

# Sustainability Report 2021/2022



# Foreword



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CHIEF SUSTAINABILITY OFFICER

## “Onwards and Upwards”

In the poem *The Present Crisis*, James Russell Lowell discusses the sociopolitical issues of his time. One extract, in particular, stands out to me:

*“New occasions teach new duties;  
Time makes ancient good uncouth;  
They must ward still, and onward,  
who would keep abreast of Truth.”*

Although Lowell’s words were penned in a different historical and cultural context from contemporary 21<sup>st</sup> century life, I cannot help but reflect on their pertinence for the global effort to create a more sustainable future.

The latest Intergovernmental Panel on Climate Change (IPCC) report warns that climate change of 1.1 degrees Celsius of warming is already causing widespread disruption in every region of the world. Unless we take swift and decisive action to tackle climate change, the world will suffer from increasingly severe impacts including drought, extreme heat, and sea level rise. Consequently, human society will also suffer from compromised food, water, and energy security.

### New occasions teach new duties

However, the IPCC report also sets out the immense capacity that we have to bring to bear to protect current and future generations from harm – policy, infrastructure, and technology interventions could reduce greenhouse gas emissions by as much as 70% by 2050.

Finance, in particular, is a powerful tool for tackling the climate crisis. However, tracked financial flows remain up to six times less than the levels needed to achieve climate mitigation goals across all sectors and regions; and up to ten times less in the case of adaptation finance.

Sustainable finance activity has accelerated significantly in Singapore and the region. Singapore is now ASEAN’s largest sustainable finance market, accounting for close to 50% of cumulative ASEAN green and sustainability-linked bond and loan issuances. From 2018 to 2021, over S\$39.8 billion of green and sustainability-linked loans have

been issued in Singapore. Notably, sustainability-linked loans experienced continued sustained growth with a quadrupling of volumes from 2019 levels.

MAS has made good progress on sustainability initiatives in its physical operations, reserves management, financial supervision, and development of the financial sector.

To reduce our organisational carbon and environmental footprint, we developed a framework to reduce emissions from business air travel and embarked on measures to further reduce our upstream and downstream emissions from currency operations.

To develop a climate-resilient investment portfolio, we are taking targeted portfolio actions to manage transition risks in the near-term. We will continue in our efforts to assess and manage the impact of climate risks on long-term returns, guided by medium-term signposts on the transition pathways and associated climate change impacts.

To strengthen the financial sector’s resilience against environmental risks, we conducted thematic reviews of financial institutions’ progress in implementing the Environmental Risk Management Guidelines, and issued information papers to share key observations and progressive industry practices. We have also supported international sustainability reporting efforts.

To develop a vibrant green finance ecosystem, we have intensified efforts to be a regional knowledge and talent hub for sustainable finance by anchoring a third Centre of Excellence and setting out Sustainable Finance Technical

Skills and Competencies. We also launched pilot programmes for the ESG Disclosure Platform and ESG Registry under Project Greenprint, to catalyse sustainability data flows between the real economy and the financial sector.

In this year’s Sustainability Report, MAS has introduced and enhanced new quantitative metrics and targets to further align with the recommendations of the Task Force on Climate Related Financial Disclosures (TCFD), including:

- 2030 targets for Scope 1, Scope 2 and Scope 3 (business air travel and outsourced currency operations) emissions reduction;
- 2030 targets for energy and water efficiency, as well as waste disposal, in line with GreenGov.SG’s targets;
- 2030 target for emissions intensity reduction in the investment portfolio; and
- Expanded analysis of Weighted Average Carbon Intensity (WACI) of investment portfolio.

### Ward still, and onward

We need to build on the progress that MAS and the financial sector have achieved so far, and continue to “ward still, and onward”.

First, in view of Singapore’s recent national commitment to achieve net-zero emissions by or around mid-century, MAS will strive towards setting a net-zero emissions target for our physical operations at the earliest possible timeframe. The interim emissions reductions targets that we have set for 2030 will kickstart early action.

In particular, we recognise the strong interlinkages between different Environmental, Social, and Governance

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(ESG) issues. The destruction of ecosystems exacerbates climate change. Deforestation and the wildlife trade, which contribute to climate change and biodiversity loss, also increase the risk of future diseases and pandemics.

MAS has taken early action to ensure that its policies and programmes address multiple aspects of sustainability, and hopes to continue to tap synergies in this space. Project Greenprint harnesses the power of technology to help capture and compare ESG data to support high-quality sustainability disclosures. MAS' bond and loan grant schemes support green, social and sustainable instruments with funding, so long as the grant criteria is met. MAS also supported the inclusion of "do no significant harm" and "biodiversity" as two out of the four criteria in the industry-led taxonomy.

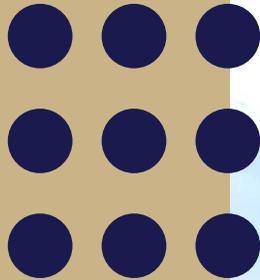
### Keep abreast of Truth

Finally, our partners in sustainability have been critical to the success of our sustainability efforts. We hope to continue to forge closer partnerships in the public, private, and people sectors, and promote innovative collaborations in areas such as ESG data and blended finance. MAS contributes actively on a number of regional and international fora and multilateral discussions on climate-related risks and sustainable finance, including taking leadership positions in international platforms.

Working together, I hope that we may always "keep abreast of Truth", and facilitate a just transition to a low carbon economy that leaves no one behind.



# EXECUTIVE SUMMARY



As an international finance centre, Singapore plays an important role in supporting Asia's transition to a sustainable future.



Overview

Efforts to combat climate change have accelerated and intensified since the Paris Agreement. 2021 was a landmark year, which saw an unprecedented number of countries and corporates pledging net-zero commitments in the lead up to COP26. Singapore has likewise ratcheted up our climate ambition, announcing in February 2022, our target to achieve net-zero emissions by or around mid-century.

Asia is key to the world’s transition to net-zero. The region accounts for about half of global carbon emissions, and more than half of global energy consumption. Asia must find ways to transition towards greater sustainability, while securing economic and social development for its people. Transition should be implemented in a just and orderly manner, even as net-zero commitments need to be backed by credible transition pathways.

Sustainable finance can be a powerful enabler for an effective yet inclusive transition to net-zero. Financial institutions (FIs) play an influential role in promoting sustainability and combating climate change, by directing capital to sustainable projects, as well as through active engagement to influence changes in their clients’ businesses. For marginally bankable but worthy green projects, or in areas where the size of funding is immense, public-private partnerships play an important role in de-risking and crowding in more private sector financing.

MAS is doing its part in the fight against climate change. MAS seeks to promote sustained non-inflationary economic growth, and a sound and progressive financial centre which

supports and fosters financial inclusion. Environmental and climate considerations are integrated across MAS’ core functions:

- As a central bank and financial regulator, MAS works with financial institutions to strengthen the Singapore financial sector’s resilience to environmental risks.
- As a promoter of Singapore as an international financial centre, we work with financial institutions to develop a vibrant sustainable finance ecosystem to support Asia’s transition to a low-carbon future.
- As the guardian of Singapore’s official foreign reserves, MAS integrates climate risks and opportunities into our investment framework.
- As an organisation, MAS seeks to reduce its own carbon and environmental footprint to support Singapore’s broader climate ambitions and commitments.

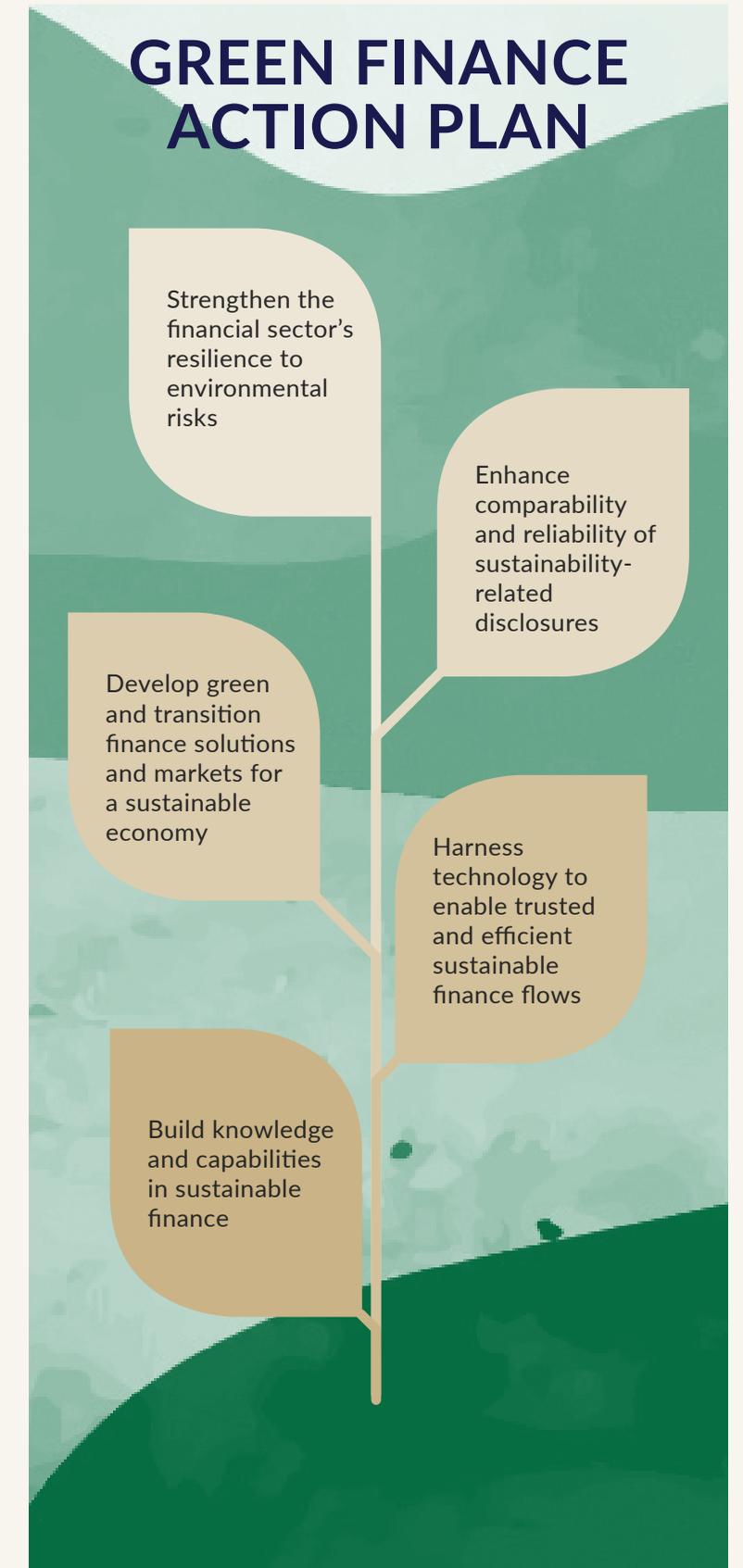
MAS has been taking progressive steps to implement the Green Finance Action Plan (GFAP) introduced in 2019, to build resilience against climate and environmental risks and support a sustainable Singapore and facilitate Asia’s transition to a sustainable future. It complements the Singapore Green Plan 2030 and lays out MAS’ sustainable finance strategy across five thrusts (details in infographic). MAS works closely with other government agencies on climate change and sustainability, in particular on international Green Economy Agreements and other efforts to enable the growth of Singapore’s green economy.

Strengthening alignment of MAS’ Sustainability Report with the Task Force on Climate-Related Financial Disclosures (TCFD) guidelines

MAS published its first Sustainability Report in June 2021, detailing our efforts to strengthen the resilience of our financial sector to environmental risks, develop a vibrant sustainable finance ecosystem, build a climate-resilient investment portfolio, and incorporate sustainable practices in our organisation.

MAS advocates early implementation of sustainability reporting for the financial sector. Globally, there is a strong movement towards transparency and mandatory climate-related financial disclosures that provide consistent and useful information for market participants.

- G7 countries have, in June 2021, agreed to mandate climate-related financial reporting which are aligned with the TCFD recommendations.
- In November 2021, the International Financial Reporting Standards (IFRS) Foundation launched the International Sustainability Standards Board (ISSB) at COP26. MAS co-led a Technical Expert Group under the International Organization of Securities Commissions (IOSCO) Sustainable Finance Taskforce (STF), which reviewed two disclosure prototypes on climate and sustainability developed by the IFRS Foundation Technical Readiness Working Group. The ISSB’s work in developing a global baseline standard is important and timely, given the current proliferation of sustainability standards around the world.



# MAS SUSTAINABILITY REPORT

Creating impact through sustainable finance, furthering inclusive transition to a net-zero economy

## 2021/2022

### A Climate-Resilient Financial Sector

- Information papers published on the environmental risk management practices of financial institutions
- Long-term climate scenarios incorporated as part of 2022 Industry-Wide Stress Test
- Worked with SGX on roadmap on mandatory disclosures for listed companies

### A Vibrant Sustainable Finance Ecosystem

- ESG disclosure platform pilot launched, targeted at Singapore listed issuers in the pilot phase
- Significant growth in green and sustainable finance instruments, including green and sustainability-linked bonds and loans
- Third centre of excellence, the Sustainable and Green Finance Institute, established by the National University of Singapore
- 12 new Sustainable Finance Technical Skills and Competencies launched under IBF's Skills Framework for Financial Services

### A Sustainable Organisation

- Reduction of Scope 1, Scope 2 and Scope 3 (business air travel) emissions by 17.5% by FY2025, and 30% by FY2030
- Reduction of Scope 3 (outsourced currency operations) emissions by 10% by FY2025, and 20% by FY2030
- Improvement of Energy Utilisation Index and Water Efficiency Index by 10%, and Waste Disposal Index by 30% by 2030, in line with GreenGov. SG's targets

### A Climate-Resilient Investment Portfolio

- Climate portfolio actions that are expected to reduce the emissions intensity of our equities portfolio by up to 50% by FY2030
- Stewardship principles that set expectations for external managers to engage portfolio companies and vote on climate-related risk issues
- Climate overlay programme to mitigate transition risk in our equities portfolio from 2023
- Exclusion of investments in companies that derive more than 10% revenues from thermal coal mining and oil sands activities

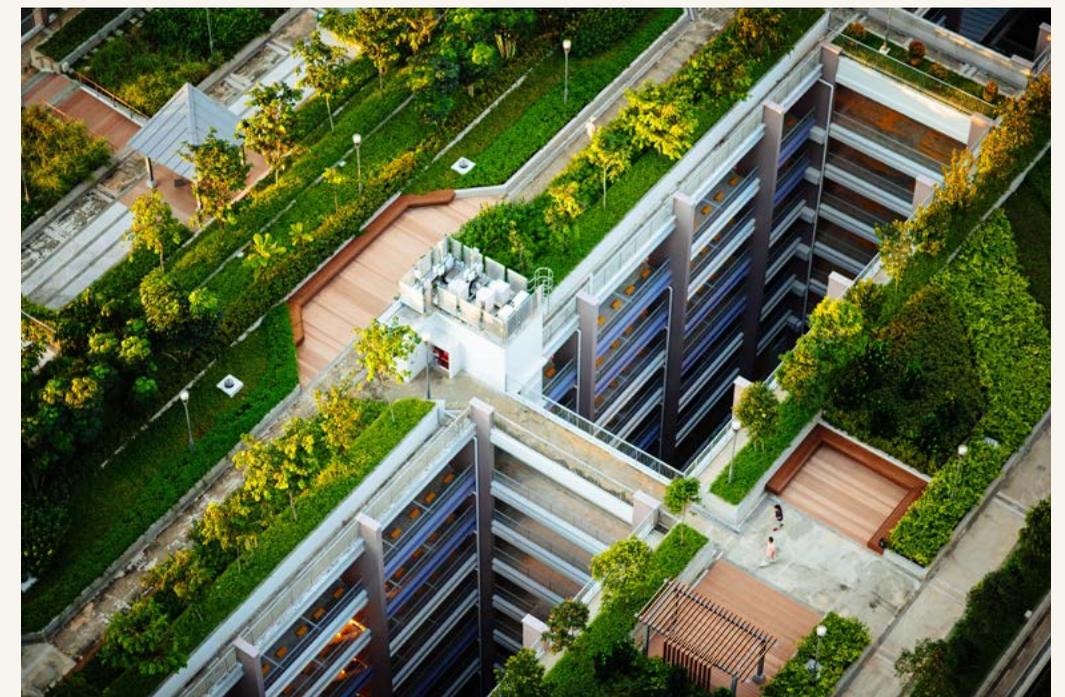
Singapore has been actively promoting high-quality sustainability reporting domestically.

- Singapore Exchange (SGX) has unveiled its roadmap for issuers to provide climate-related disclosures based on the TCFD recommendations. The new listing rules require all SGX-listed entities to provide climate reporting on a 'comply-or-explain' basis from 2022. Climate reporting will be mandated in phases, with SGX-listed entities operating in industries identified by TCFD as most affected by climate change to be progressively subject to mandatory climate reporting from the financial year 2023.
- MAS is likewise setting out a roadmap for mandatory climate-related disclosures against a single, internationally aligned standard for our financial institutions. This builds on MAS' current supervisory

expectations for all banks, insurers, and asset managers to make climate-related disclosures from June 2022, in accordance with well-regarded international reporting frameworks, such as the TCFD recommendations and/or future ISSB standards.

For the 2021/2022 MAS Sustainability Report, MAS has aligned the reporting of our sustainability efforts with the TCFD recommendations. This entails integrating TCFD's four core pillars of governance, strategy, risk management, and metrics and targets within each of our four key themes – *A Climate-Resilient Financial Sector*, *A Vibrant Sustainable Finance Ecosystem*, *A Sustainable Organisation*, and *A Climate-Resilient Investment Portfolio*.

For *A Sustainable Organisation* and *A Climate-Resilient Investment Portfolio*, the disclosure of MAS' physical operations and investment portfolio



sustainability efforts references as relevant TCFD's guide for asset owners and the Network for Greening the Financial System (NGFS)' guide on climate-related disclosures for central banks.

- MAS aims to reduce emissions sizeably and achieve net-zero emissions at the earliest possible timeframe for our physical operations.
- The report outlines our strategy and efforts to mitigate the physical and transition risks arising from climate change on these core activities.
- Targets and new metrics have been introduced in this year's Sustainability Report. This includes the setting of FY2025 and FY2030 targets for MAS' Scope 1, Scope 2 and Scope 3 (business air travel and outsourced currency operations) emissions. For the reserves portfolio, we are implementing portfolio actions that are expected to reduce Weighted Average Carbon Intensity (WACI) for equities investments by up to 50% by FY2030. The WACI metric for corporate bonds will be reported for the first time this year.

