INSTITUTE OF SINGAPORE CHARTERED ACCOUNTANTS

ISCA Climate Disclosure Guide

Taking First Steps Towards Climate-related Disclosures

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Global Mindset, Asian Insights

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ISCA is the Designated Entity to confer the Chartered Accountant of Singapore – CA (Singapore) – designation.

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About ISCA's Sustainability and Climate Change Committee

ISCA's Sustainability and Climate Change Committee (SCCC) comprises individuals with significant experience and subject matter expertise in sustainability-related matters.

The SCCC promotes the relevance of sustainability, climate change and related advances to business strategy and the accountant's role in advancing these agenda. It also furthers the adoption of quality sustainability reporting and advocates Singapore's interests in relation to sustainability reporting standards and requirements. These are executed with the support of three sub-committees – the Sustainability Reporting Quality Sub-Committee; Sustainability Excellence Sub-Committee; and Education Sub-Committee.

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Foreword

Recent events have reaffirmed the urgent demand for consistent and comparable climate reporting. Among other crucial developments, the IFRS Foundation Trustees and Singapore Exchange (SGX) held robust public consultations about their plans regarding sustainability reporting in 2020 and 2021, respectively. These consultations led to the prioritisation of climate-related disclosures in the International Sustainability Standards Board's (ISSB) IFRS Sustainability Disclosure Standards and the introduction of mandatory climate reporting by SGX. Central to the plans of both the ISSB and the SGX is the adoption of the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD or TCFD Recommendations) which had already been gaining global traction.

This guide seeks to help Singapore listed companies meet SGX's listing rules for climate reporting. However, in the face of strong signals from key stakeholder groups, even non-listed companies must consider if sufficient climate-related information is available to meet stakeholder expectations, and this guide will be useful for voluntary adoption of the TCFD Recommendations as well.

As the Chinese proverb goes, a journey of a thousand miles begins with a single step. Meaningful climate-related disclosures, such as those highlighted within this publication, are not populated overnight. On the contrary, they are the result of a constant iterative process of continual reflection and refinement born out of a commitment to address climate-related risks and opportunities in the strategy, operations and reporting of the organisation.

Organisations will find that just by implementing the TCFD Recommendations, significant direction is provided to approach climate reporting. As the pillars of the TCFD Recommendations spread across the core elements of how organisations operate, new adopters gain clarity over how to build on existing components and work towards components that they are currently lacking.

To provide practical guidance on how to adopt the TCFD Recommendations, the guide features exemplary disclosures sourced from local forerunners and global exponents that illustrate how the various recommended disclosures can be met, in the process helping new adopters to visualise and plan their own disclosures. When using the guide to develop their own disclosures, adopters must tailor the disclosure examples included within to the context and circumstances unique to their organisations.

The disclosures highlighted within this guide may appear intimidating or even unattainable to companies just embarking on the journey. The guide hopes to assuage possible doubts by sharing the learning experiences of advanced adopters, which demonstrate how the current state of their reporting was reached only after years of progress. Practical considerations gleaned from their learning experiences and other observations are given to further smoothen the journey for new adopters.

We hope this guide helps new adopters take the first step on the journey of climate reporting with confidence. As the name of the guide implies, the journey does not stop here. As adopters mature in their reporting, they could next look to ways to provide even more decision-useful information, for example by developing more industry-specific disclosures or conducting climate scenario analyses. Furthermore, it could be an opportunity for accountants to play a larger role in developing climate-related disclosures. ISCA will continue to support the ecosystem by providing relevant guidance and good practices for these topics, among other relevant initiatives.

The guide was developed with the support of SGX, ISCA's Sustainability and Climate Change Committee (SCCC) and SCCC Sustainability Excellence Sub-Committee. We would like to extend our deepest thanks and gratitude to everyone who has contributed to this publication.

We hope you find this useful as a foundational reference and wish you a fruitful journey in this urgent but new and exciting area.

