Goldman Sachs | Equity Research

28 February 2022 | 10:39PM AEDT

GS SUSTAIN: APAC ESG Regulation

A deep-dive on progress across key Asia Pacific markets

In GS SUSTAIN - APAC ESG Regulation: A new era for ESG in Asia Pacific we explore material ESG regulations that are emerging across the region, highlighting the connection between regulation and expanding green valuation premia. **In this companion report, we examine regulatory progress by market in more detail, and summarize the implications for asset managers and corporates.**

Across the region, a **jump in ESG data disclosure** across most markets now equips funds investing into APAC with more information than investors in the US. This will be further bolstered by incoming mandatory **TCFD-aligned climate reporting** requirements in Singapore, Hong Kong, Japan, Malaysia, and Taiwan, as well as **global ESG standards** currently in development. Robust **supply chain due diligence and transparency regulation is notably lacking** across the region, leaving many companies unprepared for future international pressures as overseas supply chain requirements accelerate. Mainland China, Japan, New Zealand, Singapore, and South Korea have all made progress on compliance **carbon pricing schemes,** however, the early stages of development limits the overall impact on reducing corporate emissions relative to more mature markets in other regions. New and emerging **ESG fund requirements** are rising in Hong Kong, Malaysia, Taiwan, India, Singapore, Australia, ASEAN, and Thailand, a potential catalyst for expanding the use case of emerging sustainable finance **Green Taxonomies** in the region beyond bond and loan issuance into a broader disclosure requirement. This forms part of an expanding regulatory theme sparked by increasingly acute stakeholder scrutiny of the sustainability claims of investment products.

Emma Jones
+61(2)9320-1041 | emma.jones@gs.com
Goldman Sachs Australia Pty Ltd

Keebum Kim
+852-2978-6686 | keebum.kim@gs.com
Goldman Sachs (Asia) L.L.C.

Sharmini Chetwode, Ph.D.
+852-2978-1123 |
sharmini.p.chetwode@gs.com
Goldman Sachs (Asia) L.L.C.

Evan Tylenda, CFA
+44(20)7774-1153 |
evan.tylenda@gs.com
Goldman Sachs International

Brian Singer, CFA
+1(212)902-8259 | brian.singer@gs.com
Goldman Sachs & Co. LLC

Derek R. Bingham
+1(415)249-7435 |
derek.bingham@gs.com
Goldman Sachs & Co. LLC

Grace Chen
+44(20)7774-5119 | grace.j.chen@gs.com
Goldman Sachs International

Brendan Corbett
+1(415)249-7440 |
brendan.corbett@gs.com
Goldman Sachs & Co. LLC

Madeline Meyer
+44(20)7774-4593 |
madeline.r.meyer@gs.com
Goldman Sachs International

Rachit Aggarwal
+1(212)934-7689 |
rachit.aggarwal@gs.com
Goldman Sachs India SPL

Enrico Chinello, Ph.D.
+1(212)357-3398 |
enrico.chinello@gs.com
Goldman Sachs & Co. LLC

Michael Hao Wu, CFA
+1(917)343-1137 |
michael.h.wu@gs.com
Goldman Sachs & Co. LLC

Table of Contents

Entering a new era for ESG in Asia Pacific

ESG regulation in Asia Pacific (APAC) is rapidly accelerating, with the twofold increase in the number of ESG policies in the region over the past 5 years (Exhibit 3) translating into increased corporate ESG disclosure across most APAC markets, to now be in line with or exceeding the US (Exhibit 4). We believe this will have material asset gathering and valuation implications. **In this report, we analyse regional progress across six key regulatory themes: Green Taxonomies, TCFD-aligned climate reporting, Carbon pricing schemes, Supply chain due diligence and transparency requirements, Corporate ESG disclosures, and ESG fund requirements (Exhibit 2).**

Exhibit 1: Six emerging ESG policy themes
Description of the six types of ESG policies reviewed in this report

CARBON AND CLIMATE		
Theme 1: Green Taxonomies A classification system for "green" economic activities. Can be used to inform disclosures (e.g. green revenue/capex tied to aligned activities) or for sustainable financing purposes (e.g. bonds, loans).	**Theme 2: TCFD-aligned climate reporting** Disclosure requirements aligned with the Task Force for Climate-Related Financial Disclosures (TCFD) recommendations on how climate risks are considered and embedded into firm strategy and processes. Covers areas of Governance, Strategy, Risk Management, Metrics and Targets.	**Theme 3: Carbon pricing schemes** National carbon pricing schemes via Carbon Taxes or Emissions Trading Schemes (ETS). This puts a direct cost on a company's carbon emissions, creating a direct incentive to decarbonise.
SUPPLY CHAIN	**ESG DISCLOSURES**	
Theme 4: Supply chain due diligence and transparency Policies requiring (i) establishing effective supply chain risk management systems and processes, (ii) including ESG risks in supplier due diligence (e.g. human rights violations), and/or (iii) greater transparency and disclosure of risks, processes, and performance.	**Theme 5: Corporate ESG disclosures** Requirements for companies to (i) publish a dedicated ESG or Sustainability report, and/or (ii) report on a specific list of ESG metrics and KPIs.	**Theme 6: ESG fund requirements** ESG-labelled financial products requirements which may mandate specific disclosures (e.g. explaining how ESG is integrated into the investment process or mandating specific metric disclosures) and/or setting investment thresholds (e.g. a min % of AUM invested in "ESG" stocks).

Source: Goldman Sachs Global Investment Research

Overview of progress within each market

Australia: A leader in the region on modern slavery requirements, however, enforcement is lacking; expect tightening. Corporate ESG disclosures lead the APAC region, a reflection of mandatory greenhouse gas (GHG), energy, and diversity metrics. Opportunities exist to revisit ESG fund disclosure requirements, to mandate TCFD-aligned climate reporting, and develop a Green Taxonomy. There is no compliance carbon pricing scheme, with the government having explicitly stated that one is not part of the national transition plan.

Mainland China: New environmental disclosure requirements for high carbon-emitting companies is a positive step towards improved corporate disclosure. The new ETS scheme is currently of limited impact due to the early development stage; this should evolve over time. There are opportunities to expand Green Taxonomy beyond sustainable bond and loan issuance to a become a disclosure requirement, and to mandate supply chain, TCFD-aligned climate reporting, and ESG fund requirements.

Hong Kong: A leader on TCFD-aligned climate reporting requirements for investors from 2022 and corporates from 2025, and on ESG fund disclosure requirements from 2022, which are guided by Europe's Sustainable Finance Disclosure Regulation (SFDR). Green

Taxonomy and carbon market mechanism is currently being explored. Opportunities exist to mandate E&S disclosures, including on the supply chain (currently on a comply or explain basis).

India: New corporate ESG reporting requirements, which are currently lacking, will significantly improve disclosures across the region. Proposed ESG fund standards will also boost ESG product transparency and impose minimum investment thresholds. Opportunities exist to develop a Green Taxonomy, mandate TCFD-aligned reporting, implement a carbon pricing scheme, and to develop supply chain requirements.

Japan: The existing carbon tax has been scrutinized as being insufficient by various stakeholders; a new ETS scheme is currently under consideration. New TCFD-aligned climate reporting requirements for issuers on the new Prime Market is a positive step, with the opportunity to expand this to investors. Notable developments include supply chain due diligence guidelines which are expected to be published in Summer 2022, and potential ESG fund requirements on the horizon.

New Zealand: Also a leader on TCFD-aligned climate reporting requirements for corporates and investors, to begin from 2023 at the earliest. The carbon ETS scheme continues to tighten and expand to more sectors, notably to Agriculture. Voluntary Green Taxonomy for agriculture sustainable financing is in development. Opportunities exist to develop supply chain due diligence and transparency requirements, and to develop dedicated requirements for ESG funds.

Singapore: Also a leader on TCFD-aligned climate reporting requirements for corporates and investors, to begin from 2022. We expect to see disclosure requirements for retail ESG funds early this year. A Green Taxonomy is also in development, heavily leveraging Europe's framework. A carbon tax exists and is currently being revised. Opportunities exist to develop supply chain requirements.

South Korea: Corporate ESG disclosure requirements are being phased in gradually, however, over an extended timeline (out to 2030). The national ETS scheme continues to tighten and expand to more sectors. Opportunities exist to formalise TCFD-aligned climate reporting requirements (currently a supporter), and to develop supply chain and ESG fund requirements.

A note on our methodology and approach for analysing the stages of policy development: We assessed key developments relating to our six emerging ESG policy themes across eight APAC markets (Exhibit 2) A coloured traffic light has been assigned to signal the stage of development for each policy within the respective market – from **Grey** (policy does not exist and there have been no significant developments), to **Yellow** (policy is under consideration, in development, or there are voluntary guidelines established), to **Light Green** (mandated policies have been established but with more limited application, for example only some elements are mandatory, requirements are on a comply or explain basis, or use case is limited), to **Dark Green** (mandatory policies have been established and there is wide application of the requirements). Known timelines are noted.

Exhibit 2: Overview of developments relating to six emerging themes of ESG policies across the region (as of Feb 2022)

No significant developments | Under consideration/ in development/ voluntary guidelines established | Mandatory policies established but with more limited application | Mandatory policies established

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
	Classification system for what can be considered a "green" economic activity.	**Disclosures on firm climate-related risks and climate strategy.**	**National carbon pricing schemes via Carbon Taxes or ETS.**	**Requirements to manage social and/or environmental risks in supply chain and provide annual disclosures on progress.**	**Requirements to report on ESG metrics.**	**Disclosure requirements** (e.g. ESG integration process, specific KPIs) **or threshold requirements** (e.g. min % AUM in ESG).
Australia	No significant developments	Encouraged on voluntary basis, debates ongoing re. mandating	No significant developments	Mandatory modern slavery disclosure req.	Mandatory GHG, Energy, Diversity metrics; rest voluntary	Higher level disclosure requirements in fund PDS
Mainland China	Green Taxonomy for green bond use of proceeds (mandatory)	No significant developments	National ETS scheme	Voluntary social disclosures include supply chain mgmt.	Mandatory Env. metrics for high polluters, rest voluntary	Voluntary ESG and Green Guidelines est. by AMAC
Hong Kong	Green Taxonomy being explored by the "Steering Group"	Investors from 2022; Corporates by 2025	Carbon market being explored by "Steering Group"	Supply chain mgmt. disclosures on comply or explain basis	Mandatory G indicators; 12 E&S indicators req. on comply or explain basis	Disclosure and process req. for ESG funds from 2022
India	No significant developments	No significant developments	No significant developments	No significant developments	Mandatory CSR/ ESG reports and KPIs from FY22-23	Min. thresholds for ESG fund investment in consultation
Japan	Transition Taxonomy developed for bond and loan issuance (voluntary)	Mandatory for companies on "Prime Market" launching April 2022	Carbon Tax established; ETS scheme under consideration	Supply chain due diligence guidelines in development, expected to be published Summer 2022.	Board indep., Diversity, and Climate metrics on comply or explain basis	Multiple sources citing ESG fund disclosures on the horizon
New Zealand	Taxonomy for agriculture activities in development (will be voluntary)	Phased in from 2023 for both corporates and investors	National ETS scheme	No significant developments	Corporate governance req. (incl. material ESG) on a comply or explain basis	Guidance on application of "misleading and deceptive" prohibitions to ESG products
Singapore	Green Taxonomy in development	Starting 2022 for both corporates and investors	National Carbon Tax	No significant developments	Diversity mandatory; Core ESG metrics voluntary	Disclosures for Retail ESG funds expected early 2022
South Korea	Green Taxonomy for bond issuance (voluntary), may apply to ESG products in future	Pledged formal support for TCFD in 2021; no established standards yet	National ETS scheme	No significant developments	Phased in mandatory ESG disclosure 2019-2030	No significant developments
Other Develop-ments	Malaysia, Indonesia with Taxonomies for bonds and loans (voluntary). ASEAN, Thailand, the Philippines in development.	Malaysia (from 2024), Taiwan (from 2023)	None identified	Thailand (from 2022)	Malaysia, Thailand, Philippines, Taiwan, Vietnam, Indonesia	Malaysia, Taiwan ASEAN, Thailand
Europe	EU Taxonomy disclosure req. for investors (from 2023) and corporates (from 2022)	CSRD corporate disclosure req's (from 2024) to build on TCFD	EU ETS scheme; incoming carbon border adj'ment tax (from 2026)	Minimum Social Safeguards Taxonomy req.; Supply chain due diligence regulation in development	CSRD to include mandatory ESG disclosures from 2024	SFDR disclosure and process req. for ESG funds
USA	No significant developments	Several initiatives at federal and state level underway	National discussions underway, Regional ETS schemes in operation	California Supply Chain Act; import restrictions from high human rights risk areas; proposed Fashion Supply Chain Act	ESG disclosure rules in development	ESG fund rules under consideration

Source: Goldman Sachs Global Investment Research

Implications for asset managers and corporates

Theme 1 – Green Taxonomy: Many of the Taxonomies emerging across APAC are **largely using Europe's framework as the foundation** to build on tailored criteria to factor in regional nuances. The **primary use-case across APAC is for sustainable financing** (bonds, loans), however, we see scope for this to potentially expand to a disclosure requirement in future. Using the EU Taxonomy as a proxy, we find highly-aligned global companies trading at 37% P/E and EV/EBITDA sector-relative premiums, with the smaller group of **highly EU Taxonomy-aligned APAC stocks** (predominantly mainland China wind and solar) **trading at 55% / 64% premiums,** respectively. This **premium may expand to more sectors** as more APAC Taxonomies emerge, **increasing ESG fund ownership in currently partly-aligned APAC companies** as we will likely see a widened group of activities that can be considered "green".

