



Monetary Authority of Singapore

INFORMATION PAPER ON
ENVIRONMENTAL RISK MANAGEMENT
(ASSET MANAGERS)

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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 asset management sector's resilience to and management of environmental risk, the Monetary Authority of Singapore (MAS) issued the Guidelines on Environmental Risk Management for Asset Managers (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 asset managers in 2021 ahead of the effective date of the ENRM Guidelines to assess the pace of implementation and to benchmark practices. The thirty asset managers (comprising fund managers and real estate investment trust managers, collectively referred to as "AMs" within this paper) were selected based on a range of factors, including level of maturity of environmental risk management practices and the size of their operations in Singapore. MAS also met with several AMs to dive deeper into their survey responses.

This information paper highlights emerging and/or good practices by selected AMs, identifies areas where further work is needed, and serves as a reference for AMs as they continue to strengthen their resilience to environmental risk. AMs 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.

Survey responses on the AMs' implementation of the ENRM Guidelines showed mixed progress across the AMs. In general, there were positive observations, including the following:

- Most AMs recognised the relevance and urgency of environmental risk, and have put in place frameworks, governance arrangements, and policies to oversee this risk;
- Many AMs have also made public commitments to sustainable investing, such as being signatories of the United Nations Principles for Responsible Investing (UN PRI) and a few AMs have pledged to achieve net zero emissions for their investment portfolios by 2050;
- Most AMs have hired staff with relevant expertise to lead their sustainable finance efforts, trained internal staff and procured relevant third-party data to supplement their internal assessment of environmental risk; and
- Some AMs have begun to make sustainability-related disclosures to share how they manage environmental risk and seize opportunities to deliver long-term value to their stakeholders.

Nevertheless, significant work remains for the AMs to meaningfully incorporate environmental risk management practices in their firms. Some areas of improvement include:

- Having clear quantitative targets over different time horizons to shape and steer strategy and business plans;
- Embedding top-down and bottom-up environmental risk assessment across all asset classes, strategies, and portfolios;
- Enhancing forward-looking assessment capabilities as appropriate, including the alignment of portfolios with climate goals; and

- Strengthening engagement of investee companies to encourage improvement in their environmental risk profiles over time, for instance, through setting clear decarbonisation/transition plans and targets, monitoring adherence and taking follow-up actions.

AMs' 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 exclusion of 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. AMs have therefore had to manage their reputational risk against this backdrop as they work towards supporting an orderly transition.

AMs 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. AMs will need to continue to push ahead even with imperfect information as hesitation to act would be costly, both for the funds/mandates that AMs manage and for the broader economy.

¹ Intergovernmental Panel on Climate Change'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).

2 GOVERNANCE & STRATEGY

The Board and Senior Management (BSM) play critical roles in an AM's efforts to integrate environmental considerations into its business. They should set the right tone from the top to spearhead enterprise-wide response to environmental risk. To do so, it is imperative that directors have adequate understanding² of environmental risk. Senior management must also be appropriately equipped with the expertise to manage this risk.

Strong governance and clear strategy are foundational to sound environmental risk management. Hence, the roles and responsibilities of the BSM, including personnel, functions, and committees responsible for the oversight of environmental risk should be well defined. A way to do so would be to set them out in the terms of reference, engagement, and/or employment job scopes.

Managing climate and environmental risk should be an integral part of the agenda of BSM committees, in line with increasing expectations by customers, regulators, and other stakeholders on the BSM's fiduciary and management responsibilities³.

As environmental risk can manifest through various physical and transition risk channels, materialise over uncertain and extended time horizons, and have far-reaching impact in breadth and magnitude, AMs need to devise comprehensive strategies to address this risk. These strategies will need to be translated into clear directions, including setting of targets and interim milestones, and be communicated to all staff for effective implementation.

Relevant Resources

- Climate Financial Risk Forum (CFRF) Guide 2021 – Climate Data and Metrics, 2021
- GFIT Handbook on Implementing Environmental Risk Management, 2021
- Singapore Exchange (SGX) Consultation Paper and Response on Climate and Diversity: The Way Forward, 2021
- Task Force on Climate-related Financial Disclosures (TCFD) Guidance on Metrics, Targets, and Transition Plans, 2021
- TCFD Implementing the Recommendations of the TCFD, 2021
- The Glasgow Financial Alliance for Net Zero (GFANZ), Our Progress and Plan Towards a Net-Zero Global Economy, 2021
- UN PRI, 2021
- World Wide Fund (WWF) Resilient and Sustainable Portfolios: A Framework for Responsible Investment, 2019
- WWF Insight Reports, 2020 – 2022
- WWF Resilient Portfolio Tool (RESPOND)

² Please refer to Section 7: Capacity Building & Culture for more information.

³ 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. MAS' ENRM Guidelines sets out expectations for BSM responsibilities to be incorporated in the environmental risk management framework.

2.1 FOCUS AREA 1: CORPORATE GOVERNANCE

Many AMs have put in place formal structures to support proper management of environmental risk. Some have defined environmental risk on its own while others have considered it within the broader context of environmental, social and governance (ESG) risks. Some AMs have also further identified climate-related risks specifically as a critical component of environmental risk.

As environmental risk has become a pertinent aspect of the risk management process, most AMs have designated the BSM to be responsible for the oversight of environmental risk management.

Some key features of governance frameworks that we have observed are outlined below:

- **Board:** The Board takes on the responsibility of reviewing and endorsing the AM's business strategies, as well as the framework and policies for environmental risk management.
- **Dedicated or regular committees:** Some Boards have delegated or assigned committees to support them in discharging their obligations. For instance:
 - Some AMs have set up sustainability committees comprising staff (in particular, senior management members) across different functions. Regular meetings are convened to oversee the implementation of the company's environmental risk strategies and policies. These committees would usually be headed by Chief Sustainability Officers (CSOs), or Heads of Investments, and the committees would in turn report to the Chief Executive Officer, and ultimately, to the AMs' Board.
 - In other cases, instead of setting up dedicated committees, some AMs have leveraged existing risk or investment committees by expanding their mandates to include the oversight of environmental risk for the funds/mandates that they manage. For the oversight of the company's own environmental risk, this is typically overseen by a separate board level committee.
- **Designated individual(s):** Some AMs have designated BSM member(s) to oversee the development and implementation of environmental risk related policies and procedures within the entity. Given the nascency but rising importance of this topic, some AMs have appointed dedicated CSOs to perform this role. Others have included the management of environmental risk within the scope of existing BSM member's responsibilities (e.g., for funds/mandates – Head of Investment, for oversight of the company's own carbon footprint – Chief Operating Officer), providing training to upskill these individuals where necessary.
- **Specialised units/officers:** Some larger AMs have set up specialised units to conduct environmental risk research, and they act as independent units providing inputs to investment teams. These specialised units may also support the designated senior management member(s) in the development and implementation of the AM's environmental risk management framework and policies. A few AMs have designated environmental risk champions within various investment teams, who are responsible for assisting their teams to integrate environmental risk into their investment processes. Others have adopted a combination of the two approaches.

Slightly more than half of AMs surveyed indicated that they have allocated responsibilities for the management of environmental risk across their three lines of defence. Where this is done, the structure largely mirrors the three lines of defence put in place for other aspects of risk management for the company. The first line of defence involves investment team members, or ESG specialists within investment teams, assessing the environmental risk of their proposed investments, and incorporating their assessments within the portfolio construction process. The risk and compliance teams form the second line of defence, which is responsible for ensuring that the AM's environmental risk policies are

being implemented on the ground. These teams may also monitor regulatory developments relating to environmental risk management and ensure that the AM's policies are kept up to date and in line with regulatory requirements. The third line of defence refers to the internal audit function within AMs, which is responsible for independently evaluating the AM's environmental risk management framework and controls, through conducting periodic audits and evaluating staff's level of compliance with the AM's policies.

Case Study: Adopting a multi-faceted approach to governance – observed in larger AMs

Below is an example of a governance structure we have observed from our review. As the AM is part of a global asset management group, the responsibility for ESG oversight ultimately resided with the Board of Directors of its parent company. To support the Board in its oversight, the AM has appointed and put in place the following structures:

- A dedicated CSO, who is also part of the Board of Directors at the Group level. This enables the CSO to advise the Board on the AM's sustainability and voting policies, which are approved by the Board. In addition, the CSO sits on the AM's investment committee, which has the ability to influence investment decisions.
- A sustainability committee, chaired by the Group's CEO, is set up to oversee and implement the Group's policies and procedures relating to sustainability investing including environmental risk management. Members of the committee comprised senior management members across relevant Group functions, such as investment, product, and marketing, to ensure end-to-end integration of sustainability considerations in a product's lifecycle across the company. The committee meets bi-monthly.

The Group also has a dedicated sustainability research team with analysts who have expertise in various asset classes and geographies. This team augments the research efforts of the bigger pool of general research analysts by supplementing information on the profiles of prospective investee companies and in proposing green solutions. The "house views" are disseminated to all investment teams for adoption.

In addition, the AM has designated ground staff (who are not part of the dedicated sustainability research team) to be "ESG ambassadors" to help promulgate awareness of ESG issues across the various functions. These ESG ambassadors undergo structured training to achieve external certifications. They help to disseminate information about sustainable investing and are the first-level helplines for staff from their respective functions who might have queries about sustainable investing.

For smaller AMs, they have largely embedded the oversight and management of environmental risk within existing organisational structures and functions. Nevertheless, for proper accountability, an existing senior management personnel would be responsible for the AMs' environmental risk management. An example of how an AM has done so is illustrated in the Case Study below.

Case Study: Leveraging existing governance structures to embed environmental risk management– observed in smaller AMs

One of the smaller AMs has embedded responsibilities for the oversight of environmental risk management processes within its existing governance framework. The roles and responsibilities of the various functions/individuals were clearly articulated in the company's handbook to create general awareness and promote accountability.

In particular, the handbook listed the roles and responsibilities of the following functions/individuals:

- Board: review and endorse the AM's environmental risk management strategy and approach, as well as the delineation of duties amongst the company's staff on environmental risk management matters;
- Designated ESG officer (Head of Compliance): review effectiveness of ESG policies, monitor staff's compliance with the AM's ESG policies and procedures, reporting breaches where warranted; and
- Individuals designated with ESG responsibilities (staff from different functions such as investment, compliance, and risk management): embed ESG considerations in the existing processes of various functions.

Further work required:

- Clear allocation of roles and responsibilities across the three lines of defence for managing environmental risk.

2.2 FOCUS AREA 2: STRATEGY

Some AMs have articulated and formulated strategies and plans to better manage environmental risk and capture opportunities. In formulating their strategies and plans, a few AMs deliberately considered the possible impact of environmental risk across different time horizons by assessing the likelihood of certain risks and opportunities (e.g. policy changes, technological advancements, and natural disasters) materialising in any given time horizon. There were also distinct strategies and plans for the AMs' own operations and the funds/mandates that they manage.

- **At company-level** – a few AMs are starting to quantify certain metrics, such as greenhouse gases (GHG) emissions and water usage arising from their internal operations in order to have a better grasp of their own environmental footprints and make plans to improve their environmental risk profiles.
- **At product-level** (i.e. individual fund/mandate) – a few AMs have developed means to measure the environmental risk exposures of their investment portfolios and have set targets to “green” them over time.
- **Scaling up green and sustainable investment options** – Beyond integrating environmental risk management in the entire investment process, some AMs are also looking to launch more green or sustainable funds to meet customer demand.

