiatives through engagement and cooperation with internal and external stakeholders.

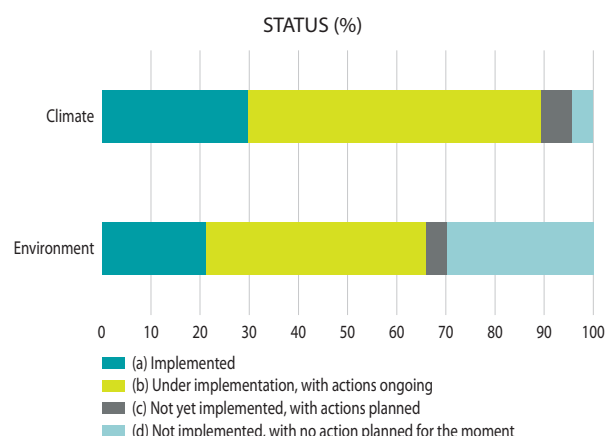
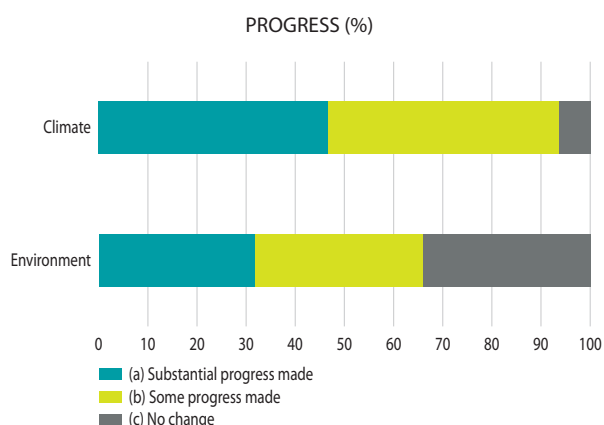
This chapter describes the progress made by supervisors with respect to the integration of climate-related and environmental risks within their supervisory scope, strategy and organisational framework and seeks to identify good practices within the NGFS membership. The chapter covers 4 Focus Areas, which include using adequate definitions of climate-related and environmental risk (**Focus Area 1**); incorporating these risks into supervisory strategies (**Focus Area 2**); embedding these

risks in the organisational structure (**Focus Area 3**); and building capacity through awareness raising and expertise development (**Focus Area 4**).

Progress in implementing recommendation 2 and cited challenges

A significant majority of supervisors responded that they have made either substantial or some progress

Recommendation 2 – Develop a clear strategy, establish an internal organisation and allocate adequate resources to address climate-related and environmental risks



in both risk categories (94% for climate-related and 66% for environmental risks). In line with this response, most respondents (89%) stated to have already implemented or have started to implement Recommendation 2 with respect to climate-related risks, followed by a smaller number (66%) with respect to environmental risks.

The results mentioned above show significant momentum. Progress in this space will allow supervisors to make further progress on the other recommendations in the future, as developing a clear internal strategy and setting up an adequate organisation are the foundations needed to further embed these risks in their day-to-day supervisory activities and tools.

A common challenge faced by supervisors is the lack of internal capacity. This may include a lack of resources, with time, funding and headcount cited as limiting factors. The survey highlighted internal pressures such as limited full-time staff allocation to climate-related and environment issues, as well as split-time requirements for those working on related initiatives. A lack of expertise is also highlighted. Respondents indicate that the development of such capacity is time-consuming and costly given the complexity of the topic (with issue-specific knowledge outside of the usual supervisory remit required), while the field’s rapidly evolving nature can lead to challenges in staying abreast of developments.

Other challenges are the need for coordination internally and with domestic stakeholders, as well as the lack of international standards. Developing strategies that are

consistent and aligned with those of other stakeholders may prove difficult in such a context.

2.1 Focus Area 1: Use adequate definitions of climate-related and environmental risks

In the NGFS Guide, **climate-related risks** referred to financial risks posed by the exposure of financial institutions to physical or transition risks caused by or related to climate change, for example, damage caused by extreme weather events or a decline in asset value in carbon-intensive sectors. Results from the survey indicate that less than half of respondents use either the same definition as the one provided in the NGFS Guide (18%) or adopted international standards and definitions issued by leading institutions and organisations such as the European Union (EU) (24%) that are broadly aligned with that of the NGFS Guide. Very few respondents (6%) crafted their own definitions, while the majority of respondents (52%) reported that there is no formal definition for climate-related risks yet, although work is underway to assess them.

Similar to the takeaway on climate-related risks, the majority of respondents (65%) have not established a definition of **environmental risks**, and in some instances explain that they are aligned with those provided by other relevant public authorities (such as the European Banking Authority’s or the EU definitions of environmental risk). Among these respondents, some have developed basic definitions of

environmental, social and governance-related (ESG) risks that will undergo improvement, and of which environmental risks are a subset; some have captured environmental risk definitions within a broader environmental and social risk framework; finally, some have focused more on climate-related risks. Again, certain supervisors (18%), whilst not providing explicit definitions, have aligned their approach to the NGFS Guide's definition of environmental risks, that is, financial risks posed by the exposure of financial institutions and/or the financial sector to activities that may potentially cause or be affected by environmental degradation (such as air pollution, water pollution and scarcity of fresh water, land contamination and desertification, biodiversity loss, and deforestation) and the loss of ecosystem services. A small minority of respondents (8%) have incorporated the NGFS Guide definition of environmental risks into their internal framework.

When developing an approach to climate-related and environmental risks, supervisors may find it helpful to first define relevant terminologies. Adopting clear definitions of climate-related and environmental risks help set out the scope for supervision and precisely determine which climate-related and environmental risk factors are material for their supervised entities. When adopting such definitions, it is important to take into account applicable regulations, standards, and common definitions proposed, for example by the NGFS. The definitions may also make clear how climate-related and environmental risks are interconnected and, where supervisors adopt a holistic approach, how these risks are connected with other sustainability-related risks (e.g. social risks, governance-related risks), considering the commonalities and specificities of each risk.

Further elements that can help supervisors in adopting adequate definitions may be found in the Focus Areas 5 and 6, which aim to help supervisors develop a clear understanding of sources and transmission channels of climate-related and environmental risks.

2.2 Focus Area 2: Incorporate climate-related and environmental risks into supervisory strategies

Consider supervisory mandates and existing regulatory frameworks

When defining their supervisory strategy, most supervisors have considered their mandate and statutory objectives, which already allow them to address climate-related and environmental risks to the extent they are sources of financial risks and relate to traditional risk categories. Most respondents indicated supervisory objectives that relate to the safety and soundness of the financial sector, along with financial stability. The majority of them also reported that climate-related and environmental risks are covered implicitly in their general mandates. In this regard, supervisors leveraged their prudential and/or financial stability mandate to focus on and incorporate climate-related and environmental risks in the scope of their supervisory activities, and some considered it useful to determine and communicate on how climate-related and environmental risks relate to their mandates and objectives (see **Box 2**).

In considering how climate-related and environmental risks can be incorporated as part of their existing regulatory frameworks, supervisors will find it useful to consider existing publications, such as the Basel Core Principles (BCPs)³ on Effective Banking Supervision and the Insurance Core Principles (ICPs) of the International Association of Insurance Supervisors (IAIS), which provide grounds for incorporating climate-related and environmental risks into supervisory activities. The IAIS and the Sustainable Insurance Forum (SIF) published an [Application Paper on the Supervision of Climate-related Risks in the Insurance Sector](#), which provides background and guidance on how ICPs can be used to address climate-related

³ BCBS, Core Principles for Effective Banking Supervision, Principle 1, Responsibilities, objectives, and powers requires supervisory authorities to ensure that the primary objective of banking supervision is to promote the safety and soundness of banks and banking system. Given the potential adverse impacts of climate-related and environmental risks and events on the safety and soundness of individual banks and the overall banking system, these risks are expected to be within the scope of the risks that should be covered by the bank supervisors as part of their ongoing supervision. Where there are safety and soundness concerns that are attributable to these risks, banking supervisors are also expected to take the necessary timely corrective actions in line with the expectation of BCPs.

Box 2

Incorporating climate-related and environmental risks into supervisory objectives

The **Bank of England – Prudential Regulation Authority** (BOE-PRA)'s response to climate change is motivated by its statutory objectives. The first objective involves promoting safety and soundness by enhancing the PRA's approach to supervising the financial risks from climate change. The second objective involves enhancing the resilience of the financial system of the United Kingdom by supporting an orderly market transition to a low-carbon economy. The recommendations of the Prudential Regulation Committee (PRC), which makes decisions for the PRA, were updated in March 2021 to include the Government's revised economic strategy and note that the PRC should 'have regard to the government's commitment to achieve

a net-zero economy by 2050 under the Climate Change Act 2008 (Order 2019) when considering how to advance its objectives and discharge its functions.' The changes to the PRC's recommendations are consistent with the existing climate work plan of the PRA, including assessing firms against its supervisory expectations. Additionally, the remit and recommendations of the Financial Policy Committee (FPC), which identifies, monitors and takes action to remove or reduce systemic risks, were updated to include the Government's revised economic strategy while also recommending that the FPC 'consider the potential relevance of other environmental risks to its primary objective'.

risks (see also **Box 26**). The Basel Committee on Banking Supervision (BCBS)'s *report on climate-related risk drivers and their transmission channels*, while not referring explicitly to BCPs, notes that evidence suggests that the impacts of these risk drivers on banks can be observed through traditional risk categories, which BCPs cover.

Setting supervisory priorities and developing strategies

Given their tangible impact on the economy and the financial sector, guiding the integration of climate-related and environmental risks into supervisory strategy appears necessary to ensure consistency with mandates and objectives. As suggested by the NGFS Guide, supervisors can do so by developing a strategic roadmap to address climate-related and environmental risks. In terms of scope of supervisory strategies, it was observed that climate-related risks were

considered either singularly, or jointly with environmental risks under a holistic ESG or sustainability framework (see **Box 3** for an example of strategy covering social and environmental risks). In view of their potential impacts, considering environmental risks more systematically when developing supervisory strategies, as well as the interconnectedness and the overlap between climate-related and environmental risks, would help supervisors fulfil their mandates.

As a general principle, such strategies benefit from having clear objectives with measurable actions and specific timelines, to provide the right frame and direction for successful execution. Guidance on the content of such strategic roadmaps and their articulation with broader supervisory or even financial system-wide roadmaps can already be found in the NGFS Guide.⁴ Supervisors may also find it helpful to consider the additional guidance given in **Chapters 4**

⁴ 'Roadmaps may cover the following subjects (not necessarily in this order): the rationale for embedding consideration of climate-related and environmental risks within supervisory activities, clearly explaining the link between these risks and the authority's mandate; internal communications; the creation of dedicated organisational structures; research, analysis and procurement of new analytical tools; the development of policy, including participation in international forums and cooperation with other institutions and authorities; the publication of key external policy communications; training of operational supervisors; the embedding of consideration of climate-related and environmental risks within supervisory activities; the development and publication of supervisory expectations.'

Box 3

Including social-environmental and climate-related risks as a supervisory priority

For the past three years, social-environmental (S&E) risks ranked among Supervision's top five priorities in the **Banco Central do Brasil** (BCB)'s Supervision Area Annual Plan (SAP). The SAP is a cyclical process that results in a detailed set of activities to be performed throughout the year, as well as its monitoring and evaluation rules and targets. Several of BCB's areas collaborate at different stages of such strategic planning, using as inputs data from a large range of sources.

In 2021, as a result of the incorporation of the new 'Sustainability Dimension' to the Agenda *BC#* (BCB's overall institutional strategic agenda), climate-related risks were specifically included in the set of supervisory priorities. Up to that point, climate-related risks were addressed to the extent of their overlap with environmental ones. Deforestation is an example of an environmental

issue deeply interconnected with climate-related risks, which has already been included at SAP's list of actions. The four main premises to include S&E and climate-related risks in the supervisory activities were: (i) the necessity to improve BCB's ability to assess and monitor these risks, including the development of new tools, such as stress tests; (ii) the importance to improve continuously the on-site supervision process; (iii) the added value from information exchange and collaboration in national and international fora; and (iv) the importance to include all financial institutions in the analysis, but considering relevance and proportionality, thus focusing on the institutions most exposed to risk and/or with risk management deficiencies. In order to determine which financial institutions will be subject to supervisory actions, BCB uses a Residual Risk Matrix (SERM), which is described in **Box 14**.

and 5 of this report concerning the development of supervisory expectations, which is a key element of supervisory strategies.

The development of supervisory strategies may benefit from the inputs of, and alignment with, external stakeholders, in particular other relevant public authorities. With a view to ensuring consistency and effectiveness, it may be appropriate that the strategy and objectives are aligned with existing governmental roadmaps, national and supranational agencies recommendations or international organisation reports (see for example **Box 4**). Regarding the latter, respondents indicate the value of the NGFS Guide and other NGFS publications, such as the *NGFS First Comprehensive Report 2019*, its *Sustainable and Responsible Investment Guide for Central Banks' Portfolio Management 2019*, and its *Climate Scenarios for Central Banks and Supervisors*,⁵ which may act as helpful reference points for exploring

the strategic options available, with case studies shedding light on their practical implementation.

Some supervisors have chosen to develop a phased approach, involving ongoing engagement with supervised entities (see **Box 5**, which includes an update on a case study featured in the NGFS Guide). Outcomes from the survey indicate that most supervisors have chosen to start engagements with the supervised entities and other stakeholders at an early stage of the development of their climate-related and environmental risk strategy.

Having developed their strategy and with implementation underway, supervisors refine their strategic roadmap by building on their assessment of climate-related and environmental risks and how they are being considered by their supervised entities and other stakeholders.

⁵ Respondents referred to the *scenarios* and *Guide* published in 2020. The NGFS published *updated scenarios* in 2021.

Developing a strategy that feeds into the broader political agenda

The strategy of the **European Insurance and Occupational Pensions Authority** (EIOPA) on sustainable finance, implemented through its *Annual Work Programme 2021* and *2021 Supervisory Convergence Plan*, identifies sustainability as a cross-cutting theme of strategic priority in keeping with the priorities set by the European Green Deal.¹ Concerning particular actions in the area of supervision, the Supervisory Convergence Plan sets as a priority for 2021 the step-by-step identification, management and supervision of ESG risks in prudential and conduct supervision. EIOPA will integrate sustainability risk assessment in its Supervisory Handbook with a focus on climate-related risks, starting with case studies and examples on governance and risk management. The work will build on guidance developed by the NGFS and other international supervisors and organisations. EIOPA continues coordinating its work internally via an Inter-departmental Group, complemented by a Sustainable Finance Project group, composed of members and observers of national competent authorities. In turn, EIOPA's standing Policy Steering Committee (PSC) coordinates the deliverables and prepares work to be adopted by the Board of Supervisors, EIOPA's main decision-making body.

Regarding the national implementation of the European Commission's sustainability package, the Austrian **Financial Market Authority** (FMA) entered into a dialogue with insurance companies and pension companies, relying on assessments of their exposures to climate-related transition risks (see **Table 2**). Regarding the insurance sector, the aim was to actively support the preparation of the industry in the transition process to achieve the goals of the European Green Deal, to inform companies as early as possible about the current developments, the initiatives of the FMA and the results of the FMA's asset screenings and supervision priorities, as well as to identify difficulties of interpretation and challenges in the practical implementation of the new regulatory requirements at an early stage. Additionally, the FMA's Asset Screening was presented to each individual company in order to address the company-specific analyses. Regarding pension companies, the FMA conducted a stress test in the area of sustainability risk management. The objective was to critically examine existing business models with regard to their resilience to sustainability risks. In addition, asset screenings were carried out for the investments. The results of the stress tests were presented to the industry as well as company-specific evaluations to individual companies.

¹ See ec.europa.eu/clima/policies/eu-climate-action/law_en

Box 5

Adopting a phased approach that involves supervised entities

The **Hong Kong Monetary Authority (HKMA)** has been adopting a three-phased approach to promote green and sustainable banking. The approach began with a 'greenness baseline' assessment of banks. After an assessment framework had been developed with the support of a group of banks, the first round of assessment was conducted during the first half of 2020, and the main observations were published in the *HKMA Quarterly Bulletin* in September. This approach not only allows banks to better understand their readiness and preparedness to build climate resilience, and make early plans accordingly, but also helps the HKMA assess the diversity in the industry, and hence informing its policy formulation. As part of Phase II of the approach, a *white paper* was published in June 2020, which outlined the HKMA's initial thinking on supervisory expectations for climate-related risk management. This forms the basis of HKMA's communication with the industry in its preparation of the formal supervisory requirements. Paving the way for Phase III to better enable banks to formulate and implement

their approach, a number of measures have been carried out, such as capacity building events, a range of practices for managing climate-related risks, and a pilot exercise on climate-related risk stress testing.

The **Malta Financial Services Authority (MFSA)** has taken preliminary actions to engage with supervised entities and inform its supervisory approach. This includes circulating a questionnaire that aims to investigate how Maltese banks expect climate-related risks to affect their business models, the measures and plans taken to assess them and their institutional view on the implications of the European Banking Authority's *advice* to the European Commission (EC) on key performance indicators published on March 2021. This exercise complements the European Central Bank's effort to understand better the banks it directly supervises. A similar initiative is currently planned in relation to insurance undertakings, in order for the MFSA to cover a broader segment of the financial services industry.

2.3 Focus Area 3: Incorporate climate-related and environmental risks into organisational structure

The NGFS Guide provided detailed guidance and examples of how to embed climate-related and environmental risks within the organisation through dedicated structures, describing several operational models that remain relevant.⁶

It stressed that commitment from the top of the organisation is a key driver, including by leveraging the sponsorship of a senior executive. As a preliminary step, supervisors may therefore consider officially designating a member of senior management to champion the cause, potentially with a role title linked to climate-related and environmental risks, to lead the institution in defining and overseeing the implementation of a dedicated strategy.

Aside from leadership commitment, having adequate staff equipped with subject matter knowledge, and a community of practitioners for capacity building, is integral for success. Beyond the top of the organisation, the dedication of adequate resources is essential to ensuring the strategy translates into concrete actions. Resource adequacy is also an expectation set by BCPs⁷ and ICPs⁸, as the IAIS and SIF's recent Application Paper stressed regarding the latter, with training being key in the case of climate-related risks.

However, the survey highlighted that some supervisors face internal pressures such as limited or no full-time staff allocation to climate-related and environmental issues, as well as split-time requirements of those working on related initiatives. Some respondents do not have the mandate to increase their human resources and have to re-prioritise other areas of supervision.

6 Such models included the internal network approach, the hub & spoke model, and the creation of dedicated units. See pp.17-20 of the NGFS Guide.

7 BCBS, Core Principles for Effective Banking Supervision, Core Principle 2 (Essential Criteria 6).

8 IAIS, Insurance Core Principle 2.10, Supervisor.

Box 6

Enhancing resources progressively

The **Bank of England – Prudential Regulation Authority** (BoE-PRA)'s internal organisation and resources to manage the financial risks generated by climate change has evolved over time. The Bank first began to consider the effects of climate change on the financial system in 2014 when the Department of Environment, Food and Rural Affairs (DEFRA) asked the PRA to complete a Climate Change Adaptation Report, focused on insurance. At this point the PRA had a very small team working on climate change, and a small cohort of personnel in the PRA's Insurance Directorate who supported the compiling of the *report* on a part-time basis.

By the time the PRA produced its report on the *Banking sector* in 2018, the number of full-time personnel involved in climate had doubled in size. More broadly, the Bank had adopted a 'hub and spoke' organisational model to support its work on climate change. In recent years this work has included the publication of *Supervisory Statement 3/19*, Sam Wood's *'Dear CEO' letter* and more recently work in support of the Bank's *Climate Biennial Exploratory Scenario* exercise. While the 'Hub' consists of a small team working on climate-related risks on a full-time basis, the 'spokes' are comprised of an increasing number of personnel who are undertaking climate-related work as part of a broader set of roles and responsibilities.

The Hub and Spoke model continues to be used today, with nearly every directorate across the Bank now routinely involved in supporting the climate-related agenda. By the end of 2021, the team will have doubled in size from its 2019 level and will continue to progress a broad agenda involving micro and macro-prudential issues while supporting a wide-range of international forums and initiatives that collectively seek to improve our approach to managing the financial risks generated by climate change. This increase in team size reflects the continued broadening of the Bank's climate change remit, and the inclusion of additional issues such as environmental risks.

To increase resources dedicated to climate-related and environmental risks, supervisors may consider using existing resources, with staff members in relevant functions, often with other responsibilities, as designated key points of contact. One of the first actions respondents took was to gather a network of people working in different directorates to make them reflect on climate-related and/or environmental risks, using their diverse set of skills, perspectives and responsibilities. This often includes financial supervisors with a knowledge of credit, market and operational risks, policy experts, data specialists and statisticians. While attributing responsibilities in such a manner may help to quickly embed the topic across the organisation, supervisors should be cognisant of competing priorities on staff, particularly in turbulent periods. Supervisors may need to consider whether the impact of external events will slow progress on climate-related and environmental risks and adapt accordingly within the legal boundaries and resources of their organisation.

Despite the resource constraint mentioned above, many respondents report an increase in the number of dedicated staff members (this is exemplified in **Box 6**). Creating a synergy between these people allows them to reflect on cross-cutting issues and helps to progressively form and deliver on a coherent and unique strategy which can benefit from the top management's steering when needed.

Supervisors may also see the need to specifically hire climate-related and environmental risk experts with knowledge of financial sector and other professionals to bring in knowledge not already held in the organisation (e.g. on climate and environmental science), although the nascency of the field may lead to challenges in finding appropriately skilled individuals.

In addition to the setting of a robust and coordinated internal organisation, supervisors may find it helpful to cooperate with external stakeholders, even more when their own resources are limited. For some NGFS members, steering on climate-related and environmental risks can also come from *ad hoc* consultative commissions where the supervisor exchanges its views with external groups such as researchers, members from the industry or NGOs. Most of the supervisors also highlighted their intensive participation in various international fora (see **Box 9** for an example) to promote research on climate-related and environmental risks, exchange good practices and reflect on

potential harmonised standards, which the NGFS considers a good practice to be followed.

2.4 Focus Area 4: Build capacity through awareness raising and expertise development

Once a strategy has been set and a structure for addressing it determined, supervisors need to actively support its implementation. As stated in the NGFS Guide, there is a need to raise awareness of the relevance of climate-related and environmental risks to a wide range of activities within supervisors and central banks. While awareness of the subject has improved in recent years, supervisors are continuing to build its profile both internally and more broadly.

Based on the survey responses, capacity building is a key priority for most respondents. Almost all respondents indicate that they are in the process of building capacity, as taking climate-related and environmental risks into account in financial supervision requires organisational adaptation, dedicated resources and specific training. Levels of progress differ among respondents and some, particularly the larger supervisors, have managed to develop the necessary skills internally.

The overwhelming majority of respondents are raising awareness on climate-related and environmental risks through a variety of common approaches including bilateral meetings, workshops and outreach sessions with supervised entities, publication of working papers and public speeches on supervisors' perspectives and vision on the significance of climate-related and environmental risks, as well as extensive engagement with supervised entities through surveys and supervisory dialogues, in addition to more formal guidance. Most supervisors are utilising numerous channels for awareness building, which is conducive to communicating to both large numbers of staff, financial institutions and members of the public. Various supervisors indicate significant involvement of senior staff in such initiatives, through actions such as speeches and interviews, may be beneficial, as also mentioned above. When held on a regular basis, such engagements could help supervisors reinforce the importance and showcase the evolution of the field.

Some survey respondents also highlighted burgeoning staff interest in the field, which may be leveraged. Supervisors may find internal networks useful not only to promote technical expertise, but also to disseminate information and to build interest. In this way a culture cognisant of climate-related and environmental risks could be fostered.

Supervisors are also looking to complement internal awareness building by pursuing initiatives with external stakeholders. A majority of survey respondents are conducting seminars, workshops, conferences and other events to inform constituents and provide them with necessary understanding on related topics such as green instruments, ESG, climate-related risks and the Task Force on Climate-related Financial Disclosures (TCFD) recommendations. They may also consider conducting specific awareness raising on certain policies that require guidance and preparation before application, as noted in **Box 7**. Risk assessment exercises involving both the supervisor and the industry may also be seen as a good opportunity to raise awareness (see examples in **Chapter 3**).

Box 7

Raising awareness among internal and external stakeholders

In order to coordinate issues related to sustainable finance and liaise across the organisation with sectoral experts, the sustainability team within the **Danish Financial Supervisory Authority** (DFSA) established an internal network of approximately 30 staff members that deal with sustainability issues in their supervisory work. This group conducts meetings on sustainability issues on a regular basis, and uses an internal mailing list to share news that may be relevant to the other members. Furthermore, internal media (i.e. DFSA Intranet) is used regularly to update staff on major external activities on sustainable finance issues. In March 2021, when the EU *Sustainable Finance Disclosure Regulation* entered into force, the DFSA undertook extensive communication activities, targeting both internal and external stakeholders. Within the DFSA, this took the form of an internal course on sustainable finance; available to all staff members, it was attended by 25% of the organisation's employees.