The Sustainability Report also updates on MAS' sustainability strategies in the areas of financial supervision and development of the financial sector. These include:

- Fostering a climate-resilient financial sector through strengthening the environmental risk management practices of financial institutions and disclosure efforts, as well as developing climate scenarios for scenario analysis and stress testing purposes; and
- Developing a vibrant sustainable finance ecosystem through accelerating the sustainable

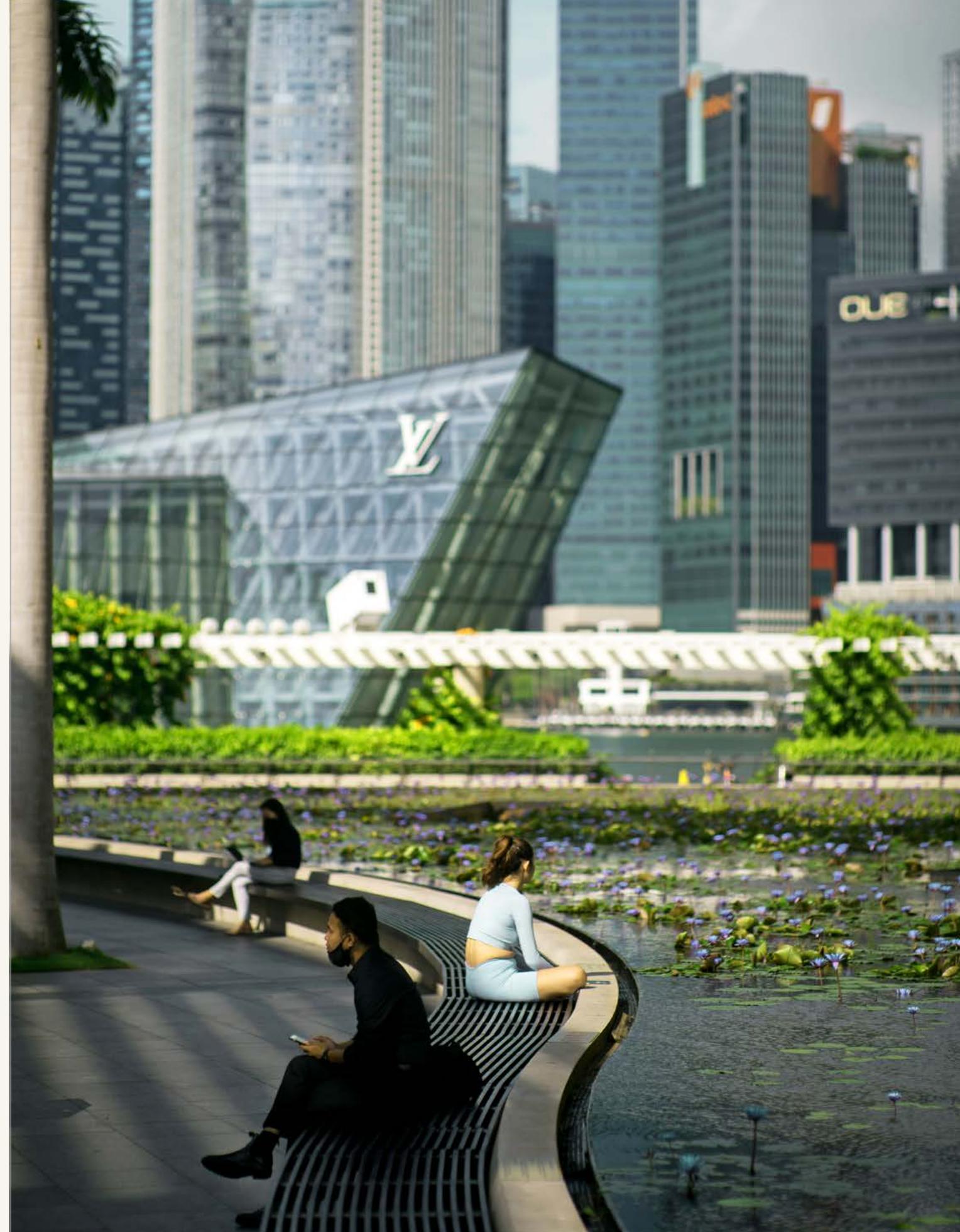
finance lending market, deepening sustainable research and capabilities and harnessing the power of FinTech.

### Governance structure for climate change and sustainability matters

The Green Finance Steering Committee (GFSC), chaired by MAS' Managing Director, is a monthly management forum within MAS that acts as the key decision-making body for all green finance and sustainability initiatives, and coordinates MAS' green finance and sustainability efforts.

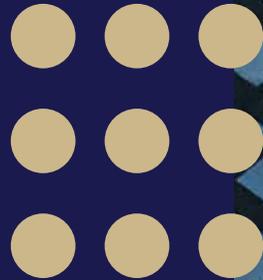
In October 2021, MAS set up the Sustainability Group, headed by a Chief Sustainability Officer, to coordinate MAS' green finance and sustainability agenda, and serve as the secretariat to the GFSC. The Sustainability Group steers the sustainability efforts across MAS, makes sense of emerging sustainability trends, and supports the organisation in deepening capabilities in this multi-faceted area. As the pace of sustainability efforts accelerates in both the public and private sectors, regionally and globally, the Group also actively engages the broader sustainable finance ecosystem to advance key sustainable financing initiatives.

MAS actively seeks industry's views on our sustainability initiatives. This includes tapping on MAS committees such as the International Advisory Panel (IAP), comprising leaders of global financial institutions, and the Financial Centre Advisory Panel (FCAP), comprising leaders from the banking, insurance and asset management industries in Singapore. Both panels advise MAS on Singapore's financial sector strategies, including those related to sustainability.



# A CLIMATE-RESILIENT FINANCIAL SECTOR

GOVERNANCE  
STRATEGY  
RISK MANAGEMENT



MAS is working with financial institutions to strengthen the sector's climate resilience through robust risk management and disclosure practices.



# Governance

## Overview

Strategies to strengthen a climate-resilient financial sector are tabled and discussed at the Green Finance Steering Committee (GFSC) which is chaired by MAS' Managing Director. Prior to tabling at the GFSC, relevant initiatives to build a climate-resilient financial sector are deliberated at the Management Financial Supervision Committee (MFSC) which is chaired by MAS' Deputy Managing Director (Financial Supervision) or Management Financial Stability Committee (FSC) which is chaired by MAS' Managing Director. The MFSC convenes on a weekly basis to decide on matters relating to the supervision and regulation of the financial services sector, such as legislative frameworks and supervisory policies. The FSC convenes on a quarterly basis and is a platform to identify and assess risks to the financial

system, discuss macroprudential and financial stability issues of concern, and formulate macroprudential policy.

In addition, MAS consults and works closely with the industry on our initiatives. In 2019, the Green Finance Industry Taskforce (GFIT) was convened by MAS, comprising representatives from financial institutions, corporates, non-governmental organisations and financial industry associations. GFIT seeks to accelerate the development of sustainable finance through four key thrusts: (i) developing a taxonomy; (ii) improving disclosures; (iii) fostering green finance solutions; and (iv) enhancing environmental risk management practices of financial institutions. GFIT will also support sustainable finance capacity building among banks, insurers, asset managers and corporates.



# Strategy

## Overview

### Strengthening financial sector resilience to environmental risks

The financial sector is exposed to environmental and climate-related risks through its financing, insurance, and investment activities. Physical risks manifesting as acute weather events or chronic environmental changes can damage property, disrupt supply chains, and displace populations. These events can reduce asset values of investments or collaterals, result in lower profitability for companies, and increase the cost of underwriting losses for insurers.

Meanwhile, the transition to a low-carbon economy can also pose risks to the financial system, as institutions can suffer from sudden write-downs in asset values induced by policy changes, technological advancements, as well as shifts in investor preferences and social norms. As Singapore's integrated financial regulator, MAS is committed to play a leading role to bolster the financial sector's resilience to environmental risks.

MAS has progressively integrated environmental risk into its supervisory framework and processes at both the individual firm and system-wide levels. MAS will continue its efforts to (1) uplift environmental risk management practices of financial institutions through ongoing supervision and industry partnership, (2) deepen climate risk assessment capabilities through climate scenario analysis, and (3) enhance environmental and

climate-related disclosure standards to promote market transparency.

### International Collaboration

Coordinated action by regulators and central banks globally is necessary to facilitate a common understanding of the pertinent challenges and set meaningful goals that consider a country or region's particular constraints. Such clarity will allow for more effective mobilisation of capital for low-carbon and sustainable investments. With data gaps still present and climate risk frameworks still evolving, international collaboration remains critical to facilitate the sharing of best practices as they emerge and promote globally compatible frameworks.

MAS actively contributes to global efforts on sustainable finance through our participation in, and leadership of, international committees and multilateral and regional platforms including the Network for Greening the Financial System (NGFS), International Association of Insurance Supervisors (IAIS), and Sustainable Insurance Forum (SIF). We work closely with our global counterparts to build alignment and advance global standards, encourage consistency in supervisory and regulatory approaches and minimise market fragmentation.

Taking on leadership roles in international committees amplifies MAS' ability to contribute and shape global best practices, regulatory and supervisory approaches to sustainability issues.

## Uplift environmental risk management practices of financial institutions

In December 2020, MAS issued the Guidelines on Environmental Risk Management (the Guidelines) that established a common understanding on the management of environmental-related risks in a risk-proportionate manner. The Guidelines set out MAS' supervisory expectations on the effective governance, robust risk management and meaningful disclosure of environmental-related risks. MAS actively engages financial institutions on their progress towards adhering to the Guidelines. MAS also partners GFIT to collectively uplift industry practices in environmental risk management.

## Deepen climate risk assessment capabilities through climate scenario analysis

Climate-related events and their associated risks are subject to significant uncertainty in terms of their timing, frequency, or severity. Given these uncertainties, stress testing and scenario analysis are useful tools for assessing the potential impact of climate risks on financial institutions and the broader economy. MAS continues to encourage the development of climate-related risk assessment capabilities by featuring thematic climate scenarios in the Industry-Wide Stress Test. Given the nascent stage of research in quantifying climate risks, MAS' work on climate stress testing and climate-related modelling will involve a multi-year iterative process in partnership with industry.

## Enhance comparability and reliability of sustainability-related disclosures

Having consistent, comparable and reliable disclosures from corporates will allow financial institutions to better understand and assess the impact of environmental and climate-related risks, on their underwriting and asset portfolios. MAS continues to take steps to enhance environmental and climate-related disclosure standards to promote market transparency and facilitate the reallocation of capital toward sustainable outcomes. Given the interconnected nature of the global financial system, it is not practical or effective to improve corporate sustainability-related disclosures in isolation. It is of paramount importance that Singaporean corporates and financial institutions align their sustainability reporting practices with recognised international frameworks and standards, such as the TCFD recommendations and the upcoming International Sustainability Standards Board (ISSB) standards, to ensure comparable and consistent disclosures globally. To this end, MAS will consult on introducing mandatory disclosure requirements for financial institutions, as soon as a global baseline sustainability reporting standard is established by the ISSB, as expected by the end of this year. MAS also works with international organisations like the International Organization of Securities Commissions (IOSCO) to enhance the quality of sustainability-related disclosures for securities issuers worldwide.

## Collaborate actively with other supervisors and central banks

### Network for Greening the Financial System (NGFS)

MAS Managing Director, Mr Ravi Menon, was appointed as the Chair of the NGFS for a two-year term starting in January 2022. The NGFS was

established in 2017 and comprises a voluntary grouping of central banks and supervisors. As of 14 June 2022, the NGFS consists of 116 members and 19 observers. It has been playing a leading role to expand and strengthen the global efforts towards greening the financial system. NGFS' efforts are focused on improving the resilience of the financial system to climate-related and environmental risks, and encouraging the scaling up of the financing flows needed to support the transition towards a sustainable economy. To this end, NGFS defines and promotes best practices to be implemented within and outside of the Membership of the NGFS and conducts or commissions analytical work on green finance.

MAS is one of the eight founding members of the NGFS and has been an active participant in its steering committee and across its workstreams.

In 2021, MAS led the workstream on microprudential and supervision, which provides guidance for supervisors on incorporating climate and environmental risks within their supervisory framework. These efforts culminated in the issuance of a progress report on the NGFS' Guide for Supervisors that highlighted the progress made by supervisors in the integration of climate-related and environmental risks in their supervisory activities, a report on the progress in capturing Climate-related Risk Differentials, and further development of the NGFS' training programme for supervisors.

MAS supports the Climate Training Alliance (CTA), a portal for training on climate risks for central banks and supervisors coordinated under the COP26 agenda and supported by the NGFS' capacity building programme.

MAS is also involved in other work at the NGFS relating to the development of climate scenarios for scenario analysis and stress testing, scaling up green finance, bridging data gaps, and advancing research priorities. For example, in the workstream on bridging data gaps, MAS led the development of a web-based data issues directory for authorities and FIs to search and analyse data issues, thereby enhancing the assessment of climate-related risks and opportunities.

### FOR FURTHER READING:

- [NGFS website](#)
- [NGFS Annual Report 2021](#)
- [Managing Director of MAS and Chair of the NGFS Ravi Menon's speech "Gearing Up for Climate Action - The Road Ahead for the NGFS", delivered on 31 May 2022, at the Green Swan Conference 2022](#)
- [MAS media release on 17 January 2022, Ravi Menon appointed Chair of the Network for Greening the Financial System](#)
- [NGFS media release on 17 January 2022, NGFS announces the appointment of new Chair and Vice Chair, and the expansion of its Steering Committee with two new members](#)

### International Association of Insurance Supervisors (IAIS)

The IAIS is the global standard-setting body responsible for developing and assisting in the implementation of principles, standards and other supporting material for the supervision of the insurance sector. In September 2021, the IAIS established the Climate Risk Steering Group (CRSG). The CRSG is responsible for the overall coordination of the IAIS' work on climate risk. MAS was appointed as the chair of the CRSG.

The CRSG has formed three workstreams, which have respectively undertaken: (i) a gap analysis of the Insurance Core Principles and supporting material to consider whether changes need to be made to address

climate risks; (ii) a stocktake of member jurisdictions' work on climate scenario analysis to assess the need for further work to support insurance supervisors to better assess climate risks; and (iii) an assessment of data elements that could be added to the IAIS' Global Monitoring Exercise to provide an annual insight of risks to the insurance sector from climate change.

### **Sustainable Insurance Forum (SIF)**

MAS is a founding member of the UN-convened SIF. Launched in 2016, SIF is a global network of insurance supervisors and regulators, and a platform for international collaborative action on sustainability issues including climate change risks, and works closely with the IAIS.

The SIF work programme for 2021-2023 includes mainstreaming climate risks into actuarial processes, studying the impact of climate-related risks on the insurability of assets and developing a report on how biodiversity loss can translate into financial risks for the insurance sector. The report on biodiversity loss was published in November 2021. MAS has been actively involved in the development of SIF's reports.

#### **FOR FURTHER READING:**

- [SIF website](#)
- [IAIS Website on Climate Risks](#)
- [IAIS Press Release published on 25 May 2021, IAIS and SIF set out key recommendations for insurance supervisors to strengthen efforts to address climate-related risk](#)
- [IAIS Press Release published on 30 September 2021, IAIS Global Insurance Market Report provides first quantitative study on the impact of climate change on insurers' investments](#)
- [SIF Press Release published on 2 November 2021, SIF Scoping Study: Nature-related Risks in the Global Insurance Sector](#)
- [SIF Press Release published on 3 November 2021, SIF Implementation of TCFD Recommendations by Insurance Supervisors and Regulators](#)

### **Basel Committee on Banking Supervision (BCBS)**

The BCBS is a global standard-setter for the prudential regulation of banks and provides a forum for regular cooperation on banking supervisory matters. Its membership comprises central banks and bank supervisors from 28 jurisdictions. MAS participates in the BCBS Task Force on Climate-Related Financial Risks (TCFR), which has published analytical reports on transmission channels and measurement methodologies of climate-related financial risks. MAS is co-leading the supervision workstream, which has published the Principles for the effective management and supervision of climate-related financial risks in June 2022. The Principles aim to promote a principles-based approach to improving both banks' risk management and supervisors' practices related to climate-related financial risks.

#### **FOR FURTHER READING:**

- [BCBS Press Release published on 16 November 2021, Basel Committee consults on principles for the effective management and supervision of climate-related financial risks](#)
- [BCBS Press Release published on 15 June 2022, Basel Committee issues principles for the effective management and supervision of climate-related financial risks](#)

### **Financial Stability Board (FSB)**

The FSB is an international body that coordinates national financial authorities and international standard-setting bodies as they work toward developing strong regulatory, supervisory and other financial sector policies. MAS is a member of the FSB Steering Committee and Plenary as well as the FSB Standing Committee on the Assessment of Vulnerabilities (SCAV) Climate Vulnerabilities and Data Group, which supports SCAV's work on climate-related vulnerabilities analysis and data.

The FSB has developed a comprehensive roadmap for addressing climate-related financial risks, which was endorsed by the G20 Finance Ministers and Central Bank Governors meeting in July 2021. The roadmap covers four main interrelated areas:

- *Firm-level disclosures*, as the basis for the pricing and management of climate-related financial risks at the level of individual entities and market participants;
- *Data*, using consistent metrics and disclosures, which provide the raw material for the diagnosis of climate-related vulnerabilities.
- *Vulnerabilities analysis*, which provides the basis for the design and application of regulatory and supervisory frameworks and tools; and
- *Regulatory and supervisory practices and tools*, that allow authorities to address climate-related risks to financial stability in an effective manner.

#### **FOR FURTHER READING:**

- [FSB Website on Climate-related Risks](#)
- [FSB Roadmap for Addressing Climate-Related Financial Risks](#)

### **International Organisation of Securities Commissions (IOSCO)**

MAS co-led a Technical Expert Group (TEG) with the US SEC within the IOSCO Sustainable Finance Task Force (STF), to inform IOSCO's potential endorsement of future standards issued by the (ISSB). The ISSB, established on 3 November 2021, aims to develop a comprehensive global baseline standard for high-quality sustainability-related disclosures. It has received support from the Finance Ministers and Central Bank Governors of 41 jurisdictions, including Singapore. IOSCO's endorsement would facilitate IOSCO members' use of the ISSB standards in their respective jurisdictions,

and enhance the consistency and comparability of sustainability-related disclosures.

