

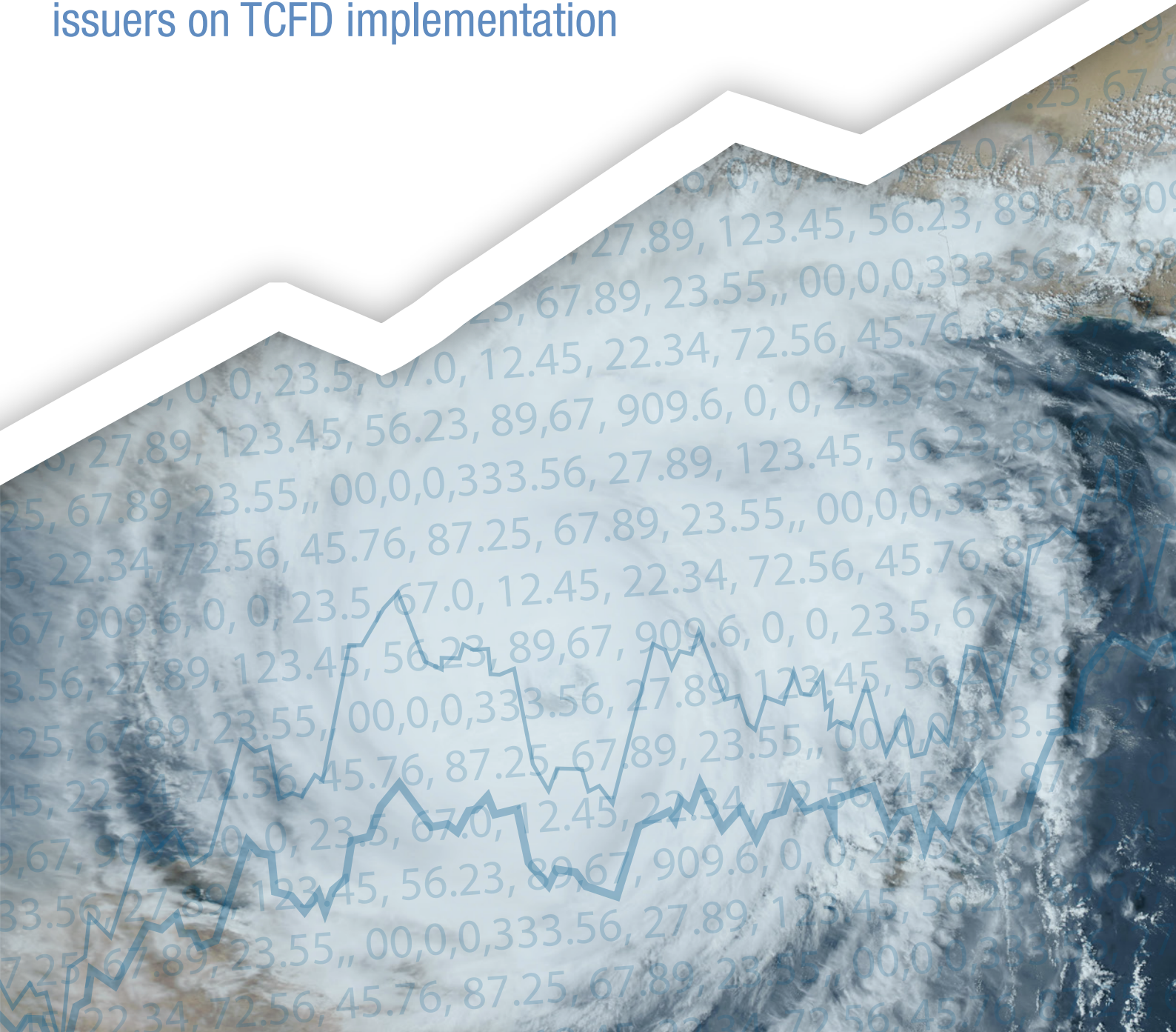


**Sustainable
Stock Exchanges**



Model Guidance on Climate Disclosure

A template for stock exchanges to guide
issuers on TCFD implementation



Note

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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. The SSE gratefully acknowledges the financial support for the production of this report provided by London Stock Exchange Group, Bloomberg Foundation and the International Finance Corporation.

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

Achieving the objectives of the Paris Agreement requires a whole economy transition—every company, every bank, every insurer and investor will have to adjust their business models, develop credible plans for the transition and implement them. This will require all forms of finance: public finance for the development of infrastructure we need to transition to a greener and more climate-resilient economy; private finance to fund technology and innovation, and to help turn the billions of public money into trillions of total climate investment.

That's why our objective for private finance for COP26 is simple: build the framework so that every financial decision takes climate change into account.

Stock exchanges have a key role to play in making this happen. Stock exchanges can play a leading and transformative role in helping corporate issuers to make the transition to a sustainable economy. When launching the COP26 private finance agenda, I stressed that comprehensive disclosure of climate financial risk is foundational to finance driving a successful transition to net zero. The work of stock exchanges in supporting the widespread adoption of TCFD reporting is critical in this regard.

I therefore commend the work that the Sustainable Stock Exchange (SSE) initiative, and its over 100 Partner Exchanges, have done over the past decade, putting in place a framework to help mainstream sustainable finance. I welcome this model guidance, updated to incorporate the latest approach on climate-related disclosure from the Taskforce on Climate-related Financial Disclosure (TCFD), as a key example of the role that exchanges can play in driving this change, and encourage exchanges worldwide to take it up.

This model guidance demonstrates clearly the role that exchanges can play in moving economies towards net zero. I recently launched the Glasgow Financial Alliance for Net Zero, which seeks to broaden, deepen and raise ambition in the financial sector, and allow firms to demonstrate their collective commitments to supporting companies and countries to achieve the goals of the Paris agreement. In the coming months, GFANZ will work with the UN Race to Zero campaign to ensure that all subsectors of the financial sector have credible net zero commitments.

I hope the publication of this model guidance is the first step that exchanges take on the journey to a net zero future.



Mark Carney
Special Envoy on Climate Action and Finance
United Nations

Foreword by David Schwimmer

Almost exactly a year ago, Mark Carney and I wrote to the heads of stock exchanges around the world, urging them to join a coalition that would accelerate action on climate change. Despite the immediate pressures of the pandemic, these leaders answered the call. Stock exchanges can play a central role in raising the flow of capital to industries that must transition to net zero and to the emerging green economy. Together, these represent one of the greatest investment opportunities of our time. By contrast, a failure to act only increases the risks of an environmental, societal and economic crisis on the horizon.

In joining this coalition, exchange leaders have recognised that our organisations can address one of the main obstacles in seizing the investment opportunity of a just transition: namely the need for investors to receive higher-quality climate data and analytics. Thanks to the unique position we occupy between investors supplying capital and companies seeking it, exchanges can help improve this flow of information and create the conditions in which investors re-allocate capital to where it is needed most.

Every day, I see just how strong investor pressure now is to make climate a part of their investment strategies. Institutional clients like pension funds are switching passive index funds into climate-adjusted versions at an extraordinary rate. Investors are asking ever more searching questions of companies in deciding whether to commit funds. Some are using shareholder power to ensure companies develop credible climate transition strategies.

Encouraging companies to adopt a reporting standard that is clear, comparable and comprehensive is essential in both meeting investors' expectations and in preparing companies for the future. The TCFD framework on which this Model Guidance is based is becoming the global standard for climate disclosure. Exchanges that support listed members in adopting these standards today will help make them more investible, more resilient to climate change, and better prepared for regulatory change in the future.

I am proud that just 12 months after we established this coalition, we are publishing Model Guidance that exchanges around the world can implement quickly and easily. The onus is now on us as individual stock exchanges to adapt the guidance to meet country-specific rules, publish it, and then work with issuers so they understand and use it.

With the COP26 climate summit approaching in November and companies stepping up their commitment to a net zero transition, we have a clear opportunity to build momentum around TCFD reporting. I am committing LSEG to publishing its TCFD-based guidance before the start of the Glasgow summit and encourage all other exchanges to do the same.

Thank you to everyone who made this possible: to the UN Sustainable Stock Exchanges team, working groups in exchanges around the world, regulators, corporates, investors and industry bodies. By creating this guidance we have a new and important mechanism that can make a significant contribution to accelerating climate action across the global financial and investment community.



David Schwimmer
Chief Executive Officer
London Stock Exchange Group

Foreword by Leila Fourie

As I reflect on the times we are living through, I am reminded of the iconic Nelson Mandela's pragmatic perspective: *"After climbing a great hill, one only finds that there are many more hills to climb."* The pandemic has made us aware of our interconnectedness with nature. As we attempt to build a better future, the work that lies ahead is daunting, and will require a coalition of the willing, ranging from government, NGOs to the private sector.

The rapid rate of biodiversity destruction poses an existential threat if not confronted quickly and effectively – indeed it may give rise to other pandemics. Moreover, the impacts of climate change serve to exacerbate the issues of inequality and biodiversity destruction. It is against this backdrop that we need to consider the opportunity for markets to be harnessed as a force for environmental and social good. Stock exchanges are conduits for capital formation and catalysts for economic growth. They connect local markets to the globe and play a role in ensuring long-term resilience of both markets and economies.

The JSE, a founding member of the UN SSE, has been a sustainability leader in the exchange industry for over 15 years charting the course for creating an enabling environment for better sustainability practices. We are honoured to co-chair the development of this Climate Disclosure Model Guidance and Action Plan together with the London Stock Exchange Group, with the dedicated support of the advisory group. This work complements and supports our efforts in working within the local ecosystem towards the development of a national framework for climate reporting, as well as our plans to launch a specialised transition finance segment.

Climate change will have varying impacts across the world. Africa will face some of the most severe climate effects economically and socially. Like many developing countries, my country, South Africa, faces the challenge of needing to decarbonise a material part of our economy and energy mix at speed if we are to meet the goals of the Paris Agreement. We need to do so in a way that considers the social impact alongside the environmental. In short, we need to achieve a Just Transition. The guidance document will help equip exchanges to understand their market dynamics and work with issuers to begin the journey of understanding both the risks and opportunities presented by climate change.

Securing our future is a collective responsibility and requires all actors across regions, industries, regulators and the financial sector to do our bit. The model guidance that we have published today is perhaps the first hill – I have no doubt, we will have many more hills to climb as we embed transparent climate reporting in our markets. I sincerely thank the UN SSE, the London Stock Exchange and Mark Carney for helping exchanges play their part and I genuinely hope that exchanges will find value in these reports.



Leila Fourie
Chief Executive Officer
Johannesburg Stock Exchange

EXECUTIVE SUMMARY

As global financial markets take steps towards better integrating climate risks and opportunities into pricing mechanisms, disclosure provides the enabling bedrock for progress in the pursuit of a more sustainable global economy. The growing demand¹ for decision-useful, climate-related financial information in annual reports and financial filings has led to an increased need for issuers to update their knowledge on climate-related risks and reporting frameworks. Climate disclosure is a prerequisite to enable finance-industry commitments such as the Global Financial Alliance for Net Zero (GFANZ) where asset owners, banks, asset managers and the insurance sector have committed to align with a trajectory of emissions reduction to net zero by 2050. Following this trend, there are rapid advances associated with regulation and policy frameworks aiming to support climate resiliency in markets. At the same time, a number of leading economists and experts see climate change as representing the greatest commercial opportunities of our time. Companies and countries most effectively navigating the transition to net zero and identifying the opportunities in providing solutions will not only be more resilient but will also achieve more sustainable growth.

Stock exchanges are uniquely positioned to advance climate disclosure through market guidance. They can have a special role in supporting consistency and standardization of information that enables both local and global progress in climate reporting and use of climate-related data. Stock exchanges have the infrastructure, networks and experience to contribute to addressing climate change via capital markets. By working with and learning from their peers, they can be essential in achieving greater climate-resiliency of markets. In order to assist stock exchanges in their efforts to guide issuers on climate-related disclosure, this guidance document includes two parts:

Part I: An introduction on how and why to use this guidance for stock exchanges; and

Part II: A template guide and diagnostic checklist that stock exchanges can utilize to develop guidance on climate-related disclosure for issuers.

After a brief introduction to the topic and how it relates to other guidance from the SSE in Part I, Part II of this guidance document, herein referred to as the “Model Guidance on Climate Disclosure”, provides a template that exchanges can use to develop issuer-oriented guidance for their markets on climate-related disclosure. The template is structured around the Financial Stability Board’s (FSB) Task Force for Climate-Related Disclosures (TCFD) recommendations, the current best practice for climate-related disclosure. While many stock exchanges (more than half tracked by the SSE) already provide guidance on environmental, social and governance (ESG) disclosure, the TCFD recommendations are unique in their application to mainstream financial filings. Therefore, stock exchanges should see this guidance as supplementary to both their financial filing guidance as well as their ESG reporting guidance. The five chapters of the Model Guidance on Climate (Part II) were developed to help exchanges provide holistic and consistent guidance for the entire disclosure process, recognizing that written disclosure is only one part of a larger process.

To help issuers integrate and communicate climate-related information in alignment with the TCFD, the template guidance in part II aims to guide issuers through a three part cyclical process (figure 1.1):

Step 1 - Disclosure diagnosis and context: Chapters 1 and 5 of part II provides a template for supporting issuers to initiate and update disclosure on climate-related topics.

Step 2 - Integration of climate-related risks and opportunities: Chapter 2 of part II provides a template for supporting issuers to identify and integrate climate-related risks and opportunities into strategy and governance processes.

Step 3 - Disclosure of climate-related practices and data: Chapters 3 and 4 of part II provides a template for supporting issuers in updating their disclosure practices to include climate-related information.

¹For example, more than 340 investors with nearly \$34 trillion in assets under management have committed to engage the world’s largest corporate greenhouse gas emitters to strengthen their climate-related disclosures by implementing the TCFD recommendations as part of Climate Action 100+.

Figure I: SSE Model Guidance on Climate Disclosure: five chapters guide issuers through a three stage process to using the TCFD recommendations



Source: SSE initiative

Part II is written in the voice of an exchange, providing text they may use when they guide their issuers, as well as ideas for strengthening their guidance by adapting it to their market’s circumstances. It is important to note that the text of this guidance aims to provide consistent and global guidance to markets worldwide. With that in mind, stock exchanges are encouraged to be a part of this global movement to align climate-related information disclosure. To assist with this, a text version of the Model Guidance on Climate Disclosure is available on the SSE’s website for public use and exchanges are encouraged to use this template and copy all or any part of the text. Consistency between exchanges through the use of the same guidance can enable and help to drive more consistent reporting globally. Stock exchanges may also wish to utilize the accompanying document “Action Plan to Make Markets Climate Resilient: How stock exchanges can integrate the TCFD recommendations” (herein the “Action Plan”.) It was developed as a companion to this guidance to support stock exchanges that wish to enhance market-wide climate-resiliency and support the amplification of impact from the TCFD recommendations. All SSE documents are publicly available at www.sseinitiative.org/publications.

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PART I: A NOTE TO EXCHANGES ON HOW AND WHY TO USE THIS GUIDE

1. Purpose of this guidance

As the global trend to align finance and investment policy with environmental goals continues to amplify in both breadth and depth, the demand for consistent, comparable and transparent disclosures of climate-related financial information has led to a need for greater education and training on how to use and disclose such data. In 2015, a landmark international accord called the “Paris Agreement” was adopted by nearly every nation with a global agreement to substantially reduce global greenhouse gas emissions in an effort to limit the global temperature increase in this century to 1.5°C.

This ambitious agreement highlighted the urgency of the climate-related context, and the same year the Financial Stability Board (FSB) responded to this urgency with the launch of its Task Force on Climate-Related Financial Disclosures (herein “Task Force” or TCFD). The Task Force’s remit was to provide companies, investors and insurance underwriters with the guidance needed to promote “informed investment, credit [or lending], and insurance underwriting decisions,” and in doing so help companies take action to tackle climate change, effectively manage both opportunities and risks related to climate change, and to facilitate a smooth transition to a more sustainable, low-carbon economy.

Since the launch of these milestone recommendations, together with a number of other key initiatives aimed at clarifying the information required to achieve climate-resilient markets, investors, issuers and financial services are now evaluating how best to adjust practices domestically, regionally and globally. Stock exchanges, as the linchpin of capital markets, have a key role to play in this global movement. Although climate change is a global phenomenon, the potential risks to various industries are highly differentiated according to geography and time-horizons. This can result in significant challenges in identifying a suitable approach to analyse risks and disclose climate-related information in mainstream financial filings or other reports. Stock exchanges are increasingly receiving questions from both investors and issuers about these topics, and while global resources are being released frequently from numerous sources, the overwhelming flood of information can seem daunting at first approach. Additionally, stock exchanges are uniquely placed to (and with the right guidance can) be an important source of global-, regional- and domestic-level support for all capital market participants.

To assist stock exchanges to support all capital market participants through these new advancements and to ensure concurrency both within their market and globally, the SSE has convened a Climate Advisory Group and together developed this guidance document and the accompanying Action Plan.

2. Differentiating TCFD and broader ESG reporting guidance

The guidance within this document acts as a continuation and as supplemental information to the SSE’s previous guidance documents on ESG disclosure and green finance.² This guidance does not aim to replace the SSE’s 2015 Model Guidance on ESG Disclosure, but instead provides bespoke guidance specific to climate-related disclosures (see section 2.2 in Part I for more information on how to align your climate-related disclosure guidance with broader ESG disclosure guidance).

2.1 What are the TCFD recommendations

The TCFD recommendations state that material climate risk 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. This suggests that some issuers are considering the audience for TCFD reporting to be a different one than the audience for their financial documents. Exchanges have a crucial role in helping to address this weakness. While the TCFD emphasizes the financial materiality of climate-related data, and focuses on inclusion of this data in mainstream financial reports, this SSE guidance builds on this by emphasizing the importance of a continual updating of disclosures and time horizons. While some climate-related information may not be deemed financially material through a single materiality lens within the time horizon used for financial filings (see box 1 for a discussion on materiality), it is important to remember that the outward impact of an organization will often also have an internal impact on the company over time, and therefore these two topics go hand-in-hand.

With more than half of the world’s stock exchanges already providing guidance on the broader ESG landscape, guidance on climate-related disclosure should fit within exchanges’ existing guidance on disclosure. Based on the current reporting guidance landscape which focuses primarily on the role of corporate governance in sustainability and the development of broader ESG disclosure, this SSE guidance focuses primarily on the aspects of climate-related disclosure not already covered by the SSE’s existing guidance. As such, when developing guidance on disclosure specific to climate, stock exchanges should remember to update other guidance documents that relate to disclosure practices. For example, exchanges may wish to review their corporate governance and sustainability reporting guidance to reflect and align with the TCFD recommendations. In addition to ensuring alignment of existing disclosure guidance with the recommendations from the TCFD, exchanges are encouraged to either add a chapter specifically focused on climate-related disclosures to their ESG reporting guide, or to develop a supplemental, stand-alone guide. While each exchange may differ on the breadth and depth of the guidance provided to their market on disclosure practices, what is essential is the exchange’s reference to the inclusion of climate-related information to mainstream financial disclosures.

²For previous guidance on ESG reporting for stock exchange, see the SSE’s 2015 guidance titled “[Model Guidance on Reporting ESG Information to Investors: A Voluntary Tool For Stock Exchanges to Guide Issuers](#)” (SSE initiative, 2015), and for guidance on Green Finance for stock exchanges, see the SSE’s 2017 guidance titled “[How Stock Exchanges can Grow Green Finance](#)” (SSE initiative, 2017), as well as the SSE’s 2015 [Policy Brief on climate, carbon & stranded assets](#) and 2016 [Policy Brief on Green Finance](#).

Box 1 The continuum of single and double materiality

First introduced by the EU Commission as part of the non-binding guidelines on Non-Financial Reporting Directive (NFRD) update, double materiality speaks to the fact that risks and opportunities can be material from both a financial and non-financial perspective (see figure below). While these two concepts may sometimes be presented as having clear boundaries, they should rather be seen as a continuum or cycle over time. In other words, issues or information that are material to environmental and social objectives can have financial consequences over time.

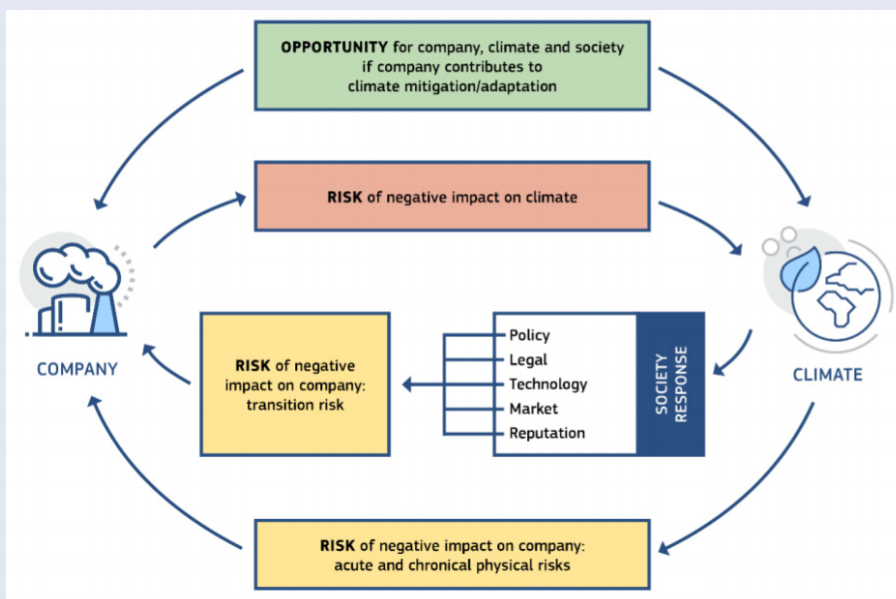


Figure source: European Commission, [Guidelines on Reporting Climate-Related Information](#) (page 11).

In simple terms, single materiality is generally defined as the financial materiality or inward impact on the organization in the timeline defined by financial reporting. Double materiality, however, is seen to take into consideration not only the first materiality (only issues with immediate financial impacts) but also the outward impact of the organization’s operations on the environment and society. What is important for issuers to understand is that information not found to be financially material in the near-term (and therefore may not appear in mainstream financial filings) but that is found to have an outward impact on society or the environment, will likely become financially material at some point in time. It is important to note that double materiality is not twice as challenging to achieve. Rather, if an organization ensures that the materiality process itself is data-driven, dynamic, and context-driven, taking into consideration a wider scope of external data, double materiality will be a more holistic and conclusive outcome.

Source: SSE initiative

2.2 Aligning your climate-related guidance with broader ESG disclosure

In 2015, the SSE answered a call for stock exchange guidance on environmental, social and governance (ESG) guidance. The resultant template, “SSE Model Guidance on Reporting ESG Information to Investors: A Voluntary Tool for Stock Exchanges to Guide Issuers”, provided stock exchanges around the world with the tools needed to guide their markets on ESG disclosure. As a result, the number of stock exchanges providing such guidance increased from 14 in 2015 to now more than half of the world’s exchanges (see figure II). Currently over half of these published guidance documents from exchanges include reference to TCFD.

Figure II: Stock exchanges providing guidance on ESG Disclosure (number of exchanges)



Source: SSE Initiative

While it remains important that stock exchanges continue to guide and educate their markets on sustainability reporting more broadly, climate-related disclosure aligned with the TCFD recommendations goes beyond the SSE's previous Model Guidance on ESG Disclosure and corporate issuers need specific 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 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. The two are complementary but not necessarily mutually dependent.

3. How to use this guide

Stock exchanges are encouraged to use part II of this document as a template and starting point, incorporating local market considerations, such as domestic reporting requirements and codes where necessary. The template includes annexes 1-3 which together with part II of this document provide issuers and public companies listing financial products with the means to make the most of the TCFD recommendations. The objective of the template is to help companies diagnose their current disclosure practices and map a path toward enhanced TCFD-alignment. This is done through practical guidelines on integrating climate-related risks and opportunities into strategy and governance practices, and through an understanding of how to effectively communicate these practices to investors.

The template aims to ensure consistency across markets by providing stock exchanges with the building blocks for guidance and education on this topic. Additional guidance on how stock exchanges can include market-specific information and a number of tips to assist exchanges in further strengthening their guidance by tailoring it to their market are also included in this document; these tips are directed at stock exchanges and not meant to be copied into the stock exchange's guidance to its issuers. While the bulk of the text in this guidance is made to copy and paste, exchanges should feel free to use only what they feel is appropriate to their specific market. A text version of the Model Guidance on Climate Disclosure is available on the SSE's website.