As stated in the NGFS Guide, it is expected that all staff members gain at least a basic level of knowledge on climate-related and environmental risks. Numerous respondents to the survey indicated they are taking a multi-faceted approach to developing knowledge within their organisation. It is important to consider which mediums are most appropriate for specific capacity building initiatives, taking into account both target audience and resource intensity. In addition, consideration should be given to the timing of capacity building, for example when on-boarding new staff members.

When pursuing more in-depth knowledge, supervisors may find it helpful to utilise external resources. Leveraging the expertise of others may reduce pressure on internal resources, allowing them to more effectively

allocate their time. Supervisors may consider approaching external engagement in various ways, tailored to organisational needs:

- At an institutional level, by collaborating with experts and organisations, as highlighted in **Box 8**. Such initiatives may be reinforced through formal agreements such as a Memorandum of Understanding.
- At a thematic level, for instance organising workshops hosted by organisations such as non-governmental organisations (NGOs), think tanks and academia.
- At an individual level, for example encouraging staff members to pursue sustainability-related certifications/qualifications.

Box 8

Skilling up through partnerships

Aware of the importance of training to accelerate the consideration of climate and environment in its mission, **Bank Al-Maghrib (BAM)** set the objective of building both in-house knowledge and capacity, while fostering credit institutions' awareness.

Internally, BAM has initially targeted supervisors in its green finance unit and those engaged in associated regulatory initiatives. Training takes the form of participation in conferences, workshops and seminars/webinars on themes such as the green economy, green and sustainable finance and climate-related risk. These are generally organised by specialised organisations, multilateral development banks, regulators and central banks, networks and associations, or international financial institutions. A study visit was also performed with an advanced central bank, with the aim of providing more practical and focused training. To ensure wider benefit within the organisation, BAM's specialised supervisors in turn organise training for on-site and permanent supervisors, with a view to popularising and raising awareness on climate-related risks and practical management tools.

Externally, BAM organises quarterly knowledge sharing meetings to accelerate capacity building among

stakeholders. It regularly updates the banking sector on recent NGFS publications, with a focus on risk management and green finance specialists in relevant institutions. These periodic informative meetings aim to both build collective understanding and potentially trigger actions by banks to help promote green finance and risk management.

As part of its ongoing two-year work programme on climate-related risk supervision and monitoring, BAM is looking to build on World Bank expertise by organising a series of training sessions and peer learning events for supervisors and banking institutions. Using international experience and knowledge, these events seek to train supervised banks on how to best implement supervisory guidance on climate-related risk management, with a focus on climate-related risk stress testing and reporting, in order to ensure consistency across banking industry.

BAM is also working to deploy periodic training utilising external resources. This is aimed to more systematically meet the needs of micro-prudential supervisors, while broadening the coverage to macro-prudential supervision and monetary policy functions.

Box 9

Technical assistance and capacity building through international networks

Established in 2012 and facilitated by the International Finance Corporation (IFC) as Secretariat and technical advisor, part of the World Bank Group (WBG), the *Sustainable Banking Network* (SBN) is a knowledge sharing and capacity building platform for financial sector regulators and banking associations from emerging markets committed to advancing sustainable finance in line with international good practice. SBN's current 43 member-countries represent over USD 43 trillion (86%) of the total banking assets in emerging markets. SBN is unique in its focus on emerging markets, facilitation of public-private partnerships, and access to IFC/WB's technical assistance and capacity building programs to help members develop and implement national sustainable/climate finance policies, leveraging WBG's globally dispersed network of offices.

The SBN Measurement Framework is based on evaluating the policies and implementation efforts of financial sector regulators and banking associations. It thereby assists members to assess their progress in comparison with peers and identify the future policy pathways

and strategies to promote sustainable finance in their countries. The Measurement Framework for 2021 is based on three pillars (ESG Integration, Climate Risk Management, and Financing Sustainability) identified and endorsed by the SBN members as critical components of sustainable finance frameworks. Within the new Climate Risk Management Pillar, the Regulatory and Industry Association Actions sub-pillar draws on emerging international trends and good practices for regulators and supervisors related to climate-related risk management, including references to the NGFS Guide, in terms of alignment on regulatory practices for overall approach, strategy and capacity for climate-related risk (e.g. research, analytical capacity, data needs), technical guidance (e.g. climate-related risk exposure, scenarios, stress testing), supervision activities and incentives (e.g. supervisory expectations and processes), and tracking and aggregated disclosure (e.g. market level climate-related risk data for the financial sector).

The 2021 SBN Global Progress Report will be published in October 2021.

Some respondents raised concerns about the capacity of supervised entities, especially smaller-sized ones.

Addressing new risk factors and reporting constraints may cause small institutions and those at early stages an additional workload that would require significant human and financial resources, as well as adequate training. A potential regulatory burden has been cited as a challenge to new supervisory actions by a significant number of respondents. To address this, supervisors may find it useful to approach skills development as a two-way initiative. Numerous respondents to the survey highlighted the effective use of interactive

forums with supervised institutions, which may support mutual understanding of direction of travel, expectations and challenges faced between participants, allowing them to focus their work plans accordingly.

International cooperation can contribute to capacity building for both supervisors and the industry.

Several initiatives have been launched, with one of the earliest initiatives being featured in **Box 9**. The NGFS, in partnership with other organisations, has launched a training programme for supervisors (see **Chapter 6**).

3. Risk transmission and assessment

Focus Areas 5 to 8

5 – Develop clear understanding of sources of climate-related and environmental risks

6 – Understand the transmission channels from climate-related and environmental risks to the economy and financial system

7 – Assess financial exposures arising from climate-related and environmental risks through quantitative and qualitative approaches

8 – Assess potential loss and impacts using forward looking methodologies

Key Takeaways

- Progress on climate-related and environmental risk identification and assessment is hampered by the limited availability and granularity of data. There are also limitations in existing methodologies to cater for the longer time horizon required for risk assessment and factor in the unique characteristics of these risks, where historical data are a poor guide to determine future risks.
- While climate-related physical and transition risk assessment methodologies have greatly improved in recent years, the understanding and measurement of environmental risks more broadly are still at a nascent stage.
- As different jurisdictions experience different sources of climate-related and environmental risks, it is important for supervisors to work with their supervised entities to determine which sources of risks are relevant and material. A multi-disciplinary approach involving collaboration with a broad range of stakeholders is useful to leverage the required expertise to identify, measure, manage and monitor climate-related and environmental risks.
- Supervisors may consider using a combination of qualitative and quantitative tools to assess their supervised entities' exposures to climate-related and environmental risks which include developing metrics and indicators such as carbon footprints, heat maps, carbon-risk exposure indices, risk indicators connected to individual obligors, and climate-related risk scores. This supports supervisory planning and informs subsequent engagements and dialogues with supervised entities.
- Supervisors may also consider complementing quantitative risk exposure and impact analysis with tools such as scenario analysis and stress testing, which enable more forward looking assessment of these risks.
- Climate-related forward looking methodologies are currently faced with some challenges and limitations. Nonetheless, they are useful tools to create awareness around the prudent management of these risks, inform supervisory planning and review, assess the magnitude of the challenges posed by these risks to the economic and financial system, as well as evaluate the climate resilience of financial institutions' business models. To this end, the NGFS scenarios provide a framework for supervisors and financial institutions to engage in forward looking climate-related risk analysis.

This chapter describes the progress made by supervisors in the area of risk identification and assessment, supported by practical examples. The chapter highlights four key phases in this process, structured around the same number of Focus Areas: (i) develop clear understanding

of the sources of risk (**Focus Area 5**); (ii) understand the transmission channels from climate-related and environmental risks to the economy and financial system (**Focus Area 6**); (iii) assess the financial exposures through quantitative and qualitative approaches (**Focus Area 7**); and

(iv) finally, assess potential loss and impacts using forward looking methodologies (**Focus Area 8**). Special attention is given to environmental risks more broadly, which the NGFS Guide covered in less detail than climate-related risks.

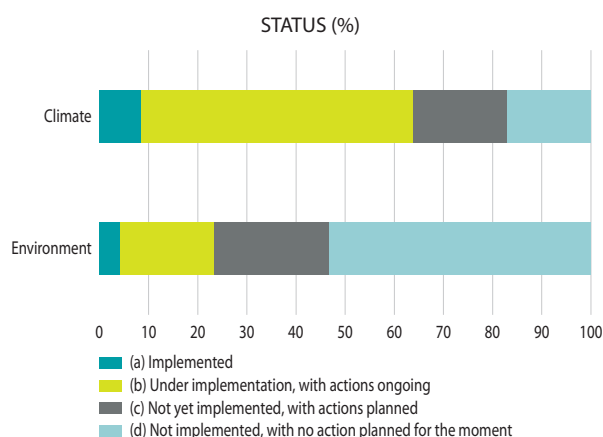
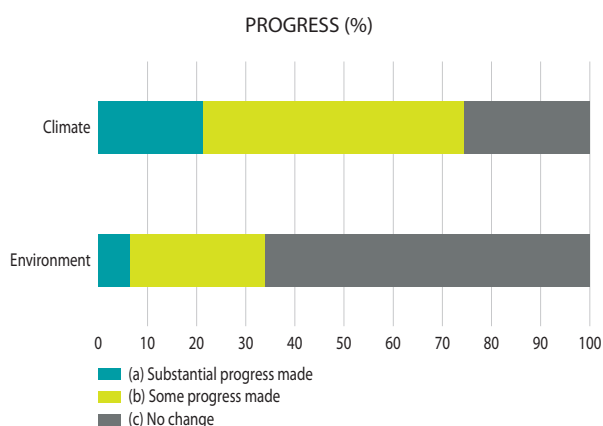
Progress in implementing recommendations 1 and 3 and cited challenges

The majority of respondents stated that they have made either substantial (21%) or some progress (53%) in identifying transmission channels of climate-related risks to the economy and the financial sector and how these risks are material to their supervised entities.

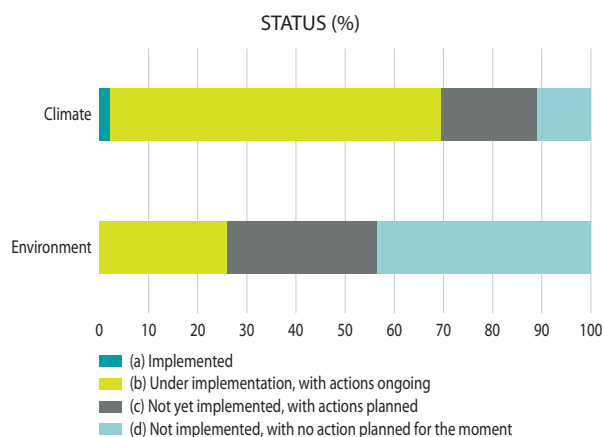
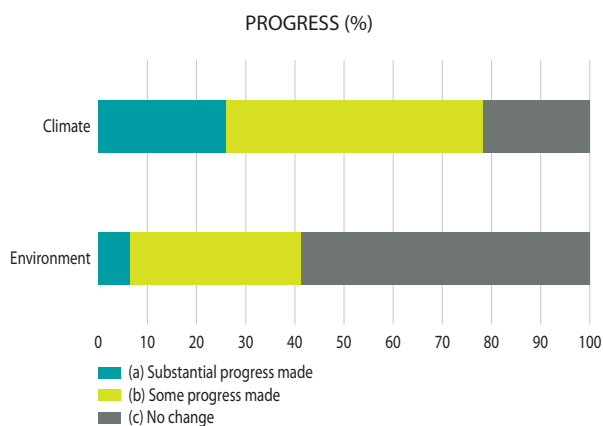
Most respondents (64%) have already implemented or are in the process of implementing climate-related risks assessment, and work is underway in a number of jurisdictions, to develop analytical tools, models and key risk indicators to monitor the transmission of physical and/or transition risks, using both qualitative and quantitative approaches.

The survey shows work is much less advanced on identifying environmental risks more broadly, when compared to climate-related risks specifically. Most respondents (66%) declared there was no progress and a majority (77%) reported that they have not started to address the issue.

Recommendation 1 – Determine how climate-related and environmental risks transmit to the economies and financial sectors in the jurisdictions and identify the risks that are likely to be material for the supervised entities



Recommendation 3 – Identify the exposures of supervised entities that are vulnerable to climate-related and environmental risks and assess the potential losses should these risks materialise



With regard to the progress on assessing exposure and/or loss potential, most respondents (78%) have included climate-related risks in their supervisory activities in one form or another, with many of them having engaged their regulated financial institutions and their senior management to better understand their climate-related risk exposures. However, for environmental risks more broadly, most supervisors (59%) did not report to have made any progress since 2019.

This trend is also observed on implementation status. While the majority of respondents are already implementing (67%) or planning to implement (20%) Recommendation 3 for climate-related risks, only 26% are acting and 30% are planning to act on exposure identification and potential loss assessment for environmental risks more broadly.

Progress in implementing these two recommendations is hampered in particular by data gaps, where the limited availability and quality of data affects the comparability and reliability of climate-related and environmental risk analysis. Work is underway at several international fora to identify and bridge these data gaps (see **Focus Area 7**).

Respondents also reported challenges related to the lack of harmonised methodologies, indicators and metrics to assess climate-related and environmental risks, including forward looking methodologies. A common methodological challenge is the extended horizon of these risks compared to conventional prudential risks, their evolving nature, the uncertainty of their impact and transition pathways as well as the likelihood of materialisation, given their non-linearity and multiple points of impact on financial institutions. Other challenges relate to the specificities of the various risk factors and transmission channels, which mean that available methodologies may have a limited scope of application. Physical risk, being seen as more granular, is regarded as being more difficult to assess than transition risk, which is more macro-level. Finally, a challenge for developing methodologies is the work required to first translate climate-related and environmental data into comparable financial risk metrics, and then to incorporate them into the supervisory framework. Even though the majority of members expressed the need for tools tailored to the specific attributes of these risks, some of them reported

that the separation between risk-specific tools and usual supervisory tools could hamper efforts to embed these issues within the work of frontline supervisory teams.

While climate-related physical and transition risk assessment methodologies have greatly improved in recent years, the understanding and measurement of environmental risks more broadly are still at a nascent stage and remain even more challenging. To help supervisors make additional progress, the next Focus Areas include additional detail on environmental risks and examples of qualitative and quantitative assessment approaches that supervisors have developed, including scenario analyses and stress testing.

3.1 Focus Area 5: Develop clear understanding of sources of climate-related and environmental risks

The NGFS Guide recognised that climate-related and environmental risks are sources of financial risks, and may therefore cause financial losses and potentially threaten financial stability. This Progress Report adds details on environmental risks, which the NGFS Guide covered in less depth than climate-related ones specifically.

As stressed in the NGFS Guide, both the BCPs⁹ and ICPs¹⁰ require supervisors to assess the risk profiles of their supervised entities, which implicitly covers all risks including climate-related and environmental risks.

Sources of environmental risks

A clearer understanding of the sources of environmental risks would enable supervisors to identify activities associated with material environmental risks, and focus their supervisory efforts to ensure that financial institutions adequately assess and manage their exposures in these areas.

Sources of environmental risks can be classified into several categories (see Box 10). Within these categories, aside from climate change, supervisors indicated

9 BCBS, Core Principles for Effective Banking Supervision, Principle 8, Supervisory approach.

10 IAIS, Insurance Core Principle 9, Supervisory Review and Reporting.

that they are focusing their attention mostly on risks related to the degradation and loss of biodiversity¹¹ and ecosystems¹² as well as ecosystem services¹³ (Box 12). This may include the impact on terrestrial, freshwater and marine ecosystems of land and sea use change (e.g. deforestation), over-exploitation of natural resources (e.g. overfishing), introduction or spread of invasive species and other factors.

Many respondents regard climate change as a source of environmental risk, along with other sources of environmental degradation, meaning that climate-related risks are seen as a subset of broader environmental risks. Indeed, as noted in the NGFS Guide, climate change itself also leads to environmental degradation and is in particular expected to have a significant impact on biodiversity and ecosystems.

Box 10

Categorising the sources of environmental risks in a consistent manner

There are various categorisations of environmental risks, and at present, no universal standard classification exists. However, this situation may change as clearer definitions and guidance emerge. One of the pioneering mandatory initiatives is that provided by the **European Union** (EU) Sustainable Finance Action Plan, as used in its Sustainable Finance Taxonomy and its proposed Corporate Sustainability Reporting Directive.¹ This defines four environmental categories beyond climate, relating to the same number of objectives within the EU policy framework: (i) water and marine; (ii) resource use and circular economy; (iii) pollution; and (iv) biodiversity and ecosystems (in addition to two objectives related to climate change mitigation and adaptation).

In addition, international efforts to harmonise sustainability reporting, such as the International Financial

Reporting Standards (IFRS) Foundation's proposal for the establishment of an **International Sustainability Standards Board** (ISSB), and work by the **International Organization of Securities Commissions** (IOSCO), the **Financial Stability Board** (FSB) and the **G20 Sustainable Finance Working Group**, may also help provide more consistency and standardisation in the categorisation of environmental risks. Voluntary initiatives such as the **Task Force on Nature-related Financial Disclosures** (TNFD) may also help support the development of clearer definitions and guidance. The TNFD's goal is to support organisations in reporting and acting on evolving nature-related risks, including clear, precise and scientifically-anchored definitions of impacts, dependencies, and the financial risks and opportunities resulting from these impacts and dependencies, supported by consensus across engaged TNFD stakeholders.

1 See for example the [communication](#) of the European Commission dated 21 April 2021, which presents, inter alia: (i) the first delegated act adopted pursuant to [Regulation \(EU\) 2020/852](#) ('Taxonomy regulation'), which covers the activities with a significant contribution to climate mitigation and adaptation and the related screening criteria; (ii) the proposal for a Corporate Sustainability Reporting Directive (CSRD), which would replace the existing [Non-Financial Reporting Directive](#) (NFRD).

11 The Convention on Biological Diversity (CBD) defines biological diversity as 'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.'

12 The CBD defines an ecosystem as 'a dynamic complex of plant, animal and microorganism communities and the non-living environment, interacting as a functional unit.'

13 The United Nations Environmental Program Finance Initiative (UNEP FI) defines ecosystem services as the benefits that nature provides that enable or facilitate business production. Such services are usually classified into four categories: (i) provisioning services, i.e. goods obtained from ecosystems (e.g. ground and surface water, or fibres and other materials); (ii) regulating services (e.g. pollination, climate or disease control); (iii) cultural services, i.e. non-material benefits from ecosystems, and (iv) supporting services that are necessary for the production of other ecosystem services.

As with climate-related risks, financial risks associated with the environment may be categorised as either physical or transition risks.

Physical environmental risks may arise when the quality or functioning of natural systems is impaired, thus disrupting or otherwise adversely affecting the economic activities that rely on them. Indeed, many economic activities depend directly upon ecosystem services provided by what is broadly called natural capital.¹⁴ For example, many agricultural activities depend on pollination, many pharmaceutical products depend on genetic diversity, and many manufacturing activities depend on the provision of goods such as non-polluted water resources. The degradation of ecosystems due to economic activities can also feed back into economic impacts. Examples of this may include reduced agricultural productivity caused by soil degradation, environmental damage reducing the appeal of tourist resorts, air pollution impairing the health and productivity of the workforce, or degradation of ground water and surface water resources needed as direct inputs for manufacturing processes and cooling agents. Like climate-related physical risks, environmental physical risks may be acute (e.g. linked to specific extreme events such as pollutant discharge) or chronic (e.g. linked to the longer-term degradation of natural systems such as deforestation and mismanagement of water basins). These risks can be local or more global. For instance, the loss of biodiversity could lead to the emergence of new pandemics,¹⁵ which can rapidly affect the global economy.

Transition risks associated with disorderly or unanticipated efforts to reduce environmental damage may have significant implications for economic activities and businesses. Delays in implementing policy actions or unexpected changes, for instance in technological developments or consumer sentiment and preferences, may require abrupt shifts in regulations, policies or lead to sudden changes in market behaviours. Examples of regulatory adjustments may include the sudden introduction of pollution standards that impose punitive measures on polluting firms, or extended producer

responsibility for post-consumer product waste, laws to prohibit the use of commodities associated with illegal deforestation, sourcing policies of downstream buyers that stipulate the procurement of certified sustainable products, or policy commitments to phase out single use plastics, which may pose threats to businesses with highly perishable or highly fragmented value chains such as agri-food. These can pose material financial threats to businesses and even result in stranded assets when firms' business models are no longer viable in the face of tightening environmental regulations and/or consumer and investor preferences.

Determining sources of climate-related and environmental risk through partnerships

Different jurisdictions experience different sources of risk. Therefore, it is important that supervisors work together with their supervised entities and other stakeholders to determine which sources of risk are relevant and material. In order to do that, supervisors may, for example, interview managers and specialists at financial institutions, conduct surveys, establish partnerships with experts, scientists or researchers outside the financial sector, both domestically as well as internationally.

Tackling climate change and preventing further environmental degradation require a multidisciplinary approach, including large-scale cooperation among stakeholders, and supervisors may find it beneficial to engage in partnerships between public and private stakeholders to leverage their expertise, as the know-how is not always available in-house. These partnerships are often mutually beneficial because they enable the scientific community to provide input into policy decisions while improving the risk assessment approaches of supervisors, through a better understanding on the underlying climate and environmental science. Some NGFS members which managed to achieve progress have taken steps to involve the broader society in policy making and the design of risk assessment methodologies. Based on the survey, some good practices would include cooperation with national environmental agencies, national academy of sciences or local universities (see **Box 11**).

14 The Taskforce on Nature-Related Financial Disclosures (TNFD) defines natural capital as 'all renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organisation. It includes air, water, land, minerals and forests, biodiversity and ecosystem health.' See TNFD (2021), *Technical scope*

15 See IPBES (2020) *Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services*

Box 11

Leveraging on external stakeholders for climate and environmental analysis

The sustainability strategy of **Magyar Nemzeti Bank** (MNB), the Green Programme, consists of three pillars, one of which is social and international relations. This pillar is aimed at enhancing domestic collaboration with various stakeholders alongside international cooperation and capacity building. Over the last two years, MNB has developed a network that enables the institution to tap into resources from different disciplines to better understand the risks stemming from climate change and other environmental issues as well as to build knowledge on approaches to greening the financial system.

The Deputy Governor of the MNB is an active member of the 'Sustainable Development Presidential Committee' of the Hungarian Academy of Sciences. Decision-makers are involved in the committee, alongside natural, life, and social scientists. Its role is to advise national policy and decision making and by raising issues such as the effect of biodiversity loss on the economy and financial

system, it may contribute to designing environmental risk assessment methodologies at the MNB. The MNB has been contributing to the work of the *Hungarian Scientific Panel on Climate Change* (HuPCC), the scientific body mirroring the structure of IPCC at the national level, by sharing its views on green finance, and in turn, receiving inputs from the scientific community of the HuPCC during its conferences. The MNB cooperates with several Hungarian universities and finances relevant research projects at the Budapest University of Technology and Economics, among others, on the topic of energy efficiency, carbon accounting or circular economy financing. Knowledge sharing takes place regularly with a network of NGOs, including WWF and Greenpeace, to include the views of the broader society into new financial regulations. The supervisory expectations on climate-related and environmental risks published by the MNB were designed with the involvement of a broad set of stakeholders too.

3.2 Focus Area 6: Understand the transmission channels from climate-related and environmental risks to the economy and financial system

To determine how climate-related and environmental risks result in potential loss for financial institutions, it is critical to have a good understanding of their transmission channels to the economy and the financial system.

Transmission channels for climate-related risks

The NGFS Guide included a section on transmission channels for climate-related risks, referencing earlier work by supervisors and the *NGFS Comprehensive*

Report 2019. Further work has been conducted since then. In October 2020, a report¹⁶ on climate change and sovereign risk, supported by the International Network for Sustainable Policy Insights, Research and Exchange (INSPIRE), identified six transmission channels through which climate change can amplify sovereign risk. Sovereign risk can directly affect financial stability, and a worsening of sovereign risk could lead to a doom loop between sovereign risk and banking risk. In April 2021, the Basel Committee on Banking Supervision (BCBS) published a *report on climate-related risk drivers and their transmission channels*, including physical and transition risks. This work contributes to the consensus that traditional risk categories (e.g. credit risk, market risk, liquidity risk, operational risk, or, regarding the insurance sector, underwriting risk) suitably capture the eventual impact of climate-related risks factors.

16 Volz, U., J. Beirne, N. Ambrosio Preudhomme, A. Fenton, E. Mazzacurati, N. Renzhi and J. Stampe. 2020. *Climate Change and Sovereign Risk*. SOAS University of London, Asian Development Bank Institute, WWF, and Four Twenty Seven.

