Sustainable Stock Exchanges

Action Plan to Make Markets Climate Resilient

How stock exchanges can integrate the TCFD recommendations

Note

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A special thanks is extended to the Co-chairs of the SSE Climate Advisory Group, Ms. Leila Fourie (CEO Johannesburg Stock Exchange) and Mr. David Schwimmer (CEO of the London Stock Exchange Group) and their representatives, Ms. Shameela Soobramoney (Chief Sustainability Officer at the Johannesburg Stock Exchange) and Mr. David Harris (Global Head of Sustainable Finance, Data & Analytics at the London Stock Exchange Group).

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The views expressed in this paper are those of UNCTAD, UN Global Compact, UNEP and the PRI unless otherwise stated; the paper does not necessarily reflect the official views of individual members of the advisory group or their respective organisations.

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About the SSE

The SSE initiative is a UN Partnership Programme organised by UNCTAD, the UN Global Compact, UNEP FI and the PRI. The SSE's mission is to provide a global platform for exploring how exchanges, in collaboration with investors, companies (issuers), regulators, policy makers and relevant international organisations can enhance performance on environmental, social and corporate governance issues and encourage sustainable investment, including the financing of the UN Sustainable Development Goals. The SSE seeks to achieve this mission through an integrated programme of conducting evidence-based policy analysis, facilitating a network and forum for multi-stakeholder consensus-building, and providing technical guidelines, advisory services and training.

PREFACE

In 2015, I was meeting with stock exchange leaders in Paris alongside COP21 to press for more action on green finance. At COP21, the UN Climate Summit, the world witnessed an historic turning point for global climate action, as world leaders came to a consensus on an accord consisting of commitments by 195 nations to combat climate change. This landmark agreement made it clear that reducing global greenhouse gas emissions was a priority for all nations, and it charted a pathway for both developed and developing nations to approach this urgent global challenge.

Looking back at this historic date, the exchange community has made good progress in promoting climate-themed investment products and sustainability reporting among their issuers. Today there are eight times the number of markets with dedicated segments for green bonds as there were in 2015 and six times as many exchanges providing written guidance on sustainability reporting. This is a good start, but the climate challenge the world faces remains enormous.

Carbon dioxide levels in the atmosphere are at record highs and still rising: emissions today are 62% higher than when international climate negotiations began in 1990, and in 2020, the upward trend continued despite the global pandemic. The past decade was the hottest in human history and related extreme weather events are damaging economic growth and human welfare around the world. Simply put, we must do more. All organs of society have a role to play and stock exchanges can make a valuable contribution.

In recent years, we've seen the world's largest companies pledge major emissions reductions. Even in the face of COVID-19, net zero commitments roughly doubled in 2020. The Glasgow Financial Alliance for Net Zero (GFANZ), chaired by Mark Carney, UN Special Envoy on Climate Action and Finance, brings together over 160 firms from the leading net zero initiatives across the financial system. Collectively the GFANZ is responsible for assets in excess of $70 trillion. This includes the Net-Zero Asset Owner Alliance and the Net-Zero Banking Alliance. The Net-Zero Insurance Alliance is under development and expected to be launched at COP26. These efforts represent a step change in the global commitment to accelerate the transition to net zero emissions by 2050 at the latest.

Disclosure plays a key role in this movement. All financial institutions rely on high-quality data to drive the market forward. Sitting at the intersection between issuers, investors, regulators and standard setters, stock exchanges can play a unique role in helping their markets to adopt and implement high-quality climate reporting practices. This is more than providing guidance, it is about taking action to lead by example, influence market participants and ultimately assist the market with a historic transformation. The SSE's Action Plan to Make Markets Climate Resilient provides an important and practical tool to help exchanges integrate climate-related financial disclosures into mainstream business and investment practices.

I thank all of the members of the SSE's Climate Advisory Group that contributed to the development of this Action Plan and encourage all exchanges to start charting their own pathway in support of the Paris Agreement. Special thanks go to Anthony Miller and his SSE team which prepared this important and timely instrument.

James Zhan
Director, Investment and Enterprise Division, UNCTAD
Chair, Governing Board, UN Sustainable Stock Exchanges

MESSAGE FROM THE CO-CHAIRS OF THE ADVISORY GROUP

The industrial transition to a green and net zero emission economy is well underway. This is impacting all sectors of the economy and redefining whole industries. The energy and auto-sector have been in the front-line of this industrial and economic transition and other industries will follow. The finance and investment sector is increasingly re-allocating capital to reflect this transition, moving capital away from companies with inadequate climate strategies and towards both those with clear transition plans and those that operate in green economy industries. It is critical that corporate issuers are able to effectively disclose and communicate their approach to climate, their strategies, how they are managing associated risks and their performance. Investors need high quality globally consistent data to inform their investment strategies and how they allocate capital.

Exchanges play a key role in helping their markets to ensure investors have access to high-quality information that allows them to make informed decisions about companies and their impact on the environment and climate. By supporting comprehensive climate disclosure in each of our respective markets, and supporting issuers to take credible action on climate we improve the quality of our markets and encourage international investment flows.

With this Action Plan, a companion piece to the Model Guidance on Climate Disclosure that the UN Sustainable Stock Exchanges initiative (UN SSE) prepared through working with our advisory group, exchanges are provided with a handbook of ideas and actions that can help us both lead and influence our markets. Together with multi-stakeholder expert input, this Action Plan has been prepared by exchanges, for exchanges.

The Action Plan proposes that exchanges enhance the resiliency of their markets to climate change by considering targeted efforts in five key areas: reporting, communication, risks and opportunities, climate data and the promotion of change. In all areas, we as exchanges can either lead our markets both through exchange-focused activities (i.e. walking the talk) and through influencing our markets by broader market focused initiatives.

Both the SSE Model Guidance on Climate Disclosure and this Action Plan focus on the implementation and integration of the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD), and underwent a three-part consultation process with a 100-member strong expert Advisory Group from around the world, of which our exchanges had the honour to be co-chairs. The guidance and action plan will need to evolve in the future as global standardisation develops. In particular it will need to reflect the work of the IFRS Foundation's International Sustainability Standards Board as it takes up and then builds on TCFD recommendations.

With the UN Climate Conference (COP26) in Glasgow approaching, which, following COP21 in Paris, is the next major climate summit, the urgency to set and finance the trajectory to net zero emissions is felt globally by exchanges and their market participants. This transition represents one of the greatest investment challenges of our times so we encourage our peers to read this Action Plan carefully, adapt it to their unique market circumstances and work together with their stakeholders to create markets that are climate resilient and that remains attractive to international investment flows.

We want to thank the UN SSE who has provided a crucially important platform for the industry to collaborate and drive high quality climate reporting and action globally. We think that together with the Model Guidance on Climate Disclosure, through this Action Plan, the SSE has provided exchanges with the necessary tools to help enhance climate resiliency and better align the trajectory of global emissions towards net-zero. We commend the SSE for its engagement and commitment to work with exchanges to help them be prepared for a greener and more sustainable future.

David Harris
Global Head of Sustainable Finance, Data & Analytics
London Stock Exchange Group

Shameela Soobramoney
Chief Sustainability Officer
Johannesburg Stock Exchange

EXECUTIVE SUMMARY

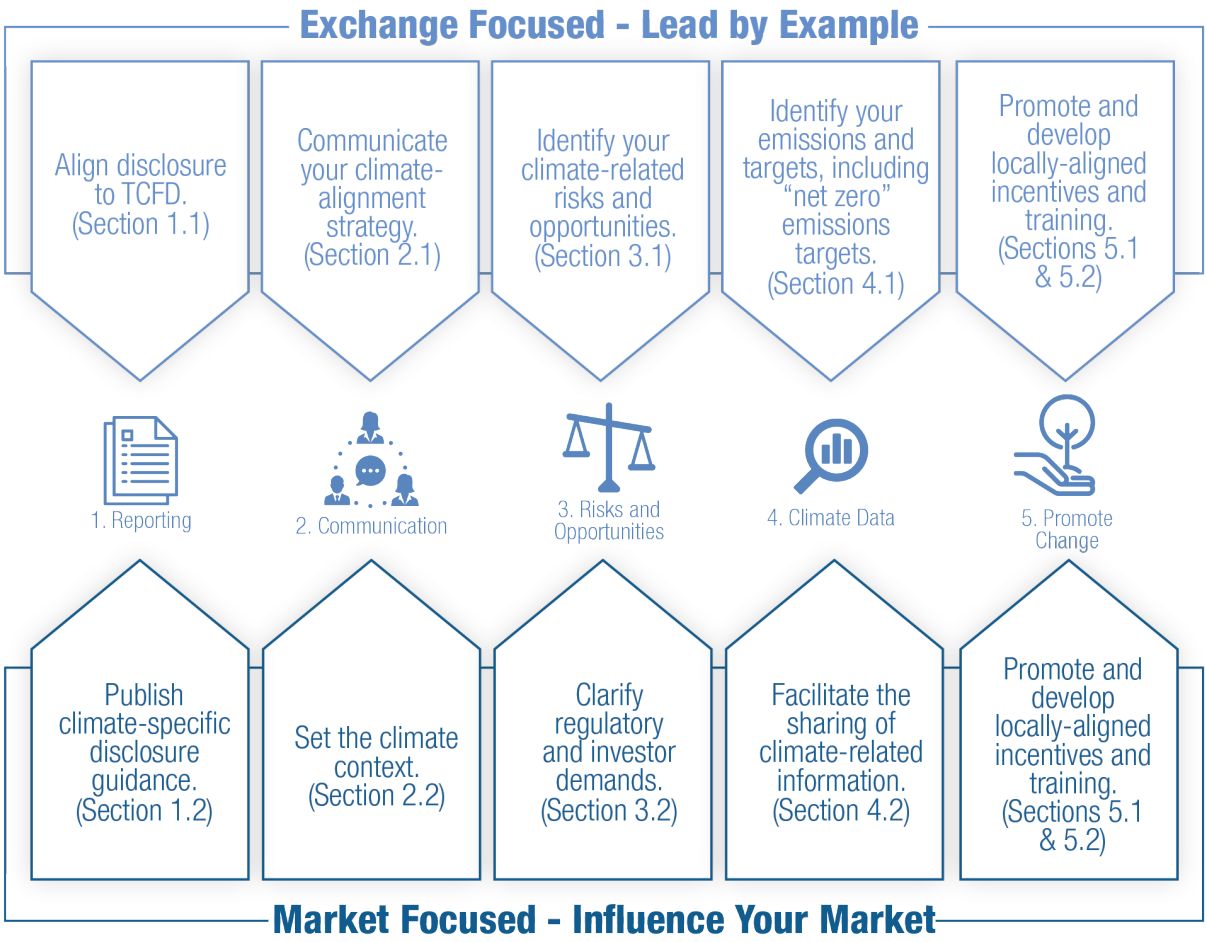
The global economy is undergoing an industrial transition to rapidly decarbonise. This has implications for business and the investment community. Stock exchanges can play an important role in helping their markets navigate this transition. In addition to pressure from policy makers, regulators and civil society, there is growing demand from investors and providers of finance for a move to net-zero emissions and decarbonisation globally. For example, the Glasgow Financial Alliance for Net-Zero (GFANZ) launched in 2021 and Chaired by Mark Carney (UN Special Envoy on Climate Action and Finance), brings together a wide variety of the financial sector industry groups, from banks and asset managers, to asset owners and insurers that are committing to net-zero in their financing and investments. Companies that do not effectively navigate the climate transition and provide adequate disclosure may find that this impacts access to capital and financial services.

To help exchanges lead a transition to more climate-resilient markets using the various tools available to them, this document provides a voluntary practical Action Plan and bespoke guidance on creating climate-resilient markets. Stock exchanges can help their market to mitigate risks associated with climate change, access growing opportunities and help align climate-related disclosures to global standards and best practices to ensure their markets are both efficient and resilient.

The Action Plan in this guidance document has five key action areas through which stock exchanges can both influence their market and lead by example to enhance climate resiliency in their markets. These five action areas (figure 1) are presented in the context of the recommendations of the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD). The Action Plan highlights two streams of activities which focus either on changing the internal operations, disclosure and governance within the stock exchange (leading by example), or on influencing the external market's operations, disclosure and governance practices (being an influencer). This Action Plan is a companion document to the SSE's Model Guidance on Climate Disclosure, and exchanges are encouraged to use them together as they work on making their markets more climate resilient.

Figure 1: SSE Action Plan for making markets climate resilient

Key action areas for exchanges to lead by example and to be market influencers on climate



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I. INTRODUCTION

1. Climate resiliency and the TCFD

The Financial Stability Board (FSB) established the Task Force for Climate-Related Financial Disclosures (TCFD) to develop recommendations for more effective climate-related disclosures. The TCFD is committed to market resiliency through both transparency and stability, based on the belief that better information will allow companies to incorporate climate-related risks and opportunities into their risk management and strategic planning processes. As this occurs, companies' and investors' understanding of the financial implications associated with climate change will grow, empowering the markets to channel investment to sustainable and resilient solutions, opportunities, and business models.

In 2017, the TCFD released climate-related financial disclosure recommendations[1] designed to help companies provide better information to support informed capital allocation, which have become the current best-practice in climate-related disclosures. Since the release of these milestone recommendations, the TCFD has issued a number of status reports, describing the alignment of companies' reporting with the TCFD recommendations. The number of organizations expressing support for the TCFD has grown significantly, spanning across 78 countries. Financial institutions responsible for assets of more than $178 trillion, including the largest asset managers and asset owners in the world, support the TCFD. On the corporate side, support for TCFD has grown to include companies representing more than $20 trillion in market capitalization.

The recommendations are structured around four thematic areas that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets. The thematic areas are intended to interlink and inform each other. A number of reporting frameworks have since mapped their disclosure metrics to the TCFD's thematic areas, recommended disclosures and metrics to ensure a cohesive and consistent global inclusion of climate-related information. It is important to note that the TCFD recommendations are not a reporting framework, but rather a set of recommendations, detailing what information relating to climate and climate-change, listed companies should be reporting in mainstream financial filings and in other reporting formats.

The subsequent Action Plan aims to support stock exchanges as they integrate climate-related disclosure practices into their markets with the end objective of creating more transparent, informed and climate-resilient markets globally. Guidance provided in this document complements more detailed guidelines on the TCFD recommendations in the SSE's Model Guidance on Climate Disclosure.

2. The business case for action

Stock exchanges have an important opportunity to prepare their markets for the growing demand for climate-related information in a systematic and globally consistent manner as is being demanded increasingly by investors and the finance sector. In all markets, stock exchanges find particular value in helping their issuers' attract capital from international or domestic investors by promoting and enhancing climate-related disclosures. As investors and providers of finance increase integration and consideration of climate risks, and many commit to align their portfolios with net-zero emissions, it's essential that companies seeking their capital through markets can provide the climate-related information needed. Stock exchanges can meet investor demands by promoting consistent and comparable reporting practices. In this manner stock exchanges also help ensure climate resiliency of their capital market system to ensure stability, transparency and long-term growth.

Through assisting their home markets to become more climate resilient and better positioned to attract investment, the same business case applies for the exchange itself as a company in that: a) supporting global capital flow inwards to an exchange's issuers also benefits the stock exchange and makes it an attractive listing venue; and b) the stock exchange will also want to be regarded as having an effective climate strategy to support its own access to capital. Regardless of their unique market circumstances domestically, all stock exchanges are encouraged to act now to prepare for changing trends in investment strategies, policy and regulation and legal and reputational risks. The key trends shaping this work are discussed in greater detail in the SSE's Model Guidance on Climate Disclosure.

A. Economic opportunities

Climate change can create substantial opportunities for economies facing deep challenges to renew infrastructure and support sustainable development. The substantial gap between the estimated cost of financing a climate-resilient infrastructure and achieving the SDGs and the available financial resources presents great opportunities for both stock exchanges and the financial system as a whole. Stock exchanges can choose to be at the forefront of these opportunities.

Governments and the private sector will see the sustainability considerations and market demand as an opportunity to bridge the gap between the demand and supply of capital. As the demand of institutional investors for thematic financial products grows, it represents a unique opportunity for some markets to attract capital to much-needed areas. By introducing adequate regulation and policies, governments and financial market regulators can foster sustainable finance and local development, providing investors with the right financial instruments and adequate information to support investment decisions and portfolio allocation. Stock exchanges can get ahead of important opportunities by guiding markets on climate-related disclosure, including the identification of opportunities for specific markets.

[1] https://www.fsb-tcfd.org/recommendations

B. Getting ahead of inevitable change

Climate change poses both risks and opportunities to financial markets as a whole, and stock exchanges have the opportunity to prepare for these changes by creating more resiliency in their markets. The financial impacts related to climate have led investors, policy makers and financial service providers to request additional data from issuers in order to effectively assess risks and to price them in the market. In particular, there are three key trends that indicate a need for accelerated action on climate resiliency: a rapid change in investment trends, new policy and regulation integrating climate-related disclosures, and increased legal and reputational risks related to climate (an expansion of these topics is available in the SSE's Model Guidance on Climate Disclosure, section 1.1 Key trends in Part II).

Stock exchanges can ensure the climate resiliency of their capital market system by providing guidance on climate-related disclosure, which includes updating issuers and investors on climate-related knowledge and updating governance and risk management mechanisms. Taking a proactive approach on climate change and associated disclosure practices offers a number of important benefits to corporations, including:

- Access to capital: Investors and finance providers are shifting capital allocation away from those companies not well positioned on climate and towards those that are. The opportunity is to be agile in the face of market disruption and report this to investors and finance sector participants.
- Competitive advantage: gaining an edge on competitors.
- Regulatory preparedness: getting ahead of likely mandatory climate-related reporting rules.
- Risk and opportunity readiness: identifying emerging environmental risks and opportunities that would otherwise be overlooked, to inform a data-driven strategy.
- Reputation: building trust through transparency and responding to rising environmental concern among the public.
- Targets and progress: benchmarking environmental performance against industry peers and receiving feedback on progress each year.