This guidance corresponds with the current best practice for climate-related disclosure, the FSB's [TCFD recommendations](#). While it provides a general overview of the recommendations, it does not aim to replicate existing guidance but rather to build from the recommendations and translate them for easy and practical implementation for listed companies at all stages of their climate and sustainability reporting journeys. This guidance is accompanied by a separate publication, “Action Plan to Make Markets Climate Resilient: How stock exchanges can integrate the TCFD recommendations”, which provides a voluntary practical Action Plan that stock exchanges can use to develop their guidance and amplify its impact.

PART II: SSE MODEL GUIDANCE ON CLIMATE DISCLOSURE AND THE TCFD RECOMMENDATIONS

An example template for stock exchanges to guide issuers

Executive Summary

By 1992 at the Rio Earth Summit, it was already established that “human influence on the climate system is clear and growing, with impacts observed across all continents and oceans”³. Since then, the scientific and economic understanding of the impacts and risks of climate change has grown substantially. Climate-related risks and the expected transition to a low-carbon economy affect all economic sectors and industries and therefore financial markets are increasingly pricing these risks as well as looking to identify and measure new investment opportunities. Globally, investors are recognizing this and are demanding higher quality, consistent data to inform their investment strategies and decisions. This requires a dramatic improvement in climate-related disclosures globally. Where companies are already advancing on this topic, with unprecedented support for climate action including setting science-based targets and net zero emissions commitments, they require support to make sure that this is being effectively communicated to investors. To help issuers integrate and communicate climate-related information in alignment with current best practices, the following three stage process is proposed:

Step 1 - Disclosure diagnosis and context: The first step to ensuring that climate-related issues are sufficiently addressed by your organization, is understanding the relevance of climate change and taking stock of your current disclosure practices. To help issuers understand the key climate-related issues for their business, this guidance provides a basic overview of the evolution of climate-related disclosures and the current financial, political and legal landscape (see chapters 1 & 5). In order to help issuers evaluate their current disclosure practices, this guidance also provides a checklist (annex 1) which helps issuers determine whether or not they are providing sufficient information to investors on this topic.

Step 2 - Integration of climate-related risks and opportunities: The second step for organizations that have recognized the need for action on climate, is to integrate climate-related aspects into their risk assessment and strategy development processes (see chapter 2). Climate change poses both risks and opportunities to all organizations. This integration should be done from the top of the organization and should filter down through policies, processes and strategy.

Step 3 - Disclosure of climate-related practices and data: The third step is communicating the organization's understanding through its disclosure of climate-related practices, strategy and objectives to investors and stakeholders (see chapters 3 & 4). The Financial Stability Board (FSB) established the Task Force on Climate-Related Financial Disclosures (TCFD) to develop recommendations for more effective climate-related disclosures. Through this Task Force, the FSB aimed to identify disclosures that could promote more informed investment, credit, and insurance underwriting decisions and, in turn, enable stakeholders to better understand the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks. This includes a growing focus on whether the climate targets a company is setting are aligned with a climate trajectory towards net zero emissions before 2050. Issuers and private companies issuing products are encouraged to use these recommendations in order to ensure the information they are communicating with investors is both consistent and useful for investors, as well as to ensure that companies are addressing the most financially-material aspects of climate change to their organization.

This three stage cyclical process can and should be undertaken by any company, regardless of size or sector. It is recognized that each company is at a unique phase of its reporting practice evolution and this guidance aims to help all companies, even those with limited reporting experience or limited resources. It is recommended that all issuers perform each of these steps, however the depth and detail of each stage of the process may vary.

Companies may also wish to communicate their commitment to disclosure through a statement supporting the TCFD. More than 2000 companies representing in excess of \$20 trillion in market capitalization have [announced their support](#) for the TCFD and its work since its launch in 2017, including global financial firms responsible for assets in excess of \$178 trillion.⁴ As a stock exchange, we support the recommendations of the TCFD and recognize the importance of educating our market on climate-related risks, opportunities, and disclosures.

We are committed to providing guidance on topics that are essential to the proper functioning of capital markets. Climate change is a mega-trend impacting all sectors of the economy. We therefore aim to guide our issuers and investors on understanding the climate crisis and how disclosure can be used not only to anticipate risk, but also to identify opportunities.

The subsequent guidance aims to clarify current global best practices in climate-related disclosure and provides a step-by-step guide to get issuers started on this journey. This guidance can be a starting point for report preparers that wish to integrate climate-related information for the first time, while also providing additional resources that can help deepen the journey into climate-related disclosure for those that are more advanced. The need for clear, consistent and decision-useful information from issuers on climate-related information is widely recognized. We therefore provide this guidance to support our market in understanding this demand and to help build consistency within our market on how to report on climate-related information.

³IPCC, *Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2014

⁴As of May 2021 - Bloomberg, *A guide to the Task Force on climate-related disclosures*, 2021

 Tip for Stock Exchanges

Strengthen your guidance

A message from your leadership

A message written from the board or CEO of your exchange can provide a more local and powerful message to your market. Exchanges may wish to provide an introduction to the topic and its urgency with a letter from its leadership at the beginning of the guidance document, or even invite their regulator or government officials to provide a message of urgency. The above text may be used as a starting point and can be adapted to align with the exchange's strategy, mission, and unique circumstances. If an exchange has not already officially supported the TCFD or initiated their own reporting journey in alignment with the TCFD recommendations, here may be a good place to announce this. This decision should be one conducted with support from your board.

Chapter 1: Climate disclosure - setting the stage

The first step to ensuring that climate-related issues are sufficiently addressed by your organization is recognizing the changing landscape and identifying your organization's current progress. Climate change science is constantly growing and issuers are encouraged to continually update their knowledge on this topic. This chapter provides an overview of key trends, and chapter 5 provides further resources to help stay up-to-date on this topic. In order to take stock of current disclosure, a diagnostic checklist is provided in annex 1, with a list of questions that investors, lenders, insurance underwriters, and other users of climate-related financial disclosures are wanting answered.

1.1 Key trends

While climate change is often seen as a defining obstacle among sustainability issues, the consequences of it can amplify other sustainability issues, such as inequality, poverty and food availability, water and resource scarcity. Not addressing it can carry a far greater cost than dealing with it today. The estimated financial impacts related to climate change have led investors, policy makers and financial service providers to request additional data from issuers to effectively assess and price risks in the market. In particular, there are three key trends that indicate a need for accelerated action on climate change, namely a rapid change in investment trends, new policy and regulation integrating climate-related disclosures, and increased legal and reputational risks related to climate.

Changing investment trends

Estimates of the financial impacts of climate change vary in both amount and purpose - from upwards of \$43 trillion in assets under management to be at risk through to the end of the century,⁵ to a cost of \$13.5 trillion in energy efficiency and low-carbon technologies required between 2015-2030⁶ (see table 1.1 for a compilation of recent studies). Such studies suggest that climate-related financial risks are not just limited to fossil fuel or high carbon sectors but exist across industries and asset classes. As a result, both investors and issuers are adapting an increasingly long-term outlook for more efficient and risk-adjusted allocation of capital and need to set out their strategies in response to this economic transition.

Table 1.1 Recent studies on potential aggregated financial impacts of climate change		
Year of report	Report title and author	Estimated impact found
2007	Stern Review, The Economics of Climate Change (Cambridge University Press)	<ul style="list-style-type: none"> Equivalent to losing at least 5% of global GDP in perpetuity With a wider range of risks and impacts, estimates of damage could rise to 20% of GDP or more
2014	The Economic Risks of Climate Change in the United States (Risky Business)	<ul style="list-style-type: none"> \$238bn - \$507bn worth of U.S. coastal property below sea level by 2100 Average annual losses from hurricanes and other coastal storms along the Eastern Seaboard and the Gulf of Mexico will rise by \$42bn to \$108bn
2015	Global non-linear effect of temperature on economic production (Nature)	<ul style="list-style-type: none"> Unmitigated warming is expected to reduce global incomes by ~23% by 2100
2015	The cost of inaction: Recognising the value at risk from climate change (The Economist Intelligence Unit)	<ul style="list-style-type: none"> Average expected loss to the total global stock of manageable assets of \$143tr is expected to be \$4.2tr by 2100 (present value)
2015	The Economic Consequences of Climate Change (OECD)	<ul style="list-style-type: none"> 1.0 – 3.3% reduction in global annual GDP by 2060 2.0 – 10% reduction in global GDP by 2100

⁵World Energy Outlook, [Special briefing for COP21, 2015](#)

⁶Impax Asset Management, [Physical climate risks designing a resilient response to the inevitable impact of climate change](#), September 2020

Year of report	Report title and author	Estimated impact found
2016	‘Climate value at risk’ of global financial assets (Nature Climate Change)	<ul style="list-style-type: none"> Mean estimate of present value at risk from climate change, 2015 – 2100, is 1.77% of the value of global assets, and possibly as much as 16.86%
2018	Temperature and Growth: A Panel Analysis of the United States (Federal Reserve Bank of Richmond)	<ul style="list-style-type: none"> Rising temperatures could reduce U.S. economic growth by up to one-third over the next century
2021	Dasgupta Review of the Economics of Biodiversity (HM Treasury)	<ul style="list-style-type: none"> Estimates suggest 1.6 Earths would be required to maintain the world’s current living standards

Source: Adapted from Impax Asset Management’s report titled [“Physical Climate Risks Designing a resilient response to the inevitable impact of climate change, 2020”](#) with additional examples added by the SSE initiative

Investors and asset managers are increasingly shifting their investments towards companies that are better positioned on climate change and often assume poor corporate disclosure will mean a company is poorly prepared for the climate transition. As a result, investments are being diverted away from those companies seen to have poor disclosure on their climate-related strategies and risk-management and towards those seen as leaders. These trends are taking place in both active and passive (index) funds. There is also a high level of coordination between investors in both measuring companies’ climate performance and interlinked engagement with companies on climate action. For example, the [Transition Pathway Initiative](#) (TPI) is a global, asset-owner-led initiative which assesses companies’ preparedness for the transition to a low carbon economy. Similarly, the inter-linked [Climate Action 100+](#) is the world’s largest investor-driven initiative which aims to engage the world’s largest corporate greenhouse gas emitters to take necessary action on climate change. Climate Action 100+ has over 500 investment institutions from around the world as members managing more than USD \$54 trillion in assets which includes the largest global asset owner (GPIF) and asset manager (Blackrock).

Impending changes to policy and regulation

A 2019 whitepaper⁷ by the PRI has highlighted the dramatic increase in attention paid by financial policy makers to sustainability issues in recent years. The PRI’s [Responsible Investment Regulation Map](#) found over 730 hard and soft law policy revisions across approximately 500 policy instruments within the world’s 50 largest economies to support, encourage or require investors to consider long-term value drivers, including ESG factors. This trend has only accelerated, with the 2020 TCFD status report indicating a number of governments beginning to embed the recommendations in policy and guidance and moving toward requiring TCFD disclosures through legislation and regulation (see table 1.2). Together with momentum from IOSCO and IFRS, markets need to prepare themselves for changes to policy and regulation globally to ensure stability and resiliency of financial markets. Issuers and investors can be prepared for regulatory changes aligned with ambitious climate-related policy goals and in doing so will gain competitive advantage and strategic opportunities.

Table 1.2 Government initiatives promoting the TCFD recommendations	
Country	Initiative
Australia	August 2019: The Australian Securities and Investment Commission updated its regulatory guidance on climate-related disclosure, encouraging TCFD-aligned reporting and welcoming TCFD as the preferred market standard. The Australian Prudential Regulation Authority is also increasing its scrutiny of institutions’ climate risk management, with plans to update its Prudential Practice Guide (PPG) to align with TCFD recommendations, including aspects of governance, strategy, risk management, metrics and disclosure.
Brazil	September 2020: Banco Central Do Brasil announced plans to disclose in line with TCFD recommendations and issue regulations for banks to disclose in line with the recommendations in 2021/2022.
Canada	May 2020: The Canadian government established COVID-19 relief financing to large employers contingent, in part, on employers publishing TCFD-aligned disclosures.
China	December 2020: The People’s Bank of China announced new priority areas to support a sustainable recovery from the coronavirus pandemic. Notably, the Central Bank’s Governor, Yi Gang, said the bank would consider introducing mandatory requirements for financial institutions to make climate disclosures.
European Union	June 2019: The European Commission incorporated the TCFD recommendations into its “Guidelines on Reporting Climate-Related Information” for 27 Member States to support companies in disclosing climate-related information under the European Union’s reporting requirements. April 2021: The European Commission published a legislative proposal for a Corporate Sustainability Reporting Directive to establish a set of mandatory European sustainability reporting standards. The TCFD recommendations will serve as the foundation for these future EU sustainability standards.

⁷PRI, *Taking stock: Sustainable finance policy engagement and policy influence*, 2019

Country	Initiative
Hong Kong	December 2020: A cross-agency group co-chaired by the Hong Kong Monetary Authority and Securities and Futures Commission launched a strategic plan that requires Hong Kong financial institutions and listed companies to disclose in line with TCFD recommendations no later than 2025. The Steering Group is also seeking to establish a platform to act as a focal point for financial regulators, government agencies, industry stakeholders and academia to coordinate cross-sector capacity building and repository of relevant resources to the Sustainable and Green Exchange (STAGE).
Japan	October 2019-2020: The Ministry of Economy, Trade and Industry (METI) released “TCFD Guidance 2.0” in 2020 and, together with the Ministry of the Environment and Financial Services Agency, supported the launch of the TCFD Consortium of Japan public-private sectors platform to pursue climate-related financial disclosures. METI held the first TCFD summit in October 2019 and a second summit on October 9, 2020. Japan currently hosts the largest group of TCFD supporters, accounting for almost a quarter of the world’s total.
Malaysia	September 2020: As part of its priorities over the next year, members of the Joint Committee on Climate Change (JC3) — chaired by Bank Negara Malaysia (BNM) and the Securities Commission, along with members from Bursa Malaysia and financial industry — have committed to work towards wider adoption of TCFD recommendations and push forward concrete actions to pave the way for the adoption of disclosure standards by financial market participants.
Mexico	September 2020: Banco de México recommended providing a clear strategy on how regulation and supervision will promote disclosure of physical and transition risk analysis of financial institutions and corporations following TCFD recommendations.
New Zealand	September 2020: The New Zealand government announced it would introduce a mandatory climate-related financial disclosure regime based on the TCFD framework. This means that approximately 90% of the country’s assets under management could be obligated to make climate-related disclosures in line with TCFD recommendations by 2023.
Singapore	December 2020: The Monetary Authority of Singapore (MAS) released three sets of “Guidelines on Environmental Risk Management” for banks, corporates and asset managers indicating that these groups should reference international reporting frameworks, including TCFD, to guide their environmental risk disclosure.
South Africa	May 2020: The National Treasury of South Africa published a draft technical paper recommending that regulators and the financial sector establish standards on identifying, monitoring and reporting environmental and social risks, including climate-related risks, that incorporate the TCFD recommendations.
Switzerland	January 2021: Switzerland became a formal supporter of TCFD to complement the country’s sustainable finance policy agenda. The decision is in line with the Federal Council’s call to have Swiss companies from all economic sectors implement the TCFD recommendations, with the Federal Council aiming to put forward legislation to make this binding.
United Kingdom	November 2020: The United Kingdom announced that all publicly listed UK companies with a premium listing will be required to “comply or explain” with the TCFD’s requirements by 2023, with mandatory TCFD-aligned disclosures across non-financial and financial sectors of the UK economy by 2025.
United States	April 2021: Secretary of the Treasury Janet L. Yellen endorsed the TCFD recommendations as the key foundational framework for climate reporting in remarks to the Institute of International Finance. In co-chairing the G20 Sustainable Finance Working Group, the US Treasury will be working with finance ministries and central banks to build on the work of the TCFD in developing their approaches to sustainability disclosures.
International	<ul style="list-style-type: none"> ■ January 2019: The International Organization of Securities Commissions (IOSCO) published a statement expressing the importance of considering ESG issues when reporting material information. Notably, IOSCO referenced the TCFD as a framework for reporting organizations to consider when disclosing climate-related information, and as IOSCO is composed of securities and futures markets regulators from over 100 countries, this statement carries significant global implications. April 2019: The Network for Greening the Financial System (NGFS), a group of 72 central banks and supervisors and 13 observers from international organizations, published “A Call for Action: Climate Change as a Source of Financial Risk.” In the report, the NGFS encouraged all companies issuing public debt or equity as well as financial-sector institutions to disclose in line with the TCFD recommendations.

International <i>Continued</i>	<ul style="list-style-type: none"> ■ October 2019: The European Union launched together with the relevant authorities of Argentina, Canada, Chile, China, India, Kenya and Morocco, the International Platform on Sustainable Finance (IPSF). The IPSF aims to promote best practices around taxonomies, disclosures, standards and labels to scale up the mobilization of private capital towards sustainable investments. Today, there are 17 members of the IPSF, representing 55% of greenhouse gas emissions, 50% of the world population and 55% of global GDP. The majority of members have also set regulatory requirements for climate disclosure. ■ February 2020: On a global level, the 26th UN Climate Change Conference of the Parties (COP26) featured TCFD implementation in its private finance agenda. In his speech at the February 2020 launch of the COP26 private finance agenda, Mark Carney — former Governor of the Bank of England and Finance Adviser to the Prime Minister for COP26 — encouraged companies to report a full set of TCFD disclosures in the 2021–2022 reporting cycle. ■ March 2021: The IFRS Foundation announced the formation of a working group to accelerate convergence in global sustainability reporting standards focused on enterprise value and to undertake technical preparation for a potential international sustainability reporting standards board under the governance of the IFRS Foundation. Specifically, the working group will provide technical recommendations, including further development of the prototype built on the TCFD recommendations, as a potential basis for the new board to build on existing initiatives and develop standards for climate-related reporting and other sustainability topics.
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Source: Adapted from Bloomberg's 2021 report titled "[A guide to the Task Force on climate-related disclosures](#)", with additional examples added by the SSE initiative

Legal and reputational risks

Both issuers and investors are increasingly cognizant of the legal and reputational risks related to the failure to act on climate change. As of January 2020, the total number of climate change legal cases filed reached approximately 1,444 for the year, continuing an upward trend of such cases.⁸ The most recent climate change litigation update by Norton Rose Fullbright notes "the growing demand from consumers for environmentally sustainable goods and services is prompting ever increasing scrutiny from consumer advocates and regulators into misleading and fraudulent corporate climate claims or commitments."

While litigation can indeed be a reputational risk as well, reputational risks associated with climate change are also on the rise. In the climate change context, McKinsey & Company define reputation risk as "the probability of profitability loss following a business's activities or positions that the public considers harmful." A damaged reputation can for example, impact sales, through consumer boycotts or local community protests. Knock on effects include damage to its investor relationships, and adjusting opinions of potential future employees. Further, not only are customers pushing for climate action from companies, but so are shareholders. Shareholder resolutions are increasingly addressing climate-related topics and putting pressure on issuers to make significant changes to business strategies and operations. The 2020 Proxy Voting Annual Review shows record-high environmental proposals both filed and making it to vote, as well as a new record number of proposals receiving majority support. Additionally, the report predicts better-targeted environmental proposals in 2021 and sees growing demand for creating environmental-focused reports or industrial waste-pollution reports.⁹

⁸Norton Rose Fulbright, [Climate change litigation update, 2020](#)

⁹Proxy Insight, [2020 Global Shareholder Voting Review, 2020](#)

Tip for Stock Exchanges

Strengthen your guidance

Identify market-specific drivers

No one knows your market better than you do. As the interface between all capital market participants, the stock exchange is uniquely knowledgeable about its market's greatest opportunities and risks. Exchanges may wish to utilize this knowledge to speak to these unique aspects of their market by adding additional drivers such as industry-specific trends, data on investment trends direct from your market, and market-specific incentives for climate-related disclosure. While it is important to highlight the global nature of this transition, market participants will benefit from also understanding how this transition is already underway and uniquely affecting the market they operate in.

If an exchange wishes to elaborate on any of the above trends or provide incentives for disclosure, they can find additional information in the accompanying Action Plan.

1.2 What is the TCFD?

Currently seen as a best practice in climate-related disclosures, the TCFD's remit upon creation by the Financial Stability Board was to provide companies, investors and insurance underwriters with the guidance needed to promote "informed investment, credit [or lending], and insurance underwriting decisions," through climate-related disclosures in mainstream financial filings. The TCFD is committed to market transparency and stability, based on the belief that better information will allow companies, investors, finance providers, policy makers and regulators to incorporate climate-related risks and opportunities into their risk management and strategic planning processes. As this occurs, the 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 designed to help companies provide better information to support informed capital allocation. Since the publication of these milestone recommendations, the TCFD has issued three 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.

These recommendations are structured around four thematic areas (table 1.3) that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets. A checklist of the specific disclosures recommended for these four categories is included in annex 1 of this guidance and can be used to both analyse current reporting practices as well as map disclosures. The four thematic areas are intended to interlink and inform each other, and therefore issuers will also find an overlapping of information between these four categories.

Table 1.3 TCFD recommendations and supporting recommended disclosures

Recommendations and Supporting Recommended Disclosures			
Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	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.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	Recommended Disclosures	Recommended Disclosures	Recommended Disclosures
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

Source: Page 14 of the [TCFD recommendations](#)

1.3 Self-diagnosis of climate disclosures

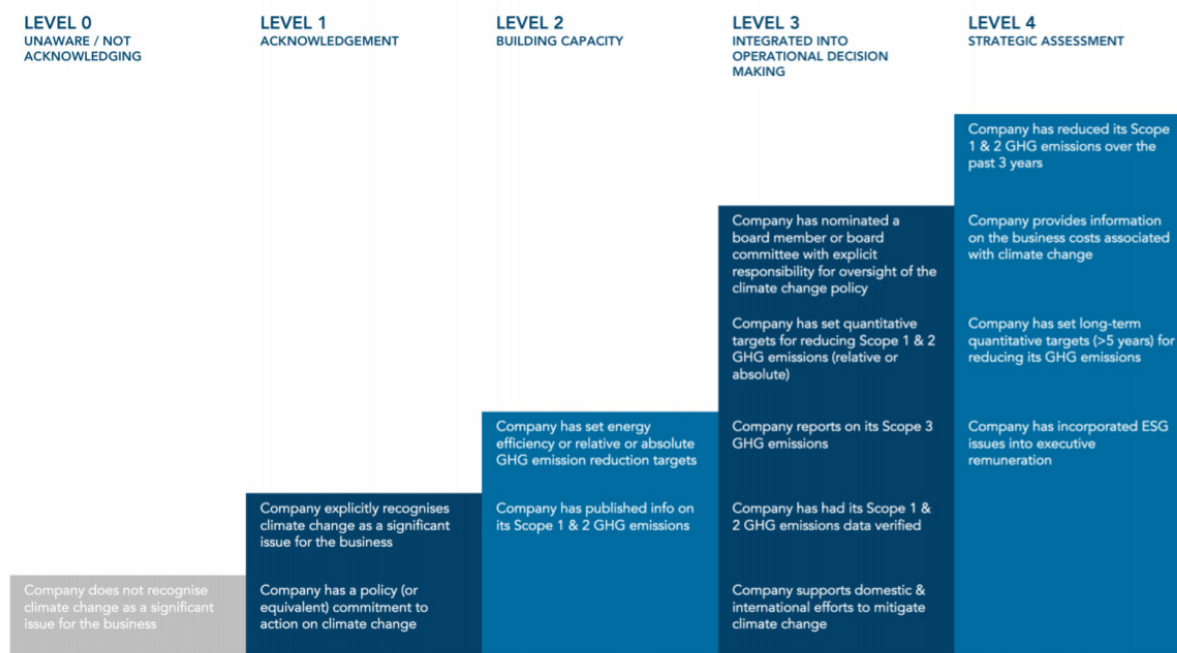
To get started in evaluating how well your organization communicates its climate-resilience, issuers may wish to use the TCFD Checklist found in annex 1, which is based on the recommended disclosures of the TCFD. Issuers can use this checklist to self-diagnose their published information and determine whether an investor could or could not answer the questions listed in the checklist. Where issuers establish that sufficient information is provided in their current disclosures to answer a question on the checklist, they may wish to indicate where that information can be found, using the checklist as a map for easy identification of TCFD-recommended information (see examples in chapter 3). If it is determined that report users cannot answer a question on the checklist using publicly available information, issuers should consider including additional information in their public disclosures. This guide will help issuers determine what information will help investors and other users of reports answer the questions on the TCFD Checklist, help identify where issuers may wish to disclose this information, and how they may wish to present it.