Transmission channels for environmental risks

Reflecting the variety of environmental risks, the transmission channels through which they may translate into financial risks are diverse and complex (see Table 1). They may take the form of dependencies, in which businesses depend on natural systems for their raw materials, production processes or mitigation of direct impacts¹⁷, or threats through which environmental risks may disrupt business activities or become subject to new regulations and changes in consumer preferences. Either way, these impacts on businesses may, especially when accumulated, have wider impacts on entire sectors. These impacts may even feed through the entire financial system and have negative implications for financial stability.

As stressed in the NGFS Guide, it is also important for supervisors and financial institutions to be aware of

potential greater impacts due to the combined effects of climate-related and environmental risks, which may reinforce each other through a negative feedback loop.

While the survey reported generally limited progress on identifying and assessing how environmental risks transmit to the economy and the financial sector, some supervisors have started to take actions. For example, De Nederlandsche Bank published a report in June 2020 on the impact of biodiversity loss for the financial sector (see **Box 12**). Banco de España conducted a survey of 15 credit institutions (92% of the Spanish banking sector) to identify ESG risks in the balance sheet of the banking sector. As shown in **Chapter 4**, numerous supervisors also issued or plan to issue supervisory expectations that cover environmental risks and call for their assessment by supervised entities, which may contribute to further progress in this area.

T1 Examples of transmission channels for environmental risks

Environmental risks	Economic transmission channels	Financial risks	
Physical risks, e.g.: <ul style="list-style-type: none"> • Loss of soil fertility • Groundwater contamination or depletion • Habitat destruction 	Businesses <ul style="list-style-type: none"> • Reduced revenue streams from both demand and supply shocks • Raw material shortages 	Credit risk <ul style="list-style-type: none"> • Defaults by businesses and households • Collateral depreciation 	
	Micro <ul style="list-style-type: none"> • Stranded assets or reduction in asset valuation • Additional capital expenditure due to transition demands • Changing demand and costs 		Market risk <ul style="list-style-type: none"> • Repricing of equities, fixed income, commodities etc.
	Households <ul style="list-style-type: none"> • Legal liability for environmental breaches • Loss of income due to productivity losses, health impacts and labour market frictions • Reduced property value due to exposure to environmental threats 		Underwriting risk <ul style="list-style-type: none"> • Increased insured losses • Increased insurance gap
Transition risks, e.g.: <ul style="list-style-type: none"> • Water pollution regulations • Consumer preference for organic or sustainable food 	Macro <ul style="list-style-type: none"> • Capital depreciation and increased investment • Shifts in prices (from structural changes, supply shocks) • Productivity changes due to environmental degradation • Labour market frictions (from physical and transition risks) • Socioeconomic changes (changing consumer preferences) • Other impacts on international trade, government revenues, fiscal space, output, interest rates and exchange rates 	Operational risk <ul style="list-style-type: none"> • Supply chain disruption • Forced facility closure 	
<i>Liability risks, as a subset of either physical or transition risks,^{q)} e.g.:</i> <ul style="list-style-type: none"> • Legal cases against polluting industries • Companies held liable for habitat destruction 		Liquidity risk <ul style="list-style-type: none"> • Increased demand for liquidity • Refinancing risk • Increased funding costs 	

Source: Adapted from (i) *Overview of Environmental Risk Analysis by Financial Institutions (NGFS, 2020)*, and (ii) *Handbook for Nature-related Financial Risks (Cambridge Institute for Sustainability Leadership, 2020)*.

q) *Liability risks –that is, the risks associated with legal cases associated with the loss of or damage to natural systems– are considered in the NGFS Guide as a subset of either physical or transition risk. Entities or individuals that suffer loss or damage due to environmental change may have reasons to seek compensation from those responsible for the environmental impacts. These may result in direct financial implications for businesses shown to be responsible for environmental damage. Examples may include fines or even enforced closure for businesses that breach air pollution or water pollution discharge restrictions.*

17 Ecosystem services such as filtration, bio-remediation and mediation of sensory impacts can mitigate direct impacts of noise, emissions and waste associated with production processes.

Assessing the impact of biodiversity loss on the financial sector

Based on its study '*Indebted to nature*', **De Nederlandsche Bank** (DNB) concluded that biodiversity loss is a source of financial risks. Financial institutions are exposed to physical risks¹ when they finance economic activities that depend on ecosystem services. The decline in these ecosystem services can jeopardise business continuity and, by extension, their financial position. Dutch financial institutions have provided worldwide EUR 510 billion in finance to companies that are highly or very highly dependent on one or more ecosystem services such as animal pollination. For instance, the financial sector is exposed to EUR 28 billion of products that depend on pollination. In addition, financial institutions are exposed to transition risks.² Government policy or changing consumer preferences aimed at reducing the damage to biodiversity require companies to undergo a transition. For example, the transition to less nitrogen-intensive business models can lead to transition risks for the EUR 81 billion in loans that the three large Dutch banks have made to sectors with nitrogen-emitting activities. Financial institutions also have exposures of EUR 28 billion to companies in areas that are protected or that might come under protection. This can have a significant impact on the risk profile of these companies. The multitude of ecosystem services and the many forms of biodiversity require more thorough

analysis. DNB recommends that financial institutions identify the physical and transition risks resulting from the loss of biodiversity, and that a standard is developed for measuring and reporting on biodiversity risks.

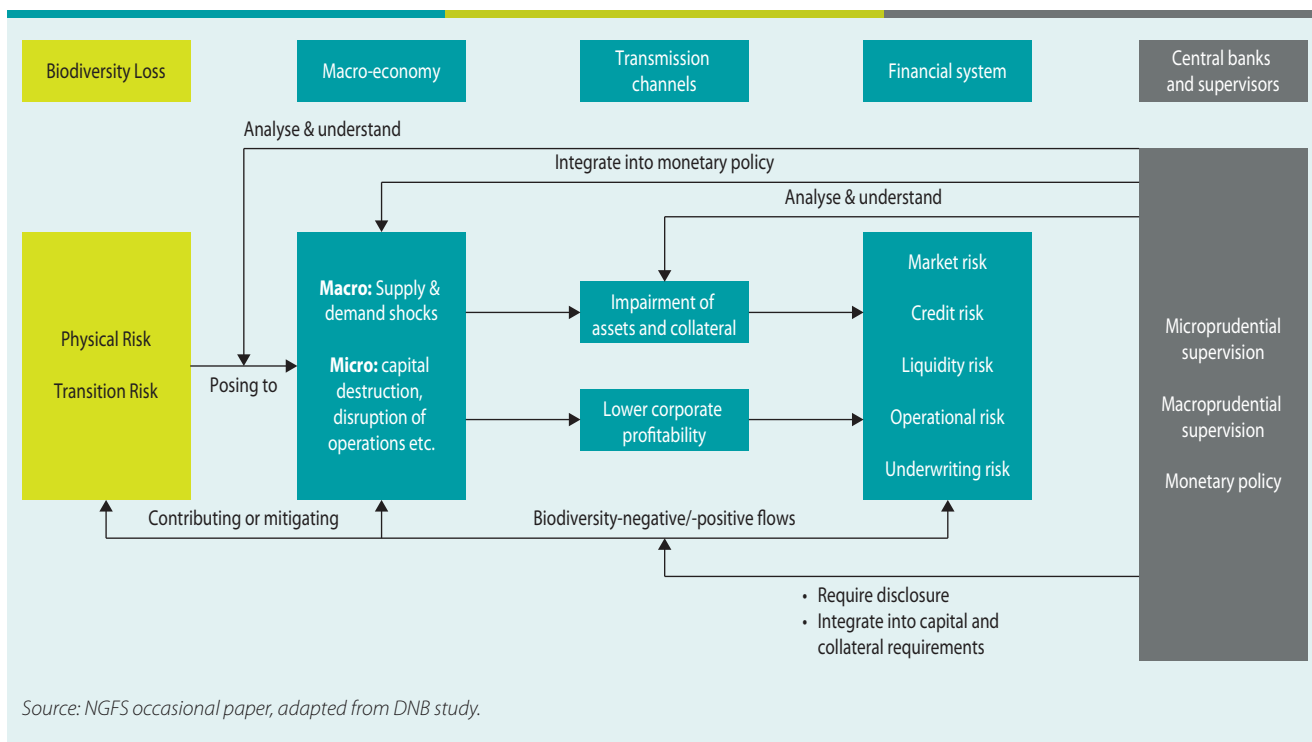
The **NGFS Research Workstream** and the **International Network for Sustainable Financial Policy Insights, Research, and Exchange** (INSPIRE)³ have set up a joint Biodiversity and Financial Stability Study Group, the goal of which is to establish an evidence-based approach to how central banks and supervisory authorities could fulfil their mandates in the context of biodiversity loss. The first output of their work is an *NGFS occasional paper* published in June 2021, which sets out the links between biodiversity loss and the macro-economy and considers both the dependency of the financial sector on nature, and the impact of the financial sector in exacerbating the degradation of natural systems. It then poses a series of questions regarding whether and how central banks and supervisors should, in the context of pursuing their mandates, address the issue of biodiversity loss. The illustration below shows the potential role of supervisors with regard to biodiversity loss. This paper was complemented by an *Interim report* in October 2021, with a final report planned in 2022.

1 To determine physical risks, DNB determined how the Dutch financial sector is indirectly dependent on ecosystem services. It made use of *ENCORE* database (developed by Natural Capital Finance Alliance) that details the dependencies on 21 ecosystem services for 86 business processes. Each business process has a dependence score for each ecosystem service. The dependence score is allocated based on two factors: the degree to which production processes are disrupted and the projected extent of financial losses if the ecosystem service is lost. Next, the exposure of Dutch financial institutions to those sectors through shares and corporate bonds and loans is determined. Finally, the ecosystem services are shown on which these business processes are highly or very highly dependent.

2 To determine transition risk, DNB determined which companies might have a negative impact on biodiversity and ecosystem services. It made use of the GLOBIO model (developed by the Netherlands Environmental Assessment Agency) to look at the biodiversity footprint which provides insight in the pressures economic activities put on biodiversity as a result of changing land use and greenhouse gas emission. A disproportionately large biodiversity footprint for financial institutions can serve as an indicator for increasing transition risks. DNB calculated the biodiversity footprint of 8,000 companies in which Dutch financial institutions invest. It concluded that the biodiversity footprint of Dutch financial institutions is comparable with the loss of 58,000 km² of pristine nature (more than 1.7 times the land surface of the Netherlands). About half of it is the result of changing land use, and the other half is due to greenhouse emissions. Government policy or changing consumer preference with stronger focus on preserving biodiversity increase transition risks. Transition risks also appear through financing companies that operate in protected areas. A transition risks exists when governments decide to designate new areas as protected areas.

3 The International Network for Sustainable Financial Policy Insights, Research, and Exchange (INSPIRE) is an independent research network built to support the central banks and supervisors of the NGFS in its work to manage climate-related and environmental risks and mobilise finance to support the transition to a sustainable economy.

.../...



3.3 Focus Area 7: Assess financial exposures arising from climate-related and environmental risks through quantitative and qualitative approaches

Clarity on the transmission channels is important to assess the financial exposures to climate-related and environmental risks. Supervisors have taken a wide range of approaches to assess the exposure of supervised entities that are vulnerable to climate-related and environmental risks.

The progress on assessing financial exposures due to climate-related risk has been more advanced than on other environmental risks.

- For climate-related risks, around 60% of respondents have qualitatively identified and assessed risks, 40% have engaged in dialogues with supervised entities, and close to 30% have issued surveys to the industry. About 10% planned to conduct the above activities in the following 12 months. Supervisors also took quantitative approaches. Around 30% have collected data or conducted exposure analysis while another

15% planned to do so. Although only a few supervisors have done forward looking exercises, sixteen planned to conduct such exercises in the form of either scenario analysis or stress testing in the following 12 months. A few supervisors have developed dashboards, defined risk indicators, or developed guides. Several more planned to do so in the following 12 months. More than 40% of the supervisors analysed transition risks while only about a quarter analysed physical risks.

- On the environmental risk side, only around 20% of supervisors have identified or assessed risks. About 12-16% have conducted surveys or engaged in dialogues with the industry. Only a handful planned to carry out the above activities in the next 12 months. Several supervisors have collected data or analysed exposure, with a few more planning to do so in the next 12 months. Only one supervisor had done scenario analysis on environmental risks. A number of supervisors have developed dashboards or defined key indicators for environmental risks.

Overcoming data challenges

Data availability is a key element for developing risk assessment approaches and, depending on the availability of data, supervisors can use qualitative

or quantitative assessment tools. The survey identified data gaps, including insufficient disclosures by financial and non-financial corporates, as a key impediment to risk identification and analysis by financial institutions and their supervisors. This is particularly challenging for some counterparties (e.g. small and medium enterprises, non-listed firms). In the case of climate-related risks, the need for highly granular and geo-located data was identified as impeding physical risk assessment. With respect to transition risk, Scope 3 greenhouse gas emissions data as well as data breakdown by sector and industry were identified as the most problematic areas. Regarding other environmental risks, the breadth of the scope was cited as a challenge, and some respondents have encountered greater difficulty in accessing and managing data for environmental risks than for climate-related risks.

Several international initiatives are aiming to address the challenge of data availability on climate-related and environmental risks, in particular by enhancing disclosures. Two initiatives focused on data challenges are described in **Box 13**, and more can be found in **Chapter 5** with regard to disclosure.

Supervisors may also take steps at their level to address data availability issues, with a view to enhance quantitative assessments with better data at a later stage. For example, as mentioned in the NGFS Guide, the National Bank of Belgium issued a regulation requiring institutions to gather and report information on the energy efficiency of their real estate exposures, which should improve future assessment of their exposure to transition risk. In this regard, supervisors are expected to take into consideration the relevant BCPs¹⁸ and ICPs¹⁹.

Box 13

Bridging data gaps through international cooperation

The **NGFS Bridging the Data Gaps (BDG) Workstream** aims to identify data gaps to enhance the assessment of climate-related risks and opportunities. To do that, the NGFS BDG Workstream has adopted a user-centric approach, informed by interactions with stakeholders from a wide range of geographies and areas of expertise. This approach — based on categorising use cases, classification of metrics, and links to data sources — will allow for a systematic identification of data gaps and ways to bridge these gaps, including through climate-related disclosures. A *progress report* was published in May 2021 and a final report is planned by the end of 2021.

The **Financial Stability Board** (FSB)'s Analytical Group on Vulnerabilities (AGV) has assessed the availability of data with which to monitor and assess climate-related risks to

financial stability, as well as any data gaps. This work builds on the FSB report on *The Implications of Climate Change for Financial Stability* published in November 2020. It also draws on the findings of the FSB's stock-take of financial authorities' experience of the availability of the data when including climate-related risks as part of their financial stability monitoring, and on a series of workshops held in Q1 2021. Compared to the NGFS BDG Workstream which has a broader focus, the FSB's work focuses on financial stability risks only. A *final report* was published for the G20 Venice Climate Summit in July 2021. The NGFS and FSB reports contributed to the discussion at this summit, following which the *FSB roadmap for addressing climate-related financial risks* called for coordination of work by various organisations (NGFS, FSB and the International Monetary Fund) to fill the identified data gaps.

18 BCBS, Core Principles for Effective Banking Supervision, Principle 10: Supervisory reporting; Principle 15: Risk management process; Principle 28: Disclosure and transparency.

19 IAIS, Insurance Core Principle 9.4, Supervisory Review and Reporting.

Quantitative and qualitative approaches

In general, as a first step, respondents have focused on climate-related risks when developing (or planning to develop) approaches to assess risk exposures of supervised entities. Among quantitative approaches, exposure analysis based on data already available or collected from institutions is the most common risk assessment method used by supervisory authorities thus far. Forward looking approaches referred to in greater detail in **Focus Area 8** are less common, although on the rise. Similarly, only a small number of supervisors are developing

or implementing frameworks or dashboards to assess the general level of exposure to climate-related and/or environmental risks in a more systematic way. Exposure analyses broadly focus on carbon-related exposure or climate-related physical risks, for which different hazards are considered (extreme heat, flooding, etc.) depending on their potential impact on the respondents' countries and economies.

Some of the most relevant risk assessment approaches developed by supervisors are summarised in Table 2, which includes examples that go beyond exposure analysis

T2 Examples of risk assessment approaches used by NGFS members

Approach ^{a)}	Risks	Sectors	Description
Qualitative and quantitative	Socio-Environmental risks	Banks Credit Unions Development Agencies Securities Brokers	Development of a risk matrix, which identifies the risky credit exposures of all financial institutions from the environmental point of view. This matrix is composed by the aggregation of two different scores, the first associated with each financial institution's Social and Environmental (S&E) credit exposures to risky activities, and the second linked to the adequacy of the financial institution's S&E governance and risk management (<i>Banco Central do Brasil</i> , see Box 14).
	Climate-related risks (physical and transition)	Banks (Re)Insurers (Re)Takaful operators	Adoption of a gradual approach: (i) determine the relationship between climate change and businesses and households, with a focus on four sectors (agriculture, energy, transportation and healthcare); (ii) determine the impact on businesses and households' financial health (revenue, cost and valuation) and; (iii) determine financial sector's exposure-at-risk to these vulnerable businesses and households (<i>Bank Negara Malaysia</i>).
		Banks	Assessments of banks' exposure to climate-related and environmental risks on the basis of banks' corporate social responsibility disclosures and available supervisory data (<i>Bank of Greece</i>).
		Insurers	Sensitivity analysis of climate-change related transition risks in the investment portfolios of European insurers (based on PACTA) and initial assessment of flood risk (physical risks, basis for potential follow-up with broader focus) (<i>European Insurance and Occupational Pensions Authority</i> ^{b)}).
	Climate-related risks (transition)	Banks Insurers Asset managers	Assessment of the achievement of financial institutions' financing commitments to fossil-fuel related sectors, due to their interrelations with the identification of the associated exposures (<i>ACPR – Banque de France and Autorité des Marchés Financiers</i> ^{c)}).
		Insurers	Pilot-project for starting to quantify transitions risks (climate-related risks) on insurance companies using the PACTA tool, with three main goals: (i) learn how transition risks could be quantified; (ii) learn how the PACTA tool works and; (iii) evaluate if the PACTA tool could be used to answer supervisory questions ^{d)} (<i>Finansinspektionen</i> , see Box 15).
Banks		Research project to examine potential effects of climate changes on the portfolios of large banks by utilising PACTA methodology (<i>Financial Services Agency, Japan</i>).	
Quantitative	Climate-related risks (physical and transition)	Banks	Analysis of the impacts of climate-related risks on credit institutions. For physical risks: (i) assessment of geographic exposures of banks in coastal areas with high incidence of hurricanes, and; (ii) exposure analysis of the effect of droughts associated with extreme heat on delinquencies in agricultural businesses. For transition risks, the supervisor assesses the banks' exposures to the main economic sectors responsible for greenhouse gas emissions (<i>Banco de México</i>).
		Banks	Estimate of the materiality of climate-related risks for supervised banks, based on two indicators: (i) physical: country exposure by residence of obligor was linked to the S&P vulnerability index ^{e)} and; (ii) transition: business model and industry exposure were used to indicate whether the bank is exposed to sectors with high transition risk (limited, medium, high) (<i>De Nederlandsche Bank</i>).
		Banks	Sensitivity analysis comprising of (i) an assessment of participating banks' exposures to non-SME non-financial corporates operating in climate policy relevant sectors; (ii) a mapping of those exposures into greenhouse gas emission intensity buckets; (iii) a scenario analysis building on shocks generated by the European Central Bank's top-down climate risk tool; and (iv) a quantification of the 'greenness' of banks' submitted exposures applying the EU taxonomy criteria (<i>European Banking Authority</i> ^{f)}).

strictly speaking, such as forward looking approaches (with further examples to be found in **Focus Area 8**). This would broadly include metrics to quantify financial institutions' portfolio exposures to geographies and sectors that are more vulnerable to climate-related and environmental risks, measure the alignment of financial institutions' portfolios with climate scenarios, and assess the carbon intensity of their portfolios. They can serve as a reference for supervisors at earlier stages in the identification and quantification of climate-related and environmental risks. With regard to climate-related risks, the NGFS Guide provided additional examples of approaches to the assessment of transition

and physical risks, with various levels of sophistication and granularity, depending on data availability.²⁰

That said, the tools and methodologies will have to be further calibrated to take into account the unique characteristics of these risks, which manifest over a significantly longer timeframe, with significant uncertainties along their trajectory and far-reaching effects, and could potentially be underestimated by historical data. This would include the adoption of forward looking methodologies such as scenario analysis and stress testing. Provided there is no overlap with other fora, the NGFS also envisages

T2 Examples of risk assessment approaches used by NGFS members (continued)

Approach ^{a)}	Risks	Sectors	Description
Quantitative	Climate-related risks (transition)	Banks	Evaluation of the banks' exposures to non-financial corporates sensitive to climate-related transition risks, whose preliminary aggregate results were presented to banks in a dedicated session (<i>Banco de Portugal</i>).
		Banks	Set up an in-house index to measure banks' carbon-risk exposure, using average carbon intensity data available at NACE code-level. By mapping the borrowers' greenhouse gas intensities to their loans, the banks' climate-related transition risks are measured (<i>Magyar Nemzeti Bank</i>).
		Banks Insurers	Quantitative assessment of vulnerability to climate-related transition risks, by examining the banks' lending exposure to, and the insurers' level of investment in, carbon intensive industries (<i>Office of the Superintendent of Financial Institutions, Canada</i> ^{g)}).
		Insurers Pension companies	Assessment of insurers and pension companies' exposures to transition risks through various approaches: (i) a mapping of insurers' investments to climate policy relevant sectors using NACE and CIC codes; (ii) a stress test of insurers and pension companies' government bonds portfolios using shock scenarios that were derived from the LIMITS Scenario Database; (iii) a stress test of insurers and pension companies' exposures using the PACTA tool (<i>Austrian Financial Market Authority</i> ^{h)}).
	Climate-related risks (physical)	Banks	Analyses to estimate the banks' exposure to a range of risks including sea level rise, drought and wildfire and reports on these analyses. These reports have focused on identifying concentrations of farmland and agricultural loans and significant delinquencies in these lending portfolios; and identifying the banks with the highest shares of wildfire-exposed deposits as a proxy for at-risk assets (<i>Federal Reserve Board</i>).
Qualitative	ESG risks	Banks	Analysis of the significant institutions' large exposures at a firm-level assigning an ESG score (where available) to each rated counterparty ⁱ⁾ (<i>Banca d'Italia</i>).
	Climate-related and environmental risks	Banks	Launch of a comprehensive 'greenness' assessment, which assessed a bank's readiness in addressing climate-related and environmental risks. Banks conducted self-assessments and the supervisor approached individual banks to seek further information or clarification. Insights from the assessment were published in a supervisor's periodical (<i>Hong Kong Monetary Authority</i> , see Box 5).
	Climate-related risks (physical and transition)	Banks Insurers Asset managers	Qualitative assessment of specific climate-related financial risks for different types of institutions, whose main outcome is a description of specific risks for the financial sector, which are represented in a heat map (level of financial impact x likelihood), with a focus on possible concentration risks in specific (carbon intensive) sectors (<i>FINMA</i> , see Box 16).

a) Qualitative approach generally refers to risk management practices (i.e. sectorial policies, ratings, etc.), definition and description of risks (i.e. transmission channels), internal governance arrangements, etc. Quantitative approach mainly refers to risk exposures identification, quantification and measurement.

b) See https://www.eiopa.europa.eu/content/sensitivity-analysis-of-climate-change-related-transition-risks-eiopa%E2%80%99s-first-assessment_en

c) See https://acpr.banque-france.fr/sites/default/files/medias/documents/20201218_rapport_vf.pdf

d) 'Which insurance companies are most at risk, in terms of exposure towards carbon intensive technologies and misalignment towards the Paris agreement?' or 'what do these exposures and alignments look like for the aggregated insurance sector?'

e) This index indicates physical climate-related risks per country (limited, medium, high).

f) See <https://www.eba.europa.eu/eba-publishes-results-eu-wide-pilot-exercise-climate-risk>

g) See <https://www.osfi-bsif.gc.ca/Eng/Docs/clmt-rsk.pdf>

h) See <https://www.fma.gv.at/download.php?d=4976>

i) The score is assigned in terms of a comprehensive ESG score or its individual components (i.e. environmental, social, governance) or sub-components (e.g. CO2 emission among the environmental pillar).

20 See Boxes 11 and 13 of the NGFS Guide.

to conduct further work on risk assessment metrics and methodologies, leveraging previous work conducted by the NGFS on *environmental risk analysis* and by other fora, such as the *report on measurement methodologies for climate-related risks* published in April 2021 by the BCBS.

In addition to the specific approaches included in Table 2, some supervisors have also engaged with supervised institutions from a more qualitative perspective, by conducting: (i) stock-take surveys to assess exposures to climate-related and environmental risks; and (ii) targeted dialogues to discuss overall assessment of climate-related

and environmental risks and current or planned approaches and methodologies for measuring these risks.