3. The role of stock exchanges in climate resiliency

Stock exchanges are uniquely positioned to advance climate resiliency in their markets through a series of tools, rooted in their important roles as educator and information gateway for the market. Stock exchanges have the infrastructure, networks and experience to contribute to addressing climate change and many are already doing so. It is recognized that each market will have unique elements regarding the local regulation, codes and standards that may already be in place. However, there is an opportunity to build on these in a manner that helps drive global consistency. Stock exchanges can play an influential role, through two equally important key mechanisms: being a market influencer and leading by example.

A. Lead by example

Stock exchanges are looked at as having the most up-to-date information of local and global market circumstances and can lead their market through widespread transitions. Due to the important guiding voice they have in the marketplace, stock exchanges should first consider their own organisational activities and behavior before or while guiding their market - particularly those exchanges that are listed themselves. This not only provides an important signal to the market, but it also helps the exchange to develop its own internal knowledge base on the topic and an understanding of the process that issuers will also undergo.

Stock exchanges can use the guidance in this Action Plan to lead by example and act internally within the exchange through the following activities:

- ☐ Align your disclosure with the TCFD (Part II, section 1.1).
- ☐ Communicate your climate-alignment strategy (Part II, section 2.1).
- ☐ Identify your climate-related risks and opportunities (Part II, section 3.1).
- ☐ Identify your emissions and targets, including net-zero emission targets (Part II, section 4.1).
- ☐ Promote and develop locally-aligned incentives and training (Part II, section 5.1 & 5.2).

B. Be a market influencer

Stock exchanges are increasingly seen as key influencers and educators on new trends, regulation, investor demands and national objectives. In particular, stock exchanges have played an important role in recent years in updating markets on new disclosure standards and voluntary best practices. At the time of publication, more than half of global stock exchanges were providing guidance on ESG disclosure, along with a number of other disclosure-related tools such as training and listing rules.

Stock exchanges can use the guidance in this Action Plan to be an influencer in their market through the following activities:

- Publish climate-specific disclosure guidance (Part II, section 1.2).
- Set the climate context (Part II, section 2.2).
- Clarify regulatory and investor demands (Part II, section 3.2).
- Facilitate the sharing of climate-related information (Part II, section 4.2).
- Promote and develop locally-aligned incentives and training (Part II, section 5.1 & 5.2).

4. How to use this guidance

This practical Action Plan provides stock exchanges with a number of voluntary activities they may wish to implement to lead by example and to be a market influencer on climate. The guidance in the Action Plan highlights five key action areas where stock exchanges are best placed to facilitate climate resiliency in their markets in alignment with the TCFD. The example activities proposed in this Action Plan are voluntary and are aimed to help exchanges to learn from. Exchanges can consider implementing these specific activities or adapting them at their discretion based on their unique market circumstances.

For those exchanges at the beginning of their climate-resiliency journey, this Action Plan can be used to help systematically engage with the areas needed for developing consistent and useful guidance in their market. For those exchanges that have already started this process, they are encouraged to focus on the areas they feel need further reinforcement and use this guidance to evaluate and enhance their current efforts. While many exchanges work first on inward changes, leading their market by example as a first step before taking on an outward focus as an influencer, the voluntary actions in this Action Plan can be implemented in any order.

Stock exchanges will find a number of tools throughout this Action Plan to help them support their market's climate resiliency, but should note that the tools and activities listed in this guidance are not exhaustive. Stock exchanges are encouraged to build their own activities unique to their market. Working together with capital market regulators, stock exchanges have a key role in guiding climate resiliency and creating markets capable of absorbing shocks and benefiting from climate-related opportunities. For additional support, stock exchanges are encouraged to contact the SSE secretariat directly.

The examples included in this report are not endorsed by the United Nations SSE initiative or its partners, but are shared to inspire ideas that stock exchanges may wish to adapt to their own market. These examples are meant for learning purposes only, and may not suit all markets. Exchanges and their regulators should evaluate the conditions and requirements of their markets, and are encouraged to adapt the following examples and guidelines to best fit their market conditions.

II. ACTION PLAN FOR CLIMATE RESILIENCY

1. Reporting

1.1 Align disclosure to TCFD

Given the leadership role that exchanges hold in their market, it is recommended that all stock exchanges commit to aligning their own reporting practices to the TCFD recommendations, especially if they are listed. When integrating TCFD recommendations for the first time, stock exchanges can make use of a number of resources in this document as well as the guidance in the accompanying document "Model Guidance on Climate Disclosure". Since stock exchanges are a unique financial services provider, the SSE together with its Advisory Group, has developed a list of recommended disclosures adapted from the TCFD recommendations to help ensure that stock exchanges can easily identify the appropriate information to disclose for report readers (annex 2). Stock exchanges are encouraged to use this list of recommendations to ensure their reporting aligns with the TCFD's recommendations. For information that the exchange decides not to disclose, commentary on why and if appropriate when the exchange plans to report on that particular information should be included in the exchange's public reports.

At the time of publication a number of stock exchanges had noted that they were in the process of aligning their current reporting procedures to the TCFD recommendations, but few had been identified as having published using the TCFD recommendations. For examples of different formats being used at the time of publication, see **Deutsche Börse,[2] Japan Stock Exchange Group,[3] London Stock Exchange Group[4] and Nasdaq[5].** Despite few exchanges explicitly referencing the TCFD Recommendations in their own disclosures, a number of exchanges have been including much of the climate-related financial information recommended by the TCFD, and are now starting to identify how to present this information and identify TCFD-aligned data within their reports. Disclosures on greenhouse gas emissions (GHG), for example, are already a part of the disclosure procedures and targets set by a number of exchanges (see section 4.1).

1.1.1 Governance and strategy

Users of climate-related financial disclosures are interested in understanding the role an organization's board and leadership play in overseeing climate-related issues as well as management's role in assessing and managing those issues. Such information supports evaluations of whether climate-related issues receive appropriate board and management attention. Good governance should intrinsically include climate governance. However, since climate data can be both new and complex, boards may require additional mechanisms to grapple with the scientific, macroeconomic and political uncertainty of climate change. Some board members may want access to further advice and information on climate risks and the role of the board. A useful resource is Chapter Zero, a global network aimed at supporting non-executive directors navigating climate risk. Exchanges should explain in their disclosure how climate is addressed and what governance mechanisms ensure its integration into strategy and risk assessments (see examples 1.1 - 1.3).

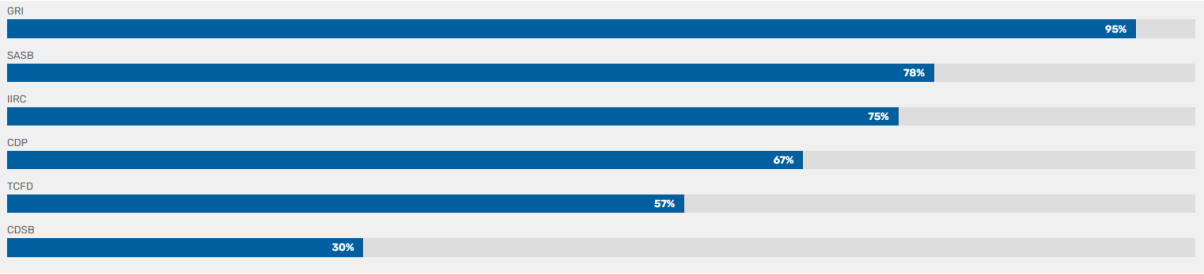
For example, **HKEX's** board of directors and senior management are accountable for ensuring the relevance and effectiveness of their sustainability and climate strategy through its corporate social responsibility sub-committee. The sub-committee monitors key trends as well as environmental laws or regulations that would have a material impact on the Group. There is also a dedicated team to act as a coordinator and central hub for execution, communications and reporting of group-wide initiatives such as its "Go Green with HKEX" campaign launched in 2020 to raise environmental awareness across its workplace and the broader community.[6]

1.2 Publish climate-specific disclosure guidance

In 2015 the SSE launched its Model Guidance on ESG Disclosure to help stock exchanges guide their market on ESG reporting. Since this launch, it has found that the majority of stock exchanges now guide their markets on non-financial reporting and choose to indicate more than one framework companies may wish to use. At the time of publication, the SSE's database of stock exchange guidance on ESG reporting found that more than 75% of guidance documents referenced three or more frameworks, with GRI (91%), SASB (75%), TCFD (73%), and IIRC (66%) being the most referenced (figure 1.1).

[2]Deutsche Börse published its climate strategy according to the TCFD as a stand-alone document titled "Climate strategy of Deutsche Börse Group according to the TCFD recommendations"
[3]Japan Stock Exchange Group has referenced in their 2020 Annual Report on page 67 their sustainability initiatives disclosed in line with the TCFD Recommendations.
[4]Pages 56-57 of the LSEG Group Sustainability Report 2020
[5]Nasdaq's 2020 TCFD Report
[6]HKEX 2020 Corporate Social Responsibility Committee Report.

Figure 1.1: Reporting instruments referenced in stock exchange guidance documents



Source: SSE database

Many exchanges (more than half of those tracked by the SSE) provide guidance on ESG reporting for their markets. While some aspects of the TCFD recommendations will likely already be covered in ESG guidance, climate-related disclosure warrant additional guidance. Exchanges will want to make clear to their market how guidance on climate-related disclosures fits within the broader guidance provided on ESG disclosure. While it remains highly important that stock exchanges continue to guide and educate their markets on sustainability reporting more broadly, climate-related disclosure aligned with the TCFD recommendations is unique and warrants additional guidance from stock exchanges for five key reasons:

1. **Capital reallocation by the investor and finance community:** Climate risk is regarded as a priority by the investment community and there is an urgent need from investors for better climate data to influence their investment strategies and portfolio allocations. Many are making net zero emissions commitments with respect to their investment portfolios. If stock exchanges do not act quickly to prepare their markets, both investors and issuers may not only be unprepared but will also miss out on the opportunities this movement presents.
2. **Global standard and global policy focus:** The TCFD recommendations ultimately come from the Financial Stability Board and unlike many ESG themes, provide a clear single global framework for reporting. It is now forming the basis of further regulatory developments and standards formation with IOSCO, IFRS and national regulators in a growing number of countries.
3. **Location of disclosure:** Climate-related disclosure as defined by the TCFD recommendations are financial disclosures which should primarily appear in mainstream financial filings. While other ESG data may already be included by issuers in their mainstream financial reports, the TCFD emphasizes the importance that markets understand the financial impact of climate change and climate resiliency. An important aspect of guidance on TCFD and climate-resiliency is helping companies to determine which information should appear in core financial reporting and which information could be provided in supplementary reporting.
4. **Scientific support and urgency for action:** Climate-resiliency is indeed one part of the broader ESG disclosure agenda and the scientific community is extremely clear that there is only a short window for rapid global action to avoid likely disastrous outcomes for societies globally. This has major implications for the economy and hence there is also a focus on scenarios that help issuers, investors and countries to prepare for the future in a strategic way. As such, climate risk is regarded as a priority by the investment community and there is an urgent need from investors for better climate data to influence their investment strategies and portfolio allocations. Many are making net zero emission commitments with respect to their investment portfolios.
5. **Global impact:** Climate change is a global challenge that is described by the TCFD as a "non-diversifiable risk," which affects nearly all sectors and therefore many investors believe it requires special attention. Climate change knows no borders and globally all people will experience both negative impacts of a changing climate as well as opportunities presented by the transition to low carbon economies. Therefore, it is essential that stock exchanges bring a global perspective to their markets on climate-resiliency and contribute to the collective movement for consistent disclosures with the end objective of creating more transparent, informed and climate-resilient markets globally.

For these reasons, it is recommended that stock exchanges provide their markets with climate-specific guidance for mainstream financial disclosures. They may wish to do this through stand-alone supplemental guidance for which they can use the SSE Model Guidance on Climate Disclosure as a template, or by expanding their current ESG guidance through the introduction of a chapter or section specifically focused on climate. For example, since July 2020, **HKEX** has introduced the requirement to disclose the impacts of significant climate-related issues and the actions taken to manage such issues in the ESG reports of listed companies. To facilitate market's understanding on climate-related disclosures, HKEX updated its step-by-step guide "How to prepare an ESG report" and launched e-trainings to assist and provide guidance to listed companies. In addition, as part of its ongoing commitment to promote quality ESG reporting, HKEX reviews ESG reports from selected issuers and publishes the review findings to provide insight and guidance to issuers on the possible improvement areas on which to focus in their approach to assessing ESG-related risks and when preparing ESG reports.

The TCFD framework explicitly states that material climate risks should be disclosed in financial filings, and doing so is essential if climate change is to be truly integrated into business strategy. However, many current TCFD reports are being issued as stand-alone documents or as part of sustainability reports. Indeed, in some regions, it is not uncommon for a firm with a detailed TCFD report to make little or no mention of climate in its regulatory filings. Exchanges have a crucial role to play in helping to correct this through guidance to their market (see the SSE's Model Guidance on Climate Disclosure and examples 1.4 and 1.5).

EXAMPLES

Examples of Leading

Example 1.1: Deutsche Börse climate governance overview

Source: Page 2 of Climate strategy of Deutsche Börse Group according to the TCFD recommendations

Example 1.2: JPX's sustainability initiatives disclosed in line with the TCFD recommendations

Governance/ Risk Management	JPX has established a Sustainability Committee, headed by the Group CEO, and is progressing with analysis of the impact of ESG issues, including climate change, on the company's business and how to respond to those issues. In FY2019, the Risk Policy Committee included discussion on climate change within the process of identifying "significant risks" which are addressed by JPX Group as a priority. The Committee reported the results of this discussion to the Board of Directors.
Strategy	JPX is currently studying and discussing the possible impact of climate change on its business over the medium to long term. As part of the Medium-Term Management Plan update carried out for FY2020, we revised our core strategies based on the importance of sustainability issues including climate change.

Source: Page 67 of JPX Report 2020

EXAMPLES

Example 1.3: London Stock Exchange TCFD Governance Disclosure

TCFD recommended disclosures	LSEG Approach	2020 Enhancements	References
Governance			
a. Information on LSEG's governance around climate-related risks and opportunities: Board's oversight	• LSEG Board has oversight of the Group Sustainability Policy, which includes our Environmental Policy; • The Group CEO sponsors the Group Sustainability Policy at Board level • The Group COO reports to the Board on environmental matters	• Board Risk Committee presented with clearly identified non-financial risk framework as part of Group ERM, including climate-related risks	• Group Sustainability Policy • LSEG Sustainability Report 2020: Environment section, pages 22–25 and 42–48 • Risk section of the Annual Report, pages 24–39 • LSEG Sustainability Report 2020, Governance section, page 35 • LSEG Annual Report 2020, Supporting Sustainable Growth section, pages 54–67
b. Growth section, pages 54–67 Information on LSEG's governance around climate-related risks and opportunities: Management's role	• Group Sustainability Committee is chaired by Executive Committee member • The EMG is responsible for setting Group-wide targets, and managing and seeking to improve our environmental performance	• There are two dimensions to our sustainability strategy. Our first pillar is described as "Transforming the global financial eco-system" this is about how we work across the market to support the shift to a net-zero sustainable economy. Our second pillar is described as "Transforming our operations and culture while supporting the wider community" – this includes our people, our communities and our environmental impacts	
Strategy			
a. Climate-related risks and opportunities identified over the short, medium and long term:	• There is a Group approach on climate-related risks and is reported through The Group Sustainability Committee – The process is managed by Risk and has been supported by an independent external consultancy, to define and model how climate change impacts our businesses and operations	• The Group is developing climate-related risk quantification models over both the medium and longer term to help identify how physical and transition risks may impact our business	• LSEG Sustainability Report 2020 : Environment section,pages 22–25 and 42–48 • FTSE Russell Green Revenues data model • Strategy section of the Annual Report, pages 14–23 • For scenario analysis, see risk section of the Sustainability Report, pages 36 and 50 • LSEG Annual Report 2020, Supporting Sustainable Growth, pages 54–67
b. Impacts of climate-related risks and opportunities on LSEG's business, strategy and financial planning	• Our EMG guides the Group's environmental strategy, and is responsible for setting Group-wide targets, managing and seeking to improve our environmental performance	• Group Risk has worked with an independent external consultancy to develop a Climate risk and opportunities heatmap and a preliminary quantitative methodology in order to quantify the financial impact on LSEG's business and support and inform future investment and business' decision making	
c. Resilience of the organization's strategy based on scenario analysis	• We have been working on developing quantification models to identify the most material physical and transition risks for the business, including our operations	• Climate Change risks and opportunities qualitative and quantitative heatmaps completed • Preliminary quantification models completed for Operations and one business unit	

Source: Page 56 of LSEG Group Sustainability Report 2020

EXAMPLES

Examples of Influencing

Example 1.4: JPX launches Japanese translation of TCFD implementation guide

On October 10, 2019, to mark the publication of a Japanese translation of the Sustainability Accounting Standards Board (SASB) and Climate Disclosure Standard Board's (CDSB) "TCFD Implementation Guide", Japan Exchange Group, Inc. held a seminar to introduce and explain the guide to it's listed companies.

Topics included recent developments in disclosure abroad, and how the guide can be helpful to Japanese companies in particular. The seminar was attended by around 270 ESG professionals and others from Japanese listed companies.

Source: JPX

Example 1.5: HKEX includes chapter on climate-related risks to ESG Reporting Guide

Understanding climate-related risks

Climate change-related impacts present financial risks to many, if not all sectors, in which our issuers operate. As such, companies need to consider their actions today in light of how financial risks from climate change may evolve in the future. Under the framework provided by the TCFD Recommendations, financial risks from climate change can arise from two primary channels or "risk factors": physical and transition[3].

Physical risks

Physical risks resulting from climate change can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for companies, such as direct damage to assets and indirect impacts from supply chain disruption.

Acute risks	Chronic risks
Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as super typhoons, floods, extreme temperature fluctuations.	Chronic physical risks refer to longer-term shifts in climate patterns (e.g. sustained higher temperatures) that may cause sea level rise or chronic heat waves.

Companies' financial performance may also be affected by changes in water availability, sourcing and quality; food security; and extreme temperature changes affecting the company's premises, operations, supply chain, transport needs, and employee safety.