#### **FOR FURTHER READING:**

- [ISSB launch on 3 November 2021](#)
- [IOSCO FR04/21 – Report on Sustainability-related Issuer Disclosures](#)
- [IOSCO FR08/21 – Recommendations on Sustainability-Related Practices, Policies, Procedures and Disclosure in Asset Management](#)
- [IOSCO FR09/21 – Environmental, Social and Governance \(ESG\) Ratings and Data Products Providers](#)

### **International Platform on Sustainable Finance (IPSF)**

The (IPSF) published its inaugural annual report in October 2020 which outlines global trends and efforts in member jurisdictions to scale up the mobilisation of private capital towards environmentally sustainable investments. MAS represents Singapore at the IPSF Steering Committee and taxonomy workgroup.

#### **FOR FURTHER READING:**

- [IPSF annual report 2021](#)
- [IPSF Common Ground Taxonomy Instruction Report](#)
- [IPSF report on ESG disclosure](#)

### **G20 Sustainable Finance Working Group (SFWG)**

The G20 re-established the Sustainable Finance Study Group and upgraded it to the G20 SFWG in 2021. Singapore, represented by MAS and MOF, participates in the G20 SFWG which seeks to scale up sustainable finance, to support the objectives of the 2030 Agenda for Sustainable Development and goals of the Paris Agreement. The group has developed a multi-year Sustainable Finance Roadmap ("the Roadmap"), with an initial focus on climate.

**FOR FURTHER READING:**

- [G20 Sustainable Finance Roadmap](#)

**ASEAN Finance Ministers and Central Bank Governors (AFMCBG)**

The ASEAN Finance Cooperation track helmed by the AFMCBG is committed to strengthen economic growth and promote financial stability, by forging greater economic and financial integration within the ASEAN Economic Community. The sustainable finance related work is primarily carried out by four sectoral bodies in the ASEAN Finance Cooperation track. These are:

- The ASEAN Capital Markets Forum (ACMF)<sup>1</sup> and the Working Committee on Capital Market Development (WC-CMD)<sup>2</sup> that cover the capital markets sector;
- The ASEAN Insurance Regulators Meeting (AIRM)<sup>3</sup> that covers the insurance sector; and
- The ASEAN Senior Level Committee (SLC)<sup>4</sup> on Financial Integration that covers the banking sector.

The ACMF aims to promote corporate sustainability and institutional investor disclosures, explore transition standards, develop sustainable fund standards and improve market access for sustainable products.

The WC-CMD is implementing the recommendations in the Report on Promoting Sustainable Finance in ASEAN. These include developing a conversation pack to promote “Sustainable Finance First for Sustainable Projects”; increasing engagement with the private sector

through the setting up of the Industry Advisory Panel (IAP) jointly with the ACMF.

MAS is the chair of the AIRM in 2021/22. Sustainability featured prominently at the November 2021 AIRM discussions. AIRM will enhance capacity building for regional insurance regulators to improve their technical knowledge and proficiency on climate risk issues, and has identified sustainability/climate risk as a priority technical assistance need in the ASEAN Insurance Training and Research Institute’s workplan for 2022.

The SLC has prioritised sustainable banking as one of its key agenda items, and has established a Task Force for Sustainable Finance to take forward the recommendations from the *Report on the Role of ASEAN Central Banks in Managing Climate and Environment-related Risks*. MAS has assumed Co-Chairmanship of the SLC in April 2022. In the coming year, the SLC will be ramping up capacity building for sustainable finance for regulators and central bank personnel; developing an ASEAN Green Map for a coherent approach to manage climate and environment-related risks; and supporting the development of the ASEAN Taxonomy under the auspices of the ASEAN Taxonomy Board (ATB).

**FOR FURTHER READING:**

- [ASEAN Capital Markets Forum to continue progress on Sustainability while building on Inclusivity and promoting recovery from the COVID-19 pandemic](#)
- [Report on Promoting Sustainable Finance in ASEAN](#)
- [Report on the Roles of ASEAN Central banks in Managing Climate and Environment-related Risks](#)

<sup>1</sup> The ACMF is a high-level grouping of capital market regulators from all 10 ASEAN jurisdictions, which aims to develop a deep, liquid and integrated regional capital market.

<sup>2</sup> The WC-CMD comprises senior officials from ASEAN capital market regulators, Ministries of Finance, and Central Banks. The WC-CMD is tasked with implementing capital market development and capacity building initiatives to achieve the long-term goal of a more integrated ASEAN capital market.

<sup>3</sup> The ASEAN Insurance Regulators’ Meeting (AIRM) is a grouping of the ASEAN insurance regulators.

<sup>4</sup> The ASEAN Senior Level Committee (SLC) for Financial Integration is a high-level grouping of the ASEAN central banks.



**Executives’ Meeting of East Asia-Pacific Central Banks (EMEAP)**

EMEAP is a cooperative forum of eleven central banks and monetary authorities in the East Asia and Pacific region.

The EMEAP Monetary and Financial Stability Committee (MFSC) has identified Sustainable Finance as a key area of strategic interest for EMEAP members. As co-Vice Chair of the MFSC, MAS takes the lead in curating the Sustainable Finance agenda at MFSC meetings, where the impact on environmental risks and vulnerabilities in financial stability, as well as the

implications of climate change on monetary policy have been discussed.

**BIS Innovation Hub Singapore Centre**

MAS and the BIS Innovation Hub Singapore Centre are collaborating on Project Viridis, which aims to help financial sector supervisors develop deeper understanding and insights on banks’ exposures to green/non-green assets. This will serve as a basis for supervisory discussions with banks on their climate risk measurement and methodologies, including the requisite data sources, and the means to assess regulatory exposure data for climate-related risks.

# Risk Management

## Overview

Environmental and climate-related financial risks have already begun to crystallise in recent years. If not well managed, they could affect the balance sheets of financial institutions (FIs), potentially contributing to financial stability risks at the system level.

MAS is committed to bolstering the financial sector's resilience to environmental risks. To this end, MAS has (1) conducted thematic reviews and published information papers on FIs' environmental risk management practices, and (2) encouraged the development of climate risk assessment capabilities through the Industry-Wide Stress Test.

Greenwashing can occur at the firm level and product level. From the market conduct angle, MAS recognises that greenwashing is a significant risk arising from the overstatement or lack of clarity about a firm's sustainability commitments, or lack of alignment between the product's sustainability-related name and its investment objective.

To mitigate risk of greenwashing, MAS has promoted the adoption of globally consistent, comparable and reliable sustainability disclosures by working with international and domestic organisations.

## Supervisory engagements

### Information Papers on Environmental Risk Management for Banks, Insurers and Asset Managers

Risks from climate change and environmental degradation can translate into financial and non-financial risks to FIs. It is crucial for FIs to build resilience to these risks by integrating environmental risk into their business strategies and risk management frameworks. To do this well, FIs would need to have effective board and senior management oversight of environmental risks, and robust risk management policies and processes to assess, mitigate and monitor their risk exposures.

MAS set out its supervisory expectations around effective governance, robust risk management and meaningful disclosure of environmental-related risks through issuance of the Guidelines on Environmental Risk Management to FIs (ENRM Guidelines) in December 2020.

Ahead of the ENRM Guidelines effective date in June 2022, MAS conducted thematic reviews of FIs' environmental risk management practices in 2021 to take stock of implementation progress. MAS engaged selected banks, insurers, and asset managers through surveys and dialogue sessions with the FIs. While progress has been made overall, the surveyed FIs were at differing levels of sophistication.

In May 2022, to accelerate FIs' adoption of the ENRM Guidelines and uplift industry standards, MAS published information papers on the environmental risk practices of banks, insurers, and asset managers. The papers provide an overview of the progress made by

selected FIs in implementing the ENRM Guidelines. The papers also highlight emerging and/or good practices by FIs and identify areas where further work is needed.

Work is ongoing to address the implementation challenges that FIs have highlighted, such as:

- To provide a baseline to guide FIs' client-level risk assessment on environmental risks, MAS collaborated with the Green Finance Industry Taskforce (GFIT) and Association of Banks in Singapore (ABS) to develop a standardised Environmental Risk Questionnaire for FIs to obtain common key risk data from clients in a way that is comparable across clients and fit-for-purpose to facilitate financing decisions. This also helps to establish a best practice for banks in Singapore to engage their clients in assessment and mitigation of their environmental risks. There are plans to develop subsequent and more advanced versions of the questionnaire, as well as to digitalise the process in future.
- To deepen knowledge and strengthen the capabilities of FIs, GFIT launched a series of capacity building workshops and e-learning modules from May 2021 to April 2022 for FIs and corporates.
- To address the financial sector's sustainability data needs, MAS launched Project Greenprint, a series of initiatives that aims to harness technology and data to enable the greening of the financial sector. Further details on Project Greenprint are within the section "A Vibrant Sustainable Finance Ecosystem".

## FOR FURTHER READING:

- [Information Papers on Environmental Risk Management for Banks, Insurers and Asset Managers](#), published on 31 May 2022
- [ABS media release on the launch of industry standard template for banks to engage corporate clients on environmental risk issues](#), published on 21 April 2022
- [GFIT Capacity Building Series](#)

## Industry-Wide Stress Test

There is growing awareness of the risk that climate change poses to the financial system, with many central banks and regulators seeking to better understand the nature of this risk and assess its implications for financial stability.

In the 2018 Industry-Wide Stress Test, MAS subjected insurers to a scenario featuring extreme flooding, and they had to consider the impact of higher claims on their balance sheets arising from damage to insured properties.

MAS also undertook further work to deepen our understanding of climate risks, as presented in MAS' Special Features on climate change in the 2020 and 2021 Financial Stability Reviews. These special features set out (1) MAS' multi-year iterative approach for climate stress testing and climate-related modelling, (2) climate risk transmission channels to financial stability and potential second-order effects and (3) preliminary estimates of the transition risk exposure of Singapore's banking and insurance sectors.

Building on earlier efforts, MAS will incorporate a range of long-term climate scenarios as part of the 2022 Industry-Wide Stress Test exercise. The exercise will raise awareness of the potential economic and financial implications of climate risks, and

facilitate learning for both MAS and financial institutions as we collectively develop capabilities in this area.

For the 2022 Industry-Wide Stress Test exercise, the long-term climate scenarios will take reference from scenarios developed by the Network for Greening the Financial System (NGFS). MAS has also incorporated feedback from financial institutions in our earlier engagements. These scenarios will include pathways featuring (1) an orderly transition, (2) a disorderly transition, and (3) no additional policy action, to capture a range of physical and transition risks that could arise due to climate change. Findings from the exercise will be published in MAS' Financial Stability Review 2022.

**FOR FURTHER READING:**

- [MAS' Financial Stability Review 2021, published on 6 December 2021](#)
- [MAS' Financial Stability Review 2020, published on 1 December 2020](#)
- [The International Monetary Fund \(IMF\) Financial System Stability Assessment for Singapore, published on 15 July 2019, containing information on the 2018 Industry-Wide Stress Test flood scenario for insurers](#)

## Sustainability disclosures

A robust sustainability reporting regime is the foundation upon which we measure progress. It will help stakeholders to allocate capital efficiently towards climate change mitigation and adaptation, thereby enhancing the financial sector's resilience. MAS continues to advance our vision of globally consistent, comparable and reliable sustainability disclosures by working with both international and domestic organisations. MAS supports the alignment of disclosures with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations and recognised international standards

such as the upcoming International Sustainability Standards Board (ISSB) standards.

Since June 2021, there have been significant developments in this area. Specifically, along with the set-up of the ISSB by the International Financial Reporting Standards (IFRS) Foundation, the IFRS Technical Readiness Working Group (TRWG) published the Climate-Related Disclosures Prototype in November 2021. The ISSB issued exposure drafts for its general requirements and climate disclosure standards for consultation on 31 March 2022, and targets to finalise its standards by end 2022.

The ISSB standards – which build on the TCFD recommendations, among others, – is expected to form the global baseline reporting standards for sustainability<sup>5</sup>. MAS co-led a Technical Expert Group (TEG) under the International Organisation of Securities Commissions (IOSCO) Sustainable Finance Task Force (STF) to provide recommendations to the IFRS Foundation, with a view towards potentially endorsing future ISSB standards for use by IOSCO member jurisdictions. MAS actively participates in the Technical Review Coordination Group (TRC) which continues the TEG's work, and leads the review of climate disclosure standards. The TRC is reviewing the exposure draft disclosure standards published by the ISSB on 31 March 2022 to assess if they meet IOSCO's expectations for endorsement. The TRC will provide comments on the draft as the ISSB looks to finalise its disclosure standards by end 2022.

MAS also worked on three IOSCO STF reports published in 2021 on sustainability-related issuer disclosures, improving sustainability-

related practices of asset managers, and understanding the increasingly important role of ESG ratings and data providers. The reports include recommendations for regulators and policymakers to supervise and improve policies, practices, disclosures, as well as address risks of greenwashing.

### Mandatory Disclosures for Listed Companies

MAS worked with SGX to finalise its roadmap on mandatory climate-related financial disclosures, consistent with recommendations of the TCFD. Issued on 15 December 2021, the new listing rules require all SGX-listed entities to provide climate reporting on a 'comply or explain' basis for financial years starting on or after 1 January 2022. Climate reporting will subsequently be mandatory for certain issuers in a phased approach, with issuers in industries identified by the TCFD as most affected by climate change progressively subject to mandatory climate reporting from the financial year 2023<sup>6</sup>. By 2025, mandatory climate reporting will cover

60% of SGX-listed entities by number, and 78% by total market capitalisation.

Other key enhancements to SGX's sustainability reporting regime include requiring issuers to minimally subject their sustainability reporting process to an internal audit review, and for directors to undergo a one-time training on sustainability. SGX has also indicated its intention to align its sustainability reporting requirements with the finalised ISSB standards. Collectively, these enhanced requirements contribute to the push towards consistent, comparable and reliable sustainability disclosures.

**FOR FURTHER READING:**

- [IFRS TRWG Climate-related Disclosures Prototype](#)
- [IFRS TRWG General Requirements for Disclosure of Sustainability-related Financial Information Prototype](#)
- [ISSB releases exposure drafts for general requirements and climate disclosure standards](#)
- [SGX consultation and response paper on Climate and Diversity – The Way Forward](#)

<sup>5</sup> Support for the ISSB has been expressed by the Basel Committee for Banking Supervision (BCBS), International Association of Insurance Supervisors (IAIS), G20 and over 40 jurisdictions.

<sup>6</sup> Climate reporting will be mandatory for issuers in the financial, agriculture, food and forest products, and energy industries from FY2023 (report issued in 2024). Issuers in the materials and buildings, as well as transportation industries must do the same from FY2024 (report issued in 2025).

# A VIBRANT SUSTAINABLE FINANCE ECOSYSTEM

GOVERNANCE  
STRATEGY  
RISK MANAGEMENT



MAS is collaborating closely with financial institutions, businesses, FinTechs and international counterparts to broaden and deepen sustainable finance capabilities, to support Asia's transition to a low-carbon future.



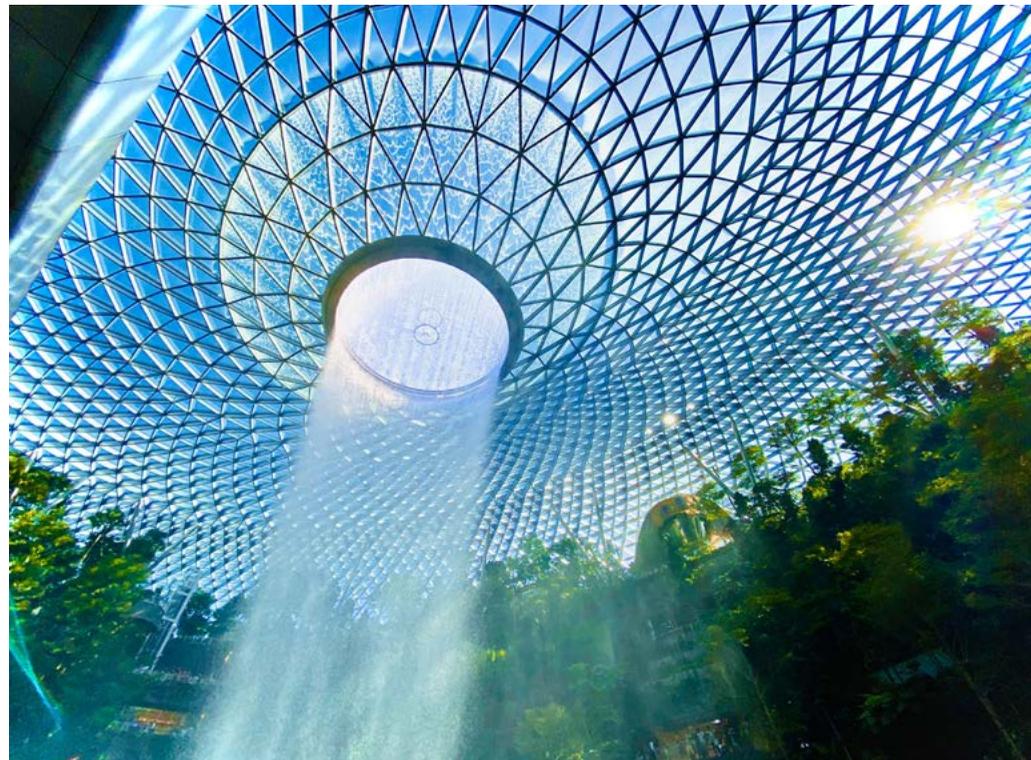
# Governance

## Overview

All strategies to promote a vibrant sustainable finance ecosystem are tabled and discussed at the Green Finance Steering Committee (GFSC) chaired by MAS' Managing Director. The development and implementation of growth strategies may also be deliberated at the Management Development and International Committee (MDIC), which is chaired by MAS' Deputy Managing Director (Markets and Development).

MAS consults and works closely with the industry on our sustainable finance

initiatives. In 2019, the Green Finance Industry Taskforce (GFIT) was convened by MAS and comprises representatives from financial institutions, corporates, non-governmental organisations and financial industry associations. The Taskforce seeks to accelerate the development of sustainable finance through four key initiatives: (i) develop a taxonomy; (ii) improve disclosures; (iii) foster green finance solutions; and (iv) enhance environmental risk management practices of financial institutions. The Taskforce will also support sustainable finance capability building among banks, insurers and asset managers.