1.4 Differential reporting

Many small- and medium-sized organizations may put off reporting on or considering climate-related information in their risk management and strategy development processes because they assume that they do not have sufficient resources to comply with recommendations such as those by the TCFD. When following the three steps proposed within this guide, issuers can be expected to vary in depth and breadth depending on size and sector. Climate risk is relevant for companies of all sizes and sectors but the depth and detail of reporting that investors expect will not be the same for all companies. There is a growing expectation from investors that larger companies and especially those in industries that are highly exposed to the risks of climate change (both physical and/or transition-based) such as extractives, energy, agriculture, steel, cement, tourism and travel will provide more detailed disclosures. Therefore in these cases the TCFD Checklist should be used to ensure that all disclosure recommendations are met.

Smaller companies in less vulnerable industries and/or those with fewer resources available for reporting procedures, may wish to use the results of the checklist exercise to map a plan for future disclosures. Progress can be disclosed so that investors are aware of the issuer's plans, such as in example 1.1. Issuers that chose to map a plan towards full disclosure may wish to use an existing staged process such as the Transition Pathway Initiative's (TPI) 4 level staircase (see figure 1.1). While initially developed as an assessment tool, the TPI staircase can also help companies chart a pathway of constant progression and set objectives for their climate-related disclosure journey. To assist issuers with this, the TCFD Checklist in annex 1 indicates to which step of the staircase each question corresponds, and can help issuers determine which questions need to be answered to achieve the next step in their progression. It is important to note, however, that a staged approach should only be considered when limited resources do not permit an organization to integrate all the recommendations of the TCFD from the start. Issuers in climate-vulnerable industries should consider either immediate alignment or an accelerated progression (within 1-2 years).

Figure 1.1: TPI's four levels of TCFD alignment



Source: Page 4 of Transition Pathway Initiative's report "[How can investors use the transition pathway initiative? Version 1.0 - 11 January 2016](#)"

1.5 The intended audience for this guidance

The primary objective of this guidance is to support listed companies in considering how they can integrate the TCFD recommendations into their disclosure processes. The Task Force believes climate-related issues are or could be material for many organizations, and its recommendations should be useful to organizations in complying more effectively with existing disclosure obligations. This corresponds with a study conducted by SASB finding climate risk to be financially material in 68 out of 77 industries classified by SASB. This equates to 89% of the market capitalization of the S&P Global 1200 or roughly \$45.2 trillion. The starting point for this guidance is that all companies regardless of sector need to consider how the impact of climate change and the economic transition to net zero emissions will impact their business and hence how to disclose climate information to investors. The Task Force recommends that preparers of climate-related financial disclosures provide such disclosures in their mainstream

(i.e., public) annual financial filings, which aims to foster shareholder engagement, promoting a more informed understanding of climate-related risks and opportunities by investors and others. The Task Force also believes that publication of climate-related financial information in mainstream annual financial filings will help ensure that appropriate controls govern the production and disclosure of the required information. If certain elements of the recommendations are incompatible with national disclosure requirements for financial filings, the Task Force encourages organizations to disclose those elements in other official company reports that are issued at least annually, widely distributed and available to investors and others, and subject to internal governance processes that are the same or substantially similar to those used for financial reporting.

 Tip for Stock Exchanges

Strengthen your guidance

Identify local requirements

In order to speak directly to the readers of this guidance, stock exchanges may wish to not only highlight the intended audience for their guidance, but also the local regulatory implications that may impact how companies or investors make use of this guidance. By highlighting how local regulation views climate-related information, the stock exchange can make regulatory obligations of both investors and issuers clear and uncomplicated. Stock exchanges may also wish to work with their regulators to clarify how local regulations align with global standards.

Chapter 1 Examples

Example 1.1: American financial services company Citi Group's TCFD Implementation Progress

	Existing Achievements	Current Priorities	Future Goals
Governance	<ul style="list-style-type: none"> Established Climate Risk Advisory Council, Climate Risk Working Group, and Global Sustainability Steering Committee Climate concerns considered by Citi Board of Directors, and oversight provided by Nomination, Governance, and Public Affairs Committee New Chief Sustainability Officer and Global Head of Crisis Management and Climate Risk roles created 	<ul style="list-style-type: none"> Enhance cross-functional collaboration on climate issues and greater climate risk training across departments Continue to establish country-level governance based on proportionality and local regulatory needs 	<ul style="list-style-type: none"> Expand governance and oversight capacity in line with increasing climate regulatory requirements
Strategy	<ul style="list-style-type: none"> Established climate risk as a key pillar of Citi's 2025 Sustainable Progress Strategy Analyzed Citi's operational vulnerabilities to physical climate risk and certain portfolios' resiliency to transition climate risks Assessed and tested different methodologies to evaluate certain portfolios' carbon footprint and scenario analysis for carbon-intensive sectors Created new business units in our Banking and Markets businesses to further integrate climate opportunities into banking advisory, client solutions, and market making Strengthened Environmental and Social Risk Management (ESRM) Policy sector standards for thermal coal mining,¹ coal-fired power, and Arctic oil and gas 	<ul style="list-style-type: none"> Evaluate climate scenarios recommended by the Network for Greening the Financial System (NGFS) for possible integration into risk management processes and to meet potential regulatory requirements Develop climate scenario analysis approach for high climate risk sectors Expand engagement with clients and third parties to gather climate-related due diligence information and improve climate data access and accuracy 	<ul style="list-style-type: none"> Utilize an enhanced suite of climate scenarios against which we periodically test relevant credit portfolios and integrate such test results into our ongoing climate strategy Continue to evolve our strategy through a combination of strengthening climate risk assessment requirements, considering climate risk in client selection, pursuing client transition finance opportunities, and evaluating sector exposures to reduce portfolio emissions over time
Risk Management	<ul style="list-style-type: none"> Embedded climate risk into Citi's Material Risk Inventory, Emerging Risks Framework, and Risk Governance Framework 	<ul style="list-style-type: none"> Develop sector-specific climate risk guidance, focusing on highest risk sectors Start to integrate climate risk into credit assessment processes Continue analyzing the alignment of relevant, high climate risk sectors of our loan portfolio with the Paris Agreement through frameworks such as PACTA and PCAF 	<ul style="list-style-type: none"> Adjust our strategy based on lessons learned from past performance Further define assessment tools and methodologies and integrate into credit assessment processes Develop key climate risk metrics and implement across various levels of the organization Further develop climate risk escalation and approval processes Improve distribution and integration of climate risk management tools across Citi's departments Continue evaluating and adjusting climate risk management process and tools in accordance with Citi's climate risk strategy

	Existing Achievements	Current Priorities	Future Goals
Metrics & Targets	<ul style="list-style-type: none"> Established five-year \$250B Environmental Finance Goal for climate and environmental solutions 	<ul style="list-style-type: none"> Identify and report on performance against key metrics and targets of our \$250B Environmental Finance Goal Implement tiered reduction in credit exposure to thermal coal mining companies with a 50% reduction by 2025 and 100% reduction by 2030 Start measuring and disclosing climate risk metrics in pilot sectors to establish baseline for evaluating portfolio decarbonization pathways towards Paris Agreement-alignment 	<ul style="list-style-type: none"> Report on decarbonization and progress towards Paris Agreement-alignment

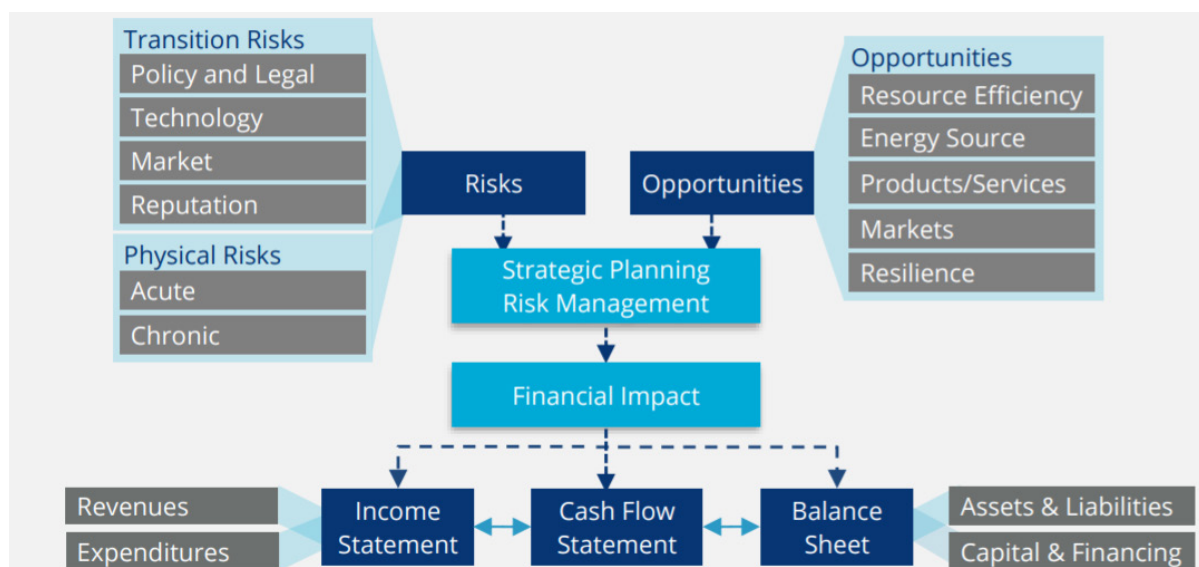
Source: Page 9 of Citi's report titled "[Finance for a Climate-Resilient Future II: Citi's 2020 TCFD Report](#)"

Chapter 2: Risks and opportunities

The second step for organizations that have recognized the need for action on climate is to integrate climate-related risks and opportunities into their governance, strategy and risk management processes. In order to do this, it is important that the board and senior-level management recognize the climate-related risks and opportunities that are relevant to their organization, their industry, their supply chain and their geographic location. To help organizations with this task, this chapter identifies key climate-related risks and opportunities, as well as providing guidance on practices used to evaluate the risk and opportunities most relevant to an organization.

While many organizations will already be considering various opportunities and risks associated with climate change, the TCFD recommendations offer a framework for these risks and opportunities that enables global consistency. The Task Force's recommendations serve to encourage organizations to evaluate and disclose, as part of their annual financial filing preparation and reporting processes, the climate-related risks (examples 2.3 - 2.5) and opportunities (examples 2.1 and 2.2) that are most pertinent to their business activities. The risks and opportunities recommended for consideration by the TCFD are those which have a financial impact and should therefore also be reflected in the organization's financial statements (figure 2.1).

Figure 2.1 - Climate-related risks, opportunities, and financial impact



Source: Page 8 of the [TCFD recommendations](#)

2.1 Climate opportunities

Efforts to mitigate and adapt to climate change can and are producing substantial opportunities for organizations and their investors. In fact, the financial impact of climate opportunities may outweigh climate risks. In a 2019 study by CDP¹⁰, it was found that 225 of the world's 500 largest companies reported climate-related opportunities representing potential financial impacts of over \$2.1 trillion - more than twice the financial impact estimation from climate risks (\$970 billion). Additionally, the report found that more than half of all reporting companies in the study identified potential opportunities that could have a substantive or strategic impact on their business.

Climate-related opportunities may come through the implementation of new resource efficiency and cost savings programs, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain. TCFD identified several areas of opportunity (see figure 2.1 for an overview) that organizations should assess and evaluate. In the same way that organizations identify potential negative impacts associated with climate risks, the financial impact of new climate opportunities should be identified and reflected in disclosures. Companies should disclose the governance structures and strategies developed to identify and assess climate-related opportunities such as cost savings strategies or product development to meet new market demands. These opportunities should also be measured for financial impact and appear in disclosures of metrics and targets. An example of reporting on opportunities can be seen in examples 2.1 and 2.2.

2.1.1 Financing opportunities

Increasingly, the financial sector is creating new opportunities when climate-related data is made available. The growth of the green bonds market is an example of these growing financing opportunities in "green" that issuers can take advantage of. The green bond market continues to reach new records. For example, in 2020 the Climate Bonds Initiative noted 60% average annual growth in green bond issuance since 2015¹¹ with a cumulative \$1 trillion milestone¹² reached in December 2020 and a doubling of issuance in the first quarter of 2021¹³. These shifting dynamics are also evident in global stock markets and therefore important for issuers to provide relevant disclosure on. This is demonstrated by the outperformance from "green industries" vs. the wider market (figure 2.2). Non-financial sector organizations should evaluate what new opportunities for financing related to climate-alignment exist (such as green bonds). Financial sector organizations can address this opportunity from a product-opportunity perspective (see example 2.2).

¹⁰CDP, *Major Risk or Rosy Opportunity: Are companies ready for climate change?* 2019

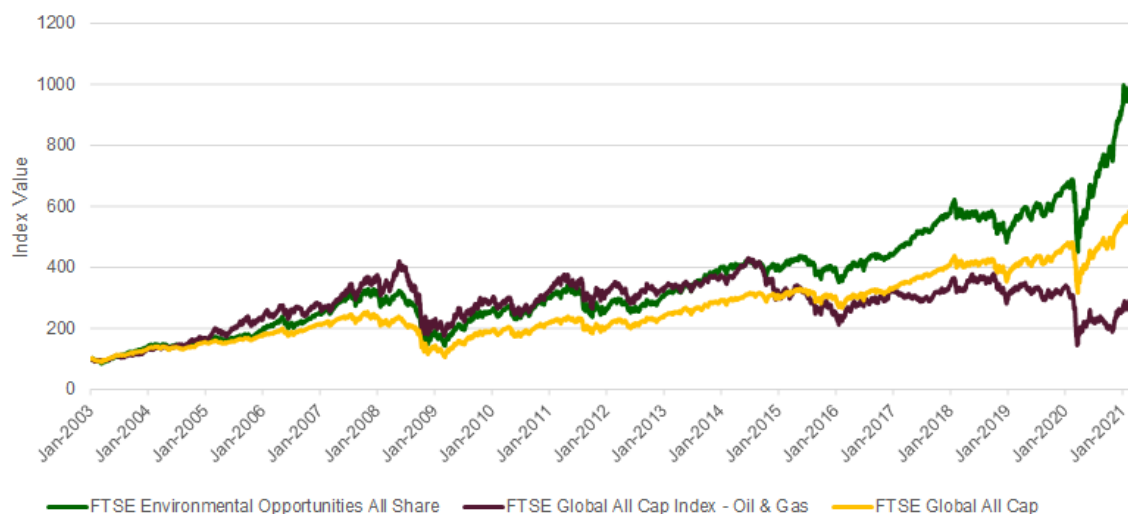
¹¹CBI, *Record \$269.5bn green issuance for 2020: Late surge sees pandemic year pip 2019 total by \$3bn*, 2021

¹²CBI, *\$1 Trillion Mark Reached in Global Cumulative Green Issuance: Climate Bonds Data Intelligence Reports: Latest Figures*, 2020

¹³Refinitiv, *Deal Insights - Sustainable finance continues surge in Q1, 2021*

Figure 2.2 – Performance of “green industries” vs. the wider market

Performance of FTSE Environmental Opportunities All Share² vs Global All Cap & Oil & Gas



Source: FTSE Russell as of February 2021

 Tip for Stock Exchanges

Strengthen your guidance

Identify your market's key opportunities and risks

Each market faces unique challenges but may also be presented with unique opportunities. Stock exchanges can enhance their guidance by identifying these, whether they are home-grown or involve foreign investment, industry or technology. Stock exchanges know best what their market's key industries need and therefore can provide more concrete examples guiding the domestic market in the direction of relevant and high-potential opportunities as well as identify high-risk scenarios. Exchanges may wish to use the TCFD's sector-specific guidance to identify key opportunities related to the sectors most prevalent in their market, and work with local governments to identify location-specific opportunities and risks.

For markets that have not yet done so, conducting a scenario analysis is an effective way to identify both opportunities and risks. Section 2.5 of this chapter provides additional information on how to conduct a scenario analysis, and stock exchanges can benefit from conducting this analysis to identify climate-related risks and opportunities in their market. Additional assistance on conducting a scenario analysis for your exchange can be found in the accompanying Action Plan.

2.2 Climate risks

The Task Force in its work evaluating risks related to climate found two key categories of risk that report preparers should be considering:

1. Risks related to the transition to a lower-carbon economy
2. Risks related to the physical impacts of climate change

Within a scenario of climate transition, companies may face risks relating to policy and legal changes, new or obsolete technologies, changing market behaviors and reputational risks. These risks are often reflected in both an organization's income statement and its balance sheet through revenues, expenditures, assets, liabilities, capital and financing. Examples of these risks were identified by the Task Force (see figure 2.1 for an overview) and may be used to initiate a risk-assessment in order to identify potential climate-related risks threatening your company. A materiality analysis (see section 2.3 of this chapter) can and should be conducted to illustrate how materiality is determined and what risks are determined to financially impact an organization.

While climate change is a global challenge, it also has unique local implications. Whether an issuer is operating in one or many countries, they should consider both global and domestic risks confronting their operations. Within the markets where an organization operates, there are also specific risks and opportunities that companies should consider when conducting initial risk and opportunity analysis (examples 2.3-2.5).

2.3 Climate governance

A key aspect of ensuring climate-related risks and opportunities are sufficiently integrated into internal processes is through governance mechanisms. Users of climate-related financial disclosures are interested in understanding the role an organization's board plays 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. While good governance should intrinsically include climate governance, 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.

Issuers should consider to what extent their current corporate governance accounts for and takes into consideration climate-related risks and opportunities (see examples 2.6 and 2.7). The Task Force considers governance, as well as risk management, to be essential information required by investors to assess an organization's financial and operating results. As such, the recommended disclosures pertaining to risk management and governance are recommended to be disclosed in the annual financial filings of all listed companies.

 Tip for Stock Exchanges

Strengthen your guidance

Link to broader corporate governance guidance

Many stock exchanges already provide guidance to their markets on corporate governance requirements and best practices. It is important for issuers to understand how climate-related issues can be integrated into their existing governance practices, while also being able to identify gaps in practices that make organizations vulnerable to climate-related impacts. Stock exchanges may wish to remind issuers in this section of the tools and guidance available to them for developing good governance and highlight how climate can be integrated into those practices.

2.4 Materiality assessment

Materiality, which can be understood in simple terms as the importance of a piece of information for decision making processes, is a crucial aspect of the TCFD recommendations. While it is noted that over time materiality will change and that time horizons impact whether or not information is relevant to a decision, the TCFD recommendations primarily relate to information deemed "financially material." In alignment with this, our guidance is primarily focused on helping report preparers to understand the financial impact of climate-related information. In most jurisdictions, if information is indeed found to be financially material, or in other words poses a financial risk or opportunity to the organization, it must legally be disclosed by the company.

The Task Force recommendations are based on the belief that climate-related issues are or could be material for many organizations, and its recommendations should be useful to organizations in complying more effectively with existing disclosure obligations. It also notes, however, that climate-related risk is a non-diversifiable risk that affects nearly all industries, and therefore many investors believe it requires special attention. For example, in assessing organizations' financial and operating results, many investors want insight into the governance and risk management context in which such results are achieved. Therefore, the Task Force believes disclosures related to its governance and risk management recommendations directly address this need for context and should be included in annual financial filings regardless of materiality priorities.

When determining whether or not to disclose certain information in mainstream financial filings, companies often conduct a materiality assessment (also known as a materiality analysis) which is a tool for prioritizing issues from both the organization's and its stakeholders' perspectives. This analysis may find some issues to be financially material (having a financial impact on the organization), while others may be found to be, within the time horizon evaluated, primarily socially or environmentally material (having an impact external to the organization). Through a mapping exercise organizations can determine what issues will be the most relevant in the near future and which are most likely to have a financial impact to the company. Both physical and transitional risks pose important financial impacts to organizations, and even in instances where corporations may not be evaluating this risk, investors in many cases are.

Companies who do not find climate-related risks or opportunities material to their organization are encouraged to report the means by which they came to this conclusion, and the time horizon used. The Task Force encourages organizations where climate-related issues could be material in the future to begin disclosing climate-related financial information outside financial filings to facilitate the incorporation of such information into financial filings once climate-related issues are determined to be material. A materiality matrix can be used to illustrate how a company has considered climate-related matters (see examples 2.8 and 2.9).

2.5 Scenario analysis

The TCFD recommends conducting scenario analyses (see box 2.1) to help identify and effectively assess the potential implications of a range of plausible future conditions due to the uncertainty of climate-related changes. Scenarios are hypothetical constructs that consider how the future might look if certain trends continue or certain conditions are met (see examples 2.10 - 2.12). Scenario analysis is not an exercise in forecasts, predictions or sensitivity analyses, but rather in evaluating resilience to different possible future scenarios. For example, while governments have agreed upon the target of limiting global average temperature rise to no more than 2°C above pre-industrial levels, 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. This analysis can be qualitative, relying on descriptive, written narratives, or quantitative, relying on numerical data and models, or a combination of both.

While climate change can impact organizations both today and in the future, the implications often vary over time in severity and conditions. Conducting scenario analyses is a method for developing strategic plans that are more flexible or robust and has become a useful tool for businesses to understand the strategic implications of climate-related risks and opportunities. While this is an important step to the TCFD, it is also often the stage for which companies have the least experience. It is important to note, that while the initial process of developing a scenario analysis may be challenging, it pays dividends in the years ahead. After the first round of analyses, only adjustments will be needed on a yearly basis; revisiting the whole process is less often required.

Organizations have numerous resources available to them, including the [TCFD's Guidance on Scenario Analysis for Non-Financial Companies](#) (2020), the TCFD's Knowledge Hub, among others (see section 5.2 of Chapter 5). For example, the TCFD's guidance on scenario analysis provides a detailed step-by-step guide on how to conduct a scenario analysis and provides a detailed analysis on available scenarios and models. The same guidance also provides a list of key messages that organizations should understand about scenario analysis. If issuers have not worked on a scenario analysis before, they may wish to use the many resources available through the TCFD and other organizations such as C2ES (see box 2.1).

To conduct a scenario analysis, companies may wish to follow the following (simplified) three stage process:

1. **Identify appropriate scenarios** - Each organization has the choice of using “out-of-the-box” scenarios or developing their own. In either case, it should choose the scenarios that align with the organization's underlying assumptions and the key risks and opportunities of its sector or industry. The scenarios used should be clearly explained. It is also important that organizations recognize the importance of consistent and comparable disclosures and therefore existing scenarios will help ensure consistency with scientific data underpinning the exercise. 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 analysing the impact of climate-change in the scenarios chosen, organizations may wish to set boundaries to their analysis. This simple process determines how far your analysis will extend. While smaller organizations may feel that an analysis of the direct operations sufficiently covers the climate-related risks and opportunities within each scenario, it will be beneficial for most larger companies and all financial-sector companies to expand their analysis beyond their headquarters. Boundaries may be set for financial institutions to include their portfolio, and all large organizations should consider including their supply chain and customers.
3. **Analyze both transitional and physical risks within the scenarios chosen** - Once the scenarios are chosen and boundaries are set, the organization undergoes an exercise of evaluating its physical and transitional risks. This exercise can also be used to identify the opportunities that may appear within the scenario. Mapping the severity and likelihood of the risks enables the organization to develop a strategic plan for future scenarios.

Box 2.1 Tips on conducting a scenario analysis

The Centre for Climate and Energy Solutions (C2ES) launched a report in 2018 that identifies best practices companies are employing when they conduct TCFD recommended scenario analyses. They include:

- **Make use of publicly available scenarios and leverage them by customizing corporate scenario exercises around company-specific risks and opportunities.** Stakeholders are familiar with the parameters and assumptions in publicly available scenarios, but companies need to explain how the scenarios were modified and used to stress test their particular portfolio and circumstances.
- **Focus scenario exercises and disclosures on a few key variables associated with long-term climate-related risks and opportunities that could have a material impact on the business.** Stakeholders want to understand how companies manage the uncertainty and long-term risks of climate change. A scenario analysis is not intended to be a predictive exercise, nor an exhaustive one. Rather, it provides an opportunity to evaluate potential strategies compatible under a range of outcomes to make companies more financially resilient.
- **Use a range of scenarios when conducting a scenario-based risk analysis, including those that do not meet 2°C.** Exploring a broad range of futures and testing those against a company's strategy will help illustrate financial resilience under a variety of climate-related outcomes. Beyond assessing the risks and opportunities related to an energy transition, companies should also consider the physical impacts of climate change and analyze them along the entire value chain.
- **Scenario exercises should be reviewed on a regular basis as part of a strategic management process.** Outcomes from scenario exercises are unlikely to change significantly from year to year if assumptions and inputs remain stable, but companies should regularly monitor signposts that might indicate a potential need to change strategy or positioning on a regular basis.

Source: Center for Climate and Energy Solutions (C2ES) report titled “Using Scenarios to Assess and Report Climate-Related Financial Risk”, 2018

2.5.1 Scenario selection

When conducting scenario analyses for the first time, organizations can choose to develop in-house scenarios or to make use of publicly available scenarios. Publicly available scenarios may be used as they are, be adapted, or used to help create an in-house scenario, or combined scenarios. However, it is important to remember that investors require consistent and comparable disclosure.