Tan Wah Yeow

Chairman, SCCC

Fang Eu-Lin

Chairperson, Sustainability Excellence Sub-Committee under the SCCC

Partner and Sustainability & Climate Change Practice Leader, PwC Singapore

Acknowledgements by MAS GFIT Workstream 2

The Monetary Authority of Singapore (**MAS**) Financial Centre Advisory Panel (**FCAP**) established a Green Finance Industry Taskforce (**GFIT**) with three objectives:

(1) to formulate and implement recommendations that would establish Singapore as a premier green finance hub;
(2) to develop and share best practices and cultivate capabilities to develop the green finance ecosystem in Singapore; and
(3) to build a thriving community of green finance experts in Singapore.

In May 2021, GFIT released the Financial Institutions Climate-related Disclosure Document (FCDD) to provide a dedicated reference on climate reporting for financial institutions. Since then, more focus on climate information has emerged. Companies listed on SGX are now required to include climate disclosures in their sustainability reports.

Climate reporting is not simply a box checking exercise. The impact of climate change must be considered carefully for it has impact on the company's ability to operate in the long run, including its ability to attract new businesses and to raise capital.

Many companies beyond financial institutions are starting to appreciate the importance of climate change to their business and are considering it as part of their overall risk management strategy.

We also recognise that climate reporting is a new area for many companies. There is hence a whole-of-market effort to upskill companies at all levels, from the board of directors, senior management, and preparers of such reports. The guide by ISCA is one example of such efforts by professional bodies to upskill their members. Companies and market professionals alike should make full use of these resources to take the quality of their disclosures to the next level.

On behalf of GFIT, we thank ISCA for its efforts in publishing this guide.

Helge Muenkel

Chief Sustainability Officer
DBS Bank Ltd

Michael Tang

Head, Listing Policy & Product Admission
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Why climate-related disclosures are important

"Climate risks are of increasing concern to all of us. Climate-related disclosures allow companies to account to their customers, investors, employees and other stakeholders their commitment to climate action. Companies should disclose their efforts in sustainability to assure their stakeholders."

— Ms Grace Fu, Minister for Sustainability and the Environment

"TCFD Recommendations are for and about enterprise value which is important to every stakeholder. I trust the ISCA Climate Disclosure Guide will give all stakeholders, led by their accountants, confidence to hit the ground running in the Race to Net Zero."

— Ms Yeo Lian Sim, Vice Chair of TCFD

Climate change as an existential threat to Singapore

Climate change has been recognised an existential threat to Singapore. At the National Day Rally in August 2019, Prime Minister Lee Hsien Loong shared, among other pertinent matters, how Singapore is facing increasing threat from rising sea levels which would necessitate added protections for buildings and developments in Singapore.

To meet this challenge, Singapore Green Plan 2030, spearheaded by five ministries and launched in 2020, coordinates a whole-of-nation movement to advance Singapore's national agenda on sustainable development. It charts targets over the next ten years that would strengthen national commitments and position Singapore to achieve long-term net zero emissions aspiration as soon as viable. For example, it was announced at Budget 2022 that Singapore will strive to achieve net zero emissions by or around mid-century.

Of particular interest to businesses would be programmes outlined under the Green Economy pillar to help them capitalise on growing markets and/or sources of capital arising from the global push for climate change mitigation. The Singapore Green Plan 2030 also shares how organisations can take the step now to contribute to Singapore's efforts in this area.

Climate change and climate-related risks

Scientists have confirmed that climate change has become a pressing reality and in large parts on account of human activity. We are currently at a 1.1°C increase in average global temperature from pre-industrial levels[1]. This "global warming" has already caused climate-related extreme events to occur with increasing frequency and increasing intensity. Droughts, extreme heat and record floods already threaten to unfold mass uncontrolled migration, food security and livelihoods for millions of people.

In Singapore, the National Climate Change Secretariat has highlighted how the potential adverse impacts of climate change can affect water resources, biodiversity and greenery, public health, urban heat, food security and sea level rise, which poses some of the most immediate threats to Singapore[2].

Climate-related risks refers to the potential negative impacts of climate change on an organization. The major categories of climate-related risks are physical and transition risks.

Physical and transition risks

Physical risks are risks related to physical impacts of climate change. Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events such as hurricanes or flood. Chronic physical risks refer to longer-term shifts in climate patterns such as increasing temperature or rising sea levels. Physical risks may result in impact such as damage to physical assets, limitation on resource availability and disruptions to operations, transportation and supply chain.