Finally, some supervisory authorities developed indicators and tools, which include: carbon footprint indicators, heat maps, carbon-risk exposure indices, risk indicators connected to individual obligors, scorecards and climate-related risk scores.²¹ These may incorporate a top-down and/or bottom-up perspective, which helps to support the supervisory planning process and inform subsequent supervisory engagements and dialogues with the supervised financial institutions.

Box 14

Using a Socio-Environmental Residual Risk Matrix

Since 2016, **Banco Central do Brasil** (BCB) has been employing a socio-environmental (S&E) risk matrix – based on the exposures of Brazilian financial institutions to S&E risks – to prioritise its supervisory activities. In 2020, a new dimension, which uses the information of the supervised institutions' risk management practices, was included, leading to the creation of what was called 'social and environmental residual risk matrix' (SERM).

From then on, the SERM has been used not only to support the supervisory planning process, but also to identify topics that should receive greater attention from the supervision. This new matrix is composed by the aggregation of two different scores, the first associated with each financial institution's S&E credit exposures (S_{SA}) to risky activities, and the second linked to the adequacy of the FI's S&E governance and risk management (S_{GRM}).

The S_{SA} is built as an application of the S&E sectoral risk criteria developed by the International Finance Corporation (IFC),¹ which assigns, to each industry sector, a grade (high, medium, or low) to different environmental and social risks. The BCB calculates the S_{SA} score as a weighted average of the financial institution's credit exposures to these

industries, assigning a weight of 3, 2 and 1 to the exposures marked as high, medium or low risk, respectively. Using the data from its Credit Information System (a database, updated monthly, in which credit providers report detailed information, including data regarding obligors' economic activity, of all credit assignments greater than BRL 200.00) the BCB is able to map the entire credit portfolio, of every financial institution, according to the IFC's criteria.

The S_{GRM} is calculated as a weighted average of several themes within the assessment of the following seven broad S&E topics: (i) governance; (ii) risk management; (iii) credit risk; (iv) specific rural credit procedures; (v) operational risk, including legal risk; (vi) market risk; and (vii) reputational risk. The weights are given according to the importance of each theme, with the highest importance being given to issues related to regulatory requirements. The first round of assessment was based on responses to a questionnaire sent to the largest Brazilian financial institutions (which collectively hold more than 95% of all credit exposures in Brazil). Since then, the SGRM has been updated through several supervisory actions, such as: (i) follow up of deficiencies identified in the financial institutions; (ii) on-site supervision work at specific financial institutions;

.../...

21 The climate-related risk score used by one supervisor involves rating of: (i) governance around climate-related risks and opportunities; (ii) the actual and potential impact of climate-related risks on the bank's strategy and financial planning; (iii) the process, metrics and tools used by the bank to identify, measure, assess and manage climate-related risks; and (iv) practices of climate-related disclosures.

(iii) assessments of specific supervisory concerns, related to significantly high S&E risks; and (iv) the Risks and Controls Assessment System (a regular risk assessment applied to Brazil's largest banks). Updated questionnaires could also be applied again in the future.

Finally, as the BCB has been continuously improving its S&E supervisory process, the SERM has also been refined.

Recent work focused on the creation of new S&E exposure metrics, and on incorporating individual borrowers' specific information. As an example of this last point, the BCB has been able to refine credit exposures to the power generation sector, distinguishing each company from the sector according to the cleanliness of the energy it produces, thus identifying with greater accuracy credit exposures associated with clean and dirty energy generation.

1 See <https://firstforsustainability.org/risk-management/risk-by-industry-sector/>

Box 15

Quantifying climate-related risks of insurers through available tools

In the autumn of 2020, **Finansinspektionen** (FI) conducted a pilot study among insurance undertakings using the PACTA tool.¹ The study identified the percentage of insurance undertakings' portfolios invested in carbon-intensive sectors, as well as how the portfolios relate to the climate goals of the Paris Agreement.² The underlying data mapped was, at the time of the study, limited to investments in listed equities and corporate bonds.³

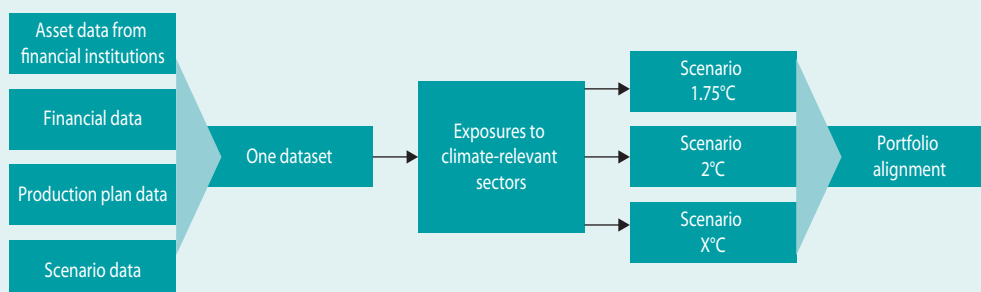
The PACTA tool in the version tested (only transition risk) combines and connects data from different sources into one dataset, from which exposures to climate relevant sectors can be derived.⁴ Thereafter the alignment analysis using the different scenarios is performed (see figure).

Already at the outset, FI was aware of the challenges posed by scarcity of data, as well as the occasionally limited quality of the data available.

FI had several objectives with the pilot study. One was to learn more about how transition risks can be quantified with the data at hand today, and to increase FI's knowledge about the approach in this type of analysis. Increasing transparency on transition risks is also part of FI's assignment. Another objective was to find out whether PACTA can be used in supervision.

FI found that the PACTA tool fulfils an important need, namely to analyse asset portfolios in relation to climate scenarios. The study has increased FI's understanding

An overview of how the PACTA tool (transition risk) works



Source: Finansinspektionen.

.../...

of how this type of analysis tool works and how well they capture climate-related risks. The analysis tool is promising and publicly available for financial firms as well as supervisors to use.

However, the quantitative results should be interpreted with caution for several reasons. One is that the analysis in the pilot study is limited to a sample of corporate bonds and shares in climate-relevant sectors, given accessible climate-relevant data. This means that exposures to other types of activities, which can also be exposed to both direct and indirect transition risks, were not considered. The analysis thus probably underestimates financial firms' exposures to activities that could be vulnerable to a transition.

FI is continuing to work with the PACTA tool and is developing a risk-based analysis of financial institutions to engage with and follow up in the on-going supervision.

This is done by both an overview of exposures towards carbon vs. non-carbon intensive sub-sectors and by an overview of the deviation from a 1.75 degree scenario vs. exposure towards carbon intensive sectors. This enables FI to use the outcome of the study in the supervisory dialogue and in internal risk analysis of insurance companies.

Following this pilot study, FI concludes that it is possible to undertake transition risk analysis using existing data, even if both the methods and data need to be improved. In addition, the open-source construction makes it readily available to financial firms as well as supervisors, and the large number of users⁵ mean more relevant data in the data base. The challenge is not within the PACTA-tool itself but rather having enough resources to allocate for a full implementation, especially for smaller competent authorities like FI. This calls for international collaboration.

1 For a full description of how the tool works, please see <https://2degrees-investing.org/resource/pacta/>

2 This Box does not convey the results of the study, which can be found on pages 26-30 in [appendix 1 of FI's report](#).

3 After Finansinspektionen's study was completed, a version of the tool that makes it possible to analyse banks' credit exposures was introduced by 2DII, the not-for profit organisation that developed PACTA. In the second half of 2021, 2DII is planning to publish a module enabling stress-testing and calculations of market and credit risks.

4 The PACTA-tool matches company identifiers, LEI- or ISIN-codes, in portfolio data with external databases in the PACTA database such as Globaldata and Bloomberg, covering information on production- and growth projection of companies and financial ownership and dependencies. With this information it is possible to allocate economic activity to the financial assets in the portfolio. Combined with scenario data from IEA it is possible to measure alignment to a given climate scenario broken down to a sector or technology level and exposures to climate relevant technologies.

5 PACTA tool has been used by over 1,500 financial institutions worldwide, as well as many supervisors.

Box 16

Using heat maps for qualitative assessments

As part of the early activities in the area of climate-related financial risks, the Swiss Financial Market Supervisory Authority – **FINMA** developed an initial qualitative assessment of relevant climate-related financial risks in the Swiss financial sector. This assessment resulted in sector-level heat maps covering physical and transition risks. FINMA uses these heat maps, which will be refined further in the future, as a basis for addressing the issue

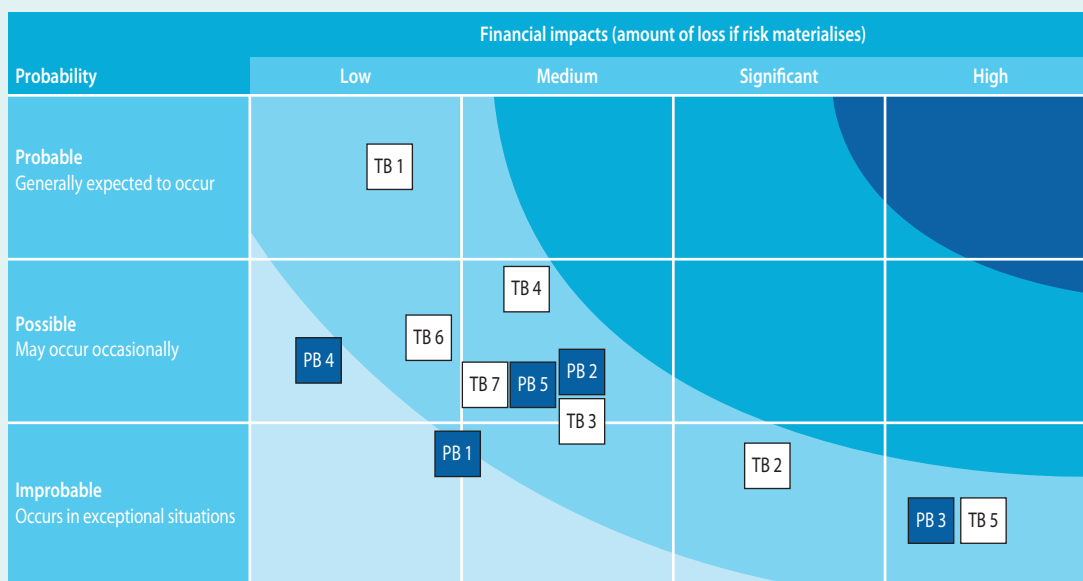
of climate-related financial risks with the representatives of the supervised institutions.

The sector-wide heat map for banks¹ shown below provides an overview of the identified climate-related risks in relation to each other based on their probability of occurrence and the financial impacts they would have in the event of an occurrence.

.../...

The qualitative assessment leveraged existing research and analysis by academia, international standard setters and other organisations as well as the acquired knowledge and experience within FINMA. It did not require data gathering from institutions and quantitative analysis. The resulting understanding of climate-related financial risks and their potential impact on the Swiss financial sector built the foundation for further high-level analysis of financial institutions' business models, activities and exposures to climate-sensitive sectors. It resulted in the first internal versions of

sector-wide heat maps. In an iterative process, they were then further developed and discussed with internal specialists (e.g. supervision teams for specific institutions, risk management specialists for specific risks etc.), academia and associations, and ultimately with specialists and senior managers of selected banks and insurers. The result, which should be considered as a preliminary snapshot of the current situation, was then published in FINMA's *annual report*.² FINMA uses the heat maps in the dialogue on climate-related risks with supervised institutions.



The physical climate risks and transition risks are not directly comparable, in particular due to their different time horizons.

Physical risks
PB 1 Credit risk domestic companies
PB 2 Credit risk foreign companies
PB 3 Mortgages (corporate/private clients)
PB 4 Market risk
PB 5 Operational risk
Time horizon: long-term

Transition risks
TB 1 Credit risk energy sector
TB 2 Credit risk industry/transport
TB 3 Financing commodities trading
TB 4 Credit risk commercial shipping
TB 5 Mortgages
TB 6 Market risk
TB 7 Business risk in asset management sector
Time horizon: short- to medium-term

Source: Heatmap for Swiss Banks developed by FINMA.

- 1 FINMA developed heat maps for the banking, insurance and asset management sectors and is working on institution-specific heat maps for a selected number of financial institutions as well.
- 2 Please refer to *FINMA's annual report 2020* (p. 40) for further information, including Explanatory notes on the individual financial risks and their positioning in the heatmap.

3.4 Focus Area 8: Assess potential loss and impacts using forward looking methodologies

There are specific challenges to assessing potential losses due to climate-related and environmental risks.

For instance, climate-related risks span very long periods of time, whereas supervisors' and financial institutions' usual stress testing models are limited to 3 to 5-year horizons. In addition, past data on exposures and impacts of climate-related risks are not necessarily reflective of those in the future, because of the limited availability of historical data and the non-linear nature of climate-related risks.

To address these challenges, supervisors have utilised tools, such as scenario analysis, climate stress testing and sensitivity analysis, which enable forward looking assessments of climate-related risks to financial stability. The use of these terms is not very consistent across respondents. To ensure more clarity and consistency among stakeholders, supervisors may refer to **Box 17** for a typology of forward looking methodologies. Supervisors may also consider reverse stress testing²² as useful complementary exercises, given the significant uncertainty over scenario design.

The NGFS Guide pointed out the value of scenario analysis and stress testing as tools for climate-related

Box 17

Typology of forward looking methodologies for climate-related risks

The **Basel Committee on Banking Supervision's** recent *report on climate-related financial risks measurement methodologies* includes a useful typology of forward looking measurement methods:

- **Climate scenario analysis** is a forward looking projection of risk outcomes that is typically conducted in four steps: (i) identify physical and transition risk scenarios; (ii) link the impacts of scenarios to financial risks; (iii) assess counterparty and/or sector sensitivities to those risks; and (iv) extrapolate the impacts of those sensitivities to calculate an aggregate measure of exposure and potential losses. Scenario analysis can be performed at different levels of granularity to identify impacts on individual exposures or on portfolios. By examining the effects of a wide range of plausible scenarios, scenario analysis can also assist in quantifying tail risks and can clarify the uncertainties inherent to climate-related risks. For the purposes of climate-related risks, scenario analyses tend to be longer-term in scope and used to evaluate the potential implications of climate risk drivers on financial exposures.
- **Stress testing** is a specific subset of scenario analysis, typically used to evaluate a financial institution's near-term resiliency to economic shocks, often through a capital adequacy target. [...] Climate stress testing evaluates the effects of severe but plausible climate scenarios on the resiliency of financial institutions or systems. However, the uncertainty inherent in longer-dated assessments and the limited predictive power of historical observations to describe future climate-economic relationships render estimates of capital shortfall (or other measures of resiliency) less reliable than those of conventional stress tests employed by supervisors and banks to evaluate resiliency.
- **Sensitivity analysis** is also a specific subset of scenario analysis that is used to evaluate the effect of a specific variable on economic outcomes. In these analyses, one parameter is altered across multiple scenario runs to observe the range of scenario outputs that result from changes in that parameter. In certain cases, several parameters can be changed simultaneously to observe interactions among parameters. Sensitivity analysis has often been used in transition risk evaluation to assess potential effects of a specific climate-related policy on economic outcomes, particularly in research settings to evaluate the range of economic impacts from the implementation of a carbon tax. Given the uncertainties noted above with scenario analyses, a climate sensitivity analysis may be a useful tool for risk decision-makers to understand the range of potential climate impacts.

22 A reverse stress test supplements the results of a conventional stress test by a conditional analysis of the state of the affairs, given a pre-defined scenario where some adverse outcome has already occurred.

and environmental risks management, highlighting the need for more supervisors to carry out such exercises. In response, the *NGFS Guide for Climate Scenario Analysis 2020* detailed how supervisory scenario analysis and stress testing exercises for climate-related risks can be given specific consideration. It is particularly important for supervisors to consider the following in the design of their scenario analysis and stress tests: objective of the exercise, scope in terms of institutions and specific risks, data granularity and limitations, time horizon, and their internal modelling capabilities. Furthermore, in carrying out scenario analysis or stress testing of climate-related and environmental risks, supervisory authorities are expected to refer to the relevant principles such as BCPs²³ and ICPs²⁴.

Based on the survey, a few supervisors have already conducted pilot forward looking exercises on climate-related risks (see **Box 18** and **Table 2**). However, a growing number of supervisors are considering incorporating climate-related risks into their scenario analysis activities and further on stress testing exercises, or have a concrete plan to do so.

Pilot exercises, albeit sometimes referred to as climate-related risk stress tests, have not primarily focused on quantifying possible capital needs of financial institutions relative to the regulatory minimum. They aimed at assessing the resilience of financial institutions' business models to climate-related risks, and at enhancing the understanding of financial institutions' governance and risk management practices in relation to climate-related risks. Supervisors' experiences have shown that pilot exercises can be particularly valuable in identifying data and methodology challenges, as well as in enabling the development of tools and methodologies to better capture climate-related risks and their specificities. It has often been noted that the exercises are also meant to create awareness of the need for financial institutions to develop tools to manage climate-related and environmental risks and to drive gradual early adjustment by financial institutions. Supervisors may also consider using the outcome of climate forward looking exercises to inform their supervisory planning process and review of the relevant supervisory expectations. **The NGFS**

collected its members' experiences with using the NGFS scenarios in its *Progress Report* on global supervisory and central bank climate scenario exercises published in October 2021. The report reads as a collection of case studies, drawing out key lessons on how the NGFS scenarios can be used in practice.

Supervisors have identified challenges and limitations to climate scenario analysis and further stress testing exercises. It appears that challenges and limitations mostly arise in the preliminary work phase, especially in designing scenarios, with issues pertaining to the correct estimation of their impact, consistent identification of transition pathways at national and international levels, correct assumptions around overshoot and negative emissions technologies, and precise forecasting of the likelihood of climate-related and environmental risks and their potential impacts. A more operational limitation is the lack of availability of relevant data at country and sector levels. For instance, most companies' public addresses do not reflect the geographical mapping of their production units and are not granular enough as an indicator.

The challenges related to forward looking methodologies can be addressed by leveraging on the existing capabilities of industry, and external scientific and academic bodies. Supervisors may further improve understanding of scenario analysis and stress testing practices by putting in place measures to ensure that the methodologies for quantification of impact of climate-related risk are fit-for-purpose and that the underlying assumptions are reasonable.

Forward looking methodologies are much less developed for environmental risks other than climate-related ones. Expanding the scope of supervisory analyses beyond climate would require further engagement within the supervisory community (e.g. at NGFS level) and with other stakeholders. For example, the NGFS Research Workstream is collaborating with INSPIRE to conduct research on the types of shocks and the transmission channels through which biodiversity loss impacts the economy and financial system in order to inform the development of scenarios (see **Box 12**).

23 BCBS Stress testing principles issued in October 2018, in particular Principles 3 and 4.

24 IAIS, Insurance Core Principle 16, Enterprise Risk Management for Solvency Purposes; Principle 24, Macroprudential supervision.

Box 18

Quantifying climate-related risks of banks and insurers through pilot exercises

The **Autorité de Contrôle Prudentiel et de Résolution (ACPR) – Banque de France** conducted a stress test pilot exercise for climate change, the *results* of which were published on May 4, 2021. Using climate scenarios pertaining to both transition and physical risks, this new exercise aimed to produce a long-term assessment of the exposure of French financial institutions to climate-related risks. The 30-year time horizon and dynamic balance sheet phase allowed supervisory authorities to better understand the industry's vision for coping with the different financial risks posed by various emissions pathways. Moreover, the exercise produced important methodological advancements and made an array of datasets publicly available for use by other supervisors or financial institutions. Within ACPR's framework, physical risk projections were applied to participants' exposures in most cases by an intermediary (CCR, a public reinsurer) using an atmospheric model developed by Météo France. All other reporting templates—including balance sheets, income statements and portfolio data—were submitted by undertakings 'bottom-up' after integrating the provided macroeconomic, financial or sectoral data for each required time step through 2050. These data were internally consistent within a general equilibrium economic modelling framework, and varied according to each scenario (orderly, disorderly or accelerated transition).

Results demonstrated a low to moderate exposure of the French jurisdiction to climate-related risks, in line with the projections of the Intergovernmental Group of Experts on the climate change (IPCC) underlying the exercise. Further, most French banks and insurers have already adopted measures to disinvest from highly polluting industries, resulting in a low ex-ante exposure to assets most affected by transition risk. This exercise also revealed a certain number of methodological limits within existing frameworks, and several areas for improvement were identified by ACPR throughout the analysis of the results. Firstly, the assumptions made in developing scenarios often lead to insufficiently significant economic impacts of climate change. Smaller than anticipated financial shocks for many sectors thus led most participants to generally maintain their current portfolio structure. An additional difficulty, particularly for insurers, concerned the translation of climate variables into financial impacts; indeed, the datasets provided were often excessively technical and could lead to incomparable results depending on the NATCAT/physical risk model utilised. Finally, many existing asset-liability management models used by banking or insurance institutions struggled to cope with the 30-year multi-step time horizon, and existing prudential data sometimes lacked sufficient granularity at the sectoral or geographical level.

4. Development and implementation of supervisory expectations

Focus Areas 9 to 11

9 – Develop supervisory expectations, factoring key aspects including governance, business strategy, risk management, scenario analysis and disclosure

10 – Engage supervised entities on the implementation of supervisory expectations

11 – Integrate climate-related and environmental risks into supervisory frameworks and processes

Key Takeaways

- Supervisors have made significant progress in issuing expectations on how banks, insurers and other financial institutions should consider climate-related and environmental risks, often covering the topics identified in the NGFS Guide. Published supervisory expectations and guidance show a degree of similarity on key aspects such as governance, business strategy, risk management, scenario analysis and stress testing, and disclosure. The level of granularity of supervisory expectations varies but is expected to increase over time.
- Challenges cited when developing such supervisory expectations and assessing their implementation include (i) capacity constraints of supervisors and financial institutions; and (ii) a lack of common international standards or guidelines. These may be overcome by adopting a risk-proportionate approach, while recognising that climate-related and environmental risks are implicitly covered by relevant standards.
- Developing supervisory assessment programmes with an adequate level of granularity is useful in promoting a common approach to managing risks among institutions. This can be seen as an iterative process, whereby supervisors identify good practices applied by supervised entities and incorporate them into supervisory expectations and dialogue.
- When assessing the implementation of supervisory expectations, supervisors have employed different approaches, such as engaging in supervisory dialogue with supervised entities, requesting self-assessment by these entities, or undertaking a direct assessment themselves (or a combination of approaches).
- An increasing number of supervisors have identified areas where climate-related and environmental risks are to be consistently and explicitly evaluated under existing supervisory review frameworks and processes. These include business model, risk strategy and appetite, governance, risk management, risks to solvency and risks to liquidity and funding.
- That said, supervisors have generally made less progress in integrating climate-related and environmental risks more broadly into binding supervisory tools. Challenges remain in the advancement of Pillar 1 treatment due to interconnecting issues such as the early stage of development of methodologies to assess climate-related and environmental risks, with their long time horizon, non-linear nature and the lack of reliable data. The setting of Pillar 1 capital requirements is also hampered by a lack of common definitions, classifications and taxonomies and evidence of risk differentials between 'green' and 'non-green' assets. Further discussion and analytical work among supervisors and with other stakeholders is therefore required to assess the benefits and costs of such approaches and address design issues.
- Pillar 2 processes (ICAAP and ORSA) are seen as being useful to incorporate these risks and are increasingly mentioned in supervisory expectations. On the latter, scenario and sensitivity analyses as well as stress tests need to be developed further before supervisors can integrate them into the supervisory review process and leverage them to take formal supervisory measures where appropriate.

This chapter elaborates on recent progress made by the NGFS members on developing supervisory expectations on climate-related and environmental risks, providing

additional guidance on both the process to develop them and their content (**Focus Area 9**). It then seeks to provide an overview of supervisory activities that can take place

once expectations have been set, echoing the gradual and iterative implementation approach that supervisors appear to be considering (**Focus Area 10**). Finally, the chapter provides an update on how climate-related and environmental risks are being integrated in the supervisory toolbox, where the journey is only beginning, especially for quantitative mitigation tools (**Focus Area 11**).

Progress in implementing recommendations 4 and 5 and cited challenges

Overall, ongoing efforts and the progress made in terms of setting supervisory expectations for climate-related and broader environmental risks management have greatly improved since 2019.