While the details of individual AMs' strategies may differ, several AMs have made public commitments to contribute to the transition to a sustainable economy and combat climate change, including through participation in global initiatives. For example:

- Some AMs have joined the Net Zero Asset Managers (NZAM) initiative, which is part of the GFANZ⁴. NZAM participation requires AMs to meet net zero emissions across their portfolios by 2050 or sooner. Other AMs are signatories to the World Green Building Council's Net Zero Building Carbon Commitment, which calls for the reduction (and compensation, where necessary) of all operational and embodied carbon emissions within portfolios by 2030, and advocates for all buildings to be net zero whole life carbon by 2050.

⁴ GFANZ (2021), “Our Progress and Plan Towards a Net-Zero Global Economy”

- A number of AMs have sought to align their strategies and business plans to the United Nations Sustainable Development Goals (UN SDGs), which set out 17 different goals and 169 targets representing a call to for action towards a range of sustainable development issues, while keeping the objectives of tackling climate change, and preservation of ocean and forests in mind. For instance, in line with the UN SDG of building sustainable cities and communities, and on climate action, some AMs have formulated strategies and targets relating to GHG reduction, and reduction of water and energy consumption.
- AMs could also be signatories of Sustainable Blue Economy Finance Principles, which promote the implementation of SDG 14 (Life Below Water) and set out ocean-specific standards, to mainstream sustainability of ocean-based sectors.
- A number of the AMs are signatories of the UN PRI, which requires signatory AMs to commit to principles such as incorporating ESG issues within their investment analysis and decision-making processes and promoting acceptance and implementation of the principles within the investment industry. Signatories are also required to publish their responsible investing activities annually, fostering transparency and accountability.

Further work required:

- Articulate the AM's strategy and business plans for the company and its funds/mandates, across different time horizons.
- Set clear quantitative metrics and interim targets.

2.3 FOCUS AREA 3: MANAGEMENT REPORTING

The surveyed AMs have, in general, established processes and controls for regular monitoring, reporting, and escalation to the BSM on environmental risk management matters. Such reporting could include topical issues that have been identified (e.g. climate change, biodiversity loss, pollution etc), effectiveness of the AM's environmental risk management controls (e.g. lapses in controls resulting in investments in prohibited sub-sectors or companies), and the implementation progress of AMs' environmental risk management roadmap or initiatives (e.g. progress in obtaining green certification on their portfolios/assets, the green/brown share of their investment portfolios over time).

Avenues through which such updates are provided to the BSM are varied and include the following:

- **Regular reporting:** Most AMs provide updates on their environmental risks and opportunities, as well as proposed strategies, during regular (e.g. quarterly) Board/committee meetings or through circulation of key risk exposure or management reports.
- **Appointing Board members to dedicated committees:** To ensure stronger involvement of the Board on sustainability issues, some AMs have included Board members in dedicated committees set up to oversee sustainability matters. These members would provide guidance on matters that should be escalated to the Board.

MAS notes that not all AMs have developed a reporting framework to facilitate regular reporting of appropriate environmental risk metrics to the BSM. In addition, current reporting tended to provide more qualitative descriptions as opposed to quantitative metrics. AMs are encouraged to enhance their management reporting to facilitate effective oversight of environmental risk issues and efficient tracking of implementation progress. Examples of information which some AMs have disclosed to their BSM are set out in the box below for reference.

Deep dive: Examples of indicators used in management reportingMetrics supporting environmental risk resilience

- Portfolio resilience
 - Updates on green accreditation status of investment portfolios/assets (e.g. attaining green certification for buildings; conversion of funds to Article 8 or 9 funds under the European Union Sustainable Finance Disclosure Regulation)
 - Measurements of the carbon footprint or green/brown share of portfolios
- Operational performance of investee companies/assets (more commonly for direct real estate managers and AMs funding infrastructure-related projects)
 - Energy and water consumption or intensity
 - Waste diversion statistics

Metrics relating to own environmental footprint

- GHG emissions per headcount across scopes 1, 2 & 3
- Energy and water consumption

Further work required:

- Enhance comprehensiveness of metrics reported (e.g. at company and/or product-level) and the alignment with the AM's overall strategy and business plans.
- Enhance risk data aggregation capabilities.
- Enhance consistency of reporting to management, to facilitate effective oversight of environmental risk issues, and efficient tracking of implementation progress.
- Consider providing periodic updates to management on the outcomes of forward-looking assessments (e.g. scenario analysis).

2.4 FOCUS AREA 4: BEHAVIOUR ALIGNMENT

To promote desired conduct and drive accountability for the delivery of AMs' strategies and business plans, some AMs have incorporated key performance indicators (KPIs) relating to the management of environmental risk within their incentive structures. Typically, this would apply to (i) senior management or members of the dedicated committee responsible for environmental risk management oversight, (ii) members of the specialised unit tasked with developing and implementing the company's environmental risk management framework and policies, (iii) investment team members responsible for incorporating environmental risk considerations in their investment process, and (iv) risk management team members charged with monitoring investment teams' compliance with the AMs' environmental risk management policies.

The performance indicators were tailored according to the seniority and roles of the different staff members. For instance:

- Senior management's remuneration could be influenced by the AM's progress in achieving the enterprise-wide environmental milestones or targets that have been set.

- Dedicated ESG specialists could in turn be assessed based on their level of expertise and mastery of the subject matter, the applicability of the environmental risk assessment framework and policies developed, or the effectiveness of engagement sessions conducted with investee companies.
- Investment team members could be assessed based on their level of compliance with the AM's environmental risk policies, which would include how well they have integrated environmental risk considerations in their security/asset selection and portfolio construction, or whether they have met green targets for the portfolio (e.g. obtaining green accreditation for the portfolio, or keeping within established investment limits for poorly rated companies).
- Risk managers could be assessed based on factors such the quality of controls designed.

MAS notes that the increasing incorporation of environmental risk considerations in compensation frameworks require greater reliance on judgement, as these are primarily non-financial at the outset, and must be supported by strong and robust governance.⁵

Case Study: Incorporating sustainability KPIs in remuneration framework

An AM, which managed largely real estate properties, had set and incorporated KPIs relating to sustainability in their remuneration framework, to promote alignment of staff behaviour with the AM's sustainability policies. The KPIs include the following:

- number of stakeholder engagements conducted within the year;
- progress in greening existing real estate portfolios;
- achievement of green rating targets for newly acquired properties; and
- operational performance of properties in existing real estate portfolios.

Progress towards achieving these KPIs was tracked on an ongoing basis and the status was published on a dashboard, which was accessible to the staff to allow them to monitor their own performance.

Further work required:

- Embed performance indicators relating to environmental risk management in an AM's appraisal framework, which are tailored to staff's roles and responsibilities, to incentivise proper implementation of AM's environmental risk management framework and policies and achievement of AM's strategy and business plans.
- Improve disclosure on the extent of senior management's remuneration that is affected by performance indicators relating to environmental risk management.

⁵Financial Stability Board (2021), "Effective Implementation of FSB Principles for Sound Compensation Practices and Implementation Standards: 2021 Progress Report"

3 RESEARCH AND PORTFOLIO CONSTRUCTION

Integration of environmental risk considerations in the research and portfolio construction processes is crucial to managing environmental risk of the funds/mandates. The value of an investee company and the returns of a portfolio can be impacted by environmental risk, and it is therefore important that AMs specifically consider the risks and opportunities associated with environmental risk in their selection of securities and construction of portfolios. To do so, AMs can leverage external assessment frameworks or develop their own proprietary assessment frameworks.

On a portfolio level, other than being mindful of internal aggregate limits that their customers set, AMs must actively track and manage the environmental risk factors that are present in a fund/mandate on an aggregate basis, such as the carbon intensity and absolute carbon emissions of the portfolio, and set clear targets for the funds/mandates that they manage.

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

In assessing environmental risk, the AMs generally consider both transition and physical risks at asset and/or portfolio levels.

To guide the assessment, several AMs have identified sectors most exposed to environmental risk, and have developed policies to exclude, limit or manage investment in these sectors. These policies could range from conditional acceptance (e.g. requiring investee companies to demonstrate they have credible transition plans aligned with recognised decarbonisation pathways) to outright prohibition (e.g. not investing in companies that are engaged in environmentally damaging activities, or which derive a significant proportion of their revenues from such activities). Such policies typically apply to actively managed funds and could be a default for segregated mandates as well.

High-risk sectors identified by AMs are varied, albeit with notable overlaps. When identifying high-risk sectors and determining appropriate actions to take, the following are generally considered by the AMs:

- **External research:** In determining these sectors, AMs have referenced sources such as international conventions, guidance from the United Nations (e.g. sectors that might face greater difficulties complying with Principles under the Global Compact), the World Bank (e.g. Environmental, Health and Safety Guidelines), and the TCFD report (sectors identified to potentially be most affected by climate change). AMs also considered the sectors of the largest GHG emitters which have been identified by collaborative engagement platforms, such as the Climate Action 100+.
- **Region-specific considerations:** Different regions are exposed to different levels of environmental risk, including physical risk (e.g. drought, floods, rising sea levels and heat waves), in terms of frequency and severity. Their ability to adapt, mitigate and manage the risk, as well as respond to stakeholder expectations also differ. Hence, the location of an investee company's operations is important, and AMs are increasingly collecting more data on this front to allow them to better assess and manage the associated risk.
- **Materiality to the portfolio:** The level of environmental risk is dependent on the size of the funds/mandates' exposure to a particular sector. AMs may take a risk-proportionate approach by focusing on the most material sectors or areas that could be hit by physical risks or where support is most needed to transition, and ensure that the risks in these sectors/areas are identified and managed appropriately.

To identify investee companies that fall within the scope of high-risk sectors, some AMs use a range of indicators. These indicators include proportion of revenue derived from activities that contribute to climate change, percentage of global production, and carbon intensity. For investee companies with diverse business operations, AMs may apply multiple sector policies depending on the significance of the different businesses. Metrics for identifying investee companies that are the subject to restrictions or exclusions could also be progressively tightened as the AMs work towards aligning their investment portfolios with the Paris Agreement goal of keeping temperature rises to well below 1.5°C above pre-industrial levels.

In managing environmental risk, some AMs also expect investee companies in high-risk sectors to obtain or maintain internationally recognised certifications or equivalent⁶, or follow best practice guidance developed by industry or international bodies (e.g. International Finance Corporation Performance Standards on Environmental and Social Sustainability) so as to be deemed “investable” by the AMs. However, exceptions to sector policies are possible if the investee companies are able to demonstrate credible plans to reduce or exit activities that the AMs have classified as posing high environmental risk, within certain timeframes.

A few AMs take into account a wider range of factors in determining their sector policies and identification of high-risk sectors, such as looking beyond climate-related risk factors, to cover risks arising from degradation of biodiversity. For instance, an AM has looked at potential impacts of investee companies’ operations, across geographies, business units, product lines and suppliers, on conservation areas and biodiversity. As a matter of policy, the AM would require such investee companies (from specific sectors) not to operate in key biodiversity areas or areas with dense forestry, as defined by industry-recognised standards. In addition, many customers, in particular institutional investors with segregated mandates, may have views on how their monies should be deployed and the type of companies that they do not want to be associated with. To do so, these AMs would include the specific exclusion criteria indicated by their customers in their portfolio management system to facilitate monitoring and adherence.