There are a number of publicly available scenarios which organizations can use to conduct their scenario analyses or to act as guidance for developing in-house scenarios, such as the Intergovernmental Panel on Climate Change (IPCC), the International Energy Agency (IEA) and the Network for Greening Financial System (NGFS) scenarios (see box 2.2). While the aforementioned scenarios are the most prominent and widely used scenarios in the public domain, other organizations, such as the International Renewable Energy Agency, and the Deep Decarbonization Pathways Project (DDPP) among others, have published their own scenarios, which provide a different narrative and outlook to those listed above. Some of these groups have taken a specific focus, such as using 100% renewable energy, or built a regional specific model that takes a deeper look into the energy mix for specific countries (such as the DDPP). Organizations should choose scenarios that best align with their own underlying assumptions in managing climate risks and opportunities and should also align with the country's Nationally Determined Contributions (NDCs) under the Paris Agreement. NDCs are refreshed every five years in accordance with the Paris Agreement. Current NDCs, however, fail to achieve a 2°C temperature goal, so companies using NDCs as another basis of scenarios should understand NDC pathways as well as their limitations.

Box 2.2 IPCC, IEA and NGFS scenarios

Intergovernmental Panel on Climate Change (IPCC)

The IPCC has developed a new basis for the construction of comparable scenarios across research and modeling groups — Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs). RCPs are “emissions scenarios” that include time series of emissions and concentrations of the full suite of greenhouse gases, aerosols, and chemically active gases, as well as land use/land cover. RCPs are used to develop climate projections by informing physical climate system models; these models, in turn, project how the physical climate may change under different levels of radiative forcing driven by greenhouse gas concentrations. SSPs were developed to complement the RCPs with varying socioeconomic challenges to adaptation and mitigation. The combination of SSP-based “socioeconomic scenarios” and RCP-based climate projections provides an integrative framework for climate impact and policy analysis. The following table outlines the RCPs:

Mean Temperature and Full Range Associated with Each RCP

Scenario	Atmospheric carbon dioxide concentrations in 2100	Temperature increase to 2081–2100 relative to a 1850–1900 baseline		Global mean sea level rise for 2081–2100 relative to a 1986–2005 baseline	
		Average	Likely range	Average	Likely range
RCP2.6	421ppm	1.6°C	0.9–2.3°C	0.40m	0.26–0.55m
RCP4.5	538ppm	2.4°C	1.7–3.2°C	0.47m	0.32–0.63m
RCP6.0	670ppm	2.8°C	2.0–3.7°C	0.48m	0.33–0.63m
RCP8.5	936ppm	4.3°C	3.2–5.4°C	0.63m	0.45–0.82m

The SSPs describe five alternative socioeconomic futures over the course of the 21st century assuming no explicit policies to mitigate or adapt to climate change, as follows:

- sustainable development (SSP1);
- middle-of-the-road development (SSP2);
- regional rivalry (SSP3);
- inequality (SSP4); and
- fossil-fueled development (SSP5).

International Energy Agency (IEA)

In contrast to the IPCC approach, the IEA focuses on energy and emission scenarios. The IEA's World Energy Model runs three main scenarios describing the future energy mix:

- Current Policies Scenario (CPS): This scenario considers policies that are in place at the preceding year of publication (i.e., mid-2019 for the 2019 World Energy Outlook), without any additional government policy intervention.
- Stated Policies Scenario (SPS): This scenario is designed to explore all policies enacted in the preceding year, plus the policies that have been firmly communicated or committed to by national authorities. The SPS scenario assumes that there is a slow implementation of these policies, based on the IEA's assessment of the many political, institutional, and societal barriers that exist to a rapid transition.
- Sustainable Development Scenario (SDS): This scenario assumes the world is successful in achieving Sustainable Development Goals by 2030. The SDS holds the temperature rise to below 1.8°C with a 66% probability without reliance on global net-negative CO₂ emissions.

The Network for Greening Financial System (NGFS) Scenario

The Network for Greening the Financial System (NGFS), a group of over 80 central banks focused on addressing climate risks, worked with an academic consortium from the Potsdam Institute, IIASA, University of Maryland, Climate Analytics and the Swiss Federal Institute of Technology (ETHZ). It set out 3 reference scenarios and 5 additional scenarios that cover a comprehensive range of transition pathways and climate outcomes, meeting the needs of the financial sector. The scenarios include multiple IAMs (REMIND, GCAM, and MESSAGE), climate models (on the physical risk side) and macro models (added in phase II) to provide more complete macro pathways. NGFS consulted the wider scientific and financial communities to ensure the scenarios are robust, effective, and usable, and will continue to evolve the scenarios, increasing sectoral and geographic granularity of emissions/energy data, and adding more climatic events, regulatory policy indicators, and macro variables.

As central banks and supervisors globally will likely ask the institutions they supervise to use these scenarios, who in turn could make the same request upon their corporate clients, there will likely be a net efficiency to the financial system using these scenarios and working with NGFS to ensure their robustness and usefulness.

Sources: UN SSE, with data from the TCFD Technical Supplement titled "[The use of scenario analysis in disclosure of climate-related risks and opportunities](#)" and the NGFS [website](#).

 Tip for Stock Exchanges

Strengthen your guidance

Disclose Nationally Determined Contributions (NDCs)

Stock exchanges can support the alignment of scenarios chosen on their market with national goals by providing the National Government's NDCs or other resources available from your government related to climate goals and national environmental sustainability plans. Stock exchanges may also wish to provide additional resources that help listed companies and investors to stay abreast of the most recent climate-related policy objectives in their market.

2.5.2 Simplified approach for first time scenarios

For those companies starting a scenario analysis for the first time, the steps and guidelines available may seem overwhelming and daunting. Choosing existing scenarios, or using aspects of existing scenarios, are often the easiest way to begin a scenario analysis, and after scenarios are chosen the process may become much more clear. As an important aspect of the TCFD recommendations, companies should always choose a simplified scenario analysis process over no scenario analysis. In order to simplify the process, companies can ask themselves three key questions:

1. Would the business be profitable if countries were successful in achieving the goals of the Paris Agreement and there is an orderly transition to a low-carbon economy?
2. Would the business be profitable if there is an abrupt and disorderly transition as countries belatedly catch up on climate goals?
3. Would the business be profitable if there is a failure to transition?

Chapter 2 Examples

Example 2.1: American multinational investment management corporation Blackrock indicates key climate-related opportunities

Opportunity	Description
Products & Services Investment Solutions	There is increasing client demand for sustainable investment solutions. According to investment Solutions Global Sustainable Investing survey , respondents plan to double their sustainable AUM, on average, in the next five years. BlackRock's \$152 billion sustainable investment platform is well-positioned to meet increased demand as more of our clients focus on the impact of climate change on their portfolios. BlackRock's iShares® Sustainable ETF range is the largest in the industry, both in terms of AUM and the number of investment options we provide to investors. BlackRock manages one of the largest renewable power infrastructure investment platforms in the world and is one of the largest investors in green bonds on behalf of clients.
Products & Services Aladdin	There is increasing demand from Aladdin clients to understand climate-related risks in their portfolios, as more investors seek to quantify and act on climate-related risks to their portfolios. Building on BlackRock's strength in risk management through the Aladdin platform, BlackRock created Aladdin Climate to address this need. Aladdin Climate is the first software application to offer investors measures of both the physical risk of climate change and the transition risk to a low-carbon economy on portfolios with climate-adjusted security valuations and risk metrics. Using Aladdin Climate, investors can now analyze climate risk and opportunities at the security level and measure the impact of policy changes, technology, and energy supply on specific investments.
Resource Efficiency Operations	BlackRock pursues a sustainability strategy that seeks to decouple company growth from our impact on the environment. By reducing waste and employing energy efficiency strategies to lower our emissions, amongst other efforts, we are minimizing the environmental impact of our operations and improving operational efficiency.

Source: Page 23 of Blackrock's [2020 TCFD Report](#)

Example 2.2: Global investment management subsidiary of BNY Mellon, Newton Investment Management identifies climate-related investment opportunities

Renewable technologies

We see a lot of investment opportunities in renewables and have made significant investments in the area. Currently, over £1.4bn of our clients' assets (as at 31 December 2019) are invested in green, clean energy and related technology equities and bonds.

SECURITY SELECTION EXAMPLE – UK WIND-FARM OPERATOR

THEMES

ESG

- **Environmental**
Strong environmental policy and implementation
- **Governance**
Strong board structure

SECURITY SELECTION

NEWTON PORTFOLIOS

FUNDAMENTALS

- Beneficiary of attractive secular trends
- Strong position in growth renewables market
- Strong management team with proven track record
- Strong balance sheet
- Dual income
- Electricity exported to grid
- ROCs (Renewable Obligation Certificates)

VALUATION




- 5-6% dividend yield
- Management targets an internal rate of return of 7%

Source: Page 14 of [Newton's 2020 Task Force on Climate Related Disclosure Report](#)

Example 2.3: Malaysian retail banking company CIMB's qualitative climate-related risk assessments

Sources of Risk			Examples of Potential Transmission Channels
Risk Category	Risk Type	Examples of Risk	
 Transition Risk	 Policy and Legal Risk	<ul style="list-style-type: none"> Policy and regulatory changes, e.g. GHG emission reduction policies including carbon taxation, outright bans on carbon-intensive activities Legal liabilities (e.g. class action on companies that cause haze pollution) 	Lower corporate profitability (e.g. due to increase in energy prices) and increased litigation
	 Technology Risk	<ul style="list-style-type: none"> Accelerated obsolescence of higher emission technologies, replaced with new low-carbon technologies Sudden rush of capital expenditures on unproven low-carbon technologies 	Corporate devaluation or premature asset write-downs (e.g. closure of coal-fired power plants due to lower cost of renewable energy)
	 Market Risk	<ul style="list-style-type: none"> Shifts in customer preferences Increased cost of raw materials or inputs, leading to higher production cost Reduced valuation of assets such as fossil fuel reserves 	Lower household wealth and higher inflation (e.g. rising living costs due to carbon cost pass-through and lower corporate profitability)
	 Reputational Risk	<ul style="list-style-type: none"> Negative stakeholder perception, concern or feedback on carbon intensive sectors Customers shunning brands that are perceived to be associated with contributing to the climate crisis 	Rising public scrutiny on corporates' unsustainable behaviours and potential drastic loss of customers, impacting profitability
 Physical Risk	 Acute	<ul style="list-style-type: none"> Increased frequency and severity of extreme weather events such as floods and droughts 	Reduced, or complete loss of, residential and commercial property values in affected areas, and increase in prices of property in higher elevations
	 Chronic	<ul style="list-style-type: none"> Long term shifts in weather patterns including mean temperature, precipitation, and sea level 	Operational disruptions resulting in income loss (e.g. due to water shortages)

Climate-Related Financial Risks		
Risk Type	Examples of Risk	Potential Time Horizon of Risk
 Credit Risk	<ul style="list-style-type: none"> Impact on repayment capacity of the customers, leading to a possible increase in the default rates Impact on the collateral value due to stranding of climate misaligned assets 	<ul style="list-style-type: none"> Medium- (1 – 5 years) to long-term (>5 years)
 Market Risk	<ul style="list-style-type: none"> High volatility and potential abrupt decline in the value of climate-incompatible securities underwritten or held by CIMB 	<ul style="list-style-type: none"> Medium- (1 – 5 years) to long-term (>5 years)
 Liquidity and Funding Risk	<ul style="list-style-type: none"> Inability of CIMB's customers to repay their facilities as contracted, which in turn affects the Group's cashflow requirements Significant withdrawals of deposits from customers to fund capital expenditures in low-carbon technology or to recover from damages caused by extreme events 	<ul style="list-style-type: none"> Medium- (1 – 5 years) to long-term (>5 years)

Climate-Related Financial Risks		
Risk Type	Examples of Risk	Potential Time Horizon of Risk
 Reputational Risk	<ul style="list-style-type: none"> • Reputational repercussion due to CIMB's financing of carbon-intensive sectors such as coal • Poor stakeholder confidence in CIMB's sustainability efforts and ability to manage its exposure to climate-related risks 	<ul style="list-style-type: none"> • Short- (<1 year), medium- (1 – 5 years) to long-term (>5 years)
 Strategic Risk	<ul style="list-style-type: none"> • Losing competitiveness, market share and attractiveness to investors due to inability to shift away from financing brown to green financing portfolios 	<ul style="list-style-type: none"> • Medium- (1 – 5 years) to long-term (>5 years)
 Enterprise-wide Risk (Capital Risk)	<ul style="list-style-type: none"> • Inadequate capital to cater for climate-related risks, which may result in the inability to absorb losses, maintain public confidence and support the competitive growth of the business 	<ul style="list-style-type: none"> • Medium- (1 – 5 years) to long-term (>5 years)

Source: Page 27-31 of [CIMB's 2020 Sustainability Report](#)

Example 2.4: American, UK-domiciled, information, data and market measurement firm Nielsen Holdings PLC's approach to assessing climate risk

WHAT ARE OUR RISKS?

To understand transitional risks, we used a variety of key inputs: a database of all current carbon and fuel taxes; potential future carbon price trajectories; revenue; operating expenditure and greenhouse gas (GHG) emissions' projections; and modelling of the pass-through pricing risks from our supply chain. To understand physical risks, we looked at multiple temperature and precipitation indices that measured changes in both average and extreme conditions today and then projected them out to the year 2030.

RISK ASSESSMENT

While the approach we took in our assessment—and the risks it uncovered—are not unique to Nielsen, we do acknowledge the significance of environmental changes and the value of knowing these risks. We will continue to effectively integrate the findings into our business and operations, and to seek out new ways to deepen our understanding of these risks as they evolve over time. Here are some key opportunities that were highlighted through the assessment:

1. **Carbon pricing risk in certain locations:** We used different emission reduction scenarios to determine which business locations are at the highest risk of increasing carbon prices. And as a result, we have identified an opportunity to prioritize clean energy investments across all our sites.
2. **Exposure to physical climate risk:** Across our global facilities portfolio, we developed a hotspot ranking for our global sites that shows the overall exposure to physical climate risk (such as rising sea levels, water and heat stress, exposure to cyclones and extreme rainfall).
3. **Technological changes:** Ongoing [operational efficiencies](#) in our data centers have helped reduce our climate change related technological risks. We now recognize the opportunity to extend these efforts by tapping into renewable energy sources. Water availability will be an increasingly relevant risk for our data centers; we plan to continue investigating further efficiency opportunities, especially in water-scarce regions such as India.
4. **Reputational opportunities:** We are actively seeking new and innovative ways to drive awareness about the impacts of climate change across the industries we support, including our fast-moving consumer goods (FMCG) and retail clients. We are committed to providing [insights into consumers' sustainability preferences](#) to help our clients evolve their products to meet changing consumer needs, and ultimately use sustainability as a way to expand the pie for all product categories and consumer environments.

Source: Nielsen's web page titled "[Measuring the Impact of Climate Change](#)"

Example 2.5 Anglo-Swiss multinational commodity trading and mining company Glencore’s Risk Management assessment and mitigation proposals

Risk management^{TCFD}

Assessing climate change-related risks is part of our Group risk management and strategy development processes. Effective and strategic management of climate change-related risks and opportunities across all aspects of our business is vital to our continued ability to operate.

We integrate risk management throughout our business through a structured risk management process that establishes a common methodology for identifying, assessing, treating and monitoring risks.

In 2020, we conducted assessments of physical and regulatory risks to our operations against the Current Pathway and Rapid Transition scenarios. The table below details the risks and opportunities identified across the business, as well as the mitigating actions.

Risk and opportunities

Regulatory developments

Government regulatory and policy developments to support emissions reductions has the potential to affect the ability to keep operating or growing assets as a result of restricting operating permits, energy regulation or emissions caps.

Carbon pricing

Pricing carbon, either through direct taxes or leakage avoidance mechanisms (such as border taxes) may create additional costs through the value chain, as well as provide opportunities to promote lower-carbon products.

Variations in carbon pricing mechanisms between multiple jurisdictions can affect both the cost and the importing of our products.



Read more
Incorporating carbon prices (p19)

Mitigation

We play an active and constructive role in public policy development on carbon and energy issues, both directly and through our industry organisations. We seek to ensure that there is a balanced debate with regard to the ongoing use of fossil fuels.

We operate successfully in multiple jurisdictions that have direct and indirect carbon pricing or regulation.

We have identified some parts of our business that would likely have financial stress in a high carbon price environment. However, our conclusion is that our business overall remains resilient. We consider local regulation and carbon price sensitivities as part of our ongoing business planning for existing industrial assets, new investments and as part of our marketing activities.

We utilise our MACC to identify opportunities to identify and act on cost ranked emission reduction opportunities to mitigate high carbon prices.

In addition, increasing demand for our metals commodities is likely to drive higher prices, in turn offsetting increases to processing costs arising from the implementation of carbon pricing instruments.

We are working with relevant industry organisations on developing lifecycle analysis to calculate our commodities’ carbon footprint.

Risk management cont.

Risk and opportunities

Energy costs

We are a significant energy consumer. Energy is a key input and cost to our business as well as being a material source of our carbon emissions.

Governments may impose taxes or levies on procured energy sources, limit supplies/ imports or introduce required purchasing or generation of renewable energy.

Physical impacts

Extreme weather events, such as floods, hurricanes and droughts, as well as changes in rainfall patterns, temperature, and storm frequency can affect our industrial assets' operating processes, related infrastructure, and the communities living close to our operations.

Access to capital

Activism may impact our access to capital or insurance, an increase in the cost of finance or divestment of our shares as banks and other financial institutions discontinue working with companies involved in fossil fuels.

Permitting risk

Negative stakeholder perception around the role of the extractive sector in contributing to climate change may result in delays or restrictions to permit approvals, as well as the loss of customers and/or sales contracts.

Product demand

Variations in commodity use from emerging technologies, move towards renewable energy generation and policy changes may affect demand for our products, both positively and negatively.

Litigation

Litigation (including class action), in which climate change and its impacts are a contributing or key consideration, including administrative law cases, tortious cases and claims brought by investors may affect our business. Delays or refusals of project due to legal challenges

Mitigation

As the global patchwork of energy and climate change regulation evolves, we closely monitor international and national developments and their potential to affect our business.

We consider energy costs and our carbon footprint into our annual business planning process. Commodity departments are required to provide energy and GHG emissions forecasts for each asset over the forward planning period and provide details of mitigation projects that may reduce such emissions, including identifying and developing renewable energy generation opportunities.

Our assessment of potential mitigation and abatement projects underpins the basis of our internal Marginal Abatement Cost Curve.

We track changing weather conditions and amend operating processes as appropriate, as well as incorporate climate risk into our design and planning. We regularly review the integrity of our assets, including tailings storage facilities, against the potential impact of extreme weather events.

We have established ongoing processes to review our operational mitigating measures and to consider opportunities, where necessary, to strengthen these.

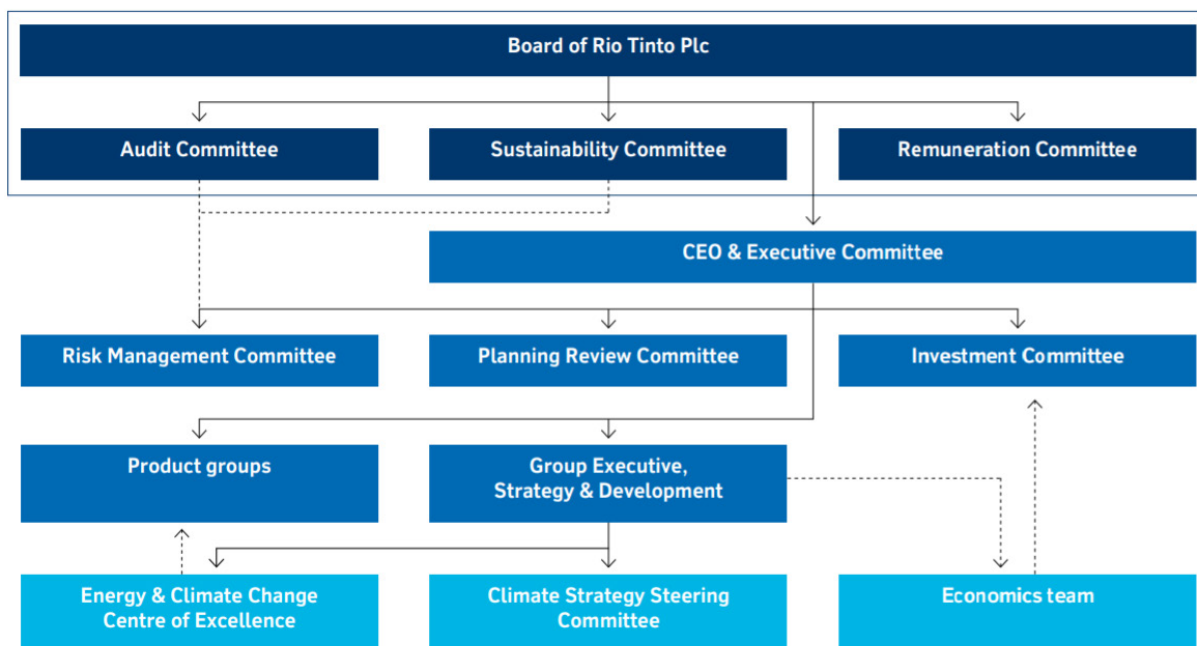
We regularly review our banks' climate change-related policies and evolving applicable restrictions, if any. Through maintaining a strong relationship with our lenders, we continue to have a broad range of sources from which to access funds.

We engage with a broad range of stakeholders on diverse topics including climate change and related areas of concern. Our engagement with our local communities and those directly affected by our operations is transparent and honest. Where we identify differing opinions, we look for opportunities to find constructive solutions.

We track and respond to regulatory and technology developments. There are near-term opportunities in positively repositioning many of our products that enable the decarbonisation transition.

Our climate change programme strives to ensure that we identify, understand and monitor our emissions and climate change issues, in order to meet international best practice standards, ensure regulatory compliance and meet our commitments that support the goals of the Paris Agreement.

Example 2.6: Anglo-Australian multinational Rio Tinto’s climate governance structure and explanation of roles



Board of Rio Tinto Plc

Confirms the Group’s climate change strategy; approves the climate change report and policy positions; approves the Group’s short-, medium- and long-term emissions targets and goals.

Sustainability Committee

Monitors Group and asset performance against targets (eg GHG emissions) and progress on Scope 3 goals; ensures operational-level resilience; reviews industry association engagement.

Audit Committee

Reviews judgements needed to apply accounting standards, including valuations, impairments and depreciation rates; responsible for external auditors – who assure GHG emissions – and the effectiveness of the risk management framework.

Remuneration Committee

Ensures the remuneration structure and policies include climate-related performance metrics and reward individual executives fairly and responsibly.

CEO & Executive Committee

Develops the Group’s business strategy, planning, investment decisions and risk management processes. The Chief Executive is responsible for delivering the climate change strategy approved by the Board.

Group Executive, Strategy & Development

Group Executive, Strategy & Development is the Executive Committee member accountable for our work on climate change including strategy, portfolio implications, the Energy & Climate Change Centre of Excellence, Scope 3 value chain partnerships and external engagement.

Risk Management Committee

The RMC assists the Executive Committee and the Board in ensuring that a robust risk management framework exists across our business. The overall objective of the RMC is to provide oversight for the management and mitigation of the principal risks – including climate change – that could materially impact the Group’s business objectives and exceed its risk tolerances. Reports to the Audit and Sustainability Committees.

Investment Committee

Reviews proposals on investments, acquisitions and disposals. Approves capital decisions within delegated authority limits. Ensures integration of climate into the investment decision-making process.

Planning Review Committee

Reviews our short-term (12 months) and medium-term (up to 10 years) plans and integrates emissions reductions planning. The Planning Review Committee includes the Chief Executive, Chief Financial Officer, Chief Commercial Officer, Group Executive, Strategy & Development and the Chief Executives from each product group.

Product groups

Develop and execute decarbonisation roadmaps, manage material risks within their business activities, including asset integrity, and ensure operational and project-level performance against emissions targets.

Energy & Climate Change Centre of Excellence

Co-ordinates the execution of our climate strategy and provides technical support to product groups, focusing on scope 1 & 2 emissions reductions.

Climate Change Steering Committee

Co-ordinates Group-wide activity on climate change. Includes corporate function leads and representatives from product groups, Risk and Health, Safety, Environment & Security.

Economics team

Forecasts the carbon price and ensures that climate change considerations are factored into our supply, demand and price forecasts for commodities, which in turn inform our investment, valuation and impairment decisions.