Most respondents are developing climate-related (83%) and environmental (59%) risks supervisory expectations. Nevertheless, some members (24%) are only considering

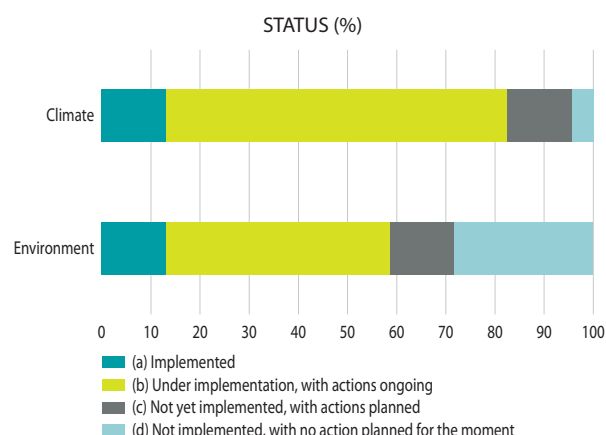
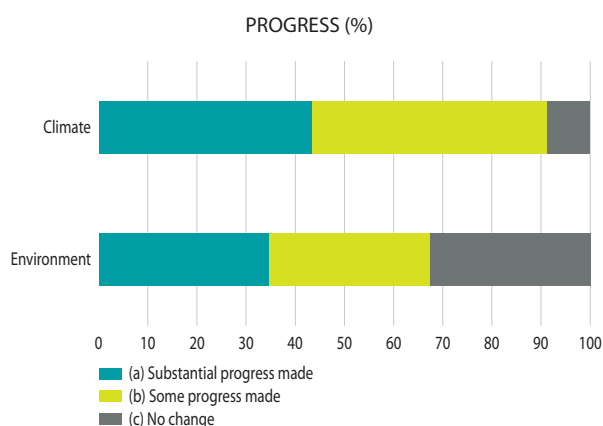
climate-related risks actions and have no actions planned for other environmental risks.

Respondents have made comparatively less progress in incorporating climate-related risks into their supervisory toolbox, and this is even more apparent in the case of incorporating environmental risk. Integrating climate-related and environmental risks into the set of formal and binding tools appears to be the next step for most, following the development of supervisory expectations and international standards or guidelines.

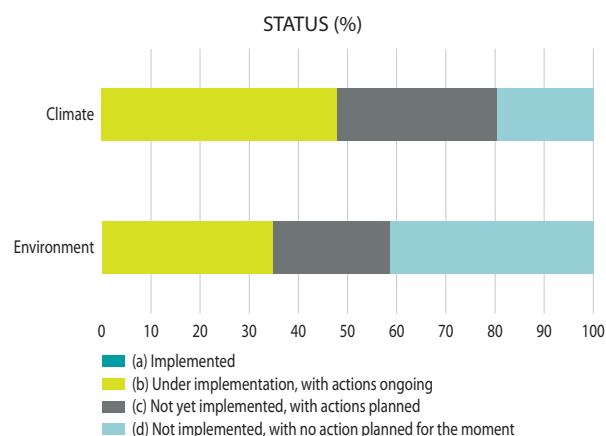
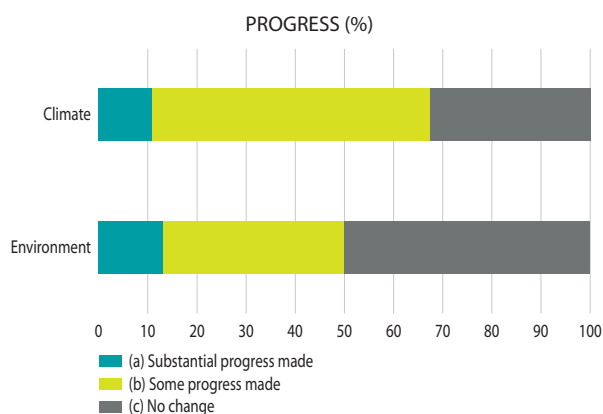
Nonetheless, most supervisors stated to have ongoing actions or at least actions planned to further integrate climate-related (80%) and environmental (59%) risks in their supervisory assessment and processes.

In addition to limited resources, capacity and expertise discussed in Chapter 2, the lack of globally agreed

Recommendation 4 – Set supervisory expectations to create transparency for financial institutions regarding the supervisors’ understanding of a prudent approach to climate-related and environmental risks



Recommendation 5 – Ensure adequate management of climate-related and environmental risks by financial institutions and take mitigating action where appropriate



standards or guidelines appears to be one of the main challenges faced by supervisors when designing and implementing supervisory expectations. In this regard, further developments of regulatory frameworks, at least in some jurisdictions, are commonly cited as a prerequisite.

Data and methodological gaps that are discussed in Chapter 3 are another challenge, in particular for environmental risks. While they are covered by broad principles in supervisory expectations, it appears that jurisdictions have placed, and plan, a more limited focus on understanding their dynamics, admittedly due to the need to prioritise actions, and the challenges relating to environmental risk analysis and the lack of data.

4.1 Focus Area 9: Develop supervisory expectations, factoring key aspects including governance, business strategy, risk management, scenario analysis and disclosure

Supervisors are at different stages of developing supervisory expectations for their supervised institutions. Since the publication of the NGFS Guide,²⁵ supervisors have generally made significant progress in terms of setting expectations and publishing guidance on the identification and management of climate-related risks and environmental risks (see above) or are planning activities to do so in the near future. Progress is visible in a number of regions, in particular in Europe and Asia.

Supervisors that published supervisory expectations pertaining to climate-related and/or environmental risks include those referenced in Table 3 below. As mentioned in the NGFS Guide, the exact nature of these documents,

their precise legal status (including binding or non-binding character) and the internal governance processes depend on national regulatory and supervisory frameworks, as does sectoral coverage.

Several other supervisors are also in the process of developing supervisory expectations. In this context, the Australian Prudential Regulation Authority (APRA), Banco Central do Brasil (see **Box 30**), the Dubai Financial Services Authority (DFSA), the Hong Kong Monetary Authority (HKMA), the New York State Department of Financial Services (see **Box 19**) and the Canadian Office of the Superintendent of Financial Institutions (OSFI) have invited supervised entities and other external stakeholders to provide feedback on their proposed approach by issuing consultation documents.²⁶

Prior to issuing supervisory guidance setting out supervisory expectations, supervisors need to consider and address several issues. These include issues identified in the NGFS Guide, which are addressed further below, including the process to define the expectations, the scope of risks to be covered in the expectations, their level of granularity and the proportionality of expectations. Supervisors are also expected to refer the relevant principles such as BCPs²⁷ and ICPS²⁸.

Process

When developing supervisory expectations, some institutions cited challenges due to a lack of technical expertise and the need for capacity building, both for supervisors and supervised entities. It is suggested these may be addressed by engaging with supervised entities and cooperating with peers and/or international organisations, as suggested in the NGFS Guide, to help develop a common understanding and build on existing good practices.

25 The NGFS Guide already referred to the expectations published by BaFin, Bank of England, Bank-al-Maghrib, Banco Central do Brasil, Bank of Bangladesh, China Banking Regulatory Commission and De Nederlandsche Bank.

26 See APRA's *Consultation on draft Prudential Practice Guide on Climate Change Financial Risks*, DFSA's *discussion paper* on sustainable finance in the Dubai International Financial Centre (DIFC), HKMA's *White Paper on Green and Sustainable Banking*, and OSFI's *discussion paper* on climate-related risks.

27 BCBS, Core Principles for Effective Banking Supervision, Principle 1, Responsibilities, objectives and powers (Essential Criteria 4); Principle 15, Risk management process. In particular, bank supervisors are expected, where necessary, to update the applicable regulations and standards to ensure that they remain relevant, which implicitly includes the update of supervisory standards and guidelines to ensure appropriate capture of climate-related and environmental risks. BCPs also expect supervisors to issue standards related to credit risk, market risk, liquidity risk and operational risk. Given that climate-related and environmental risks are generally drivers of these risks, bank supervisors are expected, where necessary, to update these risk specific standards/guidelines or develop supplementary guidelines aimed at clarifying supervisory expectation in relation to management of climate-related and environmental risks. Besides clarifying on supervisory expectation, the updated guidelines should be aimed at ensuring that banks appropriately capture climate-related and environmental risks in their risk management processes consistent with the requirements of Principle 15.

28 IAIS, Insurance Core Principle 8.1, 8.4, 8.5, 8.6 and 8.7, Risk Management and Internal Controls.

T3 Examples of supervisory expectations published by NGFS members

Supervisor	Publication	Date	Risks	Sectors	Areas
Banco Central do Brasil	Resolution on Social and Environmental Responsibility Policy (<i>Resolução nº4.327</i> , available in Portuguese only) Guide to Supervision Practices (<i>Guia de Práticas da Supervisão</i> , available in Portuguese only)	April 2014 December 2020	Social and environmental risks	<ul style="list-style-type: none"> • Banks • Credit Unions • Development Agencies • Securities Brokers 	<ul style="list-style-type: none"> • Governance • Risk management
Bank of England	<i>Supervisory Statement – Enhancing banks' and insurers' approaches to managing the financial risks from climate change</i>	April 2019	Climate-related risks	<ul style="list-style-type: none"> • Banks • Insurers 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
De Nederlandsche Bank	Q&A for: <ul style="list-style-type: none"> • Banks • Insurers <i>Good Practice – Integration of climate-related risk considerations into banks' risk management</i> <i>Good practice – Integrating climate-related risks in the ORSA</i>	November 2019 (Insurers) April 2020 (Banks)	Climate-related risks	<ul style="list-style-type: none"> • Banks • Insurers 	Banks: <ul style="list-style-type: none"> • Governance • Risk management (including scenario analysis and stress testing) • Disclosure Insurers: ORSA
Danish Financial Supervisory Authority	<i>Climate change and sustainable finance in the financial sector</i>	December 2019	Climate-related risks	<ul style="list-style-type: none"> • Banks • Insurers 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
BaFin	<i>Guidance Notice on Dealing with Sustainability Risks</i>	January 2020	Sustainability/ ESG risks	All supervised entities: <ul style="list-style-type: none"> • Credit institutions • Insurers • Pension funds • Asset managers • Financial services institutions 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Bangko Sentral ng Pilipinas	<i>Circular No. 1085 on the Sustainable Finance Framework</i>	April 2020	Environmental and social risks	<ul style="list-style-type: none"> • Banks 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Autorité de Contrôle Prudentiel et de Résolution	<i>Governance and management of climate-related risks by French banking institutions: some good practices</i>	May 2020	Climate-related risks	<ul style="list-style-type: none"> • Banks 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Austrian Financial Market Authority	<i>Guide for Managing Sustainability Risks</i>	July 2020	Sustainability/ ESG risks	All supervised entities: <ul style="list-style-type: none"> • Credit institutions • Insurers • Investment fund managers • Alternative investment fund managers • Investment firms • Pension companies • Occupational severance and retirement funds 	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure

T3 Examples of supervisory expectations published by NGFS members (continued)

Supervisor	Publication	Date	Risks	Sectors	Areas
Banco de España	<i>Supervisory expectations relating to the risks posed by climate change and environmental degradation</i>	October 2020	Climate-related and environmental risks	• Credit institutions	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
European Central Bank	<i>Guide on climate-related and environmental risks</i>	November 2020	Climate-related and environmental risks	• Banks	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Monetary Authority of Singapore	Guidelines on Environmental Risk Management for: <ul style="list-style-type: none"> • Banks • Insurers • Asset managers 	December 2020	Environmental risks (including climate-related risks)	<ul style="list-style-type: none"> • Banks • Insurers • Asset managers 	<p>Common areas:</p> <ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure <p>Additional areas for insurers:</p> <ul style="list-style-type: none"> • Underwriting • Investment <p>Additional areas for asset managers:</p> <ul style="list-style-type: none"> • Research and portfolio construction • Stewardship
Bank of Russia	<i>Information Letter No. N-015-53/1, dated 12 January 2021, 'On Factoring in Climate-related Risks' (available in Russian only)</i>	January 2021	Climate-related risks	• Insurers	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management
Bank Al-Maghrib	Directive on climate-related and environmental financial risks (<i>Directive des risques financiers liés au changement climatique et à l'environnement</i> , available in French only)	March 2021	Climate-related and environmental risks	• Banks	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Banco de Portugal	Circular Letter n° CC/2021/00000010 (<i>Carta Circular n.º CC/2021/00000010</i> , available in Portuguese only)	April 2021	Climate-related and environmental risks	• Banks	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure
Magyar Nemzeti Bank	<i>Recommendation on climate-related and environmental risks and the integration of environmental sustainability considerations into the activities of credit institutions</i>	April 2021	Climate-related and environmental risks	• Credit Institutions	<ul style="list-style-type: none"> • Governance • Business models and strategy • Risk management (including scenario analysis and stress testing) • Disclosure

Supervisors have often relied on engagement with supervised entities, capacity building and knowledge sharing to assess the extent to which financial institutions are considering climate-related and environmental risks.

This may in turn help inform the possible adjustment of the existing prudential and regulatory framework, or the clarification of how it may apply.

Such engagement can take the form of surveys conducted among supervised financial institutions with the aim of raising climate-related and/or environmental risks awareness and being better informed when setting the applicable supervisory expectations. **Box 19** outlines the process that some supervisors have been following when developing their guidelines and defining their approach.

Box 19

Engaging with external stakeholders prior to the development of supervisory expectations

In December 2020, the **Monetary Authority of Singapore** (MAS) issued Guidelines on Environmental Risk Management (see **Table 3**). The Guidelines, which were co-created with financial institutions and industry associations, set out MAS' supervisory expectations around effective governance, robust risk management and meaningful disclosure. These extend beyond climate change to include other environmental factors such as pollution, biodiversity loss and changes in land use. MAS adopted a consultative approach in the development of its Guidelines to support a consistent, system-wide response to environmental risks. This included collaboration with an industry working group and extensive external engagement through the issuance of a public consultation paper to seek feedback from a wide array of stakeholders (ranging from financial institutions, consultancies, ratings agencies and legal firms to think tanks and civil society organisations). In addition, MAS actively sought to incorporate within its Guidelines best practices adopted by other global regulators, including those developed at international fora. MAS will continue to review international developments in other jurisdictions, and update its guidance as appropriate, to reflect the evolving nature and maturity of environmental risk management practices.

In March 2021, the **New York State Department of Financial Services** (DFS) issued *proposed guidance* for New York domestic insurers on managing climate-related risks, elaborating on expectations from its earlier letter. DFS' guidance is broadly consistent with the NGFS Guide and international regulators' guidance. DFS had joined the NGFS in 2019 and hired its first-ever Director

of Sustainability and Climate Initiatives in 2020. Since then, DFS has held bilateral discussions with regulated entities, reviewed their climate-related disclosure and risk management reports to determine the status of their understanding and actions on financial risks from climate change. DFS also has engaged with international regulators and networks such as the NGFS, SIF, the Bank of England, and the European Central Bank to learn about their approach and process. Based on the resulting findings, DFS issued formal letters to banks, non-depository financial institutions, and insurers to alert them that climate change is a material risk to the financial system, introduce the concepts of physical and transition risks, and establish a holistic set of high-level expectations that considerations of climate-related financial risks must be integrated into firms' governance, risk management, business strategies, and disclosure approaches. DFS held multiple webinars to educate its entities on climate-related risks.

In 2020, Mexico's **Financial System Stability Council** (CEFS) created the Sustainable Finance Committee (CFS). The committee is integrated by financial authorities and regulators (including **Banco de México** and **Comisión Nacional Bancaria y de Valores**) as well as representatives from the private financial sector, with the objective of engaging financial markets participants in this agenda, to raise awareness within financial markets participants, as well as to set out the ground for the issuance of supervisory expectations. The CFS will also support the CEFS with analyses, information, and guidance on sustainable finance and its implications for financial

.../...

stability. The CFS has approved four working groups, focusing in the development of a sustainable taxonomy, the mobilisation of sustainable finance, the integration of environmental, social and climate-related risks and opportunities in decision making processes of financial institutions and regulators, and finally, the disclosure of climate and ESG related risks, through the adoption of the TCFD framework and global ESG standards.

In Japan, the **Financial Services Agency** (JFSA) has been organising numerous meetings with financial institutions, academics and other supervisors on climate-related risk management issues to understand their current practices, future plans, and challenges regarding climate-related risks since 2019. During 2020-2021, JFSA made intensive

discussions with financial institutions focused on their risk management approaches, use of scenario analysis and relevant challenges. JFSA also established the Expert Panel on Sustainable Finance (EPSF) in December 2020, and the panel discussed the issues and their recommendations on policy actions in three areas: (i) enhancing corporate disclosure; (ii) demonstrating capital market functions; and (iii) financial institutions' support for borrowers and risk management. The Panel published its *report* with policy options in June 2021. Building on the EPSF's recommendations, JFSA declared in its *annual strategy* published in August 2021 its intention to take further steps to promote sustainable finance, including issuance of supervisory guidance on climate transition support and risk management by March 2022.

Risk frameworks

The scope of risks covered in supervisory expectations vary, as observed in **Table 3**. While some members have issued guidance only for climate-related risks, often distinguishing between physical and transition risks, the majority have a broader approach, covering environmental risks or wider sustainability factors (e.g. social factors for Banco Central do Brasil and Bangko Sentral ng Pilipinas, or ESG factors for BaFin, the Austrian Financial Market Authority and the European Banking Authority).

Supervisors may find it helpful to consider how climate-related and environmental risks can be assessed as part of their existing regulatory framework and related to traditional risk categories, as stressed in the NGFS Guide and in **Chapter 2** of this report. While it is generally agreed that climate-related and environmental risks are potential drivers of established risk categories, some supervisors stated that institutions may treat such risks as a separate risk category for organisational or analytical purposes. It was also observed that some supervisors have been setting their expectations with regard to risk management frameworks in general and more specifically with regard to the management of traditional risk categories (see **Box 22** for an example).

The majority of respondents reported that revising regulatory frameworks to consider how climate-related and/or environmental risks could be embedded in supervision was under consideration. It is good practice for supervisors to conduct reviews of regulatory frameworks to ascertain if such frameworks are accommodative of these risks. Such reviews may include dialoguing with supervised entities in order to assess which of the existing regulation may sufficiently integrate these risks.

In practice, most expectations and guidance issued rely on established rules and principles, without a need for new regulation specific to environmental and climate-related risks. Supervisors may indeed consider issuing principle-based expectations on how to integrate such risks into risk management frameworks, referring for example to general principles and rules pertaining to good governance and risk management that apply to traditional risk categories, including the relevant BCPs²⁹ and ICPs³⁰. International and supranational standard-setters are conducting work to clarify how climate-related and environmental risks are fitting within such principles and other applicable frameworks (see **Focus Area 11**). This may be particularly helpful when developing supervisory expectations with regard to environmental risks, which may be seen as more difficult to develop than those focused on climate-related risks.

29 BCBS, Core Principles for Effective Banking Supervision, Principle 14, Corporate governance; Principle 15, Risk management processes.

30 IAIS, Insurance Core Principle 7, Corporate Governance; Principle 8, Risk Management and Internal Controls; Principle 16, Enterprise Risk Management for Solvency Purposes.

Granularity

The supervisory expectations referred to in Table 3 do not all have the same level of granularity, with some setting high-level or general expectations, while others are more detailed (for an example of the latter, see **Box 22**).

As stressed in the NGFS Guide, it is expected that granularity will increase over time, noting this requires that certain existing challenges be overcome. NGFS members point to a lack of data, expertise and resources within both supervisors and financial institutions to properly identify and assess climate-related and environmental risks.

A close monitoring of trends and developments, in view of the evolving nature of climate-related and environmental risks and of the applicable regulatory framework, is also key to ensure that expectations stay up-to-date and as granular as possible.

Proportionality

The risk of regulatory burdening and capacity constraints in supervised entities, which some respondents highlighted as a challenge, can be addressed by applying a proportionality principle when developing supervisory expectations, as suggested in the NGFS Guide. It is nevertheless worth underlining that the small size of a financial institution does not imply that it is only exposed to minor climate-related or environmental risks, as specified in the NGFS Guide.

In addition, when defining supervisory expectations, it is important to consider the implementation timeframe needed, taking into account internal capacities and tools of supervised entities. Once supervisory expectations have been set, supervisors may consider a gradual implementation approach as the understanding of and the technical expertise on the prudential implications of climate-related and environmental risks evolve for both supervisors and supervised entities. This gradual

approach enables supervisors to provide early guidance on how climate-related and environmental risks fit, in a proportionate manner, into the broader risk management framework of financial institutions.³¹ It also motivates financial institutions to improve internal analytical capacities and develop the appropriate measurement tools and methodologies.

The approach regarding proportionality and gradual implementation can be clarified in the supervisory expectations (see **Box 20** and **Box 21**). Supervisors may also consider specifying what expectations need to be fulfilled in the short term, and those to be achieved over a longer timeframe, before clarifying the applicable timeline.

In line with the principle of proportionality, some supervisors have also provided (or are considering providing) specific guidance to smaller and less complex institutions. For instance, Banco de Portugal has established supervisory expectations for smaller banks under its direct supervision (see **Box 21**).³²

Box 20

Requiring proportionate and gradual implementation

Bank Al-Maghrib – Directive on climate-related and environmental financial risks (Directive des risques financiers liés au changement climatique et à l'environnement) (Article 3).

Climate change related and environmental risks management framework, described in the present directive, shall be proportionate to the risk profile, systemic importance, size and complexity of the institution and the volume of its activities. It shall evolve progressively as the institution's expertise in terms of assessing and managing these risks improves.

31 In the case of banks, BCBS, Core Principles for Effective Banking Supervision, Principle 15 (risk management process) requires that the banks' risk management processes should be commensurate with their risk profile and systemic importance.

32 As observable in Table 3, a number of National Competent Authorities (NCAs) of the Single Supervisory Mechanism (SSM) have established supervisory expectations for smaller banks in the Eurozone.

Adapting supervisory expectations to smaller banks

In April 2021, **Banco de Portugal** established supervisory expectations on the management of climate-related and environmental risks for the less significant institutions (LSIs) under its direct supervision. These credit institutions will be expected to make progress towards the identification, measurement, and mitigation of climate-related and environmental related-risks, in a manner which is proportional to the nature, scale, and complexity of the activities and risks to which they are exposed, or may become exposed to. The need to ensure a level playing field in the SSM and the fact that some smaller institutions may be especially exposed to climate-related and environmental risks, given their potential lower level of diversification and exposures to certain sectors and

geographies, provided a rationale for Banco de Portugal to extend the scope of application of the supervisory expectations defined by the European Central Bank for the significant institutions of the SSM (see **Box 22**). Considering the evolving regulatory and supervisory framework, and the multiple methodological challenges that remain, a transition period for the application of these expectations is envisaged until mid-2022, when the supervisory dialogue is expected to begin integrating these matters. Planned actions during the interim period include outreach activities to improve awareness of the expectations and a stock-take of current practices and planned initiatives by LSIs to address material climate-related and environmental risks.

Increasing alignment in supervisory expectations

As international standards are emerging (see **Focus Area 11** and **Chapter 5** concerning disclosure), **some respondents note that the current lack of common approaches to supervisory methodologies and mandatory requirements regarding climate-related and environmental risks identification, assessment and monitoring slow down the development of supervisory expectations.** In fact, certain supervisors are waiting for standards to be developed first at international or supranational level (e.g. European Union, Single Supervisory Mechanism), to save resources and ensure consistency as well as a level playing field.

The production of clearer and more detailed expectations promoted by international organisations, the development of tools and metrics available on the market and the large number of studies being published can help to reduce the capacity gap and enable more NGFS members to take concrete actions in the near future. In particular, expectations under implementation within jurisdictions and recommendations developed in international fora can promote a preliminary set of principles and concrete examples for those who are planning to develop supervisory expectations, also helping the financial institutions prepare for future possible mandatory regulations.

With this in mind, many supervisors that have issued or are planning to issue supervisory expectations stated that they have performed a benchmarking of existing publications, including the NGFS Guide. When developing their supervisory expectations, supervisors may therefore refer to those already issued by their peers, as well as to the NGFS Guide that contained details on the topics to be addressed. It should be noted that the increasing number of supervisory expectations being issued show a certain degree of similarity, as expectations usually cover the key areas mentioned in the NGFS Guide (see **Table 3**), namely:

- governance;
- business models and strategy;
- risk management;
- scenario analysis and stress testing;
- and, finally, disclosure (see **Chapter 5**).

This said, some of supervisory expectations may include details that were not mentioned explicitly in the NGFS Guide. They cover for example the allocation of responsibilities to the relevant internal control functions, some details of the risk appetite framework such as the need to set limits and thresholds to the key performance or risk indicators pertaining to climate-related and environmental risks, the need to engage with customers as a potential risk mitigation action and the need for a periodic review of the risk identification, measurement and mitigation frameworks (see **Box 22**).

Box 22

Setting granular supervisory expectations under the current prudential framework

The **European Central Bank** (ECB) issued in November 2020 non-binding *supervisory expectations* which detail how the ECB expects banks to prudently manage and transparently disclose climate-related and environmental risks under current prudential rules. The guidance applies to the significant institutions of the SSM and will be considered as part of the supervisory dialogue going forward. The guidance covers five key areas: (i) governance; (ii) strategy; (iii) risk management; (iv) scenario analysis and stress testing and (v) disclosure.