MAS notes that a significant number of AMs have published information on the sectors that they consider to be high-risk and their approaches in dealing with investee companies from these sectors. This was in addition to explaining sector policies to their investee companies during the one-to-one engagements. Such information is either published on a standalone basis or included in the AMs’ broader sustainability disclosure documents, which are available on the AMs’ websites. Clarity around the sector policies and the assessment criteria is useful to all stakeholders and increases the AM’s accountability. For example, investee companies would know what is expected of them to ensure they continue to remain investable, and customers would know the AM’s stance with respect to the development of a more sustainable economy and whether it is aligned with the customers’ own values and beliefs.

Deep dive: Example of disclosures relating to sector policies

Information on high-risk sectors that can be found in a sustainability disclosure report include:

- Types of funds or segregated mandates to which these policies apply (e.g. actively managed funds versus passively managed funds)
- Specific sectors which are deemed to be of high risk and the thresholds for determining whether an investee company within the sector would be subject to the restrictions

⁶ For example, certifications on health & safety requirements for infrastructure projects, or certifications relating to responsible agricultural/food sourcing practices etc. where applicable

applicable to that sector (e.g. by proportion of revenue derived from specific business activities or amount of carbon emissions)

- Types of restrictions applicable to investee companies that are in such high-risk sectors (e.g. total exclusion or capping of environmental risk rating assigned to such companies).

Further work required:

- Specify the types of investee companies that would be covered based on certain thresholds/metrics and the corresponding restrictions that would apply.
- Share the sector policies more broadly with all relevant stakeholders, such as with investee companies so that the AMs' expectations are clear, and with AMs' customers (existing and prospective) to facilitate their decision-making.

3.2 FOCUS AREA 2: SOURCES OF INFORMATION TO ASSESS ENVIRONMENTAL RISK

AMs have begun procuring environmental data and information to assist them in their assessment of environmental risk. To do so, AMs have leveraged a wide range of resources, such as:

- **Third-party data providers:** Many AMs rely on multiple third-party data providers for inputs on different metrics that they have identified to be material for their assessment. Increasingly, third-party data providers are beginning to specialise by subject matter⁷ or asset class⁸. In shortlisting the use of third-party data providers, AMs would generally consider the following: (i) area of specialisation; (ii) scope of coverage (e.g. number of issuers, countries/regions covered); (iii) strength of estimation methodology to address data gaps; and (iv) granularity of information available, including whether the data behind the underlying metrics is accessible to subscribers.

When relying on ESG ratings provided by third-party data providers, AMs should ensure that they have rigorous measures to assess the reliability of the providers, as this sector continues to grow. Of note, there are increasing calls for transparency on the methodological approaches (including scope and reliability of the underlying data, frequency of review, assumptions, etc) adopted by ESG data providers, and these factors could be relevant to AMs in their selection process.

- **Engagement of investee companies:** In addition to relying on publicly disclosed information, AMs also engage investee companies directly through meetings/correspondences with key/senior management, conversations with their stakeholders (e.g. past employees, suppliers, etc.) or through questionnaires. To that end, some AMs have developed a reporting framework, or platforms for regular reporting of ESG-related metrics from investee companies.

⁷ E.g. research on sovereign/government entities, ESG controversies, or on climate-related risk data such as carbon emission, brown share data etc

⁸ E.g. Equities, fixed income, sovereign debt, and real estate

- **International bodies:** Some AMs also refer to ESG data provided by international bodies or organisations such as the International Energy Agency (IEA)⁹, the United Nations¹⁰ (which launched the Global Sustainable Development Goals Indicators Data Platform), and the World Bank¹¹ (which provides the DataBank platform and a portal for sovereign ESG analysis).
- **Public domains:** In addition to relying on disclosure documents published by the investee companies, many AMs gather additional data points through alternative sources (e.g. reported controversies on the internet, social media accounts posts, publications by civil societies and academics). Where AMs rely on such data sources, MAS would generally expect AMs to independently assess and corroborate information, to ensure that the information being relied upon is accurate, valid, and current.

Further work required:

- AMs should be cognisant of the shortcomings of different information sources and take steps to address or manage their shortcomings before including them in the AM's environmental risk assessment. Specifically with respect to ESG ratings, the AM should understand the methodology applied by the ratings provider and seek to obtain the breakdown of the underlying sub-components to independently evaluate the reasonableness of ratings assigned.

3.3 FOCUS AREA 3: FRAMEWORK FOR ASSESSING ENVIRONMENTAL RISK

We have observed a spectrum of practices adopted by AMs to incorporate environmental risk considerations within their research and portfolio construction processes based on our engagement with AMs on their environmental risk management practices. Broadly, the practices of AMs can be classified as follows:

- **Proprietary scoring framework:** Advanced AMs have developed proprietary environmental risk assessment frameworks to generate a quantitative environmental risk score for each investment. These AMs have identified a list of metrics to be used to assess the environmental risk exposure of an investee company. Different weights may be assigned to each metric, based on materiality and relevance, taking into account the asset class, sector, and/or geographical location of the investment. A risk-weighted score would then be assigned to each investment. Some AMs add an additional layer of reasonableness check before arriving at the final score by checking with investment teams who have a better understanding of the operations of the investee companies. The final score may also be cross-referenced to that assigned by external data providers. Differences in their own scores and those of the data providers must be adequately substantiated.

⁹ The IEA collects, assesses, and disseminates energy statistics on supply and demand, compiled into energy balances in addition to a number of other key energy-related indicators.

¹⁰ The UN hosts, amongst others, a Global Sustainable Development Goals Indicators Data Platform, providing access to information such as data on the SDG indicators and SDG Country profiles.

¹¹ E.g. the WorldBank's Sovereign ESG Data Portal which provides country dashboards on ESG profiles, or its DataBank, which is an analysis or visualisation tool contain collections of time series data on a variety of topics.

Selecting metrics to be used for environmental risk assessment framework

A most common resource which AMs referred to in developing their list of relevant and material metrics is the Sustainability Accounting Standards Board (SASB)'s materiality map/finder, which provides information on financially material issues that are reasonably likely to impact the financial or operating performance of a company in particular sectors.

Other factors considered include the following: (i) data availability, (ii) data coverage and (iii) data measurability to facilitate the scoring and ranking of large number of investee companies.

In assigning weights to the different metrics, AMs would also take into account their sector policies and the particular sectors identified as posing higher environmental risk. AMs may also assign higher weights to metrics in a manner that is in line with the commitments that they have made, (e.g. GHG emissions that are in line with science-based targets that they have adopted).

- **Leveraging third-party ratings:** Some AMs that have just started out in their journey on ESG integration relied primarily on the methodologies and ratings of third-party data providers. Nevertheless, instead of outright adoption of these ratings, the AMs have independently analysed and adjusted the ratings where necessary (e.g. by applying/disapplying, or tweaking weights assigned to specific metrics) based on their understanding of the investee companies' operations from their ongoing engagements with these companies.
- **In-depth risk assessment for each investment:** This approach is more commonly adopted by AMs with a smaller and/or targeted universe of investee companies, where the AMs have substantive influence (e.g. real estate AMs or private equity/venture capital (PE/VC) AMs focussed on impact investing). These AMs place more emphasis on their investment due diligence process, which is carried out for every single potential investee company or asset, using a combination of quantitative metrics and qualitative criteria to analyse the environmental risk associated with each investment. This includes whether the risks can be sufficiently mitigated through plans and procedures developed with the investee companies. Third-party consultants may also be contracted to conduct more in-depth environmental risk assessment.

Based on our observations, a few factors drive the approach that AM would adopt, such as the following:

- **Relevance and materiality of environmental risk:** Where environmental risk is assessed to be material and to have a greater impact on investment decisions, AMs have opted for more autonomy over their environmental risk rating frameworks (i.e. developing and maintaining their own proprietary risk assessment methodologies). On the other hand, for investment strategies with higher turnover, shorter investment horizons and smaller investment holdings, AMs would generally opt to rely on third party data providers.
- **Size of investable universe:** AMs with larger investable universes were more likely to adopt more structured approaches to incorporate environmental risk considerations in their research and portfolio construction processes to enhance comparability across investee companies.
- **Level of access and influence over investee companies or assets:** Based on our observations, AMs with smaller number of investee companies and/or assets generally have higher level of access to granular and comprehensive data, and a greater level of influence over them.

Accordingly, these AMs were able to conduct more in-depth assessments, including engaging third-party consultants to provide expert opinions before making their investment decisions.

- **Resources available:** Smaller and less well-resourced AMs with limited influence over investee companies were more likely to rely on public disclosures and/or leverage third-party ratings.

Some AMs would conduct further analysis such as peer benchmarking, to assess how an investee company scored relative to its peers in the same sector and/or region. This is important as different countries and sectors are at different stages of assessing, adapting, managing, and mitigating environmental risk. While an absolute approach may thus lead to indiscriminate exclusion of investee companies operating in sectors or regions assessed to be of higher environmental risk, peer benchmarking allows AMs to continue investing in and supporting investee companies' efforts in their transition towards more sustainable business practices over time, while maintaining the AMs' risk management standards.

A few of the more advanced AMs have also incorporated forward-looking elements in their environmental risk analyses, by assigning some weightage of ESG scores to the AM's assessment of the company's ESG trajectory. Incorporation of forward-looking element in analysis is important as it provides investment teams with additional insights as to whether there could be opportunities for them to invest in a company whose environmental risk scores may not be favourable at this point in time but would likely improve in the future, or vice-versa, where the ratings are currently acceptable but may deteriorate over time.

Case Study: Incorporating forward-looking trend in environmental risk analysis

In its environmental risk analysis, an AM has incorporated a brief assessment of the investee company's likely environmental risk trajectory (e.g. whether its practices are going to improve, deteriorate or remain unchanged over time) in deriving the final ESG score. The assessment of the investee company's likely trajectory is based on several factors, such as the following:

- The AMs' understanding of the sector of operation of the investee company;
- The investee company's attitude towards and controls for managing environmental risk; and
- The credibility of investee company's plans to adopt more sustainable practices over specific time frames.

For investee companies with multiple diverse businesses, AMs have generally classified and applied their risk assessment framework based on the dominant business of the investee company. Other approaches that AMs could consider include: (i) separately assessing the different significant businesses that an investee company is engaging in using sector-specific metrics¹²; or (ii) scoring the investee company based on the business that poses the highest level of environmental risk.

Some AMs are implementing their environmental risk management frameworks in phases, starting with equities funds/mandates or sustainable funds/mandates before moving to other asset classes or investment strategies. Some AMs have also developed a framework to systemically track the extent of environmental risk integration across all its funds/mandates. For instance, an AM required all investment teams to complete a questionnaire yearly to provide information on how they have taken environmental risk factors into consideration within their investment process and demonstrate the extent to which they have stepped up their governance processes to ensure that it was indeed done in practice. Investment teams would also conduct annual reviews to ensure that their past

¹² Where there is sufficiently granular data available for each of these businesses and an appropriate risk-weight is assigned to each business to arrive at a composite risk score for the investee company.

assessments remained valid and document the outcome of their reviews. Internal audit teams would then independently evaluate these assessments and documentations.

Further work required:

- Regular review of the relevance of the framework adopted, bearing in mind the size and nature of its activities, including the invest focus and strategy of its funds/mandates.