At present, there are a few possible temperature increase scenarios that could play out, depending on how much and how fast we decarbonise. The Intergovernmental Panel on Climate Change (IPCC), the foremost global scientific authority on climate change, has said that in order to keep to a +1.5°C world, man-made global net carbon dioxide (CO_2) emissions would need to fall by about 45 percent by 2030 from 2010 levels and reach "net zero" by mid-century[6]. Any additional emissions would require removing CO_2 from the air. A +1.5°C target is important as beyond that, we will see increased frequency and severity of climate change catastrophes and longer-term shifts in climate patterns that may lead to sea level rise or chronic heatwaves/ droughts taking place in several countries, and the physical risks of climate change at +1.5°C and beyond can be exacerbated. According to a recent release by IPCC in February 2022, these weather extremes are occurring simultaneously, causing cascading impacts that are increasingly difficult to manage. They have exposed millions of people to acute food and water insecurity, especially in Africa, Asia, Central and South America, on Small Islands and in the Arctic[3].

[1] IPCC Special Report: Global Warming of 1.5°C - https://www.ipcc.ch/sr15/chapter/chapter-1/
[2] https://www.nccs.gov.sg/singapores-climate-action/impact-of-climate-change-in-singapore/
[3] https://www.ipcc.ch/report/ar6/wg2/resources/press/press-release/

It is even conjectured that such change may become irreversible leading to the potential extinction of life on Earth, as we know it now.

Transition risks are risks related to the transition to a lower-carbon economy. Transition risks can include policy and legal risks, technology risk, market risk and reputation risk. Reputation risk can lead to damage to brand value. When moving towards a green economy, there may be various implications such as an increase in compliance costs, costs to invest in new technologies, impairment of existing assets arising from changes in business model or technology.

There may also be liability risk, for example, due to breach of fiduciary duty or failure to implement carbon reduction commitments. Litigation risks may arise from parties seeking compensation for damage or loss incurred as a result of the effects of climate change.

Given the existential nature of climate change, many countries and companies have started to make strong commitments, including at global platforms such as the Conference of Parties (COP). As we transition to a low carbon economy, we are already seeing strong action being taken through actions such as moving away from high CO_2 emitting industries like cement and coal, and control levers being used such as emission trading schemes and carbon taxes (classified as "transition risks" for companies). More recently, as announced by Singapore Minister for Finance at Budget 2022, Singapore will be ratcheting up its carbon taxes from current $5 per tonne CO_2 to $50-80 per tonne CO_2 by 2030[4].

Thus, physical risks and transition risks arising from climate change can have a significant bearing on the risks and opportunities for an organisation.

Strong interest from regulators, investors and other stakeholders

SGX recognises that securities exchanges can enhance transparency and accountability on sustainability issues, facilitate the integration by market participants of sustainability issues into the pricing and allocation of capital and thereby contribute towards long-term resilient and sustainable investment. Investors have expanded their focus beyond corporate governance to financially material environmental, social and governance (ESG) factors in their investment decision-making process, which includes understanding and evaluating climate risks in the portfolios. Climate risks are viewed by many investors as systemic risks which cannot be diversified and also perceived as a cross-cutting risk which may impact various risks such as credit, market, liquidity, operational and reputational risks. This would explain the increasing push from investors (and regulators) for climate-related disclosures. Investors, lenders, and insurance underwriters have begun seeking/ demanding adequate information on how companies are preparing for a lower-carbon

[4] https://www.nccs.gov.sg/singapores-climate-action/carbon-tax/

economy and therefore more effective, clear, and consistent climate-related disclosure is needed from companies.

Benefits of climate-related disclosures

Preparers, users and those interviewed during the compilation of this document shared what they saw as benefits from climate-related disclosures, and they include but are not limited to:

- **Better understanding of climate risks and opportunities** – This in turn informs better organisational risk management and strategic planning. For example, understanding potential physical risks that might impact hotel operations in a certain region can inform management to invest in adaptation and resilience measures against potential physical risks.

- **Better access to capital through increasing investor/lender confidence that climate risk is well understood and managed by the organisation** – For example, investors and lenders often request for ESG related information including climate-related information in their due diligence and assessment.

- **Addressing investor demand for such disclosure** – This shows pro-activeness in addressing climate-related risks and disclosing it through a credible and well-recognised frameworks such as the TCFD. In PwC's 2021 Global Investor Survey[5], 76% of investors interviewed consider a company's exposure to ESG risks and opportunities when screening potential investment opportunities.