Theme 2 – TCFD-aligned climate reporting: The rise in TCFD-aligned climate reporting requirements on **both asset managers (ESG and non-ESG) and corporates** across the region demanding transparency on carbon emissions and climate strategy will likely **increase the weighting of carbon in investment decisions**, which may **widen valuation premiums for low carbon emitters**. We already find low carbon-emitting APAC companies in the region trading at 28% P/E and 9% EV/EBITDA sector-relative premiums (33% and 20% globally, respectively) over their high carbon-emitting peers.

Theme 3 – Carbon pricing schemes: Across the region, existing carbon tax or emissions trading schemes all have varied application which limits the overall impact on incentivising corporates to decarbonise. There will likely be an **increased focus on tightening or establishing carbon pricing schemes in the medium term**, where (i) national net zero transition strategies rely on a pricing mechanism to help achieve carbon goals, and (ii) Europe's carbon border tax, which comes into effect from FY26, taxes imports of some high-carbon products from jurisdictions without sufficient carbon policies. We find **companies in Indonesia having the most exposed earnings** to an incremental increase in carbon prices, while m**ainland China, India, and South Korea are potentially the most exposed to Europe's carbon import tax**.

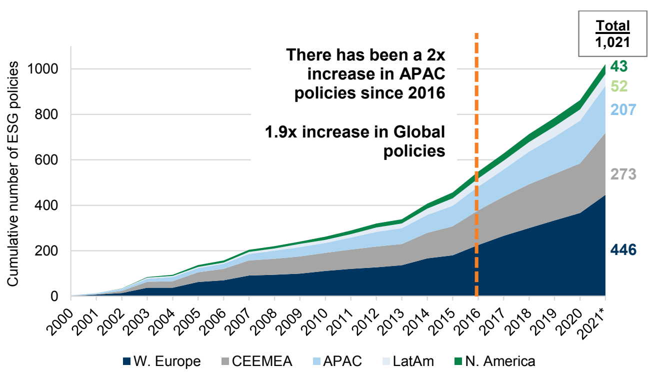
Theme 4 – Supply chain due diligence and transparency: Policies exist across the region, but are largely inefficient due to (i) disclosures only relating to higher level supply chain matters, or (ii) lacking enforcement to incentivise strong compliance. International supply chain regulation developments will likely have a profound impact on APAC corporates as the region is a major global supply chain hub with high exposure to E&S risks. We expect greater regulatory focus and investor engagement on supply chain issues in the near term.

Theme 5 – Corporate ESG disclosures: Disclosure requirements are increasing for corporates across the region, which will be bolstered further by global ESG standards currently in development. As disclosure improves, **investors should focus on measuring ESG performance rather than disclosure alone**. We find consistent links between ESG metrics and return on capital (CROCI), with a large divergence in outcomes when analysing ESG performance vs disclosure-based scoring approaches.

We find top-quintile ESG performers in our GS SUSTAIN ESG framework have generated +157 bps higher CROCI over the bottom quintile, while top ESG disclosers generated -488 bps lower CROCI vs. bottom disclosers, since 2011 on average.

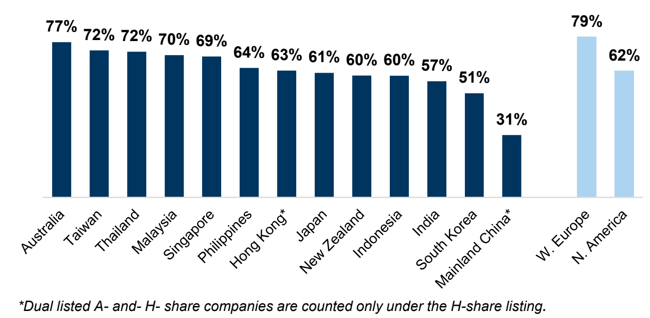
Theme 6 – ESG fund labeling requirements: Many regional markets are developing ESG fund disclosure and process requirements to increase transparency and reduce the risk of greenwashing. As a read-across for what may evolve in the APAC market, European ESG funds have benefited from tightened ESG fund requirements, with flows into EU Article 8 & 9 (ESG) funds having significantly outpaced those flowing into Article 6 (non-ESG or 'not stated') despite the latter representing nearly double the number of funds. We also see ESG funds as a potential catalyst for wider application of Taxonomies to become a disclosure tool.

Exhibit 3: APAC ESG policies and amendments have increased 2x in the past 5 years...
Cumulative capital market ESG regulations and amendments, Jan 2000 to Aug 2021*



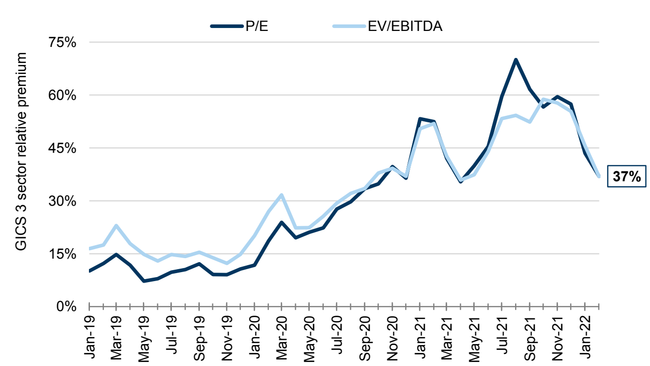
Source: PRI, data compiled by Goldman Sachs Global Investment Research

Exhibit 4: ...helping increase disclosure in most APAC markets to be in line with or above the US
Average corporate operational E&S disclosure rates in the GS SUSTAIN framework across APAC, MSCI ACWI, latest available data



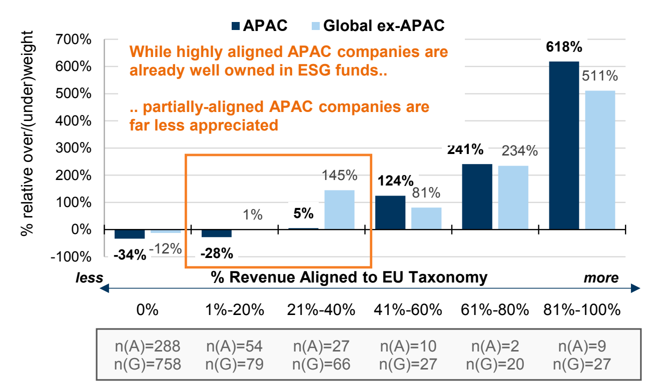
Source: Goldman Sachs Global Investment Research

Exhibit 5: The market is paying a +37% "green" premium for global companies with high exposure to the EU Taxonomy...
Trimmed mean 12m fwd consensus EV/EBITDA and P/E premium vs. GICS 3 peers for companies with 40% or more EU Taxonomy-aligned revenue, MSCI ACWI universe



Source: FactSet, Goldman Sachs Global Investment Research

Exhibit 6: ...and we expect the underappreciated partly EU Taxonomy-aligned APAC companies to benefit from expanded APAC "green" definitions
ESG funds' relative weight for EU Taxonomy aligned revenue groupings, Oct 2021



Source: Morningstar, Factset, Goldman Sachs Global Investment Research

Australia

Australian companies have generally led the broader Asia Pacific region on ESG and sustainability initiatives and disclosures, which outside of mandated GHG emissions, energy, and diversity metrics, has largely been due to investor pressure and engagement (particularly superannuation/pension funds). On average, Australian corporates disclose 77% of the material Operational E&S metrics in our GS SUSTAIN framework, and Australian investors account for 38% of total APAC UN PRI signatories.

Overview of progress: Australia was the first country in the region to implement requirements for companies to mitigate and report on modern slavery risks in the supply chain, however, current enforcement measures appear insufficient to promote adequate disclosure and processes. Corporate ESG disclosure has been bolstered by mandatory GHG, energy, and diversity reporting requirements, with the remainder of metrics required on a voluntary basis. We find high level disclosure requirements for ESG funds, however, international developments suggest this could be tightened, as requirements were last updated in 2011. Progress on mandating TCFD-aligned climate reporting recently stalled, with the regulators instead taking a voluntary approach while keeping an eye on international global ESG standards in development. There are no significant Green Taxonomy developments. There has been no compliance carbon pricing scheme since the former carbon tax was repealed in 2014.

Exhibit 7: Overview of ESG policy progress in Australia (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Australia	No significant developments	Encouraged on voluntary basis, debates ongoing re. mandating	No significant developments	Mandatory modern slavery disclosure req.	Mandatory GHG, Energy, Diversity metrics; rest voluntary	Higher level disclosure requirements in fund PDS

Source: Australian Government, ASIC, APRA, ASX, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

We note that the Australian Sustainable Finance Institute, a group representing both the public and private sector, has listed the development of a Taxonomy as a medium-term (2023-2025) recommendation in their Sustainable Finance Roadmap. However, we did not find any significant developments relating to this recommendation to date.

Theme 2: TCFD-aligned climate reporting

Investors are pushing for mandatory financial disclosure on climate risk in Australia, aligned with TCFD... In June 2021, the Investor Agenda (founded by CDP, the Investor Group on Climate Change (IGCC) and the Principles for Responsible Investment) published a roadmap detailing the actions Australian financial regulators and the Federal Government can take to mandate clear and standardised climate-related reporting from corporates and investors that can allow the market to appropriately price in the risks of climate change.

...however, recent APRA guidance and ASIC commentary suggest mandated climate reporting is still some time away, while voluntary TCFD reporting is encouraged. In November 2021, the Australia Prudential Regulation Authority (APRA) stopped short of mandating climate-related risk disclosures for banks, insurers, and pension funds, instead providing voluntary guidance. The Australian Securities and Investment Commission (ASIC) has also suggested they are waiting for future global ESG standards which build upon the recommendations of the TCFD to be published by the new International Sustainability Standards Board (ISSB), established during the COP26 conference, to leverage for mandated requirements domestically, which may come late-2022. However, ASIC have previously stated that they consider the law requires an operating and financial review to include climate risk discussion where it is a material risk that could impact financial performance and that disclosing and managing climate-related risk is a key director responsibility. ASIC recommends the TCFD framework for listed companies, which is similarly recommended by the ASX Corporate Governance Principles and Recommendations.

Climate-related claims by companies are under increased regulator scrutiny. ASIC have warned that ESG claims made by companies in their IPO prospectus' are under increased scrutiny to ensure that claims, e.g. around net zero emissions, are backed by detailed plans to achieve the targets.

Theme 3: Carbon pricing schemes

There is currently no mandatory carbon pricing scheme in the form of a carbon tax or ETS in Australia. Notably, a Carbon Tax was implemented in 2011 as part of the Clean Energy Act 2011. However, it was subsequently repealed with effect from 1 July 2014. The currently position of the Australian Government is that the country's decarbonisation strategy will be driven by "technology not taxes." The lack of carbon pricing exposes certain exports to possible taxation on arrival into Europe under the new European Carbon Border Adjustment Mechanism (CBAM) to come into effect from FY2026.

Theme 4: Supply chain due diligence and transparency

Australia's modern slavery laws aim to increase transparency and accountability for human rights risks throughout operations and supply chains, however, sufficient enforcement is lacking; we expect further engagement from investors and a tightening of the regulation in 2022. Australia is the only country in the region to implement regulation mandating reporting and accountability of companies on modern slavery and human rights related risks throughout operations and supply chains, including due diligence and remediation actions. However, multiple studies find that existing enforcement measures under the Modern Slavery Act 2018 prevent the legislation from effectively holding companies accountable. For example:

- A report by the Australian Council of Superannuation Investors (ASCI) published in July 2021 found **~33% of 151 ASX200 companies' statements were potentially non-compliant with one or more of the reporting requirements** and that **most statements failed to disclosure mitigation measures** (e.g. ensuring grievance mechanisms put in place, developing standards to measure the effectiveness of mitigation measures, reporting actual modern slavery incidents). Additionally, **only 5% of companies clearly articulated their potential involvement in modern slavery risks** (i.e. causing, contributing or being directly linked) by using UN Guiding Principles on Business and Human Rights (UNGPs) or equivalent frameworks.

- The report Paper Promises? Evaluating the early impact of Australia's Modern Slavery Act published by a coalition of human rights organisations, church groups, and academics in February 2022, reviewed the statements of 102 companies sourcing from four sectors with known modern slavery risks: garments sourced from mainland China; rubber gloves sourced from Malaysia; horticulture sourced in Australia; and seafood sourced from Thailand. The report found that **77% of companies failed to address all mandatory reporting criteria, 52% failed to identify obvious modern slavery risks** (in operations and supply chains), **78% failed to describe how the pandemic affected their modern slavery risk profile**, and **only 27% demonstrated some form of effective action to address modern slavery risks.**

Calls for review of Modern Slavery laws to tighten application and enforcement. During 2021, the Senate Foreign Affairs Defence and Trade Legislation Committee published recommendations for a Senate Bill proposing to amend laws on the importation of goods from regions with forced labour risks. Notably, Recommendation 10 called for a **lowering of the turnover threshold for reporting** under the Modern Slavery Act, Recommendation 11 called for a review as soon as possible, and Recommendation 12 called for **provisions to strengthen and broaden the act and to establish an independent body to oversee and enforce implementation**.

Modern Slavery Act 2018

Scope: Corporates – Australian companies or those that carry on business in Australia with A$100mn or more of annual consolidated revenue. Over 2,506 entities are required to report.

Timing: Companies are required to submit an annual statement six months after the end of the reporting period. The legislation came into operation in 2019.

Requirements: Reporting criteria relates to identifying and assessing the risk of modern slavery in the operations and supply chain of a company and details of the steps to address those risks. Modern slavery refers to situations that exploit a person's freedom and right to refuse or leave work through use of coercion, threats or deception, and includes: human trafficking, slavery, servitude, forced labour, debt bondage, forced marriage, and child labour. To ensure high level engagement, the statement also requires approval from the Board of Directors and has to be signed by a director.