3.4 FOCUS AREA 4: ADAPTING FRAMEWORK FOR DIFFERENT ASSET CLASSES AND INVESTMENT STRATEGIES

More advanced AMs have tailored their risk assessment framework, which were originally designed for equities and fixed income investments, to cater to the characteristics of other asset classes, such as the following:

- **Sovereign issuers:** fiscal impact arising from countries' actions in adapting, mitigating, and managing environmental risks (e.g. rising sea level, extreme weather events, such as flood, storm and wildfire and depletion of natural capital), or in restructuring their economies to reduce GHG emissions (e.g. under the Paris Agreement). These actions could lead to costlier or higher debt issuances that could in turn affect a country's repayment abilities.
- **Real estate:** operational performance of physical assets (e.g. energy efficiency, water usage, water recycling, prevention of water pollution, waste reduction and recycling), and inherent risks associated with their locations (e.g. rising sea level, flooding due to excessive rainfall, heat waves and storms).

Some AMs (e.g. hedge fund managers) have assessed environmental risk considerations to be less relevant and material to their business models, given their shorter investment horizons and smaller holdings of individual securities, or where they employ top-down absolute return macro strategies. However, others have endeavoured to incorporate environmental risk considerations within their research and portfolio construction processes where possible. For instance, they may apply an exclusion policy as a baseline or incorporate such considerations in selected strategies, such as long/short equity and activist investing.

A UN PRI report recognises that the breadth and range of trading instruments and market strategies adopted by hedge fund managers could add complexity to the ability of hedge fund managers in incorporating ESG considerations in their investment decisions¹³. Nevertheless, the report posits that environmental risk considerations can still be pertinent to hedge fund managers, given increasing recognition that ESG factors can affect risk and return on investments.

MAS encourages all AMs to keep abreast of developments and glean insights from peers and ongoing work as well as studies into how AMs can better integrate environmental risk considerations within their different investment strategies.

Case Study: Influencing environmental risk management - PE/VC AMs

AMs managing impact PE/VC funds typically undertake environmental risk assessment at the due diligence phase, which could include employing external consultants to conduct deep dives into the environmental impacts of the projects that they intend to finance. Following the assessments, some of the AMs use the findings to formulate ESG-focused remediation plans in consultation with the investee companies to set time-bound quantitative and qualitative targets to work towards (e.g. improvement in operational indicators such as waste management/minimisation/reuse, energy

¹³ UN PRI (2020), "Technical Guide: ESG Incorporation in Hedge Funds" (pp. 5)

consumption as well as compliance with environmental regulations and standards). The remediation plans also serve as a means for AMs to convey their ESG-related expectations to investee companies and as a tool to monitor progress in meeting ESG targets.

An AM managing traditional PE/VC funds had remarked that it could be more challenging to consistently assess and compare environmental risk across young and/or private investee companies due to the lack of data. Nevertheless, the AM acknowledged that PE/VC AMs usually have larger stakes in investee companies and therefore may exercise greater influence through BSM involvement in these companies. To this end, the AM had worked with an independent third-party consultant to develop an ESG strategy, as well as policies that would enable it to measure, monitor and report on key ESG objectives.

Further work required:

- AMs should enhance respective environmental risk assessment frameworks to take into account specific characteristics of various asset classes and investment strategies and should go beyond climate-related risks to include natural capital and biodiversity.

4 PORTFOLIO RISK MANAGEMENT

Environmental risks are wide ranging and constantly evolving. AMs should put in place appropriate processes and systems to systematically monitor, assess, and manage their potential and actual impact on individual investments and portfolios on an ongoing basis. To support this effort, there must be clarity of roles and responsibilities within the AMs.

The growing demand for environmentally sound or sustainable products has introduced the risk of greenwashing, which AMs must actively manage. Greenwashing¹⁴ refers to the practice of misrepresenting sustainability-related practices or features in investment products. Such practices may vary in scope and severity, ranging from the inappropriate use of specific sustainability terms, misrepresentations about a company's sustainability-related commitments and frameworks, to deceptive marketing practices.

Relevant Resources

- Financial Sector Science-Based Targets Guidance, 2022
- International Finance Corporation's Performance Standards
- Partnership for Carbon Accounting Financials (PCAF): Global GHG Accounting and Reporting Standard for the Financial Industry

4.1 FOCUS AREA 1: KEEPING ENVIRONMENTAL RISK RATINGS UP-TO-DATE

AMs generally have processes in place to conduct ongoing surveillance of their investee companies and ensure their environmental risk ratings are reflective of the environmental risk that they are exposed to. Revisions to the environmental risk ratings are either triggered by external events and/or because of regular reviews.

Typically, where there are changes in third-party ratings or adverse news that potentially affect the ESG performance of investee companies, AMs would trigger a review of the environmental risk ratings of these companies. AMs with close engagements with their investee companies may also use information from the course of their interactions to assess if reviews of ESG ratings are warranted. This can, for instance, be triggered by changes in policies towards sustainable practices.

Information on the ESG performance of investee companies or portfolio performance is also made available to investment teams on an ongoing basis to ensure that investment teams rely on updated information for their investment decisions. Specific information that some AMs have included are:

- **ESG score of the company**, including a time-series comparison and the benchmark of its score compared to its peers. Some AMs also provide basic information on how the ESG risk score is derived (e.g. weightages and scores for E, S, G pillars and its general score), so that investment teams may propose overrides to the rating based on their engagements with the investee companies.
- **Climate-related metrics**, such as GHG emissions (Scopes 1 to 3), carbon intensity relative to benchmarks, temperature alignment, energy transition rating
- **Operational indicators**, such as statistics relating to energy and water consumption/intensity, waste generation (e.g. split according to hazardous/non-hazardous waste) and waste diversion (e.g. proportion of waste reduction through recycling, reuse, composting etc), and

¹⁴ IOSCO (2021), "Setting regulatory and supervisory expectations for assets managers is fundamental to address greenwashing concerns, says IOSCO"

GHG emissions level. These indicators are typically more relevant for real estate investments or infrastructure financing.

- **Controversy scores**, as they indicate the presence of ESG-related issues or challenges faced by a company and may provide insight on the potential trajectory of the company's future ESG score

Further work required:

- To facilitate timely assessment and intervention, AMs should collect more regular ESG-related data from investee companies for which the AM has significant holdings in and that may be exposed to greater environmental risk.

4.2 FOCUS AREA 2: INDEPENDENT MONITORING

In line with the three lines of defence model, a number of AMs have involved their risk management or compliance teams as the second layer of control, to ensure compliance with environmental risk policies, objectives, and fund/mandate constraints. These teams would independently monitor that the following restrictions and requirements are complied with:

- **Environmental risk policies:** ensuring the trades made by investment teams comply with firm-wide policies. These may, for instance, include sector-based exclusion policies and investment limits that are applied to lowly-rated securities.
- **Regulatory requirements:** ensuring that sustainable funds comply with applicable product disclosure/labelling requirements.
- **Objectives of funds/mandates:** ensuring the trades made by investment teams comply with fund/mandate specific restrictions, taking into consideration the investment objective and strategy of the fund/mandate.

More advanced or larger AMs conduct environmental risk monitoring on a pre-trade basis, by programming some, if not all, applicable rules into their portfolio management or compliance monitoring systems. To illustrate, these AMs may have exclusion policies prohibiting or limiting investments in specific companies or companies operating in certain sectors or that have relatively poorer environmental risk ratings. Information and restrictions relating to such these companies would be reflected in these systems.

Portfolio managers would be alerted to potential breaches and specific approvals would be required to override the pre-trade controls in the system. Post-trade checks would also be conducted by the independent risk management or compliance teams to ensure that all restrictions are complied with, and exceptions are properly approved. For rules that are monitored on a post-trade basis, the risk management or compliance teams would be responsible for assessing the need to escalate breaches to a higher authority and ensuring that portfolio managers take the necessary corrective actions to bring the funds/mandates within the restrictions or limits prescribed.

Further work required:

- Incorporate environmental risk monitoring in the job scopes of staff operating in the second line of defence.
- Leverage IT systems to automate control checks.

4.3 FOCUS AREA 3: MONITORING FOR GREENWASHING

With the mainstreaming of sustainability disclosures by issuers and financial institutions (FIs), regulatory attention has also turned globally towards the issue of greenwashing. The report published by the International Organisation of Securities Commissions (IOSCO) on Recommendations on Sustainability-Related Practices, Policies, Procedures and Disclosure in Asset Management in November 2021 has provided various examples on greenwashing that could occur at the company or product level.

At the company level, AMs should be mindful of not overstating their sustainability-related commitments, without demonstrating their progress towards meeting such commitments. To manage such risks, AMs can take steps such as:

- Setting out roadmaps with measurable milestones in the shorter-term, to chart the company's proposed pathway towards the public commitments it has made, and demonstrate credibility in the AM's ability to meet its goals.
- Developing clear policies and procedures on how AMs intend to achieve ESG integration in their investment processes, so that the AM's broader strategy is translated into actionable steps and concrete outcomes.

At the product level, AMs should put in place processes to ensure alignment between their marketing materials (including name of their products) and the product's investment objectives and/or strategies. This is particularly important for products that are marketed with some sustainability focus. Some AMs set clear internal requirements for a prescribed percentage of the fund/mandate to be invested into investee companies with good environmental risk ratings. They also impose caps on investments into companies that are poorly rated. For such investments, investment teams would generally be required to justify their investments into these investee companies.

Independent monitoring would be conducted by the relevant support units, such as risk management, compliance, or audit teams for both company-level and product-level disclosures. This is to provide assurance that the AM is indeed practising sustainable investing as marketed, or that the portfolio's metrics (e.g. carbon/fossil fuel exposure) is kept within specific disclosed limits.

Case Study: Incorporating sustainability checks in a fund's life cycle

Mitigation of greenwashing risk begins from the conception of new funds. An AM has put in place a product governance procedure, to require vetting of new funds' investment objectives from the onset, as well as the steps investment teams would take to meet the fund objectives.

In the idea generation stage, investment teams (with the support of sustainability experts) were required to articulate how ESG risks were to be monitored and managed on an ongoing basis. The proposals would be put through multiple committees for approval, prior to the funds' launch.

For funds that were either labelled sustainable or marketed to have integrated environmental risk considerations in their securities selection and portfolio construction processes, investment and risk teams would be required to monitor the environmental risk of the funds on an ongoing basis. Reviews of the status or labelling of the funds would also be conducted regularly, for instance, yearly or quarterly.

Further work required:

- Reduce ambiguity by putting in place quantitative targets and metrics to be achieved at the company, as well as product level.
- Regular monitoring by independent functions to ensure compliance with company commitments, as well as product-level obligations.
- Independent approvals for all marketing materials and stakeholder communications to ensure the veracity of information provided.

5 SCENARIO ANALYSIS

Climate scenario analysis is a key tool for assessing physical and transition risks that could impact the resilience and performance of funds/mandates managed by the AMs. It allows AMs to better understand the potential impact of climate-related risks and opportunities under different scenario pathways. In addition, scenario analysis can be used to assess the alignment of funds/mandates with climate goals and may result in changes being made to their portfolio compositions. Scenario analysis also supports AMs' strategy formulation and business planning.