Regarding governance and risk appetite, the ECB expects the credit institutions it supervises to explicitly include climate-related and environmental risks in their risk appetite framework, and in particular to develop appropriate key risk indicators and set appropriate limits for effectively managing these risks in line with their regular monitoring and escalation arrangements. The ECB also expects credit institutions to assign responsibility for the management of these risks within the organisational structure in accordance with the three lines of defence

model, stressing the role of the risk management function, the compliance function and the internal audit function.

Regarding risk management, the ECB has a general expectation that credit institutions incorporate climate-related and environmental risks as drivers of existing risk categories into their risk management framework. As part of this framework, credit institutions are encouraged to engage in constructive dialogue with critical counterparties, including with a long-term view to improving the sustainability rating and/or credit rating of a counterparty. Institutions are expected to evaluate the appropriateness of their identification, measurement and mitigation instruments for climate-related and environmental risks in their periodic reviews.

The ECB Guide also provides a series of specific expectations on integrating climate-related and environmental risks into credit, operational, market and liquidity risk management, as well as into scenario analysis and stress testing as part of the ICAAP.

4.2 Focus Area 10: Engage supervised entities on the implementation of supervisory expectations

Once supervisory expectations have been set, supervisors need to assess their implementation by financial institutions to gauge and track progress, and, where needed, set appropriate mitigation actions.

Possible follow-up actions are manifold, with varying degrees of bindingness. Some of them feed into supervisory processes defined by regulation, involving formal assessments potentially leading to mitigation actions (more on which can be found in **Focus Area 11**). Other kinds of actions aim to serve as a basis for supervisory dialogue, with a view to discussing further regulatory materials and guidance, while encouraging financial institutions to develop and enhance existing risk management frameworks.

According to the survey, many of the actions taken or planned by supervisors as a follow-up to guidelines and regulation have focused primarily on assessing the integration of climate-related and environmental risks in financial institutions' risk management practices, including performing qualitative assessment of financial institutions practices, undertaking on-site inspections and informing supervised entities of the planned next steps.

Such assessments help supervisors better understand financial institutions' approaches to climate-related and environmental risks management, and their most common challenges when operationalising supervisory guidelines and regulation. Similarly, by examining financial institutions approaches and practices, supervisors can steer industry's efforts towards climate-related and environmental risks management and potentially trigger actions by supervised entities that mitigate these risks.

Fostering ownership and awareness by supervised entities

As a first step to engage with and foster ownership by financial institutions, some supervisors asked their supervised entities for a self-assessment of how they address climate-related and environmental risks and meet relevant supervisory expectations. Such self-assessments can be used to raise awareness, with no binding character, although supervisors may take more formal steps such as requiring an action plan and sending a letter to the Board of financial institutions, relating this to formal supervisory review process and meetings (see **Box 23**).

Developing supervisory assessment programmes

Some supervisors also conduct their own assessments of compliance with the supervisory expectations, either as a first step following the issuance of supervisory

expectations or as a second step in reviewing the self-assessments provided by supervised entities. In order to effectively conduct follow-up supervisory dialogues, supervisors may need to support their internal staff through the issuance of pre-defined handbooks and questionnaires to ensure consistency and improve supervisory processes as regards climate-related and environmental risks (see **Box 24**). Since issues around climate-related and environmental risk are emerging ones, in some cases a more principle-based and flexible approach may also be suitable.

In addition to assessment methodologies, supervisors may develop processes and programmes to gauge the implementation of supervisory requirements by financial institutions. Supervisors are expected to embed climate-related and environmental risks in their supervisory activities where these risks are material to the supervised entities, in line with relevant principles such as BCPs³³ and ICPs³⁴.

Box 23

Incorporating self-assessments by supervised entities into supervisory programmes

As of 2019 and onwards, **De Nederlandsche Bank (DNB)** has explicitly requested institutions to identify the effects of climate-related risks and indicate how these risks are being managed by banks (ICAAP), insurance companies (ORSA) and pension funds (ESG assessment in the Own Risk Assessment (ERB)). Regarding banks, this is a yearly exercise. The focus of DNB is on four areas: governance, strategy and business model, risk management, measurement and reporting, and disclosure. The input received was evaluated and feedback was shared with the banks. Further, DNB included a paragraph on climate-related risks in the SREP letter. The banks were subsequently in 2020 asked to submit an update of their self-assessment. This update was again evaluated and discussed by the supervisor with the banks. In 2021, all Dutch banks received a questionnaire on how they assess themselves on the supervisory expectations of the ECB Guide on climate-related and environmental risks. The answers to this questionnaire will feed into the supervisory dialogue with the banks.

Bank Negara Malaysia (BNM) has communicated general climate-related supervisory expectations to Board and Senior Management of supervised institutions via a standard paragraph in the Composite Risk Rating (CRR) letter since 2020. The objective has progressed from just elevating awareness to inspiring supervised entities to accelerate their efforts in integrating climate-related risk into risk management framework, while giving them the flexibility to progress at their own pace. While the recommendations of the letter are not binding at this juncture, entities are encouraged to provide detail on their management action plans to implement the recommendations via quarterly progress reports. Additionally, during the annual engagement session on business plan with entities, the critical need for full integration of climate-related and environmental considerations in making informed decisions is emphasised and reiterated.

33 BCBS, Core Principles for Effective Banking Supervision, Principle 9 (supervisory techniques and tools, Essential Criteria 2) requires supervisors to have a coherent process for planning and executing on-site and off-site activities, and policies and processes to ensure that such activities are conducted on a thorough and consistent basis with clear responsibilities, objectives and outputs.

34 IAIS, Insurance Core Principle 9, Supervisory Review and Reporting.

Box 24

Ensuring consistency of assessments through a supervisory handbook

The German financial supervisory authority **BaFin** published its Guidance Notice on Dealing with Sustainability Risks in December 2019 (see **Table 3**). The supervised entities from the banking, insurance and securities/asset management sectors should be enabled to deal with sustainability risks in a broader sense, meaning the coverage of not just climate-related and environmental risks, but also social and governance risks. Based on the guidance notice, BaFin developed in cooperation with **Deutsche Bundesbank** a supervisory handbook to serve line supervisors as guidance and checklist. In the course of 2021, this handbook is used to assess supervised entities' efforts to strategically and

organisationally implement sustainability aspects into their risk management. This is done via the supervisory dialogue, risk profiling, questionnaires and, soon, stress testing. In addition to supervisory assessments of individual institutions, BaFin attempts to systematically take stock of financial institution's alignment with its Guidance Notice. In the second quarter of 2021, a survey was conducted among 100 less significant credit institutions, the majority of German insurance undertakings and a smaller number of investment firms under BaFin's supervision, the results of which are currently being evaluated. The outcome of the survey may then also inform the supervisory dialogue and potential amendments to the handbook.

Some supervisors, such as De Nederlandsche Bank (see **Box 23**), have already included these actions within their supervisory programmes for the coming years. Developing thematic reviews, programming on-site inspections or promoting discussions and exchanges with the financial institutions during the ongoing supervisory process could be helpful for financial institutions to identify and overcome the main obstacles that hinder implementation of supervisory guidance and rules.

Such activities help promote a common approach to managing risks within the sector, while acting as an opportunity to propose individual resolutions for challenges that the financial institutions face regarding the identification, assessment or management of climate-related and environmental risks or to share good practices.

To enhance the level of expectations towards the implementation of requirements, developing a supervisory programme with an adequate level of granularity is important. Supervisors can, for instance, define clear internal procedures and guidelines (with dedicated actions points, identified data requirements, qualitative and quantitative assessment methods), timelines, monitoring tools and reporting processes. This could help off-site and on-site supervisors conduct adequate micro-prudential supervision of climate-related and environmental risks. Indeed, this could be helpful for

supervisors to properly identify gaps between current practices and provisions that are already in force, and intervene if potential breaches or fragilities relating to climate-related and environmental risks are identified.

Leveraging assessments to enhance supervisory expectations and guidance

Some supervisors see the development of supervisory expectations and the assessment of their implementation as iterative processes that feed into each other. Indeed, the findings of follow-up activities can serve to identify best practices and help supervised entities comply more efficiently with supervisory expectations (see **Box 25**). Improvements in such supervisory activities also enable supervisors to better shape and set further regulatory developments.

4.3 Focus Area 11: Integrate climate-related and environmental risks into supervisory frameworks and processes

As climate-related and environmental risks are drivers of existing risk categories, the NGFS Guide noted that supervisors can already impose a wide variety of measures if supervised institutions insufficiently integrate climate-related and environmental risks into their strategy,

Identifying best practices through stock-taking exercises

In May 2020, the **Autorité de Contrôle Prudentiel et de Résolution (ACPR) – Banque de France** shared *good practices* of governance and management of climate-related risks collected from French banking institutions. The aim was to disclose relevant practices set up by the industry, to encourage convergent practices among the French banking industry and to help the institutions prepare for the implementation of further recommendations and mandatory requirements expected in the near future. The good practices identified in the document derive from interactions with the nine banking institutions that participated to the survey conducted by the ACPR in 2018, as well as with the French Banking Federation. Institutions shared their practices on a voluntary basis during four thematic meetings (dedicated to each topic of the ACPR Guide) that ACPR organised in order to elaborate it. ACPR launched in April 2021 a similar process for the Insurance sector; this Guide is supposed to be published by the end of the year 2021.

Following the issuance of its Environmental Risk Management Guidelines in December 2020 (see **Box 19** and **Table 3**), the **Monetary Authority of Singapore** provided financial institutions with an 18-month implementation period. During this time, MAS engaged key financial institutions on their progress, and undertook a thematic review of practices within the financial sector. This included a stock-take exercise and subsequent bilateral engagement with financial institutions. MAS will incorporate the key observations from this thematic review into an information paper (to be published in the first quarter of 2022), which will feature good practices and common areas for improvement, with a focus on elements that remain challenging for financial institutions to implement. The information paper is intended to provide a useful reference source for banks, insurers and asset managers as they build their ENRM capabilities and complement a *handbook* issued in January 2021 by the MAS convened, industry-led, Green Finance Industry Taskforce.

governance, risk management, or disclosure frameworks, in compliance with relevant principles such as BCPs³⁵ and ICPs³⁶.

Supervisory framework

Since the publication of the NGFS Guide, international standard-setting bodies have been conducting further work to integrate climate-related risk and, to a lesser extent, other environmental risks into the supervisory framework. In the insurance sector, the IAIS and SIF jointly published a report on the supervision of climate-related risks (see **Box 26**). For other environmental risks, the SIF is undertaking a scoping study³⁷ on nature-related

financial risks and will analyse how insurance supervisors and insurance companies are responding to these risks. In the banking sector, building on its recently published reports on climate-related risk transmission channels and measurement methodologies (see **Focus Area 6**), the BCBS is undertaking further analysis on how the Basel framework may incorporate climate-related risks into its three pillars.

The European Supervisory Authorities are also developing guidance with regard to climate-related and environmental risks. Examples of the work conducted by the European Banking Authority³⁸ and the European Insurance and Occupational Pensions Authority³⁹ can be found in **Boxes 27** and **29**.

35 BCBS Core Principles for Effective Banking Supervision, Principle 1, Responsibilities, objectives, and powers, requires supervisors to undertake timely corrective actions to address safety and soundness concerns. Principle 11, Corrective and sanctioning powers of the supervisor, also requires supervisors to have at its disposal an adequate range of supervisory tools to bring about timely corrective actions.

36 IAIS, Insurance Core Principle 10.4, Preventive Measures, Corrective Measures and Sanctions, expects the supervisor to require the insurer to take action to address the supervisor's concerns; Principle 10.5 requires the supervisor to escalate action including preventative or corrective measures and enforcement if the supervisor's concerns are not addressed.

37 See <https://www.sustainableinsuranceforum.org/biodiversity-loss-and-associated-risks-to-be-addressed-in-new-study-by-un-convened-sustainable-insurance-forum>

38 See in particular EBA's *Report on management and supervision of ESG risks for credit institutions and investment firms*.

39 See in particular EIOPA's *2021 Supervisory Convergence Plan* as well as its *opinion* on the supervision of the use of climate change risk scenarios in ORSA, *opinion* on sustainability within Solvency II, *technical advice* on the integration of sustainability risks and factors in the delegated acts under Solvency II and the Insurance Distribution Directive.

Box 26

International recommendations for climate-related risk supervision in the insurance sector

The **International Association of Insurance Supervisors** (IAIS) and **Sustainable Insurance Forum** (SIF) jointly published an *Application Paper on the Supervision of Climate-related Risks in the Insurance Sector* in May 2021 that aims to promote a globally consistent approach in addressing climate-related risks in the supervision of the insurance sector. Selected ICPs¹ were included in the scope for climate-related risks in a consistent way with the five key areas covered by the NGFS Guide. The role of the supervisor was emphasised particularly to assess the extent to which climate-related risks are likely to be material to insurers operating in their jurisdiction. The Application Paper covers five key areas, namely corporate governance, risk management and internal controls, enterprise risk management for solvency purposes (including ORSA), investments, and public disclosures.

Relative to corporate governance (ICP 7), the focal points are on oversight and management responsibilities, business objectives and strategies, the role of the Board, duties related to risk management and internal controls, as well as remuneration through a climate-related risk lens.

As far as risk management and internal controls (ICP 8 and 16) are concerned, the Paper sets out how supervisors could integrate climate-related risks into their supervisory expectations around risk management system and for each of the control functions, including outsourced functions in relation to climate-related risks. It is recommended that insurers that are still using an approach that mainly addresses climate change from a reputational risk

perspective transition to a more fully integrated approach that considers the risks more holistically. One notable example for managing climate-related risks is defining investment limits to specific companies, sectors, regions, jurisdictions, etc. The use of heat maps or ESG scoring that highlight climate-related risks may also be a helpful method to get a better understanding of, and monitor the impact of climate-related risks.

Concerning Enterprise Risk Management (ERM), the Paper reminds that climate-related risks have the potential to impact all insurers and should therefore be considered for inclusion in the ORSA. Likewise, it is expected that insurers adopt the appropriate risk management actions to mitigate any identified risks.

With regards to investment policy, insurers should assess the impact from physical and transition risks on their investment portfolio, as well as on their asset-liability management. A forward looking view, including the use of scenarios, may help insurers gain a better understanding of such risks.

Finally, on disclosures, material risks associated with climate change should be disclosed by insurers (in line with ICP 20). Supervisors may use the TCFD framework when designing best practices or as input for setting their own supervisory objectives. Insurers should incorporate in their disclosure the extent to which their risk profile exposes them to the impacts of climate-related risks, as well as any metrics or targets developed by the insurer.

¹ ICP 9 (Supervisory Review and Reporting); 7 (Corporate Governance); 8 and 16 (Risk Management and Internal Controls); 15 (Investments); and 20 (Disclosures).

Supervisory review process

As stressed in the NGFS Guide, climate-related and environmental risks can be considered part of different elements of the supervisory review process. To the extent they are material, climate-related and environmental risks may already be implicitly considered as part of the

supervisory assessment of traditional financial risks categories, in consistency with relevant principles such as BCPs and ICPs.

An increasing number of supervisors identify specific areas of the supervisory review process to be consistently and explicitly evaluated against climate-related and

environmental risks. These include business model, risk strategy and appetite, governance, risk management, risks to solvency and risks to liquidity and funding.

Within the European Union, the European Banking Authority, the European Insurance and Occupational

Pensions Authority, and the European Central Bank committed to develop guidelines to integrate ESG risks into the supervisory review and evaluation processes of European supervisors (see **Box 27**). To this end, they will revise the sectorial supervisory handbooks to include dedicated supervisory requirements on the issue.

Box 27

Integrating ESG risks into the SREP

The **European Banking Authority** (EBA) published a *report* including an analysis and recommendations outlining how ESG risks should be integrated into the supervisory review and evaluation process (SREP) performed by EU competent authorities.¹ The EBA proposes a phase-in approach, starting with the inclusion of climate-related and environmental risks into the supervisory business model analysis and the assessment of institutions' internal governance and wide controls, whilst encouraging institutions and supervisors to build up data and tools to develop quantification approaches in order to increase progressively the scope of the supervisory analysis to other elements. In order to further enable supervisors to understand the longer term impact of ESG risks, the EBA sees a need to introduce a new aspect of analysis, pertaining to an evaluation of whether institutions sufficiently test the long term resilience of their business model against the time horizon of relevant public policies or broader transition trends, applying at least a ten year-horizon. The impact of ESG risks materialising in the form of existing categories of financial risks (e.g. credit, market, operational and reputational, liquidity and funding), the supervisory review should proportionately and progressively incorporate ESG risks as drivers of financial risks, in particular risks to capital and risks to liquidity and funding.

¹ The SREP process was described in the NGFS Guide.

Qualitative mitigation tools

The NGFS Guide included a series of qualitative binding tools that supervisors could use to mitigate shortcomings concerning climate-related and environmental risk management by their supervised entities,⁴⁰ some of which have already been utilised by NGFS members. As exemplified in **Box 20**, Bank Negara Malaysia has engaged with the boards of financial institutions, which have been asked to submit regular actions plans. Several supervisors also required financial institutions to integrate climate-related and environmental risks into ICAAP / ORSA, as described further below. In addition, supervisors may use other kinds of qualitative approaches to engage supervised entities. For example, at an earlier stage of the supervisory process (e.g. risk assessment) they may use some approaches described in **Table 2**.

Quantitative mitigation tools

When the NGFS Guide was published, it acknowledged that it was difficult for supervisors to properly quantify the impact of climate-related and environmental risks on capital adequacy. This remains the case. Supervisory tools with sound approaches to translate climate-related and environmental risks into quantifiable financial risks remain at a nascent stage. Supervisors acknowledge that even relatively advanced financial institutions are at an early stage in the process of developing sound quantitative approaches and metrics for assessing climate-related risks, and even more so for broader environmental risks. As discussed in **Chapter 3**, gaps in data, risk classification and assessment methodologies have hindered faster progress in this area.

⁴⁰ These tools include: (i) discussing the findings with the boards of financial institutions and requiring adequate follow-up on the shortcomings identified; (ii) requiring financial institutions to strengthen risk management and internal control systems, procedures and processes; (iii) requiring financial institutions to integrate climate-related and environmental risks into ICAAP/ORSA; (iv) requiring financial institutions to reduce the level of risk, ultimately imposing limitations on carrying out certain categories of transactions or operations or, alternatively, guiding financial institutions towards adjusting their business models before the risk could materialise; (v) setting limitations to the distribution of profits or other assets.

Given current quantification challenges, most supervisors start the process gradually, first requiring institutions to consider the implication of climate-related and environmental risks for qualitative elements such as business model and strategy. Over time, institutions are expected to build internal capacity and expand the analysis to include scenario analysis and stress testing. Notwithstanding these challenges, considering the importance of risk quantification for the assessment of capital and liquidity adequacy and the establishment of prudential limits, supervisors continue their efforts to incorporate climate-related and environmental risks into quantitative supervisory tools.

Work on incorporating a Pillar 1 treatment for climate-related and environmental risks in the prudential framework remains at an early stage, as jurisdictions wait for international and supranational standard setters to advance their work first and as there are specific challenges due to the nature of climate-related and environmental risks, which are non-linear and usually span longer than the time-horizon captured by Pillar 1 treatment. Furthermore, as highlighted by the NGFS Guide and the *Status Report on Financial Institutions' Experiences from working with green, non-green and brown financial assets and a potential risk differential*, the lack of data, the mismatch between current methodologies for quantifying these risks and the time horizon of their materialisation, the lack of common taxonomy, classification systems or definitions of 'green' and 'non-green' assets and, as a result, the lack of evidence of a risk differential between these assets, hamper efforts in this area. The NGFS is continuing its work to assess such risk differentials, together with some of its members. In particular, the European Banking Authority has started assessing whether a dedicated prudential treatment of exposures related to assets or activities associated substantially with environmental and/or social objectives would be justified.⁴¹ This includes investigating the riskiness of green and environmentally harmful exposures, and potential evidence of a risk differential, as well as a qualitative analysis of potential gaps in the

existing EU capital requirements framework with regard to environmental risks and how to close them. In parallel, the BCBS Task Force on Climate Risk has also initiated a gap analysis of the Basel Framework which shall be followed by exploring possible policy options.

Supervisory efforts have mostly focused on enhancing Pillar 2 tools. The forward looking nature of these tools, their key role in incorporating risks not fully captured by Pillar 1, and their flexibility make them the natural point through which climate-related and environmental risks can be included into the supervisory process. Some supervisors expect that, in the near future and once the relevant regulatory framework is updated, Pillar 2 analyses conducted as part of the supervisory review process will substantiate decisions about capital add-ons covering climate-related and environmental risks, as suggested in the NGFS Guide.

Such tools include the banks' Internal Capital Adequacy Assessment Process (ICAAP) and the insurers' Own Risk and Solvency Assessment (ORSA). The ICPs⁴² and the BCPs⁴³ require, respectively, insurers and banks to undertake an evaluation of their capital needs for material risks. To this aim, the ICAAP and ORSA produce several outputs, including the determination of the amount of capital that is necessary to cover material risks that firms are exposed to. In this respect, many supervisors have required or intend to require financial institutions to consider climate-related and environmental risks in their assessment.

Considering that ICAAP and ORSA related regulations often mention the need to incorporate all material risks, and that climate-related and environmental risks materialise in the form of existing risk categories, amending these regulations is not always necessary. However, as suggested in the NGFS Guide, supervisors may consider it useful to explicitly require institutions to consider climate-related or environmental risks into their ICAAP or ORSA. Supervisors that have done so include for instance De Nederlandsche Bank (see **Box 23**), the

41 As per Article 501 (c) of the revised EU Capital Requirements Regulation (CRR II), the EBA shall submit a report on its findings by 28 June 2025.

42 IAIS, Insurance Core Principle 16.10, Enterprise Risk Management for Solvency Purposes, requires insurers to perform a regular ORSA; Principle 16.12 requires the ORSA to encompass all reasonably foreseeable and relevant material risks.

43 BCBS, Core Principles for Effective Banking Supervision, Principle 16, Capital Adequacy, requires supervisors to set prudent and appropriate capital adequacy requirements for banks that reflect the risks undertaken by, and presented by, a bank in the context of the markets and macroeconomic conditions in which it operates.

European Central Bank (see **Box 22**), the Monetary Authority of Singapore (see **Box 28**), the European Insurance and Occupational Pensions Authority (see **Box 29**) and Banco Central do Brasil⁴⁴.

Other quantitative tools include scenario and sensitivity analyses as well as stress testing, which in many cases need to be developed further before supervisors can

integrate them into the supervisory review process and leverage them to take binding mitigation measures.

Major developments and challenges in supervisory scenario analyses and stress testing are summarised in **Chapter 3**, which recalls that pilot exercises sometimes referred to as climate-related risk stress tests have not been primarily focused on quantifying possible capital needs of financial institutions relative to the regulatory minimum.

Box 28

Integrating environmental risks in the ICAAP

The **Monetary Authority of Singapore** (MAS) has set out guidance for financial institutions to incorporate environmental considerations within their risk analysis. MAS' Guidelines on Environmental Risk Management (ENRM) include supervisory expectations for financial institutions to develop tools and metrics to monitor and assess their exposures to environmental risk. Financial institutions are also expected to develop capabilities in scenario analysis and stress testing to assess the impact of environmental risk on their risk profiles and business strategies and explore their resilience to financial losses under a range of outcomes.

MAS has also set out risk-based capital adequacy requirements under its regulatory notice for banks incorporated in Singapore, which requires a reporting bank to ensure that its ICAAP identifies and assesses all material risks. This includes environmental risk insofar as it is assessed to be material by the reporting bank.

Nevertheless, MAS does recognise that financial institutions' assessment of environmental risks, and their implications for capital adequacy, will evolve in an iterative and progressive manner alongside the development of relevant data and metrics. To this end, it is working with

financial institutions to build capabilities in environmental risk analysis. Financial institutions can start by identifying relevant metrics, improving data collection, and exploring pilot analyses for sectors with higher environmental risk. This would strengthen their understanding of the impact of environmental risk on their portfolios and financial positions, and determine the relevant risk factors and scenarios in their risk assessment.

MAS is reviewing and identifying appropriate metrics and methodologies to be used in environmental risk analysis, based on its engagement with external research institutes and rating agencies, and through its involvement in international networks such as the NGFS and the BCBS Task-force on Climate-related Financial Risks. MAS will look to publicise good practices on environmental risk analysis as part of its supervisory engagements with financial institutions. MAS also intends to incorporate a broader range of climate-related risks in its industry-wide stress-tests for the financial industry by end 2022; this will attune the industry to the economic and financial implications of climate-related risks, and facilitate financial institutions' development of relevant capabilities in scenario analysis and stress-testing.