Transition risks

Transitioning to a lower-carbon economy may entail extensive policy, legal, technological, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to companies.

Policy and legal risks	Technology risks
Potential climate-related regulation and policy changes, such as the adoption of energy-efficiency requirements, as well as increased exposure to legal risks may impact operational costs and product demand.	Development and use of emerging technologies may increase production and distribution costs, and reduce the company's competitiveness.

Market risks	Reputation risks
Supply and demand for certain commodities, products and services may change as climate-related risks and opportunities are increasingly taken into account.	A company's reputation may be impacted due to changing customer or community perceptions of said company's contribution to or detraction from the transition to a lower-carbon economy.

TCFD Recommendations

Issuers may refer to the TCFD Recommendations for guidance on identifying and disclosing the potential financial impacts of climate-related risks and opportunities on their businesses.

What are the TCFD Recommendations?

The TCFD Recommendations focus on helping companies identify and disclose the potential financial impacts of climate-related risks and opportunities on their businesses under four thematic areas:

- Governance - the company's governance around climate-related risks and opportunities.
- Strategy - the actual and potential impacts of climate-related risks and opportunities on the company's businesses, strategy, and financial planning where such information is material.
- Risk Management - how the company identifies, assesses, and manages climate-related risks.
- Metrics and Targets - the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Scenario analysis

The purpose of scenario analysis[4] is to explore alternatives that may significantly alter the basis of "business-as-usual" assumptions. The TCFD Recommendations advocate scenario analysis as an important and useful tool for companies to assess the potential business implications of climate-related risks and opportunities, and for informing stakeholders about how companies are positioning themselves in light of these risks and opportunities.

This kind of analysis will be helpful for issuers to improve disclosure of decision-useful, climate-related financial information.

Tips

Companies may include scenario analysis into their strategic planning and/or enterprise risk management processes by:

- Identifying and defining a range of scenarios, including a 2°C scenario, that provide a reasonable diversity of potential future climate states.
- Evaluating the potential resiliency of their strategic plans to a range of scenarios.
- Using this assessment, enabling the identification of options for increasing the company's strategic and business resiliency to plausible climate-related risks and opportunities through adjustments to strategic and financial plans.

Source: Page 3-5 of HKEX "How to Prepare an ESG Report" (March 2020)

EXAMPLES

2. Communication

2.1 Communicate your climate-alignment strategy

Stock exchanges are encouraged to set the stage for their market by communicating their support for TCFD and showing support from their leadership. By publicly declaring support for the TCFD and its recommendations, exchanges demonstrate that they are taking action to build a more resilient financial system through climate-related disclosure. They can do this by visiting the TCFD supporter page, and completing the "Statement of Support" form. A TCFD representative will reach out in response if they have further questions or if they need to confirm information. Stock exchanges have a strong and important voice in the market and an introduction or foreword to a new guidance on climate-related disclosures enables the exchange to state their position and to show their support for TCFD (see examples 2.1 and 2.2). As of May 2021, 32 stock exchanges were official supporters of the TCFD.[7]

When developing a communications plan, it is important for stock exchanges to determine who their key stakeholders are. They may wish to conduct a stakeholder analysis which will allow them to consider who their key stakeholders are and how they are coordinating with them on the issue of climate change. These likely include regulatory authorities, policy makers, issuers and investors (institutional and private). A stakeholder analysis is a process of identifying these people before the project begins, grouping them according to their levels of participation, interest, and influence in the project, and determining how best to involve and communicate with each of these stakeholder groups throughout.

Stock exchanges should consider both their upstream and downstream stakeholders, evaluating the needs of both investors and issuers, as well as all other relevant stakeholders in their market and region. For example, in markets where there is a significant portion of listed companies in fossil fuel industries, stakeholders of this sector should be included, such as civil society groups, companies servicing those industries, regulatory authorities, and relevant government ministries. The objective of a stakeholder analysis is to first cast the widest net possible of potentially relevant stakeholders, and then analyze to what extent they may influence a particular project (such as climate-related initiatives).

It is also important that stock exchanges keep their board involved in their climate-resiliency plans and therefore governance plays an important role in climate communication strategies (see section 1.1.1). The first step in initiating a conversation with your board may be the proposal of launching guidance on climate-related disclosures (for which you can use the accompanying SSE Model Guidance on Climate Disclosure) and by supporting the TCFD recommendations.

2.2 Set the climate context

As the linchpin of capital market systems, stock exchanges are ideally placed to communicate developing trends and changing demands together with key contextual information to the market. While many exchanges provide education on climate-related topics, it is also important that issuers and investors are a part of the dynamic conversation relating to climate resiliency. As such, stock exchanges should consider communication through various channels to ensure market participants are aware of the current context and the demand for greater climate disclosure and resilience (see examples 2.3 and 2.4).

Engaging market participants in this conversation can be achieved by providing facts, announcing accomplishments and awards, sharing educational tools or promoting leaders on climate-resilience. Additionally, stock exchanges should engage their peers in this conversation, and partnerships can support a dialogue on climate. Climate change is a global issue and requires an internationally united solution. Many exchanges have found opportunities in partnering both for training as well as market development related to climate. For example, **Luxembourg Stock Exchange** signed a memorandum of cooperation with **Shanghai Stock Exchange** and **Shenzhen Stock Exchange** to start the green bond information sharing channel, and a similar agreement with the Santiago Exchange.

[7]To see which stock exchanges have officially supported the TCFD, visit https://www.fsb-tcfd.org/supporters/ and use the industry filter to select "stock exchange".

Examples of leading

Example 2.1: JPX news release supporting TCFD

"Oct. 29, 2018 JPX
JPX Expresses Support for TCFD

Today, JPX expressed its support for the Task Force on Climate-related Financial Disclosures (TCFD) under the Financial Stability Board (FSB).

TCFD, a private-sector-driven task force established in 2015 in response to a request from G20 Finance Ministers and Central Bank Governors Meeting, had deliberated on recommendations and reports regarding climate-related financial disclosure. In June 2017, TCFD released the final report whose aim is that individual financial institutions and business corporations will seize and disclose financial impacts of the risks and opportunities presented by climate change. As of September 2018, 513 entities around the world, including financial institutions, enterprises, governments, and international organizations, have shown their support for TCFD.

JPX has actively promoted ESG investment initiatives through such measures as formulating Japan's Corporate Governance Code, offering ESG-related indices and ETFs, launching an infrastructure fund market, and establishing an information platform for green and social bonds. As other relevant entities in Japan also promote initiatives for facilitating sustainability, JPX will be committed to continued promotion of ESG investment through its support for TCFD."

Source: JPX

Example 2.2: Stock exchanges supporting TCFD - a list of quotes from leadership

Bolsa de Comercio de Santiago
"One of the strategic objectives of Santiago Exchange, the largest stock exchange in Chile, is to contribute to the development of a fair, competitive, orderly and transparent capital market, where best international practices are incorporated, thus facilitating participation of different stakeholders, and good decision making by investors. In this context, the Exchange supports and shares the principles of the TCFD on improving the delivery of information related to climate change, its impacts and risks for the market, assuming the commitment to update its guidance for the construction of sustainability reports with these principles."
– José Antonio Martínez, Chief Executive Officer, Bolsa de Comercio de Santiago

The Egyptian Exchange
"The Egyptian Exchange (EGX) is proud to be one of the pioneering exchanges in promoting sustainability, governance, and environmental related disclosures evidenced by the issuance of the first ESG index in the region in 2010 by EGX. As a continuum to EGX efforts, we are pleased to announce supporting the recommendations of the Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures (TCFD), believing that enhanced transparency and disclosures of climate-related issues will provide an opportune chance for issuers and investors to actively participate in achieving the Sustainable Development Goals (SDGs) announced by the United Nations (UN)."
– Mohamed Farid Saleh, Executive Chairman, The Egyptian Exchange

Hong Kong Exchanges and Clearing Limited
"Climate-related financial disclosure is of paramount importance for transparent and sustainable capital markets. At HKEX, we are committed to engaging our stakeholders, including the investor community and listed issuers, to understand and address climate change through ongoing efforts. We are delighted to be a TCFD supporter and join the global community to raise the awareness of climate change impacts and facilitate the understanding of climate-related risks and opportunities to build a resilient financial system."
– Laura M Cha, Chairman, Hong Kong Exchanges and Clearing Limited

Singapore Exchange
"A well-functioning market relies on the transparent flow of quality information. As the world progresses, disclosures need to address evolving issues of global importance including climate change. SGX is delighted to support the extensive work done by the Task Force on Climate-related Financial Disclosures (TCFD). The recommendations provide guidance for understanding of companies' climate-related risks, and ultimately create conditions for better informed markets, more accurate pricing and greater financial stability."
– Loh Boon Chye, Chief Executive Officer, Singapore Exchange

Source: TCFD (Support Quotes)

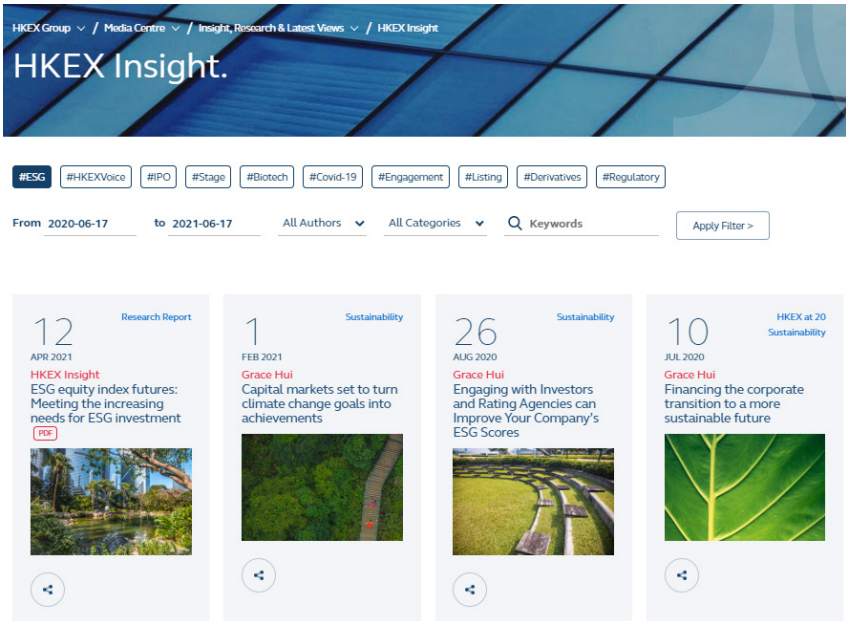
EXAMPLES

Examples of influencing

Example 2.3: Stock exchange social media posts setting the context for climate-resilience

Source: LSEG Twitter Account (tweet from 16 February 2021), Mexican Stock Exchange Twitter Account (tweet from 17 April 2021), SGX Facebook Account (post from 9 April 2021), Luxembourg Stock Exchange Linkedin Account (post from 15 April 2021), HKEX LinkedIn Account (post from 22 April 2021).

Example 2.4: HKEX Insight #ESG and #Stage filter helps market participants find information related to environmental, social and governance topics



Source: HKEX Insight

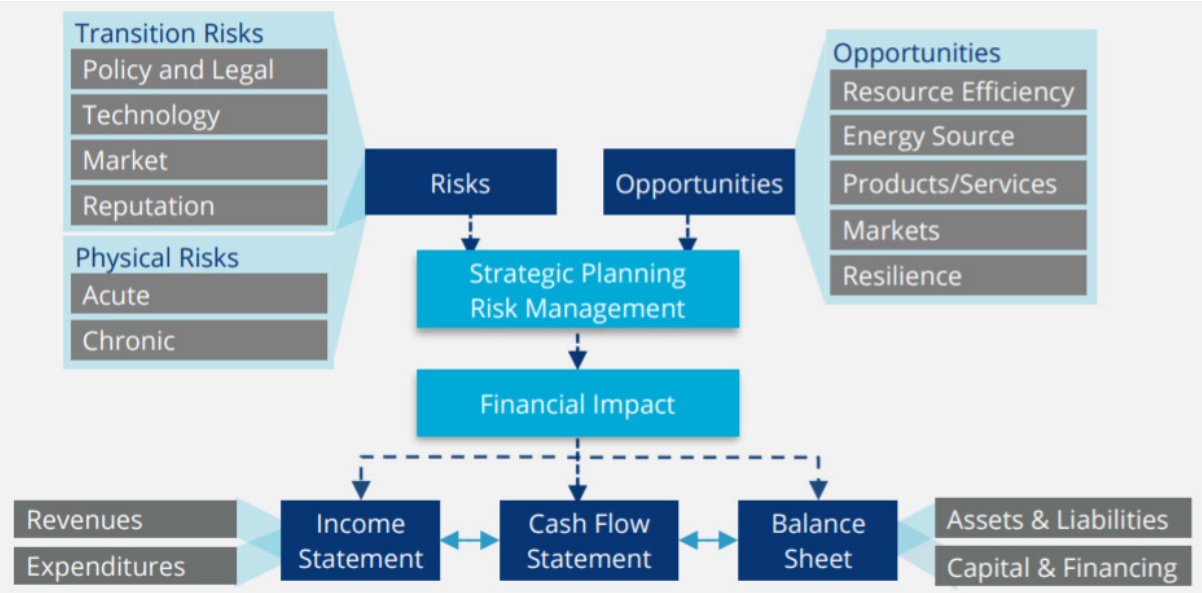
3 Risks and opportunities

3.1 Identify your climate-related risks and opportunities

It is in the interest of the stock exchange to be aware of all broad risks and opportunities within its market, and those in relation to the main listed sectors. In addition, stock exchanges have a unique position that exposes them to systemic market wide climate risk. A mapping exercise to identify key risks and opportunities can not only help the exchange itself improve its resiliency, but by publishing the results, it will help market participants update their own risk analysis and management procedures and ensure they are aware of relevant opportunities in the market (see figure 3.1 for an overview of risks and opportunities exchanges should consider). For example, by identifying opportunities in new financial products such as green bonds, the stock exchange is identifying a financing opportunity for its entire market.

Stock exchanges have a number of climate-related opportunities related to either the development of new markets that are climate-aligned such as listings in green industry segments (such as renewables, energy storage, and low carbon mobility), green bonds, climate-related indices and associated ETFs, or internal opportunities related to resource efficiency. Consider what green opportunities are untapped in your market or in your organization and how you could further develop these markets. The Task Force in its work evaluating risks related to climate found two key categories: 1) risks related to the climate transition to a lower-carbon economy and 2) risks related to the physical impacts of climate change.By sharing the results of this exercise with the market, the stock exchange can facilitate the identification of climate-aligned opportunities market-wide (see examples 3.1-3.6). Annex 1 provides a table of opportunities and risks identified for stock exchanges that can help exchanges to start their own risk and opportunity analysis, but they are encouraged to deepen this analysis based on their unique circumstances.

Figure 3.1: TCFD's mapping of climate risks and opportunities



Source: Page 8 of the TCFD Recommendations

3.1.1 Conduct scenario analysis

Scenarios are hypothetical constructs that consider how the future might look if certain trends continue or certain conditions are met. For example, while governments have agreed upon the target of limiting global average temperature rise to well below 2°C, preferably to 1.5°C above pre-industrial levels, corporations should consider the impact on their business in the scenario that this target is met, or not. Scenario analysis should evaluate an organization's resilience to a range of plausible alternative scenarios. This analysis can be qualitative, relying on descriptive narratives, quantitative, relying on numerical models, or some combination of both (see examples 3.7 and 3.8).

It is advisable to determine national objectives the market operates under as these may have a significant impact on the scenarios chosen. Most countries have promulgated Nationally Determined Contributions (NDCs) under the Paris Agreement that outline their intended pathway to achieve the Paris Agreement goals. While not scenarios per se, they provide indications of temperature and emissions targets and related policy that countries are pursuing. NDCs are refreshed every five years in accordance with the Paris Agreement. Current NDCs, however, fail to achieve a 2°C temperature goal, so exchanges sshould understand NDC pathways as well as their limitations.

To conduct a scenario analysis, the following three simple steps can be followed (for more detailed information on scenario analysis see the SSE Model Guidance on Climate Disclosure):

1. **Identify appropriate scenarios** - Exchanges can choose to use "out-of-the-box" scenarios or to develop their own. In either case, they should choose the scenarios that align with their underlying assumptions and vision and the scenarios used should be clearly explained. It is also important that exchanges recognize the importance of consistent and comparable disclosures in their market and globally. Stock exchanges may wish to coordinate with their regulator or national government to determine the most appropriate scenario for their market. Scenarios aim to evaluate a company's resilience to what 'may' happen, therefore, more than one scenario will help identify resilience in the various possible futures.
2. **Set the boundaries of your scenario analysis** - Before conducting a scenario analysis, it is often recommended to determine how far that analysis will extend. For stock exchanges, it is recommended that they take into consideration how their selected scenarios will play out not only for themselves, but also for their key stakeholders, the main listing sectors, key investment groups and regulator and policy stakeholders.
3. **Analyze both transitional and physical risks within the scenarios chosen** - The final step is to identify how the opportunities and risks identified in each scenario will impact the exchange. This exercise is similar to that conducted previously through the mapping of risks and opportunities, but within the context of the scenarios chosen. Mapping the impact and likelihood of the risks and opportunities enables the organization to develop a strategic plan for future scenarios.

3.2 Clarify regulatory and investor demands

As issuers enhance their disclosure of climate-related risk and opportunity management, stock exchanges can play a particularly vital role in helping issuers determine what information to disclose publicly and where. While many issuers may already be integrating climate-related risks and opportunities into governance and strategy procedures, they require support in determining what aspects should be disclosed to investors, and what disclosures are required by local regulations and laws.