Enforcement and penalties: There are no financial penalties for non-compliance but the Minister has the power to identify non-compliant entities, bringing risk of reputation damage, public criticism, and shareholder activism.

Relevant links: Modern Slavery Act 2018; statements are made available on a national register here.

Theme 5: Corporate ESG disclosures

Corporate GHG emissions and energy disclosures have historically been bolstered by a mandatory national reporting scheme. Australia's strong disclosure on GHG and Energy metrics is largely due to the National Greenhouse and Energy Reporting Act 2007 which provides a mandatory framework for Australian companies (or those doing business in Australia) that exceed set GHG emissions and energy thresholds to report certain metrics to the government. In scope companies are required to report annually their greenhouse gas emissions (Scope 1 and 2), energy production, and energy consumption. This data is then published by the Clean Energy Regulator annually for companies that exceed the publication threshold.

Diversity disclosures are also required by Australian companies with 100+ employees under the Workplace Gender Equality Act, which has set a standardised set of gender equality indicators including workforce composition, remuneration, flexible working arrangements, gender based harassment and discrimination.

Other material E&S disclosures are required on a comply or explain basis by the ASX's Listing Rules and the recommendations in the Corporate Governance Principles.

Corporate Governance is regulated primarily under the Corporations Act 2001 and its subsidiary regulations. Beyond this regulation, governance standards are also driven by the ASX Corporate Governance Council, which requires ASX listed entities to benchmark their own governance practices against the recommendations of the Council and to disclose this comparison on their annual report on a comply or explain basis.

Theme 6: ESG fund requirements

ESG disclosure requirements exist, but have not been updated since 2011. Requirements relate to ESG investment funds offered under a Product Disclosure Statement (PDS). The Corporations Act 2001 requires the PDS to outline the extent labour standards or environmental, social, or ethical standards are taken into account in the selection, retention, or realisation of investments. More detailed disclosures on what factors a financial product issuer considers in relation to the ESG purpose of an investment and how this is taken into account in investment decisions is required by the Corporations Regulation 2001. ASIC has also provided guidelines on how investors can meet these ESG disclosure requirements. **Against a fast-moving backdrop of international regulation mandating more granular disclosures of ESG integration in investment products, we find the there may be greater focus on tightening requirements in the coming years**.

Investors have been warned of increased regulator surveillance of climate-related disclosures in financial products. In July 2021, ASIC launched a review to assess "green" and "ESG" claims made by managed funds and superannuation funds to ensure that the practices of those funds were consistent with claims made, in a bid to reduce greenwashing risks across the market.

Mainland China

While mainland China has traditionally lagged its global counterparts in ESG policies and disclosure obligations for corporates and investors, recent developments suggest this may be changing. Recent changes come against a backdrop of mainland China companies having the lowest corporate disclosure rates on E&S metrics globally, - just 31% on Operational E&S metrics in our GS SUSTAIN framework (Exhibit 4). Now, both investors and regulators are pushing for greater ESG transparency driving performance improvements on key issues, including decarbonisation to better align portfolios with ESG objectives.

Overview of progress: Mainland China launched its national carbon emissions trading compliance scheme in 2021, which we expect will continue to expand in coverage in the coming years. A Green Taxonomy (Green Bond Endorsed Project Catalogue) has been developed, but use case is currently limited to bond issuance. Corporate ESG disclosures in the near term will likely improve with new mandated environmental disclosure requirements for high carbon-emitting companies from 2022. Companies are also encouraged to provide select social disclosures on a voluntary basis, which includes supply chain-related metrics. ESG funds are guided by voluntary ESG and Green Guidelines by the Asset Management Association of China (AMAC). We find no significant developments relating to TCFD-aligned climate reporting to date. **Other developments discussed** include China's 14th Five-Year Plan to guide national ESG policies, and a new sustainable financing evaluation plan for banks.

Exhibit 8: Overview of ESG policy progress in mainland China (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Mainland China	Green Taxonomy for green bond use of proceeds (mandatory)	No significant developments	National ETS scheme	Voluntary social disclosures include supply chain mgmt.	Mandatory Env. metrics for high polluters, rest voluntary	Voluntary ESG and Green Guidelines est. by AMAC

Source: PBOC, NDRC, CSRC, MEE, AMAC, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

China's Green Taxonomy application is currently limited to bond issuance. China's Green Bond Endorsed Project Catalogue (the "Taxonomy") is mainly used by financial institutions and corporates for the issuance of green bonds in China's onshore markets. Effectively, it is a classification system defining the permitted projects for which the proceeds of issued "green" bonds can be used. While there is no commentary at this stage around whether the use case of the Taxonomy will expand beyond bond issuance, there may be appetite in future to use the framework as a disclosure tool, in line with other jurisdictions.

Eligible projects have been determined based on their contribution to three environmental objectives: (1) climate change response, (2) environmental improvement (pollution control and ecological conservation), and (3) more efficient resource utilization (circular economy, waste recycling, and pollution prevention). **The latest update to the**

Green Bond Catalogue, effective from July 2021, most notably removes "clean coal" as an eligible Green activity and harmonizes different green bond standards previously set by a number of regulatory bodies within China, including the NDRC, PBOC and CSRC.

The EU's and China's Common Ground Taxonomy (CGT) maps areas of commonality and differences between each jurisdictions' green classification system. Developed by the EU- and-China-initiated CGT working group, established in July 2020, the first CGT publication released in Nov 2021 serves as a tool to guide interoperability between the EU and China Taxonomies. While it is not a legally binding document, it will likely continue to expand across jurisdictions in the long term as more Taxonomies are developed to help the broader market understand commonalities and differences in requirements and application. We summarise key findings between the EU-China CGT in Exhibit 9.

While China's Taxonomy has the potential to be considered a global gold standard, its application to only green bonds will limit its status, in our view. China's latest Taxonomy has arguably taken a stronger stance than that of the EU by excluding gas and LNG, along with coal-fired power activities. On the contrary, the potential inclusion of Natural Gas in the EU Green Taxonomy has triggered ongoing market-wide debate, with opposing arguments stressing that Natural Gas is a fossil fuel that should not be defined as green or sustainable within any limits, as it opens the door for continuing to attract capital and arguably disincentivises a transition towards no-carbon energy sources.

Exhibit 9: While China's and the EU's Green Taxonomies have some areas of overlap at a high level, there are differences in classification and measurement to alignment
Summary of key commonalities and differences between China and EU Green Taxonomies

	China	EU
Objectives	**(1)** Environmental improvement **(2)** Addressing climate change **(3)** More efficient resource utilization	**(1)** Climate change mitigation **(2)** Climate change adaptation **(3)** Sustainable use and Protection of water **(4)** Transition to a circular economy **(5)** Pollution prevention and control **(6)** Protection and restoration of biodiversity and ecosystems
Classification methodology	Based on **6 industry categories**	Based on **economic activities** (EU NACE codes)
Scope	Mandatory for green bond issuance	Mandatory for EU corporates and investors
Approach to alignment	Must meet industry-specific green standards and criteria set by local environmental regulators.	Must pass technical screening criteria + "Do No Significant Harm" + Minimum social safeguards

Source: IPSF Taxonomy Working Group

China's Green Bond Endorsed Projects Catalogue (2021 Edition)

Scope: **Mandatory for all green bond issuers,** including financial institutions, corporates, state-owned enterprises, third-party appraisal agencies and regulatory agencies.The Green Bond Endorsed Projects Catalogue serves as the classification system for which use of proceeds for Green Bonds can be certified against.

Timing: Latest 2021 edition is effective from July 1, 2021.

Requirements: In mainland China, bonds can be issued via a number of domestic regulators, including the NDRC, PBOC, and CSRC. While reporting requirements on use of proceeds will vary depending on the supervising regulator, each regulator will now reference the Green Bond Endorsed Project Catalogue rather than their own standards to determine eligible Green projects.

Enforcement and penalties: As the Green Bond Endorsed Projects Catalogue is a classification system rather than a disclosure requirement, there are no direct enforcement or penalties.

Relevant regulation: Green Bond Endorsed Project Catalogue (2021 Edition)

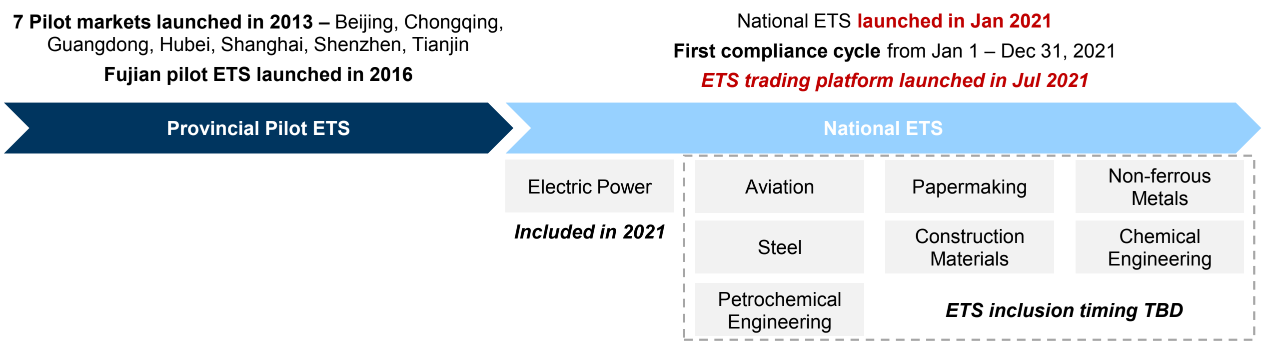
Theme 2: TCFD-aligned climate reporting

We find no significant developments in relation to TCFD-aligned climate reporting.

Theme 3: Carbon pricing schemes

China prices carbon through the recently launched national Emissions Trading Scheme (ETS). Utilities companies have been included following the launch of the national ETS in 2021, and seven other industries will be added at an unspecified timeline. Since the start of trading on Jul 16, 2021, Carbon prices in the national ETS have fluctuated between Rmb41.5-58.7 per tonne (~US$6-9), broadly in line with expectations from industry participants from the 2020 annual survey conducted by the China Carbon Forum prior to the ETS launch. Market participants generally expect prices to steadily increase in the long term, as (1) market reforms introduce auctions for allowances, which are currently freely distributed, and (2) more participants enter the market from industries where emissions are more difficult to abate which could add demand for allowances (e.g. Industrials where certain processes are difficult to decarbonize).

Exhibit 10: China's national ETS is expected to include seven other industries in the future
Timeline for China's ETS programs



Source: MEE, Goldman Sachs Global Investment Research

China's National ETS

Scope: Corporates – More than 2,200 power plant operators (including some on-site power generation units from non-Utilities sectors) are responsible for ~40% of China's national carbon emissions. To be expanded further in future.

Timing: First compliance cycle is from Jan 1 - Dec 31, 2021. The ETS trading platform has been online since July 2021.

Requirements: Each year by the end of March, covered entities must submit the previous calendar year's GHG emissions, with verification authorized by provincial-level ecological and environmental authorities. Entities must then surrender CO2 emissions allowances based on their permitted emissions levels, with gas-fired plants only required to surrender allowances up to their free allocation level (i.e. those that have been freely allocated to them by the government which is determined by benchmarks) and other entities are required to surrender allowances up to their free allocation level plus 20% of their verified emissions at maximum. At this stage, carbon allowances are mainly distributed through free allocation, with auctioning likely to play a bigger role in future.

Enforcement and penalties: Compliance obligations are enforced by the National Development and Reform Commission (NDRC). Reporting breaches can lead to fines of Rmb10-30k. Compliance obligation breaches can lead to fines of between Rmb20-30k.

Relevant regulation: 2019-2020 National Carbon Emission Trading Cap Setting and Allowance Allocation Implementation Plan (Power Generation Industry)

Theme 4: Supply chain due diligence and transparency

Voluntary disclosures exist under updated ESG reporting guidelines. Under the updated CSRC Guidelines relating to ESG reporting for listed companies (discussed below under Theme 5) there are voluntary disclosure relating to the supply chain, including the protection of the rights and interests of employees, suppliers, customers, and consumers; and efforts relating to poverty alleviation and rural revitalisation. We were unable to identify any other significant supply chain due diligence and transparency related policies.

Theme 5: Corporate ESG disclosures

While mandated disclosures have traditionally lacked, recent developments are a positive signal for corporate ESG disclosure improvement. Two major recent developments covering both Environmental and Social disclosures are the (1) updated CSRC disclosure guidelines relating to ESG, and (2) new MEE environmental disclosure requirements.

1. **Updated CSRC Guidelines relating to ESG reporting for listed companies:** In June 2021, the China Securities Regulatory Commission (CSRC) introduced new requirements for listed companies to report consolidated E&S information under a new section titled *Section 5: Environmental and Social Responsibility* in annual and semi-annual reporting. As part of the disclosure requirements, (1) all companies are required to disclose administrative penalties relating to environmental issues, and (2) corporates from "key polluting industries" (as defined by local regulators) must provide certain environmental disclosures, e.g. types and amount of pollutants. Other disclosures are encouraged on a voluntary basis, including measures and progress on reducing carbon emissions; social responsibility metrics such as the protection of the rights and interests of employees, suppliers, customers, and consumers; and efforts relating to poverty alleviation and rural revitalisation.
2. **New MEE environmental disclosure requirements, may be publicly accessible:** In December 2021, the Ministry of Ecology and Environment (MEE) released environmental disclosures requirements for domestically listed companies and bond issuers that were subject to environmental penalties in the previous years or companies falling within another category (such as high polluters) identified by the MEE. Disclosures relate to environmental management, pollutant generation, carbon emissions, and contingency planning for environmental emergencies, with listed companies and bond issuers also asked to disclose information on the impact on climate change, ecological, and environmental protection relating to their financing and investment projects. The requirements came into effect from 8 February 2022 and companies risk fines up to Rmb100,000 for failure to disclose or for providing misleading information. Some reports suggest the disclosures will be made available for the broader market and public to access freely via a corporate environmental information disclosure system.

