



Monetary Authority of Singapore

**INFORMATION PAPER ON
ENVIRONMENTAL RISK MANAGEMENT
(BANKS)**

May 2022

CONTENTS

1	Overview.....	3
2	Governance & Strategy	6
2.1	Focus Area 1: Corporate Governance	6
2.2	Focus Area 2: Strategy	8
2.3	Focus Area 3: Risk Appetite	9
2.4	Focus Area 4: Reporting.....	10
2.5	Focus Area 5: Behaviour Alignment.....	11
3	Risk Management.....	13
3.1	Focus Area 1: Identification and Approach to High-Risk Sectors.....	13
3.2	Focus Area 2: Due Diligence and Risk Assessment	16
3.3	Focus Area 3: Risk Mitigation and Client Support.....	21
3.4	Focus Area 4: Scope of Risk Impact	23
4	Scenario Analysis.....	25
4.1	Focus Area 1: Scenario Selection and Development	25
4.2	Focus Area 2: Analytical and Methodological Choices	26
4.3	Focus Area 3: Usage of Results	29
5	Capacity Building & Culture.....	32
5.1	Focus Area 1: Board and Senior Management	32
5.2	Focus Area 2: Organisational Culture and Capacity Development	33
6	Disclosure.....	35
6.1	Focus Area 1: Form, Frequency and Review of Disclosures.....	35
6.2	Focus Area 2: Reporting Frameworks Utilised.....	36
6.3	Focus Area 3: Climate-Related Disclosures Under TCFD Recommendations	37
6.4	Focus Area 4: Assurance	41
6.5	Focus Area 5: Disclosures for Environmental Risks Beyond Climate	42
7	Key Challenges	44
7.1	Data and Methodology	44
7.2	Skills Shortage	46
7.3	Reliance on Head Office.....	47
8	Abbreviations.....	49

1 OVERVIEW

The transition to a sustainable future involves real economy transformation and presents significant risks and opportunities to the financial system. To strengthen the banking sector's resilience to and management of environmental risk, the Monetary Authority of Singapore (MAS) issued the Guidelines on Environmental Risk Management for Banks (ENRM Guidelines) in December 2020, setting out supervisory expectations on sound risk management practices. The ENRM Guidelines take effect in June 2022. In January 2021, the MAS-convened Green Finance Industry Taskforce (GFIT) produced a complementary handbook with practical implementation guidance and good practices on environmental risk management.

MAS conducted a survey of selected banks in 2021 ahead of the effective date of the ENRM Guidelines to assess the pace of implementation and to benchmark practices. The 12 banks (referred to collectively as "banks" within this paper) were selected based on a range of factors, including level of maturity of environmental risk management practices and share of Singapore's banking system assets. MAS also met with the banks to dive deeper into their survey responses.

This information paper highlights emerging and/or good practices by selected banks, identifies areas where further work is needed, and serves as a reference for banks as they continue to strengthen their resilience to environmental risk. Banks should assess the applicability of the practices in the paper as they work to bolster their resilience to environmental risk in a way that is commensurate to their size, nature of activities and risk profile. Particular attention should be paid to areas where further work is required, as highlighted in this paper. The practices here are not exhaustive and better approaches will continue to be developed.

Banks were at varying stages of progress in integrating environmental risk considerations into their risk management framework and processes. Majority of the banks expected themselves to be in full compliance with the ENRM Guidelines come June 2022, while the rest were committed to accelerating their implementation. Apart from climate-related risks, banks have yet to make meaningful progress to address other environmental risk factors, such as biodiversity loss.

Banks cited a number of challenges in addressing environmental risks, but work is underway domestically and internationally to address them.

- Need for readily available data that is reliable and comparable: Ongoing work by the International Sustainability Standards Board (ISSB) is expected to result in international convergence to a set of baseline climate disclosure standards. To support banks in gathering data from their customers as they manage risks and identify opportunities in green financing, GFIT has developed the first iteration of an Environmental Risk Questionnaire (ERQ) that will provide a consistent baseline template for data gathering. Where feasible, technological solutions like Project Greenprint will be employed to promote data consistency, comparability and reliability.
- Need for robust methodologies to quantify financial impact: A number of international bodies have issued guidance on best practices on forward-looking risk assessment methodologies to factor in the unprecedented, complex and interconnected nature of environmental risks, such as the Network for Greening the Financial System (NGFS) work on climate scenario analysis. In Singapore, GFIT has launched a series of capacity building workshops to deepen knowledge and strengthen capabilities in environmental risk management. MAS will also incorporate a range of thematic climate scenarios as part of the 2022 Industry-Wide Stress Test exercise, to encourage the collaborative development of capabilities in climate risk scenario analysis and assessment.

- **Increased demand for staff skilled in sustainable finance:** MAS and industry stakeholders are collaborating to facilitate a strong talent pipeline, through supporting centres of excellence and training providers to strengthen sustainable finance skills and capabilities.

Banks' actions to address environmental and climate-related risk, including their transition plans, are also under increasing scrutiny by stakeholders. While stakeholders have rightly called for a swift transition, indiscriminate credit withdrawal from sectors deemed to be of higher climate-related risks would adversely impact companies with credible transition plans and increase the risk of stranded assets and a disorderly transition. Banks have therefore had to manage their reputational risk against this backdrop as they work towards supporting an orderly transition.

Standard setting bodies, international bodies and local regulators are progressively setting out supervisory expectations and regulations that banks will need to consider. In this regard, the Basel Committee on Banking Supervision's Task Force on Climate-related Financial Risks (BCBS TFCR) has consulted on a set of 'Principles for the Effective Management and Supervision of Climate-related Financial Risks' in November 2021, that set out a principles-based approach on banks' management and supervisors' practices related to climate-related financial risks.

MAS will continue to partner with banks to accelerate their efforts in:

- **Translating their environmental risk strategy and risk appetite into concrete milestones and tangible targets for action.** This includes actions to be taken within the bank to support progress towards more sustainable operations and to steward their clients' transition in accordance with science-based transition pathways (e.g. sector policies).
- **Deepening the understanding of the potential impact and consequences of environmental risk, both within their own institution and from their financed emissions.** Within banks, this would include building forward-looking risk assessment capability, further work on risks manifesting beyond credit risks, as well as developing an understanding of environmental risks beyond climate change. In relation to financed emissions, this would include building awareness among clients and financing the change necessary to avert materialisation of credit events related to environmental risk.
- **Designing and executing necessary changes to internal and external processes to effect and sustain meaningful outcomes,** including embedding environmental risk considerations into business-as-usual process (e.g. data, risk management infrastructure and processes, and credit decisioning) to mitigate potential risks arising from greenwashing and transition-washing.
- **Being accountable to stakeholders in relation to environmental risk by disclosing and explaining potential impact on business and risk implications.** This would include clearly communicating the implications on the bank and its clients arising from financing decisions (such as through sector policies) and the bank's progress in meeting decarbonisation targets (including financed emissions).

Banks have to set tangible targets to address environmental risk with urgency and ambition. This will allow them to track rapidly evolving industry best practices and act before the global window of opportunity to stave off the worst effects of climate change closes. Climate-related risks are expected to materialise as temperatures rise¹ – it is not a matter of if, but a matter of when and how. Banks

¹ Intergovernmental Panel on Climate Change (IPCC)'s Sixth Assessment Report, Regional Fact Sheet for Asia, highlights that weather patterns are expected to change (e.g., increase in average and heavy precipitation, continued rise in sea level and increases in heat extremes).

should continue to push ahead even with imperfect information as hesitation to act would be costly, both for banks themselves and for the broader economy that they finance.

2 GOVERNANCE & STRATEGY

Strong governance and a clear strategy are foundational to sound environmental risk management.

Environmental risks can impact a bank on various fronts, hence an enterprise-wide response with the right support from the Board of Directors and senior management is critical. These risks can manifest through various physical and transition risk channels, materialise over uncertain and extended time horizons, and be far-reaching in breadth and magnitude. A bank's strategies will need to set clear direction that is cascaded down for effective implementation to strengthen the bank's resilience to environmental risk and facilitate the transition to a sustainable economy.

Environmental considerations should be integrated into a bank's governance and risk management framework, risk appetite, strategies, and business plans. This would facilitate consistency of the bank's publicly-stated environmental goals and objectives with its internal risk appetites and strategies. Clients, investors, regulators, and other stakeholders now have growing expectations of the need for a bank's leadership to incorporate considerations on environmental risks, as part of their fiduciary and management responsibilities².

Relevant Resources

- GFIT Handbook on Implementing Environmental Risk Management, 2021
- BCBS, Consultative Document: Principles for the effective management and supervision of climate-related financial risks, 2021
- Task Force on Climate-related Financial Disclosures (TCFD), Implementing the Recommendations of the TCFD, 2021
- TCFD Guidance on Metrics, Targets, and Transition Plans, 2021
- Singapore Exchange (SGX) Consultation Paper and Response on Climate and Diversity: The Way Forward, 2021
- The Glasgow Financial Alliance for Net Zero, Our Progress and Plan Towards a Net-Zero Global Economy, 2021
- Climate Financial Risk Forum (CFRF) Guide 2021 – Climate Risk Appetite Statements, 2021
- CFRF Guide 2021 – Climate Data and Metrics, 2021

2.1 FOCUS AREA 1: CORPORATE GOVERNANCE

Environmental risk was defined and scoped in the risk inventory by banks in different ways. Some banks defined environmental risk on its own, while others defined it as part of environmental, social and governance (ESG) risk, responsible financing risk, or sustainability risk. Several banks also further identified climate risk specifically as a critical component of environmental risk.

Banks have defined environmental and climate risks as cross-cutting risk types to be integrated into the bank's enterprise risk management framework progressively. This is in line with the wide-ranging impact of environmental risks, which can translate into financial risks to banks in the form of credit, market, liquidity, and operational risks³, as well as other risks including strategic, reputational, regulatory, and litigation or liability risks.

² For example, company directors in Singapore are obliged by SGX to consider climate change risks as part of their duties to act in the company's best interests. The ENRM Guidelines set out expectations for Board and senior management responsibilities to be incorporated in the environmental risk management framework.

³ Including legal risk

Banks have formalised the roles and responsibilities of Board and Senior Management (BSM) in relation to oversight of environmental risks by:

- (a) Updating the terms of reference of Board-level committees (typically the Board risk management committee), such as to include responsibility for approval of the environmental risk management framework and policies and the environmental risk appetite.
- (b) Updating the terms of reference of management-level committees (typically the executive committee, executive risk committee and/or executive credit risk committee), such as by incorporating responsibilities on the development and implementation of environmental risk management framework, policies and procedures, regular updates to Board on environmental risk matters, the internal escalation process for managing environmental risk, and resource allocation.
- (c) Designating a senior management member or a combination of senior management members, such as the Chief Risk Officer and Chief Credit Officer, to assist the Board and Chief Executive Officer in their governance and oversight on environmental risk management.

In recognition that this is a rapidly developing area, many banks have set up dedicated functions and decision-making bodies. Some examples of such structures include:

- (a) Establishment of dedicated committees that could have a mandate to oversee the development and implementation of the bank's sustainability strategy, including around environmental risk management.
- (b) Appointment of a senior management member with specific coverage on environmental risk management, such as a Chief Sustainability Officer, to drive and coordinate the environmental risk management agenda across the institution.
- (c) Establishment of specialised functions with specific coverage on environmental risks. Examples include a sustainability office and environmental risk management team. These specialist functions supported senior management with their subject matter expertise to discharge their governance and risk oversight duties, including development of policies and procedures, implementation and coordination of the environmental risk management strategy and initiatives, capacity building and training etc.
- (d) Appointment of in-business representatives for sustainability and environmental risk to allow for immediate touchpoints and building of internal expertise within business via a network approach.

Nonetheless, banks also recognise that the integration of environmental risk considerations across the organisation cannot be limited to specific silo functions and are moving in the longer term towards a more integrated structure.

Case Study: Corporate Governance Structure for Environmental Risk ManagementFormalised governance structure with sustainability strategy integrated across the banking group

Environmental risk governance structure and responsibilities are clearly specified in the bank's environmental risk management framework, which has been endorsed by the management level sustainability committee and risk and capital committee and approved by the Board risk management committee.

The management level sustainability committee chaired by Chief Sustainability Officer sets the bank's sustainability strategy and roadmap and ensures sustainability pillars and objectives are implemented through plans by functions across the banking group.

Regular reporting to Board and senior management

The risk management function reports the bank's environmental risk exposures to relevant Board and senior management committees on a quarterly basis, including the bank's exposure to sectors with elevated environmental risks and borrowers under heightened monitoring in the ESG watchlist.

Other good corporate governance structure practices included:

- Inclusion of local representatives in global workstreams to ensure local needs would be considered.
- Appointment of management executives as key sponsors to drive specific initiatives.

2.2 FOCUS AREA 2: STRATEGY

Banks have formulated and implemented strategies and plans, to advance their objectives to manage environmental risks and opportunities that materially impact their businesses and the environments in which they operate. Banks' strategies typically aim to strengthen the bank's environmental risk resilience and capitalise on opportunities from the transition to a sustainable economy. This is usually captured in the bank's sustainability strategy or similar initiatives. Key aspects considered include:

- Improving resilience of their portfolio** - Banks actively quantified existing risks in their portfolio and set out roadmaps to enhance risk management. Risk assessment outcomes (e.g. identification of high-risk sectors) (see Risk Management section) and forward-looking assessments (see Scenario Analysis section) were key inputs supporting the development of roadmaps prioritising material risks. Recognising the growing urgency to transition, banks have developed structured processes to engage clients to support their transition (see Risk Management and Capacity Building & Culture sections).
- Scaling up green and sustainable finance** – Banks are committing funds and setting goals for financing and investing in environmentally sustainable businesses or activities.
- Reducing the environmental footprint of own operations** – Banks have been able to quantify and work towards reducing the environmental footprint arising from their internal operations.