3.2.1 Regulatory requirements

Whether climate-related disclosure is mandated within a market or not, issuers require guidance on what is expected from them legally, and what they may choose to disclose voluntarily. Exchanges can play a key role in clarifying these requirements, or work with the appropriate authorities to do so (examples 3.9 and 3.11). Where stock exchanges are updating listing requirements, training and guidance is often used to help markets adjust to new requirements. For example, **Singapore Exchange (SGX)** introduced sustainability reporting requirements on a comply or explain basis in 2016. To help companies navigate this requirement they set up a resource page on their website that includes the regulatory requirements, guidance on getting started, and resources such as global reporting frameworks and a sustainability reporting guide. This information is located within the regulation section of their website.

If stock exchanges are contributing to the development of new requirements with their regulatory authorities, they should keep in mind the importance of consistency among companies both domestically and globally. Where new regulation is introduced, exchanges can help amplify its impact by working with all companies, encouraging those that fall outside the mandate to also comply. For example, in India, the market regulator **SEBI** requires the top 100 listed companies to submit a "Business Responsibility Report" in line with the 'National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business (NVGs). While the regulation applied only to the top 100 issuers, the two stock exchanges in India - **NSE and BSE** - encourage those not in the top 100 to also report. The **Nigerian Exchange (NGX)** also adopts a similar approach where companies listed on its Premium Board are required to publish annual sustainability reports in line with the exchange's sustainability disclosure guidelines. Whilst this requirement does not apply to companies listed on its Main and Growth Boards, **NGX** encourages these companies to publish their sustainability reports and supports them through various capacity development initiatives.

The TCFD makes the recommendation that climate-related financial disclosures be included in mainstream financial filings. Not only does this provide a more informed evaluation of issuers by investors, but it aligns the timing with a reporting cycle already familiar to the company. For both climate-specific and broader ESG disclosures, investors are asking for information that is consistent, clear and comparable. When reporting, exchanges should encourage listed companies to pay attention to the accuracy of data reported, comparability and consistency of the information in alignment with global reporting standards such as CDP, CDSB, GRI, IIRC or SASB, adapted to the local context as needed. Reporting should, if not integrated into the firm's annual report, align with the annual reporting cycle to ensure timeliness of disclosure.

For example, while **Euronext** exchanges do not mandate that all ESG-related information be included in mainstream financial filings, they do give recommendations for timing in their ESG reporting guidance. Euronext states: "If sustainability disclosure is separate from financial disclosure, it is recommended that the two types of disclosure are published for the same reporting period. This will allow investors to consider financial information within the context of ESG information. Cross-references within these documents ensure connectivity and accessibility of information."

If there is already regulation stating who is required to report additional information pertaining to climate and other non-financial details, this should be stated clearly by the exchange. In addition, and in markets where no regulation stipulates who should disclose climate-related information, exchanges should also indicate the fiduciary duties and how climate-related disclosures may be related to these duties. Once the regulatory requirements of listed companies are clarified, exchanges and regulators are encouraged to indicate if voluntary measures or training and education will target a particular section of the market. In addition to providing requirements domestically, exchanges may also wish to provide global examples of best practice for harmonization of regulations or to create an incentive for those issuers looking to attract international investment.

For example, the **Securities and Exchange Commission (SEC) of Thailand** issued revised disclosure requirements for listed companies on 1 September 2020 to enhance ESG disclosure. Among other things, all listed companies are required to disclose topics regarding carbon emission on a mandatory basis. However, the degree of disclosure remains based on a comply or explain approach since it is at the early stage of development. Moreover, it also encourages companies to consider climate-related risks when analysing their business risks. These new requirements will become effective for listed companies' reports as of 31 December 2021 (filing in 2022) and for IPO filing in 2021 onwards. This change in regulation, however, was also paired with online training courses for listed companies and a seminar for financial advisors with partners such as Thailand Greenhouse Gas Management Organization to further incentivize compliance.

Similarly, **HKEX's** latest upgrade of its ESG guide which came into effect on 1 July 2020 introduced a new requirement, among others, that issuers are required to report significant climate-related issues, on a "comply or explain" basis. This includes any issues which have impacted and may impact the issuer together with the actions taken to manage them in their annual ESG reports. Issuers are also required to set targets in respect of emissions, wastes, energy and water efficiency. To facilitate issuers' understanding of the new requirements, HKEX has updated its step-by-step guide "How to prepare an ESG report" and launched an e-training course, "Exchange's new ESG requirements" which covers six topics, namely, the exchange's new ESG requirements, board governance, reporting principles and boundaries, setting targets, and climate change and social KPIs.

3.2.2 Investor demands

In addition to understanding what information is required and what may be voluntarily disclosed, it is important that report preparers and report users understand each other's needs. From an issuer's position, they should understand that investors are looking for information on how a company is positioning itself strategically in light of its climate-related risks and opportunities. Investors frequently indicate that climate-related risks and opportunities have a significant impact on their investment decisions. In a 2019 TCFD survey, investors rated information on the resiliency of a company's strategy and how its strategy might be affected by or changed to address potential climate related issues as very useful.[8]

Companies reporting on climate should be aware that investors are looking for information that gives them confidence that companies are on top of climate-related issues. They may therefore wish to include non-material issues as well as those found to be material. In order to ensure that the efforts put in by report preparers have the desired impact in informing shareholders of the climate-resiliency of listed companies, information should be shared in both the format and including the content that investors are looking for and understand. To further ensure that issuers in your market are meeting the needs of their key investors, consider creating the space (physically or virtually) in order to enable a dialogue between investors and issuers on climate-related disclosure (see example 3.10). This will both incentivize issuers to report on climate-related information, but also ensure that the information reported is useful to investors.

Stock exchanges are natural facilitators of the investor-issuer exchange. There are numerous ways that stock exchanges can ensure sufficient dialogue is taking place between these two sides of the market, enabling more effective, efficient, and decision-useful disclosures (examples 3.9 - 3.11). For example, in 2017, **Borsa Italiana** launched its Italian Sustainability Day which allows for an annual dialogue between issuers and investors on material environmental, social and governance (ESG) issues. The annual event features one-to-one meetings between issuers and investors organized by the exchange to give market participants the opportunity to learn more about ESG risks and opportunities at the company level. Additionally, the **Shanghai Stock Exchange's** ESG webinar, "Dialogue with International Investors: ESG Capacity Building for Listed Companies," brought together senior managers of listed companies, global institutional investors and industry experts to share views and thoughts on China's ESG development and how ESG can help listed companies achieve high-quality development. The webinar also provided listed companies with an opportunity to inform the investors of their good practices in ESG. As another example, in alignment with the UAE's SDGs 2030 and Dubai's Strategic Plan 2021, **Dubai Financial Market** (DFM) and the Dubai International Financial Centre (DIFC) launched the Dubai Sustainable Finance Working Group with various stakeholders to coordinate efforts to create a sustainable financial hub.

[8]See Table A5-5 in Appendix 5 in the 2020 TCFD Status Report

EXAMPLES

Examples of leading

Example 3.1: Deutsche Börse AG's climate-related opportunities and risks

	Opportunities	Risks
Overarching opportunities and risks	Tapping new markets as a consequence of increased regulation or changed market preferences	■ Legislation /regulation ■ Reputation ■ Market position / competitiveness
Pre-IPO and listing	■ World's leading hub for IPO's of 2-degree-compatible companies ■ Promotion of (young) companies at the interface between finance and climate technology / data (Climate-Tech Hub)	
Trading	■ Platform to transfer climate-related risks ■ Segment for 2-degree-compatible investments (segments for funds, shares…) ■ Platform for emissions allowances trading (as market-based mechanisms to combat climate change)	Regulatory risks
Clearing	Since new investments come along with high default risks, EEX transacts those through clearing houses	
Settlement	■ ICDS settlement and custody volumes benefit indirectly from the LuxSE Green Exchange via issuance in the international market (XS ISIN) ■ Take-up by other listing venues, and Xetra could increase volumes	■ Outright competition with LuxSE by Xetra could damage the relationship between ClearStream and LuxSE ■ Issuance shift to CBF (lower fees) and other listing venues (using other CSDs) could reduce ICSD revenues
Custody	The European Commission's High Level Expert Group on sustainable finance recommended EU-wide label for green investment funds and European standard for green bonds could both be used to attract AuC	■ Failure of one of more market participants or issuers as a result of extreme climatic events ■ Issuance shift to CBF (lower fees) or other listing venues (using other CSBs) could reduce ICSD revenues)
Collateral and liquidity management	Inclusion of climate risks in risk management	Depreciation of collateral
Market data	■ Increasing market transparency ■ Increasing security	
Indices	■ Increasing visibility ■ Depiction of a 2-degree-compatibile economy	
Technology	Innovative products and services in response to changing markets (facilitating transformation to low-carbon economies, e.g. Wind Power Futures, PPAs, Trade Registration of Guarantees of Origin)	

Source: Page 4-5 of the Climate strategy of Deutsche Börse Group according to the TCFD recommendations

Example 3.2: London Stock Exchange Group's risk and opportunity analysis and climate risks description and mitigation overview

Significance and relevance of climate-impact

No	VL	L	M	H	VH

Risk/ Opportunity area	Risk/Opportunity sub areas	Operations	Business Functions			
			Information services	Post Trade services LCH	Capital markets	Technology services
Transition	Policy and legal risk	M 1	M	L	H 5	L
	Market and economy risk	VL	M 3	L	M 3	L
	Technology risk	M 1	L	L	L	L
	Reputational risk	VL	M 6	M 6	M 6	M 6
Physical	Acute physical risk	H 2	VL	L	VL	VL
	Chronic physical risk	M 2	VL	L	VL	VL
Opportunity	Resource efficiency	M	VL	L	VL	VL
	Energy efficiency	M	VL	L	VL	VL
	Product and service efficiency	No	H 4	L	H 4	L
	Market opportunity	No	L	L	M 7	L

1. Medium transition risk to the operations of the business with stronger carbon regulations and greater technology risk such as energy efficiency measures.
2. Physical risk is most material at an operational level but will have knock-on impacts for each of the business functions.
3. Medium market risks to capital markets and information services given trends towards a greater climate focused risk or investors switching benchmark if LSEG doesn't have the capability or ambition to include a climate aspect on the benchmark.
4. The most material opportunities exist within information services where there are opportunities to develop low carbon indexes and capital markets business units where there are opportunities to promote green products.
5. High regulatory risk to capital markets as greater disclose requirements may discourage companies from listing altogether.
6. Reputational risk is relevant at a Group level and therefore impacts all business units.
7. Market opportunities to capitalise on new structure of business within the economy.

Source: Page 50 of LSEG Sustainability Report 2020

LSEG climate-related risk description and mitigation

Risk Description	Mitigation	Risk Trend
Climate-related risk Executive Lead: Group Sustainability Committee International organisations, governments and regulators are focused on integrating climate risks and opportunities into investment decision making, to enable transition to a low carbon economy. This is an area of emerging and wide-ranging policy making, impacting financial market participants and corporates. The increased focus from regulators, investors and other stakeholders, has generated a requirement for enhanced climate-related risk oversight. Climate-related risks include Transition risks (e.g. Regulation and Litigation risks) and Physical Risks. To further align with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations, the Group has developed some preliminary quantification models to facilitate the risk assessment of climate related risks stemming from the Climate Scenarios previously selected.	We support consistent global standards and encourage continued alignment between the EU and UK on sustainable finance. We have been members of the EU High Level Expert Group and the Technical Expert Group, and the FCA/PRA Climate Financial Risk Forum. To further align with the TCFD recommendations, the Group has developed climate-related risks scenarios over both the medium and longer term, and how these may impact credit, operational, market and liquidity risks. In line with increased disclosure requirements for corporations and financial markets participants, LSEG has taken proactive steps to develop its methodology to define and model how climate change impacts its businesses. The aim is to reinforce the Group's resilience to acute physical risks today and chronic physical risks in the future, and to address transition risks, to be aligned with the TCFD recommendations, be prepared for potential future mandatory reporting requirements and to protect the Group's reputation.	Emerging Risk

Risk Description	Mitigation	Risk Trend
The two models currently developed cover Physical Risks for Operations and Transition Risks for one of the Group's business units. The Operations model developed has focused on three main pathways, namely the impact of climate events on our operations and resultant foregone revenue, the business disruption and repair costs for uninsurable buildings and equipment and the rising insurance costs. The associated preliminary output of the quantification of the financial risk for our Operations ranges between the probable values of £395,000 and £690,000 of likelihood weighted annual costs before mitigation over the next 10 to 30 years for the Group prior to the Transaction. With respect to this, it is acknowledged that climate-related risks are inherently linked to other strategic, financial and operational risks, as well as commercial opportunities. Please see also Supporting Sustainable Growth on pages 54–67 for details regarding sustainability.	See the TCFD disclosures section under Supporting Sustainable Growth for more information. From the review of published climate scenarios, IEA WEO SDS and IEA WEO SPS were selected for transition risk, and for physical risk, SSP 2 RCP 4.5 and SSP 5 RCP 8.5 were considered as most appropriate. These scenarios cover a <2 degree and 3-4 degree scenario, over both the medium term (2025-2035 for transition risks) and longer term (2030-2050 for physical risks). Looking ahead, we plan to continue to integrate climate risk into our existing risk management frameworks, use and further improve the new Operations model to inform future strategic decisions and footprint planification, and develop further quantification models and climate risk assessment tools for the other Business Units and for the new Group following the Transaction.	Emerging Risk

Source: Page 39 of LSEG's 2020 Annual Report

Example 3.3: Nasdaq's risk and opportunity analysis

Risks		
Classification	**Relevant Risks**	**Time Horizon**
Transition: **Policy & Legal**	**Increased pricing of GHG emissions** The introduction of mandatory carbon pricing or increases in costs of mandatory carbon pricing in regions where Nasdaq operates, may result in increased operating or compliance costs.	Long-Term
	Enhanced climate reporting obligations Enhanced public company reporting obligations may result in a decrease in new listings or increase in de-listings, which may adversely affect Nasdaq's business, financial condition and operating results.	Medium-Term
Transition: **Technology**	**Costs to transition to lower emissions technology** Costs borne by emissions intensive listed companies and business customers, research & development, capital investments, and adoption and deployment of new technologies, may result in reduced demand for Nasdaq's products and services.	Long-Term
Transition: **Market**	**Changing customer behaviors** Shifts in customer behavior may reduce demand for any services that are not aligned with global climate goals, or alter revenue mix and sources, which may result in decreased revenues.	Medium-Term
	Increased costs of raw materials This may result in the re-pricing of assets for Nasdaq's listed companies operating in certain sectors (e.g. fossil fuel reserves, land valuations, securities valuations), or potentially an increase in bankruptcy of listed companies.	Long-Term
Transition: **Reputation**	**Increased stakeholder concern or negative stakeholder feedback, shifts in consumer preferences, sectoral stigmatization, and uncertainty in market signals** These factors may result in reduced investor appetite and reduction in capital availability, as well as reduced revenue from goods and services, from decreased production capacity (e.g. delayed planning approvals and supply chain interruptions), and from negative impacts on workforce management and planning (e.g. employee attraction and retention).	Long-Term
Physical: **Acute**	**Increased severity of extreme weather events** Extreme weather events, such as hurricanes, and floods could directly result in increased costs for adaptation measures or repairs, or decreased revenues due to disruptions to Nasdaq's business operations. Nasdaq might also be indirectly affected by acute risks due to event-driven impacts across the value chain, such as disruptions to suppliers, listed companies, or business customers.	Long-Term

Opportunities		
Classification	**Relevant Opportunities**	**Time Horizon**
Products & Services	**Shift in consumer preferences** Increased demand for ESG related products and services could result in increased revenue from these growing business opportunities, and increased trust from clients and investors.	Short-Term
Resource Efficiency	**Reduced operating and procurement costs from resource efficiency gains** By continuing to operate more efficiently, Nasdaq could reduce operating costs across its offices and data centers.	Medium-Term
	Adapt our resource needs for our workforce As we pursue greater resource efficiency across our real estate portfolio and incorporate the lessons of the COVID-19 pandemic, our climate risk analysis also provides opportunities to continue to right size our physical footprint—focusing on the optimization of space to meet business needs and facilitate home working solutions. This optimization may reduce fixed asset costs and increase our resilience in the event of direct disruptions to our business.	Long-Term
Energy Source	**Use of lower emissions sources of energy** By pursuing the procurement of 100% renewable electricity across our offices and data centers, we may reduce exposure to future fossil fuel price increases and fuel costs as the price of renewable energy decreases over time.	Medium-Term
Reputation	**Climate leadership commitments and memberships** Committing to and achieving our climate ambitions, including Science Based Targets and transparency through reporting and disclosure, may bolster Nasdaq's reputation as a climate-focused organization.	Short-Term
Resilience	**Engagement of market on climate risks and disclosure** Encouraging listed companies and customers to better evaluate, benchmark and minimize their climate exposure may increase market stability and valuations due to more widespread resilience planning.	Long-Term

Source: Page 6,7 and 9 of Nasdaq's 2020 TCFD Report

Example 3.4: Singapore Exchange's assessment of climate change as a key ESG risk

Our ESG Risks and Opportunities

Where we have assessed the impact of our ESG risks and opportunities to be material, we have addressed them below:

Risks

Human Resource Risks

People are our key asset. Talent attraction and retention are crucial in Singapore's highly competitive financial market. Our talent and retention strategy ensures SGX remains an attractive place to work.

Amid the COVID-19 pandemic, we ensured that the workplace continues to be a safe environment for staff. We implemented numerous measures to prevent the potential spread of the virus, and enabled staff to work from home.

Technology Risks

Ensuring that we provide reliable technological platforms is critical to business continuity. Any technology-related disruption will not only cripple our operations, but may also sustain a wider negative social impact, particularly to the investment community. To address this, we continuously review and enhance our recovery capabilities, processes and procedures to manage any crisis. In today's digital society, the risk of disruptions due to cyber-attacks is a reality. SGX is committed to putting in place safeguards to predict and prevent cyber-attacks on our platforms.

Climate Change Risks

As a small island state, Singapore is vulnerable to rising sea levels and other features of climate change. Although SGX's environmental footprint is small, we manage it prudently, guided by our Environmental Policy.