Theme 6: ESG fund requirements

Investor ESG disclosure and integration requirements remain voluntary, as guided by AMAC. The Asset Management Association of China (AMAC) was formed in June 2012 to be the self-regulatory body of the mutual funds industry in China, and is authorised and supervised by the China Securities Regulatory Commission (CSRC) and the Ministry of Civil Affairs. As of August 2017, total AUM subject to AMAC self-regulation was Rmb54.12 tn (U$8.53 tn). In 2018, the Green Investment Guidelines trial was implemented by AMAC, to establish basic principles and standards for green investment methodologies, strategies, regulations, benchmarks, and evaluations. While the guidelines are not mandatory, they promote green investment processes and seek to improve corporate ESG performance and disclosures through active engagement.

Other notable policy developments

The 14th Five-Year Plan: The agenda for important environmental, social, and economic policies. In March 2021, the 14th Five-Year plan, arguably one of the most comprehensive and important policy documents in China, was approved. It outlines a commitment to develop an action plan for China's goal of reaching peak carbon by 2030, and includes Green Development as one of the key priorities setting out a number of energy and carbon intensity targets over the next 5 years. Combined with the longer-term commitment for China to meet net zero carbon emissions by 2060, the 14th Five-Year Plan helps clarify the direction policymaking is headed and how this might affect corporates in the transition to a lower carbon economy. A number of initiatives have launched that are helping to progress the goals of the 14th Five-Year Plan, including an update to China's Green Taxonomy, the launch of the national Emissions Trading Scheme, and the new green finance evaluation plan for banks, all discussed further below.

A new evaluation plan for banks may incentivise green financing. As discussed by our Credit Strategy team in Asia Credit Line: ESG investing in Asia Credit, Asia's ESG bond market has been dominated by China in recent years. In an effort to further strengthen sustainable finance initiatives, the People's Bank of China (PBOC), China's central bank, released an evaluation system to assess green financing performance of banks. While the assessment will only cover bonds and loans, it will eventually expand into other forms of green investments. Based on the PBOC's announcement, the evaluation results will mostly be used to inform policy decisions to support China's transition to Net Zero. Although explicit incentives have not been announced for Banks that score higher, the results of the evaluation system may be indirectly rewarded through market participants, for example investors looking more favourably at banks with a higher rating.

China's Green Finance Evaluation for Banks

Scope: Corporates – 24 major Chinese banking institutions.

Timing: First assessment from 1 July 2021 and then conducted quarterly thereafter.

Requirements: Banks' performance on developing and promoting green finance business will be assessed by the PBOC, with the results incorporated into the financial institutions' rating alongside the central bank's other policies and prudential management tools. There will be an 80% weighting given to quantitative measures (value of green finance business versus total assets and relative to other banks, yoy growth in green finance business, and total risk of green finance business) and 20% to qualitative measures (national and local green finance policy implementation, green finance systems and governance, and financial support to green industries).

Enforcement and penalties: Assessment is run by the PBOC, China's central bank. There are no penalties.

Relevant regulation: Announcement of the PBOC on Printing and Distributing the "Green Finance Evaluation Plan for Banking Financial Institutions"

Hong Kong

Corporate ESG disclosures have significantly improved in Hong Kong in recent years, which has largely been driven by the rollout of enhanced ESG disclosure requirements (some mandatory, others on a comply or explain basis). We find average operational E&S metric disclosure for H-share companies in our GS SUSTAIN framework of 63% vs 31% for China A-shares vs 45% for AeJ (Exhibit 4). Notably, Hong Kong has taken steps to enhance climate-related disclosures and to outline requirements to enhance transparency of ESG financial products.

Overview of progress: New requirements for TCFD-aligned climate-related disclosures from investors (from 2022) and corporates (from 2025) will continue to improve carbon transparency across the region. Significant developments are also underway to improve ESG product transparency (such as new disclosure and process requirements for ESG-labelled funds from 2022) and to establish further mechanisms to accelerate decarbonisation progress and to attract an increased share of global sustainable assets (such as a proposed Carbon Market and Green Taxonomy development). Companies are subject to mandatory governance disclosures, with 12 environmental and social indicators, covering supply chain-related disclosures, required on a comply or explain basis.

Exhibit 11: Overview of ESG policy development in Hong Kong (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Hong Kong	Green Taxonomy being explored by the "Steering Group"	Investors from 2022; Corporates by 2025	Carbon market being explored by "Steering Group"	Supply chain mgmt. disclosures on comply or explain basis	Mandatory G indicators; 12 E&S indicators req. on comply or explain basis	Disclosure and process req. for ESG funds from 2022

Source: Hong Kong Government, SFC, HKEX, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

Hong Kong's Sustainable Finance Cross-Agency Steering Group is eyeing a domestic green classification system aligned with the EU-China Common Ground Taxonomy. In December 2021, the Steering Group discussed the focus on developing a green classification framework for domestic use, which would aim to align with EU-China Common Ground Taxonomy (see Mainland China section for more details on the Common Ground Taxonomy). This could have major implications for capital market flows and sustainable finance within Hong Kong and continue to bolster disclosures from both investors and corporates on sustainability issues. With the incoming regulation relating to TCFD-aligned climate reporting in HK (see Theme 2 below), we see this early signal of future taxonomy development as an opportunity for (a) corporates to develop in house expertise to understand how their business model fits into the EU and China Taxonomies, and (b) for investors to understand the exposure to green activities across their portfolios and investable universe.

A "Circular" is a document published by the HK SFC outlining regulatory requirements for industry participants.

Theme 2: TCFD-aligned climate reporting

Most asset managers (both ESG and non-ESG) will be asked to report on how material climate-related risks are integrated throughout the organisation and in each specific product from 2022. In August 2021, the Hong Kong Securities and Futures Commission (SFC) established new requirements for mostly all asset managers to consider climate-related risks in their investment processes and to provide TCFD-aligned climate-related disclosures by 2022. In line with the recommendations of the TCFD, the new requirements have four key pillars: governance, investment management, risk management, and disclosure. The SFC implemented the new requirements by (1) amending the Fund Manager Code of Conduct, and (2) issuing a Circular to Licensed Corporations setting out compliance expectations. **We see a mix of investor approaches to satisfying the requirements, from relying on third party data and climate analytics tools to building in house expertise through dedicated teams or placing responsibility for integration at the CIO level.**

Corporate TCFD-aligned disclosures expected by 2025. Throughout 2021, Hong Kong's Green and Sustainable Finance Cross-Agency Steering Group ("the Steering Group") expressed the intention to make TCFD disclosures mandatory for "relevant sectors" by 2025. We expect the government to make further progress in providing more specific details on implementation timeline and sectors included in the reporting requirement in the near-term.

Circular to licensed corporations Management and disclosure of climate-related risks by fund managers

Scope: Investors – *baseline requirements* for all fund managers of collective investment schemes (CIS); additional *enhanced standards* for "Large Fund Managers" with >HK$8bn AUM. It does not include discretionary accounts.

Timing & Requirements

Exhibit 12: Summary of key disclosure requirements for CIS fund managers in HK, which must be provided annually

	Large Fund Managers (HK$8bn AUM or above)	**Other Funds** (<HK$8bn AUM)
Baseline requirements		
• Governance - Define the **Board and Management's roles and responsibilities.** • Investment Management - incorporate relevant **material physical and transition climate-related risks** into the investment process for each strategy and fund. • Risk Management - take appropriate steps to **identify, assess, manage, and monitor** relevant climate-related risks. • Disclosure - provide relevant disclosures.	**Required** by Aug 20, 2022	**Required** by Nov 20, 2022
Enhanced standards		
• Risk Management - if climate-related risks are deemed to be relevant and material, (1) conduct a **climate scenario analysis** and (2) take reasonable steps to **measure the portfolio carbon footprint** for at least Scope 1-2 emissions. Scope 3 analysis encouraged. • Disclosure - describe, (1) **at the entity-level, the engagement policy r**elating to material climate risks and (2) **at the fund level the portfolio carbon footprint** including scope coverage.	**Required** by Nov 20, 2022	Not required

Disclosure requirements above are not mandatory for discretionary account managers

Source: SFC

Enforcement and penalties: The Circular sets out the expectations under the amended Fund Manager Code of Conduct (FMCC). The SFC has stated that a breach of any of the requirements under the FMCC will reflect adversely on the "fitness and properness" of the Fund Manager, with potential disciplinary actions that have not been explicitly specified.

Relevant regulation: Consultation Conclusions on the Management and Disclosure of Climate-related Risks by Fund Managers and Circular to licensed corporations Management and disclosure of climate-related risks by fund managers.

Theme 3: Carbon pricing scheme

No carbon pricing scheme exists, however developing a regional carbon trading centre is on the agenda. A preliminary assessment of carbon market opportunities in Hong Kong recently concluded by the Steering Group favours developing a carbon market mechanism, including a global voluntary carbon market.

Theme 4: Supply chain due diligence and transparency

Supply chain disclosures exist on a comply or explain basis. The Hong Kong Stock Exchange's ESG reporting guide includes supply chain disclosures on a comply or explain basis. It generally requires disclosure on the policies on managing E&S risks in the supply chain, including (i) the number of suppliers by geographical region, (ii) the description of practices relating to engaging suppliers, number of suppliers where the practices are being implements, and how they are implemented and monitored, (iii) description of practices used to promote environmentally preferable products and services when selecting suppliers and how they are implemented and monitored.

Theme 5: Corporate ESG disclosures

Most recently updated in 2020, the HKEX's ESG Reporting Guide imposes two levels of disclosure requirements on listed corporates - (1) mandatory disclosures and (2) "comply or explain" provisions. Mandatory disclosures relate to (a) the governance structure (e.g. board oversight of overall ESG strategy and progress), (b) how reporting principles of (i) materiality, (ii) quantitative, and (iii) consistency are applied when preparing the report and (c) the reporting boundary. Disclosure on various metrics for a total of 12 Environmental and Social aspects are also required on a "comply or explain" basis, outlined in Exhibit 13. The 2020 update also notably shortened the disclosure timeline to within five months after fiscal year-end.

Exhibit 13: The HKEX's ESG reporting guide includes both mandatory and 'comply or explain' criteria
Summary of HKEX ESG reporting guide

Mandatory disclosure requirements

Governance Structure	Reporting Principles	Reporting Boundary
• Board's oversight of ESG issues • Board's ESG management approach • Board's review on material ESG-related goals/targets	• Process and criteria to identify materiality and engagement process/results • Standards, methodologies, assumptions and sources used to report • Report changes on methodology or KPIs used or other relevant information to provide consistency	• Reporting boundaries of the ESG report, including descriptions on entities or operations included in the report.

Comply or explain

Environmental	Social
1. **Emissions** (incl. GHG and waste) 2. **Use of Resources** (incl. water and energy) 3. **Environment and Natural Resources** (policy) 4. **Climate Change** (policy)	5. **Employment** (incl. diversity and turnover) 6. **Health and Safety** (incl. fatalities and accidents) 7. **Development and Training** (incl. training hours, % emp. trained) 8. **Labor Standards** (policy) 9. **Supply Chain Management** (incl. # of suppliers, policies) 10. **Product Responsibility** (incl. recalls, complaints, assurances) 11. **Anti-corruption** (incl. # of legal cases, policies) 12. **Community Investment** (incl. focus areas, resources contributed)

Source: HKEX, Goldman Sachs Global Investment Research

Theme 6: ESG fund requirements

ESG-labeled funds are facing new disclosure and process requirements on how ESG is embedded into the investment process from January 2022. For investment funds incorporating ESG factors as a key investment focus, reflected in the objectives or strategy of the fund, new disclosure requirements are being imposed to increase transparency and reduce greenwashing risks, ultimately helping investors make informed investment decisions. Notably, the SFC requires these ESG funds to disclose the expected or minimum proportion of securities or other investments (e.g. as a % of net asset value) that are in line with the fund's ESG focus, disclosures of methodologies and datasets that are used, and a description on the due diligence process carried out to measure the ESG related attributes of the fund's underlying assets.

Undertakings Collective Investment in Transferable Securities (UCITS) refered by the SFC include SFC-authorized funds that are domiciled in select European countries.

A sign that European themes are arriving in Hong Kong with compliance with the EU's SFDR regulation deemed to generally satisfy the requirements of HK's ESG Funds Circular. UCITS ESG funds that meet the disclosure requirements for Article 8 or Article 9 under the EU SFDR regulation will generally be considered as ESG funds in Hong Kong. We believe this highlights the SFC's broader willingness to harmonize ESG disclosure requirements across different jurisdictions, which will increasingly become more important as more regulators across the region begin to adopt their own ESG fund related disclosure requirements.

Circular to management companies of SFC-authorized unit trusts and mutual funds - ESG funds

Scope: Investors – SFC-authorised funds incorporating ESG factors as key investment focus (see this link for the list of ESG funds recognized by the SFC).

Timing: In effect from 1 January 2022.

Assessment of the attainment of ESG objectives must be conducted at least annually and disclosures provided to investors.