Source: Page 51 of Rio Tinto’s report [Our Approach to Climate Change 2020](#)

Example 2.7: American financial information and analytics company S&P Global lists governance mechanisms in place for climate-related risks and opportunities

Governance	Overview
Board of Directors Audit Committee	Reviews and discusses with management the Company's Enterprise Risk Management process including its risk governance framework, risk management practices and key risk factors. Facilitates the identification, measurement, mitigation, and reporting of key risks across the Company, including material climate-related issues such as business disruptions from natural disasters.
Chief Executive Officer	Member of the Board of Directors and accountable for reporting to the Board on all risks and opportunities. CEO pay (Pay-for-Performance) is tied to the Enterprise Strategy and Goals, which in recent years have included a target focusing on building out the Company's ESG products and services.
Chief Financial Officer	Reports directly into the CEO and oversees many functions related to the governance of climate risks and opportunities including those related to the Company's global facilities footprint.
Chief Risk and Audit Executive	Reports directly into the CEO and oversees corporate risk functions such as Business Continuity Management and Disaster Recovery.
ESG Design Team	Identifies strategic ESG opportunities, coordinates market and product development across the Company and solidifies S&P Global's position as a trusted provider. The team will also advise on partnerships and potential acquisitions.
Environmental Action Committee	Co-chaired by Corporate Sustainability and Global Real Estate Services, the Committee oversees collection and tracking of key environmental metrics, sets environmental performance targets and has ownership of related policies and programs.
TCFD Committee	Launched in 2019, sponsored by the CFO, the Committee supports ongoing monitoring and quantification of company-wide climate-related risks and opportunities, development of products and sharing of best practices.

Source: Page 7 of S&P Global's [Task Force on Climate-Related Disclosure \(TCFD\) August 2019](#)

Example 2.8: Thai state-owned SET-listed oil and gas company PPT's materiality assessment

Materiality Assessment

For effective and balanced management, PTT conducts materiality assessment annually to consider issues that stakeholders are interested in and affected by. This includes a variety of issues that may affect corporate's value creation throughout the value chain. The process referenced GRI Sustainability Reporting Standards 2016 and International Integrated Reporting Council (IIRC)'s reporting framework.

Materiality Assessment Process

- 1. Identification of Material Issues for the Organization and Stakeholders**

Considers internal and external factors, such as economic, social and environmental issues crucial at present and in the upcoming future. This includes the country's strategic plan, regulations, laws, international agreements, corporate's key competency, business risks and opportunities, as well as stakeholders' interests, needs and expectations.
- 2. Prioritization**

This part considers the level of impacts to PTT's value creation, encompassing finance, business and operations, corporate reputation, impacts to customers, suppliers and employees. Level of importance to stakeholders is also included in consideration. Material issues are then brought into the process of strategy development, and manage effectively thereafter.
- 3. Validation**

Relevant high-level executives review, consider and validate material assessment results.

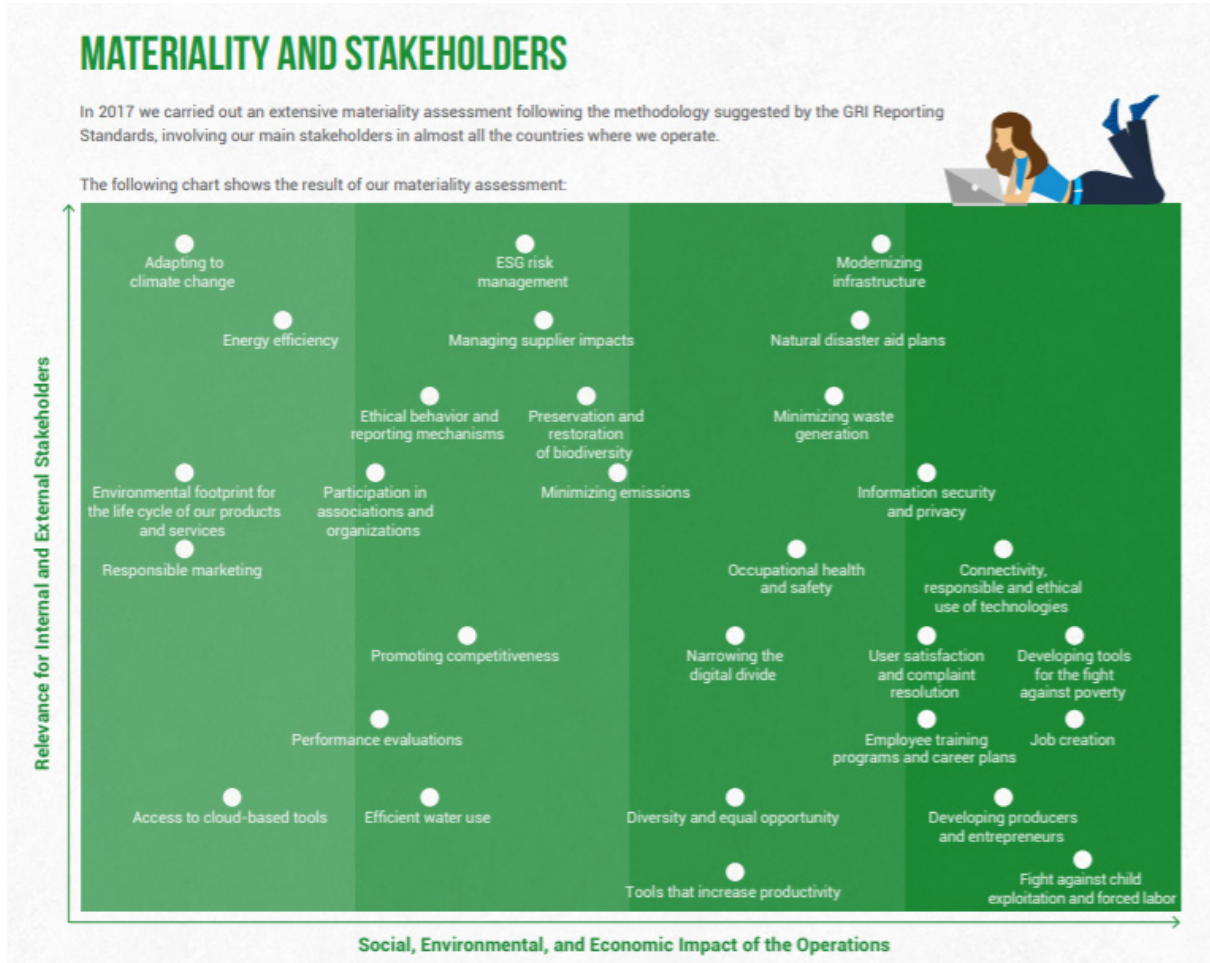
Materiality Assessment Results

PTT reviews material issues to have comprehensive coverage over the changing context. There is a revision of material issue's title from Safety to Safety and Occupational Health, in order to increase clarity and be more reflective of real performance. Materiality assessment reveals the first 3 material issues, which are climate change, sustainable governance, and product stewardship. Climate change remains one of the key global issues. Similarly, sustainable governance, responsible product and service development allow PTT's operation to be secure and sustainable. These are PTT's key issues for sustainability management. Details of management approach and performance in each issue can be found in relevant chapters.



Source: Page 8 of the PTT's 2019 [Corporate Sustainability Report](#)

Example 2.9: Mexican telecommunications corporation América Móvil's materiality and stakeholders map using GRI methodology



Source: Page 15 of América Móvil's 2019 [Sustainability Executive Summary](#)

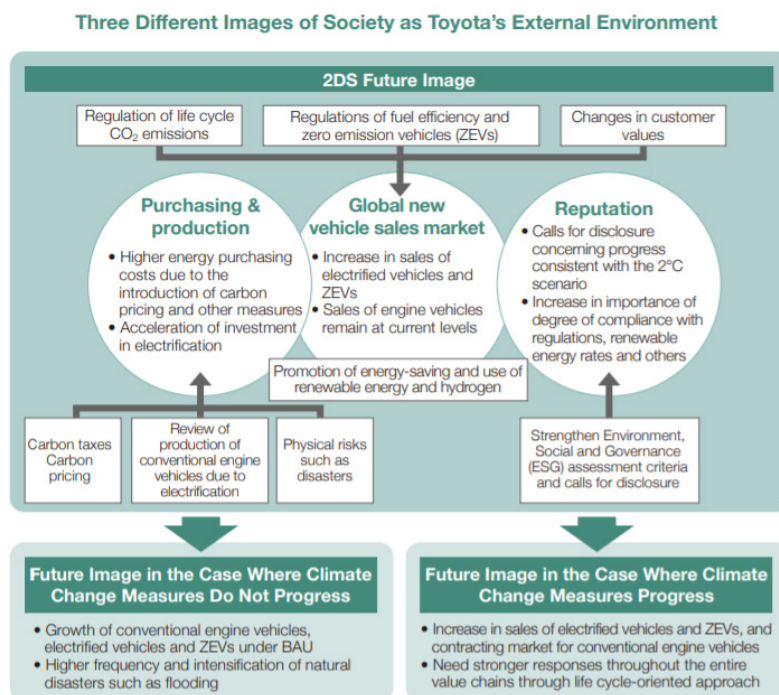
Example 2.10: American multinational retail corporation Walmart’s scenario analysis

Climate Scenarios: Methodology		
Timelines	Scenarios applied	Risk Categories
2030, 2050	RCP 8.5 (Business As Usual), RCP 2.6 (2 degrees Celsius scenario), IEA-450	Physical, Transition

Scope of Analysis		
Climate variables	Modeled risk	Considerations for enhancing climate resilience
Rising temperature	Net increase in days requiring heating and cooling facilities	Progress toward 100% renewable energy Improvements in energy efficiency; performance of refrigeration systems
Drought	Reductions in crop yields	Adoption of sustainable agriculture practices Technology and seed innovation (e.g., controlled environment)
Storm intensity	Cost of facility damage and recovery	Facilities siting; construction specifications Disaster preparedness; recovery capabilities
Rising sea level	Viability of facility locations	Facilities siting; construction specifications
Carbon pricing	Cost of Scope 1, 2 emissions	Progress toward zero emissions

Source: Page 24 of [Walmart’s 2020 Environmental, Social and Governance Report](#)

Example 2.11: Japanese multinational automotive manufacturer Toyota’s scenario analysis using International Energy Agency (IEA) scenarios in combination with others



Source: Page 13 of [Toyota Motor Corporation’s Environmental Report 2020](#)

Example 2.12: American financial services company Citi Group's scenario analysis

Scenario	Sectors	Key Findings
Transition Risk - Sudden Carbon Tax (Short Term)	Oil & Gas Exploration and Production	<ul style="list-style-type: none"> The credit ratings impact associated with the sudden introduction of carbon pricing is dependent on a number of factors, including the starting credit rating and financial strength of a company. Companies with higher costs of production saw greater volume impacts and higher asset impairments. Management actions to conserve cash or reduce debt had minimal impact on overall results.
Citi Operations - Acute Extreme Weather (Short Term)	Citi's Facilities - NYC & Tampa	<ul style="list-style-type: none"> Although significant damage may occur to our facilities, it is unlikely to significantly impact Citi's operational resiliency. Work-from-home strategies, such as those implemented in response to COVID-19, have significant potential to maintain business continuity following acute extreme weather events.
Citibanamex - Physical Risk (Long Term)	Commercial Real Estate & Agriculture	<ul style="list-style-type: none"> Extreme weather impacts can be highly location-specific, even within sub-regions. Location information and data granularity are paramount. Extreme weather reduces the property value and increases the loan-to-value ratios of properties that are exposed, and credit parameters may need adjustment to account for the changing frequency and severity of extreme weather events due to climate change. Agricultural clients see decreased yields and increased prices for products. For several sub-sectors, the increased prices offset declining yields; however, global commodities (e.g., coarse grains) do not experience a sufficient price increase and, therefore, have an increased probability of default.
Citibanamex - Transition Risk (Long Term)	Commercial Real Estate & Agriculture	<ul style="list-style-type: none"> Carbon pricing and energy efficiency standards for buildings can affect the operating costs and credit worthiness of commercial real estate clients. Carbon pricing and the role of agriculture and land use for bioenergy and carbon sequestration raises the cost of agricultural production. All client segments would be affected, but livestock producers would see a bigger ratings downgrade than crop producers.

Source: Page 20 of Citi's report titled "[Finance for a Climate-Resilient Future II: Citi's 2020 TCFD Report](#)"

Chapter 3: Disclosure content

The third step for organizations that have recognized the need for action on climate is to communicate their action and intentions through climate-related disclosures. The TCFD recommendations for disclosure are the current best practice in determining what information relating to climate should be reported on. Many companies may already be reporting on some or all of the recommended disclosures, but should ensure that this information is accessible and easy to find. Report preparers can initially use the TCFD Checklist (annex 1) as a means of taking stock of where this information can be found, and provide it as a map in their TCFD or climate-related reporting (see examples 3.1 and 3.2). The recommended disclosure content within the TCFD publications has also been mapped with most major reporting frameworks (annex 2). Further discussion on frameworks can be found in chapter 4 of this guidance.

 Tip for Stock Exchanges

Strengthen your guidance

Provide additional guidance for key sectors

To make use of the TCFD's thorough sector specific guidance, stock exchanges may wish to include the recommended disclosures within their guidance for those industries most present in their market. For example, if the majority of listed companies in an exchange's market are financial services organizations, it would be helpful to include the TCFD's recommendations addressing specifically this sector. It may also be helpful to provide one or two examples of companies using the TCFD recommendations within these sectors for reference.

3.1 Investor-useful information

Investors want to understand how a company is positioning itself strategically in light of its climate-related risks and opportunities. They 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.¹⁴ While the TCFD recommendations emphasize single materiality (information which has an immediate financial impact and therefore should appear in financial filings), it is important for issuers to understand the temporal aspect of materiality¹⁵. For example, while a strategic decision made by a company (such as changing suppliers) may seem to have a positive financial impact in the short term, the longer-term impact may be much greater and in the opposite direction (such as a reputational impact or legal risks).

Companies reporting on climate should be aware that investors are looking for information that gives them confidence that companies understand climate-related issues, how they impact the business and what action they are taking as a result. Many investors with diversified portfolios are also asking for consistent data across all companies they invest in to be able to apply consistent methodologies to inform the level of investment they are making in each company. Therefore in order to ensure that the efforts put in by report preparers have the desired impact in informing shareholders of the climate-resiliency of their company, information should be shared in a standardised format and include the content that investors are looking for.

In addition to the TCFD's resources, there are a number of other initiatives aimed at supporting report preparers to align data with investor decision-making processes. One such example are stock exchange-led events aimed to facilitate an active conversation between issuers and investors on the type of data that is most helpful for both parties. Another example is data-driven services such as the Transition Pathway Initiative (TPI), which is a global, free to use tool, which assesses companies' preparedness for the transition to a low-carbon economy. Launched in 2017, TPI is an important corporate climate action benchmark that can be a useful tool for both issuers and investors (see box 3.1). Portfolio-alignment metrics are another tool for investors: they measure the alignment of investments to net zero.

Box 3.1 Benchmarking climate transition readiness with TPI

The Transition Pathway Initiative (TPI) is a global initiative led by asset owners and supported by asset managers. Aimed at investors and free to use, it assesses companies' preparedness for the transition to a low-carbon economy, supporting efforts to address climate change. Through robust and independent research, the tool aims to empower investors to assess the alignment of their portfolios with the goals of the Paris Agreement and to drive real world emission reductions through actions.

Using publicly disclosed company information, the TPI does the following assessments:

- Evaluates and tracks the quality of companies' management of their greenhouse gas emissions and of risks and opportunities related to the low-carbon transition;
- Evaluates how companies' planned or expected future carbon performance compares to international targets and national pledges made as part of the Paris Agreement;
- Publishes online the results of this analysis through a publicly-available tool hosted by its academic partner, the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science (LSE).

¹⁴See Table A5-5 in Appendix 5 in the 2020 *TCFD Status Report*

¹⁵For an explanation of the temporal aspect of single and double materiality concepts, see the FTSE Russell blog "[Materiality in sustainable investment: in the eye of the beholder](#)" (2021).

- The TPI complements existing initiatives and frameworks, by aligning with prevailing disclosure initiatives and with investors' climate change and sustainability expectations. It is also being aligned with the requirements of the TCFD and is used for the disclosure assessment of the Climate Action 100+ Net Zero Company Benchmark - an assessment of the world's largest corporate greenhouse gas emitters on their progress in the transition to the net zero future.

How investors can use the TPI

Investors are using the TPI for a broad range of activities, including ESG integration, active ownership, informing proxy voting, exclusions, product creation due diligence, and demonstrating commitment to environmental sustainability.

How listed companies can use the TPI

Companies can use the analysis already conducted by TPI on their own company, or if they have not been evaluated by TPI, they can use the analysis of a competitor or similar industry analysis to determine the baseline scenario analysis. Additionally, companies are also using TPI for other ESG-related exercises such as helping suppliers to align climate policies across a global value chain.

Source: SSE initiative, with data from [The Transition Pathway Initiative](#) website and the [Climate Action 100+](#) website.

3.2 Reporting on opportunities and use of taxonomies

TCFD recommends that where relevant, organizations should provide climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy. Some of the opportunities created by the climate transition impact financial statements primarily through cost reductions and efficiency creation, such as resource efficiency and energy sources. Opportunities that the corporation is taking advantage of should be reported to investors not only to indicate a strategic alignment with climate-resiliency but also to indicate expected future savings or efficiency increases. Other opportunities, however, also provide new revenue to the business, often referred to as "green revenues". By introducing new products or services, or accessing new markets, organizations may tap into new revenue streams that are climate-aligned (see examples 3.3 and 3.4).

Reporting on climate-related opportunities will often mean breaking down the revenues associated with certain activity segments that enable climate mitigation or adaptation. To be more specific, a manufacturer that manufactures lighting should not just report revenues from a whole lighting segment but instead break down its revenue from relevant sub-segments where those offer climate solutions, in this case LED lighting given its superior efficiency to other lighting products. However, a common concern is that competitors may use this information to gain an advantage in the market. While this concern may be genuine, many companies are realising that this is becoming essential information for their investors and the analysts following their company.

One significant challenge in reporting opportunities is defining which product and service categories to identify. A solution for this can be found in the growing development of green and sustainable finance "taxonomies" by various regulators. The EU has been pioneering in this regard and the activity categories they provide can be a useful framework. As market innovation drives new solutions and as market norms shift, these taxonomy definitions will also need to evolve, hence it is important for companies to set out which of their products and services provide solutions to climate challenges and to break out revenue and capital expenditure associated with those activities. Standard setters, data and research firms, as well as investors can learn from those distinctions and decide whether to include such products within their definitions. Where taxonomies are used, report preparers should be sure to indicate this in their reports (see example 3.5).

Each market has specific resources and taxonomies to help companies identify risks and opportunities unique to their sector and market. As noted above, in the European Union the EU's Technical Working Group on Sustainable Finance has developed a taxonomy that aims to assist companies in navigating the transition to a low-carbon, resilient and resource-efficient economy. The taxonomy provides a classification system to determine whether an economic activity is environmentally sustainable, as well as guidance on disclosure. A number of other countries have launched or are in the process of developing their own taxonomies related to the green economy or sustainable finance that are specific to their unique market as well. However, companies should be conscious of the differences between these taxonomies and be sure to keep consistency and concurrency of disclosure paramount. For multinationals, multiple taxonomies may bear relevance.

 Tip for Stock Exchanges

Strengthen your guidance

Help provide categories and examples of climate solutions activities possibly linked with Taxonomies.

For those markets with a taxonomy in place, it will help issuers to understand how these definitions align with reporting standards being used in your market and how they may compare to other taxonomies that issuers may be more familiar with. In markets where taxonomies do not currently exist, exchanges should help issuers to make use of current best practice definitions such as those used in the main reporting frameworks or those most prevalent in the market.

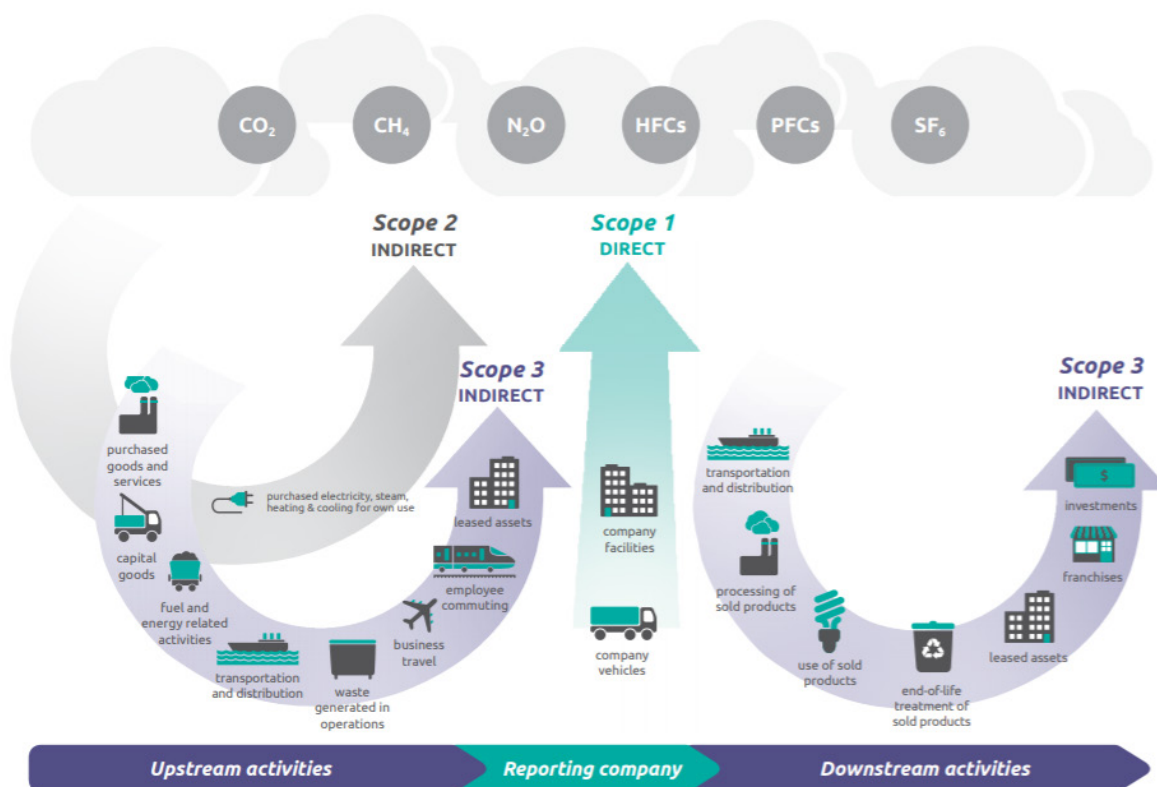
3.3 Carbon emission reporting

Carbon reporting (examples 3.6 and 3.7) 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 referred to as carbon footprinting, this activity measures 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 3.1). As per the GHG Protocol Corporate Accounting and Reporting Standard¹⁶, 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).

GHG emission calculation is now an integral part of many corporations' reporting, and is used to set targets, identify opportunities and show progress. Many reporting frameworks provide guidance on reporting and measuring GHG emissions, such as SASB's Implementation Supplement which provides an overview of SASB's approach to GHG emissions and related topics in the SASB Standards. It also offers guidance for reporting entities that wish to disclose Scope 1, 2, or 3 emissions. GHG Protocol (figure 3.1) has been widely adopted by many companies to measure GHG emissions and has been referenced by many standards and frameworks including TCFD, CDP, GRI, and SASB).

Figure 3.1: 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

3.4 Setting targets

To achieve climate-resilient markets and net-zero emissions issuers will need to set both attainable and impact-driven targets, based on widely understood and accepted definitions. The TCFD recommends that organizations describe their climate-related targets such as those related to GHG emissions, water usage, energy usage, etc. in line with the anticipated regulatory requirements or market constraints. Organizations should also align their climate-related targets with other goals such as efficiency or financial goals, financial loss tolerance, avoidance of GHG emissions through the entire product life cycle, or net revenue goals for products and services designed

¹⁶The Greenhouse Gas Protocol, *A Corporate Accounting and Reporting Standard* (revised edition), 2004

for a lower-carbon economy. A major and growing focus for many companies and investors is in the setting of emissions targets that are aligned with the trajectory towards net zero emissions before 2050, which according to the scientific community, is needed to achieve keeping global average temperature increases below 1.5°C. To ensure that targets align with climate-science, resources such as the Science Based Targets initiative (SBTi - see box 3.2) can be consulted.