- **Better understanding and assessment of climate risks and opportunities for financial accounting** – This could inform the assessment of the impact of climate-related matters on the recognition, measurement and disclosure and valuation of items in the financial statements. For example, climate-related matters may potentially result in impairment or write-off of existing assets or may affect the fair value measurement of assets and liabilities in the financial statements.

[5] PwC's Global Investor Survey, December 2021

SGX requirements on climate-related disclosures

Climate reporting requirements for SGX listed companies

Singapore Exchange ("**SGX**") introduced sustainability reporting for listed companies in 2016. In 2021, SGX enhanced the reporting regime by unveiling its roadmap for issuers to provide climate-related disclosures based on recommendations of the Task Force on Climate-related Financial Disclosures ("**TCFD**"), in its response to the feedback received on its public consultation entitled *"Climate and Diversity: The Way Forward"*. The roadmap is aimed at helping issuers better address the increasing demand for climate-related information from stakeholders such as investors and financial institutions, as well as to help to future-proof their businesses and build business resilience by anticipating potential climate-related issues.

Under the roadmap, climate-related disclosures consistent with the recommendations of the TCFD has been added as a new primary component for issuers' sustainability reports for the financial year commencing on or after 1 January 2022.

This is in addition to the other primary components of the sustainability report, namely: (a) material environmental, social and governance factors; (b) policies, practices and performance; (c) targets; (d) sustainability reporting framework; and (e) Board statement and associated governance structure for sustainability practices. [6]

If the issuer excludes any primary component, it must disclose such exclusion and describe what it does instead, with reasons for doing so[7] (i.e. on a 'comply or explain' basis).

For certain industry sectors that are more susceptible to climate risks as identified by the TCFD (the "**TCFD-identified Industries**"), climate-related disclosures will be progressively made mandatory. This implementation roadmap is set out in the table below[8]:

For Financial Year Commencing	Baseline Reporting Practice	Earliest Calendar Year in which Report will be Published
1 January 2022	Climate reporting is on a *'comply or explain'* basis for all issuers.	2023

[6] See Mainboard Rule 711B(1)/ Catalist Rule 711B(1).
[7] See Mainboard Rule 711B(2)/ Catalist Rule 711B(2).
[8] The roadmap is also set out in the Sustainability Reporting Guide of the SGX-ST Listing Manual.

For Financial Year Commencing	Baseline Reporting Practice	Earliest Calendar Year in which Report will be Published
1 January 2023	Climate reporting is *mandatory* for issuers in 3 out of the 5 **TCFD-identified Industries**[9], namely: • financial; • agriculture, food and forest products; and • energy. Climate reporting is on a *'comply or explain'* basis for all other issuers.	2024
1 January 2024	Climate reporting is on a *mandatory* basis for all 5 **TCFD-identified Industries**, namely: • financial; • agriculture, food and forest products; • energy; • materials and buildings; and • transportation. Climate reporting is on a *'comply or explain'* basis for all other issuers.	2025

SGX recognises that climate reporting is a journey for many issuers, and will take time to mature in quality and depth. In this regard, issuers may progressively adopt certain practices of the TCFD recommendations. Issuers may consider adopting the phased approach over a three-year period as set out in the Sustainability Reporting Guide of the SGX-ST Listing Manual[10]. **However, issuers prioritised for mandatory climate reporting should note that they may need to adopt the TCFD recommendations fully in two years instead of the suggested three years in the Sustainability Reporting Guide.**

With the roadmap for mandating climate reporting, it is hoped that issuers will be better prepared for reporting against the anticipated international climate reporting standard by the International Sustainability Standards Board, which will build on the TCFD recommendations.

[9] The TCFD-identified Industries refer to those industries identified by TCFD as most affected by climate change and the transition to a lower-carbon economy. Accordingly, these industries are prioritised to provide mandatory climate-related disclosures, consistent with the TCFD recommendations.
[10] See Mainboard Rules Practice Note 7.6/ Catalist Rules Practice Note 7F.