Requirements:

- **Disclosures required in offering documents:** (a) ESG focus of the fund, (b) ESG investment strategy, (c) Asset allocation (*the expected minimum proportion of net asset value of the fund that align with the ESG focus),* (d) reference benchmark, (e) where to find additional information, and (f) Risks. Additional requirement exist for climate-focused funds.
- **Additional required disclosures (prospectus, website, or other means):**
  - How the ESG focus is measured and monitored throughout the lifecycle of the ESG fund
  - The methodologies to measure ESG focus and attainment
  - Due diligence carried out in respect to the ESG related attributes of the fund's underlying assets
  - Engagement and proxy voting policies
  - Sources and processing of ESG data or a description of any assumptions made where data is not available
- **Periodic assessment and reporting:** See circular for specific requirements around what needs to be reported along with periodic assessments.

Enforcement and penalties: Failure to comply could lead to the removal of the fund from the SFC's list of ESG funds, as well as additional regulatory actions that the SFC deems to be appropriate.

Relevant regulation: Circular to management companies of SFC-authorized unit trusts and mutual funds - ESG funds

India

While ESG disclosure rates amongst companies in India lags the majority of the region (57% average disclosure on our Operational E&S GS SUSTAIN framework), incoming mandatory disclosure requirements will likely continue to boost transparency across the region. Proposed requirements on ESG funds will also likely boost investor engagement and demand for greater ESG disclosure.

Overview of progress: From FY22-23 onwards, there will be a new Business Responsibility and Sustainability Report (BRSR) published by large corporates, with a proposal in consultation that ESG funds would be unable to invest in companies without a BRSR or equivalent report from October 2022 onwards. There are additional proposals for greater disclosure and tighter thresholds on what can be owned in an ESG fund, with an 80% minimum threshold in "ESG-themed" stocks under consideration. We find no significant developments relating to Green Taxonomy development, TCFD-aligned reporting (we note, however, that the new BRSR draws on international frameworks including thee TCFD), Carbon pricing, and supply chain due diligence and transparency requirements. **Other notable developments** includes the country's Social Taxonomy, that will aim to promote financing towards "Social Enterprises" with at least 67% of their revenue, expenditure, or customer base aligned to at least one out of fifteen eligible social activities.

Exhibit 14: Overview of ESG policy development in India (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
India	No significant developments	No significant developments	No significant developments	No significant developments	Mandatory CSR/ ESG reports and KPIs from FY22-23	Min. thresholds for ESG fund investment in consultation

Source: SEBI, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

We did not identify any significant developments relating to Green Taxonomy development.

Theme 2: TCFD-aligned climate reporting

The new corporate ESG reporting requirements (see Theme 5 below) draws on global sustainability reporting frameworks, including the TCFD. However, there are not any additional climate reporting requirements that fully align with all disclosures from the TCFD framework.

Theme 3: Carbon pricing scheme

We did not identify a carbon pricing scheme in India.

Theme 4: Supply chain due diligence and transparency

We did not identify any significant supply chain due diligence and transparency requirements in India.

Theme 5: Corporate ESG disclosures

A new mandatory Business Responsibility and Sustainability Report (BRSR) incoming for large corporates... The Securities and Exchange Board of India (SEBI) have announced new Business Responsibility and Sustainability Report (BRSR) disclosure requirements for the top 1,000 largest listed companies by market cap. In order to provide a transition period, the reports will be voluntary for FY21-22, but will become mandatory from FY22-23 onwards. Environmental KPIs such as GHG, energy, waste, as well as social KPIs, including employee diversity, turnover, median wages, and supply chain management practices, are included in the annual reporting requirements.

...building on existing requirements. The BRSR will build on SEBI's previous disclosure recommendations under the Business Responsibility Report (BRR), which became mandatory for the 100 largest market cap companies in 2012. The company size threshold for mandatory BRR disclosure requirements was subsequently expanded to the top 500 in 2015 and the top 1,000 in 2019. The previous BRR primarily included qualitative disclosures (although some metrics were numeric, such as number of employees by gender), which was significantly enhanced under the new BRSR reporting requirements to include more numeric metrics.

Theme 6: ESG fund requirements

Proposal for a new 80% minimum investment threshold in "ESG themed" stocks for ESG funds. In October 2021, SEBI launched a Consultation Paper proposing to introduce more detailed disclosure guidelines for ESG labeled mutual funds, and importantly, to introduce a requirement mandating these funds to invest at least 80% of AUM into securities aligned to "ESG themes". The latter requirement is similar to requirements in other jurisdictions, including across Europe. For example, there is a requirement in France for 20% of the investable universe of an ESG fund to be excluded based on an ESG factor. Meanwhile in Germany, regulators are implementing a minimum 75% threshold into investments that help reach ESG goals.

While the definition of an "ESG theme" has not been explicitly stated in the proposal to guide where the 80% of AUM must be invested in, SEBI clarified that ESG funds should aim to invest in sectors, industries or companies that are expected to benefit from "long-term macro or structural ESG-related trends". While the remaining 20% of AUM does not fall under specific guidelines, these should not be in "stark contrast" with the fund's ESG investment philosophy.

Additional requirements will push adoption of corporate ESG reporting. SEBI's proposal also include a requirement that, starting from October 1, 2022, ESG funds should only be able to invest in companies that have BRSR disclosures available. Funds that are investing in overseas markets will be able to choose global equivalents of the BRSR as specified by the Association of Mutual Funds in India (AMFI).

Other notable ESG developments

A new Social Taxonomy is being developed to support the new Social Stock Exchange (SSE). The creation of a new Social Stock Exchange (SSE) was approved by SEBI in September 2021 which aims to promote fund-raising activities for social enterprises (SEs). SEs are defined as either non-profit organizations or for-profit social enterprises that have eligible social impact activities which must satisfy various standards set by SEBI's Technical Group report. Notably, **the standards require SEs to be able to demonstrate that at least 67% of their (a) revenue, (b) expenditure, or (c) customer base are aligned to at least one out of fifteen eligible social activities (Exhibit 15)** as defined by SEBI (e.g. poverty alleviation, affordable housing, promoting gender equality, etc). The activities are created with reference to the UN Sustainable Development Goals. SEs will also have more enhanced disclosure requirements including mandatory social audits by certified entities.

While the timeline to launch the SSE has not been disclosed, the SSE will allow entities with high social impact to raise funds through multiple instruments including equities, mutual funds, and social impact funds. The SSE also allows issuers to raise capital through less conventional debt instruments including "zero coupon zero principal" bonds which measure returns in terms of social impact rather than interest and principal repayments, and "development impact bonds" which are structured finance products where the issuer receives funding from the donor upon completion of a project that meets predetermined social metrics at predetermined costs.

Exhibit 15: SEBI has proposed 15 eligible activities for the SSE, most of which are tied to social outcomes
Overview of eligible activities in the Social Stock Exchange

Eligible activity #	Activity details	Eligible activity #	Activity details
1	Eradicating hunger, poverty, malnutrition. Promoting health care, sanitation and access to safe drinking water.	9	Promoting livelihoods, including enhancing income of small and marginal farmers/workers in non-agricultural sectors
2	Promoting education, employability and livelihoods	10	Slum area development, affordable housing and other interventions to build sustainable and resilient cities
3	Promoting gender equality, empowerment of women and LGBTQIA+ communities	11	Disaster management including relief, rehabilitation and reconstruction
4	Ensuring environmental sustainability, addressing climate change mitigation and adaptation, addressing forest and wildlife conservation	12	Promoting financial inclusion
5	Protecting national heritage, art and culture	13	Facilitating access to land and property assets for disadvantaged communities
6	Training to promote rural sports, nationally recognized sports, Paralympic and Olympic sports	14	Bridging the digital divide in internet and mobile phone access, addressing issues of misinformation and data protection
7	Supporting incubators of social enterprises	15	Promoting welfare of migrants and displaced persons
8	Supporting other platforms that strengthen the non-profit ecosystem in fundraising and capacity building		

Source: SEBI

Japan

While Japanese corporate ESG disclosure rates have generally been ahead of most peers in the region (61% average disclosure in the SUSTAIN Operational E&S framework vs 45% for Asia ex-Japan), a comprehensive set of mandatory ESG disclosure regulations have lacked, with the exception of some environmental and employment related regulations. However, recent developments suggest this is changing.

Overview of progress: We see the Financial Services Agency's (FSA) latest revision of Japan's Corporate Governance code bringing further enhancements to ESG disclosure standards, promoting an expanded net of metrics around board independence, diversity, and climate, and instilling board accountability for companies' sustainability strategy on a comply or explain basis. TCFD-aligned climate reporting requirements will also impact companies listed on the new "Prime Market" launching in April 2022. Japan has an established carbon tax, with a compliance ETS scheme under consideration. A Transition Taxonomy has been developed for bond and loan issuance, but is for guidance on a voluntary basis, with issuers able to cite other equivalent frameworks. Supply chain due diligence guidelines are in development and expected to be published by Summer 2022. Investors can expect to see future standards on ESG fund disclosures and potential investment thresholds, as suggested by multiple media sources. **Other developments discussed** include Japan's Stewardship code for institutional investors.

Exhibit 16: Overview of ESG policy developments in Japan (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Japan	Transition Taxonomy developed for bond and loan issuance (voluntary)	Mandatory for companies on "Prime Market" launching April 2022	Carbon Tax established; ETS scheme under consideration	Supply chain due diligence guidelines in development, expected to be published Summer 2022.	Board indep., Diversity, and Climate metrics on comply or explain basis	Multiple sources citing ESG fund disclosures on the horizon

Source: METI, JPX, FSA, Bloomberg, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

The new "Transition Taxonomy" is a voluntary standard to guide issuance of bonds and loans for energy efficiency and other low-carbon enabling activities. In December 2020, the Taskforce on Preparation of the Environment for Transition Finance was jointly established by the FSA, the Ministry of the Environment, and the Ministry of Economy, Trade and Industry (METI), tasked with creating guiding principles for Japan's sustainable finance initiatives. The Taskforce published its guidelines in May 2021, largely leveraging the International Capital Market Association's (ICMA) Climate Transition Finance Handbook, to help companies raise transition funds through bonds and loans for projects related to energy efficiency and other low-carbon initiatives.

There are four key pillars with requirements for corporates to raise transition finance funds through bonds and loans. Under the Transition Finance guidelines, companies must meet guidelines set across four key pillars which include: (1) transition strategy and governance, (2) business model environmental materiality, (3) "science-based" climate strategies, and (4) implementation transparency (Exhibit 17). Each pillar includes more specific guidelines mainly to enhance the credibility of transition activities, such as the requirement to incorporate both environmental and social factors to promote 'just transition' in the transition strategy, and requirements to include capex, opex, R&D and other cost considerations to provide better transparency on the implementation and execution of the strategy.

Exhibit 17: Japan's Transition Finance guidelines include four key elements that corporates must meet in order to raise transition finance funds through bonds and loans
Summary of four key elements of Japan's Transition Finance guidelines

Climate transition strategy and governance • Transition strategy must incorporate targets **aligned with Paris Agreement** goals. • Transition strategy must incorporate environmental and social contributions into the strategy to **promote a 'just transition'.**	**Business model environmental materiality** • Transition initiatives must cover present and future **core business activities** that are environmentally material.
Science-based targets and pathways • Targets must **consider 'science-based'** pathways. • **Short-to-mid term targets** must be set • Scenarios recognized by the international community can be leveraged, including the IEA's SDS. • SBTis and other relevant organizations can be referenced.	**Implementation transparency** • Investment plan must include not only **capex, but also opex and costs related to R&D, M&A** and others. • **Quantitative indicators** must be used where possible to assess investment results or impact. • Investment plans must incorporate considerations of a **'just transition'.**

Source: FSA, METI, Japan Ministry of the Environment

Theme 2: TCFD-aligned climate reporting

Companies listed on the Tokyo Stock Exchange's new "Prime Market" (expected to launch in Apr 2022) will be required to make mandatory climate-related disclosures aligned to TCFD or other equivalent international frameworks. There is no mandated requirement on investors, at this stage.

Theme 3: Carbon pricing schemes

A carbon tax exists, however it has been scrutinized as being insufficient, with no changes made in the latest tax plan. Japan has implemented a carbon tax for fossil fuels in an effort to transition to low carbon since 2012. However, despite being a relatively early mover in the region, its carbon tax scheme received significant scrutiny from various stakeholders as the tax rate of JPY289 per ton of CO_2 (~US$2.5/t) was considered too low to incentivize decarbonization. While there were various government discussions that signaled a potential hike for carbon taxes in 2021, the latest tax plan for fiscal year 2022 did not address any further changes.

Japan is currently considering the introduction of a compliance ETS in the future where proposals are being developed separately by the Ministry of the Environment and Ministry of Economy, Trade, and Industry (METI). Detailed guidelines are still not available, but METI's ETS is characterized by voluntary participation, while the Ministry of the Environment is aiming to propose an ETS with mandatory participation. METI's proposal would include the ability for selected companies (referred to as the "Green Transformation League") to purchase offsets to meet their voluntary CO2 targets. The voluntary pilot market is intended to ultimately support the launch of a national platform for a wider group of companies, although details have yet to be finalized.

Theme 4: Supply chain due diligence and transparency

Supply chain due diligence requirements are coming by summer 2022. In December 2021, it was reported in the Japan Times that the government is considering drawing up guidelines for supply chain risk management and due diligence, quoting the impact the surge of overseas regulation mandating human rights due diligence across supply chains is having on Japanese companies. In February 2022, Bloomberg confirmed that a panel on human rights in corporate supply chains has been established, with guidelines expected to be published by summer 2022.