# Strategy

## Overview

### Ecosystem development

Singapore accounts for close to 50% of cumulative ASEAN green and sustainability-linked bond and loan issuances. To enable companies to invest in sustainable projects and assets, and adopt sustainable business practices, MAS has introduced grant schemes to defray the costs of issuing green and sustainability-linked bonds and loans that meet international standards. MAS also partners the private sector and multilateral development banks to catalyse financing solutions for longer-term and marginally bankable sustainable projects.

MAS is keen to expand the sustainable finance ecosystem, covering financial institutions, ancillary service providers, academia, standard setting bodies and international organisations in Singapore. These stakeholders will catalyse the co-creation of innovative financing solutions, raise competencies, and enhance corporates' adoption of sustainability practices. To mitigate risks of greenwashing, the Green Finance Industry Taskforce (GFIT), is developing a taxonomy that will define green and transition activities for Singapore-based financial institutions.

MAS is working with the public and private sector to support the development of a trusted and robust voluntary carbon market. Carbon markets provide a possible

decarbonisation pathway for hard-to-abate sectors, alongside the development of decarbonisation technologies such as carbon capture, utilisation and storage.

### Promote growth of sustainable finance solutions

MAS is catalysing the growth of sustainable finance solutions that enable companies to invest in sustainable projects and assets, and adopt sustainable business practices.

### Grant schemes for sustainable finance solutions

MAS' Sustainable Bond Grant Scheme (SBGS) was launched in 2017. The grant sought to support the issuance of green bonds in Singapore, by defraying the additional costs of verifying green, sustainability and sustainability-linked bonds as compared to conventional bonds while promoting the adoption of internally accepted standards. MAS' Green and Sustainability-Linked Loan Grant Scheme (GSLs) was launched in November 2020 to encourage businesses to take up green and sustainability-linked loans. The grant defrays the expenses of engaging independent service providers to validate the green and sustainability credentials of the loan. The grant also encourages banks to develop green and sustainability-linked loan frameworks to make such financing more accessible to small and medium-sized enterprises (SMEs).

Notable bond issuances include:

- Surbana Jurong Group in Singapore issued Southeast Asia's first SLB in February 2021, raising S\$250 million. Its Sustainability Performance Targets (SPTs) are linked to a reduction in carbon emissions.
- Indonesia's PT Japfa Comfeed issued a US\$350 million SLB in March 2021, marking it as the first USD denominated SLB from Southeast Asia. Its SPT focuses on the construction of new water recycling facilities for sustainable water and wastewater management.
- China's Yanlord Land issued a US\$500 million green bond in May 2021. Proceeds from the issuance will be used to finance or refinance new or existing eligible green projects as described in the company's green finance framework, including green buildings, enhancing energy efficiency, amongst others.
- In June 2021, Bayfront Infrastructure Management's second issuance of infrastructure asset backed securities included a US\$120 million sustainability tranche. Proceeds from this tranche are used to finance or refinance sustainable infrastructure projects. The sustainability tranche achieved a greenium of 5bps over its regular tranche, reflecting strong investor demand for high quality sustainability offerings.

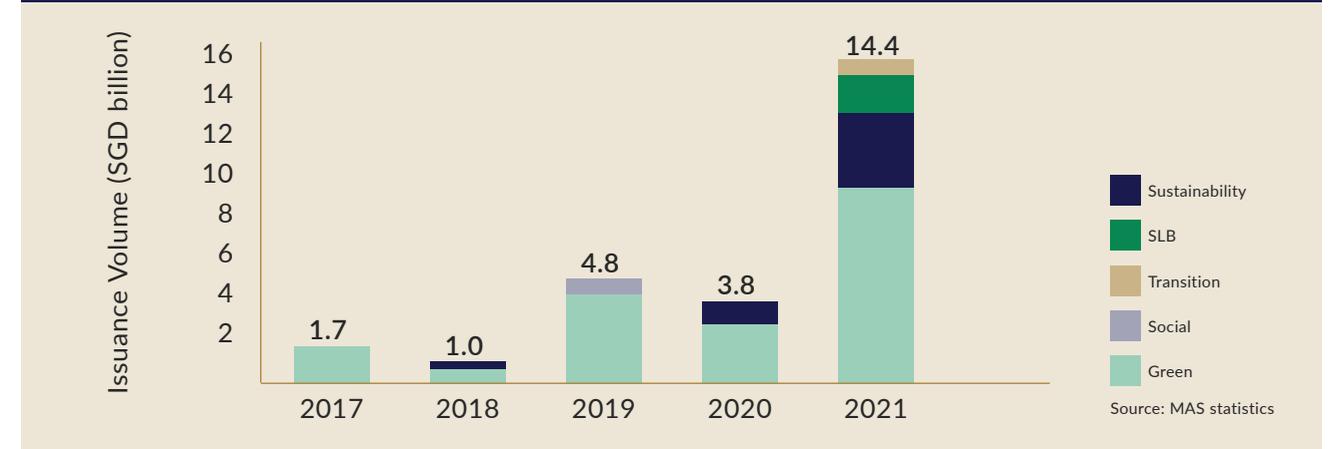
From 2018 to 2021, over S\$39.8 billion of green and sustainability-linked loans have been issued in Singapore. In particular, sustainability-linked loans experienced exponential growth as volumes quadrupled since 2019. This

reflected growing market acceptance for sustainability-linked loans, and the flexibility in use-of-proceeds as compared to green loans makes it applicable to a wider range of sectors.

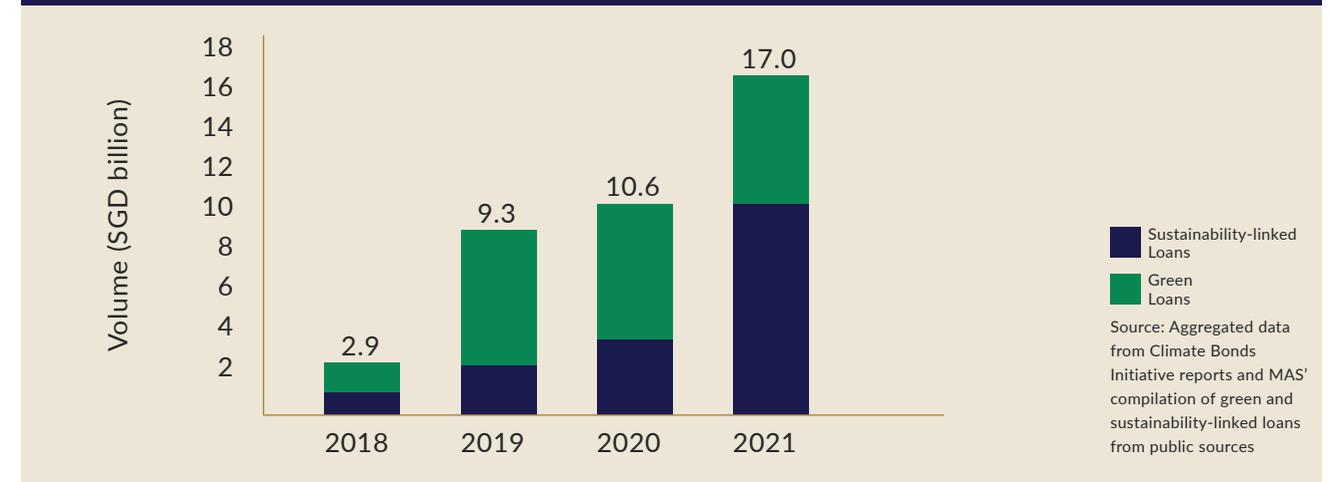
Notable loan issuances include:

- The S\$1.95 billion green loan by M+S Pte Ltd, which was the largest green loan secured by a real estate company in Asia Pacific. The proceeds of the loan will be used to partially refinance the office and retail components of Marina One.
- PSA Marine obtained a EUR30 million sustainability-linked loan, the first in Singapore's maritime industry. The loan features an interest rate adjustment linked to ESG targets, which include requiring a fleet of PSA Marine's Crew Transfer Vessels to be substantially deployed to support offshore wind energy-related activities.
- The US\$374 million sustainability-linked loan by Hafnia Pte Ltd arranged by a syndicate of ten banks. The facility has an annual sustainability margin adjustment mechanism that depends on Hafnia's continuous improvements in emissions-related key performance indicators (KPIs). It is one of the largest of its kind in the shipping sector.
- Sunseap Group obtained a S\$85.8 million green loan for its SolarNova 4 project to instal solar photovoltaic (PV) systems across more than 1,200 public housing blocks and 49 government sites in Singapore. This represents the largest clean energy project in Singapore to date.

GREEN, SOCIAL, SUSTAINABILITY, SUSTAINABILITY-LINKED AND TRANSITION BOND ISSUANCE VOLUME IN SINGAPORE (2017-2021)



GREEN AND SUSTAINABILITY-LINKED LOAN VOLUMES IN SINGAPORE (2018-2021)



### Develop voluntary carbon markets

Asia's priority, as is Singapore's, must be to reduce carbon emissions through abatement efforts. However, it may be challenging for some sectors, such as steel and utilities, to significantly reduce emissions in the short to medium term. A robust and high-quality carbon market is an important mechanism to channel

funds to emissions reduction and removal projects for a more sustainable world.

The Singapore Government is keen to facilitate the growth of the carbon services ecosystem, by encouraging existing carbon services players and new entrants to expand their capabilities and use Singapore as a regional gateway for carbon services. Singapore

houses a vibrant ecosystem of key carbon services players, with Trafigura, Mercuria and Pavilion Energy expanding carbon trading desks here. Singapore is also home to carbon exchanges such as AirCarbon Exchange and Climate Impact X (CIX) which are poised to become major players in scaling the voluntary carbon market regionally and globally.

CIX was established in Singapore in end-2021, and MAS has supported the development of CIX since its inception. In October 2021, CIX piloted an auction of a portfolio of eight high-quality, nature-based carbon credits projects, and the pilot auction cleared 170,000 carbon credits and was supported by 19 buyers from across various industries including Boston Consulting Group, City Developments Limited, Mercuria Energy, and Trafigura. In March 2022, CIX launched Project Marketplace and announced a partnership with Carbonplace, a new carbon credit settlement platform. Project Marketplace enables businesses and carbon project suppliers to list, compare, buy, and retire carbon credits. The digital platform will offer robust information on projects, along with third-party ratings and satellite monitoring technology to create greater trust in the voluntary carbon markets.

**FOR FURTHER READING:**

- [CIX Pilot Auction](#)
- [CIX Project Marketplace](#)
- [CIX pilot with Carbonplace](#)

### Grow sustainable finance expertise

MAS has been working with financial institutions and sustainable finance providers to expand the sustainable finance ecosystem in Singapore. In addition to Deutsche Bank, which set up an ESG Centre of Excellence in May

2021, and Moody's Corporation which is deepening its suite of ESG resources, several financial institutions have also announced the establishment or expansion of their APAC ESG hubs in Singapore. These include Schroders and abrdn. Global firms such as McKinsey & Company and PwC also announced the respective launches of their Asia Sustainability Innovation Hub and Asia Pacific Centre of Sustainability Excellence in Singapore.

To establish Singapore as a regional knowledge hub for sustainable finance, MAS is anchoring centres of excellence, think tanks and research networks, and deepening sustainable finance skills and capabilities. This will deepen and expand Asia-focused climate research and training, and develop a strong pipeline of local sustainable finance talents.

### Centres of Excellence (CoEs)

MAS has anchored three CoEs in Singapore – (i) Singapore Green Finance Centre (SGFC), (ii) Sustainable Finance Institute of Asia (SFIA), and (iii) Sustainable and Green Finance Centre (SGFin). The three CoEs have set out distinct value propositions, with the respective research areas complementing each other:

- [Singapore Green Finance Centre \(SGFC\)](#) is Singapore's first centre of excellence dedicated to green finance research and talent development. It was launched in October 2020 by Imperial College Business School and Singapore Management University's Lee Kong Chian School of Business, supported by MAS and nine founding industry partners<sup>7</sup>. SGFC's research includes regional climate risk modelling and impact assessment and measurement. In March 2022,

SGFC held their inaugural Climate Academy for executives and key representatives from decision making functions across capital markets origination, risk management and asset management based in Singapore or across Asia Pacific.

- [Sustainable Finance Institute Asia \(SFIA\)](#) aims to catalyse and support the implementation of sustainable finance policy ideas in Asia, beginning with ASEAN, through advocacy and engagement activities. SFIA is the host of the ASEAN Taxonomy Board, which is developing a multi-tiered ASEAN Taxonomy for Sustainable Finance that will identify economic activities that are sustainable and help direct investment and funding towards a sustainable ASEAN.
- [Sustainable and Green Finance Institute \(SGFin\)](#), announced in September 2021, is hosted by the NUS Business School and collaborates with other faculties within NUS to produce multi-disciplinary research and training targeted at shaping sustainability outcomes and policy-making across the corporate and financial sectors. SGFin will be developing a sustainability impact measurement and assessment framework for corporates in Singapore and Asia, which aims to capture and translate granular ESG and impact data to determine the monetary value of companies' environmental and social performance.

**FOR FURTHER READING:**

- [NUS to establish Sustainable and Green Finance Institute to drive green finance education and research](#)

### Industry efforts to build capacity in sustainable finance

GFIT has launched a series of workshops and e-learning modules from May 2021 to April 2022 for financial institutions and corporates. These programmes aim to strengthen the capabilities of ecosystem in environmental risk management, environment-related disclosures, and sustainable finance instruments to enable financial institutions and corporates to customise sustainable financing solutions for transition sectors. Since the launch, these capacity building workshops have been well-received by the industry players.

### Sustainable Finance Skills and Training Roadmap

In February 2022, MAS and IBF launched the Sustainable Finance Technical Skills and Competencies (TSCs) under the IBF's Skills Framework for Financial Services<sup>8</sup>. The new 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 financial institutions to design and calibrate training programmes and for employers to refer to when hiring new recruits. Banks, asset managers and insurers have the flexibility to adopt SF TSCs relevant to their employees and organisation. The SF TSCs will be reviewed periodically to take account of evolving developments and needs in sustainable finance.

<sup>7</sup>Bank of China Limited, BNP Paribas, Fullerton Fund Management, Goldman Sachs, HSBC, Schroders, Standard Chartered Bank, Sumitomo Mitsui Banking Corporation, and UBS AG.

<sup>8</sup>The SF TSCs cover a range of thematic (e.g. climate change policy developments, natural capital, green taxonomies) and functional knowledge (e.g. sustainability risk management, sustainability reporting, sustainable investment management) topics.

# CENTRES OF EXCELLENCE

Growing sustainable finance knowledge and building a strong talent pipeline is at the heart of supporting financing flows for a more sustainable economy in Singapore and Asia. The Monetary Authority of Singapore (MAS) is developing a vibrant sustainable finance research and talent development ecosystem, comprising Centres of Excellence (CoEs), training providers, think tanks, and expertise, tailored for Asia's needs.

Since 2020, MAS has anchored three CoEs in Singapore with complementary and holistic coverage across the broad sustainable finance domain. The multi-disciplinary research and training from these institutions can help bridge the gap in Asia-focused sustainable finance research and talent development, shaping the path forward for a sustainable future for Asia.

CoEs	Key Objective	Research Outcomes	Training/Engagement Outcomes	Training Courses	Target Training Participants
 <p>Singapore Green Finance Centre</p> <p>Singapore Green Finance Centre (SGFC)</p>	<p>Develop sustainable capital markets and solutions to support Asia's transition, in partnership with nine founding partners from the financial sector<sup>1</sup></p> <p><small><sup>1</sup> Founding partners include Bank of China, BNP Paribas, Fullerton Asset Management, Goldman Sachs, HSBC, Schroders, SMBC, Standard Chartered, and UBS.</small></p>	<p>Industry-applicable research focusing on <b>sustainable finance markets and solutions</b> (e.g. improving efficiency of sustainable finance markets, catalysing development of sustainable solutions, and integrating ESG considerations in decision-making)</p>	<p><b>Finance Focused:</b> Equip finance professionals with <b>industry-applied skills in climate finance and knowledge in Asian markets</b></p>	<ul style="list-style-type: none"> <li>Foundational sustainable finance topics</li> <li><b>Financial sector</b> applications, e.g. Climate Risk Management and ESG Reporting</li> </ul>	<ul style="list-style-type: none"> <li>Undergraduates, postgraduates with a finance focus</li> <li>Finance professionals</li> </ul>
 <p>NUS National University of Singapore</p> <p>Sustainable and Green Finance Institute</p> <p>Sustainable and Green Finance Institute (SGFin)</p>	<p>Shape <b>sustainability outcomes and policymaking</b> across the <b>real economy and financial sectors</b>, in collaboration with NUS faculties, corporates, financial institutions</p>	<p>Macro-level research focusing on <b>real economy sustainability topics</b> (e.g. circular economy), and <b>sustainability and impact measurement and assessment framework</b> that allows for standardised measurement of companies' ESG performance</p>	<p><b>Real Economy Focused:</b> Equip companies and financial institutions to <b>incorporate sustainability considerations</b> within business strategies, policies, financing, and investment decisions</p>	<ul style="list-style-type: none"> <li>Foundational sustainable finance topics</li> <li><b>Real-economy</b> and financial sector applications, e.g. impact assessment and impact investing, green finance, social and sustainable investing etc.</li> </ul>	<ul style="list-style-type: none"> <li>Undergraduates and postgraduates, beyond finance-centric disciplines</li> <li>Business practitioners from <b>both</b> corporate and financial sector</li> </ul>
 <p>Sustainable Finance Institute Asia</p> <p>Sustainable Finance Institute Asia (SFIA)</p>	<p>Drive actionable sustainable finance <b>policy agenda, particularly in ASEAN</b> (e.g. ASEAN Taxonomy), by building collaborative networks across governments, regulators, central banks, academia, non-governmental organisations, and private stakeholders</p>	<p>Inputs-based <b>ESG data platform</b> to address the market gap for high quality ESG data</p>	<p><b>Policy Focused:</b> Provide sustainable <b>finance policy recommendations and implementation support</b> for ASEAN Member States</p>	<ul style="list-style-type: none"> <li>Webinars</li> <li>Bilateral and multilateral engagements</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable finance actors in the financial community</li> <li>Students in local Institutes of Higher Learning</li> </ul>

Making reference to the TSCs, the Wealth Management Institute (WMI), Investment Management Association of Singapore (IMAS), and the Association of Banks in Singapore (ABS) have introduced a series of capacity building workshops and initiatives.