The application of scenario analysis by AMs to assess climate-related financial risk is a relatively new and developing field, and best practices in the usage of this tool continue to evolve. AMs are thus encouraged to keep abreast of industry practices while continuing to innovate and refine their own practices.

An AM 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

- Climate Financial Risk Forum (CFRF) Guide 2021 - Scenario Analysis, 2021
- Network of Central Banks and Supervisors for Greening the Financial System (NGFS), Scenarios in Action: a progress report on global supervisory and central bank climate scenario exercises, 2021
- Transition Pathway Initiative (TPI) tool
- UN PRI Inevitable Policy Response 2021: Forecast Policy Scenario and 1.5°C Required Policy Scenario

5.1 FOCUS AREA 1: SCENARIO SELECTION AND DEVELOPMENT

Surveyed AMs 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 other forms of environmental risk could impact the financials of companies and ultimately the resilience of the funds/mandates managed.

AMs mostly referenced publicly available climate scenarios to perform their analyses. These analyses are largely focused on assessing if their funds/mandates are aligned to various climate scenarios, with fewer AMs conducting analyses on financial impact of climate scenarios on portfolio values. Common scenarios utilised by AMs include those developed by the IEA, Intergovernmental Panel on Climate Change, NGFS and TPI. In addition, AMs can refer to the UN PRI's paper on "Implementing the TCFD recommendations – A guide for asset owners" when developing their scenarios.

A few AMs have worked with external vendors to co-create scenarios tailored to the profiles of their investee companies. This allows AMs greater autonomy to modify the assumptions underlying the different climate scenarios, taking into consideration the sectors and regions that their investments are in.

Case Study: Tailoring scenarios to fit AMs' own needs

Publicly available tools are often good starting points for AMs that are starting out on scenario analysis, as they are usually developed by research or policy groups and provide useful information about plausible climate pathways. However, larger AMs with wider range of investments (in terms of geographic reach and investment sectors) may find that off-the-shelf tools may not be sufficiently aligned to the AMs' business model, focus or commitments.

We note that an AM had worked with a vendor to co-develop a bespoke analysis model to allow the AM greater flexibility to vary parameters to align with the AM's own assessment of (i) the probabilities of various scenarios and (ii) the sector's, country's or region's environmental progress.

AMs are encouraged to review the scenarios on an ongoing basis to ensure that they cover a range of potential future climate pathways, so as to facilitate a good understanding of the potential climate-related risks and opportunities they may face. In some cases, Nationally Determined Contributions¹⁵ (NDCs) and associated plans may inform AMs' understanding of the likely pathways that they may be exposed to in the jurisdictions that they operate and invest in.

In addition, as scenario analysis approaches are often very dependent on the choice of underlying assumptions, sensitivity analysis can be 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:

- Ensure the relevance of scenarios adopted and be ready to articulate the rationale for selecting those scenarios.

5.2 FOCUS AREA 2: ANALYTICAL AND METHODOLOGICAL CHOICES

Less than half of AMs surveyed have commenced on climate scenario-based analyses, although most AMs were working towards doing so. AMs were generally also still in the exploratory stages of conducting scenario analysis, which aimed at assessing the resilience of AMs' business models and operations to climate-related risks. Information gleaned from scenario analyses could help AMs to finetune their governance and risk management practices in relation to climate-related risks¹⁶.

Transition risk analyses were more advanced overall compared to physical risk analyses. Most AMs that have conducted scenario analysis have focused on transition risks so far, with only a handful conducting physical risk analyses. The exceptions were AMs managing real estate properties, which analysed vulnerabilities of their assets to physical climate risk events, as part of pre-acquisition due diligence and post-acquisition risk monitoring.

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 by 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.

AMs 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 recognition that physical risks 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.

The approaches AM have taken for climate scenario-based analyses can be broadly classified into three categories:

- **Top-down analysis** uses forecasted variables to determine the impact of climate-related risks at various levels – aggregated portfolio, by asset classes, sectors, or geographies.
- **Bottom-up analysis** looks at the financial impact on individual investee companies.
- **Portfolio alignment** seeks to determine whether a portfolio is aligned with globally agreed (climate) targets.

Top-down scenario analysis

AMs more commonly perform top-down analysis, estimating the behaviour or alignment at an aggregated portfolio or sectoral level.

One relatively common and straightforward scenario analysis AMs have performed, is the Carbon Value-at-Risk or earnings at risk assessment, which measures the impact of rising carbon costs on a company's profitability.

Other AMs have used scenario analysis in the context of assessing their funds' projected future emissions, against their allocated carbon budget (across various temperature scenarios). The results would be furnished to individual investment teams, who can use the information for their investment decisions, or for reporting purposes.

Bottom-up scenario analysis

Transition risk

Transition risk analysis was not usually performed at an individual security level. Nevertheless, we observed that an AM has begun to design scenarios to estimate the impact of these transition pathways on the impairment of securities and probabilities of default. The results of the scenario analysis were then fed into its asset allocation process and used as a tool to prioritise engagement with issuers.

As a guide to prioritising resources, AMs may opt to focus on investee companies that they have larger exposures to or operate in higher-risk sectors. In addition, AMs may choose to add investee companies to better understand the impact of the various climate scenarios, across sectors and geographies.

Physical risk

Most AMs were still in the midst of developing capabilities in physical risk analysis, which requires a mix of asset 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) for meaningful analysis. Given this, physical risk analysis is more common amongst AMs that manage real estate properties as they have access to more granular information

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

that can be used to estimate climate-related outcomes with greater accuracy and reliability. In general, AMs who did physical risk scenario analysis were able to incorporate and assess the impact of both acute (e.g. flood, hurricane, and typhoon risks), and chronic physical risks (e.g. sea level rise) on the value of their assets, or on the value required to protect assets.

As simplifying assumptions were utilised for such analyses, additional care is needed in the interpretation of results. AMs may wish to disclose the possible limitations of the analysis, and/or provide more information on the estimated impact in worst-case scenarios.

Portfolio alignment

One of the more common set of scenarios cited was the IEA's Sustainable Development Scenarios, to determine their portfolio's projected emissions trajectory against its allocated carbon budget.

Another tool AMs could consider tapping on, is the Paris Agreement Capital Transition Assessment (PACTA) tool developed by the 2 Degrees Investing Initiative. It is a free and open-source methodology and tool which allows users to measure financial portfolios' alignment with various climate scenarios consistent with the Paris Agreement.

Horizons chosen for scenario analysis varied significantly depending on the risk that was being assessed. For instance, transition risk could materialise as soon as in the very near term, while the likelihood of physical risks materialising would range from the near term to the very long term. Among the sampled AMs, scenario analysis was conducted across a range of time horizons, ranging from about three years up to 30 years. Covering a range of time horizons would allow AMs to better address a myriad of scenarios. For instance, they can help AMs identify risks that crystallise within business planning horizons and/or gauge exposures to longer term structural changes that may have implications for investment strategy.

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, AMs have continued to face significant hurdles obtaining enough data and identifying suitable methodologies to assess the full impact on their funds/mandates and strategies. In terms of environmental risks beyond climate-related risks, methodologies were even less developed and further work is needed.

Further work required:

- Consider various time horizons in the conduct of scenario analysis.
- Enhance capabilities for physical risk assessment. For immovable assets, the AM could consider the locations of operations of their investee companies. As a starting point, an AM could consider utilising the PACTA tool for its analysis.

5.3 FOCUS AREA 3: USAGE OF RESULTS

The approach to incorporating the information gleaned from forward looking assessments has varied across AMs. A few AMs had started to use the outcomes of scenario analysis to augment their environmental risk management processes through the following:

- **Enhancing environmental risk research and portfolio construction:** The results of scenario analysis were incorporated into the AM's environmental risk scoring model to take into account an investee company's projected behaviour/performance under various outcomes. More advanced AMs have used the results of scenario analysis to identify characteristics of companies that are more climate-resilient for portfolio construction.

- **Strengthening portfolio risk management:** The results of scenario analysis are made available to investment teams to enable them to understand the possible financial impacts of environmental risk on the funds/mandates that they manage, and to make the necessary adjustments.
- **Corporate engagement:** The results of scenario analysis were used to identify and prioritise sectors or investee companies for engagement.

Further work required:

As the conduct of scenario analysis in the context of environmental risk management is relatively nascent, AMs may focus on strengthening confidence around the outcome of their assessments. The points below illustrate some common limitations or challenges that an AM may face in conducting scenario analysis/utilising their outcomes, and suggestions to address them:

- To address uncertainty around the likely transition pathways, an AM could explore a range of outcomes through a variety of scenarios.
- To address resource constraints, an AM could focus initial efforts on sector(s) assessed qualitatively to be of higher risk, or have higher impact to their portfolio. Such pilot exercises could serve to examine issues at the targeted sectors while building internal capacity for later extension to other sectors.
- To address the reliability concerns arising from the use of industry-level proxies in the analysis, AMs could consider collecting non-publicly disclosed data from investee companies, especially those that are privately held.
- To address uncertainty about the multiple assumptions used, AMs could conduct sensitivity analysis to identify material drivers of outcomes¹⁸ and highlighting them to decision-makers.

To enhance understanding of the limitations of the assessments, AMs could, when presenting the analysis to stakeholders, include additional information to aid decision-making. For instance, data granularity and limitations¹⁹, model capabilities, scope, risks intended to be addressed, etc.

¹⁸ As with other forms of analysis, sufficient rigor should be applied when examining such key drivers, including ensuring that such relationships make economic sense.

¹⁹ 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.

6 STEWARDSHIP

Stewardship is one of the key levers for AMs to effectively manage the environmental risk in their funds/mandates and achieve long-term performance for their customers. Direct engagement with investee companies can improve their environmental risk profiles by shaping the companies' behaviour towards more sustainable policies and practices.

AMs are expected to support investee companies' efforts in the transition towards more sustainable policies and practices over time, in line with the AMs' risk management standards.

Relevant Resources

- Singapore Stewardship Principles for Responsible Investors
- UN PRI, An introduction to responsible investment stewardship

6.1 FOCUS AREA 1: TYPES OF ENGAGEMENTS

Most AMs recognise their role in supporting investee companies' efforts to transition towards more sustainable policies and practices over time. In this regard, AMs have generally adopted a combination of approaches:

- **Bilateral engagement:** The mode of engagement could vary, depending on the issues to be discussed. This ranges from phone calls, written or electronic correspondence to face-to-face meetings.
- **Proxy voting:** Some AMs have developed and published voting policies to exercise their rights as shareholders of an investee company. Clear voting policies help the AM to vote in a manner that is transparent and consistent with its overall responsible investment values and the interests of the AM's customers.
- **Collaborative engagement:** A sizeable number of AMs were participants of collaborative engagements platforms that align to their needs and priorities. These include (i) Climate Action 100+, which focuses on engaging the world's largest GHG emitters to mitigate the effects of climate change, and (ii) Farm Animal Investment Risk & Return Initiative, which represents an investor network to drive change in the animal agriculture sector and raise awareness on ESG risks and opportunities in the global food sector.

Case Study: A multi-pronged approach to stewardship

One of the surveyed AMs adopted all the above-mentioned approaches to stewardship – bilateral engagement, proxy voting and collaborative engagement. The AM has aligned its voting policy to its commitments to international climate agreements, and to support other environmental issues, such as biodiversity and pollution.