Theme 5: Corporate ESG disclosure

The latest Corporate Governance Code revision enhances disclosure requirements introduced on a comply or explain basis. In June 2021, the FSA revised Japan's Corporate Governance Code, which notably enhances disclosure standards on board independence, diversity, and climate, and expands the board of director's responsibilities to include the development of company sustainability policies. Enforcement will continue to be on a 'comply or explain' basis, with the extent of the comply or explain requirements differing by market segment, with Prime Market having the most stringent requirement.

Although providing an explanation can be sufficient to satisfy cases of non-compliance with the Corporate Governance Code, our Japan Strategy team believes that a large number of companies will be able to meet the new disclosure requirements as a previous TSE survey (August 2020) revealed that 26% of TSE1 companies had implemented all 78 principles of the code, and that 63% had implemented at least 90% of the principles.

Theme 6: ESG fund requirements

While no mandatory requirements currently exist, reports suggest that ESG-labeled fund disclosures are on the horizon. First reported in March 2021 (Bloomberg) and reiterated in June 2021 (Responsible Investor), media sources have suggested that the FSA is considering introducing specific ESG fund labeling in an effort to promote better transparency for investors and mitigate greenwashing risks. While the FSA has not published official documents stating specific investment thresholds or disclosure criteria that ESG labeled funds must satisfy, the FSA's Sustainable Finance Report published in June 2021 stated that asset managers selling 'ESG' or 'SDG' labeled products should disclose relevant metrics and methodologies to explain how sustainability considerations are factored into the investment process. Initiatives that were highlighted in the FSA's Sustainability Report are beginning to materialize. For example, the Technical Committee for ESG Rating and Data Providers was officially established in February 2022 in order to address topics discussed in the June 2021 report. **In our view, investors can expect greater focus on increasing transparency and setting tighter thresholds of what can be owned in an ESG funds in the medium term as details from the Sustainable Finance Report crystallize.**

Other notable ESG developments

While not legally binding, Japan's Stewardship Code has growing support from investors. Japan's Stewardship Code was initially published in 2014 by the FSA in order to enhance the fulfillment of fiduciary responsibilities for investors and to promote medium- to long-term growth of companies through engagement. The Stewardship Code provides a set of 'comply or explain' based principles, and is not considered to be a legally binding document. Despite the nature of the Code's adoption, the Stewardship Code has gathered significant support from various stakeholders. As of December 31, 2021, the FSA reported that there are 320 signatories to the Stewardship Code, up ~10% from 2020 (291 signatories). The majority of signatories are asset managers (64%), followed by pension funds (23%) and other financial service providers (13%).

ESG has become an explicit responsibility for investors under the Stewardship Code. Major changes were made to the Stewardship Code in 2020 following its second revision, where the FSA introduced sustainability factors and ESG as part of stewardship responsibilities, which requires investors to ultimately incorporate ESG into investment strategies. While the Code does not explicitly stipulate how ESG should be factored in or whether certain reporting frameworks should be adopted (e.g. TCFD), we believe the latest revision will provide further momentum for investors to integrate ESG as Sustainability becomes mainstream.

New Zealand

An absence of mandatory ESG policies historically in New Zealand has contributed to average levels of corporate ESG disclosure, which is notable given the country's position as a more developed economy in the region (60% average disclosure across metrics in our SUSTAIN Operational E&S framework). However, we see a number of initiatives underway which will continue to improve disclosures over the medium term.

Overview of progress: New Zealand is one of the first countries in the region to codify a requirement for mandatory TCFD-aligned climate reporting, which will be phased in for both corporates and investors by 2023 at the earliest. The country also has a national ETS scheme, which continues to expand in terms of sector coverage and tightened thresholds. Material ESG disclosures are required by corporates on a comply or explain basis as part of broader corporate governance requirements. A Taxonomy for agriculture activities is also currently being developed by a coalition of public and private sector representatives to help with sustainable financing needs. While there are no specific ESG fund requirements, guidance has been provided on how broader misleading and deceptive prohibitions apply to ESG products. There are no significant supply chain due diligence and transparency requirements.

Exhibit 18: Overview of ESG policy development in New Zealand (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
New Zealand	Taxonomy for agriculture activities in development (will be voluntary)	Phased in from 2023 for both corporates and investors	National ETS scheme	No significant developments	Corporate governance req. (incl. material ESG) on a comply or explain basis	Guidance on application of "misleading and deceptive" prohibitions to ESG products

Source: The Aoteroa Circle, New Zealand Govenment, NZX, FSA, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

No formal Green Taxonomy currently exists, however, market initiatives are underway to promote standardisation. The Aotearoa Circle is a voluntary collaboration of leaders and experts from both the public and private sectors, as well as government agencies, with a dedicated work stream focused on developing a Taxonomy for agriculture activities, leveraging the structure of the EU Taxonomy framework as a foundation. The initiative, known as the Sustainable Agriculture Finance Initiative (SAFI), published their Phase One SAFI guidance in June 2021, with the group now working on Phase Two guidance which will provide a final guidance standard that can be used on a voluntary basis.

Theme 2: TCFD-aligned climate reporting

New Zealand's climate-related reporting requirements, aligned with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations, are due to commence in 2023 at the earliest for roughly 200 New Zealand entities in scope. The policy aims to provide the market with disclosure of consistent, comparable, reliable, and clear information about climate-related risks and opportunities.

Financial Sector (Climate-related Disclosures and Other Matters) Amendment Bill

Scope: Investors and corporates – Around 200 entities will fall within scope, including:

1. Registered banks, credit unions and building societies with >NZ$1bn in assets
2. Managers of registered investment schemes with >NZ$1bn in AUM (note disclosures will be required on a fund-by-fund basis)
3. Licensed insurers with >NZ$1bn in assets or annual premium income >NZ$250mn
4. Listed issuers of quoted equity securities with a combined market price >NZ$60mn
5. Listed issuers of quoted debt securities with a combined face value of quoted debt >NZ$60mn

Timing: The New Zealand External Reporting Board (XRB) will develop a reporting standard in line with the recommendations of the TCFD. The XRB is aiming to issue the first climate standard in December 2022, with entities in scope required to make disclosures alongside wider year-end reporting in 2023 at the earliest.

Requirements: Investors and corporates can expect disclosure requirements to align to the TCFD framework, which considers different climate risk and opportunities across four key pillars: (1) governance, (2) strategy, (3) risk management, and (4) metrics and targets. Elements of the disclosures relating to GHG emissions reporting will be required to have independent assurance starting two years after the initial reporting requirement starts.

Enforcement and penalties: The Financial Markets Authority (FMA) will be responsible for monitoring, regulation, and enforcement. Penalties for noncompliance are unknown at this stage.

Relevant links: Financial Sector (Climate-related Disclosures and Other Matters) Amendment Bill

Theme 3: Carbon pricing scheme

An Emissions Trading Scheme (ETS) has been in effect since 2008, and is expected to expand to Agriculture from 2025. New Zealand's ETS was established in 2008, undergoing significant legislative reforms in June 2020 to establish a cap on emissions for the first time which will gradually reduce over time to limit emissions in line with the country's decarbonisation goals. Sectors covered includes forestry, liquid fossil fuels, stationary energy, industrial processes, synthetic greenhouse gases, agriculture, and waste. Agricultural emissions, particularly from livestock, will also be subject to a carbon price under the new legislation from 2025, either through a farm-level levy/rebate system (separate to the ETS), or at the processor level (via the ETS).

Theme 4: Supply chain due diligence and transparency

We did not identify any significant developments relating to supply chain due diligence and transparency regulation.

Theme 5: Corporate ESG disclosure

Corporate governance principles required on a comply or explain basis; includes consideration of material ESG risks. Companies listed on the New Zealand Stock Exchange have a comply or explain requirement to report annually against a set of principles and recommendations outlined in the NZX Corporate Governance Code. Recommendations relate to a code of ethical behavior, board composition and performance, board committees, reporting and disclosure, remuneration, risk management, auditors, and shareholder rights and relations. Reference to material ESG indicators are made in a number of recommendations, with a separate accompanying ESG Guidance Note available to assist with corporate reporting.

Theme 6: ESG fund requirements

The Financial Markets Authority in New Zealand released guidance in December 2020 on financial products that incorporate non-financial factors, which includes issuers of 'green' bonds and ESG funds. It outlines certain fair dealing provisions under NZ law, including how misleading or deceptive conduct prohibitions relates to these ESG products. In addition, it outlines expected disclosures and enforcement actions that can be taken by the FMA where products are found to be misleading or deceptive.

Singapore

While Singapore companies have provided a good level of ESG disclosure in previous years, with 69% average Operational E&S metrics disclosures in our GS SUSTAIN framework, new policy developments, particularly around climate, will only continue to strengthen the ESG credentials of the region, in our view.

Overview of progress: Major developments have included the mandating of new TCFD-aligned reporting requirements (starting in 2022 for both corporates and investors), new mandatory diversity metric disclosures, and the development of a voluntary list of 27 core ESG metrics that firms are strongly encouraged to disclose. A Green Taxonomy instrument is in development, and disclosure requirements for retail ESG funds are expected to be announced in early 2022. Singapore also has a national carbon tax, which is planned to be revised upwards given a recent review suggesting it was not sufficient in the current environment. There are no significant supply chain due diligence and transparency regulations. **Other developments discussed** include initiatives to use artificial intelligence to help curb greenwashing risks.

Exhibit 19: Overview of ESG policy development in Singapore (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Singapore	Green Taxonomy in development	Starting 2022 for both corporates and investors	National Carbon Tax	No significant developments	Diversity mandatory; Core ESG metrics voluntary	Disclosures for Retail ESG funds expected early 2022

Source: MAS, SGX, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

Green Taxonomy is being developed by an industry working group under Singapore's Green Finance Action Plan, launched in 2019. The Monetary Authority of Singapore (MAS)-convened Green Finance Industry Taskforce (GFIT) aims to accelerate the development of green finance through four key initiatives: (i) develop a taxonomy; (ii) enhance environmental risk management practices of financial institutions ("FIs"); (iii) improve disclosures; and (iv) foster green finance solutions.

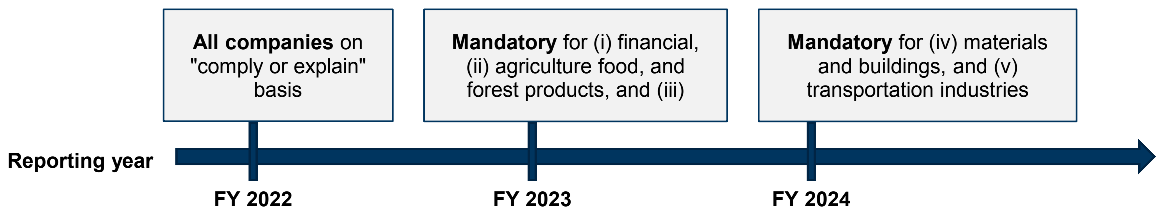
Planned Green Taxonomy will leverage Europe's framework. Notably, in early 2021, the GFIT proposed a draft taxonomy for Singapore-based financial institutions to help identify green and transitioning economic activities. In the published consultation paper, the GFIT acknowledges the need for *"consistency and comparability"* and that a *"Taxonomy for Singapore-based Financial Institutions would draw on the theoretical underpinnings of the EU Taxonomy."* This includes leveraging the six environmental objectives of the EU Taxonomy for framing eligible activities.

Theme 2: TCFD-aligned climate reporting

Both investors and corporates will come under TCFD-aligned reporting requirements from 2022. For companies, the Singapore Stock Exchange announced in

December 2021 that issuers will initially be subject to comply or explain obligations from FY22, **phasing into mandatory** disclosures for the (i) financial, (ii) agriculture food, and forest products, and (iii) energy industries from FY23, and further to (iv) materials and buildings, and (v) transportation industries from FY24 (Exhibit 20). **For investors**, guidelines published by the MAS in December 2020 are not legally binding, however the **MAS will expect financial institutions to follow the guidelines and may include the degree of adherence to the guidelines in their overall risk assessment of an institution**. Notably, the investor guidelines are broader than just climate and includes biodiversity, pollution, and changes in land-use.

Exhibit 20: The SGX is implementing TCFD-aligned reporting for issuers in phases
TCFD adoption timeline for companies



Source: SGX

MAS Guidelines in Environmental Risk Management for Asset Managers

Scope: Investors – Fund management companies registered in Singapore (RFMC) and holders of a capital markets license for fund management (LFMC) or real estate investment trust (REIT) management in Singapore are in scope. For asset managers that do not have discretionary authority over the investments of the funds/mandate they are managing, the Guidelines would not apply.

Timing: Disclosure is expected from June 2022 onward.

Requirements: There are five key areas that asset managers should address to comply with the guidelines on managing environmental risk, including:

1. **Governance and Strategy:** This includes processes around the role of the board (approval, oversight, and accountability of environmental risk management frameworks and policies, setting clear roles for senior management and ensuring directors have the required level of knowledge) and senior management (developing and implementing environmental risk management frameworks and policies, regular review, internal escalation process, adequate resourcing, and timely board updates).
2. **Research and Portfolio Construction:** This includes embedding environmental risk considerations where material (e.g. what is the impact on an investment's long-term return potential), assessing risk at individual asset levels leveraging international frameworks such as the TCFD, and using external and internal research to guide processes.
3. **Portfolio Risk Management:** This includes processes and systems for ongoing monitoring, the development and documentation of scenario analysis, and capacity building internally to manage environmental risk.

4. **Stewardship:** For example, active engagement with investee companies and collaboration with peers.
5. **Disclosure:** Provide disclosures and metrics around environmental risk management including disclosures aligned with the TCFD recommendations.

Enforcement and penalties: The Guidelines are not legally binding, however the degree of adherence to the guidelines may have an impact on the MAS's overall risk assessment of an institution.