While the details of individual banks' strategies may differ, multiple banks have made public commitments to contribute to the transition to a sustainable economy and combat climate change, including through participation in global initiatives⁴. For example, several banks have made public commitments to net zero targets in line with the goals of the Paris Agreement which include setting interim sectoral and/or geographic targets to reduce emissions in alignment with transition pathways.

Banks have expanded their planning horizon and put in place a structured process to consider the risks and opportunities brought about by environmental issues, in particular climate change, on their business and strategic plans.

- Planning horizon**: Several banks have defined the relevant short-, medium-, and long-term time horizons considered, and the specific environmental-related issues arising in each time horizon that could have a material financial impact on the bank. While climate change risks may only fully materialise over the longer term, banks are increasingly incorporating such considerations into the short- and medium-term horizons to account for the physical and

⁴ At the international level, these include the Paris Agreement, United Nations Environmental Program Finance Initiative Principles for Responsible Banking, and the recent Glasgow Financial Alliance for Net Zero, which includes the Net Zero Banking Alliance.

transition risks that have already begun to materialise. These shorter timeframes also facilitate the incorporation of environmental risks into short-term business planning horizons.

- (b) Impact on business strategy: A few banks have a structured process to integrate environmental risks into their regular monitoring of the business environment. A few banks conducted studies to evaluate how environmental risks such as climate change and environmental degradation are changing market dynamics that would influence the business environment and competitive landscape, and the bank's business and plans.

Case Study: Regular management report to facilitate adjustments to strategies and risk appetite

One bank incorporated a quarterly Environmental and Social Risk Monitor (ESR Monitor) report for management reporting to its group executive committee. The ESR Monitor is used to report emerging ESR risks such as industry developments and risk trends, sensitive sectors, and the bank's management of these risks. Based on this analysis and considering the potential impact on its business and risk profile, the bank may adjust its strategies and risk appetite as necessary.

2.3 FOCUS AREA 3: RISK APPETITE

Most banks had taken steps to address environmental risk in their risk appetite framework. Some banks have developed a qualitative risk appetite statement, while looking to introduce quantitative risk appetite measures. Some banks that have developed initial environmental risk appetite measures were looking to expand their measures to provide more comprehensive risk oversight and control.

- (a) Qualitative risk appetite: Banks have developed a qualitative risk appetite statement to articulate their approach towards financing environmentally sensitive activities. For example, one bank articulated the usage of its risk management framework (such as through exclusions or limitations on lending to industries with material environmental risks) to control environmental risk exposure in its qualitative risk appetite statement.
- (b) Quantitative risk appetite: A few banks have developed quantitative risk appetite measures and metrics to monitor and take actions to manage risk in alignment with their risk appetite. These took the form of quantitative key risk indicators, limits, and tolerance levels. Examples of quantitative risk appetite measures observed included:
- Proportion of exposures to extreme transition and physical risk buckets.
 - Proportion of exposure concentration to sectors identified by the bank as posing high transition risk.
 - Share of coal in the primary and secondary energy mix financed by the bank, in line with the bank's objective to limit its commitments to coal financing.

Care would need to be taken by banks when translating their risk appetite into metrics so as not to result in unintended consequences. For example, a sudden and collective withdrawal of credit from industry sectors deemed to be of higher climate-related risks could cut financing prematurely and deprive firms of the opportunity to transit.

Further work required to:

- Set a risk appetite clearly articulating the risks, both in qualitative and quantitative terms, in a manner that facilitates strategic alignment of organisational targets across the business (including through use of metrics that can be monitored).

2.4 FOCUS AREA 4: REPORTING

Congruent with their corporate governance structure and risk appetite, most banks have established processes and controls for regular monitoring, reporting, and escalation to the Board and senior management on salient environmental risk management matters. Such reporting included topical issues (e.g. regulatory developments), the effectiveness of the bank's environmental risk management controls and the implementation progress of environmental risk management roadmaps or initiatives.

Banks consider collection of risk data, and by extension, risk data aggregation as important to enable them to position themselves for the transition to a sustainable economy. Infrastructure enhancements and investments⁵ may be necessary to identify, collect, cleanse, and centralise the data necessary to assess material climate and environmental-related financial risks.

The reporting of quantitative risk indicators to management was less developed and varied across banks. Only a few banks had developed management reporting capabilities on the relevant quantitative data required for management to exercise oversight of environmental risk comprehensively. These banks have reported quantitative indicators such as a heatmap of environmental risk exposures with sector and risk breakdown, exposures to carbon-related assets, exposures to higher transition risk sectors, exposure of bank operations to physical risks, and carbon footprint.

Deep dive: Examples of Key Environmental-related Indicators used in Management Reporting

Metrics supporting environmental risk resilience

- Portfolio resilience
 - Open regulatory findings and fines linked to climate
 - *See Risk Management section for more*
- Operational resilience
 - Potential financial and operational impact of physical risks on bank operations
 - Actual financial and operational impact of physical risks on bank operations

Metrics supporting sustainable finance

- Sustainable financing and investment provided
- Net new flows of sustainable investments in assets under management and assets under deposit
- Balance sheet assets qualifying as green or sustainable or transition

⁵ These could include processes to (i) collect additional data from clients where necessary to develop a better understanding of client transition strategies and risk profiles; (ii) integrate and aggregate data from external data providers; (iii) review use of proxies and assumptions where data is not yet available; and (iv) ensure accuracy and reliability of aggregated data. Institutions should also take into account the need to incorporate new data requirements given the evolving understanding of climate and environmental-related financial risks and need to produce timely reports.

Metrics supporting own environmental footprint

- Greenhouse gas (GHG) emissions per headcount across scope 1,2 & 3
- *See metrics required by SGX and ISSB for more*

Further work required to:

- Enhance risk data aggregation and reporting capabilities to facilitate management oversight (including setting up necessary risk infrastructure, identification of appropriate quantitative metrics).

2.5 FOCUS AREA 5: BEHAVIOUR ALIGNMENT

Banks have established key performance indicators (KPIs) in the form of metrics and targets to monitor the bank's progress in achieving strategic objectives. These performance measurement indicators are quantifiable and tracked at the relevant governance and risk committees.

Banks have started incorporating environmental risk management into their incentive structures, to link incentives to performance, promote desired conduct and drive accountability for delivering target outcomes. One bank incorporated customised sustainability related objectives across functional and regional scorecards, including the risk management function, to strengthen the link between sustainability and remuneration for individuals and functions with specific roles in sustainability and environmental risk management. As banks incorporate ESG considerations in their compensation frameworks, robust governance should be applied as non-financial measures will require a greater reliance on judgement⁶.

Case Study: Incorporation of sustainability KPIs in incentive structure

A bank had a structured process to incorporate sustainability KPIs and targets to its balanced scorecard incentive structure to set objectives, drive behaviours, measure performance, and determine the remuneration of staff.

Sustainability is defined as a specific area of focus in the bank's balanced scorecard. The bank's sustainability leadership committee developed an annual sustainability balanced scorecard tracking the sustainability initiatives taken and the performance achieved. Performance would be evaluated qualitatively and quantitatively based on the objectives and KPIs set on the sustainability balanced scorecard, at the group (enterprise level), as well as at key business and support units' level (department level).

Another potential means of aligning incentives is through the internal funds transfer pricing mechanism. While it may be challenging to establish and quantify climate and environmental risk differentials, banks may consider incorporating strategic adjustments to internal pricing where appropriate to facilitate implementation of their strategy, such as to incentivise green assets.

⁶ Financial Stability Board (2021), "Effective Implementation of FSB Principles for Sound Compensation Practices and Implementation Standards: 2021 Progress Report"

Further work required to:

- Integrate and embed climate and environmental risk considerations in the bank's existing processes, to facilitate implementation of strategic targets (including through incentive structures and internal pricing).

3 RISK MANAGEMENT

The holistic management of environmental risk requires a systematic and consistent approach across a bank's risk management frameworks and processes, namely risk identification, assessment, monitoring and reporting, and mitigation. To adequately address potential material risks at the institution, portfolio, customer, and transaction levels, a combination of top-down and bottom-up approaches to risk management should be applied.

Client engagement is an important part of effective environmental risk management and risk mitigation. Banks can play an active role in facilitating their clients' transition and in turn mitigate their own environmental risks. This includes encouraging client transition towards sustainable business practices and enhancing their environmental risk disclosures over time.

Relevant Resources

- GFIT Handbook on Implementing Environmental Risk Management, 2021
- GFIT Environmental Risk Questionnaire, 2022
- Association of Banks in Singapore (ABS) Responsible Financing Guidelines, 2018
- Science Based Targets Initiative, Financial Sector Science-based Targets Guidance, 2022
- Cambridge Institute of Sustainability Leadership: The Banking Environment Initiative's Guide to Bank-Client Engagement, 2021
- Equator Principles Framework & Guidance Notes, 2020
- International Finance Corporation, Environmental and Social Performance Standards, 2021
- Partnership for Carbon Accounting Financials (PCAF), Global GHG Accounting and Reporting Standard for the Financial Industry, 2020
- World Resources Institute / United Nations Environment Programme Finance Initiative / 2 Degrees Investing Initiative: Exploring Metrics to Measure the Climate Progress of Banks, 2018

3.1 FOCUS AREA 1: IDENTIFICATION AND APPROACH TO HIGH-RISK SECTORS

Banks typically begin by identifying the "high-risk sectors" most exposed to environmental risks or with a higher potential of association with environmental degradation, then tag customers accordingly. Apart from just a customer-impact focus (e.g. a client polluting the environment, and the subsequent reputational impact), banks recognised that the impact of the physical and business environment on companies was also relevant.

Banks are taking an iterative approach in determining the scope of high-risk sectors, hence the sectors identified can differ. When identifying and prioritising sectors, banks take into consideration a range of factors, such as:

- Transmission mechanisms: These include transition risk arising from the need to make changes to business operations to lower emissions, or physical risk arising from a dependency on weather conditions (e.g. production of agricultural commodities). External lists referenced by banks included the ABS Responsible Financing Guidelines, climate policy relevant sectors and sectors identified by regulators as the target of stress testing exercises.
- Region-specific considerations: The location of customer operations may affect the level of risk and the necessary level of granularity in approach. For example, physical risk in areas expected to be impacted by future sea level rise could be significantly higher. Transition risk

could manifest differently in different jurisdictions due to differences in starting point and policy responses, such as carbon pricing.

- **Materiality to the portfolio:** Levels of risk a bank is exposed to may be dependent on the size of exposure to the sector. Banks may take a risk-proportionate approach by concentrating on the most material sectors in ensuring that risks are both identified and managed appropriately, and prioritise areas where support is most needed to transition. For example, a bank may initially choose to focus on policy development for sectors where it has the highest exposure, while in the interim addressing fewer material sectors in a case-by-case, principle-driven manner. However, caution should be applied when taking such ad-hoc approaches, given the potential for inconsistency in decisions and actions across exposures.

Some banks opined that over time, with greater maturity in risk awareness, environmental and climate-related risk considerations would be incorporated for the broader portfolio, and possibly integrated into the credit risk assessment process. The more specific policies applied to high-risk sectors could then serve as additional overlays.

Banks typically set sector-level policies to translate their identified risk appetite to client-level engagement. These often applied at both an activity and borrower level and ranged from outright prohibition (e.g. financing certain types of environmentally damaging projects, or customers deriving a proportion of revenues from such activities) to conditional acceptance (e.g. for borrowers with transition plans aligned with recognised decarbonisation pathways).

High-risk sector policies were sometimes forward-looking in nature, setting out a clear pathway to manage and mitigate risks over specific time horizons. This included progressive tightening of the restrictions and prohibitions (see Case Study: Prohibitions, restrictions and additional requirements applied by a bank when financing high-risk sectors).

To identify which customers fell under the scope of high-risk sectors, a range of indicators were utilised. This included factors such as the proportion of revenue derived from identified activities (e.g. certain fuel sources for customers in the energy sector) or the assigned industry identifier code. For customers with diverse operations, banks may look to apply multiple sector policies.

Some banks also stipulated minimum performance standards for clients in high-risk sectors. These included obtaining/maintaining internationally recognised certifications or equivalent⁷, or following best practice guidance developed by industry or international bodies (e.g. the International Finance Corporation).

Case Study: Prohibitions, restrictions and additional requirements applied by a bank when financing high-risk sectors

In high-risk sectors, many banks set restrictions on what activities they will or will not finance at both a customer and activity level.

As part of its publicly available power generation position statement, one bank publicly stated that it would not provide financial services directly towards:

- New coal-fired power projects in any location
- Any coal-fired power plant expansions, retrofits or dedicated infrastructure, in any location

In addition, it stated that it would not provide financial services to clients that are:

- Building new thermal coal infrastructure

⁷ For example, the Forestry Stewardship Council; Roundtable on Responsible Soy; International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold.

- Investing in new or additional thermal coal power-generating capacity
- Acquiring standalone thermal coal power assets.