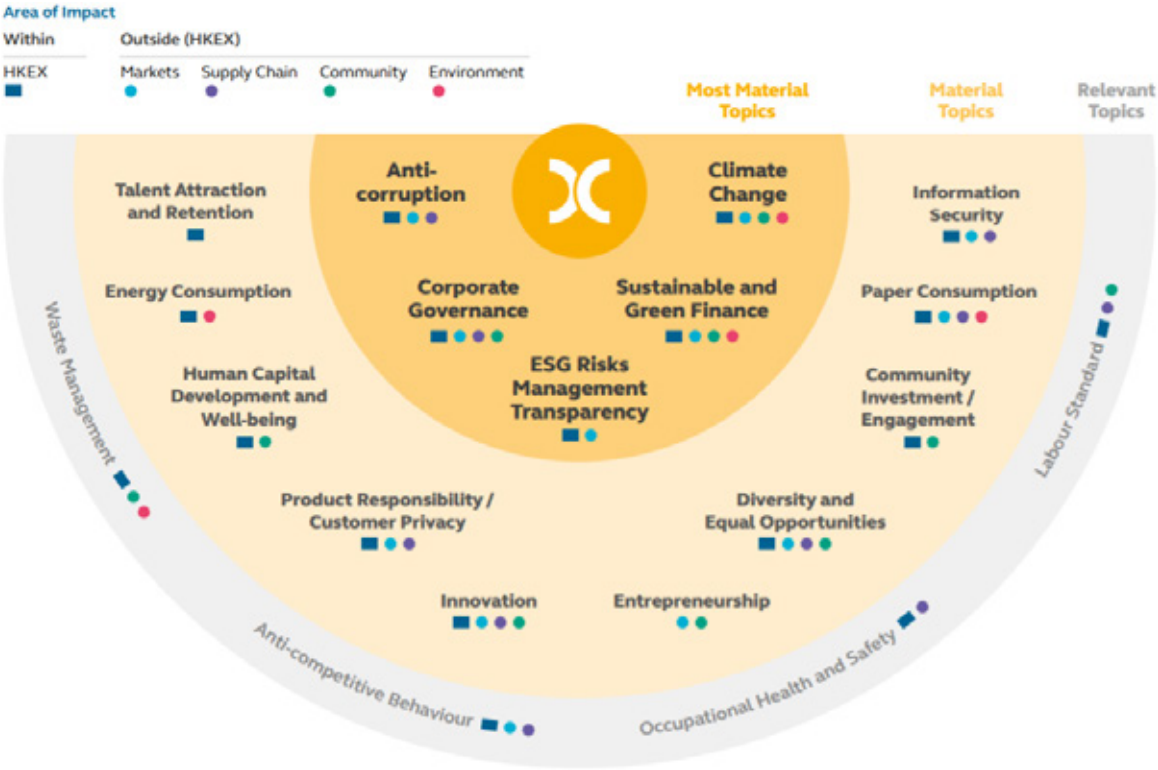
In the short term, we will monitor, manage and offset our electricity usage, and keep abreast of developments in climate change and environmental issues. We will also assist listed companies by guiding them on their ESG reporting efforts.

In the longer term, our product development strategy will consider the establishment of climate-related products and services.

Source: Page 40 of SGX's Annual Report 2020

EXAMPLES

Example 3.5: HKEX materiality mapping indicates alignment of impact both within the exchange as well as outside of the exchange



Source: Page 17 of HKEX's CSR Report 2020

Example 3.6: Euronext identifies five material impact areas supporting the United Nations SDGs, including climate

Source: Page 8 of Euronext Brochure Empowering Sustainable Growth

Example 3.7: LSEG Scenario Selection

Physical risks

Scenarios and timeframes	~2 degree warming scenario	~4 degree warming scenario
Scenarios for financial impact analysis used	IPCC SSP245	IPCC SSP585
Timeframes considered	2030 & 2050	2030 & 2050

Transition risks and opportunities

Scenarios and timeframes	~2 degree warming scenario	~4 degree warming scenario
Scenarios for financial impact analysis used	IEA Sustainable Development Scenario (SDS)	IEA WEO Stated Policies Scenario (SPS)
Timeframes considered	2025 & 2035	2025 & 2035

Source: Page 36 of LSEG's Group Sustainability Report 2020

Example 3.8: Nasdaq's physical and transition risk analysis

Physical Risk -

Physical risks under RCP 8.5		% FTEs by region with significant long-term exposure to respective hazard			Resilience Measures & Approach
		Americas	EMEA	APAC	
Acute Sudden and severe event-driven climate impacts	Riverine floods	0%	0%	0%	Existing and planned riverine flood defense adaptation measures in major cities where Nasdaq has a physical presence.
	Hurricanes and tropical storms	0%	0%	2%	Storm-centric building design and retrofits, remote working capabilities, procurement of backup energy sources.
Chronic Impacts due to long-term shifts in average weather patterns	Heat stress	0%	0%	64%	Focus on energy efficiency and minimum performance standards for HVAC in heat-stressed areas.
	Water stress	24%	0%	36%	Efficient water systems to reduce demand and commodity price exposure. Energy-efficient cooling systems and data center design.
	Sea level rise	0%	0%	0%	Existing and planned coastal flood defense adaptation measures and proactive real estate planning and lease due diligence.

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Transition Risk -

Transition Category	Exposure Type		Resilience Measures & Approach
	Direct	Indirect	
Policy & Legal	Long term annual cost of emissions <1% of 2020 net income attributable to Nasdaq[1]	Costs of purchased goods & services, listed companies and business customers	Nasdaq's commitment to set Science-Based Targets for reducing our emissions will help minimize the direct impact of policy changes that increase the costs of greenhouse gas emissions. Our customer and supplier focused sustainability efforts aim to minimize our indirect exposure to carbon pricing risks in the value chain.
Technology	Operating and capital costs of data centers and offices	Emissions intensive listed companies and business customers	Nasdaq's sustainable leasing strategy helps reduce office space requirements, seeks to ensure energy-efficient office spaces, and procurement of renewable electricity to seek to minimize our direct exposure to technology risks. We also select data center operators with ISO Certifications, renewable energy offerings, and sound sustainability policies.
Market	Revenue from Nasdaq products and services	Emissions intensive listed companies and business customers	Nasdaq's ESG-focused marketplace solutions such as Nasdaq Sustainable Debt Markets, OneReport, and Nasdaq Sustainable Bond Network, aim to capture the increased financial sector market appetite for ESG related products and services. Similarly, by supporting the ESG progress of our customers we aim to minimize our indirect exposure to market risks.
Reputation	Revenue from Nasdaq's business customers	All listed companies and business companies that are vulnerable to climate risks.	Nasdaq's commitment to leading the shift towards more sustainable and inclusive capital markets via ESG product and service offerings aims to mitigate possible reputational concerns our stakeholders may have, which could lead to reduced interest in Nasdaq's offerings.

Source: Page 12 and 13 of Nasdaq's 2020 TCFD Report

Examples of influencing

Example 3.9: HKEX participates in steering group to align disclosure requirements with TCFD recommendations

HKEX is one of the members of the Hong Kong Green and Sustainable Finance Cross-Agency Steering Group which was established in May 2020 with an aim to coordinate the management of climate and environmental risks to the financial sector, accelerate the growth of green and sustainable finance in Hong Kong and support the Government's climate strategies. In December 2020, the Steering Group launched its Strategic Plan and agreed to implement five near-term action points in supporting the sustainable finance development, in which HKEX will have a key role to play. One of the action points is to make climate-related disclosures aligned with the TCFD recommendations mandatory across relevant sectors no later than 2025.

Source: HKEX

Example 3.10: Japan TCFD Consortium

JPX works with Japanese listed companies, investors and regulators to promote the use of TCFD via the TCFD Consortium which was set up in May 2019. The TCFD Consortium mainly consists of a general meeting, a planning committee, a working group (WG) (information disclosure WG, information utilization WG) and a round table. Member companies participate in the general meeting, and as a result of discussions at the WG, important matters such as sharing and revision of the rules are decided. The Planning Committee is a place where the Planning Committee members discuss the activity policies of the TCFD Consortium.

The WG will be held for all member companies. The Information Disclosure WG will discuss effective information disclosure. In July 2020, we formulated " TCFD Guidance 2.0 ". On the other hand, the Information Utilization WG will discuss how to utilize the disclosed

information. In October 2019, we formulated the " Green Investment Guidance ". In addition, we hold a round table as a place for small groups to exchange opinions between investors and business companies. The secretariat also provides information on TCFD.

Source: https://tcfd-consortium.jp/

Example 3.11: SGX uses regulator's column of media centre to inform issuers on TCFD

Climate Change and Sustainability Disclosure: Why We Must Start

12 Dec 2017 I Category: Regulator's Column

Companies are currently facing disruption from technological innovation but there is another disruptive force which is all around you: climate change. The increasing focus on climate change has resulted in calls for a transition to a lower-carbon economy. While this directly impacts companies in more obvious sectors – such as energy, transportation, construction and agriculture – it will also affect most economic sectors and industries.

It is therefore unsurprising then that four Singapore-listed companies have voiced their support for the final recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) established by the Financial Stability Board straightaway, namely CDL, Olam, Singtel and SGX. Significantly, DBS, Singapore's largest bank, on 12 December 2017 joined these companies and other global financial institutions in endorsing these recommendations, underscoring the impact of this new perspective on Singapore companies.

Why the TCFD recommendations matter

The TCFD's four widely adoptable recommendations[1] allow companies to provide specific climate-related disclosures in their financial filings. The disclosures are on governance, strategy (including a +2°C scenario), risk management and targets and metrics. They were formulated in answer to the need for climate change considerations to be incorporated into financial and business decisions.

The recommendations represent market solutions agreed by reporting companies, investors and financial institutions – those who produce and use the information. In signing on to this initiative, banks, insurers, asset owners and asset managers will require their clients and investee companies to make climate-related disclosures, in order to satisfy their own sustainability processes and their TCFD commitments to in turn make disclosures to their clients.

For listed companies to tap into capital, whether debt or equity, they will need to meet the expectations of the financial community. Using the TCFD recommendations would enable companies to effectively address questions on how climate change imparts financial risks and opportunities to their businesses and how they are responding, now and for the future. All companies need to assess their climate opportunities and risks periodically as they do for the rest of their businesses, although not all may identify material matters. This exercise dovetails with what companies are already expected to do when reporting on sustainability. Many companies have been voluntarily reporting sustainability for several years. To them, the taxonomy of TCFD recommendations is familiar and some have been progressing along the route outlined by TCFD. Adopting TCFD recommendations, like the rest of sustainability, is a journey. Companies can adopt some recommendations now, and share their plans and timelines, charting their way forward.

Conclusion

As appreciation of the impact of climate change grows, consumer preferences will change, technologies will develop and alternatives will rise. Governments will respond with new regulations. These trends will impact bottom lines, and companies will need to overhaul their business models to varying degrees to maintain relevance and competitiveness.

Climate change ultimately affects a company's financial viability and investors, lenders and insurers are therefore placing increasing importance on how companies are dealing with climate-related risks and opportunities. DBS is the first Singapore bank to embrace the TCFD recommendations and it certainly will not be the last.Consistent with this trend, mandatory sustainability reporting was introduced in 2016 for Singapore-listed companies, and the first reports under that requirement will be published in 2018.

SGX is committed to assisting our listed companies in their sustainability reporting journey. The TCFD recommendations on climate-related financial disclosures contribute to a more comprehensive understanding of financial investments. We will be including these recommendations within existing guidance as additional resources for companies when they have implemented the current reporting requirements.

Michael Tang (Head of Listing Policy & Product Admission)

Source: SGX Media Center's Regulator's Column post from 12 December 2017
[1] https://www.fsb-tcfd.org/publications/final-recommendations-report/

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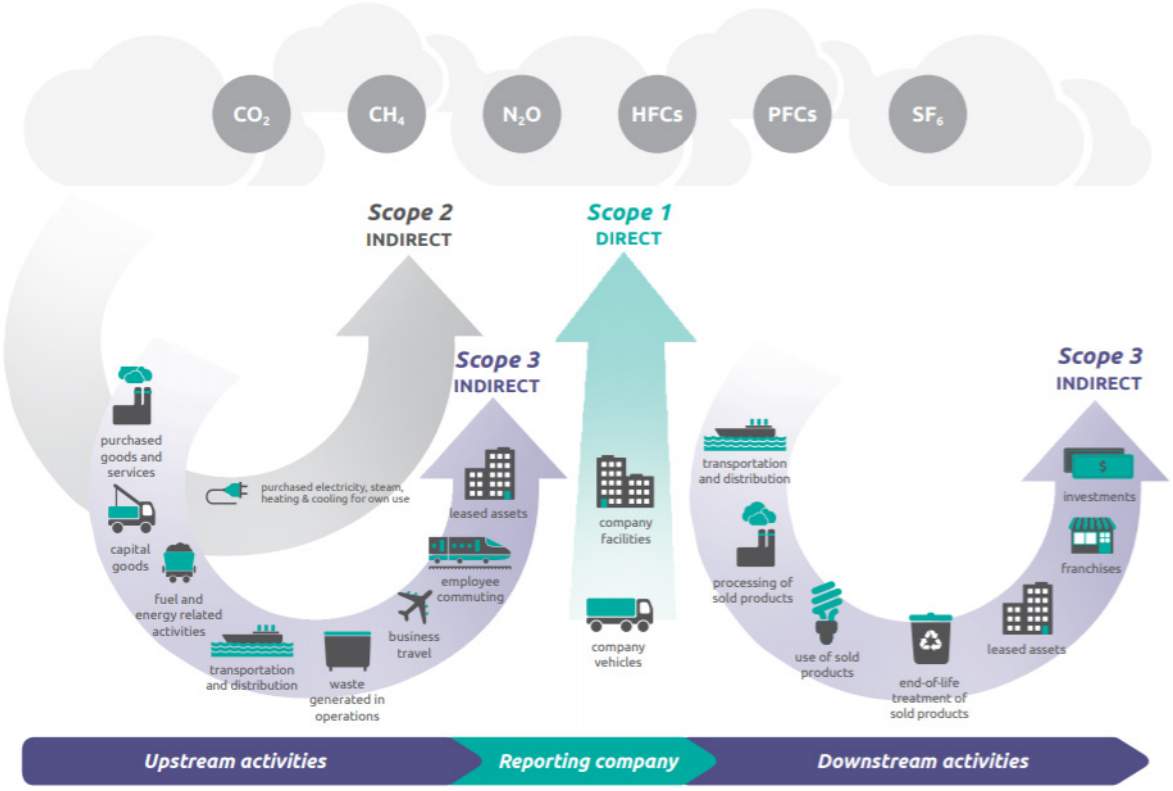
4 Climate data

4.1 Identify your emissions and targets

Carbon reporting (examples 4.1 and 4.2) is short-hand for CO2 equivalent greenhouse gas emissions (GHG's) in order to standardise into one metric the combined climate impact in carbon equivalent units for the measurement of the release of all gases linked to the greenhouse effect and climate change. Also having been referred to as carbon footprinting, this activity looks to measure what amount of these gases an organization is responsible for through a system which classifies emissions as scope 1, 2 or 3, depending on the source of the emissions (figure 4.1). As per the GHG Protocol Corporate Accounting and Reporting Standard[9], scope 1, 2 and 3 emissions can be broadly understood as:

1. **Scope 1 (Direct GHG emissions):** Emissions that occur from sources that are owned or controlled by the company. For example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.
2. **Scope 2 (Electricity indirect GHG emissions):** Emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.
3. **Scope 3 (Other indirect GHG emissions):** Emissions that are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; business travel and employee commuting, and use of sold products and services. For stock exchanges, scope 3 emissions will include business travel (emissions of means of transport).

Figure 4.1: Overview of GHG Protocol scopes and emissions across the value chain



Source: Greenhouse Gas Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting Standard, 2011

A number of stock exchanges already report their emissions, providing both past values as well as future objectives (examples 4.1 and 4.2). For example, **Euronext** began publishing its carbon footprint (scope, 1, 2 and 3) in its 2019 Financial Report,[10] which not only informs investors of its climate-related data but creates a source of knowledge within the exchange, enabling it to help other listed companies to follow their lead. As another example, the **Shanghai Stock Exchange** has been releasing its own social responsibility reports since 201. They show the exchange's continuous efforts to encourage market participants to promote sustainable development and report its own organizational behaviour. Although Shanghai Stock Exchange is not a listed company, it publishes its own sustainability reports to provide an important signal to the market and set a lead for listed companies to follow.

In its climate-alignment journey, reporting GHG emissions should only be the starting point, alongside setting rigorous targets for emission reductions, with the end objective of achieving net-zero emissions. In the process of making such a commitment, exchanges should

[9]The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard (revised edition), 2004
[10]Euronext, 2019 Universal Registration Document – English version, 2019 (see Page 78 for scope 1, 2 and 3 emissions reporting).

consider setting a combination of shorter term targets, objectives and the associated governance structures. For example, **HKEX's** CSR strategy states that one of the Group's environmental objectives is to decouple its carbon footprint from business growth. Having reported its GHG emissions since 2008, HKEX escalated its actions to mitigate the carbon footprint in 2020 by offsetting all indirect GHG emissions arising from business air travel by introducing a carbon offset policy for business air travel. The Group also continuously reduces its energy consumption (which is the major source of the Group's carbon footprint) via various energy saving efforts, including the external review of its data centre energy usage. In addition, in the UK, the **London Metal Exchange** (owned by HKEX Group) office premise has adopted 100% renewable energy since March 2020 to continue its efforts to reduce its carbon footprint.

Reporting on emissions is an important step to begin further action such as carbon offsetting and setting targets. For example, **B3** (Brazilian Stock Exchange) has made an inventory of its greenhouse gas emissions since 2009. Since 2010 it has been audited externally and the document has been included in the Public Registry of the Brazil GHG Protocol Program, where it can be seen and downloaded. Since 2013, B3 has annually compensated its greenhouse gas (GHG) emissions that it has been unable to reduce, thus becoming carbon neutral. This process has been backdated to 2011 and 2012 and seeks among other things to encourage the adoption of best practices in sustainability by listed companies and by the market in general.