Its voting policy also set expectations on investee companies to meet certain environmental risk management criteria, such as reducing GHG emissions, disclosing GHG emissions targets and enhancing environmental risk management oversight.

Further work required:

- Work towards a more varied and active engagement of investee companies, commensurate with the risks that they pose.

6.2 FOCUS AREA 2: SELECTION OF INVESTEE COMPANIES FOR ENGAGEMENT

Some AMs use a combination of bottom-up and top-down approach to aid their selection of investee companies to engage. The “bottom-up” selection process prioritises investee companies with poorer environmental risk ratings, including those which are dealing with more urgent and/or severe ESG issues. The “top-down” selection process considers investee companies by matching their business activities and operations to pre-identified engagement topics. The topics for engagement could be based on areas that may pose material environmental risk to the investment holdings of their funds/mandates or reflect the AMs’ commitment to internationally-recognised goals and principles, such as the UN SDG or UN PRI.

Most AMs have also developed clear processes and criteria to identify and prioritise investee companies for engagement. For instance, when identifying investee companies for engagement, some AMs consider the impact of climate-related risks and opportunities on the companies’ financial positions, as well as the impact of their operations on broader communities and the environment. The order of engagement of shortlisted investee companies takes into account factors such as financial materiality, size of investment, level of responsiveness, and urgency of matter (e.g. recent controversies).

Engagement efforts would typically be led by investment teams, given their familiarity and frequent interactions with investee companies. Environmental risk specialists would help with more in-depth discussions and sharing of expectations for investee companies that are exposed to more significant environmental risk. They would also be responsible for engagement sessions on key risk topics (e.g. transition to low-carbon energy sources, water risk, biodiversity etc.) that are common across multiple investee companies (e.g. thematic engagements) to ensure consistent messaging and benchmarking of practices, plans, metrics, and targets.

Further work required:

- Enhance the engagement framework for investee companies by adopting a combination of bottom-up and top-down (e.g. theme-based) selection approaches.

6.3 FOCUS AREA 3: EVALUATING EFFECTIVENESS OF STEWARDSHIP APPROACHES

AMs generally seek to encourage investee companies to commit to more sustainable policies and practices. These include having detailed plans, and roadmaps to manage environmental risk and opportunities, transition towards a sustainable economy (e.g. phasing out of coal and setting science-based targets to cut emissions), and/or enhance the transparency of their sustainability strategy, governance structure, risk management practices and key performance metrics and targets.

It is important that AMs set clear timelines and milestones for investee companies, and closely track their progress in managing environmental risk. To this end, the AMs would generally document the investee companies’ action plans in their engagement/investment platforms and make them accessible to all investment analysts and portfolio managers. Some of these action plans are also made public to promote greater accountability and market discipline.

Some examples of time-bound outcomes include requiring investee companies to:

- Manage transition risk by meeting specific, quantifiable improvement in key operational indicators, such as reducing carbon emissions by up to 50% within a certain time frame (e.g. by 2030);

- Improve information availability and comparability for market participants, e.g. by publishing sustainability disclosure reports, including relevant metrics (e.g. carbon emissions, water usage) by a certain date; and
- Commit to divest/downsize parts of their business with significant exposure to environmental risk by a certain date.

AMs would re-evaluate the environmental risk rating of investee companies that are not receptive to their engagement or have failed to meet the agreed outcomes within the stipulated timeline.

Where warranted, AMs would join other like-minded investors to collectively engage these investee companies, issue public statements, vote against management/resolution, reduce and/or even exit their investment.

Case Study: Evaluating and reporting of engagement efforts in an organised manner

One of the AMs adopted a structured approach to evaluating and reporting on the effectiveness of their engagement efforts. The AM collected and categorised statistics on companies that they have engaged into ESG-related issues. The AM logged important information, such as the engagement themes, discussion points and subsequent action plans on a centralised tracking platform. The platform enables the AM to track and encourage investee companies' adherence to previously agreed action plans as well as adoption of ESG performance targets over time.

The AM further defined and tabulated successful engagement outcomes on an annual basis through statistical analysis on their engagement efforts. These were reported to customers through stewardship reports, which would elaborate on the engagement campaigns and successful outcomes. An example in the AM's stewardship report was its vote against an investee company's shareholder resolution on climate alignment plan.

The AM also participated in a collaborative engagement platform to encourage the investee company to set more ambitious targets, including interim targets for carbon reduction. The investee company consequently refined its climate ambitions and demonstrated credible commitment by setting aside additional budget to pursue its revised and more ambitious targets.

Further work required:

- Enhance stewardship framework by providing sufficient guidance on assessing and monitoring the effectiveness of engagement efforts, as well as the definition and consequences of an unsuccessful engagement.

7 CAPACITY BUILDING & CULTURE

An organisational culture with strong awareness of environmental and climate-related risks and its impact on the AM, is an essential enabler to navigate the transition to a sustainable economy. AMs need to build company-wide understanding of the transversal and evolving nature of the risks and opportunities, as well as the variety of ways to address them

As the Board plays a critical role in integrating environmental considerations into an AM's business, it is imperative for AMs to ensure that Board members are sufficiently equipped with the knowledge and skills needed to provide the necessary strategic steer. For instance, the SGX has announced requirements for directors of listed companies to undergo mandatory sustainability trainings.

Relevant Resources

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

7.1 FOCUS AREA 1: INTERNAL CAPACITY BUILDING

In recognition of the increasing urgency of environmental and climate-related risks, most AMs have begun to upskill relevant staff on identifying, assessing, mitigating, and managing such risks, with some going further to require environmental risk training for all staff. Various approaches adopted by AMs are discussed below:

- **Hiring qualified staff:** Some AMs have hired environmental specialists to work alongside regular investment analysts. These environmental specialists, which are deployed to the different investment teams, have had specialised training to fully integrate ESG considerations within the investment process of their respective investment teams.
- **Regular updates:** For the upskilling of BSM members, attendees of BSM meetings would be regularly updated on environmental and climate-related developments (e.g. green taxonomies, standards for responsible investment disclosures and emerging business trends that pose environmental risk) to raise their awareness and facilitate discussions of the company's environmental risk management strategy and business plans.
- **In-house trainings:** Subject matter experts within some AMs (e.g. ESG research analysts from the sustainability units) have conducted in-house trainings that could be more closely tailored to the company's business context. For instance, staff could gain a better appreciation of the company-specific considerations and policies that underpin its overall environmental risk management strategy.
- **External trainings:** Other AMs have leveraged the expertise and resources of third-party providers to train their staff on environmental and climate-related risks and trends. Such

third-party providers include industry associations²⁰, rating agencies (e.g. Morgan Stanley Capital International (MSCI)), international investor networks (e.g. UN PRI), institutes of higher learning (e.g. Singapore Management University) and non-governmental or non-profit organisations (e.g. WWF for Nature, World Resources Institute and Global Canopy). A few AMs have also enlisted staff in certain roles/functions in structured, certified courses offered by professional bodies²¹.

Many AMs adapt the training to their staff's roles and responsibilities. AMs usually deliver more in-depth training to staff in investment, research and risk management functions given their more direct responsibility for identifying, assessing, mitigating, and managing the environmental risk exposure of the company's funds/mandates.

AMs are beginning to extend high-level/basic training on environmental risk to all staff, for instance as part of their onboarding programme. Some AMs also place their sustainability training resources (e.g. webinars) on their shared sites or training platforms for easy access by all staff to keep abreast of developments in this space.

Case Study: Adopting different approaches and tailoring them to staff's roles

One of the AMs offered a wide range of training programs to upskill their staff on ESG and stewardship-related matters. The training comes in different formats and is customised to specific business lines. For instance, the AM offered videos on ESG topics, knowledge sharing sessions with subject matter experts and technical training sessions for investment analysts to effectively utilise both in-house and externally developed ESG-related tools. The training content was also routinely reviewed by the AM's central ESG investment function, with the help of dedicated ESG experts.

The AM also used its ESG specialists to provide investment teams with ad-hoc guidance on ESG investing considerations, and to stay abreast of emerging trends within the ESG investing space. Where possible, the AM's senior ESG specialists also collaborated with academia and other market intelligence institutes to conduct ESG investing research.

Further work required:

- Offer environmental risk trainings to all staff, with appropriate calibration where necessary.
- Encourage relevant staff to pursue accreditations/certifications offered by professional bodies.

²⁰ For instance, the Investment Management Association of Singapore had launched an ESG e-Learning Module that introduced sustainable investing, including adoption methods and challenges in Asia, to the asset management industry. The Association of Independent Wealth Management has also organised helpful webinars that provide an introduction to ESG investing and guidance for the adoption of the December 2020 MAS ENRM Guidelines, whereas the Alternative Investment Management Association and Standards Board for Alternative Investments have made available useful resources to AMs to deepen their understanding on incorporating responsible investment principles within their investment frameworks.

²¹ For example, CFA Institute's Certificate in ESG Investing and Global Association of Risk Professionals' Sustainability & Climate Risk Certificate

7.2 FOCUS AREA 2: EXTERNAL CAPACITY BUILDING

A handful of AMs recognise the role of customer education in mainstreaming sustainable finance. Improving customers' understanding of environmental and climate-related risks, and their economic impact and implications on investments could increase demand for sustainable investment products and prevent greenwashing. As such, these AMs have included customers in their capacity building efforts to empower them to make informed investment decisions. They organise webinars to discuss topics such as ESG considerations and their implications on investment portfolios.

Some AMs have also shared with customers the sustainability risks associated with certain investments, such as plastics pollution. Such sustainability-related training is provided to customers through a myriad of platforms. Some AMs have opted to host podcasts, webinars, and conferences. Others have disseminated thought pieces to customers about environmental and climate-related risks, and their approach towards managing such risks.

Some AMs have also focused on ESG research initiatives and published ESG research papers to uplift customers and the wider industry peers' understanding on specific topics, such as the potential impact on climate-related events on financial systems. As part of their research initiatives, some AMs have collaborated on tools enabling their customers or peers to perform analysis on their investee companies, such as by measuring the alignment of companies to the Paris Agreement objectives, or the potential financial impact of specific physical climate risk events on the companies.

Case Study: Raising awareness and understanding of environmental risk amongst external stakeholders

One of the AMs raised the awareness of customers and the public on environmental risk matters relating to investments through a multitude of channels:

- Engagement with media (i.e. educational segments broadcast on news channels).
- Publication of thought leadership articles that provide an overview of ESG investing matters and best practices.
- Collaboration with academia through engagement activities (e.g. case competitions), which provide the wider public (e.g. students) with a deeper understanding of ESG issues in the context of investments.

Further work required:

- Keep published information and contents of training sessions current, bearing in mind evolving environmental trends and customer needs.

8 DISCLOSURE

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

- Disclosures are 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 International Sustainability Standards Board (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 IOSCO and the Basel Committee on Banking Supervision.
- In Singapore, the SGX has set out a roadmap for mandatory climate reporting for listed issuers that is aligned with the TCFD recommendations. MAS will also be setting out a roadmap for mandatory climate-related disclosures for FIs in line with global baseline sustainability reporting standards.

AMs have assessed and enhanced their environmental risk disclosures and have generally made improvements in a phased manner year-on-year. As their risk management capabilities matured, AMs have been better able to articulate as well as provide more details about their environmental risk management framework and policies, including disclosing quantitative metrics and targets for the AMs' own operations and their funds/mandates.