In addition, it stated it would only provide financial services to customers active in the sector if:

- By 2024, are less than 80% dependent on thermal coal (based on % EBITDA at group level)
- By 2025, are less than 60% dependent on thermal coal (based on % EBITDA at group level)
- By 2027, are less than 40% dependent on thermal coal (based on % EBITDA at group level)
- By 2030, are less than 5% dependent on thermal coal (based on % EBITDA at group level)

Within its palm oil business, the same bank only provided financial services to clients who:

- Have Roundtable on Sustainable Palm Oil (RSPO) membership and achieve 100% RSPO certification of owned or managed units of production – applicable to producers.
- Publicly commit to No Deforestation, No Peat and No Exploitation (NDPE), verified by credible assessors when developing new plantations – applicable to producers.
- Have RSPO membership and RSPO Supply Chain Certification of owned facilities and/ or obtain a Traders License – applicable to refiners and traders with direct linkages to units of production (plantations).

Clarity around thresholds as set out by this bank are useful to all stakeholders, including customers (who are aware of what is expected of them), investors (who may wish to factor in environmental considerations into their decision-making), employees (who may wish to ensure their values and beliefs align with that of their employer) and civil society organisations (who may wish to drive for accountability within financial system).

When developing these policies, banks may take into consideration the type of banking activities covered. For example, while the focus may be on prohibiting financing for the construction of a new asset, banks may also face risks when extending financing to existing assets that are ‘new to the bank’ where such assets have no credible transition plan. These may be subject to similar risks, such as the inability to refinance at a later date, leading to a concentration of risks within laggard institutions. In addition, banks are expected to consider the reputational risk presented beyond direct financing, such as when providing advisory services to clients.

In developing their policies, banks may also take into account the impact of environmental degradation, beyond climate-related risk factors. While many banks had taken into consideration wider environmental risks within their sector-level policies (for example requiring NDPE commitments), these were typically focused on the impact of customers on the environment and the corresponding reputational risk. However, environmental degradation (e.g. from pollution or loss of biodiversity) may also pose other risks to the customer beyond reputational risks and would hence need to be accounted for.

Many banks had published information on the sectors they considered high-risk, and their approach to deal with such sectors.⁸ Banks may further explain the rationale for their approach and the client-level impact on financing conditions as part of client engagement, to make clear the expectations of bank in relation to customers from high-risk sectors. Publication also increases the bank’s accountability to stakeholders and provides a clear indication of the level of commitment to the transition to a sustainable economy. In line with the global trajectory toward higher environmental risk management awareness, many banks have committed to increasing their level of transparency over time.

⁸ Policies were typically published on the bank’s websites / referenced in disclosure documents.

Further work required to:

- Adequately consider financial impact from environmental risks beyond those explicitly linked to climate change (e.g. biodiversity loss).
- Align policies and processes, and in particular, provide for comprehensive and measurable actions over the short, medium, and long-term to address the identified environmental risks (e.g. through iterative identification and development of roadmap(s) for high-risk sectors to ensure adequate coverage of customers, activities, and banking products).
- Enhance transparency to stakeholders around approaches to integrating environmental considerations into the bank's operations (e.g. through disclosure of high-risk sector policies).

3.2 FOCUS AREA 2: DUE DILIGENCE AND RISK ASSESSMENT

Customers may be impacted by and respond to environmental risks in different ways, even if the risk factors at the sector level are common. Systematic customer due diligence and risk assessment is therefore important. This can be broken into several key steps, as undertaken by a bank:

- Allocating responsibility
- Targeting due diligence
- Collecting information
- Assessing customer risk
- Assessing portfolio risk

Allocating responsibility

Rather than rely solely on specialist teams, banks have allocated responsibilities for environmental risk management across various business lines and functions, in accordance with the three lines of defence model. Doing so fosters greater responsibility for environmental risk management across the organisation. These responsibilities were articulated in policies and procedures, such as sector lending policies.

Where due diligence highlighted an elevated level of risk (for example when undertaking high-risk activities), most banks required escalation to the second line of defence for further assessment. This may include specific sustainability teams, who may perform further due diligence and assessment (potentially resulting in further customer engagement), before determining how to proceed. While many banks leveraged the expertise of existing in-house environmental risk experts, inviting them to directly engage with customers, some had set up specific climate-focused departments or project teams in either the first or second line of defence with such interaction in mind. In cases of high reputational risk, escalation to specific committees may take place.

Targeting due diligence

Banks performed due diligence on customers from identified high-risk sectors. Ending a relationship midstream is generally more challenging so extensive analysis was typically frontloaded at onboarding⁹. Relevant information is refreshed during the course of the relationship, for example during the annual credit review process or when material changes in risk profile occur (e.g. at the provision of new facilities, changes in customer business model or significant negative news events).

⁹ For example, a customer whose financing is not subsequently renewed may face operational difficulties, resulting in increased credit risk to the bank. As such, taking a long-term view in banks' decision-making will be crucial. This may include considering the necessary changes in a customer's profile over time, their commitment, capacity, and track record in effecting such changes, as well as the bank's appetite to support such customers.

When identifying which customers should be assessed in more depth, a materiality threshold was often applied. This threshold may be based on the exposure to the customer, or the size of the transaction. Nevertheless, exposure size is not always a good proxy (e.g. a large exposure to a well-managed company could pose less risk than a smaller exposure to a poorly managed firm).

Due diligence was typically performed at a customer level as reputational issues could arise from other parts of a customer's business given the fungibility of financing. However, banks still performed due diligence on a transactional basis in some situations, such as project finance transactions and debt/equity security offerings. Many banks have become members of the Equator Principles Association to facilitate an appropriate management of environmental risks and to create a common expectation of the client.

While most banks focused their efforts on large corporates and material portfolios (e.g. mortgages), some banks also performed due diligence across a variety of business areas. This included private banking (e.g. promoter share financing), small-businesses banking or investments (e.g. bond purchases).

Banks should continue to take a holistic approach in their due diligence. They should be cognisant of the risks that could manifest as part of companies' transition to a sustainable economy and to include these as part of their risk assessment process, where material. For example, companies placing increasing reliance on low-carbon technologies with critical dependency on raw materials (e.g. cobalt, rare-earth elements) that have a lack of ready/viable substitutes (to date) could be more exposed to significant supply chain risks.

Collecting information

Banks typically gathered information in a standardised manner (e.g. via templates tailored to the customer's sector) to facilitate analysis. This is in addition to publicly available information such as sustainability reports. For customers operating in multiple sectors, banks may ask for multiple sector-specific templates to be completed. Customer due diligence considerations may include:

- Types of activities undertaken
- Location of high-risk activities undertaken
- Revenues from high-risk activities
- Environmental governance and strategy (including management views on climate-related risks to business models)
- Presence of an environmental and social management system
- Presence of industry certifications
- Metrics and targets (including emissions related)
- Track record (e.g. adverse events, negative news, fines and penalties)

Where additional information is needed, this is gathered through business-as-usual processes where possible, such as client onboarding and credit review. Specific thematic information gathering and analysis may also be undertaken if new data needs are identified as a result of new research or analytical requirements.

Box: Hurdles to environment risk-related due diligence and industry efforts to address them

Presently, there is limited convergence in the questions utilised by different banks during their environmental risk-related due diligence process. They may differ in scope, granularity, methodology and depth depending on both the bank's level of sophistication and the significance with which they view environmental risk.

In some circumstances, customers may be unwilling or unable to provide the requested information. They may find it overly onerous to meet the varying needs of differing stakeholders, not have the information available or have concerns that it may impact their market competitiveness, resulting in a preference to deal with other banks with less rigorous data gathering efforts.

Efforts are underway to address the above challenges. One key initiative was the launch of the ABS ERQ, the first industry standard template that sets a consistent baseline for banks in Singapore to engage their corporate clients on environmental risk issues. See Key Challenges section for more details.

To supplement their data gathering and analysis process, banks worked with third party providers specialising in ESG¹⁰. Vendors were typically tasked with providing less readily available quantitative information, such as counterparty level carbon emissions, as well as their proprietary view on a customer's performance through metrics such as 'sustainability ratings'. Tools developed by such vendors were also utilised directly by some banks – for example, when performing negative news screening, banks have used platforms that consolidated unstructured sources and interpreted multiple languages, something particularly useful when evaluating clients with operations in less internationally connected areas.

The use of vendors may be driven by a lack of subject matter expertise within the bank, which may be too complex or irregularly utilised to warrant in house development. In addition, independent assessment may be a condition of financing under certain frameworks, such as the Equator Principles. Nonetheless, banks still endeavour to understand the methodologies or assumptions embedded within the sourced information. Due consideration is also given to the experience of the vendors in both the sector and geography of focus, and any potential conflicts of interest.

While most banks engaged fee-based third-party products and services, they also utilised free to access resources. These included industry certification records (e.g. the RSPO's company-level Annual Communication of Progress), as well as the work of non-governmental organisations who produced sector- or counterparty-specific analysis. Various new initiatives are underway to expand such resources, sometimes backed by multilateral institutions or governments. Banks are encouraged to stay abreast of such developments, and potentially engage with the organisations leading them.

To incentivise greater levels of transparency, one bank applied potentially punitive proxies for missing information, both incentivising the customer to provide additional levels of transparency and creating a conservative approach to risk management.

Assessing customer risk

Banks sought to assess their customers' risk in a manner that facilitated benchmarking, with a focus on the clients' commitment, capacity, and track record, as well as compliance with the bank's policies. Several banks had developed rating scales to bucket client's risk profiles. Such ratings may be used to assess the level of engagement and oversight needed, for example the frequency of review or necessity for covenants, as well as the need for internal escalation within the organisation.

¹⁰ For example, Baringa, Carbon Disclosure Project, Moodys, Munich Re, MSCI, RepRisk, S&P, Sustainalytics, Vigeo Eiris.

Case Study: Customer risk profiling across different risk aspects

During its environmental risk analysis, a bank categorised the environmental risk profile of its customers in two aspects:

- The business activity, where it falls under the scope of activities defined in the bank's policies, was given a risk rating of High, Medium, or Low based on its potential impact on people or the environment.
- The relevant customer was given a risk rating according to its performance against the standards in the bank's policy.

Some banks were developing specific internal scoring tools to better differentiate their customer's susceptibility to climate-related risks. These may be focused on physical and transition risk factors and be designed to assist the lines of defence to understand the risks and opportunities for each client (in a comparable manner) and assess the client's transition readiness.

In addition to customer level ratings, certain banks utilised ratings at a transactional level, typically in the case of project finance. For instance, the Equator Principles signatory banks are required to classify projects into one of three buckets based on the International Finance Corporation's (IFC) environmental and social categorisation process, to determine the necessary level of due diligence.

All banks incorporated environmental due diligence, including ratings, into their credit assessment process on a largely qualitative basis. Across the lines of defence, the information collected was used to support expert judgement and provide a reference point for analysis. In the longer term, certain banks were exploring ways to incorporate environmental factors directly into their credit models, to allow more integrated decision making and potentially differentiated pricing to account for risk and strategic thinking.

Assessing portfolio risk

All banks were taking steps to assess and manage environmental risks at the portfolio level. While this was relatively nascent, partially as a result of data and methodological challenges of assessing risk at a customer and sectoral level, rapid progress was being made.

Diverse customer activities and non-specific financing make bucketing exposures challenging. For example, banks may provide general purpose credit facilities to customers who are commonly identified as fossil fuel producers, but who are moving towards renewable energy production.

In the absence of sufficient information, portfolio level exposure to high-risk sectors or subsectors was used as a metric for risk management, but these should be used with care. Such point-in-time information provide a high-level indication of the extent of potential vulnerabilities, often in accordance with industry identifier codes. However, if used for target setting (e.g. through limits on exposure to customers operating in certain industries), banks should be mindful not to inadvertently create financing gaps. Efforts should be made to distinguish companies willing and able to transit, incorporating a longer-term perspective to complement point in time metrics.

Some banks had sought to combine exposure data with environmental indicators in their portfolio analysis and risk management. This included utilising internally generated environmental risk ratings or similar externally developed third party generated indicators¹¹. The distribution of exposures against these ratings or categorisations have provided some insight into the performance of the portfolio.

¹¹ It should be noted that third-party risk indicators typically include a range of underlying drivers, the limitations of which should be taken into consideration when applying to both customer and portfolio-level data.

Some banks had also begun to develop more sophisticated tools to provide decision-useful metrics.

These may be sector specific and incorporate climate-related metrics (such as carbon intensity), taking reference from external publications such as the work of the TCFD. Future targets may be set against such metrics, utilising transition pathways aligned with the goals of the Paris Agreement, allowing analysis of portfolio alignment and subsequent portfolio redistribution if necessary, along with targeted customer engagement.

Case Study: Carbon-related portfolio target setting

To align its financing with the goals of the Paris Agreement, one bank developed (with the support of an external consultant) a methodology for assessing the weighted carbon intensity of several sectors within its portfolio, along with interim targets. During development, several key choices and considerations were taken into account. These included the necessity to be:

- Science-based, building upon recognised transition pathways
- Sector-specific, recognising that each industry faces unique challenges
- Decision-useful, so that metrics may be applied in the normal course of business
- Practicable in the face of imperfect data.

The methodology was intended to allow the bank to gauge the current performance of its portfolio, its evolution over time and the comparative performance of individual clients. This would inform strategic decision-making, such as re-distribution of capital, and support client engagement.

When assessing portfolio risk, banks used a range of metrics for accuracy and completeness of oversight. For example, a bank may need to consider both carbon intensity and absolute emissions, as a reduction in both is essential to meet the goals of the Paris Agreement. Acceptable thresholds for emissions are expected to continually decrease in Paris-aligned pathways, meaning that forward-looking assessments will be needed to assess compliance with a bank's risk appetite on an ongoing basis (see Scenario Analysis section).