It is important that common definitions are used when setting climate-related targets. First and foremost, issuers should always refer to the relevant law and guidance provided by their regulatory authority, using this guidance as a supplement to legal requirements. Climate data can also be available in pre or post issuance documents of bond issuers. Investors are interested in consistency across companies as well as within companies. Trend lines, or proof of progress are more useful than static targets or long-off objectives (see examples 3.8 and 3.9). Therefore, companies should endeavor to show how they have progressed over time on the climate-related targets chosen. Whether providing historical data to show this trendline or setting up new programs to collect this data moving forward, it is important to set targets that can be measured progressively and that allow to monitor progress and update information on climate-related science, and investor and reporting requirements.

TCFD and global data vendors recommend providing the following details when describing targets:

1. Definition of measure, and if an emissions reduction target is set, which scopes (1,2 and 3) are covered.
2. Whether there are absolute and intensity-based targets. For the intensity-based targets, include the details of the denominator used and its associated changes over the equivalent time.
3. Time frames over which the target applies.
4. Base year from which progress is measured.
5. Whether there has or will be use of offsets in achieving the target, with associated details.
6. Details regarding how and why the specific target/s were determined.
7. Key performance indicators used to assess progress against target.

Linking these targets to remuneration should also be considered. A 2019 CDP report covering companies worth three quarters of European market cap finds 47% reward their senior management for managing climate topics, with 1 in 4 tying incentives to climate targets.¹⁷ In December 2018, following significant investor engagement, including by those involved in TPI and CA100+, Shell announced plans to link executive pay to carbon pollution reduction targets and by October 2019, four of the other seven supermajors had formally linked remuneration for senior executives to climate change performance, including ConocoPhillips, Eni, Exxon Mobil and Total.¹⁸

Box 3.2 Setting Science Based Targets

The Science Based Targets initiative (SBTi) is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI), and the World Wide Fund for Nature (WWF) and one of the We Mean Business Coalition commitments. Central to SBTi's mission is ensuring that companies have the tools they need to set targets in line with climate science, recognizing that the science itself is nuanced and dynamic. Due to the complexity of the science, the SBTi plays an important role by conducting in-depth research and analysis, as well as consulting with scientists and sustainability professionals, in order to develop science-based targets (SBT) and setting methods that are transparent, robust, and actionable.

Methods endorsed by the SBTi are instructive frameworks that may be used by companies to set emissions reduction targets consistent with the best available climate science. These methods are constructed from three main elements: a greenhouse gas (GHG) budget, a set of emission scenarios, and an allocation approach. The SBTi's procedure for developing a method begins with determining a representative set of emissions scenarios that are considered plausible, responsible, objective, and consistent and that are aligned with specific temperature goals (1.5°C - 2°C of global warming). In general, SBTi scenarios must not exceed the GHG budget associated with the temperature goal prior to reaching global net-zero emissions, in addition to meeting other criteria. An allocation approach is used to translate the resulting global or sector-specific emissions pathway into practical requirements that align company emissions with the pathway.

The Science Based Targets initiative has also developed methodologies to support net-zero targets. In 2019 SBTi launched a process to develop the first science-based global standard for corporate net-zero targets, to ensure that companies' net-zero targets translate into action that is consistent with achieving a net-zero world by no later than 2050.

Source: SSE initiative, with data from the Science Based Targets initiative website – www.sciencebasedtargets.org

3.4.1 Targeting 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 3.3). 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. Achieving net-zero emissions means that your organization 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.

¹⁷CDP, "Half of Europe's largest firms now link executive pay to climate change". February 2019

¹⁸Corporate Knights, "Climate bonus: Is paying executives to address the climate crisis good business?" November 2019.

Many countries have announced the timeline for achieving carbon neutrality since 2019 and started to explore the pathways in achieving the goal. Such national goals will influence the actions and decision-making process for financial institutions and listed companies. Therefore, the timeline, goals, and pathways to achieve carbon reduction for each individual company, including the models and tools used, would be relevant for disclosure.

Box 3.3 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 campaign - <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>

Chapter 3 Examples

Example 3.1: Italian international banking group Intesa Sanpaolo's TCFD Correspondence Table identifies key disclosures

CORRESPONDENCE TABLE		
Thematic Area	TCFD recommendations	References
GOVERNANCE	<p>Describe:</p> <ul style="list-style-type: none"> the Board's oversight of climate-related risks and opportunities management's role in assessing and managing climate-related risks and opportunities 	<p>Report on Corporate Governance and Ownership Structures:</p> <ul style="list-style-type: none"> The governance of corporate social responsibility Powers of the Board of Directors Board Committees: composition and operations Corporate Control Functions <hr/> <p>Consolidated Non-financial Statement:</p> <ul style="list-style-type: none"> Governance structure Sustainability Governance Management of potential risks and impacts related to climate change Responsible asset management and customer protection Environment and climate change <hr/> <p>Annual Report:</p> <ul style="list-style-type: none"> Report on operations – Sustainability
	STRATEGY	<p>Describe:</p> <ul style="list-style-type: none"> the climate-related risks and opportunities the organization has identified over the short, medium, and long term the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario
RISK MANAGEMENT		<p>Describe:</p> <ul style="list-style-type: none"> the organization's processes for identifying and assessing climate-related risks the organization's processes for managing climate-related risks how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management

Thematic Area	TCFD recommendations	References
METRICS AND TARGETS	Disclose: <ul style="list-style-type: none"> the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks 	Consolidated Non-financial Statement: <ul style="list-style-type: none"> United Nations Sustainable Development Goals Responsible asset management and customer protection Environment and climate change Direct environmental impacts Green economy Improvement objectives Indicators Eurizon Fund Absolute Green Bonds - Global Impact Report
	Describe: <ul style="list-style-type: none"> the targets used by the organization to manage climate-related risks and opportunities and performance against targets 	<ul style="list-style-type: none"> Environmental and social results Annual Report: <ul style="list-style-type: none"> Report on operations – Sustainability

Source: Page 195 of [Intesa Sanpaolo's 2019 Consolidated Non Financial Statement](#)

Example 3.2: Canadian multinational banking and financial services company Scotiabank provides maps reporting to TCFD recommendations on TCFD dedicated webpage

Scotiabank recognizes that climate change poses a significant risk to the global economy and to society as a whole. As a major financial institution, we have both the responsibility and opportunity to take action, which is why we fully support the TCFD recommendations. Following our public commitment by our President and CEO in February 2018, we have had significant engagement with a number of investors, NGOs and governments, to discuss climate-related impacts in the short-, medium- and long-term. We began reporting according to the TCFD recommendations in our 2018 Annual Report.

The table below is an Index using the TCFD, and is complementary to the language found on pages 39 and 40 of the 2018 Sustainable Business report.

Theme and area	Disclosure/Further information for reference
GOVERNANCE: Disclose the organization's governance around climate-related risks and opportunities.	
a) Board Oversight	<ul style="list-style-type: none"> 2018 Annual Report: Climate Change (TCFD) and Governance of Climate Change risk (p. 87-88), Environmental Risk (p. 108) 2018 Management Proxy Circular: Shareholder proposal – Commitment to Decarbonization (p. 24) 2018 CDP Response: Governance C1.1a, C1.1b (p. 3-4)
b) Management Role	<ul style="list-style-type: none"> 2018 Annual Report: Climate Change (TCFD) and Governance of Climate Change risk (p. 87-88), Environmental Risk (p. 108) 2018 Management Proxy Circular: Shareholder proposal – Commitment to Decarbonization (p. 24) 2018 CDP Response: Governance C1.2, C1.3 (p. 4-8)
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) Risks and Opportunities	<ul style="list-style-type: none"> 2018 Annual Report: Provision for Credit Losses (p. 29), Risk Identification and Assessment (p. 76), Climate Change Risks (TCFD) and Governance of Climate Change risk (p. 87-88), Environmental Risk (p. 108) 2018 CDP Response: Risks and Opportunities C2 (p. 7-16), Business Strategy C3.1c (p. 17-18)
b) Impact of climate risk and opportunities on business	<ul style="list-style-type: none"> 2018 Annual Report: Climate Change (TCFD) and Governance of Climate Change risk (p. 87-88), Environmental Risk (p. 108) 2018 Management Proxy Circular: Shareholder proposal – Commitment to Decarbonization (p. 24) 2018 Sustainable Business Report: Environmental Governance (p.38-40), Sustainable Finance (p. 41) 2018 CDP Response: Risks and Opportunities C2.3, C2.4, C2.5, C2.6 (p. 11-17)
c) Resilience of corporate strategy, considering climate scenarios	<ul style="list-style-type: none"> To be completed in FY2019 and FY2020

Theme and area	Disclosure/Further information for reference
RISK MANAGEMENT: Disclose how the organization identifies, assesses, and manages climate-related risks.	
a) Process to identify and assess climate risks	<ul style="list-style-type: none"> 2018 Annual Report: Risk Identification and Assessment (p. 76), Climate Change Risks (p. 87-88), Environmental Risk (p. 108) 2018 Sustainable Business Report: Environmental Governance (p.38-40), Sustainable Finance (p. 41) 2018 CDP Response: Governance C1 (p. 3-6), Strategy C2.1-C2.2c (p. 7-10), 2.3 (p. 11-13)
b) Managing climate risk	<ul style="list-style-type: none"> 2018 Annual Report: Risk Identification and Assessment (p. 76), Climate Change Risks (pg. 88), Environmental Risk (p. 108) 2018 Sustainable Business Report: Stakeholder Engagement and Materiality (p. 10-13) 2018 CDP Response: Strategy C2.2d (p.10-11), 2.3 (p. 11-13)
c) Integrating climate risk into overall risk management	<ul style="list-style-type: none"> 2018 Sustainable Business Report: Environmental Governance (p.38-40) 2018 CDP Response: Governance C1 (p. 3-5), Strategy 2.2 (p. 8-11)

Source: Scotiabank's [website](#)

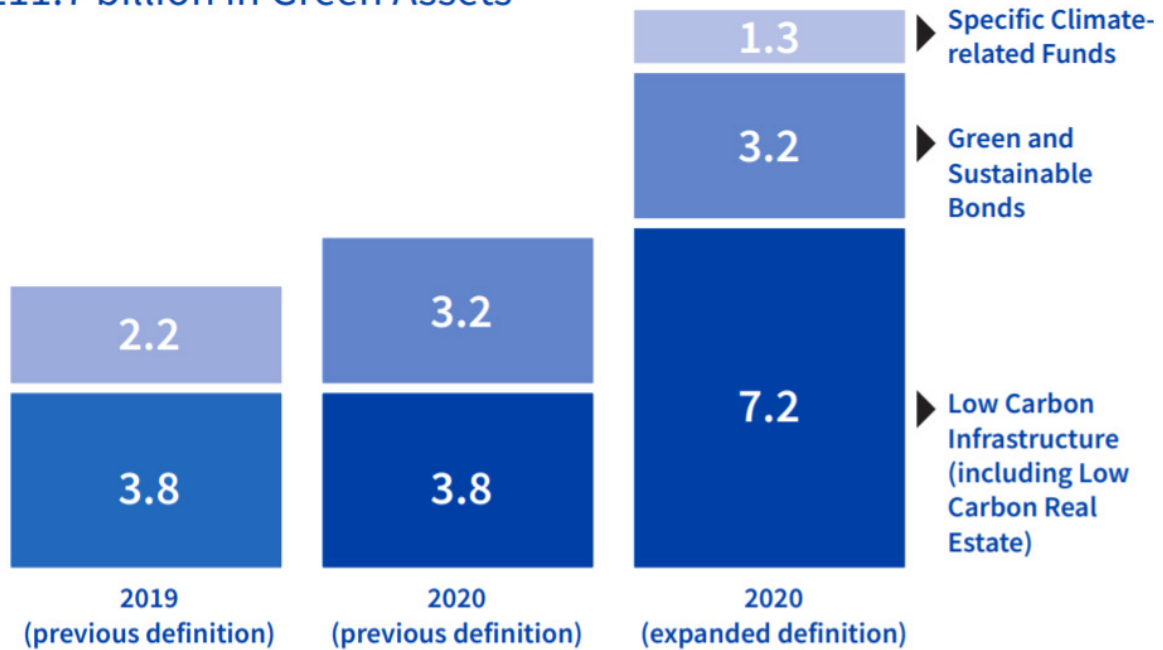
Example 3.3: American multinational technology company Apple's green bond allocation overview



Source: Page 5 of Apple's [2020 Annual Green Bond Impact Report](#)

Example 3.4: British multinational insurance company Aviva reports on green assets

£11.7 billion in Green Assets



Source: Page 63 of Aviva plc's [Annual Report and Accounts 2020](#)

Example 3.5: Danish multinational power company Ørsted's indicates intention to align with EU taxonomy

The EU is defining 'green'

Sustainable finance is a critical enabler of the green transformation of industries across the EU and globally. For the energy industry alone, the IPCC estimates a USD 2.4 trillion annual shortfall in clean energy investment through 2035 to meet the 1.5 °C Paris Agreement goal. Mobilisation and reallocation of institutional and private capital will be necessary to meet this challenge. The global economy remains far from operating at a net-zero level, and emissions are not being reduced by the required volume and pace. At the same time, countries and businesses need to prepare better for a changing climate.

The EU is preparing a taxonomy to be used as a tool to help plan and report on the transition to an economy that is consistent with the EU's environmental objectives. Upcoming taxonomy regulation will determine when an economic activity can be considered sustainable.

In 2018, The European Commission established a technical expert group on sustainable finance which was assigned with developing recommendations on the taxonomy's technical screening criteria for the objectives of climate change mitigation and adaptation. The group's recommendations were presented to the European Commission in March 2020 and generally formed the basis for draft legislation put forward by the Commission in November 2020.

At Ørsted, we plan to align with the taxonomy after the final version is launched by the EU, expectedly in 2021.

Source: Page 19 of [Ørsted's Annual Report 2020](#)

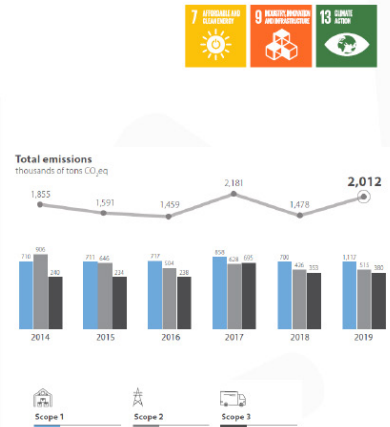
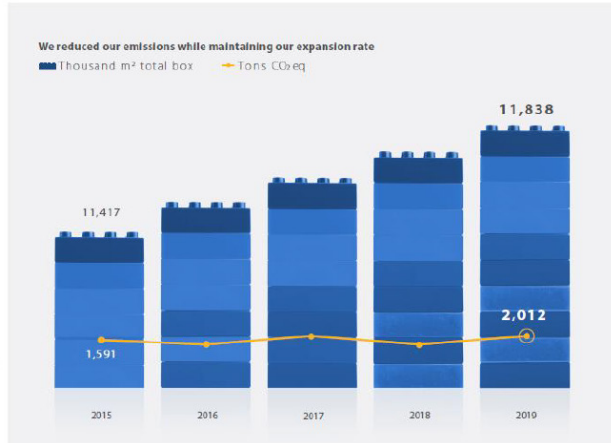
Example 3.6: Mexican and Central American Walmart division. Walmart de México y Centroamérica's emissions

Mitigate climate change

Emissions

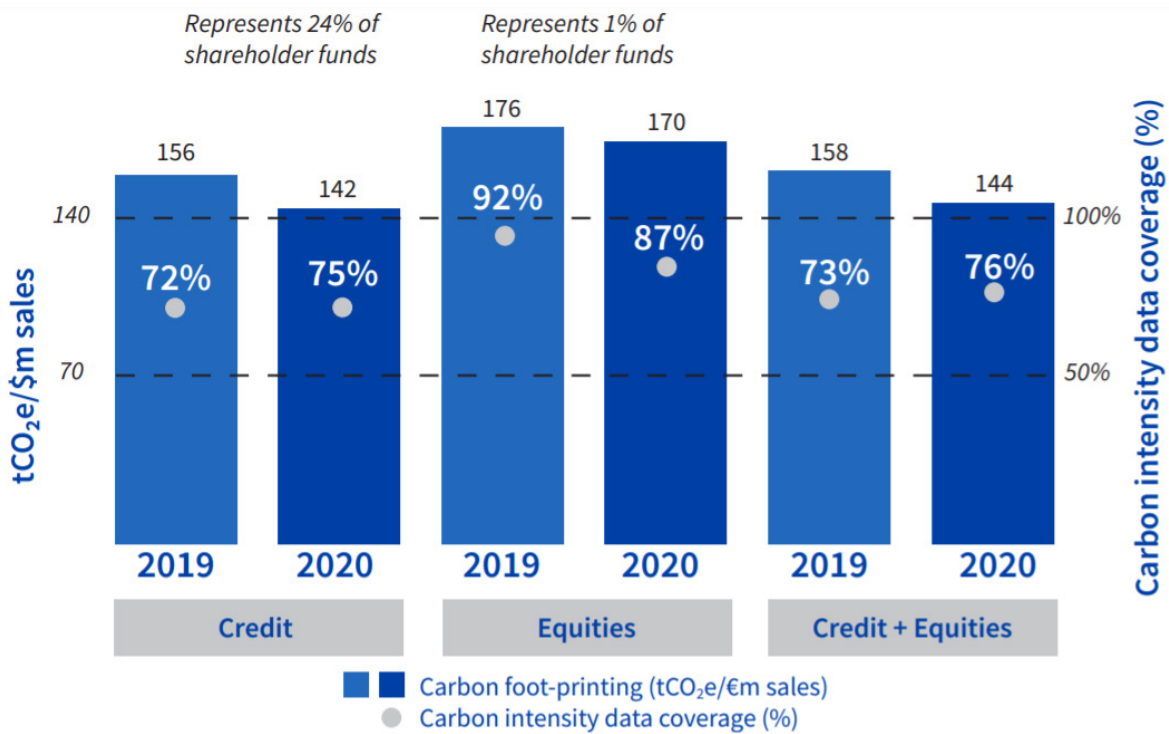
In 2019, our Scope 1 and 2 emissions increased 17% compared to 2015, because of an unusual refrigerants consumption.
GRI 303-4

170 ton/m²
GHG emissions intensity



Source: Page 10 of Walmart de México y Centroamérica's 2020 ESG Overview

Example 3.7: British multinational insurance company Aviva's carbon footprinting

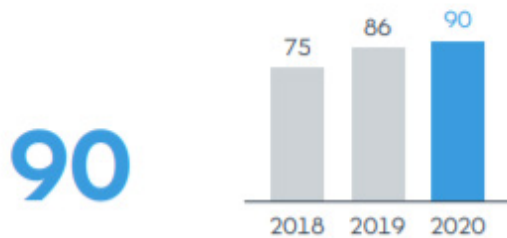


Source: Page 63 of Aviva plc's Annual Report and Accounts 2020

Example 3.8: Danish multinational power company Ørsted's performance highlights

Environment

Green share of generation %



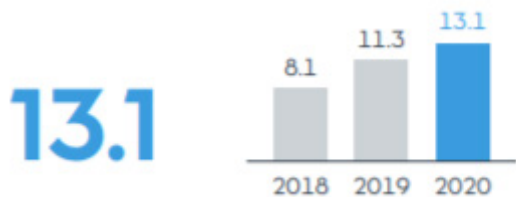
The green share of our heat and power generation continued to increase to a new high of 90 %, following continued ramp-up of our offshore and onshore wind capacity and lower heat and power generation based on fossil fuels.

Installed renewable capacity GW



Installed green capacity increased by 14 % to 11.3 GW in 2020 due to the commissioning of the offshore wind farm Borssele 1 & 2 and the three onshore wind farms Sage Draw, Plum Creek, and Willow Creek.

Avoided emissions from green capacity Million tonnes, CO₂e



Avoided emissions from our green heat and power generation relative to fossil-fuelled generation increased by 16 %, mainly due to increased wind-based power generation.

Greenhouse gas emissions, scopes 1 and 2 Million tonnes, CO₂e



The scopes 1 and 2 greenhouse gas emissions were at the same level as in 2019 despite lower fossil-fuelled heat and power generation. This was due to an increase from ancillary services from our coal-fuelled units as we are legally obliged to deliver these services with the lowest marginal costs.

Greenhouse gas emissions, scope 3 Million tonnes, CO₂e



Our scope 3 greenhouse gas emissions were reduced by 27 %, mainly due to reduced sales of natural gas.

Social

Safety

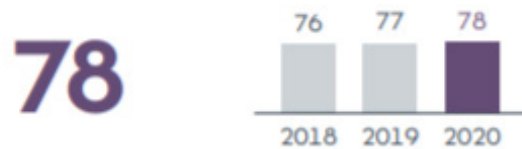
Total recordable injury rate (TRIR)



We continue to have a strong focus on the safety and well-being of our employees. We are progressing satisfactorily towards our target of 2.9 by 2025.

Employee satisfaction

Index 1-100

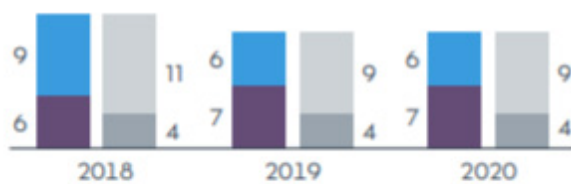


The 2020 employee satisfaction survey, People Matter, showed a record-high satisfaction and motivation score of 78.

Governance

Board of Directors and the Executive Committee

Nationality and gender diversity



We continue to have strong focus on increasing diversity at all management levels.

● Danish ● Non-Danish ● Male ● Female

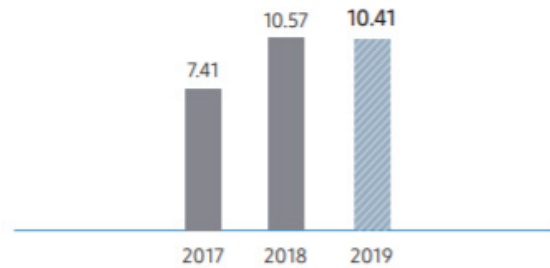
Source: Page 13 of [Ørsted's Annual Report 2020](#)

Example 3.9: South Korean multinational conglomerate Samsung reports “true value”

2019 Value Creation Achievements

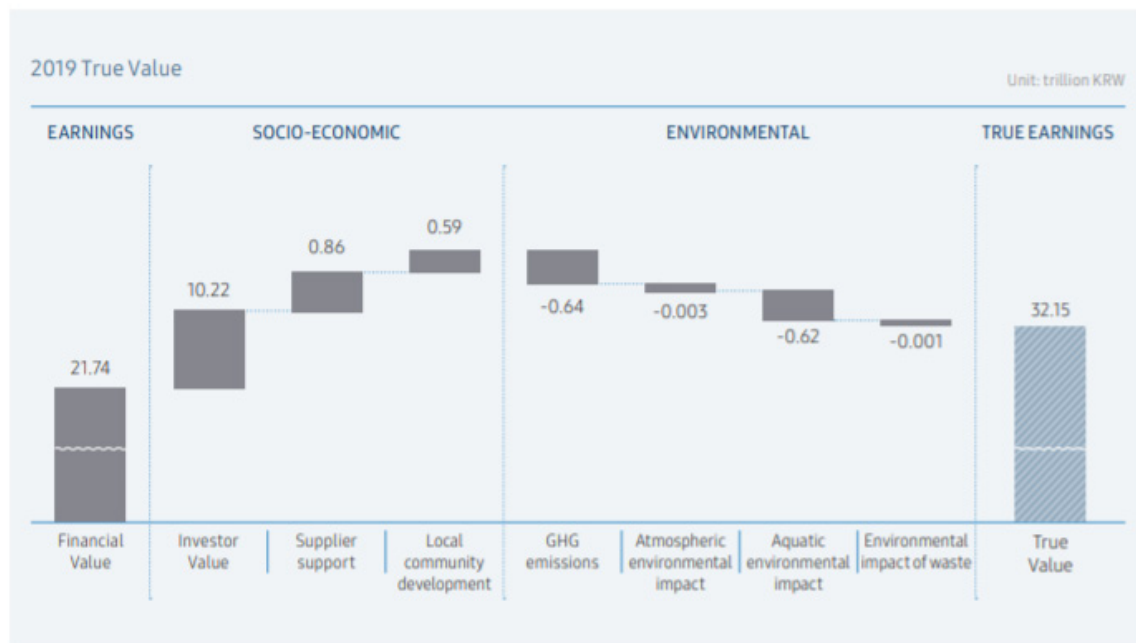
From January 1 to December 31, 2019, the total value of sustainable management created by Samsung Electronics amounts to approximately KRW 32.15 trillion. The financial value came out to be KRW 21.74 trillion, down by 51% from 2018 due to the decreased net income. Despite such conditions, based on our new CSR vision of ‘Together for Tomorrow!’ which pursues socio-economic value creation, we increased our support for future generations, and have continuously strengthened our partner collaboration programs for improving the competitiveness of the supply chain. Furthermore, we continued to expand the use of renewable energy since declaring our commitment to go 100% renewable energy in the United States, China and Europe to improve environmental value. As a result, we generated socio-economic and environmental value amounting to KRW 10.41 trillion in 2019 on par with that of 2018.