- WMI is expanding its ESG programmes, taking reference from the MAS-IBF Sustainable Finance Technical Skills and Competencies. In March 2022, WMI launched an Applied ESG Investment and Advisory certification programme for family office professionals and advisors, and has plans to roll-out additional ESG programmes for asset managers, private bankers, next generation family principals and other stakeholders in the financial ecosystem in the coming months.
- IMAS has organised e-learning courses on their online portal iLearn and workshops on sustainable investing, environmental risk management, disclosures, and impact investing. In March 2022, IMAS held a full-day hybrid conference themed “Stewarding Capital Towards New Horizons: Investing for a Greener Future” to foster greater industry awareness on best practices in ESG and discussing topics such as the importance of integrating ESG into investment processes, what ESG would mean in Asia, and blended finance.
- ABS introduced a set of courses this year targeted at upskilling professionals in the financial sector, to facilitate the implementation of the Environmental Risk Management Guidelines that were introduced in December 2020.

#### FOR FURTHER READING:

- [Press Release for Sustainable Finance Technical Skills and Competencies](#)
- [WMI Aims to Upskill Over 1,000 Professionals and Investors in ESG and Sustainable Finance](#)

#### Anchoring sustainable finance teams and organisations

On 8 June 2022, the Glasgow Financial Alliance for Net Zero (GFANZ) announced the formation of its Asia Pacific (APAC) Network and the establishment of the GFANZ APAC Network Central Office in Singapore. GFANZ is supported by a permanent professional secretariat with expanded global representation and reach to facilitate ongoing and increased collaboration across the global climate community. MAS Managing Director will chair the GFANZ APAC Network’s Advisory Board. The APAC Network will serve as the coordination bridge between GFANZ and sub-sector alliances’ work and financial ecosystems in APAC, and anchor technical climate transition related discussions, knowledge, research, capacity building and related initiatives.

#### FOR FURTHER READING:

- [GFANZ Launches Asia Pacific Network to Support Asia Pacific Financial Institutions’ Move to Net Zero](#)

#### Harness technology to enable trusted and efficient sustainable finance flows

Project Greenprint is a collection of initiatives which seeks to harness technology and create a data-centric ecosystem to support the financial sector’s sustainability agenda. The three key strategic focus areas for Project Greenprint are to (i) establish robust data infrastructure that will facilitate sustainability data flows between real economy and financial sector; (ii) develop a vibrant sustainability FinTech ecosystem

through ecosystem development efforts; and (iii) promote innovation through partnerships and collaboration. These will foster a vibrant ESG FinTech ecosystem, and position Singapore as a launchpad for ESG FinTech solutions.

To develop a robust data infrastructure that will facilitate sustainability data flows between the real economy and the financial sector, MAS is working with industry partners to develop four interoperable data platforms. The data platforms will collect and aggregate ESG data across multiple sectoral platforms and industry players, and avail it for use by the financial sector.

- **ESG Disclosure Portal** - Facilitates consistent, comparable and reliable sustainability disclosures in line with internationally recognised reporting frameworks and enables external stakeholders’ access to these data by consent.
- **Data Orchestrator** - Aggregates ESG data from multiple data sources - major ESG data providers, utilities providers, ESG Disclosure Portal, and other sectoral platforms, and provides consent-based access to these sources. The platform will enable new data insights to be generated through data analytics to better support investment and financing decisions.
- **ESG Registry** - Records and maintains the provenance of ESG certifications and ESG data verified by certification bodies in different sectors, and facilitates trusted data flows between the financial sector and the real economy.
- **Greenprint Marketplace** - Connects green technology providers to investors, financial institutions and corporates, to facilitate partnerships and investments.

#### Greenprint ESG Disclosure Portal

The ESG Disclosure Portal seeks to be an integrated disclosure portal where reporting companies can upload corporate-level sustainability data in a structured and efficient manner and enable accessibility of sustainability data to multiple external stakeholders.

The portal seeks to (i) streamline structured and quality sustainability disclosures by corporates; (ii) promote transparency by enabling access to structured corporate-level sustainability data; and (iii) enable efficiency. To enhance efficiency, the ESG Disclosure Portal will address corporates’ current pain points where corporates report in varied systems, templates and formats. The integrated portal will be able to map data requirements across various standards and frameworks and facilitate the transfer of sustainability data to multiple external stakeholders. Data ownership belongs to the corporates and corporates will be able to give consent for authorised recipients to view and access their sustainability data, and these data will be presented in a structured format to allow for data consistency and comparability.

This project will start with a pilot with SGX for listed issuers in Singapore and SGX will be looking to onboard the first batch of listed issuers in 2022. Beyond the pilot, the portal will seek to also reflect other regulatory or voluntary disclosure requirements by other government agencies and private sector players based in Singapore.

#### FOR FURTHER READING:

- [SGX public consultation for the ESG Disclosure Platform](#)
- [Press release on launch of Project Greenprint](#)

## **Greenprint ESG Registry**

The Greenprint ESG Registry, which is developed in partnership with Hashstacs Pte Ltd (STACS)<sup>9</sup>, aims to be a blockchain-powered data platform supporting a tamper-proof record of sustainability certifications and verified sustainability data across various sectors, providing financial institutions, corporates, and regulatory authorities a common access point for these data. This will facilitate better tracking and analysis of corporates' sustainability commitments, impact measurement, alleviate greenwashing risks, and improve overall management of ESG financial products.

The Registry will be powered by STACS' ESGpedia, which is currently deployed in its beta phase, with ongoing partnerships with numerous leading financial, non-governmental organisations and a growing ecosystem starting with the agri-food, building and construction, transport and logistics, carbon credit, and renewable energy sectors.

### **FOR FURTHER READING:**

- [Press release on official launch of ESGpedia](#)

## **Facilitating FinTech partnership and innovation**

MAS has earmarked S\$50 million from the Financial Sector Technology and Innovation Grant Scheme (FSTI) to support Green FinTech projects in Singapore. The funding can be used to support proofs-of-concept, innovation labs, industry-wide utilities,

and technology platforms focused on Green FinTech. As at March 2022, MAS is supporting eight Green FinTech projects through our FSTI Proof-of-Concept and Industry Wide funding schemes.

In November 2021, MAS and the Singapore FinTech Association (SFA) announced the award winners of the Global FinTech Hackcelerator, under the theme of "Harnessing Technology to Power Green Finance". 283 participants in the Local Programme, supported by Oliver Wyman, addressed high-priority problem statements collated from financial institutions and green finance industry players in Singapore and globally. MAS will be working with the industry to develop an ESG Innovation Accelerator Programme, to catalyse and expand the Green FinTech eco-system.

In May 2022, MAS announced the launch of the 7th edition of the Global FinTech Hackcelerator, with the theme "Accelerating A Greener Digital Future". The competition, powered by Oliver Wyman, seeks to leverage the potential of FinTech in accelerating the development of Web 3.0 and Green Finance in Singapore and the region. FinTech firms and solution providers around the world are invited to submit innovative solutions to address over 50 problem statements that have been collected from financial institutions and industry players. Under Green Finance, the problem statements focus on enhancing investor and financial institution's ease of monitoring commitments and measuring impact

of loans and investments against their sustainability goals. Examples of problem statements aimed at helping corporates and SMEs meet their sustainability goals include leveraging technology to create sustainable benchmarks in order to rate companies' performance on a green scale.

To further expand the Green FinTech ecosystem, MAS will join the industry in launching a physical ESG Impact Hub - a co-working facility dedicated to the sustainability community and foster more collaboration and communication on cross-sectoral sustainability initiatives.

## **Collaborate with international partners**

### **Collaboration with US, UK and Indonesia**

The US and Singapore launched a climate partnership in August 2021 to strengthen collaboration between the US and Singapore on climate action, environmental governance, sustainable development and low-carbon solutions. Under the partnership, MAS will work closely with US counterparts on (i) advancing sustainable finance, including mobilising private capital for sustainable infrastructure; and (ii) enhancing climate and environmental risk management in the financial sector.

Indonesia and Singapore signed a bilateral Memorandum of Understanding (MoU) on Cooperation on Climate Change and Sustainability in March 2022. The cooperation was formalised following the Singapore-Indonesia Leader's Retreat in January 2022 and will further strengthen engagement between Singapore and Indonesia on climate change and sustainability. Under the

MoU, Singapore and Indonesia will collaborate on projects and initiatives for (a) carbon pricing and markets, (b) nature-based solutions and ecosystem-based approach, (c) clean technology and solutions, and (d) green and blended finance. A key objective is to support decarbonisation in Indonesia, Singapore and the Southeast Asia region, by curating a list of low-carbon pilot projects and crowding in capital through blended finance mechanism. The success of these pilot projects would be used as a model to scale up or extend to other projects subsequently.

MAS and the UK Financial Partnership is supported by a MOU signed in June 2021. Under the Partnership, the UK and Singapore will explore opportunities for greater financial cooperation, including in green finance and carbon markets. Both countries reaffirmed the importance of interoperability of taxonomies to facilitate cross-border, sustainable financial flows and will work towards identifying compatibilities in the UK and Singapore taxonomy principles and metrics for green and transitional activities. Both countries also supported mandatory climate-related financial disclosures aligned with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations, and will explore collaborating on a biodiversity pilot study, which will inform research into how nature-related risks will affect the financial system and contribute to this area of growing importance.

### **FOR FURTHER READING:**

- [Official visit of Vice President of the United States of America Kamala D. Harris, 22 to 24 August 2021](#)
- [UK and Singapore mark a new era of Financial Services Cooperation](#)
- [Singapore and Indonesia Sign Memorandum of Understanding Concerning Cooperation on Climate Change and Sustainability](#)

<sup>9</sup> STACS is an award-winning technology company. It was a winner of the MAS Global FinTech Innovation Challenge Awards 2020 and was awarded the Best FinTech ESG Solution (Asset & Wealth Management) at the DigFin Innovation Awards 2021. STACS will be developing the ESGpedia, as one of the four digital platform enablers of Project Greenprint.

# Risk Management

## Overview

As global financial institutions ratchet up their climate ambitions and pledge to achieve net-zero, it is important that these ambitions are accompanied by transparent and credible decarbonisation pathways. This involves the setting of robust interim targets, as backloading needed measures in the later years increase the risks of missing the net-zero goals. MAS is engaging key international organisations such as the Glasgow

Financial Alliance for Net Zero (GFANZ) that are developing decarbonisation pathways backed by science for the financial and real economy sectors. These organisations will work closely with financial institutions in Singapore and the region to support their net-zero and decarbonisation efforts.

MAS also recognises the need to guard against the risk of greenwashing given increasing inflows into sustainable products and funds. Greenwashing can occur at the firm level and product

level, such as the overstatement or lack of clarity about a firm's sustainability commitments, or lack of alignment between the product's stated sustainability objective versus its actual investment allocations.

MAS seeks to mitigate greenwashing in the financial system through the following enablers, (i) taxonomies to serve as an established, science-based and common reference for financial institutions to determine if an economic activity is green or transition, by enabling activities to be evaluated against specific criteria; (ii) consistent disclosures to ensure that financial institutions and corporates report the activities conducted and the extent of greenness, and in certain jurisdictions, referencing the taxonomy; and (iii) leveraging technology to obtain real-time data to facilitate timely evaluation of the greenness of companies and activities, and verifying compliance with international standards. MAS' efforts on disclosures are detailed in the "A Climate-Resilient Financial Sector" section of the Sustainability Report.

## Interoperability across different taxonomies

To unlock sustainable finance, we need common definitions for activities that contribute to climate goals. Taxonomies are emerging as a key tool for unlocking green and sustainable finance. By providing clarity to the market on what activities can be considered green or sustainable, taxonomies facilitate the scaling up of green finance.

In January 2021, the Green Finance Industry Taskforce (GFIT) issued a Phase 1 taxonomy for public consultation. The taskforce proposes for the taxonomy to cover five core sectors

comprising agriculture and forestry/land use, real estate, transportation, energy, and industrial, which account for 90% of ASEAN GHG emissions and 40% of economic value add, and three enabling sectors comprising information and communications technology, waste/circular economy, and carbon capture and sequestration, whose products and services contribute to the environmental objectives. The GFIT launched a second public consultation in May 2022, which laid out a guiding framework to define green and transition activities and the technical screening criteria in the three core sectors – energy, buildings and construction, transportation and fuels. Thresholds for the remaining five sectors will be detailed in a subsequent public consultation. The May 2022 public consultation also incorporates a user guide for financial institutions and companies to apply the taxonomy.

## ASEAN Taxonomy Board (ATB)

In March 2021, the 7th ASEAN Finance Ministers and Central Bank Governors Meeting (AFMGM) endorsed the development of a multi-tier ASEAN Taxonomy for Sustainable Finance, to serve as an overarching guide for all ASEAN Member States (AMS), complementing their respective national sustainability initiatives and serving as ASEAN's common language for sustainable finance. The ASEAN Taxonomy Board (hosted by Sustainable Finance Institute Asia) was established in March 2021 to undertake the taxonomy development.

The ASEAN Taxonomy comprises two tiers, (i) the principles-based Foundation Framework which provides baseline guidance to determine if activities contribute to the Taxonomy's environmental objectives, and (ii) the



Plus Standard, with metrics and data-backed activity-level thresholds to further classify transition economic activities in the 6 focus sectors<sup>10</sup> and 3 enabling sectors<sup>11</sup> identified by the ASEAN Taxonomy Board (ATB).

MAS is the Vice-Chair of the ATB, and Chair of the workstream that is developing the Plus Standard. The first iteration of the ASEAN taxonomy, entitled “Version 1 of the Key Components of the ASEAN Taxonomy for Sustainable Finance”, was published on 10 November 2021 during COP26.

The ATB is conducting a targeted consultation on the ASEAN Taxonomy Version 1 document through 2022. Feedback from stakeholders will inform the next phase of work, which includes the development of guidance under the Foundation Framework for the other environmental objectives (beyond climate change mitigation), as well as the development of activity-level thresholds for the Plus Standard.

**FOR FURTHER READING:**

- [Joint Statement of the 7th AFMGM](#)
- [ASEAN Taxonomy](#)
- [GFIT's 2nd Taxonomy Public Consultation](#)

### Alignment of products with international principles

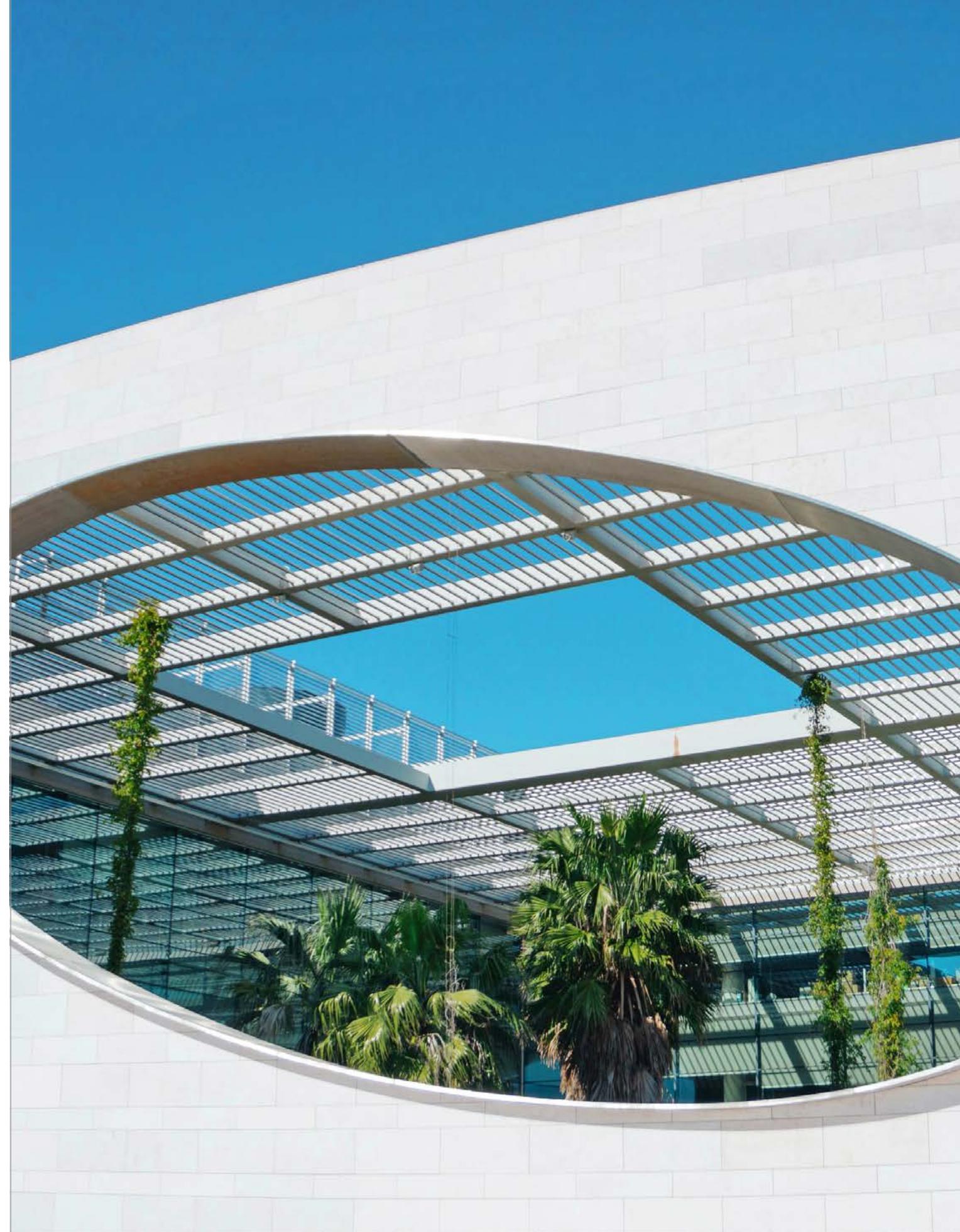
MAS seeks to promote the development of sustainable finance solutions products that are robust and aligned with internationally recognised principles and standards. The Green

and Sustainability-Linked Loan Grant Scheme (GSLs) and Sustainable Bond Grant Scheme (SBGS) require recipients to be aligned with well-established and internationally recognised principles such as the International Capital Market Association (ICMA) Green, Social, Sustainable, and Sustainability-linked bond principles, and the Loan Market Association (LMA) Green and Sustainability-linked loan principles. These principles provide guidance on preserving the integrity of the product by capturing the fundamental characteristics common to each type of ESG product. This includes guidance on the use-of-proceeds of capital raised, level of ambition for target setting, reporting frequency, and external verification. The principles allow for standardisation in the market on what constitutes a green, social, sustainable, or sustainability-linked bond or loan, which in turn discourages the origination or issuance of falsely categorised products that fall short of the guidelines.