Internal reviews and external assurance over sustainability reporting

SGX also recognises the importance of internal reviews and external assurance in enhancing stakeholder confidence in the accuracy and reliability of the sustainability information disclosed, including climate-related disclosures. As such, issuers are required to minimally subject the sustainability reporting process to internal review by the internal audit function. An internal review of the sustainability reporting process builds on the issuer's existing governance structure, buttressed by adequate and effective internal controls and risk management systems. The identified processes relating to sustainability reporting should be incorporated into the internal audit plan, which should cover key aspects of the sustainability report. The review may take place over an audit cycle, which may span one or a few years in accordance with risk-based planning, as approved by the Audit Committee.

Issuers whose sustainability reporting has already matured after several annual exercises are strongly encouraged to undertake external assurance by independent professional bodies to add credibility to the information disclosed and analysis undertaken. Issuers are encouraged to consider independent external assurance on selected important aspects of their sustainability reports even in their initial years, expanding coverage in succeeding years.

"Climate change has become a real business risk for companies as well as their lenders and insurers. Investors are also paying close attention to how companies tackle carbon regulations and comply with other relevant requirements. SGX is working with and encouraging the market community to help companies on this journey. The ISCA foundational guide on climate reporting is one such effort which all preparers of climate disclosures, including accountants, should find useful."

— Mr Tan Boon Gin, CEO of SGX RegCo

"The move by SGX to mandate climate-related disclosures for listed companies is a clear signal to provide investors with useful climate information to make informed decisions. With increasing attention on climate-related issues and their financial impact, Chartered Accountants (CA) must seize the opportunity to champion and play a leading role in enabling positive climate action and reporting in their companies. ISCA is committed to helping the profession and this guide will be a useful reference for climate disclosures."

— Ms Fann Kor, CEO of ISCA

State of adoption of the TCFD Recommendations

Strong global adoption of the TCFD across jurisdictions

The TCFD was established in 2015 by the Financial Stability Board. Its goal is to develop recommendations for more effective climate-related disclosures that could promote more informed investment, credit, and insurance underwriting decisions and, in turn, enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks. The Task Force consists of 31 members[11] from across the G20, representing both preparers and users of financial disclosures. In 2017, the TCFD released climate-related financial disclosure recommendations designed to help companies provide better information to support informed capital allocation.

We list down the salient developments in global adoption of the TCFD (as of March 2022):

Global regulatory developments

- **The G7** made an announcement in June 2021[12] **to mandate climate risk reporting** in line with the TCFD framework recommendations.

- **The G20 finance ministers** and central bank governors will work towards a "baseline global reporting standard" for climate and biodiversity-related financial disclosures. July 2021 saw a **statement of the G20's Support of TCFD Framework**[13].

- **The International Sustainability Standards Board (ISSB)** Technical Readiness Working Group (TRWG) have said they are **proposing that all standards are based on TCFD 4 pillar framework**. On 31 March 2022, ISSB launched a consultation on its first two proposed standards, one setting out general sustainability-related disclosure requirements and the other specifies climate-related disclosure requirements. The proposals build upon the recommendations of TCFD[14].

Other regulatory developments (by territories)

- **The UK has already mandated TCFD reporting**[15] for premium listed companies on a 'comply or explain' basis from 1 January 2021. With all other listed, financial services firms and large private businesses taking effect from 2022.

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[11] Task Force on Climate-Related Financial Disclosures, April 2022
[12] Michael R. Bloomberg, June 2021
[13] Michael R. Bloomberg, July 2021
[14] IFRS Foundation, March 2022
[15] Financial Conduct Authority, December 2021

- On 21 March 2022, the **United States Securities and Exchange Commission released its proposal climate-related disclosure requirements**[16]. The proposed rules would, for the first time, require public companies, including banks, to disclose their greenhouse gas (GHG) emissions as well as the climate-related risks they face and how they manage those risks.

- **Other territories that already have or are in the process of setting TCFD-aligned official reporting requirements** include Australia[17], Brazil[18], Hong Kong[19] Japan[20], New Zealand[21], Switzerland[22], Taiwan[23], and the EU[24], where the EC noted that reporting standards under the Corporate Sustainability Reporting Directive should take into account existing frameworks, including the TCFD.