Relevant Resources

- CFRF Guide 2021 – Disclosures – Managing Legal Risk, 2021
- GFIT Financial Institutions Climate-related Disclosure Document, 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
- 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
- TCFD Guidance on Metrics, Targets, and Transition Plans, 2021
- TCFD Implementing the Recommendations of the TCFD, 2021
- TCFD Knowledge Hub

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

Company-level environmental risk disclosures were generally published on a group-wide basis due to common governance structures, environmental risk management strategies and frameworks across all entities of the group. The disclosures were either embedded in the groups' annual reports and/or issued as standalone sustainability reports. Smaller AMs that may not publish annual sustainability reports have embedded environmental risk disclosures in their periodic investor reports, or made them available to customers upon request. Most AMs that currently publish such disclosures would also review their disclosures at least annually to update and improve them.

AMs generally supplemented their annual environmental risk disclosures with more current and/or bite-sized information on their webpages or microsites. Likewise, AMs that have yet to publish their inaugural environmental risk disclosures, have provided their views and approaches for managing environmental risk on their websites.

- **Many AMs have set up dedicated webpages or microsites to share information about climate change and/or environmental degradation and their sustainable finance efforts and/or approach.** The information could be delivered via short videos, audiocasts, podcasts or feature articles.
- **Several AMs published their environmental risk management policies as well,** which typically cover organisational structure, environmental risk assessment methodology, exclusions, and engagement in more detail.

At a product-level, most AMs have confined sustainability-related disclosures to funds marketed to be “sustainable”, or funds with ESG considerations integrated within their investment processes. Examples of sustainability-related information that are disclosed to customers include:

- Specific sustainable objectives of the fund, and how these objectives are intended to be met. This would entail description of how ESG considerations are being integrated in the fund's portfolio construction process, as well as information on any targets that the fund should meet (e.g. minimum investments in investee companies that are assessed to fare better in ESG, or vice versa).
- Processes for ongoing monitoring to ensure that investment parameters are being met.
- Sustainable labels received on the fund.
- Actual ESG performance of the company, including the ESG score distribution of investee companies within the fund/portfolio, carbon footprint of the fund/portfolio (e.g. weighted average carbon intensity).

Further work required:

- Improve access and facilitate informed decision making by making company-level and product-level sustainability-related disclosures publicly available to all potential customers.
- Expand the reporting of sustainability-related information and metrics to non-green labelled funds/mandates as the AM progressively integrates environmental risk considerations across all portfolios.

8.2 FOCUS AREA 2: REPORTING FRAMEWORKS USED

AMs were using a variety of reporting frameworks for their climate-related risk disclosures, with the TCFD being the most common framework used. 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 program of work to develop a comprehensive global baseline of sustainability disclosure standards, starting with climate. On 31 March 2022, the 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 the 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 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 AMs have aligned their reporting to other well-regarded sustainability reporting frameworks such as the Global Reporting Initiative (GRI). This was more common amongst real estate AMs, as the GRI has a Construction and Real Estate Sector Supplement that is relevant to their business model. Other standards which AMs referenced include the Carbon Disclosure Project, which provides guidance on disclosure of environmental data including GHG emissions.

For fund-level reporting, AMs were mostly reporting based on the regulatory requirements of where their funds were domiciled, such as the European Union's sustainable finance disclosure regulations for funds domiciled in the European Union. In January 2022, MAS issued a consultation paper regarding the proposed disclosure requirements for retail ESG funds through industry associations such as the Investment Management Association of Singapore. As sustainability disclosure standards continue to evolve, we encourage AMs to monitor and comply with international developments, regulatory requirements, and best practices in this space, where appropriate.

Further work required:

- Monitor and ensure compliance with evolving product-level and company-level national and international disclosure or reporting frameworks.

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

AMs 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 report²² and made material updates to its guidance²³, as well as provided additional guidance²⁴ on specific topics. In particular, the Supplemental Guidance for the Financial Sector – Asset Managers and Asset Owners, under the Annex of the TCFD Recommendations Report, provides practical implementation guidance on the information that AMs should seek to integrate as appropriate in their-climate-related disclosures.

From the review, for AMs that adopted the TCFD framework, the extent of compliance with the TCFD recommendations was varied. All the AMs reviewed, including those that were currently aligned with other disclosure frameworks, have stated that they would work towards complying with the TCFD recommendations.

Governance

Disclosures in governance were relatively more advanced than the other areas. AMs have generally disclosed their governance structures and the BSM's roles, including information on persons and/or committees assigned to oversee the management of environmental risk.

Good practices included clear descriptions or diagrammatic representations of reporting lines and organisational structures for climate-related risk reporting and oversight. AMs have also generally provided information on the scope of responsibilities, as well as the frequency of meetings of relevant committees that have climate-related risk management responsibilities.

A handful of AMs have elaborated on the mechanisms for monitoring and managing climate-related risks and opportunities by the BSM and any relevant committees. To further enhance stakeholders' assessment of how their BSM have discharged their responsibilities, AMs may want to consider providing examples of key discussion topics, review areas or decisions made by BSM and/or committees in the past year.

A couple of AMs also highlighted the importance of integrating climate-related factors in remuneration policies to achieve their company's climate goals and objectives. AMs are encouraged to disclose how their remuneration policies incorporate climate-related objectives, as one of the means to demonstrate their commitment to these objectives and to drive accountability across different functions in the company.

Strategy

There was a wide range of information disclosed on the potential and actual impacts of climate-related risks and opportunities²⁵ by AMs. At one end of the spectrum, AMs with inadequate disclosures had yet to commence or complete their assessments and scenario analyses on the impact of climate change on their business. At the other end, a few AMs had described the resilience of their business strategies to different climate-related scenarios, including a 2°C or lower scenario.

²² TCFD (2021), "2021 Status Report: TCFD"

²³ 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.

²⁴ 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.

²⁵ 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 TCFD (pp. 9,74).

Good practices by AMs observed include:

- Clear mapping of 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 that were complemented with descriptions of their potential impact on the AM's strategies, strategic responses, and actions.
- Use of multiple scenario analyses to drive security selection, strategic asset allocation, customer engagement and/or product offerings. A limited number of AMs could also quantify the impact of rising carbon costs on their portfolio value (Carbon Value at Risk).

Several AMs have disclosed their transition plans by laying out a set of targets and actions supporting their transition toward a sustainable economy, including actions such as GHG emissions reduction commitments. Transition plans are of particular interest to stakeholders, especially in verifying the credibility of companies' commitments to climate change. AMs should 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.

Risk management

Most AMs have described their policies and processes to identify, assess, manage, and integrate climate-related risks within their investment decisions. The level of granularity should be further improved generally to aid in the upskilling of the industry and to allow stakeholders to hold the AMs accountable for their commitments. For example, only a handful of AMs provide information on the generic factors and/or sector-specific factors for determining the environmental risk rating of an investee company operating in a particular sector. More detailed information would be useful for stakeholders to better understand the AMs' framework for managing environmental risk and to make more informed investment decisions. Many AMs also acknowledged that the limited disclosures relating to the use of climate-related scenario analysis for risk management purposes remained work in progress.

Good practices observed included detailed descriptions of the AM's policies and processes for managing climate-related risks. For instance, some AMs have set out the conditions for, or restrictions on, investing in particular sectors. These sector policies may require the AMs to exclude, divest or limit their funds/mandates' exposure to certain high-risk sectors, and/or heighten customer engagement for investee companies in these sectors. Other AMs also provide information on adapting their risk assessment framework to the characteristics of different asset classes.

Several AMs have also provided comprehensive disclosures on their engagement policy, strategy, and outcomes, including how they have prioritised engagements, number of companies they have engaged, key topics of engagement, as well as the overall impact of their engagements (such as statistics on their ESG-related proxy votes).

Metrics and targets

AMs have cited metrics and targets as a key area for improvement for disclosures, as they were still in the process of developing or strengthening their methodologies to measure their risks and opportunities and set targets. While most AMs had disclosed some form of quantitative metrics and targets for assessing climate-related risks and opportunities (e.g., green/brown share, weighted average carbon intensity, etc.), the comprehensiveness of these disclosures can be improved.

Disclosures on climate-related metrics were wide-ranging. For metrics and targets used to assess climate-related risks and opportunities in relation to business strategies and plans, several AMs have

separate metrics for the company and their investment portfolios, to provide clearer distinction between environmental risk arising from their own operations and those relating to their investment management activities. Some company-level metrics include Scope 1, Scope 2 and Scope 3 GHG emissions, where possible, as well as energy and water usage. At the investment-level, AMs have disclosed the weighted average carbon intensity of portfolios, or portfolio carbon emissions by asset class and/or geographies.

While forward-looking metrics are still in their infancy, some AMs have starting using and disclosing forward-looking metrics for transition risk. This includes metrics to estimate temperature rise implied by the AMs' portfolio holdings, or the projected alignment of portfolios with various climate scenarios and temperature trajectory.

Most AMs were able to report their Scope 1 and 2 GHG emissions. AMs typically utilise an internationally accepted GHG accounting system, such as the GHG Protocol, to measure the Scope 1 and 2 GHG emissions for their own operations. Certain AMs have also obtained third-party verification of their Scope 1 and 2 GHG emissions. However, AMs faced more challenges in reporting their Scope 3 GHG emissions due to data gaps. Most AMs have to disclose their Scope 3 GHG emissions on a best-efforts basis without incorporating the full downstream impact, for example by only capturing the GHG emissions derived from air travel undertaken by employees for business trips, or emissions from production and distribution of construction materials, in particular for direct real estate managers.

AMs have sought to overcome incomplete data on investee companies, which inhibit comprehensive Scope 3 emissions reporting, through other data collection means and use of proxies. Several AMs collected emissions data directly from investee companies through questionnaires or engagement, and third-party service providers, while other AMs explored proxy methodologies like the Partnership for Carbon Accounting Financials²⁶.

The climate-related metrics disclosed by AMs were not always accompanied by targets, making it harder to assess the AM's performance with respect to the various metrics used. However, this area is expected to progress rapidly with the increasing focus on transition plans and interim target setting to track progress more effectively. In the meantime, most AMs have only set high-level targets, such as long-term targets (e.g. achieving net-zero GHG emissions by 2050 across all assets under management). Fewer AMs have broken down their long-term targets into more manageable and actionable short-term and medium-term targets. For example, these AMs set interim targets to green their investment portfolios (e.g., for 80% of real estates managed to be green-certified²⁷ by 2024 and 50% reduction in the carbon footprint of investment portfolios by 2030) or for their investee companies to comply (e.g., for relevant investee companies from non-agricultural sectors such as mining and infrastructure to comply with "No deforestation, no peat and no exploitation" commitments by 2030).

Metrics and targets reported are continuing to evolve as data becomes more available and international standards develop. AMs may refer to the TCFD Guidance on Metrics, Targets and Transition Plans, which sets out useful guidance on climate-related metrics²⁸ and targets²⁹, and the

²⁶ 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.

²⁷ Green Mark in Singapore and Vietnam, Green Star in Australia, and Europe, BREEAM in the UK, and WELL and LEED in Thailand.

²⁸ Refer to Cross-Industry, Climate-Related Metric Categories and Example Metrics (pp. 16-17) in the Guidance.

²⁹ Refer to Examples of Quantified Targets (pp. 33) in the Guidance.