To verify that grant scheme applicants adhere to these principles, applicants must obtain external verification of the alignment to relevant principles prior to the inception of the product. For Sustainability-linked instruments with defined Sustainability Performance Targets (SPTs) or targeted ESG ratings scores, applicants are required to seek external verification of their progress towards the fulfilment of the SPTs or attainment of higher ESG ratings on an annual basis.

<sup>10</sup> These were selected according to their environmental and economic importance to ASEAN based on 2 criteria: greenhouse gas emissions and gross value added.

<sup>11</sup> Enabling sectors improve the performance of other sectors and activities and do not of themselves harm environmental objectives.



# A SUSTAINABLE ORGANISATION

GOVERNANCE

STRATEGY

RISK MANAGEMENT

METRICS AND TARGETS



MAS is reducing its carbon and environmental footprint to support Singapore's climate ambitions and commitments.



# Governance

## Overview

All initiatives to further a sustainable organisation are tabled and discussed at the Green Finance Steering Committee (GFSC), which is chaired by MAS' Managing Director.

These initiatives include greening MAS' buildings, transportation, procurement, and currency operations as well as deployment of solar panels.

The initiatives are aimed at meeting our emissions reduction targets and public sector sustainability targets. The latter comes under the GreenGov. SG initiative, where the public sector in Singapore leads the way to pursue sustainable development and supports the national sustainability agenda mapped out in the Singapore Green Plan 2030.

potable water. Through these strategies, MAS has maintained the GreenMark certification (Platinum) since 2015, and was awarded the Energy Efficiency National Partnership (EENP) Award in 2018.

## Reduce scope 2 electricity emissions

Measures to reduce electricity emissions in MAS' premises include:

- Using cool paint to lower the temperature of our water storage tanks,
- Raising indoor air-conditioned temperature to 25°C,
- Using more energy efficient, motion-controlled LED lightings in our office premises,
- Installing solar panels on the rooftop of MAS Building and Currency House, and
- Replacing the central air conditioning system at Currency House.

## Reduce scope 3 outsourced currency emissions

MAS' currency value chain comprises outsourced currency operations, in-house currency processing and waste incineration<sup>12</sup>. The outsourced currency operations include currency production, processing and transportation. The reduction of carbon emissions from MAS' outsourced currency operations hinges on a lowering in the public demand for notes and coins, given MAS' mandate to meet the demand. Nonetheless, MAS seeks to reduce the carbon footprint of our outsourced currency operations where we are able to, across the currency value chain – both upstream and downstream.

### Upstream:

- In currency production, we are working with our current polymer note printer, Note Printing Australia (NPA), to reduce carbon emissions from the production of our notes. For example, NPA has increased the use of its renewable energy to 20% of its grid electricity since July 2021 and is planning a production optimisation programme to further reduce its carbon emissions in the coming year.
- In currency-related procurement, MAS will incorporate environmental considerations in selecting future

# Strategy

## Overview

### 2030 environmental sustainability roadmap

The major components of our carbon footprint are electricity consumption (Scope 2 emissions), business air travel and outsourced currency operations (Scope 3 emissions). These cumulatively account for 96% of our total emissions in FY2021. We have reduced Scope 2 emissions by 23% from its peak in 2013 and it has since been on a downward trajectory.

MAS has launched a 2030 environmental sustainability roadmap that sets out our Scope 1, Scope 2, and Scope 3 (business air travel and outsourced currency operations) near-term emissions

reduction targets and strategies. We aim to achieve these near-term targets in FY2025 and FY2030 through evaluating the potential for reducing the major components of our carbon footprint, choosing the best approaches through cost-benefit analyses, and assessing the potential use of carbon offsets for emissions that are difficult to abate.

Our 2030 roadmap builds on our ongoing efforts since 2013 to deploy energy efficiency measures such as central air conditioning, heat recovery system, and lighting systems in MAS Building, to keep pace with technological advancements. We also introduced NEWater in our overall water reticulation system, which provides water to our air-con cooling system. This reduced the need to use

## Reduce scope 3 business air travel emissions

New norms for international meetings present an opportunity to reduce the air travel of MAS staff. Many international engagements, such as meetings, conferences, courses and workshops, were held virtually during the COVID-19 pandemic. As air travel normalises, we can expect some meetings to return to an in-person format. Others may continue in an exclusively virtual setting, while some organisers may choose to adopt a hybrid meeting format.

<sup>12</sup> The carbon emissions arising from in-house currency processing (e.g., electricity consumption) and waste incineration are under MAS' Scope 2 and Scope 3 emissions respectively.

currency vendors. MAS hopes to influence change by making clear that this will be a key consideration in future procurement exercises.

#### Downstream:

- MAS will continue with our ongoing efforts to reduce the public demand for new notes, by encouraging the use of fit notes and e-gifting during festive seasons including Lunar New Year (LNY), and promoting e-payments<sup>13</sup>.
- Approximately 100 million pieces of new notes for LNY and other festive periods are issued annually. These new notes are used once for gifting, and the majority of these notes are returned to MAS shortly after each LNY. While most of these returned notes are recirculated to meet demand (e.g., they replace unfit notes in circulation), the excess will accumulate and are subsequently destroyed before the end of their useful life as they far exceed the replacement demand. This wastes resources, resulting in unwarranted carbon emissions.
- MAS aims to shift public preferences by encouraging the use of fit notes during festive gifting and continuing with the progressive reduction of new notes to reduce the environmental impact of new notes issuance. This will pave the way for a sustainable future where MAS will no longer issue new notes for festive gifting.

### Reduce waste

MAS will work towards the GreenGov.SG target of reducing our waste disposal by 30% (from 2022) by 2030. MAS continues to actively encourage the three 'R's of reduce, reuse and recycle amongst staff, to minimise waste, conserve natural resources and reduce carbon emissions.

### Develop a culture of sustainability

MAS recognises the importance of building a culture of sustainability and encourages staff to actively adopt sustainability-friendly practices through the three 'A's of Awareness, Advocacy and Action. MAS actively encourages staff to develop and deepen their understanding of sustainability issues through webinars, learning events and brownbag sessions. This year, sustainability was a key theme in our annual staff seminar, One MAS Connect (OMC), where officers from various departments spoke about their work in sustainability and other ground-up activities in the organisation. We also launched our inaugural sustainability sentiment survey in 2022 to understand staff's attitudes, willingness and perceptions towards building a culture of sustainability within MAS.

The MAS Recreation Club formed a Sustainability Committee to implement ground-up initiatives and actionable interventions. These aim to change the behaviours and attitudes of staff towards waste generation or resource usage in the office. Initiatives such as plastic free days and reusable bag sharing points will be piloted to encourage staff to adopt environmentally friendly habits.

<sup>13</sup> The use of e-Payments such as PayNow, FAST and SGQR are convenient alternatives to cash and cheques. By reducing the reliance on physical notes and cheques, we can help reduce the lifecycle carbon and environmental footprint from their production to eventual disposal.



# Risk Management

## Managing physical and transition risks from climate change

### Management of physical risks to MAS building

Physical risks could impact our buildings and property, for instance via flash floods or peak temperature. Physical risks can also impact companies which supply MAS with goods, services and raw materials, for instance, companies that supply our currency vendors with key raw materials used to produce currency notes.

Fortuitously, the MAS Building is located in a non-flood prone area. Several mitigating measures have been incorporated in the design of the building, including the placement of key critical equipment above ground level, having elevated building entrances, and implementing a water alert system in the basement carpark.

At the national level, PUB, our national water agency, has installed more than 300 water level sensors around Singapore for the monitoring of drainage systems, and has a SMS alert system in place, to facilitate timely updates to the public on potential flash floods.

### Management of outsourced currency operations

MAS' outsourced currency operations are exposed to both physical and transition risks arising from climate change. MAS has taken measures to mitigate and reduce the risks.

Physical risk arising from extreme weather conditions may result in production or delivery delays. MAS maintains sufficient stock to meet notes and coins demand.

Transition risk may cause a rise in cost for MAS' outsourced currency operations. The open-tender procurement approach for currency replenishment allows us to award to a vendor that meets our requirements and provides the most value-for-money bid. As our vendor transits towards less polluting and greener operations, this may result in higher production and operation costs due to factors such as policy constraints on emissions in the vendor's country of operation, higher carbon taxes imposed, and market changes. As such, it is important for us to lower our carbon footprint and progressively introduce measures to reduce public demand for new currency notes and coins.

## Factoring climate-related considerations in procurement

MAS has factored climate-related considerations in our procurement processes. We adopt the green procurement requirements from the GreenGov.SG framework and other initiatives such as National Environment Agency's (NEA) Guaranteed Energy Savings Performance contracting model. This contracting model optimises the chilled water system design and ensures efficient performance, comprehensive maintenance, and guaranteed savings over a typical period of five years.

# GREEN PROCUREMENT REQUIREMENTS



# Metrics and Targets

## Environmental sustainability targets

### MAS' near-term targets for FY2025 and FY2030

MAS' near-term targets for Scope 1, Scope 2 and Scope 3 emissions reduction are set based on the Science Based Targets initiative (SBTi) methodology, which has been independently validated by KPMG Services Pte Ltd. In particular, MAS' Scope 1, Scope 2 and Scope 3 (business air travel) near-term targets are aligned with the well below 2°C science-based pathway, and Scope 3 (outsourced currency operations) near-term targets are aligned with the 2°C science-based pathway.

The following targets use FY2018 (ending March 2019) as the base year.

- Scope 1, Scope 2 and Scope 3 (business air travel) emissions:
  - FY2025 target: reduce by 17.5%
  - FY2030 target: reduce by 30%
- Scope 3 (outsourced currency operations) emissions:
  - FY2025 target: reduce by 10%
  - FY2030 target: reduce by 20%

MAS is committed to reducing Scope 3 emissions as it forms the bulk of our carbon profile, despite the greater challenges in reducing such emissions. MAS has set higher emissions reduction targets for Scope 3 (business air travel) by aligning these targets with the well below 2°C science-based pathway as

<sup>14</sup> MAS' carbon profile is calculated in accordance with the Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard developed by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), using the operational control approach. MAS has applied an operational control approach, instead of equity share or financial approaches because MAS has full authority to introduce and implement its operating policies.

<sup>15</sup> Fugitive emissions due to fire extinguishing agent calculated using emission factor from the IPCC Fifth Assessment Report, 2014.

<sup>16</sup> The emission factor is obtained from the National Environment Agency (NEA), GHG Emissions Measurement and Reporting Guidelines 2018.

<sup>17</sup> Other fuel is used for standby generators at our premises. The emission factor is obtained from the NEA, GHG Emissions Measurement and Reporting Guidelines 2018.

<sup>18</sup> The GHG emissions from electricity consumption are computed using the location-based approach instead of market-based approach as MAS currently purchases all electricity from power grids, and the grid emission factors are obtained from the Singapore Energy Market

Authority (EMA), UK Department for Business, Energy & Industrial Strategy (DBEIS), USA Egrid (2020) and China's National Development and Reform Commission Guidelines for Singapore offices and buildings, as well as offices in London, New York, Beijing and Shanghai. For Singapore, FY2018 carbon emissions is calculated based on 2018 grid emission factor of 0.4206 kg CO<sub>2</sub>/kWh; FY2019 and FY2020 carbon emissions are calculated based on 2019 grid emission factor of 0.4085 kg CO<sub>2</sub>/kWh and FY2021 carbon emissions are calculated based on 2020 grid emission factor of 0.408 kg CO<sub>2</sub>/kWh.

<sup>19</sup> MAS' overseas offices in New York City, London and Beijing contribute to only Scope 2 indirect carbon emissions from electricity consumption. Shanghai office, which started operations in January 2021, has been included in this year's Sustainability Report: FY2018: 18 Tonnes of CO<sub>2</sub>e, FY2019: 15 Tonnes of CO<sub>2</sub>e, FY2020: 12 Tonnes of CO<sub>2</sub>e, FY2021: 16 Tonnes of CO<sub>2</sub>e.

<sup>20</sup> Emissions from business travel are calculated with emission factors developed by World Resource Institute and UK DBEIS. The distance between each flight was calculated using [www.distancecalculator.net](http://www.distancecalculator.net). The FY2018 and FY2019 air travel emissions

have been restated from 4,314 tonnes CO<sub>2</sub>e to 4,417 tonnes CO<sub>2</sub>e and 3,749 tonnes CO<sub>2</sub>e to 4,024 tonnes CO<sub>2</sub>e respectively to include trips that were made on MAS' business, but not paid for by MAS.

<sup>21</sup> Emissions from staff travel in Singapore, are calculated with emission factors developed by UK DBEIS.

<sup>22</sup> Emissions from electricity consumption of downstream leased assets are calculated using emission factors obtained from the Singapore EMA.

<sup>23</sup> Emissions from waste incineration are calculated using emission factors obtained from the NEA (2018) Singapore's Fourth National Communication and Third Biennial Update Report.

<sup>24</sup> MAS' outsourced currency operations comprise activities such as outsourced currency production, processing and transportation. Carbon emissions arising from in-house currency processing (e.g., electricity consumption) and waste incineration are disclosed under Scope 2 and Scope 3 respectively.

<sup>25</sup> In addition to our efforts to reduce the impact of currency operations on the environment, the decline in FY2021 emissions for outsourced currency operations was also due to the lower demand of coins during the Covid-19 pandemic.

## MAS' CARBON PROFILE<sup>14</sup> COMPRISING SCOPE 1, SCOPE 2 AND SCOPE 3 EMISSIONS

Tonnes of CO <sub>2</sub> e (% of total)	FY2018	FY2019	FY2020	FY2021
<b>Direct Carbon Emissions (Scope 1)</b>				
Fire Extinguishing Agent <sup>15</sup>	86 (<1%)	89 (<1%)	89 (1%)	86 (<1%)
MAS-owned vehicles <sup>16</sup>	8 (<1%)	8 (<1%)	3 (<1%)	1 (<1%)
Other fuels <sup>17</sup>	4 (<1%)	2 (<1%)	2 (<1%)	0.7 (<1%)
<b>Sub-total CO<sub>2</sub>e emissions (Scope 1)</b>	<b>98 (1%)</b>	<b>99 (1%)</b>	<b>94 (1%)</b>	<b>88 (1%)</b>
<b>Indirect Carbon Emissions (Scope 2)</b>				
<b>Electricity<sup>18</sup> (including MAS' overseas offices<sup>19</sup>)</b>	<b>3,884 (24%)</b>	<b>3,848 (25%)</b>	<b>3,696 (34%)</b>	<b>3,849 (38%)</b>
<b>Indirect Carbon Emissions (Scope 3)</b>				
Business air travel <sup>20</sup>	4,417 (27%)	4,024 (26%)	296 (3%)	342 (3%)
Business travel - Land <sup>21</sup>	14 (<1%)	15 (<1%)	7 (<1%)	5 (<1%)
Leased office space <sup>22</sup> (MAS Building)	370 (2%)	283 (2%)	132 (1%)	161 (2%)
Waste incineration <sup>23</sup>	302 (2%)	246 (2%)	165 (1%)	103 (1%)
Outsourced Currency operations <sup>24</sup>	7,216 (44%)	6,776 (44%)	6,444 (60%)	5,459 <sup>25</sup> (55%)
<b>Sub-total CO<sub>2</sub> emissions (Scope 3)</b>	<b>12,319 (75%)</b>	<b>11,344 (74%)</b>	<b>7,044 (65%)</b>	<b>6,070 (61%)</b>
<b>Total Carbon Emissions</b>	<b>16,301</b>	<b>15,291</b>	<b>10,834</b>	<b>10,007</b>

this is an area where MAS is able to do more. In contrast, it is challenging to make significant reductions in carbon emissions of MAS' outsourced currency operations given MAS' mandate to meet public demand for currency. Nevertheless, MAS has set near-term emissions reduction targets for our outsourced currency operations that are aligned with the 2°C science-based pathway. MAS will continue to monitor our ongoing efforts and explore additional measures to further reduce our emissions.

**GreenGov.SG's targets by 2030**

- Energy Utilisation Index: improve by 10% from 2018-2020 baseline
- Water Efficiency Index: improve by 10% from 2018-2020 baseline
- Waste Disposal Index: improve by 30% from 2022 baseline

**Carbon footprint of MAS' corporate activities**

MAS will continue to measure and report our corporate emissions using the Greenhouse Gas (GHG) Protocol. Overall, our FY2021 emissions declined 39% from FY2018 baseline, given the

	2021
Energy Utilisation Index	118 kWh/m <sup>2</sup>
Water Efficiency Index	94 litres/person/day

substantial decline in business air travel due to the COVID-19 pandemic. This is an aberration.

**Electricity, waste and water usage profile**

MAS will introduce new metrics to report our energy utilisation, water efficiency and waste disposal, in accordance with the GreenGov.SG targets. The metrics are computed as follows:

- Energy Utilisation Index (EUI): annual energy consumption divided by the total Gross Floor Area
- Water Efficiency Index (WEI): annual water consumption per day divided by the total number of occupants including visitors
- Waste Disposal Index (WDI): total amount of waste disposed per day divided by the total number of occupants including visitors

Only EUI and WEI are reported in this year's Sustainability Report. The WDI uses 2022 as the base year, so this metric will only be reported in our 2023 report.

**Progress in developing a culture of sustainability**

MAS recognises the importance of building a culture of sustainability and

encourages staff to actively adopt environmentally sustainable practices through the three 'A's of Awareness, Advocacy and Action. The outcomes achieved are highlighted in the table.