Socio-economic and Environmental Value Unit: trillion KRW



Footnote:

1) Changes of methodology used to calculate social contribution costs and GHG emissions caused the re-calculation of the sustainable management value over the past three years.



Source: Page 109 of [Samsung's 2020 sustainability report](#)

Example 3.10: American technology conglomerate Facebook's climate commitment

Our Climate Commitment

Science tells us that the next 10 years will be the defining decade for dramatic emissions reductions to limit the worst impacts of climate change. Facebook is committed to tackling climate change through our global operations, value chain, and beyond, and supporting cross-sector collaboration to scale innovations and science-driven solutions.

From the beginning, we have been committed to designing, building, and operating some of the most energy and water efficient data center facilities in the world. We are on track to meet our operational renewable energy goal and emissions reduction target. In 2020 and beyond, Facebook will achieve net zero greenhouse gas (GHG) emissions for our global operations (scopes 1 and 2) and be supported by 100 percent renewable energy. **We are committing to reaching net zero GHG emissions for our value chain (scope 3) in 2030.**

We support the [Science Based Targets initiative](#) (SBTi) and we are aligning our program with the latest science on what is necessary to transition to a zero carbon future.

Source: Facebook's [sustainability webpage](#)

Example 3.11: Brazilian global personal care cosmetics group Natura's Carbon Neutral Programme

Natura Carbon Neutral Programme

GRI 103-2, 103-3

2020 ambitions

Offset all our emissions, primarily in the Pan-Amazon region

Reduce relative GHG emissions by 33% (base year 2012)

Where we are

We offset 100% of our emissions. We neutralise emissions by fostering projects that generate a positive impact for the climate, as well as a series of other benefits, such as generating jobs, technology transfer, reinforcement of local economies, women's empowerment, among others.

1.2% Cumulative reduction of 1.2%. Our challenge is to find new opportunities and to develop technologies to reduce GHG emissions throughout the value chain.

Natura is a carbon neutral company that offsets all the greenhouse gas (GHG) emissions it is unable to avoid. The Natura Carbon Neutral Programme functions in three main areas: mapping of emissions throughout the value chain, the constant pursuit of emissions reductions and neutralisation of emissions that cannot be avoided.

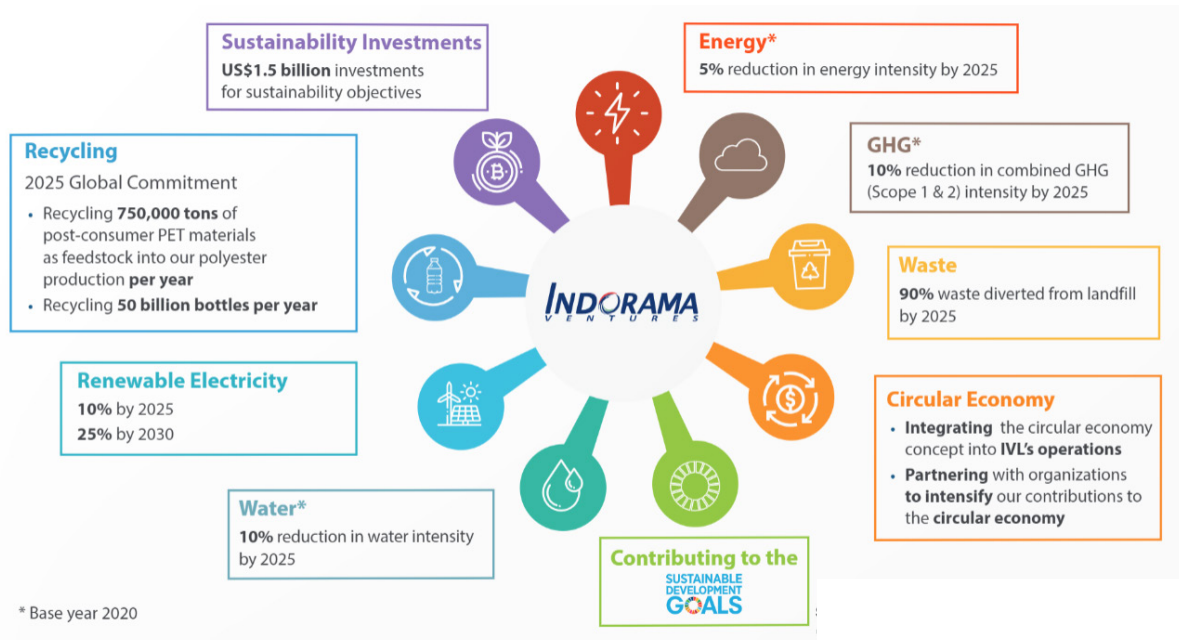
We adopt an expanded scope, which takes into account not only our own production process, but the entire value chain – from the extraction and transportation of raw materials to the manufacture of packaging materials by third-parties and the final disposal of packaging after use. Ongoing emissions reduction targets are incorporated into the company's 2020 ambitions.

The role we play in the Amazon biome is also an integral part of combating climate change. In our offsetting programme we seek to support projects that help keep the forest standing. Furthermore, we maintain a platform that shares our learnings from emissions neutralisation with other companies and encourages the adoption of a low carbon economy.

We are aware that we can boost the effectiveness of our measures if we work with partners who share the same goal. Our supply chain and companies from different sectors will

Source: Page 114 of Natura's [2019 Annual Report](#)

Example 3.12: India's petrochemical leader Indorama Ventures Public Company Limited, outlines strategy to carbon neutrality



Source: page 10-11 of IVL's [Sustainability Report Executive Summary 2020](#)

Chapter 4: Disclosure presentation and validation

Issuers have a number of frameworks or formats to present the information recommended for disclosure by the TCFD. By using the TCFD Checklist (annex 1), together with the guidance in previous chapters, issuers should now have an idea of what information they are already disclosing and what disclosures they are missing. This chapter of the guidance helps issuers to align TCFD recommendations with disclosure frameworks to enhance efficiency, as well as providing guidance on how and where to disclose climate-related data.

4.1 Frameworks for disclosure

Issuers should aim to follow TCFD's Principles for Effective Disclosures to ensure they achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organizations. These principles state that disclosures should:

1. Represent relevant information,
2. Be specific and complete,
3. Be clear, balanced and understandable,
4. Be consistent over time,
5. Be comparable among companies within a sector, industry, or portfolio,
6. Be reliable, verifiable and objective,
7. Be provided on a timely basis.

While companies have a number of frameworks at their disposal for disclosing climate-related data, as well as social and corporate governance information, most, if not all, have now been mapped and aligned to the TCFD recommendations to ensure consistency and efficiency. It has been recognized that consistency among reporting frameworks is essential to ensure information provided by companies is decision useful. To this end, a number of initiatives have been launched to ensure consistency among reporting frameworks.

For example, the Better Alignment Project is an initiative that explored how sustainability reporting frameworks can work together to support organizations preparing ESG disclosures. As part of this collaboration, the initiative has outlined alignment with CDP, CDSB, GRI, IIRC, and SASB (see annex 3 for a description of each). These five framework and standard-setting institutions also issued a letter of intent in September 2020, outlining a vision for a comprehensive corporate reporting system, and a commitment to work together to achieve it.¹⁹ As part of this collaborative effort facilitated by Impact Management Project, World Economic Forum and Deloitte, the organizations have since launched a "Reporting on enterprise value: Illustrated with a prototype climate-related financial disclosure standard"²⁰ which is based on the four principles of the TCFD recommendations (Governance, Strategy, Risk Management, and Metrics and Targets).

To help map issuers' current disclosure formats to the TCFD, annex 2 indicates alignment of indicators between main reporting frameworks to the TCFD. If issuers already report using GRI and CDP, for example, they can use annex 2 as a cross-reference when completing the TCFD Checklist (annex 2), and may wish to include this in their map of TCFD information (see examples 3.1 and 3.2). Issuers are encouraged to use the metrics recommended by the TCFD to ensure consistency throughout the market and globally. The Corporate Reporting Dialogue has also conducted a mapping exercise which indicates the level of alignment of CDP, GRI and SASB²¹.

 Tip for Stock Exchanges

Strengthen your guidance

Identify alignment with local reporting practices and guidance

Exchanges should decide before developing guidance specific to the TCFD how they will ensure alignment to previous guidance on disclosures and to current practices in their market. In markets that are primarily using a particular framework for ESG reporting, or where a standard framework is mandated, guidance on TCFD should be tailored to align with that framework. To help issuers understand how new guidance relates to previous ESG disclosure guidance or mandates, an exchange may wish to clarify how they align and provide a mapping of metrics to that specific framework.

4.2 Data verification and assurance

Information disclosed in external reports should follow internal assurance procedures to ensure the data is accurate, appropriate, and reliable (example 4.1). Issuers may consider engaging external consultants to undertake assurance procedures to improve the credibility of their data with third party audit and external support may be essential if the capacity does not exist internally. As climate-related disclosures become more common and are included in mainstream financial filings, the governance process should be similar to those used for existing public financial disclosures and should therefore include a review by the chief financial officer and audit committee or equivalents.

An internal assurance process can ensure accurate and better data, leading to better decision-making and performance for the issuer. This process can be undertaken using the existing internal audit, risk and data control verification systems already developed for mainstream financial reporting processes. If internal systems are not currently sufficient for the task, a company may decide that it is in

¹⁹ *Statement of Intent to Work Together Towards Comprehensive Corporate Reporting - Summary of alignment discussions among leading sustainability and integrated reporting organisations CDP, CDSB, GRI, IIRC and SASB. Facilitated by the Impact Management Project, World Economic Forum and Deloitte.*

²⁰ *Prototype of a Sustainability-related Financial Disclosure Presentation Standard*

²¹ *Corporate Reporting Dialogue, Driving Alignment in Climate-related Reporting, Year One of the Better Alignment Project, 2019, Page 24*

its long-term best interest to invest in building capacity in this area. This information is often reported by the company in the governance section of the TCFD recommendations.

In addition to internal assurance procedures, an external audit can add trust, credibility and recognition to the organization's reporting practices (example 4.2). Accounting, engineering and specialist service firms are the most common third-party assurance providers. In order to decide the type and level of assurance, it is important for companies to consider recommended standards for assurance within their sector, as well as stakeholder expectations. Additional resources on assurance procedures can be found in table 5.1.

4.3 Location and timing of climate-related disclosure

The purpose of disclosing climate-related information is that investors and other market participants and stakeholders can access and use the information provided by issuers for their own internal decision-making processes. Information determined to be financially material (see section 2.3 of Chapter 2) and legally required, will be disclosed within organizations' mainstream financial filings. Both primary accounting standard setting bodies the International Accounting Standards board (IASB) and the Financial Accounting Standards Board (FASB) have issued standards to address risks and uncertainties affecting companies. The International Accounting Standard (IAS) 37 "Provisions, Contingent Liabilities and Contingent Assets" and the Accounting Standards Codification (ASC) 450 "Contingencies" both provide guidance on how to account for and disclose contingencies such as those discussed in this guidance. In addition, IAS 36 "Impairment of Assets" and ASC 360 "Long-lived Asset Impairment" provide additional guidance on long-lived assets that may be impacted by climate-change.

The TCFD recommends that organizations provide climate-related financial disclosures in mainstream financial filings and our exchange supports this recommendation. It is recognized, however, that some climate-related information may not be compatible with the current reporting requirements or deemed financially material. When this is the case, organizations may wish to disclose certain elements in other official company reports that are issued at least on an annual basis and are widely distributed and available to investors and other stakeholders. The reports should be subject to internal governance processes that are the same or substantially similar to those used for financial reporting. Ideally, climate data and financial data should be reported at the same point in time and cover the same reporting boundaries and time periods to aid comparison and analysis.

For climate-related information that organizations choose to include outside of or in addition to their mainstream financial filings, it is important that this information is easy to find and easy to understand. It is also important to include references in the mainstream filings to additional information reported elsewhere as it can significantly improve its accessibility. Issuers can use the TCFD Checklist in annex 1 to map this information. Reports containing this information should clearly lay out where climate-related information can be found. In addition to sharing with investors and stakeholders, the organization can also share information with the exchange for easy access for investors.

 Tip for Stock Exchanges

Strengthen your guidance

Indicate or develop platforms for posting disclosures

Stock exchanges can play a particularly important role as information keepers or gateways, publishing public 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 this information and can also help investors and other market participants to find information by keeping it publicly available on their website. Let both investors and issuers know if you have a platform where they can, or are expected to, share climate-related information. For more detailed guidance on how exchanges can better facilitate the sharing of climate-related data, see section 4.2 of the accompanying Action Plan.

Chapter 4 Examples

Example 4.1: Canadian commercial banking company TD highlights internal review of climate-related information in governance section

1.0 Governance

A. BOARD OVERSIGHT

TD's Board of Directors oversees the implementation of an effective risk culture and internal control framework across the enterprise. As part of its mandate, the Board oversees controls and risks related to climate change issues affecting TD and its stakeholders, and it accomplishes its mandate through its committees, including the Risk Committee and the Corporate Governance Committee. The Risk Committee oversees risk management, including climate-related transition and physical risks, while the Corporate Governance Committee provides oversight and direction on the Bank's climate-related commitments, targets and performance. The Board and its committees also consider climate-related issues in reviews of major action plans and policies, including our strategy for supporting the transition to a low-carbon economy.

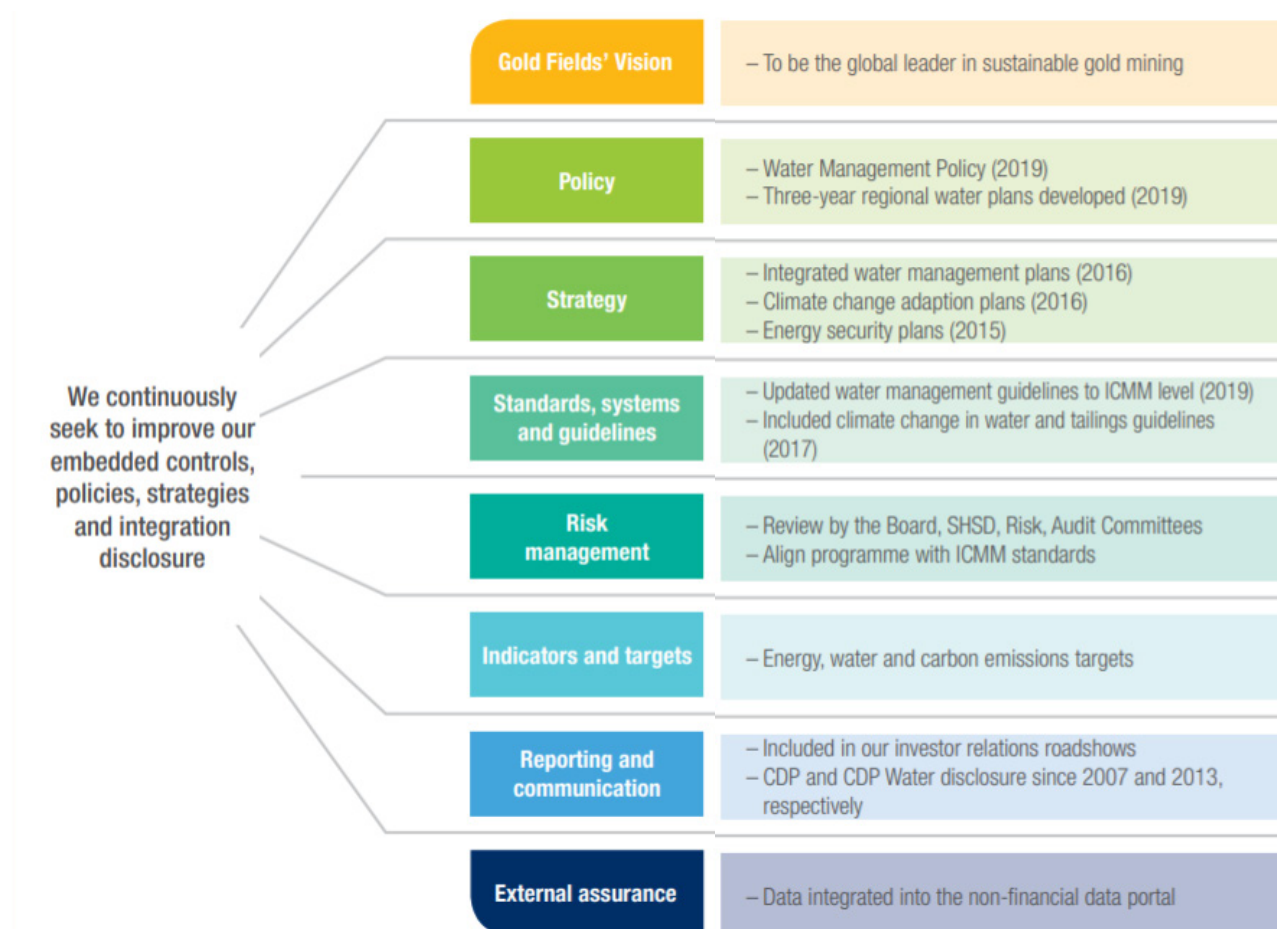
B. MANAGEMENT ROLE

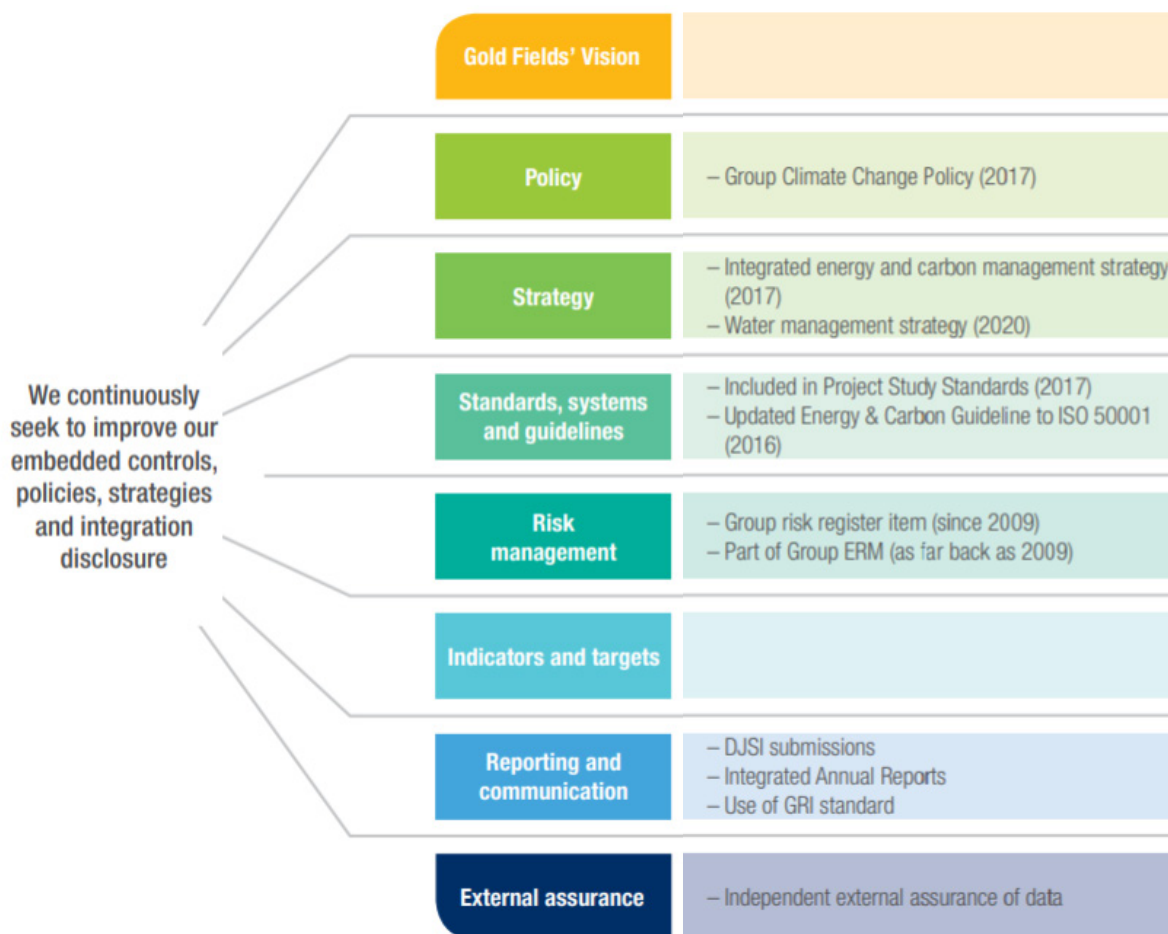
The Senior Executive Environmental Champion is responsible for promoting the considerations of climate change matters and issues at TD and is supported by the Corporate Citizenship team. Within the Corporate Citizenship team, the Head of Environment leads the Corporate Environmental Affairs team, which is responsible for developing TD's environmental strategy, setting environmental performance standards and targets, and reporting on performance.

TD also has an enterprise-wide Corporate Citizenship Council (CCC) composed of senior executives from TD's business segments and corporate functions. The CCC is responsible for meeting performance standards and communicating results throughout the business. TD's business segments are responsible for implementing the environmental strategy and managing associated risks within their units.

Source: Page 4 of TD's [2018 TCFD Report](#)

Example 4.2: South African gold mining company Gold Fields's controls, policies and strategies outline assurance procedures





Source: Page 4 of [Gold Fields' 2019 Climate Change Report](#)

Chapter 5: Education and resources

This guidance acts as a starting point for all issuers to evaluate and update their current disclosure practices to ensure their resilience to climate-related issues. It provides three important stages of disclosure and a diagnostic TCFD Checklist to help issuers begin their journey to climate-resiliency. It is essential, however, that issuers see this as an ongoing journey and aim to improve upon and update knowledge on this topic on an ongoing basis. This chapter provides issuers with a series of resources they can use to continually update their climate-related knowledge and know-how, as well as to support those report-preparers looking to deepen their climate-related disclosure.

 Tip for Stock Exchanges

Strengthen your guidance

Link to local education and training opportunities

A number of opportunities for education and training arise pertaining to the TCFD and climate-related disclosure. Let readers of the guidance know where they can access educational resources in their market, or how to request educational resources if needed.

For stock exchanges that wish to have support in training market participants on TCFD and climate-related disclosures, they should contact the SSE directly, or see the accompanying Action Plan for guidance on education and training.

5.1 Resources for updating scientific knowledge

There are a number of resources available for organizations to maintain up-to-date information on this constantly evolving topic. As both the science behind climate-related issues as well as the reporting requirements evolve and grow, organizations should ensure they are working with the most up-to-date information. To do this, a number of resources are available, through the TCFD as well as many other financial service providers, NGOs, UN agencies and international organizations. In addition, issuers and investors can engage with national regulators and stock exchange(s) on training and educational needs through working groups or by requesting training and education resources.

To further assist in your disclosure journey, the following resources (table 5.1) can help those companies that wish to delve deeper or access specific resources on a particular stage of this journey. For additional resources, all capital market stakeholders are encouraged to access the TCFD knowledge hub at [tcfhub.org](https://www.tcfhub.org).