Relevant links: Guidelines on Environmental Risk Management (Asset Managers), Guidelines on Environmental Risk Management (Banks), Guidelines on Environmental Risk Management (Insurers), Handbook on Implementing Environmental Risk Management

Theme 3: Carbon pricing scheme

Singapore has a carbon tax in place, with a revised tax for 2024 onward expected to be announced in this year's budget. Singapore's Carbon Pricing Act came into effect in January 2019, establishing Singapore as the first Southeast Asian nation to introduce a tax on carbon. **Companies emitting more than 25,000 tonnes of GHG emissions per year (covers ~50 large emitters that contribute ~80% of the country's total emissions) are currently required to pay a tax of S$5 per ton of emissions.** This was due to increase to between S$10-S$15 in 2025, however, recognising that the planned trajectory of the carbon tax was too low, the **government noted that a revised carbon tax rate for 2024 and comments on what to expect up to 2030 would be announced with the 2022 budget.**

Separately, Singapore's Carbon Impact X (CIX), a voluntary carbon market joint venture between SGX, DBS bank, Standard Chartered and Temasek, is expected to conduct **new auctions for high-quality carbon credits in early 2022** (S&P Global), following successful completion of pilot auctions in late 2021. CIX ultimately aims to enhance the project quality and data transparency of global voluntary carbon markets, which have historically been largely fragmented.

Theme 4: Supply chain due diligence and transparency

We did not identify any significant supply chain due diligence and transparency requirements.

Theme 5: Corporate ESG disclosure

Issuers have been required to provide sustainability reporting on a "comply or explain" basis since June 2016, with the SGX encouraging that globally recognised ESG reporting frameworks be followed in the absence of a prescribed format. However, **in December 2021, the SGX announced 1) a roadmap for climate-related disclosures based on the recommendations of the TCFD** (discussed in Theme 2)**, 2) new board diversity policies and disclosures requirements, 3) a voluntary list of 27 core ESG metrics for companies to disclose, and 4) other additional ESG-related requirements.**

Diversity (mandatory): Mandatory requirements will begin from 1 January 2022 for

A survey found 87% of the 3,700 directors from 587 Singapore-listed firms were male, and 45% of companies had all-male boards (*Corporate Governance Advisory Committee*).

companies to develop a board diversity policy addressing gender, skill, experience, and other diversity areas. The policy must then be disclosed in annual reports along with targets, accompanying plans, and timelines for achieving targets, as well as progress against targets and a description of how the combination of skills, talent, experience, and diversity of directors serves the needs and plans of the issuer.

Core ESG metrics (voluntary): Leveraging common metrics across globally recognised ESG frameworks such as the Sustainability Accounting Standards Board (SASB), TCFD, the Global Reporting Initiative (GRI) and the World Economic Forum's recommended metrics, the SGX has compiled 27 recommended core metrics across E, S, and G that issuers can use as a starting point for companies in making their ESG disclosures (Exhibit 21). Issuers are still asked to conduct a materiality assessment to ensure relevance and completeness of their reported metrics. There are also plans to develop an ESG data portal to reduce costs and increase transparency.

Exhibit 21: SGX recommends a set of 27 core numeric ESG metrics that are broadly relevant across different sectors
List of 27 core ESG metrics recommended by SGX

Environmental (7 metrics)	Governance (8 metrics)
Absolute Scope 1-2 GHG emissions (Scope 3 if appropriate)	Board independence
GHG intensity (normalization metric not specified)	Board gender diversity
Total energy consumption	Management team gender diversity
Energy intensity (normalization metric not specified)	Anti corruption disclosures
Total water consumption	Anti corruption training data
Water intensity (normalization metric not specified)	Disclosure of relevant certifications
Total waste generation	Alignment with external frameworks and disclosure practices
	Disclosure on assurance status of Sustainability report
Social (12 metrics)	
Employee mix by gender	Average training hours per employee
Employee turnover and new hire mix by gender	Average training hours per employee by gender
Employee mix by age group	Fatalities
Employee turnover and new hire mix by age group	High-consequence injuries
Total employee turnover	Recordable injuries
Total number of employees	Recordable work-related ill health cases

Source: SGX

Other additional ESG-related requirements (mandatory): Issuers will be required from 1 January 2022 to subject sustainability reporting processes to internal review through the internal audit function, with external assurance encouraged, and sustainability reports are to be issued together with annual reports unless issuers have conducted external assurance. All directors must also undergo a one-time training on sustainability.

Theme 6: ESG fund requirements

The MAS is expected to announce minimum disclosure standards for ESG retail funds in early 2022. Speaking at a conference in September 2021, Managing Director of the MAS, Mr. Ravi Menon, said that the new rules will allow investors to understand the fund's investment process and the risks and limitations associated with the fund's ESG strategy, adding that strong disclosure requirements are needed as green investments become more mainstream.

Other notable ESG developments

Singapore looking to AI to help curb greenwashing risks. Singapore's Deputy Prime Minister, Mr. Heng Swee Keat, announced in November 2021 the new National Artificial Intelligence (AI) Programme in Finance. The initiative includes "NovA!" – an industry-wide AI platform for financial risk insight generation that will initially focus on helping financial institutions asses the environmental impacts of organisations and help to identify emerging environmental risks.

South Korea

South Korean companies have notably lagged the broader region (with only China A-shares underperforming) on ESG disclosures, with 51% average disclosure in our GS SUSTAIN Operational E&S framework. However, recognising the growing need for greater ESG information from corporates, we see a number of developments promoting increased environmental and social transparency from corporates.

Overview of progress: South Korea has a carbon ETS Scheme which recently entered a new phase of requirements to place greater pressure on corporates to decarbonise. Mandated ESG disclosures for KOSPI-listed companies are being phased in between 2019-2030. A Taxonomy for sustainable financing purposes has been developed to be used on a voluntary basis (e.g. other internationally recognised green standards can also be used). The "K-Taxonomy" largely follows the structure of the EU Taxonomy. South Korea pledged formal support for TCFD-aligned climate reporting in 2021, however there are no mandatory reporting requirements. We find no significant supply chain due diligence and transparency regulation or ESG fund requirements. However, notably, there have been reports of verbal warnings to asset managers that they must be able to substantiate ESG product claims. **Other developments discussed** include the Stewardship code for institutional investors.

Exhibit 22: Overview of ESG policy development in South Korea (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
South Korea	Green Taxonomy for bond issuance (voluntary), may apply to ESG products in future	Pledged formal support for TCFD in 2021; no established standards yet	National ETS scheme	No significant developments	Phased in mandatory ESG disclosure 2019-2030	No significant developments

Source: South Korea ME, FSC, KRX, Goldman Sachs Global Investment Research

Theme 1: Green Taxonomy

New K-Taxonomy heavily references Europe's green classification system. The Ministry of Environment (ME) published Korea's Green Taxonomy Guidelines (K-Taxonomy) on Dec 30, 2021 based on the Environmental Technology and Industry Support Act. The K-Taxonomy is significantly influenced by the EU Taxonomy, which the Korean government has heavily referenced partly to promote consistency and harmonization. The K-Taxonomy has six objectives in total which broadly resembles the EU Taxonomy's six objectives, and similarly also applies Do No Significant Harm (DNSH) and minimum social safeguards criteria into the assessment of green activities.

Use case will primarily apply to bonds (on a voluntary basis), but may expand to other financial products in future. The K-Taxonomy will be primarily applied for bonds and project financing initially on a voluntary basis, but will later expand applications to other financial products such as Green funds. The government is looking to run pilot phases in the near-term before eventually rolling the K-Taxonomy into the national Green Bond guidelines in 2023. The K-Taxonomy will also be revised in the coming years, with potential to include nuclear energy depending on public support and industry consultations. Currently, various transition activities that satisfy specific environmental criteria are included in the Taxonomy at least until 2030, including the production of blue hydrogen (must be 60%+ less carbon intensive than grey hydrogen) and certain LNG power plants (340g CO2e/kWh or less).

Theme 2: TCFD-aligned climate reporting

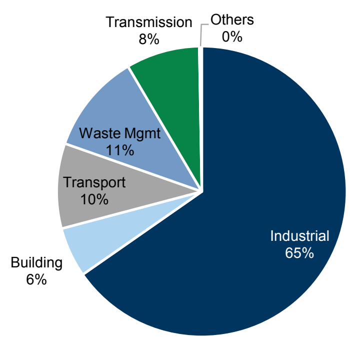
No mandated TCFD requirements, though regulators support the initiative. The Financial Services Commission (FSC) of Korea pledged official support for the TCFD Recommendations in May 2021, however no mandatory requirements on corporates or investors have been imposed since the announcement. As we see greater focus on the climate transition and decarbonisation, we expect to see TCFD-aligned reporting requirements emerge in the medium-term.

Theme 3: Carbon pricing scheme

South Korea's ETS continues to mature, covering >70% of total emissions. South Korea launched its Emission Trading Scheme (ETS) in 2015, which has been progressively enhanced in recent years by phasing out the amount of freely allocated emission allowances and introducing new sectors. The ETS covers 718 companies as of Feb 2022 (>70% of national emissions), with annual GHG inclusion thresholds being set at >125,000 tonnes at the entity level, or >25,000 tonnes at the asset level.

Latest phase of the ETS tightens free allowances to put more of the cost on corporates to incentivise decarbonsiation. Phase 3 of the ETS officially launched in 2021, requiring companies to purchase 10% of required allowances through auctions, whereas previously they were largely freely allocated to limit cost burdens for corporates (100% free allocation in 2015-2017, 97% free allocation in 2018-2020). The government aims to make further enhancements once Phase 3 expires in 2025 in order to meet Korea's newly announced (Oct 2021) Nationally Determined Contribution (NDC) to reduce emissions by 40% by 2030 vs. 2018 (vs. 26.3% reduction previously).

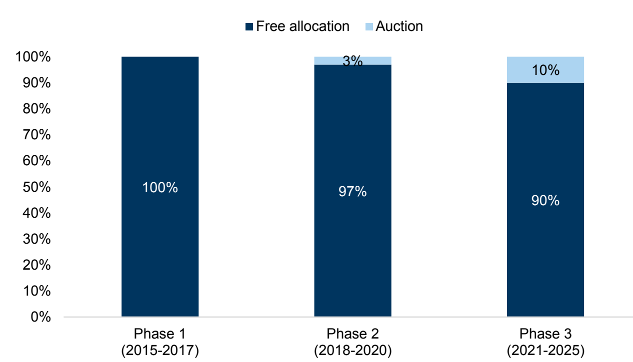
Exhibit 23: Industrial companies make up the majority of Korea's ETS participants
Breakdown of total number of companies covered by Korea's ETS



NGMS reported 718 companies covered as of Feb 2022

Source: National Greenhouse Gas Management System (NGMS)

Exhibit 24: Companies will be required to purchase 10% of emission allowances through auctions in the new ETS Phase
Allowance allocation method in Korea's ETS



Source: Ministry of Environment

Theme 4: Supply chain due diligence and transparency

We did not find any significant supply chain due diligence and transparency requirements.

Theme 5: Corporate ESG disclosure

Mandatory ESG disclosures are being phased in, impacting companies with assets of KRW2tn or more from 2025 to all companies from 2030. In January 2021, the FSC announced mandatory E&S disclosure requirements which will be phased in starting from 2025 for companies with total assets of KRW 2 trillion or more (~US$1.7bn). The FSC ultimately aims to mandate E&S disclosures for all KOSPI-listed companies by 2030.

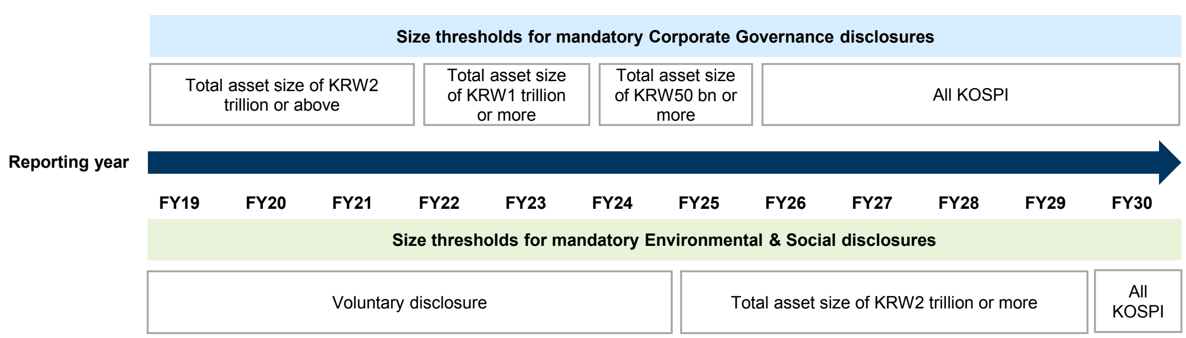
Exhibit 25: List of E&S disclosures that will be mandated over a phased in timeline
Key summary of E&S metrics recommended by the Korean Stock Exchange

Theme	Topic	Metric
Organization	Management	Management's role in ESG management
	Materiality assessment	Material ESG risks and opportunities
	Stakholders	Process to engage with key stakeholders
Environment	GHG	Scope 1-2 emissions
	Energy	Energy consumption
	Water	Water consumption
	Waste	Waste generation
	Legal	Details on legal fines
Social	Employees	Diversity, turnover, new hires, maternity/paternity leave
	Safety	Injuries, fatalities, illnesses, product safety, responsible marketing
	Data security	Data security breaches and corrective actions taken
	Fair competition	Anti-copetitive breaches and corrective actions taken

Source: KRX

Governance disclosure requirements for companies with total assets of KRW2tn or more have been mandatory since 2019, however, **starting from 2022, the threshold for mandatory disclosure has been lowered to KRW1tn**. This will be furthered lowered to KRW50bn by 2024 until all KOSPI-listed companies will be required to make disclosures starting from 2026.