In setting targets the following should be observed /reported for each target:

- Clear start date and end date.
- Units defined including whether absolute or intensity.
- If intensity then denominator defined.
- Any changes in methodologies during the period clearly explained with recalculated history.

4.1.1 Commit to net-zero emissions

A number of public and private organizations globally have begun committing to decreasing or offsetting all scope 1, 2 and 3 emissions to achieve what's referred to as "net-zero emissions". Recognizing the importance of keeping global warming to 1.5°C, companies are increasingly adopting net-zero climate targets. For example, the United Nations launched a campaign aimed at building momentum towards net-zero emissions called the "Race to Zero" campaign (box 4.1). At the time of publication there were 1,675 businesses and 85 of the biggest investors already committed to net-zero. In addition, more than 500 companies, representing in excess of $13 trillion in market cap, have responded to an open letter from global leaders as part of the Business Ambition for 1.5°C campaign and signed the Business Ambition for 1.5°C commitment.

Box 4.1 United Nations Race to Zero Campaign

Race To Zero is a global campaign to rally leadership and support from businesses, cities, regions and investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.

It mobilizes a coalition of leading net zero initiatives, representing 471 cities, 23 regions, 1,675 businesses, 85 of the biggest investors, and 569 universities. These 'real economy' actors join 120 countries in the largest ever alliance committed to achieving net zero carbon emissions by 2050 at the latest. Collectively these actors now cover nearly 25% global CO2 emissions and over 50% GDP.

Led by the High-Level Climate Champions for Climate Action – Nigel Topping and Gonzalo Muñoz– Race To Zero mobilizes actors outside of national governments to join the Climate Ambition Alliance, which was launched at the UNSG's Climate Action Summit 2019 by the President of Chile, Sebastián Piñera.

The objective is to build momentum around the shift to a decarbonized economy ahead of COP26, where governments must strengthen their contributions to the Paris Agreement. This will send governments a resounding signal that business, cities, regions and investors are united in meeting the Paris goals and creating a more inclusive and resilient economy.

Starting line criteria

All commitments in the Race to Zero Campaign are channeled through networks and initiatives that require their participants to meet the following procedural criteria:

1. **Pledge:** Pledge at the head-of-organization level to reach net-zero in the 2040s or sooner, or by midcentury at the latest, in line with global efforts to limit warming to 1.5C.
2. **Plan:** In advance of COP26, explain what steps will be taken toward achieving net zero, especially in the short- to medium-term. Set an interim target to achieve in the next decade, which reflects a fair share of the 50% global reduction in CO2 by 2030 identified in the IPCC Special Report on Global Warming of 1.5C.
3. **Proceed:** Take immediate action toward achieving net zero, consistent with delivering interim targets specified.
4. **Publish:** Commit to report progress at least annually, including via, to the extent possible, platforms that feed into the UNFCCC Global Climate Action Portal.

The Glasgow Financial Alliance for Net Zero (GFANZ)

Building on the momentum from the Race to Zero, GFANZ which was launched in the spring of 2021 with the objective of broadening the Race to Zero's existing finance sector campaign, raise ambitions, coordinate commitments, support technical collaboration and to showcase the collective efforts and achievements of the sector. For financial sub-sector alliances, entry to Race to Zero will automatically grant entry to GFANZ. Individual firms that do not have a relevant financial sub-sector alliance will also be able to participate in GFANZ if they join the Race to Zero through SBTi's Business Ambition for 1.5 campaign, with the expectation that they will join a relevant sub-sector alliance if/when available. Race to Zero will ensure entry criteria are reviewed annually, with a view to raising ambition over time.

Source: SSE initiative, with data from the UNFCCC website on the race to zero campaig - https://unfccc.int/climate-action/race-to-zero-campaign and the GFANZ launch - https://unfccc.int/news/new-financial-alliance-for-net-zero-emissions-launches

Achieving net-zero emissions means that an exchange either emits no greenhouse gas emissions or offsets its emissions, for example, through actions such as tree planting or employing technologies that can capture carbon before it is released into the air. The **London Stock Exchange Group (**LSEG) was the first stock exchange or market infrastructure group to officially commit to net-zero emissions, announcing its commitment in February 2021 (example 4.3). They were also one of the first financial services companies outside of asset managers and banks, to commit to emissions reductions using long-term science-based carbon reduction targets. However, a number of resources exist for the financial sector, including a Finance Sector Expert Group (FSEG) for Race to Zero and Race to Resilience[11] and the GFANZ (see box 4.1).

A key component of committing to net-zero is access to reliable and accurate data, and therefore this commitment goes hand in hand with the guidance on and promotion of consistent, comparable and reliable global climate disclosure. Stock exchanges can further lead this movement for climate-related disclosures by committing their own organizations to reaching net-zero emissions as soon as possible, and by midcentury at the latest.

4.2 Facilitate the sharing of climate-related information

Stock exchanges can play a particularly important role as information keepers or gateways, publishing documents on their website and tracking disclosures. Stock exchanges can help issuers in both mandatory and voluntary disclosure situations by providing information on where to submit or publish their climate-related disclosures, particularly those not included in mainstream financial reports such as strategy and governance procedures for climate-related risks and opportunities. Stock exchanges could also help investors and other market participants to find this information by keeping it publicly available on their website (see example 4.4).

For example, the **Stock Exchange of Thailand** (SET) displays report information on the page of each listed company, making it easy for investors to find this information on a company-by-company basis. Another example of supporting corporates in their disclosure of ESG data is **Nasdaq's** One Report which is a workflow tool for corporates to manage ESG data internally. The tool helps to navigate among frameworks, to streamline data gathering and responses, and finally to simplify sharing with agencies and stakeholders. Stock exchanges also have the opportunity to help investors manage this information through their data services.

Stock exchanges can also play a vital role in their country's local and regional climate change-related disclosure targets by providing data support. For example, the **Nigerian Exchange Limited** (NGX) is working with the Federal Ministry of Environment to collate data from listed companies. The collated data is valuable private sector climate change-related data that feeds into Nigeria's progress reports on its Nationally Determined Contributions (NDCs). As another example, **HKEX** has been supporting the Environment Bureau of the Hong Kong Government in promoting the Carbon Footprint Repository (CFR) for listed companies in Hong Kong since 2014. The CFR enables listed companies in Hong Kong to disclose their carbon footprints and share successful stories on carbon management and practices.

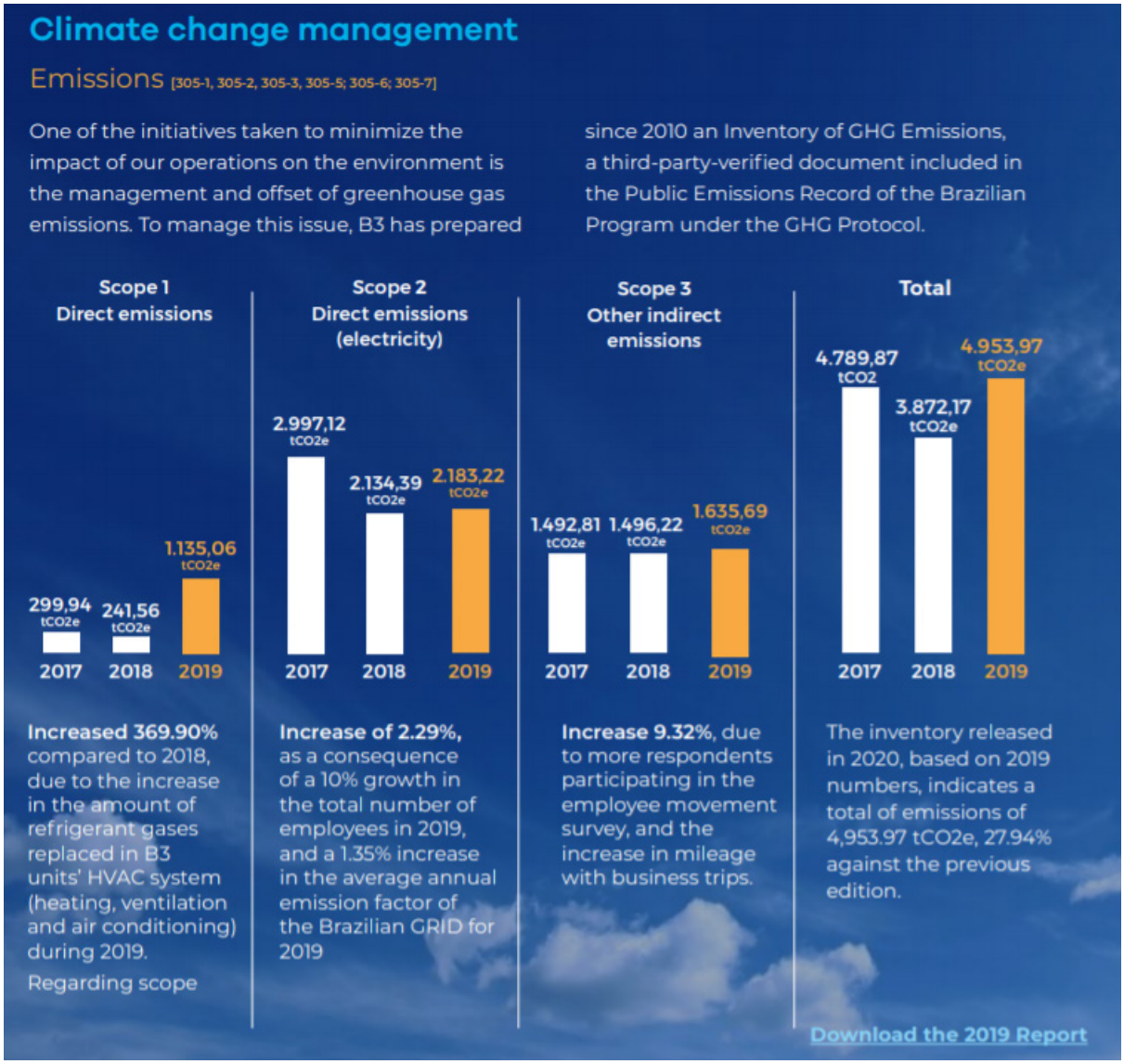
In addition to making data publicly available and easy to use, exchanges can also leverage this data to serve a number of investor needs. **London Stock Exchange Group** (LSEG) has leveraged its ESG expertise and data sets from its FTSE Russell in-house benchmarks business that were created to serve investor needs, to support its capital markets issuers. Using green revenues data, it established the "Green Economy Mark" to highlight issuers who generate a majority of revenues from environmentally positive products and services and expanded its Sustainable Bond Market to host the growing variety of fixed income instruments to raise capital for green, social and sustainability programmes as well as providing tools to support issuers ESG and climate disclosure.

When evaluating how information is being collected and stored in a market, an exchange should consider both issuers' and the investors' needs. Issuers should have a clear understanding of where and how to disclose their climate-related information, in a way that does not significantly add to the reporting burden. At the same time, it must also be easy to find for investors. An exchange is encouraged to consult both investors and issuers to ensure they are able to disclose and locate information easily.

[11]For more information on the FSEG visit the UNFCCC's Race to Zero webpage

Examples of leading

Example 4.1: B3's scope 1, 2 and 3 emissions reporting



Source: Page 43 of B3's 2019 Annual Report

Example 4.2: New Zealand Stock Exchange (NZX) details scope sources of emissions

NZX 2020 Greenhouse Gas Inventory

Scope	Emissions Sources CO_2-e	2020 Tonnes	2019 Tonnes
Scope 1	Rental Cars	1.2	3.6
Scope 2	Electricity Purchased	47.5	48.0
Scope 2	Air Travel		
	-Domestic	75.6	167.5
	-Short haul international	4.8	35.3
	-Long hayul international	31.8	206.5
	Accommodation	5.4.15.3	
	Transmission and distribution losses for purchased electricity	4.0	4.1
	Paper disposal	1.3	1.3
Total		**171.6**	**481.6**

CO2 equivalent emissions calculated using Ministry for the Environment 2020 Emissions Factors. Air travel emissions are calculated with radiative forcing.

Source: Page 35 of NZX's 2020 Annual Report

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Example 4.3: London Stock Exchange Group commits to net-zero emissions

Net-zero commitment

LSEG is the first global exchange group to commit to net-zero through the Business Ambition for 1.5C and is a member of the United Nations Climate Change 'Race to Zero'. This commitment to net-zero, and action on climate change, covers our own carbon emissions and also our influence across the marketplace, through our business and how we support clients.

Taking action on our own carbon emissions

LSEG was one of the first companies in the financial services sector to commit to long-term science-based carbon reduction targets, which have subsequently been approved by the Science Based Targets initiative (SBTi). We have committed to reduce absolute scope 1, 2 and 3 (business travel) GHG emissions 46% by 2030 from a 2019 base year. We have also set a target of engaging with all key suppliers, accounting for 57% of Scope 3 emissions, to set science-based targets by 2025.

LSEG has also been a supporter of the Task Force for Climate-related Financial Disclosures (TCFD) since its launch in 2017. We not only encourage issuers to report against TCFD through our reporting guidance but aims to go further each year in embedding these standards into our own financial reporting.

Taking action to catalyse decarbonisation across the marketplace

Climate risks pose threats to ecosystems, societies, markets and to companies and a globally coordinated response is needed to mitigate and manage those risks. LSEG is committed to taking action, supporting the growing drive to a net-zero carbon economy. LSEG is well positioned at the heart of global financial markets to act as a facilitator, bringing together investors and issuers in three critical areas:

- **Data and disclosure** - catalysing consistent, comparable and reliable global climate data
- **Growth of the green economy** - enabling the growth and development of green industries
- **Climate transition across all sectors** - supporting investment and capital flows to achieve climate transition and resilience

Our role is to convene the market and drive action on climate change:

- In **data and disclosure**, we're co-chairing the UN Sustainable Stock Exchange's advisory group developing Model Climate Reporting Guidance, to be launched later in 2021. This follows the call to collaborative action from David Schwimmer and Mark Carney to stock exchanges around the world, and the letters we sent to exchange CEOs globally.
- To **grow the green economy**, our LSE Green Economy Mark recognises listed companies with 50% or more of their revenues derived from products and services that contribute to the global green economy, as defined by FTSE Russell's Green Revenues 2.0 Data Model.
- To support **climate transition**, our Data & Analytics division helps investors calibrate their requirements to achieve climate and other environmental, social and governance goals. For example, we launched the FTSE TPI Climate Transition Index early last year – the first global index to enable investors to align a broad equity portfolio with climate transition and the goals of the Paris Agreement. We also offer one of the richest ESG databases in the industry and have been delivering ESG data and solutions for over 15 years through our heritage Refinitiv business. This now includes Lipper fund and portfolio ESG scores, sustainable financing deals, carbon pricing data and research from Point Carbon, renewable energy projects through Infrastructure 360.
- **As part of our sustainability approach, we launched a dedicated Transition Bond segment on London Stock Exchange on the same day as announcing our net-zero Commitment.** The segment displays debt instruments from issuers who have a corporate strategy or transition framework aligned to the Paris Agreement and joins our other sustainability-aligned bond segments to form the Sustainable Bond Market (SBM). The SBM allows for Green Economy issuers with over 90% of green revenues to display their bonds on a dedicated green revenues segment.
- LSEG is also partnering with the UN-backed **Principles for Responsible Investment (PRI)** to co-host the COP26 Investor Action on Climate series of free-to-attend online events which started in 2020 and run up to COP26 in November 2021.

Source: LSEG - https://www.lseg.com/investor-relations/sustainability/net-zero-commitment

Examples of influencing

Example 4.4: HKEX's Sustainable and Green Exchange (STAGE) enables easy access to information on sustainability and environmental information

With the aim to connect market participants, issuers and investors, HKEX's STAGE, launched in December 2020, provides a one-stop shop for reliable green data and products, helping to drive growth potential, transparency and access to Asia's green and sustainable financial market. At the heart of STAGE is an online repository of sustainable-themed products from leading Asian corporations listed in Hong Kong. These HKEX-listed sustainable products include sustainability, green, and transition bonds from issuers across a variety of sectors including utilities, transportation, property development and financial services as well as ESG-related exchange traded products.

Issuers included on STAGE must provide additional voluntary disclosures on their sustainable investment products, such as use of proceeds reports, as well as annual post issuance reports. This additional information will enable investors to access a trusted, easy-to-use platform for the region's fast growing 'green sector'. At the same time, the data will act as a benchmark for issuers seeking to raise funds for their sustainable projects, and will also contribute to the standardisation of sustainability metrics.

Source: HKEX and HKEX Website

EXAMPLES

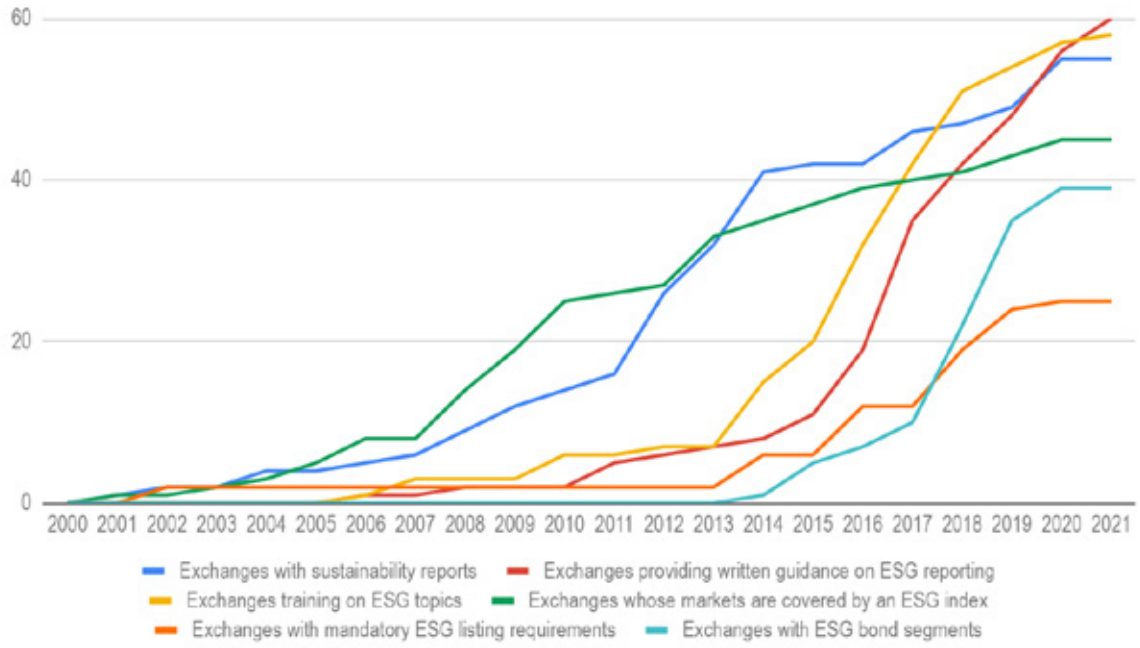
5 Promote change

By promoting change, stock exchanges can both lead and influence through the same activities. Through education and training, monitoring and incentives, the stock exchange becomes a leader in its market as a source of knowledge and training, while also influencing its market's trends and climate-resilience.