Deep dive: Examples of portfolio-level risk metrics utilised by banksCount-based descriptors

- Number of customers falling under the scope of high-risk sector policies
- Number of environmental risk reviews being performed
- Number of customer review escalations to specific environmental/climate-related risk teams
- Number of customers by internal environmental risk rating

Exposure-based descriptors¹²

- Exposure to high-risk / climate-sensitive sectors
- Exposure to high-risk / climate-sensitive subsectors (e.g. coal, palm oil)
- Exposure to carbon-related assets
- Exposure to high transition and/or physical risk countries
- Exposure by environmental risk rating
- Exposure by customer transition readiness (as defined by the bank)

Other descriptors

- Risk-weighted Assets (RWAs) consumed by high-risk sectors
- Weighted portfolio carbon intensity

¹² Typically presented in comparison to overall portfolio size.

Increased absolute or proportional levels of “green” financing does not necessarily correspond to a change in the bank’s risk profile. Green financing may increase without any corresponding reduction in exposure to high-risk sectors (e.g. exposures to the renewable energy sector may grow without a corresponding drop in fossil fuel funding). Banks are also mindful of the need to guard against greenwashing, particularly regarding rebadging of assets (for example when refinancing), or the provision of green financing products to companies in high-risk sectors with insufficient transition plans.

Certain banks had extended portfolio-level analysis to material areas of their portfolio beyond the corporate sector. For example, some banks had assessed the susceptibility of mortgage portfolios to the impact of climate-related physical risks, such as rising sea levels, and in turn applied risk mitigants, such as capping loan to value ratios or requiring insurance coverage in certain at-risk geographical areas.

Most banks had yet to start considering climate-related risk in their capital adequacy plans, although they expect to progressively integrate financial risks assessed as material into their internal capital adequacy assessment process (ICAAP). In its ICAAP, one bank had qualitatively explored the potential susceptibility of its retail mortgage portfolio across its key markets to extreme physical risk scenarios in the short to medium term, including increased frequency and intensity of typhoon risk, sea-level rise, and frequent flash floods. This allowed the bank to assess the capital needed to withstand physical risk driven by reduction in property valuation. Another bank had started incorporating environmental risk considerations under the potential impact to reputational risk in its ICAAP.

Further work required to:

- Strengthen client engagement process (e.g. due diligence target identification, including calibration of thresholds).
- Strengthen customer-level risk assessments (e.g. usage of a variety of information sources including both public sources and information gathered from clients, and development of metrics suitable for aggregation and comparison).
- Integrate environmental and climate-related risks into internal capital adequacy assessment processes where appropriate.

3.3 FOCUS AREA 3: RISK MITIGATION AND CLIENT SUPPORT

Once risks had been identified, banks looked to manage them and capitalise upon opportunities.

This may happen in several ways:

- Building customer awareness and capacity
- Supporting improved performance and transition by clients
- Employing risk mitigants

Building customer awareness and capacity

Recognising the lack of awareness in customers around environmental risk, engagement typically began with attempts to upskill customers. By offering capacity building, banks provide their customer with a valuable service that deepens their relationship. Improved client awareness and understanding of environmental risks has several benefits:

- Encourages a prudent response to the environmental challenges, reducing future risks to the customer and the bank.

- Increases customers' receptiveness to the bank's information requests for risk analysis. Banks can better explain their approach to environmental risk management, helping customers realise the importance of the issue and the rationale for bank requests.
- Improves understanding of the need to transition to more sustainable business practices, creating new financing opportunities for the bank.

Capacity building typically occurred organically in the normal course of business through bilateral discussions. External research may be utilised to support the bank's engagement, for example sharing specific client level insights from third party agencies on transition risks and temperature alignment. One bank shared that peer comparison analysis of customers was viewed as particularly useful to relationship managers during the engagement process.

Some banks have been particularly proactive and structured in approaching customer upskilling. These banks organised outreach events or roundtables, held webinars, or participated in forums with businesses active in the green sector. Such events may be organised with partner organisations, such as academic institutions, think tanks and non-governmental organisations, both to increase credibility and draw on the experience of subject matter experts. These interactions may allow banks to not only advocate for more sustainable business practices, but also provide them with opportunities to connect with new customers in value-adding ways.

Case Study: Hosting a series of forums to discuss the challenges and opportunities of sustainability

On an annual basis, a bank organised an event for external stakeholders (corporates, investors etc.) to raise awareness around pertinent environmental issues. At one such event, areas of discussion included:

- Nationally Determined Contributions (NDCs)
- Companies leading the way in the transition
- Global and regional policy and implications for business
- Biodiversity & natural capital and how they interconnect with climate change / net-zero
- ESG data, tech & innovation to accelerate the transition
- Validating the legitimacy and impact of sustainable finance for investors and issuers
- Ensuring a 'just' transition

In addition to providing insights on environmental risks to stakeholders, the events were intended to highlight the bank's commitment and leadership on contributing towards the United Nations Sustainable Development Goals (UN SDGs). The bank viewed this as a potential key differentiator for the bank when attracting/retaining clients.

Banks may find it useful to share their own internal training materials where relevant, when interacting bilaterally or with larger groups. Given that the risks presented by climate change are common societal challenges, and not business specific, insights may be shared without significant incremental resource dedication. In addition, such an approach may help foster a common understanding between the bank and its clients, which may help facilitate the orderly transition to a sustainable economy.

Supporting improved performance and transition by clients

Banks typically looked to assess each client's current situation and transition plans against their own objectives and commitments. For example, banks that have set targets to reduce their exposure to certain sectors, or reach certain performance metrics at a portfolio level, will need to ensure their customer's plans are aligned to those goals if they wish to keep banking them. Certain banks had gone a step beyond this, actively encouraging their customers to adopt science-based targets to create a

clearly defined path to reduce emissions in line with the Paris Agreement goals. Such science-based targets may allow banks to support companies in their transition whilst ensuring accountability.

Banks sought to proactively incentivise customers to adopt more sustainable business practices and adapt to the challenges presented by climate change. Common tools included the provision of financing for specific purposes (e.g. green loans for renewable energy projects or green bonds to increase the resilience of existing infrastructure), or differentiated pricing based on the attainment of environmental objectives (e.g. sustainability linked loans tied to third party ratings). Ability to access such products and commitment to meet any necessary requirements may also benefit the client's reputation. To mitigate the risk of greenwashing, banks have sought to align with international guidance, such as the Green Bond, Green Loan, Sustainability-Linked Bond and Sustainability-Linked Loan Principles.

Employing risk mitigants

To ensure compliance with prohibitions and restrictions on an ongoing basis, banks included conditions within financing agreements (where necessary). Such conditions provide a method of recourse if expectations are not met. Examples included covenants or ringfencing agreements (e.g. preventing funds flowing to non-compliant areas of customer's business operations, or only financing 'green' areas). Such an approach will typically create mutual benefit for both the bank and the customer, for example by reducing the legal risk that is typically associated with unsustainable practices.

Where borrowers fell short of expectations, banks would take action, such as engaging borrowers, imposing additional limits on facilities or even exiting the relationship. However, banks were generally open to working with their customers to rectify concerns in a timely manner, including through the use of time-bound action plans, so that financing continued for clients committed to transitioning.

Further work required to:

- Leverage banks' unique position to raise awareness and understanding of the risks associated with environmental and climate-related degradation within their client base, along with the opportunities that the transition to a sustainable economy presents.
- Support customers' transition to sustainable business practices and adaptation to the risks posed by environmental degradation through upskilling and financing.
- Ensure transparency when providing environmental and climate-related financing to avoid greenwashing risks such as through alignment with established international guidance.

3.4 FOCUS AREA 4: SCOPE OF RISK IMPACT

Environmental risks are complex and transverse in nature, requiring a multi-faceted approach to risk management. However, more progress has been made in the integration into credit and reputational risk management processes, and less so on the other risk areas for the bank.

Liquidity risk

Banks had yet to assess whether environmental-related financial risks assessed as material over relevant time horizons could have a significant impact on their liquidity risk. For example, whether there was any potential impact to net cash outflows or depletion of liquidity buffers, under both

business-as-usual and stressed conditions (such as precautionary demand for liquidity triggered by natural disasters¹³).

Further work to understand the potential impact of environmental-related financial risks on liquidity buffers could consider severe but plausible scenarios over relevant time horizons, for example the potential impact on withdrawal behaviour when natural disasters occur. Banks could include this in their internal liquidity adequacy assessment process, including their stress testing where appropriate.

Market risk

While many banks noted the importance of factoring in market risk considerations into their environmental considerations, progress was at a somewhat nascent stage in comparison to credit risk. This is in part because the holding periods of financial assets are typically short, relative to the time horizon over which environmental risks could manifest, and historical data may not reflect future trajectories. Further work in this area could include the potential impact on financial asset valuations from physical risk over longer time horizons (e.g. sea level rise), risk premiums on carbon-intensive investments (e.g. whether future value of coal exploration is discounted), impact of potential carbon taxes or climate-triggered supply chain disruptions on global commodity prices etc.

Operational, legal and compliance risks

Banks have begun to consider the impact of environmental degradation on their operational resilience. Physical risks, such as more frequent flooding, may impact a bank's branch and automated teller machine networks, or the operations of its critical service providers. Banks may look to ensure their business continuity planning processes accommodate such scenarios.

Legal and compliance risks may arise due to a fragmented regulatory landscape globally, as well as increasing expectations of stakeholders. Banks look to reduce the compliance risks through upskilling the appropriate functions and performing ongoing monitoring of regulatory developments. As stakeholder expectations increase, legal risks associated with climate change will become more prevalent. There is a clear upward trend in climate-related cases being filed around the world in recent years, especially following the adoption of the Paris Agreement in 2015¹⁴.

Further work required to:

- Consider potential manifestations of environmental and climate-related risk in non-credit risk types, including market, liquidity, operational, compliance and legal risks.
- Develop appropriate methodologies to assess and manage such risks.

¹³ Basel Committee on Banking Supervision (2021), "Climate-related risks drivers and their transmission channels"

¹⁴ Network for Greening the Financial System (November 2021), "Climate-related litigation: Raising awareness about a growing source of risk"

4 SCENARIO ANALYSIS

Climate scenario analysis and stress testing is a key tool for assessing the physical and transition risks that could impact banks financially. It allows the bank to better understand the potential impact of climate-related risks and opportunities under different scenario pathways and could in turn inform their strategic decision-making. The application of scenario analysis by banks to assess climate-related financial risks is a relatively new and developing field, and best practices in the usage of this tool continue to evolve.

A bank new to scenario analysis may consider starting with qualitative scenario narratives to explore the potential range of implications. As it gains more experience, it can then consider using quantitative information to describe the potential outcomes and enhance the rigour of its exercises.

Relevant Resources

- BCBS, Climate-related financial risks – measurement methodologies, 2021
- Bank of International Settlements, Stress testing banks for climate change - a comparison of practices, 2021
- Institute of International Finance, Navigating Climate Headwinds: Reference Approaches for Scenario-based Climate Risk Measurement by Banks and Supervisors, 2021
- NGFS, Scenarios in Action: a progress report on global supervisory and central bank climate scenario exercises, 2021
- CFRF Guide 2021 - Scenario Analysis, 2021
- TCFD, TCFD Recommendations Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities, 2017
- UNEP FI, Pathways to Paris: A practical guide to climate transition scenarios for financial professionals (2021), as well as other publications from UNEP FI under its Banking Pilot Projects
- Various TCFD/sustainability reports published by leading banks that detail their individual approaches to scenario analysis

4.1 FOCUS AREA 1: SCENARIO SELECTION AND DEVELOPMENT

Banks focused their efforts on climate-related risks. This was likely driven by increased stakeholder focus in this area, as well as the relatively nascent understanding of how broader environmental risks could be transmitted to the financial sector. One bank had nonetheless started analysis at a sectoral level to identify the potential impact of environmental risks such as water shortages.

Stress testing considers the changes in portfolio characteristics (e.g., risk profiles) under severe but plausible scenarios. In the context of assessing climate-related risks, parameters featured in such scenarios could include macrofinancial variables like GDP and interest rates, transition variables like carbon prices, as well as physical variables like precipitation, flood levels and temperature.

Banks mostly drew on publicly available climate scenarios to perform their analyses, for instance those by the International Energy Agency (IEA), the IPCC, and NGFS. Other approaches, albeit less common, included the direct use of the underlying models used to generate the publicly available climate scenarios, such as the REMIND-MagPIE model from the Potsdam Institute for Climate Impact Research and MESSAGE-GLOBIOM from the International Institute for Applied Systems Analysis, regulators' scenarios, and customised scenarios. One bank noted that the development of scenarios

focusing on physical risks has been relatively slower, while another bank faced challenges customising physical risk scenarios given the nascent stage of academic research in this area.

Case Study: Worked with vendors to flesh out scenarios to fit its own needs

A bank has a global footprint and required a greater granularity of scenario parameters than those afforded by existing available scenarios to better reflect its operating model, asset base and geographic spread. Building on the NGFS climate scenarios, the bank worked with a vendor to apply a regional carbon price (more relevant to its footprint), regional energy demand as well as underlying assets exposed to physical risk for its top corporate clients. This was further adjusted for regional GDP growth rates under various climate scenarios.

Going forward, the bank plans to further increase the geographical granularity of its scenario parameters and design more scenarios that align with its Net Zero by 2050 commitment. It also plans to expand its scenario parameters to cover more asset classes and clients.