Exhibit 26: KOSPI-listed companies will have to comply with phased mandatory E&S and G disclosure requirements within the next decade
Timeline of mandatory ESG disclosure requirements for KOSPI-listed companies



Source: Financial Services Commission

Theme 6: ESG fund requirements

No formal ESG fund requirements exist, however we see early signs that requirements may be on the horizon. While South Korea does not currently have requirements or standards that ESG funds need to adopt, according to local media (The Bell, Jun 2021) various asset managers have received verbal warnings by local regulators, such as the Financial Services Commission, that funds claiming to be ESG oriented must have legitimate basis or else it may lead to investigations. We believe that, over time, South Korea may develop ESG disclosure regulations for funds in order to mitigate greenwashing risks, potentially referencing the EU SFDR or other regulations as we have seen with Korea's adaptation of the K-Taxonomy.

Other notable ESG developments

South Korea's Stewardship Code, while voluntary, guides the fiduciary duties for institutional investors. The Stewardship Code consists of seven detailed principles and guidelines that institutional investors can declare their participation in. Once declared, institutional investors are bound by the principles on a comply or explain basis. The implementation guidebook notes that a stewardship policy should specify the non-financial (ESG) risk factors monitored by institutional investors, the relationship between those risk factors and the value of the investee company, and risk management principles and procedures. Despite the voluntary nature, as of January 2021, 137 institutional investors have adopted the Stewardship Code, including 46 asset managers and 43 private equity fund managers.

Additional developments across Asia

In this section, we highlight additional significant developments across the region with respect to our Six Policy themes – Green Taxonomies, TCFD-aligned climate reporting, Carbon pricing schemes ,supply chain due diligence and transparency, Corporate ESG disclosures, and ESG fund requirements. We note there may be other ESG policies developments outside of these themes, and the list is not intended to be exhaustive.

Exhibit 27: Overview of additional ESG policy developments across APAC (as of Feb 2022)

	1) Green Taxonomies	2) TCFD-aligned Climate Reporting	3) Carbon Pricing Scheme	4) Supply Chain Due Diligence and Transparency	5) Corporate ESG Disclosures	6) ESG Fund Requirements
Other Develop-ments	Malaysia, Indonesia with Taxonomies for bonds and loans (voluntary). ASEAN, Thailand, the Philippines in development.	Malaysia (from 2024), Taiwan (from 2023)	None identified	Thailand (from 2022)	Malaysia, Thailand, Philippines, Taiwan, Vietnam, Indonesia	Malaysia, Taiwan ASEAN, Thailand

Source: ASEAN, Bank Negara Malaysia, OJK, Bank of Thailand, Philippines Department of Finance, Bursa Malaysia Stock Exchange, Taiwan FSC, Thailand SEC, Philippines SEC, Vietnam SSC, Securities Commission Malaysia, Data compiled by Goldman Sachs Global Investment Research

Theme 1: Green Taxonomies

ASEAN: The ASEAN Taxonomy for Sustainable Finance version 1 was launched in November 2021 to provide a framework for guiding discussions around the development of a regionwide Taxonomy. The ASEAN Taxonomy will provide a common language for sustainable finance among the ten ASEAN member states. The proposal adopts a multi-tiered approach taking into consideration the region's unique needs: (i) a principles-based Foundation Framework which provides a qualitative assessment of activities and (ii) a Plus Standard with metrics and thresholds to further qualify and benchmark eligible green activities and investments.

Malaysia: The Bank Negara Malaysia (BNM) issued its final Climate Change and Principle-based Taxonomy guidance in April 2021. The Taxonomy largely classifies five activities (C1-C5) under three broader categories to identify economic activities that are Climate Supporting, Transitioning or are on a Watchlist (i.e. causing significant harm to the environment with no remedial actions taken). The Taxonomy will be voluntary for financial institutions regulated by the BNM, such as licensed banks and insurers. The BNM is encouraging the Taxonomy to be used by other stakeholders such as rating agencies and asset managers.

Indonesia: The Financial Services Authority (OJK) launched a green finance taxonomy in January 2022. It is based on a determination of how damaging a company's activities are to the environment, classifying damage into three tiers: (i) green – activities that improve the environment, (ii) yellow – activities that do no significant harm, and (iii) red – activities that are harmful. The Taxonomy is structured based on the Indonesia Standard Industrial Classification (KBLI).

Thailand: The Bank of Thailand announced in August 2021 that it is working with various stakeholders such as Thailand's Securities Exchange Commission, the Stock Exchange of Thailand, the Fiscal Policy Office, the Office of Insurance Commission, and the finance ministry to develop a green taxonomy to define environmental sustainability for financial assets. There is no timeline for the project.

Philippines: In November 2021, the "Green Force" taskforce co-chaired by the Philippines' Department of Finance and the central bank launched the Sustainable Finance Roadmap, which included a stated focus to develop a principles-based taxonomy to improve the definition of sustainable finance.

Theme 2: TCFD-aligned climate reporting

Malaysia: Financial institutions will be required to provide mandatory climate-related risk disclosures aligned with the TCFD from 2024. In addition, the second edition of the Sustainability Reporting Guide published by the Bursa Malaysia Stock Exchange in 2018 incorporated TCFD recommendations into its voluntary disclosures.

Taiwan: The Financial Supervisory Commission (FSC) released its "Corporate Governance 3.0 Sustainable Development Roadmap" in 2020, including a roadmap for TCFD-aligned disclosures to be mandated for listed companies by 2023 (for FY2022 reporting). The FSC also announced in December 2021 that banks and insurers would be required to provide climate risk disclosures starting from June 2023.

Theme 3: Carbon pricing schemes

We did not identify any material carbon tax or emissions trading schemes in other areas of the region.

Theme 4: Supply chain due diligence and transparency

Thailand: Starting from January 2022, the Securities and Exchange Commission will require 'One Report' disclosures which include supply chain risk considerations.

Theme 5: Corporate ESG disclosures

Malaysia: Listed companies are required to report on the management of material economic, environmental and social (EES) risk and opportunities in their annual reports. A Sustainability Reporting Guide is provided to help guide preparation, leveraging internationally accepted frameworks such as the TCFD, SASB, and GRI.

Thailand: The 'One Report' disclosures starting January 2022 include corporate sustainability strategy, targets, supply chain issues and E&S impact.

Philippines: The Securities and Exchange Commission (SEC) implemented requirements in February 2019 for companies to make sustainability disclosures on a comply or explain basis, which will become mandatory for publicly listed companies by 2023.

Taiwan: Listed companies will be required to disclose in their annual reports metrics relating to GHG emissions, water, waste, workplace injuries, and gender diversity from 2022.

Vietnam: Listed companies are required by the State Securities Commission (SSC) of Vietnam to annually report their environmental and social impact and sustainability objectives. This includes metrics on raw material management, compliance with environmental laws, human capital policies, and community relations.

Indonesia: All listed companies have been required to publish a Sustainability Report since 2020.

Theme 6: ESG fund requirements

Malaysia: In 2017, the Securities Commission Malaysia launched the Guidelines on Sustainable and Responsible Investment Funds (SRI funds) which must be met in order to qualify as an SRI fund. Eligible areas for SRI projects include natural resources, renewable energy, community and economic development and non-profit or charitable properties and assets. The regulation also imposes disclosure and reporting requirements for SRI funds.

Taiwan: In July 2021, the Financial Supervisory Commission (FSC) announced new requirements for ESG funds, notably including a minimum 60% allocation threshold into ESG assets and disclosure requirements to explain how ESG is embedded into the investment process. The new rules were guided by ESG fund disclosure rules set in Hong Kong (*see the Hong Kong section).*

Thailand: A public consultation was launched in 2021 on proposed standards for SRI funds in a bid to tackling greenwashing risks. This includes requirements to embed sustainability considerations into the fund name, investment policy, and investment strategy, and to describe associated risks to the sustainability focus. Additionally, periodic reporting must disclose how the sustainability goals and objectives we achieved and what action the asset manager has taken to achieve the objectives and goals.

ASEAN: In February 2022, the Philippines Securities and Exchange Commission (SEC) launched a consultation for proposed ASEAN Sustainable and Responsible Fund Standards (SRFS) which aim to require ESG funds to periodically disclosure on sustainability objectives, how ESG is integrated into the investment process, and more. The Philippines SEC noted that it will engage with investors in the region to develop technical requirements relating to the composition of ESG funds. No timeline for next stages of development have been provided.

Disclosure Appendix

Reg AC

We, Emma Jones, Keebum Kim, Sharmini Chetwode, Ph.D., Evan Tylenda, CFA, Brian Singer, CFA, Derek R. Bingham, Grace Chen, Brendan Corbett, Madeline Meyer, Rachit Aggarwal, Enrico Chinello, Ph.D. and Michael Hao Wu, CFA, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our coverage universe) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

Growth is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

M&A Rank

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

Disclosures

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Distribution of ratings: See the distribution of ratings disclosure above. **Price chart:** See the price chart, with changes of ratings and price targets in prior periods, above, or, if electronic format or if with respect to multiple companies which are the subject of this report, on the Goldman Sachs website at https://www.gs.com/research/hedge.html.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. **Brazil:** Disclosure information in relation to CVM Resolution n. 20 is available at https://www.gs.com/worldwide/brazil/area/gir/index.html. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Resolution n. 20, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** This information is being provided to you for information purposes only and is not, and under no circumstances should be construed as, an advertisement, offering or solicitation by Goldman Sachs & Co. LLC for purchasers of securities in Canada to trade in any Canadian security. Goldman Sachs & Co. LLC is not registered as a dealer in any jurisdiction in Canada under applicable Canadian securities laws and generally is not permitted to trade in Canadian securities and may be prohibited from selling certain securities and products in certain jurisdictions in Canada. If you wish to trade in any Canadian securities or other products in Canada please contact Goldman Sachs Canada Inc., an affiliate of The Goldman Sachs Group Inc., or another registered Canadian dealer. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. **Singapore:** Goldman Sachs (Singapore) Pte. (Company Number: 198602165W), which is regulated by the Monetary Authority of Singapore, accepts legal responsibility for this research, and should be contacted with respect to any matters arising from, or in connection with, this research. **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union and United Kingdom: Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council (including as that Delegated Regulation is implemented into United Kingdom domestic law and regulation following the United Kingdom's departure from the European Union and the European Economic Area) with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at https://www.gs.com/disclosures/europeanpolicy.html which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Public Communication Channel Goldman Sachs Brazil: 0800 727 5764 and / or contatogoldmanbrasil@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Canal de Comunicação com o Público Goldman Sachs Brasil: 0800 727 5764 e/ou contatogoldmanbrasil@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom.

Effective from the date of the United Kingdom's departure from the European Union and the European Economic Area ("Brexit Day") the following information with respect to distributing entities will apply:

Goldman Sachs International ("GSI"), authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA, has approved this research in connection with its distribution in the United Kingdom.

European Economic Area: GSI, authorised by the PRA and regulated by the FCA and the PRA, disseminates research in the following jurisdictions within the European Economic Area: the Grand Duchy of Luxembourg, Italy, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Norway, the Republic of Finland, the Republic of Cyprus and the Republic of Ireland; GS -Succursale de Paris (Paris branch) which, from Brexit Day, will be authorised by the French Autorité de contrôle prudentiel et de resolution ("ACPR") and regulated by the Autorité de contrôle prudentiel et de resolution and the Autorité des marches financiers ("AMF") disseminates research in France; GSI - Sucursal en España (Madrid branch) authorized in Spain by the Comisión Nacional del Mercado de Valores disseminates research in the Kingdom of Spain; GSI - Sweden Bankfilial (Stockholm branch) is authorized by the SFSA as a "third country branch" in accordance with Chapter 4, Section 4 of the Swedish Securities and Market Act (Sw. lag (2007:528) om värdepappersmarknaden) disseminates research in the Kingdom of Sweden; Goldman Sachs Bank Europe SE ("GSBE") is a credit institution incorporated in Germany and, within the Single Supervisory Mechanism, subject to direct prudential supervision by the European Central Bank and in other respects supervised by German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and Deutsche Bundesbank and disseminates research in the Federal Republic of Germany and those jurisdictions within the European Economic Area where GSI is not authorised to disseminate research and additionally, GSBE, Copenhagen Branch filial af GSBE, Tyskland, supervised by the Danish Financial Authority disseminates research in the Kingdom of Denmark; GSBE - Sucursal en España (Madrid branch) subject (to a limited extent) to local supervision by the Bank of Spain disseminates research in the Kingdom of Spain; GSBE - Succursale Italia (Milan branch) to the relevant applicable extent, subject to local supervision by the Bank of Italy (Banca d'Italia) and the Italian Companies and Exchange Commission (Commissione Nazionale per le Società e la Borsa "Consob") disseminates research in Italy; GSBE - Succursale de Paris (Paris branch), supervised by the AMF and by the ACPR disseminates research in France; and GSBE - Sweden Bankfilial (Stockholm branch), to a limited extent, subject to local supervision by the Swedish Financial Supervisory Authority (Finansinpektionen) disseminates research in the Kingdom of Sweden.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (https://www.sipc.org).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analyst's published price target expectations for such stocks. Any such trading strategies are distinct from and do not affect the analyst's fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage universe as described herein.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at https://www.theocc.com/about/publications/character-risks.jsp and
https://www.fiadocumentation.org/fia/regulatory-disclosures_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018.
Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation

will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by the Global Investment Research division of GS may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to https://research.gs.com.

Disclosure information is also available at https://www.gs.com/research/hedge.html or from Research Compliance, 200 West Street, New York, NY 10282.