5.1 Be an educator

A number of opportunities for education and training arise pertaining to the TCFD and climate resiliency. Stock exchanges should engage their stakeholders to determine where the gaps in the market's knowledge are, and evaluate how they can contribute to filling these gaps. Education and training have long been an important aspect of stock exchange's activities, and in recent years this has been particularly important for sustainability-related topics. Since 2017, training has been one of the most-utilized ESG-related activities at stock exchanges worldwide, with 57 stock exchanges currently providing their market with ESG-related training. "Training activities" is exceeded only by the 60 stock exchanges that also provide written guidance on ESG-disclosure (figure 5.1).

Figure 5.1 Strong growth in sustainability activities by stock exchanges



Source: SSE database

The SSE's database of stock exchanges' sustainability activities illustrates the breadth and depth of training taking place worldwide. An evaluation of the educational activities offered by exchanges globally shows that a series of methods and formats are currently being used. By categorizing these methods and formats, five key considerations have emerged that stock exchanges will need to decide when implementing new training, being (annex 3):

- education content,
- partners and expertise,
- delivery format,
- audiences and reach, and
- resource accessibility.

A number of stock exchanges have already started training their markets on TCFD and climate-related topics (see examples 5.1-5.3), and in doing so, are becoming leaders in their own right. While a number of mechanisms exist to incentivize disclosure, training and education can be a good tool alongside or in preparation for other mechanisms such as product development, regulatory guidelines, or listing requirements. For example, the **Egyptian Stock Exchange** does not make reporting on climate-related or ESG disclosure mandatory, but when it launched its guidance on ESG reporting, it held a mandatory training session that listed companies were required to participate in. Another example is a six-part webinar series hosted by PRI and the **London Stock Exchange Group** to correspond with the 2021 United Nations Climate Conference (COP26). The webinar series titled "COP26: Investor Action on Climate", aims to build further momentum toward taking action on climate change by the investment industry.

In addition to training direct stakeholders, stock exchanges are also expanding education and training programs to the general public or businesses not listed on the stock exchange. For example, in 2020, **HKEX** supported The University of Hong Kong's programme to promote ESG stewardship among small and medium enterprises. Through the HKEX Foundation, the dedicated charitable channel of the Group, HKEX has been supporting local environmental education projects to promote awareness and understanding of environmental impacts brought by climate change under the HKEX Charity Partnership Programme.

5.1.1 Monitor your market's progress

Education programs should be filling a gap of knowledge in the market, and to identify this gap exchanges may wish to track progress on key aspects of climate resilience. Exchanges may also wish to track the number of companies supporting and using the TCFD recommendations and/or other climate-related items such as GHG disclosures. This process should be ongoing and iterative, to ensure that education and training address the real needs within the market. In the first instance, an analysis of the current best practices and/or recent progress should be the starting point of any training or educational program.

For example, under **Bursa Malaysia's** sustainability reporting framework, issuers are required to disclose a narrative statement of the management of material economic, environmental and social ("EES") risks and opportunities ("Sustainability Statement") in their annual reports. Such requirements ensure that, at a minimum, certain ESG-related information is made available to investors. Since the introduction of these reporting requirements on a staggered basis from 2016-2018, Bursa Malaysia has undertaken annual Sustainability Disclosure Review (SDR) exercises and provides feedback to issuers on their sustainability reporting practices. Feedback for the 2020 SDR exercise was provided via an article published on "BURSASUSTAIN", Bursa Malaysia's dedicated microsite for sustainability, corporate governance and responsible investment. As another example, **HKEX** reviews ESG reports from selected issuers and publishes its findings to provide insight and guidance to issuers on the possible improvement areas on which to focus in their approach to assessing ESG-related risks and when preparing ESG reports.

5.2 Promote or create incentives

Exchanges should be asking themselves what incentives they can provide to encourage improved climate-related disclosure? This could include the development of new listing segments, analytics and indexes, helping investors find climate-aligned issuers through web-platforms or search categories, highlighting companies aligning their reporting practices with the TCFD, working with regulators for regulatory changes, adjusting listing rules, and more. Stock exchanges are encouraged to remind and support report preparers of the existing incentives in their markets and consider developing new incentives where possible.

Exchanges have implemented new platforms, developed partnerships and created financial products that support climate-resiliency in their markets (examples 5.4 - 5.5). By investing in these programs and products, stock exchanges can grow their market while simultaneously enhancing its climate-resiliency. For example, **B3**'s Efficient Carbon Index (ICO2 B3) has served as a reference to the market since 2010 for how companies in the portfolio are managing their GHG emissions and demonstrate their commitments on the climate change agenda. In addition, B3 has the CBIOs (Decarbonisation Credits) which were created by the National Biofuels Policy (RenovaBio) and aim to contribute to the decarbonization goals assumed by Brazil under the Paris Agreement in 2015. B3 also seeks to promote ESG thematic bonds (green, social and sustainability bonds) that assist in the transition to a low carbon economy and market resiliency.

EXAMPLES

Examples of leading and influencing

Example 5.1: MOEX partners to train on TCFD

As part of a collaboration with the Foreign, Commonwealth & Development Office (FCDO), the Carbon Trust and EthnoExpert (EE), two environmental consultancies based in the UK and Russia respectively, have been working with the Moscow Exchange (MOEX) to raise awareness on and promote the uptake of TCFD-aligned disclosure in Russia. The project consisted of running a series of sector specific webinars and developing written guidance on TCFD disclosure, inclusive of practical how-tos for implementation. As part of the project, Carbon Trust and EthnoExpert organised a Knowledge Exchange Session between MOEX, the Sustainable Stock Exchange Initiative (SSE) and the London Stock Exchange (LSE).

The aim of the session was for the attendees to openly share their insights on the role that stock exchanges can play in promoting TCFD uptake in their markets, as well their experiences with promoting TCFD (including main barriers and success factors). The session is a good example of how stock exchanges can collaborate and leverage external partnerships to build and share knowledge on climate-related topics. The positive feedback received from the session goes to show that it helped solidify the relationship between SSE, LSE and MOEX and served as the basis for future collaboration opportunities. As a deliverable of the project, the key takeaways of the session were also incorporated in a report authored by Carbon Trust and EthnoExpert.

Source: Carbon Trust

Example 5.2: NGX X-Academy trains policy makers on climate change in line with TCFD recommendations

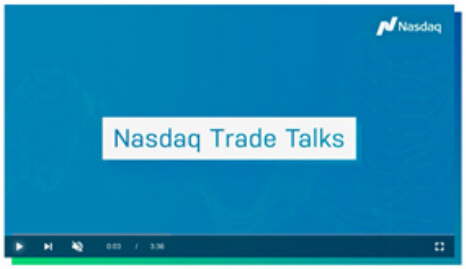
Building on the leading role played by the Nigerian Exchange (NGX) in developing Nigeria's inaugural sovereign green bond, the dedicated capacity development arm of NGX, "The X-Academy", holds periodic training for the Federal Ministry of Environment on climate and sustainability related topics.

In January 2021, X-Academy's training for key ministry personnel on Measurement, Verification and Reporting (MRV) for environmental and climatic processes in Nigeria highlighted the recommendations of the Task Force for Climate Related Disclosures (TCFD) as an evaluation and reporting tool for listed companies. The continued partnership between NGX and key policy makers is aimed at strengthening the ecosystem to improve the adoption of sustainability reporting in Nigeria. Through its ongoing collaboration with Global Reporting Initiative (GRI), X-Academy continues to build the capacity of listed companies on sustainability and climate related reporting.

Source: NGX

Example 5.3: Nasdaq TradeTalks unpacks TCFD

For Climate Week, Nasdaq TradeTalks host Jill Malandrino spoke with Nasdaq Global Head of Sustainability Evan Harvey to explore the Task Force on Climate-Related Financial Disclosures and how such disclosures could impact markets. The video of their conversation titled "Will Adhering to Climate Risk Disclosures Make an Impact on Financial Markets?" is accessible via the Nasdaq website.



Source: Nasdaq website

Example 5.4: Luxembourg Green Exchange expands to welcome climate-aligned issuers

In February 2021, the Luxembourg Green Exchange (LGX) teamed up with Climate Bonds Initiative to include a section exclusively dedicated to Climate-Aligned Issuers on the LGX platform. Due to their environmentally friendly line of business and revenue streams from climate-aligned activities, Climate-Aligned Issuers contribute directly to the global climate goals. Debt securities issued by Climate-Aligned Issuers, whether thematically labelled or not, are considered climate-aligned investment opportunities through their positive environmental impact and so offer investors an additional range and diversity in the climate-aligned investment universe.

Climate Bonds-LGX Climate-Aligned Issuers aims to shine a light on the wider climate-aligned investable universe by highlighting private and public companies that derive at least 75% (strongly aligned issuers) or at least 95% (fully aligned issuers) of their revenues from low-carbon activities. Given the strong environmental dimension of their line of business, all debt securities issued by CAIs will be displayed as climate-aligned investment opportunities.

"Today's launch aims to cater to investors' demand for climate-aligned investment opportunities and contributes to a low-carbon and more inclusive economy. While the bonds issued by CAIs may not necessarily be labelled as green, they finance low-carbon activities with a positive environmental impact. With this new section, investors can identify untapped opportunities in climate finance and support companies with climate-aligned business activities. In the transition decade that has just started, LGX is keen on encouraging a broader pool of strong investment opportunities to ESG-conscious investors," commented Julie Becker, Deputy CEO of LuxSE and Founder of LGX.

Source: Luxembourg Stock Exchange

Example 5.5: Euronext partnership for blue economy entrepreneurs

Euronext announced on 20 January 2021 a partnership with JA Europe, the largest non-profit in Europe dedicated to preparing young people for employment and entrepreneurship, to promote the Blue Economy by encouraging financial literacy amongst European youth across seven of its main countries.

The programme aims to inspire students about sustainable finance whilst helping them develop core skills such as teamwork, problem solving, and entrepreneurial skills. Through this collaboration, Euronext underlines the important role of the financial sector in boosting the Blue Economy by contributing to the promotion of financial literacy and innovation among students aged 16 to 18. In this regard, the JA Company Programme provides a unique opportunity for engagement in the area of mentoring and coaching the next generation of European citizens.

Starting in February 2021, 175 JA Company Programme students from 7 countries (Belgium, France, Ireland, Norway, Portugal, the Netherlands and the United Kingdom) will participate in a series of activities providing exposure to the Blue Economy, including the promotion of financial literacy, and culminating in a final European-level competition. The Euronext Blue Challenge will include thematic e-mentoring and webinars provided by Euronext volunteers in two key areas:

1. **Blue economy (oceans, seas and marine resources):** with all participating countries adjacent to the ocean, it is vital to protect the resource base on which economic activities depend. Euronext's goal is to be a leader in advancing the Blue Economy in order to address the threats to the oceans and contribute to enhanced coastal resilience.
2. **Financial literacy:** as a market infrastructure, Euronext is at the centre of financial markets and communities. Improving the financial knowledge and skills of young Europeans will impact the broader community of stakeholders at the local level, including businesses, teachers, parents and the school community at large.

Furthermore, in April-May 2021, JA Europe will organise national selections from a pool of 35 applicants, resulting in one mini-company per country competing in a final online challenge on World Oceans Day, 8 June 2021. For the first time, Euronext will give the "Blue Innovation Award" to the mini-company that best embodies a sustainable use of the ocean resources for economic growth.

Salvatore Nigro, CEO JA Europe said "Our new collaboration with Euronext allows young people in Europe to tackle one of the biggest challenges of our times through an entrepreneurial approach". He added that "the combination of entrepreneurship and financial literacy skills for the benefit of the Blue Economy is a win-win for the future generations, our planet and our economies".

Stéphane Boujnah, CEO of Euronext, said: "The Euronext Blue Challenge is a unique programme that equips youth across Europe with concrete business skills and inspires them to innovate and strive to protect marine life. It represents one of the major ESG community initiatives we want to develop within the Sustainable Finance pillar of our Let's Grow Together 2022 strategic plan. With the support and commitment of our volunteers, this partnership with JA will help ensure the new generation develops the financial literacy needed to successfully contribute to and advance the Blue Economy in the future."

Source: Euronext

ANNEX 1: Climate-related opportunities and risks for stock exchanges

Opportunities: examples of climate related opportunities and potential financial impacts tailored for stock exchanges		
Type	**Description**	**Financial Impact**
Resource efficiency	■ Use of recycling ■ Move to more efficient buildings ■ Reduced water usage and consumption	■ Reduced operating costs (e.g., through efficiency gains and cost reductions) ■ Increased value of fixed assets (e.g., highly rated energy efficient buildings) ■ Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy source	■ Use of lower-emission sources of energy ■ Use of supportive policy incentives ■ Use of new technologies ■ Participation in carbon market ■ Shift toward decentralized energy generation	■ Reduced operational costs (e.g., through use of lowest cost abatement) ■ Reduced exposure to future fossil fuel price increases ■ Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon ■ Returns on investment in low-emission technology ■ Increased capital availability (e.g., as more investors favor lower-emissions producers) ■ Reputational benefits resulting in increased demand for goods/ services
Products and services	■ Development and/or expansion of products such as green bonds or ETFs ■ Development of new services such as climate-related indices, education and training for the market ■ Ability to diversify business activities ■ Shift in consumer preferences	■ Increased revenue through demand for lower emissions products and services ■ Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) ■ Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	■ Partnerships with other markets such as dual listings agreements and regional markets, enabled through best-practice disclosure practices ■ Public-sector incentives encouraging increased market participation such as tax incentives or regulatory incentives ■ Attracting international investment through achieving global standards in disclosure ■ Use of public-sector incentives	■ Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) ■ Increased revenues through a growing market due to public-sector incentives for market participation ■ Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) ■ Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	■ Stock exchange participation in renewable energy programs and adoption of energy efficiency measures ■ Providing market training and education ■ Market participation in renewable energy programs and adoption of energy efficiency measures	■ Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) ■ Increased reliability of market participants ensures stability ■ Increased stability and valuation of market participants through resilience planning

Source: Adapted from TCFD general recommendations to suite stock exchanges

Risks: examples of climate related risks and potential financial impacts tailored for stock exchanges		
Type	**Description**	**Financial Impact**
Transition Risks		
Policy and Legal	■ Increased pricing of GHG emissions affecting bottom line of listed companies ■ Listed companies' exposure to litigation costs ■ Enhanced emissions-reporting obligations deterring new listings ■ Exposure to litigation as an exchange	■ Increased operating costs (e.g., higher compliance costs, increased insurance premiums) cause listed companies to fail ■ Decrease in new listings or increase in de-listings lead to income loss ■ Litigation costs
Technology	■ Substitution of existing products and services with lower emissions options ■ Unsuccessful investment in new technologies ■ Costs to transition to lower emissions technology	■ Write-offs and early retirement of existing assets ■ Reduced demand for products and services ■ Research and development (R&D) expenditures in new and alternative technologies ■ Capital investments in technology development ■ Costs to adopt/deploy new practices and processes
Market	■ Changing customer behavior (ie: increase investors' demand for ESG-related / sustainable investment products) ■ Increased cost of raw materials may lead to a growing bankruptcy of listed companies	■ Reduced demand for goods and services that are not aligned with climate goals due to shift in consumer preferences ■ Change in revenue mix and sources, resulting in decreased revenues ■ Re-pricing of assets for listed companies (e.g., fossil fuel reserves, land valuations, securities valuations)
Reputation	■ Shifts in consumer preferences ■ Stigmatization of sector ■ Increased stakeholder concern or negative stakeholder feedback ■ Uncertainty in market signals may dampen investor appetite	■ Reduced revenue from decreased demand for goods/services ■ Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) ■ Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) ■ Reduction in capital availability
Physical Risks		
Acute	■ Increased severity of extreme weather events such as cyclones and floods (vis-a-vis stock exchange headquarters as well as vis-a-vis listed companies and their supply chains)	■ Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) ■ Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) ■ Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) ■ Increased capital costs (e.g., damage to facilities) ■ Reduced revenues from lower sales/output ■ Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations
Chronic	■ Changes in precipitation patterns and extreme variability in weather patterns ■ Rising mean temperatures ■ Rising sea levels ■ All vis-a-vis stock exchange headquarters as well as vis-a-vis listed companies and their supply chains	

Source: Adapted from TCFD general recommendations to suite stock exchanges

ANNEX 2: TCFD recommended disclosures, adapted for stock exchanges

TCFD recommended disclosures, adapted for stock exchanges	
Governance Disclose the organization's governance around climate-related risks and opportunities	
a) Describe the board's oversight of climate-related risks and opportunities.	Processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues, whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organization's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures, and how the board monitors and oversees progress against goals and targets for addressing climate-related issues. Similar to asset managers, stock exchanges may consider describing concentrations of exposure to carbon-related industries listed on their exchange. Stock exchanges may also consider disclosing their climate-related risks (transition and physical) in their activities related to lending, such as bonds and other debt products.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	Whether the organization has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues, a description of the associated organizational structure(s), processes by which management is informed about climate-related issues, and how management (through specific positions and/or management committees) monitors climate-related issues. Stock exchanges, like insurance companies, may wish to indicate whether specific climate-related products or competencies are under development, such as green bonds, specialty climate-related advisory services, and climate-related client engagement.
Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	
a) Describe the climate-related risks and opportunities identified over the short, medium, and long term.	The risks and opportunities identified as financially relevant, a description of what is considered to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer term, a description of the specific climate-related issues for each time horizon (short, medium, and long term) that could have a material financial impact on the organization, and a description of the process(es) used to determine which risks and opportunities could have a material financial impact.
b) Describe the impact of climate-related risks and opportunities on the businesses, strategy, and financial planning.	How identified climate-related issues have affected businesses operations, strategy, and financial planning, considering their impact on products and services, value chain, and adaptation and mitigation activities, describe how climate-related issues serve as an input to financial planning process, the time period(s) used, and how these risks and opportunities are prioritized, and reflect a holistic picture of the interdependencies among the factors that affect the ability to create value over time. Stock exchanges, like asset managers, may wish to describe how climate-related risks and opportunities are factored into relevant products or services. They may also wish to describe how each product or service might be affected by the transition to a lower-carbon economy.
c) Describe the resilience of the strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Where the exchange believes its strategies may be affected by climate-related risks and opportunities, how strategies might change to address such potential risks and opportunities, and the climate-related scenarios and associated time horizon(s) considered.
Risk Management Disclose how the organization identifies, assesses, and manages climate-related risks	
a) Disclose how the organization identifies, assesses, and manages climate-related risks.	Describe risk management processes for identifying and assessing climate-related risks, including how organizations determine the relative significance of climate-related risks in relation to other risks, and describe how the exchange considers existing and emerging regulatory requirements related to climate change and how this impacts their business. Stock exchanges, like asset owners and asset managers, may wish to describe engagement activity with issuers to encourage better disclosure and practices related to climate-related risks to improve data availability and the ability to assess climate-related risks. Stock exchanges, like asset managers, may also wish to describe how they identify and assess material climate-related risks for each financial product. This might include a description of the resources and tools used in the process.