Strong global support from global, regional and local organisations for the TCFD

The TCFD has garnered strong support from over 3,000 organisations across 93 jurisdictions. In Singapore, supporters include CapitaLand, City Developments Limited, DBS, Everstone Group, Frasers Property Limited, Fullerton Fund Management, GIC, Greenview, Keppel Corporation, Monetary Authority of Singapore, OCBC Bank, Olam International Limited, Sembcorp Industries, Singapore Exchange Limited, Singtel, Temasek, Tsao Family Office, UOB, Vena Energy.

Around the region in Asia, examples include ICBC, Bank of Communications, CLP Holdings, Tata Steel, Mitsubishi Corporation, Sumitomo Corporation, Hitachi, Toyota Motor Corporation, CIMB, Samsung, First Financial Holding and many others.

The largest companies globally have also supported and embarked on their TCFD journey. These include Google, Amazon, Taiwan Semiconductor Manufacturing Company, Ltd., JPMorgan Chase, Walmart, Nestlé, Bank of America, Mastercard, BHP, Coca-Cola and many others.

[16] U.S. Securities and Exchange Commission, March 2022
[17] Australian Prudential Regulation Authority, November 2021
[18] The Banco Central, September 2021
[19] Hong Kong Monetary Authority, July 2021
[20] Financial Services Agency, April 2021
[21] Ministry for the Environment, December 2021
[22] The Federal Council, August 2021
[23] Financial Supervisory Commission Republic of China, December 2021
[24] European Commission, June 2019

Salient points from the TCFD Recommendations

The TCFD recommendations are designed to help companies provide better information to support informed capital allocation. The full TCFD Recommendations may be found in the *Final Report on the Recommendations of the Task Force on Climate-related Financial Disclosures* issued in June 2017. Salient points for the implementation of TCFD Recommendations are set out below.

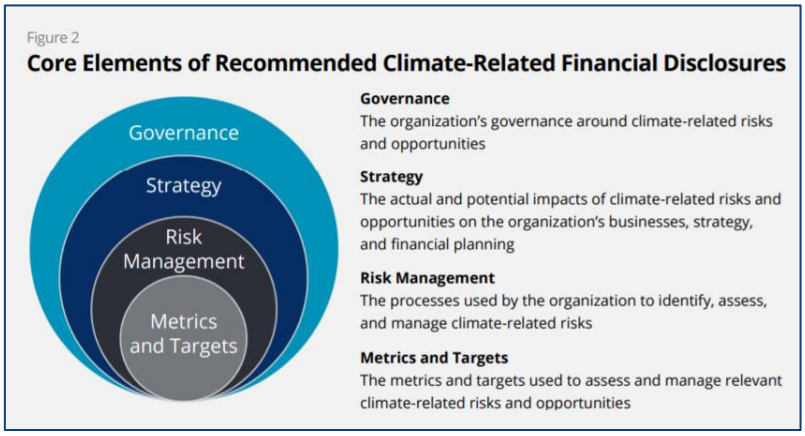
Climate-related risks, opportunities and its financial impact

In order to make more informed financial decisions, investors, lenders, and insurance underwriters need to understand how climate-related risks and opportunities are likely to impact an organisation's future financial position as reflected in its income statement, cash flow statement and balance sheet. This will help to inform the capital allocation with information on the potential impact arising from climate change. Refer to 'Climate-related risks, opportunities, and financial impact' in Appendix A for more information.

The financial impacts of climate-related issues on an organisation are driven by the specific climate-related risks and opportunities to which the organisation is exposed to and its strategic and risk management decisions on seizing those opportunities and managing those risks. Once an organisation assesses its climate-related issues and determines its responses to those issues, it can then consider actual and potential financial impacts on revenues, expenditures, assets and liabilities, and capital and financing. Refer to Appendix A for some examples of climate-related risks and opportunities and their potential financial implications provided by TCFD.

TCFD Recommendations

The recommendations are structured around four thematic areas that represent core elements of how organisations operate: governance, strategy, risk management, and metrics and targets.



Source: *Final Report on the Recommendations of the Task Force on Climate-related Financial Disclosures*

The four overarching recommendations are supported by recommended disclosures that build out the framework with information that will help investors and others understand how reporting organisations think about and assess climate-related risks and opportunities.