Common Set of Core ESG Metrics³⁰ 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-related 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:

- Enhance transparency around how the AM is actively identifying, assessing, managing, and mitigating environmental risk, which is not limited to climate-related risks.
- Identify and disclose relevant metrics and targets, including interim targets and the achievements against these targets, consistently across time.

8.4 FOCUS AREA 4: ASSURANCE

Most AMs have yet to obtain assurance even though they recognise that assurance can enhance the credibility of disclosures. This is partly attributed to the absence of globally recognised standards or frameworks for assurance at this point in time. Greater reliance on independent review can be a pragmatic alternative to improving reliability of climate-related disclosures, while the ecosystem for quality external assurance of climate reports continues to develop.

Most AMs had not engaged their internal audit function to review and provide internal assurance over their environmental risk disclosures. AMs have instead chosen to rely on their existing internal controls and checks (including obtaining BSM approvals) to ensure that their disclosures are accurate.

Reviews by the internal audit function of an AM's sustainability reporting process for environmental risk disclosures could build on the AM's existing governance structure and internal controls. This would be in line with the expectation for internal audit to review the robustness of the AM's risk management framework, which includes environmental risk. 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 can form the basis for the development of an audit and assurance framework. On this front, the International Audit and Assurance Standards Board 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 AMs have obtained external assurance³¹ on a limited scope, while others are considering following suit, to add credibility to their disclosures. The scope of such external assurance engagements included:

³⁰ 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.

³¹ External assurance if performed, should be done in accordance with recognised assurance standards, for example the International Standard on Assurance Engagements 3000, the Singapore Standards on Assurance Engagement 3000, the AA 1000 Assurance Standards or the ISO. Where AMs have conducted external assurance on the environmental risk disclosures, to provide transparency to users of the reports, they should disclose (a)

- Verification of quantitative environmental data, such as GHG emissions reported in the AMs' sustainability reports, in accordance to established reporting standards such as the GHG Protocol.
- Upstream audit of methodologies used in various computations, such as GHG emissions level.

AMs that wish to obtain external assurance should scope the assurance engagement toward 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 regulations. AMs are encouraged to consider the scope of assurance engagement that is appropriate for them. AMs can consider independent external assurance on selected important aspects of its environmental risk disclosures in the initial years, expanding coverage in succeeding years.

Further work required:

- Put in place processes to enhance the credibility of the AM's sustainability-related disclosures. This could include subjecting their sustainability reports or the related processes to independent review by support functions, internal audit, or assurance by third parties.

8.5 FOCUS AREA 5: DISCLOSURES FOR ENVIRONMENTAL RISK BEYOND CLIMATE

The impact of AMs' investment activities on biodiversity preservation is a less well-studied area, with data gaps further inhibiting the broader integration of such considerations within AMs' investment approaches.

Only a handful of AMs have made disclosures beyond climate-related risks. Such disclosures would typically not be as extensively covered within the sustainability reports of AMs as climate-related risks. They also focused more on qualitative indicators. Examples that went beyond climate-related risks include:

- Commitments to go beyond minimising harm to enhancing biodiversity, for instance through participation in platforms (e.g., Taskforce on Nature-related Financial Disclosures) that target to reverse nature loss, and undertaking projects (e.g., designating areas or building structures to support biodiversity) to preserve biodiversity through the real estates that they manage.
- Commitments to invest in projects aimed at achieving broader environmental goals such as preservation of natural resources and prevention/management of pollution.

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.

Case Study: Progressing towards biodiversity preservation

Building on its years of work of increasing integration of biodiversity into strategic approaches and ESG analysis criteria, an AM joined the Finance for Biodiversity Pledge. The signatories to the Pledge comprises FIs that have committed to collaborate, engage, assess their own biodiversity impact, set targets and report on biodiversity matters by 2024.

As a first step towards its commitment and given the lack of concrete data in this area, the AM had engaged multiple stakeholders, including investee companies, as well as other non-governmental organisations on how they account for biodiversity management. In the course of its engagements, the AM has also urged investee companies to improve their reporting, management and disclosure of biodiversity risks and impacts.

Although the frameworks and methodologies around the reporting of environmental risk beyond climate were nascent, AMs looked to stay abreast of ongoing developments and augment disclosures over time. For example, upcoming developments around nature-related risks include:

- (a) The G20, in its Sustainable Finance Roadmap³², 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 Guidance³³ 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 which will apply to all large and/or listed companies. The European Financial Reporting Advisory Group 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:

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

³² G20 Sustainable Finance Roadmap (2021)

³³ CDSB (2021), "CDSB Framework Application guidance for biodiversity-related disclosures"

9 KEY CHALLENGES

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

Challenges could broadly be categorised into the following 3 categories: (i) data and methodology, (ii) skills shortage; and (iii) reliance on the Group.

9.1 DATA AND METHODOLOGY

Development of environmental risk assessment methodologies was commonly highlighted as challenging due to the unique characteristics of such risks. These are exacerbated by data availability, accuracy, and comparability issues. In particular, AMs faced challenges from incomplete public disclosures, inability, or unwillingness of investee companies to provide data, lack of data standardisation and granularity³⁴, positivity bias in disclosed data, and the fact that external data can be costly. These challenges were similarly raised in the NGFS Progress Report on Bridging Data Gaps³⁵.

There are a few initiatives to address these data challenges:

- **SGX has mandated disclosures by listed entities and MAS has plans to mandate disclosures by FIs against an internationally aligned disclosure standards.** Given the urgency of the threat from climate change, 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 Greenprint³⁶ 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 SGX³⁷. 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.

To meet the increasing demands on the range and granularity of data over time, AMs will need to consider developing additional systems capabilities and utilising agile data collection methods that reflect an evolving understanding of risks.

³⁴ For example, detailed customer information at an asset-specific level, including geospatial data required for physical risk scenario analysis.

³⁵ Network for Greening the Financial System (2021), "Progress report on bridging data gaps"

³⁶ MAS webpage on Green Fintech, available at: <https://www.mas.gov.sg/development/fintech/Green-FinTech>

³⁷ 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.

Here are some interim solutions to methodological and data issues to address climate-related risks:

- Focus on larger investee companies for which more extensive data is available. In other instances where data is less readily available, AMs may leverage the expertise of external ESG data providers that offer ESG assessment services for smaller or mid-sized companies. In doing so, AMs should exercise caution and discernment by examining the reliability or reasonableness of underlying assumptions made by these third-party providers in deriving their ratings.
- In some cases, AMs have used proxies to simplify assessment. For example, an AM has developed a set of objective data points, as a means of assessing how well investee companies would likely be able to adapt to changing social and environmental trends and pressures.

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

- **Iteratively enhance their risk management practices as methodologies evolve and mature.** AMs 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 & Culture section, along with the efforts of international organisations and regulators, such as NGFS, IOSCO's Sustainable Finance Taskforce and UK CFRF.
- **Leverage 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.

Most AMs have yet to start work on environmental risks beyond climate. While the methodologies and expertise needed to assess environmental risk will likely overlap with that of climate-related risks, the development of such methodologies will take time and may require specific knowledge not within the usual remit of AMs.

Relevant Resources

- Finance for Biodiversity (F4B) Foundation, '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 Foundation, '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

9.2 SKILL SHORTAGES

Some AMs have cited increasing demand for staff skilled in sustainable finance (both frontline and specialist risk roles) as a challenge. There is a talent and knowledge gap due to demand-supply mismatch as traction around environmental risk has only picked up in the past few years. Makeshift sustainable financial hires without strong and deep ESG expertise and credentials could create a slippery slope of ‘talent’ greenwashing and lead to significant repercussions for the industry³⁸.

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 topics (e.g. climate change policy developments, natural capital, green taxonomies). The TSCs set out a robust, common level of sustainable finance proficiency, knowledge and abilities needed for individuals to perform various roles in sustainable finance. The TSCs will also serve as a reference for training providers and FIs 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 the following:

- (a) The Singapore Green Finance Centre (SGFC) was launched in October 2020 as a collaboration between SMU and Imperial, and 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-related risk assessment at the firm level. The programme was attended by finance professionals in key decision making and management roles across SGFC’s founding partners³⁹;
- (b) The Sustainable and Green Finance Institute (SGFIN), established by the National University of Singapore 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

³⁸ Muruganathan, K. (2021), “Talent greenwashing risk in finance sector”, The Business Times Singapore, 14 Sep 2021

³⁹ 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.

batch of students for its Masters programme in Sustainable and Green Finance in August 2022, the first of its kind among leading Asian universities; and

- (c) The Sustainable Finance Institute Asia (SFIA) is 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. On building capabilities at the organisation level, 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 FIs 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.

9.3 RELIANCE ON GROUP

Some AMs that are part of a global group cited the divergence between the effective date of MAS' ENRM Guidelines and that of the requirements in their home jurisdiction as a challenge, due to their reliance on the Group or parent company.

Singapore entities should engage and work with their parent companies to meet the expectations of the ENRM Guidelines and set concrete action plans and timelines to uplift their environmental as soon as practicable. As clarified in the 'Response to Feedback Received for Proposed Guidelines on Environmental Risk Management for AMs', MAS does not expect AMs with limited resources and capacity to ramp up their environmental risk management capabilities to full capacity immediately.

Smaller firms can take measured steps to uplift their environmental risk management capabilities. This could include for instance, establishing appropriate local governance structures (e.g. appointing senior management members to be responsible for the oversight of environmental risk), and embedding environmental risk factors within their investment decision processes, such as by incorporating a qualitative assessment on the potential impact of environmental risk on an investee company's financial position or valuation based on publicly available information or referencing data from external data providers. After performing a gap analysis, AMs should engage MAS if there are particular challenges in meeting the implementation timelines.

10 ABBREVIATIONS

AM	Asset Manager
BSM	Board and Senior Management
CDSB	Climate Disclosure Standards Board
CSO	Chief Sustainability Officer
CFRF	Climate Financial Risk Forum
COE	Centre of Excellence
ENRM Guidelines	Guidelines on Environmental Risk Management for Asset Managers
ESG	Environmental, Social and Governance
F4B	Finance for Biodiversity
FI	Financial Institution
GFANZ	Glasgow Financial Alliance for Net Zero
GFIT	Green Finance Industry Taskforce
GHG	Greenhouse Gases
GRI	Global Reporting Initiative
IBF	Institute for Banking and Finance
IEA	International Energy Agency
IFRS	International Financial Reporting Standards
IOSCO	International Organisation of Securities Commissions
ISSB	International Sustainability Standards Board
KPI	Key Performance Indicator
MAS	Monetary Authority of Singapore
MSCI	Morgan Stanley Capital International
NDC	Nationally Determined Contribution
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NZAM	Net Zero Asset Managers initiative
PACTA	Paris Agreement Capital Transition Assessment
PCAF	Partnership for Carbon Accounting Financials
PE/VC	Private Equity/ Venture Capital
SASB	Sustainability Accounting Standards Board
SFIA	Sustainable Finance Institute Asia
SGFC	Singapore Green Finance Centre
SGFIN	Sustainable and Green Finance Institute
SGX	Singapore Exchange
TCFD	Financial Stability Board's Task Force on Climate-related Financial Disclosures
TPI	Transition Pathway Initiative
TSCs	Technical Skills and Competencies
WWF	World Wide Fund for Nature
UN PRI	United Nations Principles for Responsible Investing
UN SDG	United Nations Sustainable Development Goals