Risk Management (Cont.) Disclose how the organization identifies, assesses, and manages climate-related risks	
b) Describe the organization's processes for managing climate-related risks.	Describe the processes for managing climate-related risks, including how decisions to mitigate, transfer, accept, or control those risks are made, and describe the processes for prioritizing climate-related risks, including how materiality determinations are made within their organizations. Stock exchanges, like asset owners, may wish to describe how they consider the positioning of their total portfolio of issuers with respect to the transition to a lower-carbon energy supply, production, and use. This could include explaining how the exchange is able to adapt and mitigate the risk if sectors listed in the market are at a high risk in relation to this transition.Stock exch anges, like asset managers, may wish to describe how they manage material climate-related risks for each financial product they offer.
c) Describe how the processes for identifying, assessing, and managing climate-related risks are integrated into overall risk management.	Describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management.
Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material	
a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable.Wh ere climate-related issues are material, consider describing whether and how related performance metrics are incorporated into remuneration policies. Provide internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy like green bonds, and similar metrics for historical periods to allow for trend analysis where possible, and where not apparent, a description of the methodologies used to calculate or estimate climate-related metrics. Stock exchanges, like banks, may wish to provide the metrics used to assess the impact of (transition and physical) climate-related risks on their financial intermediary business activities in the short, medium, and long term. Metrics provided may be broken down by industry, geography, and investment grade. Stock exchanges, like asset managers, may wish to describe metrics used to assess climate-related risks and opportunities in each product. Where relevant, they could also describe how these metrics have changed over time.
b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks (see section 4.1 of Part II of this document), historical GHG emissions to allow for trend analysis, and where not apparent, organizations should provide a description of the methodologies used to calculate or estimate the metrics.
c) Describe the targets used to manage climate-related risks and opportunities and performance against targets.	Describe key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc., in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a lower-carbon economy. Consider whether the target is absolute or intensity based. Consider time frames over which the target applies. Consider the base year from which progress is measured. Consider key performance indicators used to assess progress against targets. Where not apparent, organizations should provide a description of the methodologies used to calculate targets and measures.

Source: SSE, adapted from the TCFD recommendations

ANNEX 3: Training your markets: a supplement for exchanges on education and training

An evaluation of the educational activities offered by exchanges globally shows that a series of methods and formats are currently being used. By categorizing these methods and formats, five key considerations have emerged that stock exchanges will need to decide on when implementing new training. They are: education content, partners and expertise, delivery format, audiences and reach, and resource accessibility. Each consideration is further explained with examples below to help exchanges design their own training and education programs as part of their efforts to create climate-resilient markets.

The examples included in this report are not being endorsed by the UN SSE or its partners, but are meant to provide ideas that stock exchanges may wish to adapt to their own market. These examples are meant for learning purposes only, and may not suit all markets. Exchanges and their regulators should evaluate the conditions and requirements of their markets, and are encouraged to adapt the following examples and guidelines to best fit their market conditions.

A. Education content

While training content will depend on the knowledge gaps and local needs identified in particular markets, exchanges have used a number of formats to present this content to their market. Since climate disclosure is still new in developing markets, it is advised to spend efforts to educate issuers on why climate related disclosure matters, besides how to disclose. Stock exchanges may wish to use the findings of initial monitoring exercises to determine what topics require additional education in the market and based on the audience that would most benefit from training, determine which format for new topics would be most appropriate. The main formats being used to present new topics and content are as follows:

- **Building on existing topics and training events:** Some exchanges have used already existing educational seminars or training events to integrate new topics related to sustainability. This is appropriate when the content being introduced is an alteration or adjustment to content already being trained. For example, in Costa Rica, the stock exchange **BNV** has added green bonds to an investment game it hosts yearly for university students to help educate future generations on investing in capital markets.
- **Introducing new topics on their own:** In other instances, exchanges have opted to develop one-off or ad-hoc training seminars or modules to help fill a particular market knowledge gap with the focus entirely on that topic. For example, the **Japan Exchange Group** (JPX) hosted a seminar in collaboration with SASB and CDSB on the implementation of the TCFD guidelines. The seminar was entirely dedicated to this topic and held as a stand-alone event.

B. Partners and expertise

When developing a new training program or evaluating existing educational activities, it is important to evaluate whether it is more beneficial to bring in external partners or to develop the knowledge internally. Often, exchanges opt to first work with partners and provide the training jointly, as a means of training its own staff. Once there is sufficient internal competencies, the exchange can consider the training opportunity as an ongoing service for its market. Other exchanges decide to continue to work with external partners in order to ensure the market receives a breadth of appropriate and up-to-date training. It will be up to the exchange to determine what method will align best with its long-term planning, resources, and market needs. Building partnerships across different fields are essential multipliers to expand the capacity of exchanges. When exchanges have worked with partners, they have tended to do it in two ways:

- **Formal partnerships:** Some stock exchanges have initiated a formal partnership with an external organization with the objective of providing ongoing training and awareness raising in the market over a set period of time. Formal partnerships may assist exchanges in raising the funds needed for training activities or help bring in the depth of expertise needed in the market. Before committing to a formal agreement, however, a stock exchange and its regulator should evaluate whether the breadth of the training will be sufficient for market needs. An example of a formal partnership is the establishment of the GRI ASEAN Hub in Singapore, supported by a consortium of 13 leading Singapore-based organizations, including **Singapore Exchange** (SGX). The partnership leverages on the strengths and network of GRI and the consortium partners to promote high quality ESG disclosures in the regional markets. Another example is the **JSE's** partnership with the Institute of Directors of South Africa to provide governance training including King IV, as well as its partnership with the Integrated Reporting Committee of South Africa to provide integrated reporting training. Also, **JPX** works with Japanese listed companies, investors and regulators to promote the use of TCFD via the TCFD Consortium. The Consortium has created two guidance documents: The TCFD Guidance, which focuses on issuer disclosure, and the Green Investment Guidance, which gives advice to investors on how to use information disclosed in line with TCFD in their investment decisions.
- **Ad-hoc partnerships:** In contrast to formal agreements made on training with specialized agencies or thematic experts, stock exchanges have also opted for bringing in one or more experts to partner on training seminars on an ad-hoc basis. Such partnerships are usually short-lived and pertain only to the seminar or event itself but may be repeated in the future if deemed necessary. This may also be implemented through participation of the exchange in climate-related events organized externally. For example, PRI and the **London Stock Exchange Group** hosted a three-webinar series to correspond with the 2021

COP26.The webinar series titled "COP26: Investor Action on Climate" aims to build further momentum toward taking action on climate change by the investment industry. Additionally, the **Shanghai Stock Exchange** ESG webinar, "Dialogue with International Investors: ESG Capacity Building for Listed Companies," brought together senior managers of listed companies, global institutional investors and industry experts to share views and thoughts on China's ESG development and how ESG can help listed companies achieve high-quality development.

- **Internal expertise:** When exchanges are confident in their internal expertise on particular topics, they will often capitalize on this expertise to offer their market bespoke training and consulting services. For example, the **Luxembourg Stock Exchange** developed the LGX Academy to utilize industry experts at the Luxembourg Green Exchange to fill the gap in current sustainable finance education, particularly as it related to green bonds and other climate-aligned investment products. In another example, **Euronext's** TechShare program utilizes staff expertise to help Cleantech SMEs learn how to leverage capital markets for funding. Similarly, the **Johannesburg Stock Exchange** (JSE) utilises its own sustainability team to offer introductory (virtual) training on sustainability as of 2020. These training sessions answer an increasing need for less advanced issuers who are keen to begin their sustainability practice and reporting journeys.

C. Delivery format

As climate change alters not only the way we do business but also the way our world interacts, training formats are becoming more flexible, modern and adaptable to changing circumstances. Even before online meetings became a near-must due to the COVID-19 pandemic, stock exchanges were providing training through various formats both in person and online. A stock exchange must consider its market and their circumstances (whether it be access to online services, current practices and norms, or temporary changes to practices). Formats may need to be adapted over time, or multiple formats offered. The following are the most common formats used by stock exchanges. However, many exchanges provide training through more than one format:

- **In-person conference:** Many stock exchanges have held in-person events, meant to attract a large audience such as a conference or multi-day event. These events usually can be broken down into a series of panel discussions covering a number of related but distinct topics and can involve both high-level speakers and specialized experts. A key objective of in-person events is the possibility of networking which can help both issuers and investors meet experts and consultants that can aid them in their continuing education. It also enables one-to-one conversations between various market participants and encourages an ongoing dialogue among participants. For example, in March 2018, **Singapore Exchange** (SGX) organised an ASEAN Conference on the recommendations of the TCFD. The programme included a keynote speech by the Chairman of the ASEAN Capital Markets Forum and various panels on the topics of investors' data needs, companies' reporting experience, setting metrics and targets and conducting scenario analysis.
- **In-person seminar or workshop:** Where more hands-on practice or training is deemed beneficial to a market, in-person seminars or workshops can provide more depth to a topic and help participants to develop practical skills and know-how. These events may take place within a larger conference or as a stand-alone workshop, and are often shorter and smaller to allow all participants to actively participate. For example, **Wiener Boerse**, the Austrian stock exchange, includes in its seminar "Invest Ethically and Sustainably" a unit on the Paris Agreement on Climate Change and EU Action Plan, as well as certification processes for green bonds and other climate-related standards.
- **Online webinar:** Increasingly, exchanges are also offering an online training format that provides the same benefits of the in-person seminar or workshop but does not require a physical venue. This option can keep costs down, while also increasing accessibility to participants who may have difficulty reaching the venue. For example, the **Dubai Financial Market** (DFM) together with the other members of the Dubai Sustainable Finance Working Group used a webinar format in February 2021 to launch two guidance documents of best practices for sustainable finance. The opportunity was also used to discuss topics such as a roadmap to issuance and listing, covering developing a sustainability framework, obtaining second party ESG verification and ongoing ESG reporting on use of proceeds. As another example, in 2020 **B3** (the Brazilian exchange) promoted a series of 3 webinars together with Inter-American Development Bank (IDB), Financial Innovation Laboratory (LAB), Securities and Exchange Commission (CVM) and the Sustainable Stock Exchanges Initiative (SSE), which discussed the operation and steps for issuing ESG thematic bonds, in addition to the current situation, trends and opportunities for Brazil.
- **Online modules:** Exchanges have also offered a flexible form of training where participants can follow pre-recorded modules at their own convenience. These modules may be part of a larger training, or be stand-alone short courses. Some offer certificates for completion and include exercises and/or examinations, while others are more informal. For example, the TCFD in collaboration with CDSB, offers as part of the TCFD Knowledge Hub, a number of online modules aimed at helping all market participants understand the various principles and aspects of the TCFD Recommendations. Stock exchanges may also wish to make their market aware of these resources. For example, in November 2020, **JPX** launched a series of on-demand "Practical Seminars for ESG Disclosure" as part of the JPX ESG Knowledge Hub, a no-fee Japanese-language information platform for listed companies. In one of these webinars, a representative from the Ministry of Economy, Trade and Industry explains the movements around climate change and TCFD in Japan and what the government is focusing on.
- **Social media and other modern platforms:** A number of exchanges have recognized the importance of reaching current and future market participants through new and innovative means. This includes the use of social media mediums, as well as using podcasts or blogs to share climate-related training and education. For example, **Nasdaq**'s "TradeTalks" is a live broadcast from MarketSite in Time Square, which is used to educate the market on various topics. Nasdaq utilized this

platform to discuss the TCFD recommendations live, alongside the United Nations Climate Week, which took place in New York in September 2020. The resulting conversation between Nasdaq's Global Head of Sustainability and the broadcast's host was then posted as a blog on Nasdaq's website.

- **Mixed formats:** Since the emergence of COVID-19, mixed formats have become increasingly relevant for all events and training formats. As such, exchanges may wish to mix formats in order to enable all interested participants to join and to prevent having to cancel events due to unpredictable changes in public health recommendations or other unforeseen circumstances. For example, the **Shanghai Stock Exchange** Global Investors Conference 2020 set up a green finance seminar allowing online and in person participation, featuring discussions on how the financial system helps deliver green recovery as well as on how to improve ESG practices of China A-share companies. Nearly a thousand delegates attend the conference online or in person.

D. Audience and reach

Depending on the market demand and requirements, exchanges have found a variety of ways to ensure sufficient information and education is provided on particular topics to the appropriate audiences. When the intended audience is identified, stock exchanges can use various methods to ensure the audience is reached:

- **The carrot or stick:** Exchanges have found a number of methods to ensure educational events have the desired impact whether that be a broad-spectrum awareness raising or targeted training. In some markets, training has been made mandatory to ensure all intended participants are reached. In other markets, exchanges may attract participation by including high-level speakers or networking opportunities. The latter can also be achieved by conducting training alongside other high-level events, for example the **Mexican Stock Exchange** (BMV) and **Argentinian Exchange Group** BCBC launched the Spanish version of the UN SSE initiative Action Plan on Green Finance alongside the G20 meetings in Buenos Aires in order to include participants of the G20 meetings that would attract a greater audience and therefore having a broader reach for their awareness raising event.
- **Series or multi-event training:** In other circumstances, not all targeted market participants will be reached through a single event or training session. As such, a number of stock exchanges have opted to repeat the same training program multiple times, or to develop a series of training sessions that build on one another or are adapted to different audiences. For example, **JPX** has co-hosted TCFD-themed symposiums with the Financial Services Agency of Japan on a regular basis since 2019, which aim to promote the uptake of TCFD in Japan and advance dialogue between listed companies and investors on the use of TCFD.

E. Resource accessibility

As exchanges begin training on a series of topics related to sustainability, it is important that the market can easily access the resources developed and shared or find future training sessions. Stock exchanges have found many different ways to gather this information for their market, most commonly on their website. Whether through a platform dedicated to education and learning on all topics, or a section of the website dedicated to climate-resilience or sustainability more broadly, exchanges are compiling their educational offerings to help the market access the numerous tools available to them. Ways which exchanges have made resources readily available and easy to find include:

- **Climate-specific website section:** Given the importance and constantly growing data and resources related to climate change, climate-related disclosure and climate-related risks and opportunities, exchanges may wish to develop a dedicated section on their website for climate-related resources. For example, the Luxembourg Stock Exchange created the **Luxembourg Green Exchange** (LGX) to focus entirely on the green bond market and climate-related developments for capital market stakeholders.
- **Adding climate to sustainability-focused platforms:** Another way that exchanges are making climate-related resources easy to find is to add them to existing sustainability platforms. For example, the **NYSE** has a one-stop ESG shop that provides resources and platforms for dialogue between issuers and investors, where climate-related resources can also be found. Additionally, the **Shanghai Stock Exchange's** 'SSE Academy' is a dedicated virtual platform offering a series of courses for investors and listed companies, including a course on green bonds. Similarly, **Bursa Malaysia's** "BURSASUSTAIN" microsite is a one-stop knowledge portal for corporate governance, sustainability and responsible investment, including climate-related resources. Also accessible via the microsite is BURSASUSTAIN's Sustainability Healthcheck - a free self-assessment tool designed to help listed companies 'diagnose' where they are on their sustainability journey. It is presented by Bursa Malaysia as part of their commitment to help listed companies embed sustainability into their governance, management and reporting systems, in order to future-proof their business and to enhance overall business resilience.

ANNEX 4: Advisory Group Members

The SSE gratefully acknowledges the valuable inputs to this document made by the experts listed here. Special thanks goes to Co-chairs of the SSE Climate Advisory Group, Ms. Leila Fourie (CEO Johannesburg Stock Exchange) and Mr. David Schwimmer (CEO of the London Stock Exchange Group) and their representatives, Ms. Shameela Soobramoney (Chief Sustainability Officer at the Johannesburg Stock Exchange) and Mr. David Harris (Global Head of Sustainable Finance, Data & Analytics at the London Stock Exchange Group).

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Note: The views expressed in this paper are those of UNCTAD, UN Global Compact, UNEP-FI, the PRI unless otherwise stated; the paper does not necessarily reflect the official views of individual members of the advisory group or their respective organisations.

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