Figure 4

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: *Final Report on the Recommendations of the Task Force on Climate-related Financial Disclosures*

Scenario analysis

The TCFD recommends that organisations describe the resilience of their strategy, taking into consideration different climate-related scenarios, including a +2°C or lower scenario, where such information is material.

Scenario analysis is a process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty. Scenarios are hypothetical constructs and not designed to deliver precise outcomes or forecasts. Instead, scenarios provide a way for organisations to consider how the future might look if certain trends continue or certain conditions are met.

Additional guidance

In October 2021, the TCFD issued the following guidance:

Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (supersedes the 2017 version)

Guidance to support all organisations in developing climate-related financial disclosures consistent with the recommendations and recommended disclosures as well as supplemental guidance for specific sectors.

Guidance on Metrics, Targets, and Transition Plans

A set of cross-industry, climate-related metric categories that the Task Force believes all organisations can disclose.

The Publications page on the TCFD website provides additional supporting guidance and other materials.

Other useful resources

There are many useful resources available to help companies on their TCFD reporting journey. Links to some of these resources have been collated in this section, including links to the latest updates on TCFD, TCFD overviews and recommended disclosures, case studies, useful tools and online courses.

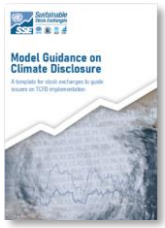
Guidances

Publications by the TCFD

- Latest updates on TCFD
- TCFD overview and recommendations
- Implementation guidelines
- Guidance on scenario analysis

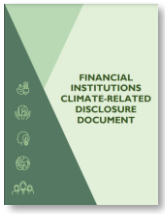
TCFD Knowledge Hub

- TCFD recommendations and recommended disclosures
- Case studies and guidance
- Useful tools and online courses



Model Guidance on Climate Disclosure by the Sustainable Stock Exchanges initiative

- Guidance for stock exchanges on TCFD disclosures
- Template guides and diagnostic checklist for stock exchanges in developing guidance for issuers



Financial Institutions Climate-Related Disclosure Document by the Monetary Authority of Singapore's Green Finance Industry Taskforce

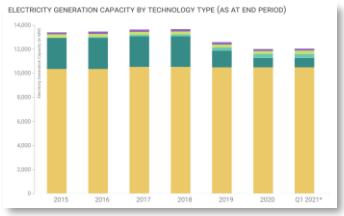
- Highlights leading environmental disclosures practices to serve as references

TCFD Good Practice Handbook by the Climate Disclosure Standards Board, Sustainability Accounting Standards Board and We Mean Business Coalition

- Highlights examples of good practices in TCFD disclosures

Emission factors data sets (examples)

[GHG Protocol Emission Factors] that cover the direct emissions from fuel use. The preparers should ensure to source emission factors that would be most appropriate for their country, as well as their industry

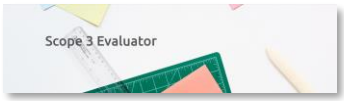


National agencies for country grid emission factors, such as [EMA for Singapore] and [National Government Department of Industry, Science, Energy and Resources for Australia]

National data sets that cover wide range of emission factors, including Scope 3 categories, such as those from [DEFRA, UK Government.] Preparers should aim to use the emission factors and sources most appropriate to their country and industry

Other sources that consolidate grid emission factors e.g. [IGES]

Analytics tools (examples)

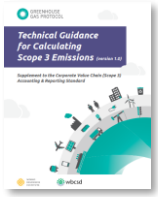


[Scope 3 Evaluator] used to assist companies in identifying their sources of Scope 3 emissions

GHG Protocol-recommended third party [Life Cycle Databases]

[GHG Emissions Calculation Tool] (beta version)

Methodology guidance (examples)



[Scope 3 Calculation Guidance]

Practical considerations to implement the TCFD Recommendations

In this section, we share reflections from our interviewees and other practical considerations from their experience in implementing and disclosing based on TCFD.

Salient reflections from our interviewees

Based on the interviews listed on pages 24 to 31, the interviewees shared the following overarching reflections on TCFD, having had some years of experience in TCFD reporting.

Relevant information useful for the reporting entity and investors

The TCFD framework discloses information which helps **inform capital allocation** for investors and investments into adaptation initiatives for the reporting entity. The framework is also structured and comprehensive, and when used across companies, will help with **comparability of climate-related information**.