Banks recognise the need to review the range of scenarios used on an ongoing basis to ensure that they cover a range of potential future climate pathways. In some cases, NDCs¹⁵ and associated plans (if sufficiently granular) may inform banks' understanding of the likely pathways that it may be exposed to in the jurisdictions it operates. For example, one bank explicitly considered its home jurisdiction's long-term low-emission development strategy in a scenario used.

Sensitivity analysis can be viewed as a complementary tool that assists in understanding the results of scenario analysis. Sensitivity analysis allows for the exploration of how projected changes in a portfolio depend on the choice of assumptions (e.g., variables chosen) as well as the composition of the portfolio itself (e.g., level of transition-readiness and proportion of assets in line with Paris Agreement pathways).

Further work required to:

- Institute processes to embed climate and environmental related risks into scenario analysis by banks.

4.2 FOCUS AREA 2: ANALYTICAL AND METHODOLOGICAL CHOICES

Most banks had started exploratory and preliminary 'pilot exercises' aimed at assessing the resilience of financial institutions' (FIs) business models to climate-related risks, and at enhancing the understanding of FIs' governance and risk management practices in relation to climate-related risks¹⁶. Such pilot exercises can help identify and address data gaps, build internal modelling capabilities and inform risk management decisions. Several banks relied on external data providers.

¹⁵ NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve.

¹⁶ As noted in the "NGFS Progress Report on the Guide for Supervisors" (Oct 2021), 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.

Transition risk analyses were more advanced overall compared to physical risk analyses. Most banks had conducted transition risk pilot exercises, while a minority had yet to complete initial physical risk pilot exercises or had yet to start.

Banks may need to cater for the possibility of an accelerated timeframe for physical risk event materialisation, as well as second order effects like supply chain disruption. There is growing recognition that physical risk could potentially manifest sooner rather than later, as evidenced by a fivefold increase¹⁷ in weather related disasters and a corresponding sevenfold increase in economic losses globally over the past 50 years.

Early mover banks have been involved in industry initiatives like the UNEP FI Banking Pilot Project¹⁸. They have explored a variety of methods, including top-down/bottom-up analysis covering transition and physical risks, supplemented by assessments of the level of alignment of their portfolio to Paris Agreement-aligned pathways. This risk discovery process has served to build capabilities, fine-tune methodologies, and identify areas for further action (e.g., in terms of data gathering, customer engagement and adjustments to business plans).

Credit risk methodologies, which are relatively more developed, can be broadly characterised into three categories, with transition and physical risks typically modelled separately:

- Top-down analysis uses forecasted variables to stress the bank's portfolio to determine the impact of climate-related risks on the portfolio.
- Bottom-up analysis looks at the financial impact of forecasted variables on individual borrowers.
- Portfolio alignment seeks to determine whether a portfolio is aligned with globally agreed (climate) targets as conceptualised through specific scenarios.

Top-down scenario analysis and stress testing

Top-down analysis has been characterised by incorporation into existing stress testing frameworks and focused on transition risk.

A few banks started efforts with top-down analysis before focusing their efforts on bottom-up, quantitative, and granular scenarios which had higher data demands. One of these banks utilised a transition risk scenario where carbon prices prompted a shift to cleaner energy alternatives with adverse impact on markets and GDP.

Another bank that started efforts at a later stage performed both a top-down analysis (on its broader portfolio) and a bottom-up analysis (on large corporate customers within selected sectors) to assess the potential impact of climate risk.

¹⁷ World Meteorological Organization (2021), "Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970-2019)"

¹⁸ Since 2017, UNEP FI has been working with its members to better equip the banking industry to implement the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD).

Bottom-up scenario analysis and stress testing

Transition Risk

Climate-related transition risk impacts were most typically proxied using changes in carbon prices. Some banks incorporated other factors like emissions data as well as sector-specific information like energy mix, where available.

Often, efforts were focused on identified higher-risk sectors, starting with a single sector. The choice of sector(s) to focus on was typically based on a combination of factors including the materiality of sector to the portfolio, the preliminary (qualitatively or quantitatively) assessed risk, and the availability of data. (See Risk Management, Identification and Approach to High-Risk Sectors section)

Efforts were mostly focused on large corporate borrowers due to both their materiality as well as the more ready availability of relevant data. Some banks attempted to sample representative borrowers, allowing for greater understanding about data limitations and regional differences. Other than corporate borrowers, material portfolios (such as mortgage lending) were also assessed for potential risks.

Physical Risk

Physical risk analysis conducted by banks included considerations relating to both acute and chronic physical risks.

Efforts were focused on clients in higher-risk sectors (e.g., those more vulnerable to weather changes) and/or located in regions most exposed to physical risk (e.g., flood-prone areas).

For stress testing, a mix of client data (e.g., asset geolocations, type of asset and impact on revenue) and climate data (e.g., data on extreme weather frequency, future probability of extreme weather events, impacts of climate on the sector) is required for meaningful analysis. These may be gathered from a variety of sources, including internally within the bank or through external data providers/aggregators, and could include a mixture of actual, extrapolated, or derived data points. Simplifying assumptions were utilised for such analyses, which meant that care needed to be taken in the interpretation of results. For example, in the case of manufacturing clients, excess production capacity from other operating sites could cushion declines in revenue from physical risk events, while insurance and climate adaptation measures could potentially mitigate some losses. Given the uncertainties in modelling which could result in a range of outcomes, a bank highlighted its usage of the worst-case scenario to minimise the risk of underestimating the potential impact of physical risks and highlighted the importance of iteratively enhancing its methodologies in future assessments.

Portfolio alignment

One of the more common tools cited was the Paris Agreement Capital Transition Assessment (PACTA) tool developed by the 2 Degrees Investing Initiative (2DII)¹⁹. Several of the banks were using this tool, with one of them sharing that it was useful due to its good portfolio coverage, its ability to capture sector-specific nuances in underlying calculations while allowing comparability at the portfolio level, and its reliance on client-provided data (which facilitated client engagement).

¹⁹ PACTA for Banks is a free, open-source climate scenario analysis toolkit for the corporate lending sector. It enables users to measure the alignment of their corporate lending portfolios with climate scenarios across key climate-relevant sectors and technologies.

Nonetheless, another bank highlighted the difficulty in utilising portfolio alignment tools in general due to data security protocols on uploading portfolio data.

Horizons chosen for scenario analysis varied significantly depending on the risk that was being assessed. Many banks conducted scenario analysis up to 2050. Among the sampled banks, scenario analysis was conducted with time horizons ranging from 3 to 80 years. Short term time horizons address risks crystallising within typical business planning horizons and assess the potential impact on capital. The long-term horizons help gauge potential exposure to structural changes in the economy and financial system, and in turn consider how the bank's strategy could be adapted to mitigate such risks.

Only a few banks had started considering market risk in their scenario analysis. One bank's initial exploration of market risk focused on an abrupt transition scenario leading to carbon price hikes that impacted equity, credit, and commodities portfolios. Another bank incorporated physical risk through a disruption in commodity prices under a traded risk stress scenario, while yet another bank planned to consider ESG scores as a proxy for susceptibility to climate change risks.

Forward-looking assessments through scenario analysis have much room for improvement. While global efforts are ongoing to close data gaps and develop/refine suitable methodologies, banks have continued to face significant hurdles obtaining enough data and identifying suitable methodologies to assess the full impact on their portfolios. In terms of environmental risks beyond climate-related risks, methodologies were even less developed and further work is needed in that space.

Further work required to:

- Deepen understanding of credit risk transmission mechanisms and suitable ways to conduct scenario analysis while building capacity.
- Explore transmission channels for non-credit risk and environmental risks beyond those driven by climate change.

4.3 FOCUS AREA 3: USAGE OF RESULTS

The approach to incorporating the information gleaned from forward looking assessments varied across banks. Several banks had yet to incorporate the outcomes of scenario analysis, including stress testing, into their business strategies. Nonetheless, some banks have translated the scenario analysis outcomes into tangible action:

- **Borrower-level engagement:** Banks indicated that climate risk analyses, including climate scenario analysis, provided them with a better understanding of how to engage with clients in various sectors on climate-related transition and physical risks and opportunities.
- **Sector strategies:** Based upon a scenario-based review of its power portfolio, a bank took the decision several years ago not to finance any new coal-fired power projects globally, while only financing coal-fired operators with a strategy to reduce coal dependency along a Paris Agreement-aligned pathway.
- **Input into corporate strategy and financial planning process:** One bank incorporated climate risk into its formal annual corporate strategy and financial planning process. Regional and client-segment Chief Executive Officers carried out a qualitative

assessment²⁰ of their corporate plans against climate risk guidelines issued by the Group. This assessment focused on revenue reliance from clients in high-carbon sectors and/or located in regions most exposed to physical risk, considering adequacy of mitigation plans. This was then independently reviewed by regional and client-segment Chief Risk Officers (CRO) and the Climate Risk team and included in the Group CRO's review of the bank's corporate plan, which was considered by the Board as part of its approval of the overall corporate plan. The bank intended to incorporate quantitative insights gained from scenario analysis as part of the corporate strategy and financial planning process.

To strengthen confidence in the outcomes of its assessments and facilitate usage thereof, banks could consider the following:

Challenges	Possible Approach
Uncertainty around the likely transition pathway	Most banks are exploring a range of outcomes through a variety of scenarios.
Accuracy of analysis conducted with high reliance on industry-level proxies	Some banks have taken a risk-based approach to collect data at borrower level for their largest clients.
Uncertainty about the multiple assumptions utilised in the analysis	One way would be to conduct sensitivity analysis to identify material drivers of outcomes ²¹ and ensure that decision-makers are aware of such key factors. One bank stated that it plans to do so.
Understanding of the limitations of the current approaches	This could be approached by providing sufficient information when presenting analysis to stakeholders within the bank, e.g. data granularity ²² , model capabilities, scope, risks intended to be addressed, etc. Such information could form an input to decisions ²³ on where to prioritise the bank's environmental risk management efforts.
Resource constraints	Most banks have started their analysis at sector(s) assessed qualitatively to be of higher risk. Such pilot exercises could serve to examine issues at the necessary sector-level granularity while building internal capacity for later extension to other sectors.

To accelerate consideration of environmental risk through use of scenario analysis in business strategies as banks continued to develop their understanding, banks could consider interim steps such as:

²⁰ This would be considered an example of a qualitative scenario analysis that factored in potential adverse outcomes, which could be used to prioritise sectors for a more quantitative deep dive as data availability and methodologies improve.

²¹ As with other forms of analysis, sufficient rigor should be applied when examining such key drivers, including ensuring that such relationships make economic sense.

²² For example, difficulties in capturing mitigating actions taken by firms or governments in mitigating transition or physical risks. Another example could be the use of sector averages for emissions, or extrapolation of emissions from larger borrowers.

²³ For example, geo-spatial data for operating assets not pledged as collateral could be identified as a key gap limiting accurate assessment of physical risks. If the bank then considered such a gap potentially material in its understanding of the risk, it could then prioritise obtaining such data as part of its multi-year roadmap to improve its environmental risk management processes.

- (a) Borrower-level qualitative or quantitative scenario analysis for their largest customers (in sectors or geographies expected to face higher transition and/or physical risk); and
- (b) Identification and disclosure of the bank's desired end-state, as well as the steps needed to do so.

Further work required to:

- Strengthen management understanding and usage of scenario analysis results (including in business strategies and planning processes).

5 CAPACITY BUILDING & CULTURE

An organisational culture with strong awareness of environmental and climate-related risks and its impact on the bank, is an essential enabler for banks to navigate the transition to a sustainable economy. The transversal and evolving nature of risks and opportunities, as well as the variety of ways in which banks may address them, necessitates an institution-wide understanding.

Relevant Resources

- GFIT Capacity Building Series, 2021
- IBF Sustainable Finance Technical Skills and Competencies, 2022
- Asia Sustainable Finance Initiative Knowledge Hub
- International Finance Corporation Financial Institutions: Resources, Solutions and Tools
- United Nations Environment Programme resources
- United Nations Global Compact Academy E-learning Course on Science-Based Targets

5.1 FOCUS AREA 1: BOARD AND SENIOR MANAGEMENT

All banks had sought to increase their BSM’s understanding of environmental risks, recognising the importance for direction and tone to be set from the top. Sufficient understanding of both the risks faced and opportunities presented are key to enabling the BSM to respond in an appropriate manner when determining risk appetites and business strategies.

Most banks have approached this via direct upskilling through training²⁴. Training for BSM thus far was observed to be typically less structured and often driven by external developments such as the launch of regulatory guidance or reputational risk events and leveraged external expertise (e.g. consultancies) in relation to specific topics.

With increased internal awareness and external attention, the breadth and complexity of the topic may necessitate more structured and regular training. Several banks incorporated the subject into their annual management training programme, while one bank made it a mandatory constituent of the onboarding process for new directors. When delivering such training, it is good practice to cover a range of issues to establish a comprehensive understanding of the subject, particularly in areas that may impact the organisation’s longer-term strategy and governance. Areas covered within BSM training by banks included:

- Terminology and definitions (e.g. transition risk, physical risk)
- Goals of the Paris Agreement, the move to net-zero, and their scientific background
- Global impacts of different temperature scenarios, with a focus on core geographies
- Drivers and transmission channels for climate-related and environmental risks
- Risks and opportunities of the transition to a sustainable economy, including decarbonisation pathways
- Regulatory developments
- Practices of peer organisations

²⁴ SGX has mandated training for all directors of listed entities to undergo training on sustainability in their “Response Paper on Climate and Diversity: The Way Forward” issued on 15 Dec 2021.