44 Circular BCB 3,846 of Sep 13, 2017.

Supervising the use of climate-related scenarios in the ORSA

The **European Insurance and Occupational Pensions Authority** (EIOPA) issued in April 2021 an *opinion* on the supervision of the use of climate change risk scenarios in ORSA. The opinion follows EIOPA's *technical advice* on the integration of sustainability risks and factors in the delegated acts under Solvency II requiring (re)insurers to assess as part of their ORSA process the impact of climate-related risks. It is expected that (re)insurers have in place processes (strategies, procedures and reporting) proportionate to the nature, scale and complexity of the risks inherent to their business in order to properly assess the risks they face in the short- and long-terms. EIOPA provides, in its opinion, practical guidance to help (re)insurers to develop appropriate and effective measures to identify and assess climate-related risks in the ORSA process. It is expected that the undertakings:

- Assess climate change risks in the short and long term, understanding that the time horizon to properly assess the impact of climate change should be longer than the usual expectations (5-10 years for short term, 30-50 years for middle term, 80-100 years for long term);
- In order to assess properly the materiality of climate-related risks, make both a qualitative analysis (to provide insight in the relevance of the main drivers of climate change risk in terms of traditional prudential risks) and a quantitative analysis (to assess

the exposure of assets and underwriting portfolios to climate-related risks);

- Develop at least two long-term climate scenarios (the first one where the global temperature increase remains below 2°C, preferably no more than 1.5°C, and the second one where the global temperature increase exceeds 2°C) that include a wide range of climate-related risks;
- Implement their own climate scenarios or build scenarios on the ones that are already available (as the NGFS first set of climate scenarios published in June 2020) to propose pathways for physical and transition risks;
- Adapt, in an ongoing process, the scope, depth and methodologies of their quantitative scenarios in order to enhance their results;
- Present and explain in the ORSA supervisory report the analysis of short and long-term climate-related risks.

The explicit integration of climate-related risks in the ORSA should help (re)insurers to better assess the resilience of their business strategies under different climate-related risk scenarios over time and to help the management body to decide on appropriate actions to mitigate climate-related risk exposures. It will also be useful for supervisory authorities to perform a review of the analysis of short and long-term climate-related risks carried out by (re)insurers.

5. Supervisory expectations with regard to disclosures

Focus Area 12

12 – Promote comparable, consistent and reliable climate-related and environmental disclosures, including by considering aligning with commonly accepted baseline frameworks or standards and future international reporting standards

Key Takeaways

- There has been a proliferation of disclosure frameworks and guidance which adopt different materiality lenses and address the needs of different stakeholders. The fragmentation is compounded by selective reporting against multiple frameworks due to the lack of mandatory disclosure requirements as well as detailed and practical guidance.
- Half of the respondents to the NGFS survey reported voluntary commitments by financial institutions to implement the TCFD recommendations. A key cited challenge faced by financial institutions in their ability to provide decision useful disclosures is the lack of consistent, comparable and reliable disclosures from the counterparties they lend to, invest in or insure.
- 42% of supervisors have set supervisory expectations on climate-related and environmental disclosures and over half have assessed the disclosures of their regulated financial institutions. Climate-related disclosures were found to be sparse and heterogeneous.
- Most supervisors stressed that no single framework or set of standards was sufficiently comprehensive for disclosures by regulated financial institutions. 40% of supervisors are considering introducing or strengthening existing disclosure requirements and a majority are in favour of mandatory disclosure requirements.
- International efforts to develop a common global baseline of sustainability reporting standards with industry specific guidelines are progressing at pace. Such standards should ideally be compatible with existing accounting reporting standards and form the basis for the development of an audit and assurance framework to enhance reliability. This development should significantly alleviate some of the aforementioned limitations.
- Supervisors can play an important role to mitigate fragmentation. When they are given the adequate prudential instruments to assess and monitor climate-related and environmental disclosures of credit institutions, supervisors can constructively steer those credit institutions to strengthen the methodologies and practices needed to disclose comparable and ambitious disclosures.
- Furthermore, supervisors can ensure that supervisory expectations and assessment methodologies are aligned with commonly accepted frameworks or standards, and in future, ensure the alignment with, or, at least, interoperability between a global baseline of international standards and their jurisdiction-specific expectations to ensure comparability of disclosed data. They can also advocate coordination with relevant agencies to harmonise disclosure from non-financial companies, as legislation on non-financial companies may not be under supervisors' mandate.
- Supervisors can provide their expertise to develop a set of core metrics and methodologies, which can potentially be considered in Pillar 3 baseline.

The NGFS First Progress Report 2018 highlighted that robust disclosure of climate-related and environmental information by financial institutions has important benefits, as it contributes to better capital allocation and risk management, by increasing transparency, improving risk pricing, and requiring financial institutions to establish the necessary data collection and procedures.

The NGFS Comprehensive Report 2019 then issued three recommendations related to this topic: (i) achieving robust and internationally consistent climate and environment-related disclosure; (ii) bridging the data gaps; and (iii) supporting the development of a taxonomy of economic activities that enhances transparency around which economic activities contribute to a green and low

carbon economy, and transition, and are more exposed to climate-related and environmental risks⁴⁵.

The NGFS Guide published in May 2020 mentioned disclosure among five topics that supervisors should cover in their expectations on climate-related and environmental risks. It provides some detail on the content of such expectations with regard to this topic.

The NGFS Progress Report on Bridging Data Gaps published in May 2021 considers that rapid convergence towards a common and consistent set of global disclosure standards is one of the three key building blocks to ensure the availability of reliable and comparable data, along with efforts towards a minimally accepted global taxonomy, and the development and transparent use of well-defined and decision-useful metrics, certification labels and methodological standards.⁴⁶

In view of the importance of this topic for the financial sector in general and financial institutions and supervisors in particular, this chapter addresses supervisory expectations with regard to disclosures. It first provides an overview of challenges relating to disclosing climate-related and environmental information that are common to all relevant stakeholders, followed by an overview of ongoing activities by financial standard setters and supervisors' approaches in this area. Following this, it identifies five key considerations with regard to supervisory expectations on disclosures (**Focus Area 12**).

5.1 Main challenges relating to climate-related and environmental disclosures

There are a number of challenges relating to disclosing climate-related and environmental information that are common to all relevant stakeholders and need to be overcome.

Fragmentation of disclosure standards

Convergence among disclosure approaches and interoperability between jurisdiction-specific frameworks and international baseline standards are needed to make disclosures consistent and comparable. Indeed, it is estimated that there are almost 400 disclosure frameworks related to climate or sustainability, in the form of guidance set out by industry or NGO groups, national laws or government-led schemes, or principles set out by international organisations.⁴⁷ The proliferation of frameworks and standards is due to financial institutions and other market participants seeking to address the needs of different stakeholders, and adopting different materiality lenses (see below). The resultant state of sustainability reporting by non-financial corporates and financial institutions does not provide the complete, consistent and comparable information that is material to financial decision-making, as highlighted by the International Organization of Securities Commissions (IOSCO)⁴⁸ and the NGFS Progress Report on Bridging Data Gaps. For example, companies report selectively against different frameworks.

Among existing disclosure frameworks, the TCFD recommendations stand out as an internationally widely-adopted baseline framework for voluntary climate-related disclosure, although implementation varies. As of May 2021, the number of TCFD's supporters has grown to over 2,000 organisations.⁴⁹ However, these commitments have not always translated into actual disclosures and the extent of the disclosures provided by companies may vary. A recent study showed that companies reporting against the TCFD framework primarily disclose non-material climate-related risk information.⁵⁰ In June 2021, the G7 Finance Ministers and Central Bank Governors supported a move towards mandatory climate-related financial disclosures

45 The NGFS recommendation is predicated on having a more comprehensive taxonomy, to thereafter help gain an understanding of potential risk differentials between different types of assets.

46 Focus Area 7 provides further description of ongoing initiatives towards bridging data gaps.

47 See <https://www.fsb.org/wp-content/uploads/Disclosure-task-force-on-climate-related-risks.pdf>

48 *IOSCO Press Release 24 February 2021*

49 See <https://www.fsb-tcfid.org/support-tcfid/>

50 Bingler, Julia Anna and Kraus, Mathias and Leippold, Markus (2021) *Cheap Talk and Cherry-Picking: What ClimateBert has to say on Corporate Climate Risk Disclosures*.

based on the TCFD framework in line with domestic regulatory frameworks.⁵¹

There is also a need for detailed and practical guidance, particularly on metrics and targets, for companies to implement the principles-based TCFD recommendations. In this sense, the TCFD has provided around 50 illustrative examples⁵² of metrics for a subset of critical industries and has issued guidance on relevant elements such as conducting climate-related scenario analysis, integrating climate-related risks into existing risk management processes and forward looking metrics for the financial sector. In June 2021, the TCFD released two consultation documents, namely a proposed guidance on climate-related metrics, targets, and transition plans and a technical supplement on measuring portfolio alignment.⁵³

Efforts to accelerate international consistency, comparability and reliability of disclosures, and resolve some of the above mentioned deficiencies are progressing at pace. In December 2020, the alliance of five standard setters, the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP), the Sustainability Accounting Standard Board (SASB),⁵⁴ the Climate Disclosure Standard Board (CDSB) and the International Integrated Reporting Council (IIRC) published a *prototype* (the 'Prototype') for climate-related financial disclosures that builds on existing content in their collective frameworks and the TCFD recommendations. The Prototype includes an industry specific materiality filter, as well as both cross-industry and industry specific application guidance on metrics and targets.

The NGFS Progress Report on Bridging Data Gaps took note of the IFRS Foundation's ongoing work to establish an International Sustainability Standards Board (ISSB) with the objective of promoting greater consistency and convergence of sustainability-related financial reporting standards. In March 2021, the IFRS Foundation formed a technical readiness working group (TRWG) to develop technical refinements to the Prototype to be a sound basis for the development of future ISSB standards. The ISSB standards are intended to be compatible with existing accounting reporting standards and drive additional interlinkage with financial statements. The importance of the work of the IFRS Foundation has been recognised by the G7 and G20 Finance Ministers and Central Bank Governors.⁵⁵

Application of different materiality lenses⁵⁶

In regard to disclosures, different materiality lenses or perspectives have been used. As entities address the needs of different stakeholders and may be part of jurisdictions with specific public policy objectives, different materiality perspectives have been adopted. Some standards, frameworks and jurisdictions are purely focused on the impact of environmental and social factors on the reporting entity, also known as financial materiality perspective (e.g. TCFD or SASB). This perspective has also been adopted by financial authorities in line with their supervisory mandates. However, other approaches focus on the impact of the reporting entity on the wider environment and society, a concept referred as environmental and social materiality (e.g. GRI). The European Union has moved towards the incorporation of both perspectives, an approach termed 'double materiality'.⁵⁷

51 G7 Finance Ministers & Central Bank Governors Communique June 5, 2021: 'We support moving towards mandatory climate-related financial disclosures that provide consistent and decision-useful information for market participants and that are based on the Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks. Investors need high quality, comparable and reliable information on climate risks. We therefore agree on the need for a baseline global reporting standard for sustainability, which jurisdictions can further supplement. We welcome the International Financial Reporting Standards Foundation's programme of work to develop this baseline standard under robust governance and public oversight, built from the TCFD framework and the work of sustainability standard-setters, involving them and a wider range of stakeholders closely to foster global best practice and accelerate convergence. We encourage further consultation on a final proposal leading to the establishment of an International Sustainability Standards Board ahead of COP26.'

52 TCFD (2017) Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures.

53 See <https://www.fsb-tcf.org/publications/>

54 SASB and IIRC completed their merger in June 2021 to create the new Value Reporting Foundation.

55 G20 Finance Ministers & Central Banks meeting Communique 9-10 July: 'We will work to promote implementation of disclosure requirements or guidance, building on the FSB's Task Force on Climate-related Financial Disclosures (TCFD) framework, in line with domestic regulatory frameworks, to pave the way for future global coordination efforts, taking into account jurisdictions' circumstances, aimed at developing a baseline global reporting standard. To that aim, we welcome the work programme of the International Financial Reporting Standards Foundation to develop a baseline global reporting standard under robust governance and public oversight, building upon the TCFD framework and the work of sustainability standard-setters, involving them and consulting with a wide range of stakeholders to foster global best practices.'

56 Within the context of disclosures, materiality assessment is the process whereby an entity determines whether an information should be disclosed to stakeholders in accordance with a specified framework. It therefore contributes to securing both the completeness and the relevance of the disclosures.

57 European Commission (2019). *Guidelines on non-financial reporting: Supplement on reporting climate-related information*

In reality, there is perhaps no hard distinction between these perspectives, as discussed in the December 2020 *Prototype document*. Entities' impacts on environment and society may affect their financial performance and position, especially in the long term, due to changes in regulations, investor preferences, stakeholder views, and evolving scientific knowledge on sustainability issues. This principle of dynamic materiality is expected to be reflected in an eventual standard developed by the ISSB. Information on entities' impacts on environment and society can be relevant for determination of an entity's enterprise value.

Gaps in data availability

There is a direct relationship between data, metrics and disclosure. Financial institutions require access to granular and reliable quantitative and qualitative data for climate-related and environmental risk management, pricing and capital allocation decisions as well as to generate the metrics required for disclosures that seek to be decision useful. The recent NGFS Progress Report on Bridging Data Gaps underlined that a significant number of data gaps still exist with a corresponding negative effect on the ability of financial institutions to effectively disclose their climate-related risks and for supervisors to assess them.

Financial institutions need climate-related data and disclosure on the entities they lend to, invest in or insure to take decisions that factor in climate-related financial risks. In that regard, the TCFD's 2020 Status Report pointed out that companies' disclosures about the financial impacts of climate change on their businesses and strategies remain scarce.⁵⁸

Less developed frameworks for disclosure of other environmental risks

Stakeholders with an interest in the financial impact of wider environmental risks are increasingly focussed on disclosures beyond those with a sole focus on climate-related risks. In recent years, biodiversity loss

and the depletion of natural capital have come to the fore as strategic risks, with linkages to climate change and the potential ability to create independent financial risks (see **Box 12**).⁵⁹ This growing recognition means that approaches that seek to quantify and disclose such associated financial risks need to continue to evolve⁶⁰ beyond frameworks developed with a climate focus, such as the TCFD.

There are initiatives to develop frameworks for disclosing on other environmental risks and their alignment with existing frameworks and the ISSB under development will be crucial to avoiding further fragmentation. For example, the recently launched Taskforce on Nature-Related Financial Disclosures (TNFD) intends to build by 2023 a framework for entities to report and act on evolving nature-related risks,⁶¹ employing an integrated approach to climate- and nature-related risks (see also **Box 10**). The ISSB intends to issue disclosure standards for other environmental and social issues after the initial climate standard. All these standards will utilise a common 'Presentation Standard' for sustainability-related financial reporting.

5.2 Ongoing activities by international standard setting bodies and supervisors' approaches to climate-related and environmental disclosures

Ongoing activities by international standard setting bodies

In July 2021, the FSB reported to the G20 on promoting climate-related disclosures. Its *report* sets high-level guidance, in the form of recommendations, to support financial authorities in their development of frameworks, as they consider appropriate to their wider public policy objectives, regulatory and legal frameworks. In particular, the report recommends that financial authorities use a framework based on the TCFD Recommendations across

58 See p.5 TCFD 2020 Status Report: <https://www.fsb.org/wp-content/uploads/P291020-1.pdf>

59 Unlike climate change where the relationship between inputs and resultant risks is increasingly well understood, identified and assessed ('volume(s) of CO₂' and 'resultant rise in temperature'), quantifying environmental risks such as biodiversity loss is comparatively more challenging. As an example, the loss of 1 acre of the Amazon Rainforest has very different implications and costs when compared to 1 acre of an English marshland.

60 Governments and policymakers are beginning to legislate to halt biodiversity loss recognising that it is not only an existential risk in its own right but protecting natural habitats can provide effective mitigation for many climate-related risks. The UK recently amended its Environmental Bill to provide legislative targets to prevent species and habitat loss by 2030: [See link](#)

61 TNFD (2021) *Nature in Scope*. Nature-related financial risks and opportunities are understood as all financial risks and opportunities to the entity as a result of impacts and/or dependencies on nature.

all sectors for climate-related financial disclosures, in line with jurisdictions' regulatory and legal requirements.

Regarding capital markets, IOSCO reviewed in 2021 the work done by its Sustainable Finance Task Force (STF) in 2020, and reiterated the urgent need for globally consistent, comparable and reliable sustainability disclosures.⁶² The IOSCO Board identified three priority areas for improvement in sustainability-related disclosures by companies and asset managers: (i) encouraging globally consistent standards; (ii) promoting comparable metrics and narratives; and (iii) coordinating across approaches by promoting closer integration with financial reporting and independent assurance of companies' disclosures.

IOSCO is working with the IFRS Foundation and has formed a Technical Expert Group (TEG),⁶³ which will review and assess the recommendations of the Foundation's TRWG, including industry-specific metrics for both corporates and financial institutions. The TEG will consider whether the refined prototype could be a sound basis for an international reporting standard under the ISSB, which will, inter alia, meet capital markets' information needs, be compatible with existing accounting reporting standards and form the basis for the development of an audit and assurance framework. The work of the TEG will inform IOSCO's views on its potential endorsement of the ISSB as the global standard setter for sustainability-related corporate reporting and recommendation to members and relevant authorities to consider the ISSB when setting national and regional level reporting requirements. The TEG intends to complete its initial assessment before COP 26 in November 2021.⁶⁴

IOSCO is encouraging the ISSB to consider a building block approach. Such approach is also supported by the International Federation of Accountants.⁶⁵ This will accommodate a common global baseline of enterprise value creation focused standards using consistent definitions and methodologies, whilst allowing for interoperability with reporting standards that adopt a wider perspective and/or allow an enhanced (voluntary) implementation by firms. Finally, whilst IOSCO supports a climate first approach for

the ISSB, it recommends that the ISSB should thereafter move forward quickly, on a defined timeline, to develop standards covering other sustainability topics.⁶⁶

For the banking sector, the **BCBS** is now investigating the extent to which climate-related risks can be addressed within the existing Basel Framework, identifying potential gaps and considering possible measures to address them. On disclosure, the Basel Committee will consider in the near-term an appropriate response to support the global initiatives to achieve consistent, comparable and reliable sustainability reporting. Depending on the progress globally, the Basel Committee could consider articulating Pillar 3 requirements for climate-related financial risks going forward.

For the insurance sector, the **IAIS** and **SIF** published in February 2020 an *Issues Paper on the Implementation of the TCFD Recommendation*, which identifies a number of areas where supervisors can encourage strengthened disclosures through the application of existing supervisory tools. In their more recent *Application Paper on the Supervision of Climate-related Risks in the Insurance Sector*, they note that, if risks associated with climate change are material to an insurer, it follows from Insurance Core Principle (ICP) 20 that information thereon must be disclosed.

Overview of current and planned mandatory disclosure requirements

The summary hereafter reflects the feedback from the 38 respondents to the NGFS stock-take survey on disclosures outlined in **Box 1**. It includes all reported initiatives whether from NGFS members themselves or from other regulators or government bodies within their jurisdictions (e.g. countries), which are not necessarily in the remit of supervisors.

Overall, 34% of respondents reported the implementation of mandatory climate-related or environmental disclosures within their jurisdictions. Since 2011, the New York State Department for Financial Services has required medium to large insurers to respond

62 See <https://www.iosco.org/news/pdf/IOSCONEWS594.pdf>

63 Co-led by Monetary Authority of Singapore and the United States Securities and Exchange Commission. The TEG will comprise sustainability reporting technical specialists from within the STF and the leadership of IOSCO's policy committee on issuer accounting, auditing and disclosures (Committee 1).

64 See <https://www.iosco.org/news/pdf/IOSCONEWS599.pdf>

65 IFAC (2021) *Enhancing Corporate Reporting: Sustainability Building Blocks*

66 See <https://www.iosco.org/news/pdf/IOSCONEWS608.pdf>

to the United States National Association of Insurance Commissioners' Climate Risk Disclosure Survey⁶⁷; starting 2019, insurers are allowed to submit their TCFD reports in lieu of responding to the survey. The Central Bank of Georgia reported the adoption of disclosure requirements in the corporate governance code applicable to commercial banks. Switzerland (FINMA) and the West African Monetary Union highlighted implicit requirements arising from the mandatory disclosure of material risks by financial institutions. With regard to requirements applicable to listed companies, various approaches have been adopted: European respondents mentioned the EU's Non-Financial Reporting Directive (NFRD),⁶⁸ the Monetary Authority of Singapore and Banco Central do Brasil reported requirements to publish sustainability reports, while Bursa Malaysia requires listed entities to include a narrative statement on sustainability risks and opportunities in their annual report. In June 2021, the Financial Service Agency in Japan adopted its revised corporate governance code, which requires prime market listed companies to publish TCFD compliant disclosures (see **Box 31**).

Looking forward, 40% of respondents are considering introducing or strengthening existing disclosure requirements. For instance, Banco Central do Brasil recently incorporated the TCFD recommendations into its prudential regulation (see **Box 30**). Moreover, the People's Bank of China, Bank Al-Maghrib, the Bank of Thailand, Banco de México and the West African Monetary Union have reported planned initiatives within their jurisdictions to implement climate-related and environmental disclosure requirements between 2021 and 2024 for listed entities and/or financial institutions. In the EU, as from 2021, the Sustainable Finance Disclosure Regulation (SFDR) requires asset managers and financial advisors to provide information about the negative environmental and social impacts arising from their investment portfolios. The disclosures will include mandatory indicators from 2023 onwards. In March 2021, the European Banking Authority launched a public consultation on draft mandatory public Pillar 3 disclosures by financial institutions related to their exposures to ESG risks (including but not limited to climate-related transition and physical risks) and strategies. The first disclosure reference date will be December 31st, 2022.

To facilitate the implementation of climate-related and environmental disclosures requirements, supervisors have also developed training programmes and led constructive dialogue with relevant stakeholders, aiming to develop key enablers and equip the financial sector with the needed technical knowledge and practical tools (**Box 31**).

Supervisory assessment of disclosure practices by financial institutions

55% of respondents carried out assessments of the climate-related or environmental disclosures of their regulated financial institutions based for instance on surveys about disclosures practices (19%) or benchmarks of disclosures against the TCFD recommendations (10%). In addition, nine European supervisors (23% of respondents) performed assessments against either the Non-Financial Reporting Directive (NFRD) or public prudential disclosure requirements.

The results highlighted a growing number of financial institutions providing voluntary public disclosures on climate-related risks, although these disclosures turned out to be sparse and heterogeneous. For instance, in 2019 the Bank of England analysed a large sample of regulated companies' TCFD disclosures and found that there was scope for improvement, particularly on metrics and targets. In 2020, Bank Negara Malaysia reviewed the narrative statement on sustainability of 40 financial institutions against the TCFD recommendations and identified shortcomings in the identification and assessment of climate-related risks and opportunities. In 2019, the Reserve Bank of New Zealand surveyed a sample of regulated institutions and found that 60% of banks and around one third of insurers were disclosing some information on climate-related risks. The Hong Kong Monetary Authority surveyed a sample of around 50 banks and highlighted that around 40% disclosed climate-related information.

In terms of frameworks and standards, 50% of NGFS respondents reported voluntary commitments by financial institutions to implement the TCFD recommendations, 30% underlined voluntary alignment with the GRI standards and around 8% referred to the

67 The Climate Risk Disclosure Survey is a multi-state initiative that collects data from large insurers about how they incorporate climate risks into their mitigation, risk-management, investment policies and business plans and how they engage with constituents and policyholders on climate change.

68 The European NFRD requires listed entities and financial institutions to report how environmental, social and governance (ESG) factors affect their business model and conversely how their economic activities affect ESG factors.

Box 30

Consulting stakeholders on disclosure requirements including TCFD disclosures

Banco Central do Brasil (BCB) published *new rules* for social, environmental, and climate-related risk disclosures by institutions of the National Financial System. This new rule is closely linked to the recent improvements to the risk management framework comprising *new requirements* for social, environmental, and climate-related risks. Both deliverables were agreed under the Sustainability Pillar of the BCB's institutional agenda (Agenda BC#) and subject to public consultation early this year. The disclosure rule was inspired by but not limited to the TCFD recommendations. The scope was enlarged to include social and environmental issues deemed

important for Brazil. The disclosure requirements will be implemented in two phases: the first one, in 2021, addresses qualitative aspects related to governance, strategy, and risk management, and the second one, launched in 2022, will address quantitative aspects such as metrics and targets. Building on the experience of the Pillar 3 standard of the Basel framework, information shall be disclosed in a standardised report ("GRSAC Report"), consisting of templates specific to each aspect and subject to principles of proportionality that consider the institution's size and risk profile, with the aim of achieving consistency and comparability.

Box 31

Facilitating constructive dialogues based on TCFD recommendations

The **Financial Services Agency** in Japan (JFSA) believes that facilitating constructive dialogues between companies and investors through disclosures is important to improve corporate value and the sophistication level of investors' risk management capabilities. With this belief, financial and non-financial companies have to disclose material information to investors as required by legislation and supervisory guidelines.