Initiatives	Year Implemented	Outcomes Achieved
<b>Minimise Plastic Waste</b>		
Removed the provision of single-used bottled water in meeting rooms at MAS' premises	2018	Reduced the use of >3,000 plastic bottles per year
Implemented clustered placement of office litter bins	2017	Reduced the use of >16,000 plastic liners per year
<b>Reduce Paper Usage</b>		
Introduced "Bring-Your-Cup" initiative and ceased dispensing paper cups when staff use beverage vending machines	2017	Reduced the use of >76,000 paper cups per year
Raised awareness and encouraged staff to go digital and print less	2016	Reduced paper usage by 18% or 2.3 tonnes (equivalent of 54 trees) year-on-year, as of FY2021
<b>Project Bring-Your-Own (BYO)</b>		
MAS provided staff with reusable utensils and lunchbox to pack meals alongside a pledge to stop using single-use items	2020	47% of MAS staff have pledged and signed up for Project BYO

# A CLIMATE-RESILIENT INVESTMENT PORTFOLIO

GOVERNANCE

STRATEGY

RISKS AND OPPORTUNITIES

METRICS AND TARGETS



MAS is integrating climate risks and opportunities into our investment framework, and supporting the transition of companies to a low carbon future.



# Governance

## Overview

MAS, as Singapore's central bank, manages the Official Foreign Reserves (OFR).

The Monetary and Investment Policy Meeting (MIPM) is a Board-level committee chaired by Chairman, MAS. The MIPM oversees the investment of the OFR, including the implementation of climate-related portfolio actions and associated metrics and objectives. The MIPM is supported by the Management Investment Committee (MIC) co-chaired by the Deputy Managing Directors

of Markets & Development and Corporate Development respectively.

On portfolio actions to manage climate risks, MIPM and MIC takes into consideration how climate change could impact long-term investment returns and risks. This includes assessments of portfolio impact under different climate scenarios, approaches to manage climate-related risks, allocation of risk capital to various climate strategies, monitoring of portfolio climate metrics, and tracking of portfolio emissions reduction progress.

# Strategy

## Long term investment objective

**MAS aims to achieve good long-term returns on our investment portfolio, while taking care that the portfolio remains resilient across market conditions. Managing the financial impact arising from climate change therefore aligns fully with our long-term investment objectives.**

Climate change introduces risks, but also opportunities, for the Official Foreign Reserves (OFR).

In particular, the actions societies take

to mitigate and adapt to climate change can result in structural changes to the economy. The transition to a low carbon economy will benefit some sectors and companies at the expense of others, and will create correspondingly differentiated impact on company values.

The full impact from this shift will be felt over the coming decades and the eventual outcome cannot be predicted ex-ante.

**Climate strategy over short, medium and long-term**

**The impact of climate change is not only structural and long term, but also dependent on the uncertain trajectory of future pathways.**

Building a climate-resilient investment portfolio requires a forward-looking approach which can be calibrated over multiple time horizons. This involves:

- Understanding the impact on portfolio returns across climate scenarios over a long-term period. We adopt a 20-year time frame as the implications of low carbon transition pathways, or the non-linear escalation of physical climate impacts can only be fully examined over a long time horizon.
- Positioning the portfolio consistent with climate signposts that provide ex-ante medium term insights on the real progress towards a low carbon future. Trends over a three to five-year period can indicate a change in the pace of transition, and allow us to calibrate portfolio actions in line with the likely transition pathway.
- Implementing portfolio actions in the near term based on a solution set that is presently available, to build internal capabilities and experience, with a view to scaling up these actions over time.

## Scenario analysis – long-term returns impact

**We continue to strengthen our study of the long-term impact of climate change as methodologies for climate scenario analysis mature**

To deepen our understanding of possible investment implications of climate change, MAS partnered GIC, Singapore's sovereign wealth fund, and industry-leading consultants to conduct climate scenario analysis on MAS' portfolio.

Scenario analysis does not aim to predict the climate outcome and transition pathways. Rather, it seeks to provide a range of potential future climate states.

In MAS' Sustainability Report 2020/2021, we developed three main climate scenarios which covered a range of risks and shocks that can manifest over both short and long term horizons. This enabled us to assess the impact on our portfolio and take appropriate portfolio actions where necessary to enhance portfolio resilience. These scenarios will be reviewed and updated periodically.

## Climate signposts – medium term trends

**Climate signposts help us to measure how the world is progressing towards a low carbon future**

We have categorised our climate signposts into various domain indicators that track real world progress along a low carbon transition. The domains include:

- Country commitments and actions
- Business commitments and actions
- Deployment of clean technologies and consumption of fossil fuels
- Changes in global carbon emissions

These indicators are mapped to modelled greenhouse gas (GHG) emissions and transition pathways developed using a myriad of Integrated Assessment Models, to estimate the likelihood of the various climate scenarios materialising. This provides a basis for subsequent portfolio actions to manage associated risks. For example, in an accelerated transition scenario, we might need to further reduce exposures to companies most-at-risk of higher carbon prices and direct our external managers to step up their engagement with these companies and closely monitor how climate risks

are addressed. Alternatively, a slower global transition away from fossil fuels might warrant a recalibration of portfolio actions.

We continue to refine the range of indicators to track across the various domains as more data become available and as higher quality indicators emerge

that can more reliably signal the transition pathway that the world is on.

In the next section, we review MAS' climate risk management process to identify, assess and manage climate risks, and update on the portfolio actions we have implemented or are in the process of implementing.

## Risks and Opportunities

### Identify – transition and physical risks

#### Climate change can create financial risks for companies and investors through two main drivers:

Physical risks that result from more frequent and extreme weather events and changes in climatic conditions

- First-order effects include the economic costs of physical infrastructure damage, operational stoppages, decreased production yields, and disruption to supply chains.
- Second-order effects include recovery and adaptation costs, reduction in land and labour productivity, with broad-based impact on economic growth and socio-economic development.

Transition risks that result from societal responses to mitigate climate change.

- The level of risks is determined by the nature and magnitude of policy and regulatory responses, low emissions innovation, and end-user (corporate

and household) behavioural changes that bring about a reduction in global emissions.

- The performance of companies in various sectors can be significantly impacted both positively and negatively. For example, higher carbon taxes can significantly impact earnings, raise the cost of capital, and reduce the availability of financing and risk underwriting for companies in carbon intensive sectors, while benefitting those involved in alternatives such as renewable energy and low carbon transportation.

### Assess – focus on transition risks

#### MAS is focusing actions on transition risks in the Official Foreign Reserves (OFR)

Transition risks are more imminent compared to physical risks.

- Climate policies and actions to transit to a low carbon economy need to occur well before the most damaging physical effects of global warming

materialise. For instance, to meet mid-century climate goals, the pace of transition would have to be aligned with a reduction of about half of global emissions by 2030 from 2019 levels.

- Results from the climate scenario analysis study conducted on the portfolio further showed that there is a wide dispersion of transition risk impact on economies, sectors and companies, depending on the pace of transition. The faster and more disruptive the transition, the wider the dispersion of impacts as it shortens the runway to navigate the switch away from a dependence on fossil fuels, adopt energy-efficient solutions and develop low-emissions technologies. More broadly, it increases the pressures on fiscal, corporate, and household balance sheets to manage the overall costs associated with a low-carbon transition.
- This suggests the need for early portfolio actions to protect the portfolio from downside risks arising from a faster-than-expected transition, and adopt strategies that can reap returns from the transition to a sustainable low-carbon economy.
- We will continue to study the effects of physical risks on our long-term investment returns, particularly in a Failed Transition scenario.

### Manage – implement actions for equities portfolio

#### We are implementing actions at the total portfolio level for equities investments and through external fund managers

##### At the total portfolio level:

**As an asset owner, MAS is responsible for the performance of the OFR, asset allocation decisions, and the level of risks that is appropriate to achieve a desired level of returns. Targeted portfolio actions to manage climate**

**risks are tools that help us shape the portfolio characteristics that best serve our investment objectives.**

Although the OFR has a larger allocation towards cash and sovereign bonds, it is the equity assets that contribute to most of the expected lowering of long-term returns arising from climate risks.

- Equities are more impacted compared to cash and bonds. Equity returns represent the discounted future earnings streams from owning a part of businesses and are therefore more sensitive to (i) changes in macro-economic factors (e.g. GDP) due to climate change and (ii) changes in companies' earnings caused by climate-related variables such as carbon prices, oil and gas demand and clean technology deployment.
- The impact on bonds is more muted as the overall higher credit quality of the portfolio, especially the credit quality of government bonds, is not expected to deteriorate significantly across climate scenarios.

#### **Implement a portfolio overlay to manage transition risk exposures**

By 2023, we will commence the Climate Overlay Programme (COP) which is aimed at mitigating transition risk exposures in our equities portfolio.

- This would be done by customising our equities benchmark to gradually tilt the portfolio towards exposures that are less carbon-intensive and more aligned with the low-carbon transition over time.
- In customising our equities benchmark, we will adopt a more granular approach of targeting allocations to less carbon-intensive companies within each sector, rather than apply a broad-based sectoral approach.

- We will be starting with a small allocation to the customised equities benchmark, and scale up over time. The program's implementation pace will be guided by new data and climate signposts, to ensure that we are positioned for the correct transition pathway.

**Allocate to climate and environmentally conscious investment strategies**

To remain nimble in capturing upside opportunities and mitigating downside risks, we are investing a portion of our portfolio through our external fund managers, in actively managed strategies focused on sustainability themes such as Climate Change Mitigation, Climate Change Adaptation, Environmental Protection, and ESG Leaders. Such actively managed strategies would allow for diversification of managers' views and enable more granular, targeted and forward-looking portfolio adjustments to be made based on evolving risks and opportunities.

As of March 2022, we have fully funded a group of five externally-managed mandates amounting to US\$1.8 billion under the Green Investment Programme (GIP). The GIP will help to enhance the climate resilience of the OFR, attract sustainability-focused asset managers to Singapore and catalyse funding towards environmentally sustainable projects in Asia and beyond. The asset management companies appointed under the GIP have established their Asia Pacific sustainability hubs in Singapore and launched new ESG thematic funds for the Asia Pacific region, which will provide a further uplift to regional efforts to transit to a low carbon economy.

**Exclude companies engaging in activities that are most impacted but least able to make the transition**

We have established an approach to identify companies that derive a significant part of their revenue from activities that are least aligned with a transition to a low carbon future.

MAS will exclude from our portfolio, the equities and corporate bonds of companies which derive more than 10% of their revenues from thermal coal mining and oil sands activities. Such companies will be exposed to significant risks of asset stranding as the world increasingly shifts towards the use of cleaner or renewable sources of energy. Excluding these companies will enhance the climate resilience of the portfolio, and is also in line with Singapore's commitment to support global efforts to tackle climate change.

We will consider exemptions only on an exceptional basis, for example, where the companies have demonstrated a clear transition path.

**Through our external fund managers: We appoint external fund managers (EFMs) to manage a portion of the OFR on a discretionary basis, subject to risk constraints and ongoing evaluation of their processes and performance. EFMs are selected after completing a rigorous due diligence process that includes, among other things, assessing how the EFMs integrate ESG considerations into their investment process, and whether they can meet our stewardship expectations.**

**Integrate ESG considerations into the investment process**

Sustainability and resilience at the portfolio level need to be built from bottom-up, through each EFM that invests on MAS' behalf, and in each company that we are shareholders of.

In addition to maintaining a strong investment performance track record, our EFMs are expected to integrate ESG considerations into their investment process to ensure that the financial returns from the portfolio companies are sustainable over the long term and take into account how these companies build successful and profitable businesses through partnering their customers, suppliers, employees and shareholders.

**Practice active stewardship**

As portrayed in the following diagram, stewardship encompasses (i) voting through shareholder resolutions, and (ii) engaging with companies in each EFM's portfolio.

To ensure that our EFMs act as proper stewards of companies which we have invested in, they must abide by the following stewardship principles:

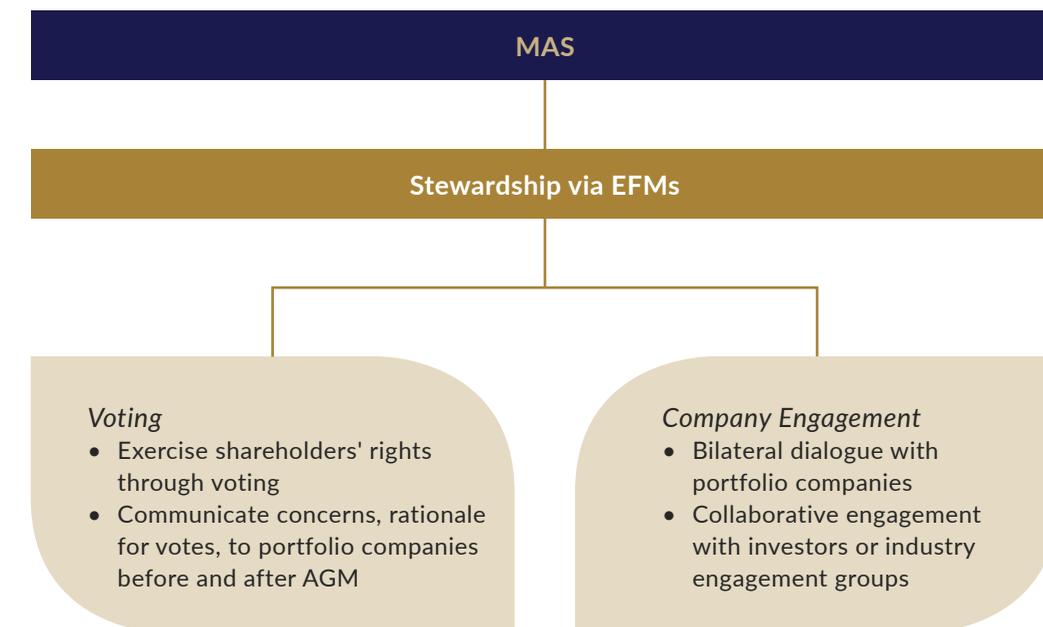
- 1) Materiality. Greater focus should be placed on sustainability risks that pose material investment risk.
- 2) Progress. Continuous improvement

should be made, in line with evolving industry standards.

- 3) Accountability. Stewardship activity must be measured and reported.
- 4) Cooperation. Engage early and engage actively. Divest only as a last resort.

Stemming from these core principles, we expect our EFMs to:

- **Establish internal frameworks and policies**, for example, setting out ESG principles and priorities, establishing policies to integrate ESG considerations in their investment process and determine materiality of companies to engage, and developing a clear, robust escalation framework.
- **Vote responsibly and have constructive and purposeful engagements** with portfolio companies on material issues, and support them in improving their ESG practices and make progress towards meeting their commitments and targets. Collaborating with like-minded investors via collective engagement platforms can allow for a stronger voice in engaging companies.
- **Monitor results on key engagement**



**deliverables and milestones**, and assess implications for subsequent engagements and voting on shareholder resolutions.

- **Disclose stewardship activities and outcomes periodically.**

Specifically on climate change, we expect our EFM to:

- **Integrate climate change considerations into policies and strategy.** EFMs should set short-term and long-term emissions targets for portfolios in a manner that is consistent with the Paris Agreement. EFMs should implement strong governance frameworks to ensure that their management teams are accountable for climate risk and describe how such risk are managed. Additionally, EFMs should set out a clear escalation framework that lays out their approach toward portfolio companies that are less responsive to engagement, with divestment as a possible last resort.
- **Integrate material climate change risks into risk management.** EFMs

should identify climate risk and consider relevant adaptation and mitigation measures. The analysis should extend to the supply chains of portfolio companies. Moreover, EFMs should encourage portfolio companies to implement relevant procurement policies, engage with strategic suppliers and integrate the cost of carbon into how they manage their supply chains..

- **Disclose material climate change information.** In alignment with Task Force on Climate-related Financial Disclosures (TCFD) recommendations, EFMs should encourage portfolio companies to disclose the greenhouse gas emissions associated with their business operations and value chains, with such emissions being estimated in accordance with the Greenhouse Gas Protocol or other relevant industry or national standards.

We assess our EFMs' ESG engagement and voting efforts on a regular basis. This assessment will inform the extent of our subsequent engagements with them.

## STEWARDSHIP CASE STUDIES ON CLIMATE CHANGE TOPICS

### A. Engagement on carbon reduction plans

- One of our EFMs is an investor in an American multinational corporation in the oil and gas industry.
- The EFM had a long history of multi-year, comprehensive engagements with the company on a wide range of governance issues that the EFM believes to drive long-term shareholder value. These include board composition and independence from management, corporate strategy, and the oversight of climate risk.
- The EFM emphasised in a vote bulletin explaining its vote in the 2020 annual meeting that the risks of climate change and the transition to a lower carbon economy present material regulatory, reputational, and legal risks that may significantly impair companies' financial position and ability to remain competitive going forward. The EFM called for the company and its board to further assess business strategy and board expertise, taking into account potential net-zero transition scenarios.
- In response to feedback from the EFM and other like-minded shareholders, the company took

steps to enhance its climate commitments and disclosures. These included updating its emissions reduction targets to include methane, committing to disclose scope 3 emissions in 2021, creating a new business segment to advance carbon capture and storage opportunities globally, and including the adoption of low emissions technologies into its broader corporate strategy. In January 2022, the company announced its ambition to achieve net-zero greenhouse gas emissions for operating assets by 2050, backed by a detailed roadmap for major facilities and assets.

### B. Collaborative engagement on decarbonisation and disclosure

- An electric utility company in Asia traditionally relying on coal- and gas-fired power plants was selected as a focus company for the Asian Investor Group on Climate Change (AIGCC) Asian Utilities Engagement Program (AUPEP). Under this programme, one of our EFMs, along with its peers, has been encouraging large Asian utilities to reduce emissions, strengthen disclosure and improve governance of climate-related risks.
- Last year, the group met with the company to better understand and provide feedback on its transition plans and targets. The company has since published a climate-related disclosure report announcing medium- and long-term decarbonisation commitments including setting emission intensity targets, phasing out its coal-based assets and achieving net-zero emissions. In addition, the company will invest more in clean energy, back renewable energy development and pursue further opportunities in transition enablers, such as hydrogen blending.

### C. Voting on energy transition and decarbonisation

- One of our EFMs is invested in a wind power company which primarily designs, develops and operates wind farms. Recently, the company has expanded its focus to include new energy, including projects in solar, biomass, tidal, geothermal and thermal power generation.
- As an active long-term investor, the EFM engages with the company on sustainability-related issues to help create value for shareholders. When the EFM first invested in the company, it was still partially dependent on coal-fired power plants to generate its energy. In view of potential growth opportunities within the renewables market, the EFM had voted in favour of a proposal to restructure the company's portfolio to eliminate all coal-fired power businesses and increase renewable energy projects. The company is currently in the midst of doing so, and the EFM believes this will reduce the company's carbon risk while also creating a stronger growth pipeline.