- Bank-specific elements: Strategy, Risk Framework, sector policies and wider initiatives (e.g. sustainable financing goals, TCFD reporting, capacity building programmes)

Banks had also complemented direct training with other approaches to develop knowledge at the BSM level:

- Direct hiring (e.g., through creation of Chief Sustainability Officer Role) – this approach was taken by several institutions. Such expertise is useful to ensure in-depth expertise for sound and informed decision making, but a sufficient team supporting the hire needs to be built up to avoid key man risks.
- Utilisation of external expertise (e.g., through an advisory panel)– this approach has been taken by a limited number of institutions, allowing direct, and potentially fast, access to deep subject matter expertise. However, in isolation, it may be insufficient for the full integration of environmental considerations into all aspects of BSM decision-making.

Building knowledge and developing understanding among the BSM may allow them to act as environmental risk advocates. This may include delivering speeches, participating in panel discussions, or endorsing training programmes. Such recognition may help to highlight the importance of the issue and increase acceptance across the business.

Further work required to:

- Create a continuous learning model for board and senior management, reflective of the rapidly evolving nature of environmental and climate-related risk understanding.
- Ensure awareness/understanding of environmental and climate-related risk is sufficiently developed within a range of board and senior-management members, so that it be taken into consideration in all aspects of business decision making.

5.2 FOCUS AREA 2: ORGANISATIONAL CULTURE AND CAPACITY DEVELOPMENT

All banks had begun to build capacity across the organisation to better integrate consideration of environmental risks in a holistic manner. The cross-cutting nature of environmental risks requires that they be taken into consideration at all levels and areas of business operations. Given the limited talent in this field, the risk of competence greenwashing²⁵ has also been observed. Relying on external hires alone may not scale the increased environmental risk awareness that will be required at all levels of the organisation.

Training was initially targeted at staff members directly responsible for the implementation of environmental risk policies, such as credit risk departments and relationship managers, and focused on information that was directly relevant to their work. Such training was typically mandatory and began at onboarding to emphasise the significance of the subject and expectations of the employee's role. Further upskilling may then be provided on a regular and ongoing basis as understanding of risks and the bank's subsequent responses evolved.

Training would then typically expand over time in breadth of audience and depth of content. Some banks made high-level training available for all staff members, with more in-depth modules for the staff whose job scope was more directly impacted. Such modules may focus on certain areas of the business, product types or thematic areas (e.g. climate data). Other banks had sought to develop overarching training programmes with a modular curriculum. Recognising the time limitations faced

²⁵ Competence greenwashing refers to the misrepresentation of knowledge, skills, competencies, or expertise relating to sustainability-related activities.

by the audience, many banks developed repeatable and less resource intensive training methods such as e-learning modules.

Structured capacity building exercises were typically supplemented by more periodic communication. These included workshops, newsletters, ‘Lunch & Learn’ events and video messages. Such informal, typically bite sized, messaging may be more easily absorbed by staff who are time constrained or less directly engaged in the field in their day-to-day activities. In addition, regular and reinforcing messaging can help foster a culture where environmental risks are front of mind.

In-house training was also complemented by leveraging existing training providers outside the organisation. Numerous institutions cited the usefulness of the ABS GFIT’s capacity building efforts. In addition, some institutions had sought to engage non-governmental organisations, industry certification bodies or academic institutions, who would be more familiar with the latest scientific advances or who were specialised in certain sectors. Where appropriate, banks could also consider enlisting relevant staff in structured, certified courses offered by professional bodies²⁶.

Globally and regionally, there are increasing numbers of training courses that banks can tap on to build internal capacity. In Singapore, MAS is also committed to ensuring that workers and local enterprises are upskilled and supported to adopt sustainability practices. See Key Challenges section.

Further work required to:

- Reinforce the transverse nature of environmental and climate-related risks, and the importance of its consideration at all levels and areas of business operations.
- Develop tailored skill sets within all departments in a structured manner, utilising external expertise from a range of sources where insufficient knowledge currently exists within the bank.

²⁶ For example, the Global Association of Risk Professionals Sustainability & Climate Risk Certificate

6 DISCLOSURE

Disclosures need to be consistent, comparable, and reliable for better pricing of climate-related risks and opportunities, effective risk management and market discipline, and effective deployment of capital towards financing green and transition activities. Banks are expected to disclose their approaches to managing environmental risk in a manner that is clear and meaningful to their stakeholders, and for such disclosures to be consistent with their internal risk appetites and strategies:

- Disclosures are also expected to be made in accordance with well-regarded international reporting frameworks, such as recommendations by the Financial Stability Board's TCFD for climate-related disclosures.
- To facilitate the development of high-quality globally comparable sustainability information, the International Financial Reporting Standards (IFRS) Foundation's ISSB is developing climate-related disclosure requirements that may become the global baseline sustainability reporting standards should these be endorsed or supported by the financial sector standard-setting bodies such as International Organisation of Securities Commissions (IOSCO) and BCBS.
- In Singapore, SGX has set out a roadmap for mandatory climate reporting for listed issuers aligned with the TCFD recommendations. MAS will be setting out a roadmap for mandatory climate-related disclosures for financial institutions in line with global baseline sustainability reporting standards.

Banks have reviewed and enhanced their environmental risk disclosures in a progressive manner. As their risk management capabilities matured, banks have been increasingly able to provide disclosures on more environmental-related factors, such as by enhancing the disclosed quantitative metrics and targets, qualitative description of factors and risk management practices. MAS looks forward to continued improvements by banks to enhance their environmental risk disclosures.

Relevant Resources

- GFIT Financial Institutions Climate-related Disclosure Document, 2021
- TCFD 2021 Status Report, 2021
- TCFD Implementing the Recommendations of the Task Force on Climate related Financial Disclosures, 2021
- TCFD Guidance on Metrics, Targets, and Transition Plans, 2021
- TCFD Knowledge Hub
- SGX Consultation Paper and Response on Climate and Diversity: The Way Forward, 2021
- SGX Consultation Paper and Response on Starting with a Common Set of Core ESG Metrics, 2021
- ISSB Exposure Draft IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, 2022
- ISSB Exposure Draft IFRS S2 Climate-related Disclosures, 2022
- CFRF Guide 2021 – Disclosures – Managing Legal Risk, 2021

6.1 FOCUS AREA 1: FORM, FREQUENCY AND REVIEW OF DISCLOSURES

Banks made environmental risk disclosures as part of their annual reporting cycle. This was typically accomplished through inclusion in the annual reports and standalone sustainability reports. Issuance of sustainability reports concurrently with the annual report or within a few months after the end of

the financial year provided stakeholders with more holistic information to facilitate timely decision-making.

Banks supplemented annual disclosures with more information on their website.

- (a) **Many banks have set up dedicated webpages or microsites to share information on their sustainable finance efforts**, including details such as their environmental risk management approach around energy transition and climate action and other sustainable finance initiatives. The use of webpages or microsites provides a mode of disclosure that facilitates ad-hoc updates to information and is readily accessible to stakeholders.
- (b) **Several banks published their environmental risk management policies**. This could include enterprise-level environmental risk management policies and sector-specific lending policies for sectors of higher environmental risks, including restricted and prohibited transactions. Publication of the bank's risk management policies provides transparency to stakeholders by conveying the bank's commitments and internal controls for risk management to its customers and other stakeholders.
- (c) **Several banks published ad-hoc information**, relating to announcements of their environmental risk management initiatives and salient developments, on their websites and through media releases, to keep stakeholders informed on a timely basis.

Banks reviewed their environmental risk disclosures regularly, at least annually, to update and improve their disclosures. One bank actively sought to enhance its disclosures in a structured manner by conducting periodic peer benchmarking of its environmental disclosures, materiality analyses, and stakeholder engagement.

6.2 FOCUS AREA 2: REPORTING FRAMEWORKS UTILISED

Banks were mainly using the TCFD recommendations as a framework for their climate-related risk disclosures. The TCFD recommendations are well regarded internationally, and there has been movement towards international convergence of global baseline sustainability reporting standards issued by the ISSB, built on the TCFD recommendations.

International developments on global baseline sustainability reporting standards

In November 2021, the IFRS Foundation set up the ISSB to oversee a programme of work to develop a comprehensive global baseline of sustainability disclosure standards, starting with climate. On 31 March 2022, ISSB launched a consultation on its first two proposed standards by publishing Exposure Drafts on the proposed disclosure requirements. One sets out general sustainability-related disclosure requirements and the other specifies climate-related disclosure requirements.

The ISSB is seeking feedback on the proposals over a 120-day consultation period closing on 29 July 2022. It will review feedback on the proposals in the second half of 2022 and aims to issue the new Standards by end 2022, subject to the feedback received.

The ISSB Exposure Drafts build upon the TCFD recommendations and incorporate industry-based disclosure requirements derived from the Sustainability Accounting Standards Board (SASB) Standards. When the ISSB issues the final requirements, they will form a comprehensive global baseline of sustainability disclosures designed to meet the information needs of investors in assessing enterprise value.

In addition to the TCFD recommendations, several banks also aligned their reporting to other well-regarded sustainability reporting frameworks such as the Global Reporting Initiative (GRI) for a multi-stakeholder perspective, the SASB²⁷, and the Carbon Disclosure Project (CDP), which provides guidance on disclosure of environmental data including GHG emissions.

6.3 FOCUS AREA 3: CLIMATE-RELATED DISCLOSURES UNDER TCFD RECOMMENDATIONS

Banks should align their climate-related risk disclosures with well-regarded international reporting frameworks for consistent, comparable, comprehensive, and decision-useful climate-related disclosures. The TCFD recommendations provide a useful, globally accepted framework for the disclosure of climate-related risks across four overarching areas – governance, strategy, risk management, and metrics and targets – and 11 associated recommended disclosures.

To guide reporting entities, TCFD has issued both general and sector-specific guidance, as well as additional supporting materials, on implementing the TCFD recommendations. In 2021, TCFD published its annual progress status report²⁸ and made material updates to its guidance²⁹, as well as provided additional guidance³⁰ on specific topics. In particular, the Supplemental Guidance for the Financial Sector – Banks, under the Annex of the TCFD Recommendations Report, provides practical implementation guidance on the information banks should seek to integrate as appropriate in their climate-related disclosures.

Most banks have made disclosures across most of the TCFD recommended areas but the extent of compliance with the TCFD recommendations varied across banks. All banks reviewed were still working towards full compliance with the TCFD recommendations. This was in line with the broader banking industry progress as set out in the TCFD 2021 Status Report, which reported that banks' disclosures of information in alignment with TCFD recommendations were in-progress³¹.

Governance

Disclosures in governance were relatively more advanced than the other areas. Banks had disclosed their governance structures and BSM roles in addressing climate-related risks and opportunities (including descriptions on the roles and responsibilities of the relevant committees and personnel).

²⁷ SASB merged with the International Integrated Reporting Council to form the Value Reporting Foundation (VRF) in 2021. VRF will be consolidated into the IFRS Foundation's ISSB by June 2022.

²⁸ Task Force on Climate-related Financial Disclosures (2021), "2021 Status Report: Task Force on Climate-related Financial Disclosures"

²⁹ TCFD released updates to the implementation guidance (Annex) initially published in 2017 with the TCFD Recommendations Report. The revised 2021 Annex updates specific elements of the general guidance and the Supplemental Guidance for the Financial Sector for certain recommended disclosures within the Strategy and Metrics and Targets recommendations.

³⁰ TCFD published a Guidance on Metrics, Targets, and Transition Plans to further support financial statement preparers in disclosing decision-useful information and linking those disclosures with estimates of financial impacts. Such information will help users better assess their investment, lending, and underwriting risks – and inform paths and progress toward net zero. The financial impacts section describes how climate-related metrics, targets, and information from transition plans provide useful information with which to estimate the financial impacts of climate-related issues.

³¹ Based on TCFD's review of 282 banks' reports, less than 50% of banks disclose information aligned with TCFD recommended disclosures for each of the 11 TCFD recommended disclosures. For seven of the 11 recommended disclosures, the percentage of banks disclosing relevant information was lower than the average across all companies reviewed. Banks also had the lowest percentage of disclosure of any industry for the Metrics and Targets (c) recommended disclosure, climate-related targets.

However, information on how the board and senior management monitored climate-related issues, such as processes and meeting frequencies of the relevant committees, were not always disclosed.

Good practices observed included clear and detailed descriptions of board oversight and management roles in relation to climate-related issues. This included the processes and frequency by which the board and senior management and/or committees were informed about issues, how leadership monitors and oversees progress against goals and targets, and the associated governance and reporting structure. Some banks provided useful illustrations and detailed descriptions on their organisational charts and roles and responsibilities for climate-related governance. One bank included the discussion topics, review areas and climate-related material decisions made in the governance committees, reflecting how leadership had considered climate-related issues when reviewing and guiding the bank's strategy, major business plans and risk management policies. Disclosure of remuneration policies, as important incentives for achieving an organisation's goals and objectives, may also provide insight on an organisation's governance, oversight, and accountability for managing environmental-related issues.

Strategy

While most banks reported a wide range of information on the potential and actual impacts of climate-related risks and opportunities³², the information and level of details could be improved. Banks had mostly focused their disclosures on the impact of their activities on climate change and the environment, but less so on the potential impact of climate change on their business, strategies, and financial planning. In general, the banks with inadequate disclosures had yet to commence or complete their assessments and scenario analyses on the impacts of climate change on their business. Only a few banks had described the resilience of their business strategies to the different climate-related scenarios, including a 2°C or lower scenario.