Box 5.1 Additional resources for TCFD implementation

Related Section of this Guidance	Author	Title
1 - Setting the Stage	International Energy Agency (IEA)	Energy Technology Perspectives 2017
1.4.1 - Differential Reporting	A4S (Accounting for Sustainability)	TCFD Top Tips for Finance Teams
1.4.1 - Differential Reporting	A4S (Accounting for Sustainability)	Maturity Map for TCFD
2.1 - Climate Opportunities	International Energy Agency (IEA)	ETP Clean Energy Technology Guide
2.1.1 - Financing Opportunities	FTSE Russell (LSEG)	Sustainable Bond Market at a Glance
2.1.1 - Financing Opportunities	Climate Bonds Initiative (CBI)	Guidance and Data on the Green Bond Market Globally
2.1.1 - Financing Opportunities	FTSE Russell (LSEG)	Case Study: Smart Beta meets Smart Sustainability
2.2 - Climate Risks	TCFD	TCFD Guidance on Risk Management Integration and Disclosure
2.2 - Climate Risks	SASB & CDSB	Climate Risk: from Principles to Practice
2.2 - Climate Risks	S&P Trucost	Interplay of Transition and Physical Risk Report
2.3 - Corporate Governance	CDSB	Webinar: Directors Duties and Liabilities around Climate Risk
2.4 - Materiality Assessment	CDSB	Materiality and TCFD
2.4 - Materiality Assessment	SASB	Materiality Map
2.4 - Materiality Assessment	Integrated Reporting <IR>	Materiality background paper for <IR>
2.5 - Scenario Analysis	TCFD	Scenario Analysis and Climate-Related Issues
2.5 - Scenario Analysis	TCFD	TCFD Guidance on Scenario Analysis for Non-Financial Companies
2.5 - Scenario Analysis	C2ES	Using Scenarios to Assess and Report Climate-Related Financial Risk
2.5 - Scenario Analysis	UNFCCC	NDC Registry

Related Section of this Guidance	Author	Title
2.5 - Scenario Analysis	IPCC	IPCC Emission Scenarios
2.5 - Scenario Analysis	IEA	IEA Scenarios
2.5 - Scenario Analysis	International Renewable Energy Agency (IRENA)	IRENA Scenarios
2.5 - Scenario Analysis	International Institute for Applied Systems Analysis (IIASA)	Shared Socioeconomic Pathways (SSP) Database
3.1 - Investor useful information	Transition Pathway Initiative (TPI)	The TPI Tool
3.1 - Investor useful information	Portfolio Alignment Team	Measuring Portfolio Alignment Assessing the Position of Companies and Portfolios on the Path to Net Zero
3.3 - Setting Targets	Science Based Targets initiative (SBTi)	Sector Guidance
3.3 - Setting Targets	International Energy Agency (IEA)	Achieving Net-zero Emissions by 2050 - World Energy Outlook 2020
3.4 - GHG Emissions	The Greenhouse Gas Protocol	A Corporate Accounting and Reporting Standard (revised edition)
3.4 - GHG Emissions	SASB	SASB Implementation Supplement – Greenhouse Gas Emissions and SASB Standards
4.1 - Frameworks for Disclosure	Corporate Reporting Dialogue	Driving Alignment in Climate-related Reporting
4.1 - Frameworks for Disclosure	CDSB, TCFD Knowledge Hub	Alignment with Other Frameworks
4.1 - Frameworks for Disclosure	CDP	CDP Technical Note on the TCFD
4.1 - Frameworks for Disclosure	European Commission	Guidelines on Reporting Climate-related Information
4.2 - Data Verification and Assurance	Chartered Accountants in England and Wales (ICAEW) and the WBCSD	A Buyer's Guide to Assurance on Non-financial Information
4.2 - Data Verification and Assurance	CDSB	CDSB Position Paper: Positions on Relevance & Materiality, Organisational Boundaries and Assurance
All	TCFD Hub	Case Studies on How Organizations are using the TCFD Recommendations
All	Bloomberg	A guide to the Task Force on climate-related disclosures
All	CDSB and SASB	TCFD Good Practice Handbook
All	CDSB and SASB	TCFD Implementation Guide
All	CPA Canada	Enhancing Climate-related Disclosure by Cities: A Guide to Adopting the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)
All	TCFD	Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures
All	A4S (Accounting for Sustainability)	Numerous Case Studies on Applying TCFD

Source: UN SSE

ANNEX 1: TCFD CHECKLIST

The TCFD recommendations give companies a list of disclosures that should be included in mainstream financial reports when deemed financially material. As such, all of the questions in the below checklist should be able to be answered by investors or report users through publicly available reports - ideally annual financial filings. Where needed further detail may be provided in supplementary reports including sustainability reports. If information is not provided then an explanation outlining the rationale for not covering it would be helpful. Issuers are encouraged to use this checklist to determine whether or not the information recommended for disclosure by the TCFD can be found in their current reporting content. The checklist was compiled by the SSE initiative by combining the TCFD recommendations as well as the TPI Management Quality Assessment to help issuers diagnose their current reporting and create a path towards full alignment with TCFD recommendations.

Issuers can use this checklist to determine whether the informational needs of investors pertaining to climate are addressed by current disclosures. Where sufficient data to answer a question is not currently available in public reports, report preparers should focus on ensuring this information is added to their disclosure content. Where the issuer determines insufficient financial materiality to deem including this information in the mainstream financial filings, the report preparers should explain at a minimum how this decision was made and what time horizons were being used in supplemental reports such as a sustainability report. Where sufficient data is provided in public reports to answer a question, report preparers are encouraged to also indicate where it can be accessed within their current disclosure so that it is easy to find. This checklist can therefore be used as a map for investors looking for the following data (see example 3.1, 3.2).

Finally, issuers can also use the checklist to determine their current level of disclosure based on TPI's Management Quality Assessment. This assessment which includes 4 levels has been mapped to the TCFD recommendations below to help issuers determine what level they may already be at. Smaller companies in less climate-vulnerable industries can use this assessment to chart a path forward aiming to achieve level 4 disclosure as part of its 2-5 year plan. However, larger companies (all with more than \$1 billion in revenue and those in climate-vulnerable industries) should consider aligning with TCFD within 1-2 years.

Table A: TCFD Checklist Does current disclosure answer the question? Stage Location of Data

Governance			
a) Board oversight of climate-related risks and opportunities			
ALL	Are board and/or board committees (e.g., audit, risk, or other committees) informed about climate-related issues?	1	
	<ul style="list-style-type: none"> Does the company recognize climate change as a relevant risk and/or opportunity for the business? 	1	
	<ul style="list-style-type: none"> Is there a board member or committee with explicit responsibility for oversight of the climate change policy? 	3	
ALL	Do board and/or board committees consider climate-related issues when reviewing and guiding:		
	<ul style="list-style-type: none"> major plans of action? risk management policies? business plans? annual budgets? 	2	
	<ul style="list-style-type: none"> strategy? performance objective, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures? 	4	
	How does the board monitor and oversee progress against goals and targets for addressing climate-related issues?	3	
b) Management's role in assessing and managing climate-related risks and opportunities			
ALL	Does the organization have assigned climate-related responsibilities to management-level positions or committees? If so, how do such management positions or committees report to the board or a committee of the board and do those responsibilities include assessing and/or managing climate-related issues?	4	
ALL	How are managers informed about climate-related issues?	2	
ALL	How do managers monitor climate-related issues?	2	
Strategy			
a) Identification of climate-related risks and opportunities over the short, medium, and long term.			
ALL	How does the organization define short-, medium-, and long-term time horizons? Does this take into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms?	2	

	Does current disclosure answer the question?	Stage	Location of Data
ALL	What specific climate-related issues that could have a material financial impact on the organization have been identified for each time horizon (short, medium, and long term)?	3	
ALL	Is this consistent with climate change policy and positions taken by trade associations of which the organization is a member?	4	
ALL	Is a materiality analysis used to determine which risks and opportunities could have a material financial impact on the organization?	1	
ALL	Is a scenario analysis used to determine which risks and opportunities could have a material financial impact on the organization?	3	
ALL	Are risks and opportunities considered by sector and/or geography?	1	
b) The impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning			
ALL	How do climate-related risks and opportunities impact on businesses and strategy in the following areas: <ul style="list-style-type: none"> ■ Products and services? ■ Supply chain and/or value chain? ■ Adaptation and mitigation activities? ■ Investment in research and development? ■ Operations (including types of operations and location of facilities)? 	4	
ALL	What are the time period(s) used, and how are climate-related risks and opportunities prioritized as inputs into the financial planning process?	3	
Insurance	How do potential impacts of climate-related risks and opportunities influence client, cedent, or broker selection?	3	
Insurance	Are specific climate-related products or competencies under development, such as insurance of green infrastructure, specialty climate-related risk advisory services, and climate-related client engagement?	4	
Asset Owners	How are climate-related risks and opportunities factored into relevant investment strategies?	4	
Asset Managers	How are climate-related risks and opportunities factored into relevant products and investment strategies?	4	
Asset Managers	How might the transition to a lower-carbon economy affect each product or investment strategy?	3	
Non Financial Org's	How are climate-related risks and opportunities integrated into current decision making and future strategy formulation through (where applicable): <ul style="list-style-type: none"> ■ research and development (R&D) and adoption of new technology? ■ existing and committed future activities such as investments, restructuring, write-downs, or impairment of assets? ■ critical planning assumptions around legacy assets, for example, strategies to lower carbon-, energy-, and/or water-intensive operations? ■ how GHG emissions, energy, and water issues, if applicable, are considered in capital planning and allocation; this could include a discussion of major acquisitions and divestments, joint-ventures, and investments in technology, innovation, and new business areas in light of changing climate-related risks and opportunities? ■ the organization's flexibility in positioning/repositioning capital to address emerging climate-related risks and opportunities? 	4	
c) The organization's strategy resilience, taking into consideration different climate-related scenarios, including a 2°C or lower scenario (ideally 1.5°C).			
ALL	Has the organization conducted a scenario analysis that evaluates how resilient their strategies are to climate-related risks and opportunities?	4	
ALL	Does the analysis include a 2°C or lower scenario (ideally 1.5°C)?	4	
ALL	What time horizons are considered in the organization's climate-related scenario analysis?	4	
ALL	How will climate-related risks and opportunities (as listed in table 1 and 2 or the TCFD recommendations) affect the organization's strategies, and how may strategies change to address potential climate-related risks and opportunities?	3	
Insurance	Is a climate-related scenario analysis conducted for underwriting activities? If so, what scenario and what time frame is used?	4	
Asset Owners	How are climate-related scenarios used to inform investments in specific assets?	4	

	Does current disclosure answer the question?	Stage	Location of Data
Non Financial Org's	Where an organization has more than one billion U.S. dollar equivalent (USDE) in annual revenue, is a more robust scenario analysis conducted? This should include assessing the resilience of strategies against a range of climate-related scenarios, including a 2°C or lower scenario and, where relevant to the organization, scenarios consistent with increased physical climate-related risks and the implications of different policy assumptions, macro-economic trends, energy pathways, and technology assumptions used in publicly available climate-related scenarios.	4	
Risk Management			
a) Climate-related risk management processes			
ALL	How does the organization determine the relative significance of climate-related risks in relation to other risks?	1	
ALL	Are existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) considered a risk by the organization?	3	
ALL	How is the potential size and scope of identified climate-related risks determined?	3	
ALL	How does the organization define or classify risk and risk-related terms? (Is a taxonomy used?)	1	
Insurance	How are climate-related risks on re-/insurance portfolios identified and assessed (by geography, business division, or product segments)? Does this assessment include the following: <ul style="list-style-type: none"> ■ physical risks from changing frequencies and intensities of weather-related perils? ■ transition risks resulting from a reduction in insurable interest due to a decline in value, changing energy costs, or implementation of carbon regulation? ■ liability risks that could intensify due to a possible increase in litigation? 	3	
Asset Owner + Managers	What engagement activities are undertaken with investee companies to encourage better disclosure and practices related to climate-related risks to improve data availability and asset owners' ability to assess climate-related risks?	4	
Asset Manager	How are climate-related risks identified and materiality assessed for each product or investment strategy? What resources and tools are used in the process?	3	
Non-Financial Org's	What key metrics related to GHG emissions, energy, water, land use, and, if relevant, investments in climate adaptation and mitigation that address potential financial aspects of shifting demand, expenditures, asset valuation, and cost of financing are used? (Have the illustrative examples in the TCFD Implementation Guide tables 3-6 been taken into consideration?)	4	
b) Managing climate-related risks.			
ALL	How are decisions to mitigate, transfer, accept, or control climate-related risks made?	3	
ALL	How is materiality determined for the risks listed in table 1 of the TCFD recommendations?	3	
Insurance	What key tools or instruments, such as risk models, are used to manage climate-related risks in relation to product development and pricing?	4	
Insurance	What are the range of climate-related events considered and how are the risks generated by the rising propensity and severity of such events managed?	3	
Asset Owner	How is the positioning of the total portfolio considered with respect to the transition to a lower-carbon energy supply, production, and use?	4	
Asset Manager	How are material climate-related risks managed for each product or investment strategy?	4	
c) Processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.			
ALL	How are climate-related risks integrated into their overall risk management?	1	
Metrics and Targets			
a) Metrics used to assess climate-related risks and opportunities in line with its strategy and risk management process			
ALL	What are the key metrics used to measure and manage the climate-related risks and opportunities found in table 1 and 2 of the TCFD recommendations?	3	
ALL	Where climate-related issues are material, are related performance metrics incorporated into remuneration policies?	4	
ALL	What internal carbon prices are used for measuring impact and setting targets?	4	

	Does current disclosure answer the question?	Stage	Location of Data
ALL	What climate-related opportunity metrics such as revenue from products and services designed for a lower-carbon economy are used?	3	
Insurance	What is the aggregated risk exposure to weather-related catastrophes of the organization's property business (i.e., annual aggregated expected losses from weather-related catastrophes) by relevant jurisdiction?	3	
Asset Owner	What metrics are used to assess climate-related risks and opportunities in individual funds or investment strategies, and how do these metrics change over time?	4	
Asset Manager	What metrics are used to assess climate-related risks and opportunities in each product or investment strategy, and how do these metrics change over time?	4	
b) Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.			
ALL	What are the Scope 1 and Scope 2 GHG emissions and, if appropriate, Scope 3 GHG emissions and the related risks of the organization, according to GHG Protocol methodology?	2	
	■ If found to be appropriate, what are the company's Scope 3 emissions?	3	
	■ Are GHG emissions data externally verified?	3	
ALL	What are the historic GHG emissions and trends?	2	
Asset Owner	What is the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund or investment strategy?	4	
Asset Manager	What is the weighted average carbon intensity, where data are available or can be reasonably estimated, for each product or investment strategy?	4	
c) Targets used to manage climate-related risks and opportunities and performance			
ALL	What are the 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?	2	
	■ What are the long-term quantitative targets for reducing GHG emissions?	3	
ALL	Does the organization have climate-related targets pertaining to: ■ efficiency or financial goals? ■ financial loss tolerances? ■ avoided GHG emissions through the entire product life cycle? ■ net revenue goals for products and services designed for a lower-carbon economy?	4	
ALL	Are climate-related targets absolute or intensity based?	2	
ALL	What time frames are applied to each climate-related target?	2	
ALL	What is the base year used for each climate-related target?	2	
ALL	What key performance indicators are used to assess progress against each climate-related target?	4	

Source: SSE initiative, adapted from TCFD recommendations and TPI Management Quality Assessment

ANNEX 2: ALIGNMENT OF RECOMMENDED DISCLOSURES WITH OTHER FRAMEWORKS

Governance Recommended Disclosures		
a. Describe the board's oversight of climate-related risks and opportunities.	EU NFRD	3.2 (Table 2)
	G20/OECD Principles of Corporate Governance	5.a.4, 5.a.9, 6.a, 6.d.1, 6.d.2, 6.d.3, 6.d.4, 6.d.7, 6.e.2, 6.f
	CDP Climate Change Questionnaire 2021	C1.1b
	GRI 102: General Disclosures	102-18, 102-19, 102-20, 102-26, 102-27, 102-29, 102-31, 102-32
	CDSB Climate Change Reporting Framework	4.16, 4.17
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-03
	International Integrated Reporting Framework	3.4, 3.41, 4.8, 4.9
b. Describe management's role in assessing and managing risks and opportunities.	EU NFRD	3.2 (Table 2)
	GRI 102: General Disclosures	102-29, 102-31, 102-32
	CDP Climate Change Questionnaire 2021	C1.2, C1.2a
	CDSB Climate Change Reporting Framework	2.8, 2.9, 4.12, 4.13, 4.16, 4.17
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-03
Strategy Recommended Disclosures		
a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	EU NFRD	3.4 (Table 4)
	G20/OECD Principles of Corporate Governance	5.a.7, 5.a.8
	CDP Climate Change Questionnaire 2021	C2.1a, C2.3, C2.4, C2.4a
	CDSB Climate Change Reporting Framework	4.6, 4.9, 4.10, 4.11, 4.14
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-02, REQ-06
	GRI 102: General Disclosures	102-15
	International Integrated Reporting Framework	3.5, 3.17, 4.6, 4.7, 4.23, 4.24, 4.25, 4.26
b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	EU NFRD	3.1 (Table 1)
	G20/OECD Principles of Corporate Governance	5.a.2, 5.a.7, 5.a.8
	CDP Climate Change Questionnaire 2021	C2.3a, C2.4a, C3.1, C3.2a, C3.3, C3.4, C3.4a, C-FS3.7, C-FS3.7a,
	GRI 201: Economic Performance	201-2
	CDSB Climate Change Reporting Framework	2.8, 2.9, 2.10, 4.6, 4.7, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-02, REQ-06
	International Integrated Reporting Framework	3.3, 3.5, 3.39, 4.12, 4.23, 4.28, 4.29, 4.34, 4.35, 4.37
c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	EU NFRD	3.1 (Table 1)
	CDP Climate Change Questionnaire 2021	C3.2, C3.2a
	CDSB Climate Change Reporting Framework	4.7

Governance Recommended Disclosures		
Risk Management Recommended Disclosures		
a. Describe the organization's processes for identifying and assessing climate-related risks.	EU NFRD	3.4 (Table 4)
	G20/OECD Principles of Corporate Governance	5.a.2, 5.a.7
	CDP Climate Change Questionnaire 2021	C2.1, C2.2, C2.2a, CFS2.2b, C-FS2.2c, C-FS2.2f
	GRI 201: Economic Performance	201-2
	CDSB Climate Change Reporting Framework	4.6, 4.7, 4.8, 4.9, 4.11
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-02, REQ-03
b. Describe the organization's processes for managing climate-related risks.	EU NFRD	3.4 (Table 4)
	G20/OECD Principles of Corporate Governance	5.a.2, 5.a.7
	CDP Climate Change Questionnaire 2021	C2.1, C2.2, CFS2.2f
	CDSB Climate Change Reporting Framework	4.12, 4.13, 4.16, 4.17
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-02, REQ-03
	International Integrated Reporting Framework	4.23, 4.24, 4.25, 4.26, 4.40, 4.41, 4.42
c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	EU NFRD	3.4 (Table 4)
	G20/OECD Principles of Corporate Governance	5.a.2, 5.a.7 6.d.1, 6.f
	CDP Climate Change Questionnaire 2021	C2.1, C2.2
	CDSB Climate Change Reporting Framework	4.6, 4.7
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-02, REQ-03, REQ-06
	International Integrated Reporting Framework	2.7, 2.8, 2.9
Metrics and Targets Recommended Disclosures		
a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	EU NFRD	3.5
	G20/OECD Principles Of Corporate Governance	6.d.1, 6.d.7
	CDP Climate Change Questionnaire 2021	C4.2, C4.2a, C4.2b, C9.1
	GRI 102: General Disclosures	102-30
	CDSB Climate Change Reporting Framework	2.36, 2.37, 2.38, 4.14, 4.15
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01, REQ-04, REQ-05, REQ-06
b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	EU NFRD	3.3 (Table 3)
	CDP Climate Change Questionnaire 2021	C6.1, C6.3, C6.5, C-FS14.1, C-FS14.1a, C-FS14.1b, C-FS14.1c
	GRI 102: General Disclosures	102-29, 102-30
	GRI 201: Economic Performance	201-2

Governance Recommended Disclosures		
b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. <i>Continued</i>	CDSB Climate Change Reporting Framework	4.19.1, 4.19.2, 4.29, 4.30, 4.31, 4.32, 4.33
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-04, REQ-05
c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	EU NFRD	3.3 (Table 3)
	CDP Climate Change Questionnaire 2021	
	C4.1, C4.1a, C4.1b, C4.2, C4.2a, C4.2b,	
	CDSB Climate Change Reporting Framework	4.12, 4.13, 4.14, 4.15
	CDSB Framework for Reporting Environmental Information & Natural Capital	REQ-01
	International Integrated Reporting Framework	4.53, 4.60, 4.61, 4.62

Source: SSE initiative, compiled from [TCFD Hub](#), [CDP](#) and the [European Commission](#)

ANNEX 3: SUSTAINABILITY REPORTING FRAMEWORKS

CDP

CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. The world's economy looks to CDP as the gold standard of environmental reporting with the richest and most comprehensive dataset on corporate and city action. CDP runs the global environmental disclosure system. Each year CDP supports thousands of companies, cities, states and regions to measure and manage their risks and opportunities on climate change, water security and deforestation. They do so at the request of their investors, purchasers and city stakeholders.

Reporting to CDP offers competitive advantage and can keep a company ahead of changes to regulation and policy, help you identify and tackle growing risks, and find new opportunities for action that your investors and customers around the world demand. Additionally, CDP helps companies publicly commit to take meaningful action and set ambitious targets to tackle climate change and transition to the low-carbon economy through renewable energy use, science-based targets, carbon pricing and more.

CLIMATE DISCLOSURE STANDARDS BOARD (CDSB)

CDSB is an international consortium of business and environmental NGOs. Jointly, they are committed to advancing and aligning the global mainstream corporate reporting model to equate natural capital with financial capital. CDSB does this by offering companies a framework for reporting environmental information with the same rigour as financial information. In turn this helps them to provide investors with decision-useful environmental information via the mainstream corporate report, enhancing the efficient allocation of capital. Regulators also benefit from compliance-ready materials. Recognising that information about natural capital and financial capital is equally essential for an understanding of corporate performance, CDSB's work builds the trust and transparency needed to foster resilient capital markets. Collectively, they aim to contribute to more sustainable economic, social and environmental systems.

CDSB has developed a framework for reporting environmental and climate change information in mainstream corporate reports, such as the annual report or the Form 10-K. It allows investors to assess the relationship between specific environmental matters and the organization's strategy, performance and prospects. To disclose environmental and natural capital information and to deliver on the TCFD recommendations, use the CDSB Framework for reporting environmental and climate change information.

Global Reporting Initiative (GRI)

GRI (Global Reporting Initiative) is the independent, international organization that helps businesses and other organizations take responsibility for their impacts, by providing them with the global common language to communicate those impacts. GRI provides the widely used standards for sustainability reporting – the GRI Standards. The organization works with businesses, investors, policymakers, civil society, labor organizations and other experts to develop the GRI Standards and promote their use by organizations around the world. With thousands of reporters in more than 100 countries, the Standards are advancing the practice of sustainability reporting, and enabling organizations and their stakeholders to take action and make better decisions that create economic, environmental and social benefits for everyone.

The GRI Standards create a common language for organizations – large or small, private or public – to report on their sustainability impacts in a consistent and credible way. This enhances global comparability and enables organizations to be transparent and accountable. The Standards help organizations understand and disclose their impacts in a way that meets the needs of multiple stakeholders. In addition to reporting companies, the Standards are highly relevant to many other groups, including investors, policymakers, capital markets, and civil society. The Standards are designed as an easy-to-use modular set, starting with the universal Standards. Topic Standards are then selected, based on the organization's material topics – economic, environmental or social. This process ensures that the sustainability report provides an inclusive picture of material topics, their related impacts, and how they are managed.

INTERNATIONAL INTEGRATED REPORTING COUNCIL (IIRC)

The International Integrated Reporting Council (IIRC) is a global coalition of regulators, investors, companies, standard setters, the accounting profession, academia and NGOs. The coalition promotes communication about value creation as the next step in the evolution of corporate reporting. The International Integrated Reporting Framework (<IR> Framework) is used to accelerate the adoption of integrated reporting across the world.

Integrated reporting applies principles and concepts that are focused on bringing greater cohesion and efficiency to the reporting process, and adopting 'integrated thinking' as a way of breaking down internal silos and reducing duplication. It improves the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital. Its focus on value creation, and the capitals used by the business to create value over time, contributes towards a more financially stable global economy. The <IR> Framework was released following extensive consultation and testing by businesses and investors in all regions of the world, including the 140 businesses and investors from 26 countries that participated in the IIRC Pilot Programme. The purpose of the Framework is to establish Guiding Principles and Content Elements that govern the overall content of an integrated report, and to explain the fundamental concepts that underpin them.

Sustainability Accounting Standards Board (SASB)

SASB Standards enable businesses around the world to identify, manage and communicate financially-material sustainability information to their investors. SASB has developed a complete set of 77 industry standards. In November 2018, SASB published these standards, providing a complete set of globally applicable industry-specific standards which identify the minimal set of financially material sustainability topics and their associated metrics for the typical company in an industry.

These standards are explained graphically through SASB's Materiality Map, are available for individual sector download and may be viewed through SASB's complete Standards Navigator database. SASB staff and Standards Board followed a rigorous due process outlined by the Conceptual Framework and Rules of Procedure to develop these standards, which are designed to be cost-effective for companies to implement and decision-useful to both companies and investors.

SASB provides an Engagement Guide for investors to consider questions to discuss with companies regarding financially material issues as well as an Implementation Guide (update in early 2019) for companies which explains issues and approaches to consider when implementing SASB standards.

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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China	Shenzhen Stock Exchange	Fiona Wan
China	Shenzhen Stock Exchange	Ye SUN
China	Shenzhen Stock Exchange	Chen Bin
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China, Hong Kong	HKEX	Vivian Woo
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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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