As the importance of ESG matters has been increasingly recognised, in 2019, JFSA amended the Cabinet Office Ordinance and developed the 'Principles' with 'Good Practices' to enhance disclosures of narrative information. Good Practices include examples of disclosed quantitative metrics. In 2020, it revised the Stewardship Code to articulate the consideration of ESG elements.

With regard to climate-related disclosure, in its strategy for sustainable development goals (SDGs) (2018) and Annual Policy (2020), JFSA declared its expectation on the use of TCFD recommendations. This was effectively linked to the establishment of the TCFD Consortium, a platform to facilitate engagements between business and financial sector. The Consortium published several guidance reports on TCFD-based disclosures. In June 2021, JFSA and Tokyo

Stock Exchange revised the Corporate Governance Code, requiring prime market-listed companies to disclose TCFD-based information.¹

Furthermore, JFSA established the Expert Panel on Sustainable Finance (EPSF) to explore ways to mobilise private capital for a smooth transition towards a decarbonised society. In June 2021, the EPSF published a *set of recommendations* for the JFSA, which highlighted the importance of active participation in the IFRS process and enhancement of the quality and quantity of climate-related disclosures in accordance with the TCFD recommendations.² Building on these recommendations, JFSA announced the establishment of a working group under the Financial System Council to discuss further with broad stakeholders on disclosure system including sustainability, which contributes to constructive dialogue between listed companies and investors. In its *annual strategy* published in August 2021, JFSA reaffirms that it will enhance the quality and quantity of climate-related financial disclosures of listed companies based on the revised Corporate Governance Code and will consider approaches to encourage listed companies to disclose their sustainability-related initiatives under the Financial System Council.

1 See <https://www.fsa.go.jp/en/news/2021/20210611.html>

2 See <https://www.fsa.go.jp/en/news/2021/20210618.html>

CDP or the SASB. Respondents also referred to voluntary classifications and principles such as the UNEP-FI Principles for Responsible Banking, the Equator Principles and the Green Bond Principles. Moreover, one third of respondents expressed support for the TCFD recommendations as a staple framework for voluntary reporting of climate-related disclosures.

However, most NGFS respondents stressed that no single framework or set of standards was considered comprehensive for climate-related and environmental disclosures by regulated financial institutions. Instead, they referred to a combination of local requirements and international standard-setting initiatives.

Supervisory expectations

42% of respondents have set up supervisory expectations on climate-related and environmental disclosures to promote better management of financial risks arising from climate change and environmental degradation and to increase transparency about climate-related and environmental risks when making financial decisions.

Most supervisors are issuing non-binding guidance to set their expectations and refer to various frameworks to foster consistency and comprehensiveness in voluntary disclosures by financial institutions. One-third of supervisors expect financial institutions to consider the TCFD

Box 32

Setting supervisory expectations on climate-related and environmental disclosures

The **Monetary Authority of Singapore (MAS)**'s Guidelines on Environmental Risk Management (see **Table 3**) set out supervisory expectations on the disclosure of environmental risk by regulated banks, insurers and asset managers. MAS expects financial institutions to take a risk-based approach when disclosing material environmental risk, commensurate with their size, nature of activities and risk profile. They are expected to disclose both their approach to managing environmental risk and the potential impact of such risk on their operations (including metrics such as exposures to high-risk sectors). MAS' Guidelines directly refer to the four TCFD pillars of governance, strategy, risk management and metrics and targets. MAS recognises that disclosure standards are continuing to evolve, and will continue to monitor developments on international reporting frameworks, and work with the industry to strengthen disclosure practices. On this front, MAS will consult the financial industry in 2021 on how existing disclosure expectations can transition into legally binding requirements to disclose against a single, internationally aligned standard.¹

The **European Central Bank (ECB)** *Guide on climate-related and environmental risks* explains how the ECB expects banks to transparently disclose relevant information

on climate-related and environmental risks. As per the European regulatory framework, financial institutions must disclose information that is likely to influence the economic decision-making of market participants. To that effect, financial institutions are expected to consider all qualitative and quantitative information on their risk profile, including information associated with the adverse environmental impacts of the institutions' activities that may result in reputational and/or liability risks. In substance, the ECB expects financial institutions to disclose their exposures to climate-related and environmental risks with due regard to the European Commission's Guidelines, which, in turn, build on the TCFD recommendations. In particular, the ECB expects that financial institutions disclose key performance and risk indicators relating to climate-related and environmental risks, scope 3 financed emissions, underlying methodologies and definitions. ECB supervisors' assessment of 125 of the largest EU financial institutions concluded that less than 3% of them disclose even a minimum set of information, indicating the urgent need to accelerate progress. The ECB announced that it will assess all supervised financial institutions' latest disclosures to identify remaining gaps and follow up on them in the supervisory dialogue.

¹ *Being the Change We Want to See: A Sustainable Future* – Speech by Mr Ravi Menon, Managing Director, Monetary Authority of Singapore, at Launch of Inaugural MAS Sustainability Report, 9 June 2021.

recommendations. Furthermore, 16% of respondents have set up these expectations in cooperation with other national regulatory authorities and legislators.

Desired modalities, scope and content of disclosures

Looking ahead, a majority of respondents are in favour of mandatory climate-related and environmental disclosure requirements to better understand these risks, thus contributing to better decision making.

Around 38% of respondents see benefits in expanding Pillar 3 requirements to climate-related and environmental disclosures. For a majority, the disclosure requirements should apply to all regulated financial institutions on a consolidated basis while safeguarding proportionality for smaller entities.

24% of respondents expect financial institutions to disclose their strategy, business model, governance, risk management and key metrics in accordance with the TCFD recommendations. Another 24% of respondents expect financial institutions to

disclose the risks, impacts and opportunities arising from climate change and four supervisors expect financial institutions to disclose climate-related data (e.g. greenhouse gas emissions, scopes 1, 2, 3).

The majority of respondents (60%) consider investors as the most important audience. Nonetheless, the same percentage of respondents support a materiality assessment of climate-related and environmental disclosures reflecting both the expected impacts on the entity's value creation and the impacts of the entity's activities on the environment (which most respondents refer to as 'double materiality assessment'). The responses from the NGFS members confirm that the TCFD recommendations have gained widespread support across jurisdictions. However, while the responses demonstrate the progress made by financial institutions to provide voluntary climate-related information, supervisory assessments also highlight shortcomings in disclosures and a lack of comparability. Consequently, a trend emerges amongst some jurisdictions towards mandatory reporting (see **Box 33**). In some jurisdictions, such reporting is based on a taxonomy defined by public authorities (see **Box 34**).

Box 33

Towards mandatory disclosures

On 1 July 2020, the **Bank of England** (BoE), following the *Statement 3/19*, published its *supervisory expectations* for enhancing banks' and insurers' approaches to managing the financial risks from climate change, with a Dear CEO letter from Sam Woods with more detailed guidance on how they should meet the Bank's supervisory expectations by the end of 2021. The **Prudential Regulation Authority** (PRA)'s expectations and supervision of the disclosures of financial risks generated by climate change are undertaken through banks' and insurers' Pillar 3 disclosures. The BoE/PRA also consider non-financial corporate disclosures to be relevant to their mandate, as without it, financial sector firms are unable to fully disclose their own exposures. A joint United Kingdom (UK) government and financial regulator taskforce published an *Interim Report and Roadmap* in November 2020, charting a path towards mandatory TCFD-aligned disclosure rules across the UK economy

by 2025. The roadmap sets out indicative measures to be taken by sector-level regulators/government departments across seven organisation types: listed commercial companies; UK-registered companies (including large private companies); banks and building societies; insurance companies; asset managers; life insurers and FCA-regulated pension schemes; and occupational pension schemes. Currently, there are no fully mandatory measures in place in the UK in relation to climate-related risk disclosure. However, the UK has announced its intention to make TCFD-aligned disclosures mandatory across the economy by 2025, with a significant portion of mandatory requirements in place by 2023. Additionally, there is also one measure that is considered very close to mandatory; namely the requirement brought in on 1 January 2021 by the Financial Conduct Authority (UK's conduct regulator) requiring premium-listed companies to disclose TCFD.

Disclosure against taxonomies of green and non-green activities

Some jurisdictions have taken steps to establish classifications of sustainable economic activities and coordination efforts at international level are ongoing. For instance, the **International Platform on Sustainable Finance (IPSF)** will publish a Common Ground Taxonomy (CGT) Report in Autumn 2021, to provide a unique common reference point for the definition of environmentally sustainable activities. The CGT will be based on existing taxonomies developed by public authorities of IPSF member jurisdictions.¹ Such classification systems are expected to provide useful criteria to identify activities that are environmentally sustainable. Alignment with a commonly accepted taxonomy may be regarded as an indicator of low transition risk at activity level.

Disclosure at entity level of alignment against these taxonomies can potentially provide insights into the level of transition risks faced by the disclosing entity, although they primarily reflect an assessment of the sustainability impacts of economic activities rather than the associated financial risks. This has been implemented by Article 8 (1)

of the **European Union (EU) Taxonomy Regulation**, which aims to increase transparency and prevent greenwashing by requiring disclosure of Taxonomy alignment of revenues, operating expenditure and capital expenditure by financial and non-financial undertakings within the scope of the Non-Financial Reporting Directive (NFRD). In April 2021, the European Commission issued a proposal for a *Corporate Sustainability Reporting Directive (CSRD)* that would replace the NFRD, expand its scope and require disclosure according to mandatory reporting standards (including indicators) to be developed in coherence with the Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy. In addition, the EU is considering whether to develop a taxonomy to cover activities that are significantly harmful to environmental objectives. To the extent such a taxonomy is created, disclosure against both green and non-green taxonomies could provide useful insights for financial institutions about their underlying counterparty exposures. Similar disclosure by financial institutions, for example the Green Asset Ratio,² can provide supervisors some insight into their supervised entities' transition risk exposures.

1 Public authorities from Argentina, Canada, Chile, China, the European Union, Hong Kong, India, Indonesia, Japan, Kenya, Morocco, New Zealand, Norway, Senegal, Singapore, Switzerland, and the United Kingdom.

2 Proposed in March 2021 by the European Banking Authority as part of a set of key performance indicators (KPIs) in response to the European Commission's call for advice on KPIs and related methodology for the disclosures by credit institutions.

5.3 Focus Area 12: Promote comparable, consistent and reliable climate-related and environmental disclosures, including by considering aligning with commonly accepted baseline frameworks or standards and future international reporting standards

Supervisors are expected to contribute to mitigating fragmentation and improving the consistency, comparability, and reliability of climate-related and environmental disclosures. In line with this, the NGFS identifies five key considerations with regard to supervisory expectations on disclosures, in addition to **Focus Area 1** on definitions of climate-related and environmental risks

(mentioned in **Chapter 2**), which is also relevant in the context of disclosures.

Adoption of commonly accepted frameworks or standards

It is worth considering ensuring consistency of these supervisory expectations with an internationally agreed-upon baseline disclosures framework or standard (or a set of them), or at least ensuring interoperability between global baseline of international standards and their jurisdiction-specific expectations to ensure comparability of disclosed data. Alignment with the TCFD recommendations for climate-related disclosures, as encouraged in the NGFS Guide, is helpful to promote the use of consistent disclosures principles in voluntary climate

related reporting. This is aligned with the G7 countries' support to move towards mandatory TCFD based reporting, in line with domestic regulatory frameworks. In relation to environmental information, various frameworks such as CDSB, GRI and SASB may provide a starting point for supervisors. It is crucial to consider that existing frameworks and standards seek to capture different materiality perspectives, as stressed in section 5.1. Additionally, it is important to follow the current discussion for achieving a comprehensive global architecture of standards by the IFRS Foundation, that jurisdictions can build on to address their specific needs and mitigate fragmentation. The work to be undertaken by the TNFD on environmental risks, to which G7 countries look forward, may provide useful insights for future development of environmental disclosure standards by standard setting bodies.

Materiality perspective

It is important to reflect a materiality perspective based on the impact of climate-related and other environmental factors on the financial entities' development, financial performance and position over the short, medium and long term horizons. In line with the concept of dynamic materiality, there is perhaps no hard line between financial materiality and double materiality.⁶⁹ For prudential oversight purposes, supervisors primarily consider financial risks borne by financial institutions and their implications on financial stability. However, their ongoing efforts to explain the transmission of climate-related and environmental risks to the financial system may also contribute to expanding the scope of information that are considered relevant by stakeholders and can increasingly translate into risks and opportunities, which affect financial institutions' financial performance and position.

As a consequence, unless supervisory expectations refer to a disclosure framework clarifying how materiality assessments should be carried out, it is useful to ensure that supervised financial institutions periodically reassess the risks that affect their development, performance and position and the corresponding disclosures.

⁶⁹ See European Commission (2019) *Guidelines on non-financial reporting: Supplement on reporting climate-related information*

⁷⁰ Partnership for Carbon Accounting Financials (PCAF) is an industry led open source accounting approach that financial institutions can use to measure financed emissions for baselining and tracking of progress against targets. PCAF and the Science Based Targets Initiative (SBTi) collaborate to enable financial institutions to align portfolios with the Paris Agreement. SBTi is currently developing a global standard for net zero to enable stakeholders to assess the credibility of net zero targets.

Disclosure of key metrics

Promoting the development of a set of core, calculable and widely applicable metrics on climate-related and environmental issues is important to ensure availability, granularity, consistency and comparability. One of the three key building blocks of the NGFS Progress Report on Bridging Data Gaps is to work towards a common set of well-defined and decision-useful metrics. Supervisory expectations can be prescriptive and specific as far as practicable. Some of these metrics should be greenhouse gas emissions, in absolute terms, including financial institutions' financed scope 3 carbon emissions, or the share of assets in economic activities that are associated either with environmental sustainability, especially in jurisdictions which have developed taxonomies, or with environmentally harmful effects. In particular, for financial institutions that have disclosed or plan to set net zero emissions targets, supervisors can consider sharing useful references such as science-based methodologies and standards⁷⁰ to support financial institutions in setting targets and monitoring progress.

Pragmatic step-wise approach

It is important to acknowledge the current state of play regarding the level of capacity, data availability and progress around measurement methodologies for climate-related and environmental risks, with climate being far more advanced notwithstanding the potential materiality of other environmental risks. Supervisors can consider that financial institutions, according to the NGFS Progress Report on Bridging Data Gaps, should leverage already available data sources, using proxies and estimates, as well as qualitative approaches, while they build up capacity to enhance their ability to process quantitative and more granular climate-related data. In practice, in line with the climate first approach proposed by IOSCO and the IFRS Foundation, a set of more prescriptive expectations for climate-related risks, based on existing frameworks such as TCFD, can be considered. Thereafter the scope can be expanded to environmental risks, when disclosure standards for other environmental risks are

developed. However, disclosures should cover material risks to entities, so their scopes should be guided primarily by a materiality assessment, not by the granularity of available data and the sophistication of existing methodologies. Where environmental risks are deemed material or likely to be material, entities may rely on proxies and estimates, as well as qualitative approaches, as suggested above for climate-related risks. Complementary, different regional approaches can be useful, considering that all jurisdictions are impacted by different types of environmental and climate-related risks and may also have specific public policy objectives.

Audit trail

Moreover, it is important to take steps to ensure reliability of disclosures. While further progress in the standardisation of climate-related and environmental information is needed before considering an external audit requirement, as part of supervisory expectations, supervisors may highlight that the reliability of public disclosures should be secured by adequate internal control procedures and internal governance arrangements. Thus, disclosures should be consistent with the internal risk management and reporting procedures of financial institutions. When an institution voluntarily reports a metric, it should provide adequate background about the framework or internal methodology used or report

variability around any estimates disclosed. In addition, if a financial institution reports a metric subject to high measurement uncertainty, it should further provide a sensitivity analysis to the key parameters and inputs. Supervisors can also consider recommending reporting standards that have linkages to financial statements and can form the basis for the development of an audit and assurance framework. This will significantly enhance the reliability of disclosures.

Finally, there is an increased need for supervisors to advocate coordination with relevant agencies to promote harmonised, comparable and consistent disclosure from non-financial companies, as legislation on their disclosures may not be under central banks' and supervisors' mandate. Indeed, supervisors should also consider that non-financial disclosures (including small and medium enterprises) represent the first input into the data chain and financial institutions need to gather information from the companies they invest in, lend to or insure, to better understand and measure the environmental risk exposure and the climate impact of their investment, insurance and lending activities. Furthermore, to ensure reliability of disclosures, supervisors could advocate coordination with relevant agencies to mitigate the potential issue of multiple reporting of climate-related data and information, by ensuring consistency and coherence between disclosure requirements set out in regulations on non-financial and financial reporting.

6. Looking forward

NGFS supervisors acknowledge that more needs to be done to effectively integrate climate-related and environmental risks into their supervisory frameworks, even as they have been making noticeable progress since 2019. Most supervisors have defined work programmes which they are continuing to implement or starting to review, with the recommendations of the NGFS Guide often used as a source of reference.

Many supervisors plan to or will be undertaking further work to enhance their assessment of climate-related and environmental risks, particularly on scenario analysis, stress testing and furthering their understanding of impact from biodiversity losses. While only a limited number of supervisors had conducted forward looking exercises for climate-related risks before the survey for this Progress Report, about one third of survey respondents planned to do so in the following 12 months, with a small number planning to expand such exercises to other environmental risks. Some supervisors will also look to increase their breadth of understanding of environmental risks beyond those that are climate-related, with work launched or planned on biodiversity loss in particular. Progress in these two areas will also be dependent on further work on data and disclosures, as well as supervisors' ability to build capacity. Supervisors also intend to further engage relevant stakeholders, starting with financial institutions and other supervisors, and participate in international fora and standard setting bodies, which have been beneficial in facilitating knowledge exchange and in contributing to convergence of supervisory best practices.

The 12 Focus Areas and the case studies of current supervisory practices highlighted in this Progress Report could serve as useful references for supervisors at varying stages of integrating these risks into their supervisory frameworks. Depending on their progress on each of these Focus Areas, a supervisor can choose to dive deeper into selected ones, learn from the experience of others and decide whether to adopt or adapt the good practices accordingly to suit their domestic needs. It is

hoped that through this approach, the NGFS Progress Report will help to further uplift supervisory capabilities and lead to greater convergence of global supervisory practices.

In line with the priorities identified in this Progress Report, the NGFS is also planning work on the following areas to better support supervisors:

- **The NGFS is launching a capacity building initiative,** which aims to address the needs expressed by supervisors in implementing practices highlighted in the NGFS Guide, this Progress Report, and other NGFS material. This represents NGFS' contribution to the *Climate Training Alliance* comprised of the BIS, IAIS, SIF and NGFS.
- **The NGFS is continuing its work to identify and prioritise data needs, enhance the availability, reliability and comparability of climate-related data, and develop policy recommendations to bridge the data gaps identified.** A final report will be published towards the end of the year.
- **The NGFS will deepen its work on risk assessment methodologies and metrics, including building on the second iteration of NGFS scenarios.** On the Phase II NGFS scenarios, further work will be undertaken to provide additional sectoral granularity, whilst building on case studies to inform their practical application.
- **The NGFS will further examine risk differentials between green and non-green assets,** which may contribute to the review of regulatory frameworks that many of its members and observers are conducting or intend to conduct in the coming years.
- **The Joint NGFS-INSPIRE Study Group on Biodiversity and Financial Stability will continue to explore whether and how central banks and supervisors can, within the remit of their mandates, play a role in addressing the risks posed by biodiversity loss** and the knowledge gaps around it.

Acknowledgments

This Progress Report on the NGFS Guide for Supervisors is a collaborative effort of the members of the Workstream on supervision and micro-prudential practices of the NGFS. This document was prepared under the auspices of Carine Moreira de Almeida Bastos (Banco Central do Brasil), serving as team lead with support from the chair of the Workstream, Goh Gek Choo and previously Wong Zeng Yi (Monetary Authority of Singapore), and from the NGFS Secretariat, Erlan Le Calvar, Marion Aubert and Renaud Concordet (Banque de France).

This document relies on the analysis and drafting work of a dedicated team composed of Workstream members. The NGFS is especially thankful to Paola Arias Gómez (Superintendencia Financiera de Colombia), Yue (Nina) Chen (New York State Department of Financial Services), Jack Collings (Monetary Authority of Singapore), Marina Moretti (International Monetary Fund) and Najwa Mouhaouri (Bank Al-Maghrib) for assisting the team lead and the NGFS Secretariat in coordinating the work of the team. Other team members included Sarah Delvigne, Alexandre Dubois, Kevin Guibert, Juliette Henry, Pierre Meignant, Ariane Mesnard and Gabrielle Siry (Autorité de Contrôle Prudentiel et de Résolution – Banque de France), Marco Laes (Banco Central do Brasil), Jose Ramon Canales Santander (Banco de España), Hector Resendiz (Banco de México), Patrícia Palhau Mora (Banco de Portugal), Rajaa Rochd (Bank Al-Maghrib), Ma. Belinda G. Caraan and Mary Ann L. Cube (Bangko Sentral ng Pilipinas), Nurhazrina Hamzah, Sellina Hutagalung, Vicknesh Rajkumar and Suraya Sani (Bank Negara Malaysia), James Rowe (Bank of England), Stephan Ah-kine and Urvashi Soobarah (Bank of Mauritius), Siripim Vimolchalao, Piyawan Khemthongpradit, Nualprang Sa-nguansak, Wichapon Suthasineenont, Thammachart Thammaprateep, and Pailin Rojrattanachai (Bank of Thailand), Jérôme Weicker (Commission de Surveillance du Secteur Financier – Luxembourg), Anneke Harbers (De Nederlandsche Bank), Craig Davies (European Bank for Reconstruction and Development), Raphaël Poinet and Guan Schellekens (European Central Bank), Philip Gollmann and Julia LEMONIA Raptis (Financial Market Authority – Austria), Stefan Gross and Thomas Koch (Financial Market Supervisory Authority – Switzerland), Sina Hbous (Financial Regulatory Authority – Egypt), Leonard Kipkemoi Chumo, Caio Fonseca Ferreira, David Rozumek (International Monetary Fund), Fejes Tibor (Magyar Nemzeti Bank), Weilun Lim and Jeanne Stampe (Monetary Authority of Singapore), Christiaan Henning, Ashendran Padayachee, Shanthessa Ragavaloo and Janet Terblanche (South African Reserve Bank), Marc Schrijver (World Bank).

The NGFS is also grateful to its other members and observers as well as other members of the Secretariat for providing comments and contributing materials to this document.

List of tables and boxes

List of Tables

- Table 1** Examples of transmission channels for environmental risks
- Table 2** Examples of risk assessment approaches used by NGFS members
- Table 3** Examples of supervisory expectations published by NGFS members

List of Boxes

- Box 1** Methodology of NGFS surveys
- Box 2** Incorporating climate-related and environmental risks into supervisory objectives
- Box 3** Including social-environmental and climate-related risks as a supervisory priority
- Box 4** Developing a strategy that feeds into the broader political agenda
- Box 5** Adopting a phased approach that involves supervised entities
- Box 6** Enhancing resources progressively
- Box 7** Raising awareness among internal and external stakeholders
- Box 8** Skilling up through partnerships
- Box 9** Technical assistance and capacity building through international networks
- Box 10** Categorising the sources of environmental risks in a consistent manner
- Box 11** Leveraging on external stakeholders for climate and environmental analysis
- Box 12** Assessing the impact of biodiversity loss on the financial sector
- Box 13** Bridging data gaps through international cooperation
- Box 14** Using a Socio-Environmental Residual Risk Matrix
- Box 15** Quantifying climate-related risks of insurers through available tools
- Box 16** Using heat maps for qualitative assessments
- Box 17** Typology of forward looking methodologies for climate-related risks
- Box 18** Quantifying climate-related risks of banks and insurers through pilot exercises
- Box 19** Engaging with external stakeholders prior to the development of supervisory expectations
- Box 20** Requiring proportionate and gradual implementation
- Box 21** Adapting supervisory expectations to smaller banks
- Box 22** Setting granular supervisory expectations under the current prudential framework
- Box 23** Incorporating self-assessments by supervised entities into supervisory programmes
- Box 24** Ensuring consistency of assessments through a supervisory handbook
- Box 25** Identifying best practices through stock-taking exercises
- Box 26** International recommendations for climate-related risk supervision in the insurance sector
- Box 27** Integrating ESG risks into the SREP
- Box 28** Integrating environmental risks in the ICAAP
- Box 29** Supervising the use of climate-related scenarios in the ORSA
- Box 30** Consulting stakeholders on disclosure requirements including TCFD disclosures
- Box 31** Facilitating constructive dialogues based on TCFD recommendations
- Box 32** Setting supervisory expectations on climate-related and environmental disclosures
- Box 33** Towards mandatory disclosures
- Box 34** Disclosure against taxonomies of green and non-green activities