Our portfolio actions therefore seek to manage transition risks in the equities portfolio in different ways, given the current nascent developments around corporate disclosures, taxonomies, standards, methodologies and regulations.

Employing a wider range of portfolio actions would allow MAS to influence real world emissions reduction of companies in the portfolio through our

fund managers, invest more actively in transition opportunities and climate solutions, maintain flexibility to effectively reduce portfolio emissions and transition risk exposures when needed and, as a last resort, avoid investing in selected companies altogether.

The actions we take will grow and evolve over time with better data and techniques and as the imminence and clarity about physical and transition risks increase.

# Metrics and Targets

## Measuring portfolio emissions

### Measuring the carbon intensity of MAS' equities and corporate bonds portfolio

In measuring the carbon intensity of our equities and corporate bonds portfolio, we only considered Scope 1 and Scope 2 emissions, which are the direct emissions of greenhouse gas controlled and produced by the company and the indirect emissions of greenhouse gas from the consumption of purchased electricity, heat or steam by the company respectively. We excluded Scope 3 emissions, which refer to all other indirect emissions occurring in the value chain of the company as (i) the level of reporting of Scope 3 emissions by companies remains low today, therefore requiring a larger degree of estimation, and (ii) the inclusion of Scope 3 emissions would result in double counting when emissions statistics are aggregated at the portfolio level.

### Weighted Average Carbon Intensity (WACI)

The carbon profile of the equities and corporate bonds portfolios are reported using WACI, which measures carbon intensity (i.e. the CO<sub>2</sub> equivalent emissions per unit of revenues) for each of the companies in the portfolio, weighted by the relative size of the investments in the respective portfolios. Therefore, WACI measures the equities portfolio's exposure based on the carbon efficiency of the underlying companies, making it a useful indicator to assess transition risks relative to benchmarks and across portfolios managed by EFMs.

WACI is also the preferred metric recommended for asset owners by the Task Force on Climate-related Financial Disclosures (TCFD).

### Weighted average carbon intensity of equities portfolio

#### Measuring equities portfolio WACI against market benchmarks

The WACI for both Developed Markets (DM) and Emerging Markets (EM) equities portfolios increased from end-March 2021 to end-March 2022, alongside an increase in the WACI of their respective benchmarks. WACI contribution continues to be concentrated in the carbon intensive Energy, Materials and Utilities sectors. These top three sectors alone contribute more than 70% of the WACI for broad equity market benchmarks like MSCI All Country World Index (ACWI). Between end-March 2021 and end-March 2022, the increase in WACI for both the equities portfolio and the benchmark was driven by an increase in exposure to these sectors.

The increase in both benchmark and portfolio WACI was due to a cyclical rotation in market capitalisation towards energy, materials and utilities companies, which typically perform well in an inflationary, strong growth environment but are also the more pollutive sectors:

- First, the market capitalisation of such companies rose as energy and commodities prices soared due to demand and supply dynamics, weather-related factors, and

geopolitical tensions. This increased their weights in the benchmarks and by extension our portfolio.

- Second, as the equities portfolio is actively managed by our external managers, the economic recovery arising from the loosening of COVID-related restrictions saw a sector rotation into economically sensitive and cyclical sectors. While the equities portfolio continues to be underweight in the Energy, Materials and Utilities sectors, the extent of the underweight has narrowed.

As at end-March 2022, the WACI for MAS' EM equities portfolio of 267 tCO<sub>2</sub>e/USD million remained lower than its benchmark by 19%. As the WACI for the DM equities portfolio was only marginally lower (3%) than the benchmark as at end-March 2021, the effects of the cyclical market movement and active allocation caused WACI to

move 8% higher than its benchmark as at end-March 2022.

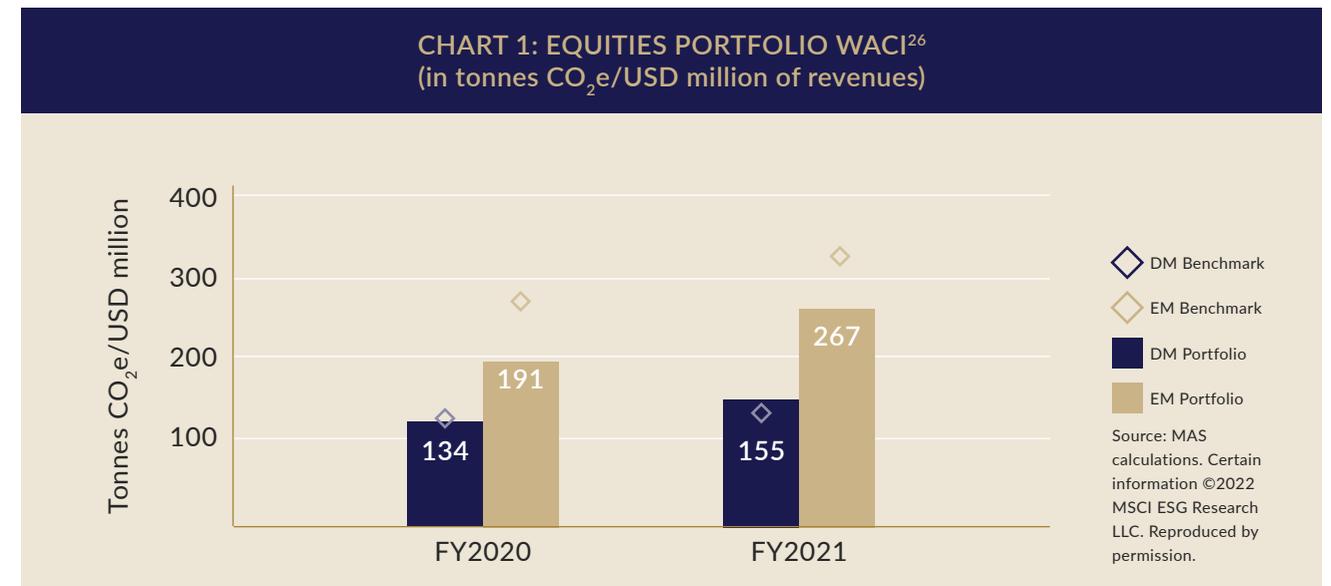
Notwithstanding the increase in WACI over the period, we expect the WACI of the equities portfolio to decline over time, supported by the implementation of the portfolio actions highlighted above.

### Emissions reduction target for equities portfolio

#### Reducing WACI of the equities portfolio

The latest Intergovernmental Panel on Climate Change (IPCC) report warned that the accumulated 1.1 degrees Celsius of warming to date has led to an increase in extreme and disruptive weather events, which heightens the risk of accelerated and aggressive transition policies, e.g. higher carbon prices.

CHART 1: EQUITIES PORTFOLIO WACI<sup>26</sup>  
(in tonnes CO<sub>2</sub>e/USD million of revenues)



<sup>26</sup> For the equities portfolio, emissions of 79% of the companies (by market value) are based on reported data, while the emissions of 20% of the companies (by market value) are estimated by MSCI using proprietary research and data models. The remaining 1% of the portfolio with no emissions data are not included in the climate-related metrics featured here.

MAS expects to reduce WACI of the equities portfolio by up to 50% by FY2030

- MAS aims to build a climate-resilient portfolio to mitigate risks arising from low carbon transition scenarios and to capture upside opportunities from climate change.
- Committed climate policy actions to-date are not consistent with an emissions trajectory that will limit expected temperature increase to 1.5°C (the temperature goal set out in the Paris Agreement).
- MAS will therefore take portfolio actions to position the investment portfolio for such a scenario<sup>27</sup>.
- However, we are of the view that the pace of decarbonisation could pick up in the coming years as government policies, business models, and consumption demand patterns worldwide change in response to growing awareness of the urgency to take stronger mitigating actions.
- We estimate that the portfolio actions that we implement over time will contribute to reducing the WACI of our equities portfolio by up to 50% by FY2030 compared to the base year of FY2018 (ending March 2019)<sup>28</sup>.
- Our climate portfolio actions, with their associated medium-term WACI reduction estimate, should put us in a position to align with a transition to net-zero by 2050, if the real economy undergoes substantial decarbonisation and generates more net-zero investment opportunities.
- In view of the uncertainties surrounding possible transition pathways and potential impacts, MAS will continuously and vigilantly monitor new data and signposts to validate the baseline expectation for the world's climate actions and decarbonisation progress, and to

adjust our climate portfolio actions as the low carbon transition risk evolves.

### Weighted average carbon intensity of corporate bonds portfolio

#### Measuring MAS' corporate bond portfolio against market benchmarks

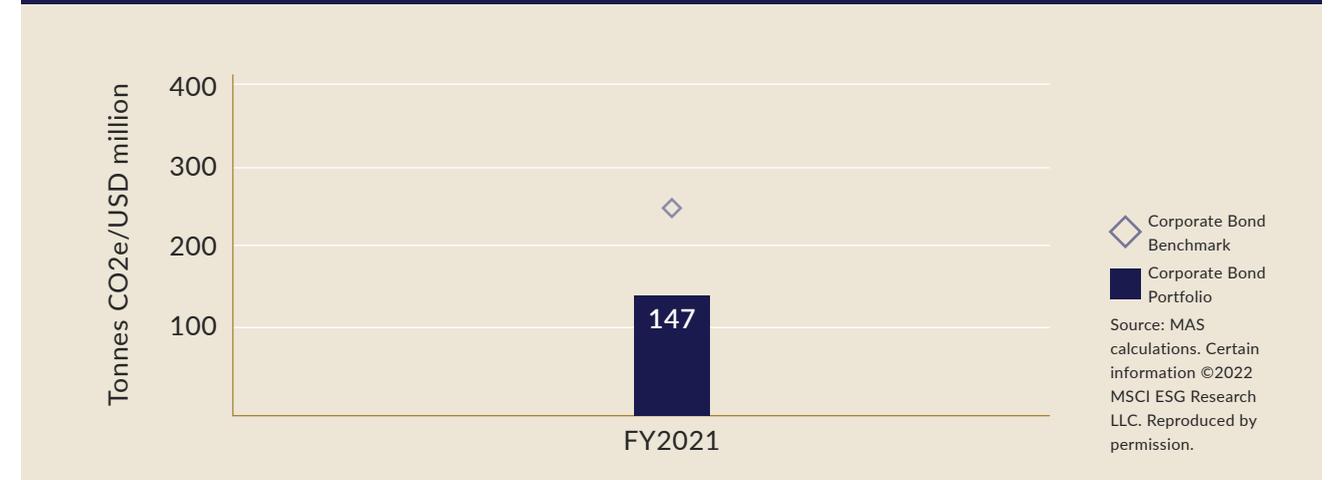
Corporate bonds are relatively less impacted by transition risks than equities, since bonds generally have fixed tenures and corporate bonds investors as creditors are higher up the capital structure relative to equity shareholders. Notwithstanding, as part of MAS' efforts to manage its long-term risks, we have expanded the scope of our monitoring and reporting of portfolio emissions to include our corporate bonds portfolio.

As the corporate bonds portfolio comprises mainly DM issuers, we report a single WACI figure (instead of segmenting into DM and EM corporate bonds) against the WACI of a broad investment grade corporate bond benchmark.

The WACI for the corporate bond portfolio as at end-March 2022 was 76% lower compared to the benchmark.

The lower WACI was attributable to MAS' portfolio construction framework that screens out debt securities with smaller issuance sizes. This has resulted in a lower portfolio exposure to securities issued by companies in carbon intensive sectors compared to market benchmark.

CHART 2: CORPORATE BONDS PORTFOLIO WACI<sup>29</sup>  
 (in tonnes CO<sub>2</sub>e/ USD million of revenues)



### Monitoring development of forward-looking metrics

#### We are monitoring the development of forward-looking metrics to complement WACI to assess and manage transition risks of the portfolio

WACI is the main carbon metric that we currently track and report for the equities and corporate bonds portfolios. However, WACI is inherently backward-looking in nature. It measures the current levels of carbon emissions of companies but does not consider the future emissions trajectory based on their climate commitments and transition plans. As a result, a portfolio with higher WACI today does not necessarily imply that it is less aligned with an orderly

transition scenario, and vice versa.

To complement WACI, we are monitoring the development of forward-looking metrics such as portfolio alignment metrics. Such metrics, e.g. implied temperature rise, are useful only if underpinned by comprehensive, comparable and consistent data on companies' future emissions trajectory. At this point, the reliability of such metrics is not high. Data and disclosure gaps make it challenging to compare future emissions trajectory against sectoral or regional decarbonisation pathways, and thereby assess the extent of the alignment of the portfolio against future climate scenarios or temperature outcomes.

<sup>27</sup> MAS portfolio actions include carbon emissions reduction via Climate Overlay Program, investment into low-carbon transition opportunities via Green Investment Programme, stewardship efforts through our EFM and exclusions from thermal coal mining and oil sands-related companies. Details of these can be found in the earlier section on "Risk and Opportunities".

<sup>28</sup> Equities portfolio WACI as at end-March 2019 was 165 tCO<sub>2</sub>e/US\$ million for the DM equities portfolio and 268 tCO<sub>2</sub>e/US\$ million for the EM equities portfolio.

<sup>29</sup> For the corporate bonds portfolio, emissions of 71% of the companies (by market value) are based on reported data, while 20% of the companies (by market value) are estimated by MSCI. Emissions data for 9% of the portfolio are not available, as these are mainly debt securities issued by companies which fall outside MSCI's coverage universe.

**We assessed the coverage of companies in the equities portfolio that have set emissions reduction targets**

Companies' verifiable emissions reduction targets can serve as a proxy to assess companies' future emissions trajectories. Such targets can be viewed as objective and quantifiable measures of a company's climate-related commitment and decarbonisation plans.

While 80% of the companies in the DM equities portfolio has announced some form of emissions reduction targets, less than 40% of companies in the DM equities and 20% of companies in the EM equities portfolios have disclosed

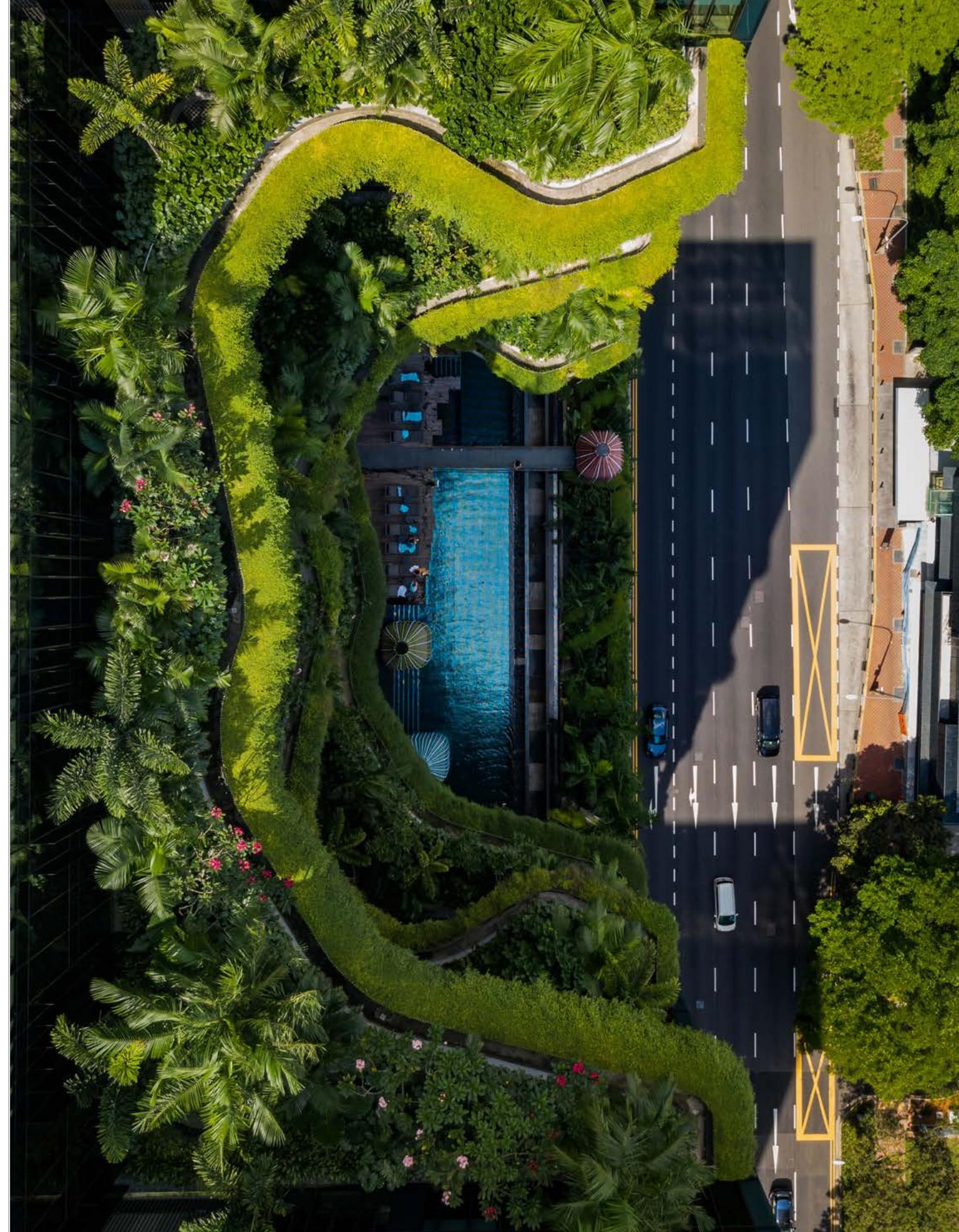
sufficient information for the emission reduction targets of these companies to be comprehensively assessed to be aligned with transition pathways that are associated with global climate goals. In particular, some companies could have set seemingly ambitious targets but cover only specific product lines and activities. An analysis of our equities portfolio coverage of target-setting companies is shown in Chart 3 using data aggregated by MSCI ESG Research LLC.

We will continue to monitor the development of portfolio alignment tools and other forward-looking metrics and evolve our approach for assessing climate risk accordingly.

**CHART 3: PERCENTAGE OF EQUITIES PORTFOLIO (BY MARKET VALUE) COVERED BY COMPANIES WITH EMISSIONS REDUCTION TARGETS**



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Monetary Authority of Singapore

Published by Monetary Authority of Singapore

The Sustainability Report 2021/2022 details progress on efforts undertaken between June 2021 to June 2022.

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