Good practices by banks observed included:

- Presenting a clear mapping of the various climate-related risks and opportunities identified over the short, medium, and long term, with the respective time horizons defined clearly.
- Disclosures on risks and opportunities were complemented with descriptions of their potential impact on the bank's strategies, the bank's strategic responses and actions, as well as associated targets and KPIs and progress made.
- Using multiple scenario analyses, a few banks were able to disclose quantitative results on the potential impact of climate-related transition and physical risks on the bank's business and financials, quantifying the impact to the probability of defaults of client portfolios and to the bank's financial performance.

Several banks also disclosed their transition plans, an aspect of their overall business strategy that lays out a set of targets and actions supporting their transition toward a sustainable economy, including actions such as GHG emissions reduction commitments. Organisations' transition plans are of particular interest to stakeholders, especially when they are seeking to verify the credibility of organisations' commitments related to climate change. Banks may refer to the TCFD Guidance on Metrics, Targets and Transition Plans, which sets out useful guidance on the characteristics of effective transition plans, transition plan considerations, and disclosure of transition plan information.

³² For guidance on climate-related risks and opportunities and their associated financial impacts to be disclosed, refer to TCFD (October 2021), Implementing the Recommendations of the Task Force on Climate related Financial Disclosures (pp. 9,74).

Risk management

Most banks had described their policies and processes to identify, assess, manage, and integrate climate-related risks, of which several have also done so comprehensively across material risk categories. Comprehensive coverage by these banks included a description of their risk management practices across material banking risk categories such as credit risk, market risk, liquidity risk, operational risk, and reputational risk. Other banks had limited coverage to credit and reputational risks. Several banks have described their use of climate-related scenario analysis for risk management in their disclosures. Even fewer referred to stress testing, although most banks have disclosed that work in these areas were in-progress.

Good practices observed included detailed descriptions of the bank's policies and processes for managing climate-related risks, including decisions to mitigate, transfer, accept, or control those risks. For example, banks that have integrated climate-related risks into their credit underwriting policies described their sectoral approach towards risk mitigation such as prohibition and restrictions on lending or heightened client engagement in the identified higher risk sectors. One bank described its definition and integration of climate change as a material cross-cutting risk, its climate risk appetite, how climate risk manifested across various risk types, the substantial work undertaken to analyse the climate risk impact and risk mitigating measures, and additional climate risk-specific actions that were being undertaken. Another bank (see Case Study: Carbon-related portfolio target setting) chose to disclose its methodology for setting sector-based carbon intensity targets, including details of scenarios utilised and key decisions made. When publishing such information, banks may consider providing sufficient depth to both upskill the industry in the face of common challenges and stay accountable to its stakeholders on its commitments in a transparent manner.

Metrics and targets

Banks cited metrics and targets as a key area for improvement for disclosures, as banks were still in the process of developing or strengthening their methodologies to measure risks, opportunities and set targets. While most banks had disclosed some form of quantitative metrics and targets used to assess climate-related risks and opportunities, and their GHG emissions, the comprehensiveness of these disclosures could be improved.

Most banks had focused on carbon-related metrics, with some banks also disclosing climate-related metrics associated with water, energy, and waste management³³. Most banks had disclosed the amount and percentage of carbon-related assets relative to total assets as well as the amount of lending and other financing connected with climate-related opportunities, typically in the form of sustainable finance assets. A majority of banks had disclosed quantitative data on their sectoral concentrations of credit exposure to carbon-related assets across sectors vulnerable to transition risks, but only a minority had disclosed their assets vulnerable to climate-related physical risks.

Some banks have started using and disclosing forward-looking metrics for transition risk. Banks have introduced metrics to measure the portfolio alignment with GHG emissions targets aligned with specific climate goals, such as the goals of the Paris agreement, and temperature alignment metrics to measure customer alignment in terms of degrees of warming at an individual corporate level against current global emissions and temperature trajectory.

Banks were able to report their Scope 1 and 2 GHG emissions. Banks typically utilize an internationally accepted GHG accounting system, such as the GHG Protocol, to measure their Scope 1 and 2 GHG

³³ SGX list of 27 Core ESG Metrics also included 7 environmental-related metrics covering GHG Emissions, Energy Consumption, Water Consumption and Waste Generation. Refer to SGX consultation on "Starting with a Common Set of Core ESG Metrics" issued on 26 August 2021, and the consultation response issued on 15 December 2021.

emissions, which relates to their own operations. Banks have also disclosed their methodologies and emission factors used.

Banks still face challenges in the reporting of Scope 3 GHG emissions due to data gaps, which they have tried to overcome via data collection or proxies. Financed Scope 3 GHG emissions were typically the predominant component of overall GHG emissions for banks. Nonetheless, most banks had disclosed their Scope 3 GHG emissions without incorporating the full downstream impact, for example only capturing the Scope 3 GHG emissions derived from air travel undertaken by employees for business trips, given challenges to capture their financed emissions generated by customers due to data unavailability. Several banks collected emissions data directly from clients through questionnaires³⁴ and client engagement and third-party service providers, while other banks explored proxy methodologies like the PCAF³⁵.

The climate-related metrics disclosed were not always accompanied by targets, making it harder to assess the bank's performance. Most banks had only set high-level targets, such as a long-term target on total sustainable finance assets or achieving net-zero emissions. Fewer banks had short-term and medium-term targets, or targets to reduce the carbon-intensity or manage concentrations of credit exposure to carbon-related assets across higher risk sectors in their portfolios by stipulated timelines. With the increasing focus on transition plans and interim target setting to track progress more effectively, banks are increasingly assessing the value of setting targets and measuring their progress against such targets.

Metrics and targets reported are continuing to evolve as data becomes more available and international standards develop. Banks may refer to the TCFD Guidance on Metrics, Targets and Transition Plans, which sets out useful guidance on climate-related metrics³⁶ and targets³⁷, and the Common Set of Core ESG Metrics³⁸ published by SGX, which included a set of seven commonly used environmental-related metrics. The ISSB Exposure Drafts IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures includes requirements to disclose, inter alia, (i) transition plans towards a lower-carbon economy; (ii) management targets to mitigate or adapt to climate risks or maximise climate-related opportunities and KPIs on progress against these targets; and (iii) results of scenario analysis (or alternative approaches such as qualitative analysis, sensitivity analysis and stress tests) with an assessment of associated implications of the resilience of the company's strategy and business model over different time horizons.

Further work required to:

- Iteratively enhance transparency around the materiality of climate and environmental related risks to the bank's operations (e.g. through usage of qualitative explanations on the potential impact of climate change on the bank's business, strategies, and financial planning, supported by quantitative metrics).

³⁴ Banks may wish to take reference from the GFIT Environmental Risk Questionnaire (see Key Challenges section for more details).

³⁵ PCAF released the "Global GHG Accounting and Reporting Standard for the Financial Industry" in November 2020, which outlines methodologies for measuring financed emissions for specific asset classes in line with the GHG Protocol.

³⁶ Refer to Cross-Industry, Climate-Related Metric Categories and Example Metrics (pp. 16-17) in the Guidance.

³⁷ Refer to Examples of Quantified Targets (pp. 33) in the Guidance.

³⁸ SGX published on 15 December a list of 27 Core ESG Metrics for issuers as guidance to assist issuers in providing, and investors in accessing, an aligned set of ESG data. These metrics include 7 environmental-related metrics covering GHG Emissions, Energy Consumption, Water Consumption and Waste Generation.

- Iteratively enhance transparency around steps the bank is taking to manage climate and environmental related risks (e.g. how the board and senior management monitored climate-related issues, bank-wide strategy, and approach).

6.4 FOCUS AREA 4: ASSURANCE

While banks recognise that assurance can enhance the credibility of disclosures, most banks have yet to obtain such validation. The absence of globally recognised standards or frameworks for assurance, as well as the evolving understanding have posed challenges to banks. This could entail greater reliance on independent review as a pragmatic and practical approach to improving reliability of climate-related disclosures, as the ecosystem to support quality external assurance of climate reports continues to develop.

Most banks had not engaged their internal audit function to obtain internal assurance for their environmental risk disclosures. Banks have instead chosen to place reliance on their internal controls and checks to ensure that their disclosures are accurate.

Reviews by the internal audit function on the bank's sustainability reporting process for environmental risk disclosures could build on the bank's existing governance structure and internal controls. This would be in line with the expectation for internal audit to review the robustness of the bank's risk management framework, which would include environmental risk. The internal audit function may involve relevant functions, such as risk management, sustainability, or other specialist functions. Internal audits should be conducted in accordance with the International Standards for the Professional Practice of Internal Auditing issued by The Institute of Internal Auditors. The upcoming ISSB disclosure standards, a potential global baseline of sustainability-related disclosure standards, can also form the basis for the development of an audit and assurance framework. On this front, the International Audit and Assurance Standards Board (IAASB) will assess the need to enhance its existing framework and guidance on assurance standards for sustainability reporting in line with the development of ISSB disclosure standards.

A few banks have obtained external assurance³⁹ on a limited scope, while others are considering following suit, to add credibility to their disclosures. Engagements with auditors included:

- Verification of quantitative environmental data such as GHG emissions reported in the banks' sustainability reports, in accordance to established reporting standards such as the GHG Protocol.
- Verification of qualitative and quantitative sustainability disclosures, in line with sustainability reporting frameworks.

Banks that wish to obtain external assurance should scope the assurance to obtain meaningful outcomes. The scope of assurance may include materiality assessment and cover different aspects of the environmental risk disclosure process, such as data and its associated data collection process, narratives, compliance with the specified reporting framework (such as the TCFD recommendations), process to identify sustainability information reported, and compliance with applicable rules and

³⁹ External assurance if performed, should be done in accordance with recognised assurance standards, for example the International Standard on Assurance Engagements (ISAE) 3000, the Singapore Standards on Assurance Engagement (SSAE) 3000, the AA 1000 Assurance Standards or the ISO. Where banks have conducted external assurance on the environmental risk disclosures, to provide transparency to users of the reports, they should disclose (a) that external assurance has been conducted; (b) the scope covered; (c) the identity of the external assurer; (d) the standards used; and (e) key findings.

regulations. Banks can consider independent external assurance on selected important aspects of its environmental risk disclosures even in the initial years, expanding coverage in succeeding years.

Further work required to:

- Take steps to assure stakeholders on the robustness of banks' processes around management and disclosure of environmental risk (e.g. through independent review, internal audits, external assurance).

6.5 FOCUS AREA 5: DISCLOSURES FOR ENVIRONMENTAL RISKS BEYOND CLIMATE

Few banks have made disclosures around environmental risks beyond climate change. A minority of banks have published mainly qualitative information on other environmental risks, such as loss of biodiversity. This information included:

- (a) Commitments to preserve biodiversity;
- (b) Considerations of the impact of environmental degradation on business strategies and risk profile; and
- (c) Transition strategy and financing criteria on clients engaging in deforestation activities.

Case Study: Publication of a Biodiversity Position

The bank published a Biodiversity Position to reaffirm the bank's commitments and initiatives to help preserve biodiversity. The Position included the recognition of biodiversity-related risks and opportunities and the bank's commitments to preserving biodiversity and the pressures on biodiversity listed by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) in its 2019 report.

The Position also articulated the bank's various levers of action to integrate the preservation of biodiversity to its business and processes:

- Reduction of pressures related to the activity of its customers and companies in which the bank invests, through constructive dialogue and supervision of credit and investment activities;
- Active support to clients' efforts to preserve biodiversity, through specific financial products and services (sustainability-linked loans, green bonds, etc.);
- Orientation of investments towards funds aiming at preserving biodiversity; and
- Reduction of the bank's direct impacts on biodiversity.

Although the frameworks and methodologies around the reporting of environmental risks beyond climate were nascent, banks looked to stay abreast of ongoing developments and augment disclosures over time. To this end, several financial institutions have joined private sector initiatives such as the Taskforce on Nature-related Financial Disclosures (TNFD) and Finance for Biodiversity (F4B), which are working towards the development of consensus metrics and methodologies, tools and resources for the measurement, management and reporting of nature-related impacts and dependencies. Banks are closely monitoring upcoming developments around nature-related risks, for example:

- (a) The G20, in its Sustainable Finance Roadmap⁴⁰, stated that the ISSB should extend its initial focus on climate to other sustainability topics such as biodiversity and social issues. The Climate Disclosure Standards Board (CDSB) which was consolidated into the ISSB in January 2022, published a new Biodiversity Application Guidance⁴¹ in November 2021 to assist companies on biodiversity-related financial disclosures within the mainstream report. This guidance is aligned with the TCFD recommendations and intended to be compatible with the ISSB Climate and General Requirements Standards, prior to the issuance of an ISSB biodiversity standard.
- (b) EU's Corporate Sustainability Reporting Directive (CSRD) which will apply to all large and/or listed companies. The European Financial Reporting Advisory Group (EFRAG) will develop mandatory sustainability reporting standards which will cover the six EU environmental objectives, including biodiversity and ecosystems. The standards are intended to take effect in 2024.

Further work required to:

- Stay abreast of ongoing developments of disclosures on environmental risks beyond climate, particularly around nature-related risks such as loss of biodiversity, and consider augmenting disclosures on nature-related risks over time.

⁴⁰ G20 Sustainable Finance Roadmap (2021)

⁴¹ Climate Disclosure Standards Board (2021), "CDSB Framework Application guidance for biodiversity-related disclosures"

7 KEY CHALLENGES

As part of our engagement with industry, MAS sought feedback on the challenges that banks faced in implementing the ENRM Guidelines.

Challenges could broadly be categorised into the following three broad categories: (i) data and methodology, (ii) skills shortage; and (iii) reliance on head office.

7.1 DATA AND METHODOLOGY

Development of environmental risk assessment methodologies was commonly highlighted as challenging due to the unique characteristics of such risks, exacerbated by data availability, accuracy, and comparability issues. In particular, banks faced challenges from incomplete public disclosures, customers being unable or unwilling to provide the necessary data, lack of standardisation in data when provided, positivity bias in disclosed data, lack of data granularity⁴², and costly external data. These challenges echo broader industry findings as set out in the NGFS Progress Report on Bridging Data Gaps⁴³.

To address these data challenges:

- **SGX has mandated disclosures by listed entities and MAS plans to mandate disclosures by FIs against internationally aligned disclosure standards.** Given the urgency of the threat from climate changes, a voluntary approach to climate-related disclosures, where FIs selectively report using different frameworks or standards of their choice, may not be sufficient to address stakeholders' needs.
- **Project Greenprint⁴⁴ is a collection of initiatives by MAS that aims to harness technology and data to enable the greening of the financial sector.** Project Greenprint is part of the Green Finance Action Plan. MAS will partner the industry to pilot four interoperable digital platforms to address the financial sector's sustainability data needs – (i) an ESG Disclosure Portal, (ii) an ESG Registry, (iii) a Data Orchestrator layer, and (iv) a Greenprint Marketplace.
- **To support listed entities to meet SGX's climate-related disclosure requirements, SGX is partnering MAS to launch a pilot ESG disclosure solution (ESGenome) as part of Project Greenprint.** ESGenome will ease sustainability reporting of listed entities by allowing them to upload ESG data and generate sustainability reports aligned with various ESG standards, including the 27 Core ESG Metrics recommended by SGX⁴⁵. Investors will also be able to access ESG data and related information reported by issuers in a structured format. While the initial focus of ESGenome will be SGX listed entities, there are plans to extend the platform to non-SGX listed entities in the longer term.

⁴² For example, detailed customer information at an asset-specific level, including geospatial data required for physical risk scenario analysis.

⁴³ Network for Greening the Financial System (2021), "Progress report on bridging data gaps"

⁴⁴ MAS webpage on Green Fintech, available at: <https://www.mas.gov.sg/development/fintech/Green-FinTech>

⁴⁵ SGX proposed a list of 27 Core ESG Metrics, to guide issuers in providing, and investors in accessing, an aligned set of ESG data. These metrics include 7 environmental-related metrics covering GHG Emissions, Energy Consumption, Water Consumption and Waste Generation. Refer to SGX consultation on "Starting with a Common Set of Core ESG Metrics" issued on 26 August 2021, and the consultation response issued on 15 December 2021.

- **GFIT has launched the ABS ERQ⁴⁶, the first industry standard template that sets a consistent baseline for banks in Singapore to engage their corporate clients on environmental risk issues.** For subsequent versions, ABS, GFIT and MAS will explore leveraging on Project Greenprint to digitise ERQ data for sharing with lending banks after obtaining client consent. Such an approach seeks to streamline the process, avoid duplication, and improve data quality.

To meet the increased demands for data, banks will need to consider developing additional system capabilities. One bank highlighted the importance of agile data collection efforts that reflect an evolving understanding of risks. In particular, the specific data that needs to be collected, and the granularity at which that data is collected, is expected to change over time.

As interim solutions to methodological and data issues to address climate-related risks:

- Banks typically focused on larger customers for which more extensive data was available. More work will be required for the smaller companies. Nonetheless, some external ESG service providers offer ESG assessment services for small and medium-sized enterprises (SMEs). In leveraging the expertise of external ESG data providers, banks should exercise caution and discernment by examining the reliability or reasonableness of underlying assumptions made by third-party providers in deriving their assessment and data.
- In some cases, banks looked to simplify assessment using proxies; for example, one institution used disclosure status as an indicator of customer awareness and management of climate-related risks.

Going forward, understanding of transmission channels and methodologies to identify and quantify climate-related risks are expected to continue evolving. Banks are encouraged to:

- **Iteratively enhance risk management practices, as methodologies continue to evolve and mature.** Banks should look to ongoing industry efforts to develop and share good environmental risk management practices, such as the upskilling efforts elaborated upon in the Capacity Building section, along with the efforts of international organisations and regulators, such as the NGFS, the BCBS TFCR, and the UK CFRF. MAS' incorporation of thematic climate scenarios as part of the 2022 Industry-Wide Stress Test exercise will encourage the collaborative development of capabilities in climate risk assessment and complement banks' efforts in this area.
- **Leverage on industry initiatives to deepen knowledge and strengthen in-house capabilities.** GFIT launched a series of capacity building workshops and e-learning modules for FIs and corporates. These initiatives aimed to deepen knowledge and strengthen the capabilities of banks, insurers and asset managers in environmental risk management and environmental-related disclosures, including around implementing and embedding the ENRM Guidelines. The workshops are targeted at relevant staff across the three lines of defence: from customer-facing to risk stewards and audit and are conducted by subject matter experts. Further, some banks have proactively shared their experiences through the publication of white papers or as part of their climate-related financial disclosures, while others have participated in interbank initiatives such as the Equator Principles.

Specific to environmental-related risks beyond climate, most banks had yet to start work on this front. As with climate-related risks, development of methodologies may require specific knowledge

⁴⁶ For details, refer to GFIT media release "ABS launches industry standard template for banks to engage corporate clients on environmental risk issues" on 21 April 2022, available at: https://abs.org.sg/docs/library/media-release_abs-launches-industry-standard-template-for-banks-to-engage-corporate-clients-on-environmental-risk-issues_20-apr-2022.pdf

not within the usual remit of banks, which will take time to fully develop. However, it should be noted that while the methodologies and expertise needed to assess environmental risk will likely overlap with that of climate-related risks, this will not be the case in all circumstances and will require additional effort to develop.

Relevant Resources

- F4B, 'Consultation on Biodiversity Issues and Approaches', 2021
- Natural Capital Finance Alliance's tool to assess impacts and dependencies on nature – Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE)
- NGFS-INSPIRE reports
 - 'Biodiversity and financial stability: exploring the case for action', 2021
 - 'Biodiversity and financial stability: building the case for action', 2021
 - 'Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability', 2022
- F4B, 'Finance and Biodiversity - Overview of Initiatives for Financial Institutions', 2022
- Studies by De Nederlandsche Bank and Banque de France on FIs' exposure to biodiversity
 - Svartzman, R., Espagne, E., Gauthey, J., Hadji-Lazaro, P., Salin, M., et al. (2021). A 'Silent Spring' for the financial system? Exploring biodiversity-related financial risks in France. Banque de France Working Paper no. 826
 - Van Toor, J., Piljic, D., Schellekens, G., van Oorschot, M., and Kok, M. (2020). Indebted to nature. Exploring biodiversity risks for the Dutch financial sector. Amsterdam: De Nederlandsche Bank; Planbureau voor de Leefomgeving.
- The University of Cambridge Institute for Sustainability Leadership's report on 'Integrating Nature: The case for action on nature-related financial risks', 2022

7.2 SKILLS SHORTAGE

Banks cited increasing demand for staff skilled in sustainable finance, both within the frontline and risk, as a challenge. As traction around environmental risk has only picked up in the past few years, there is a talent and knowledge gap due to demand-supply mismatch. Makeshift sustainable financial hires without strong and deep ESG expertise and credentials could lead to 'talent greenwashing', potentially resulting in significant repercussions for the industry⁴⁷.

MAS' efforts to facilitate a strong talent pipeline

Sustainable finance requires interdisciplinary skills. Beyond pure finance expertise, green finance roles require specialised skills such as climate change policy development and sustainability risk management.

MAS and the Institute for Banking and Finance (IBF) have set out 12 Sustainable Finance Technical Skills and Competencies (TSCs) under the IBF's Skills Framework for Financial Services. The TSCs cover a range of functional knowledge (e.g. sustainability risk management, sustainability reporting, sustainable investment management) and thematic (e.g. climate change policy developments, natural capital, green taxonomies) topics. The new TSCs set out a robust, common level of sustainable finance proficiency, knowledge and abilities needed for individuals to perform various

⁴⁷ Muruganathan, K. (2021), "Talent greenwashing risk in finance sector", The Business Times Singapore, 14 Sep 2021

roles in sustainable finance. The TSCs will also serve as a reference for training providers and financial institutions to design and calibrate training programmes, and for employers to refer to when hiring new recruits.

To further support the build-up of sustainable finance capabilities out of Singapore, MAS has anchored green finance centres of excellence (COEs) to spearhead research and training, tailored for Asia. The COEs include:

- (a) The Singapore Green Finance Centre (SGFC), launched in October 2020 as a collaboration between the Singapore Management University (SMU) and Imperial College Business School, which will support applied research focusing on catalysing green finance solutions by the industry. SGFC will also provide training programmes across a range of levels of expertise on sustainable finance. The centre recently held its inaugural SGFC Climate Academy in March 2022, focusing on topics such as climate scenarios and potential impact, implications of climate change on macro factors, data and portfolio risks, and climate risk assessment at the firm level. The programme was attended by finance professionals in key decision making and management roles across SGFC's founding partners⁴⁸.
- (b) The Sustainable and Green Finance Institute (SGFIN), established by the National University of Singapore (NUS) in September 2021, will collaborate with other faculties within NUS to produce multi-disciplinary research and training targeted at shaping sustainability outcomes and policymaking across the corporate and financial sectors. SGFIN will take in the inaugural batch of students for its Masters programme in Sustainable and Green Finance in August 2022, the first of its kind among leading Asian universities.
- (c) The Sustainable Finance Institute Asia (SFIA), an independent research and capacity building institute that has established its headquarters in Singapore. SFIA aims to catalyse and support the implementation of sustainable policy ideas in Asia, beginning with ASEAN, through advocacy and engagement activities. SFIA is also partnering the investment community to develop an AI-driven ESG information tool to harness qualitative data at scale to support investment decision-making, particularly into Asian assets. It is in discussions with several financial institutions on a proof of concept.

MAS is committed to working with industry stakeholders, including FIs, COEs and training providers, to groom a steady pipeline of local sustainable finance talents across all levels of expertise.

7.3 RELIANCE ON HEAD OFFICE

Some banks cited the divergence between the effective date of MAS' ENRM Guidelines and that of their home jurisdiction as a challenge, due to their reliance on Head Office initiatives.

Singapore entities should work with their head offices to meet the expectations of the ENRM Guidelines and set concrete action plans and timelines to uplift their practices as soon as practicable. As clarified in the 'Response to Feedback Received for Proposed Guidelines on Environmental Risk Management for Banks', for banks with limited resources and capacity, MAS does not expect such firms to ramp up their environmental risk management capabilities to full capacity immediately. Instead, smaller firms can take measured steps to uplift their environmental risk

⁴⁸ SGFC's founding partners are Bank of China Limited, BNP Paribas, Fullerton Fund Management, Goldman Sachs, HSBC, Schroders, Standard Chartered Bank, Sumitomo Mitsui Banking Corporation, and UBS AG.

management capabilities. After performing a gap analysis, banks should engage their MAS Review Officer if there are particular challenges in meeting the implementation timelines.

8 ABBREVIATIONS

2DII	2 Degrees Investing Initiative
ABS	Association of Banks in Singapore
BCBS	Basel Committee on Banking Supervision
BSM	Board and Senior Management
CDP	Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
CFRF	Climate Financial Risk Forum
COE	Centre of Excellence
CSRD	Corporate Sustainability Reporting Directive
EBITDA	Earnings before Interest, Taxes, Depreciation, and Amortisation
EFRAG	European Financial Reporting Advisory Group
ENRM Guidelines	MAS Guidelines on Environmental Risk Management (Banks)
ERQ	Environmental Risk Questionnaire
ESG	Environmental, Social and Governance
F4B	Finance for Biodiversity
FSB	Financial Stability Board
G20	Group of Twenty
GDP	Gross Domestic Product
GFIT	Green Finance Industry Taskforce
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
IAASB	International Audit and Assurance Standards Board
IBF	Institute for Banking and Finance
ICAAP	Internal Capital Adequacy Assessment Process
IEA	International Energy Agency
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
INSPIRE	International Network for Sustainable Financial Policy Insights, Research, and Exchange
IOSCO	International Organisation of Securities Commissions
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
KPI	Key Performance Indicator
MAS	Monetary Authority of Singapore
NDC	Nationally Determined Contribution
NDPE	No Deforestation, No Peat, No Exploitation
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NUS	National University of Singapore
O&G	Oil and Gas
PACTA	Paris Agreement Capital Transition Assessment
PCAF	Partnership for Carbon Accounting Financials
RSPO	Roundtable on Sustainable Palm Oil

RWA	Risk-weighted Assets
SASB	Sustainability Accounting Standards Board
SFIA	Sustainable Finance Institute Asia
SGFC	Singapore Green Finance Centre
SGFIN	Sustainable and Green Finance Institute
SGX	Singapore Exchange
SMU	Singapore Management University
TCFD	Task Force on Climate-related Financial Disclosures
TFCR	Task Force on Climate-related Financial Risks
TNFD	Taskforce on Nature-related Financial Disclosures
TSC	Technical Skills and Competency
UN SDG	United Nations Sustainable Development Goal
UNEP FI	United Nations Environmental Program Finance Initiative
VRF	Value Reporting Foundation