Typically, financial statements are historical. The TCFD provides for disclosures that are **forward-looking** and gives the reader an understanding of the risks and opportunities that may manifest in future timelines in selected scenarios.

While not straightforward, it is a useful way of **quantifying and communicating financial impacts** arising from climate change, and with quantification and numbers, more action, whether to inform strategic decisions or investments required, can be garnered.

"Not starting from scratch"

The sustainability reporting regime implemented by SGX was useful in having a foundation to venture further into climate-related disclosure reporting, as organisations **will not be "starting from scratch"**. For example, many organisations may have climate-related risks as part of their material ESG topics and may also have already started to disclose climate-related metrics such as Scope 1, 2 and 3 emissions[25].

In addition, there is now more information and experience locally, regionally and globally to leverage, to deploy a good start of an organisation's TCFD reporting.

Useful mindsets to adopt

All the interviewees and other literature focused on the **importance of leadership awareness and support** in the TCFD-based undertaking. Given the breadth and depth of TCFD reporting, including the scenario analysis, it was important to obtain leadership buy-in and for the mission to be driven from the top. It is also important to **keep an open mindset** as reporting requires exploring possible scenarios, "what ifs" or potential impact pathways, analysis of which might lead to potential risks and opportunities.

[25] The GHG Protocol Corporate Standard classifies a company's GHG emissions into three 'scopes'. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

TCFD could also be more complex and wider in nature, which might take beyond just one year to fully adopt. It is important to view this as a iterative process and as a journey, especially when new information and inputs come into play (e.g. updated physical risks and transition risks inputs), whilst being ambitious on quality and progress.

Finally, interviewees shared about the importance of **"making it work for you"**, and not merely for reporting's sake; it is about using the process to understand how the climate-related risks and opportunities can impact your business and inform your strategic decisions.

Practical considerations from our interviews, literature reviewed and practitioner experience

Governance

- Where assessed to be material, climate-related issues should be **made strategic priorities by leadership**, acknowledged and recognised that these are not for the short-term, but medium to long-term.
- Obtain **buy-in from not only the ESG related departments**, but the respective business departments.
- It is also important to **differentiate between the role of the board and management** in respect of climate-related risks and opportunities.
- **Upskilling** for management and those charged with governance is critical especially if there is an understanding gap. For eligible training for board of directors for listed Singapore companies, refer to SGX announcement.

Strategy and Risk Management

- There is sometimes **confusion between strategy and risk management**. For clarity, consideration of the specific climate-related risks and opportunities should be disclosed in line with the TCFD's recommended disclosures on strategy, whereas the process for identifying and managing these climate-related risks, including their integration into existing risk management processes, should be disclosed under the risk management pillar.
- **Risk management will be aligned if the business understands its climate risks.** Therefore, it is critical to assess material climate-related risks before these can be assessed and integrated into enterprise risk management.

Metrics and Targets

- Important to **set ambitious targets**, including considering stakeholder and societal expectations over the medium to long-term, rather than only what the organisation considers is feasible from a collection of its efforts.
- Where companies acknowledged exposure to risks related to climate, as well as strategies to mitigate such risks, **disclosures often do not directly explain the process by which companies assessed and determined the materiality of such risks to their business**. In some cases, the metrics and targets reported did not relate directly to the risks or opportunities identified by the company in its strategy and risk management disclosures, leading to uncertainty about what risks the company viewed as material.

Building your "A-team"

- Where possible, the core team should include individuals who are **"systems thinkers" who understand the organisation well and are able to provide the required data** (e.g. emissions data, electricity data, activity data, financial data).
- **Useful skillsets** can also include:
  - Sustainability
  - Finance
  - Communications
  - Actuarial type skills (particularly for the climate scenario analysis)
- Where there are **skills gaps** (e.g. developing the approach, building the climate model), it might be useful to engage an internal or external advisor at the initial stages, but with a focus to build internal capability.

Scenario analysis and data

- **Scenario analysis takes time** and as such, would be useful to start sooner rather than later.
- **Choose and "pilot"** a location/locations or business/ businesses that management believe, based on the current trends in physical and transitional risks that would be material or most materially susceptible to climate-related risks.
- Always take a step back to check **if the numbers and data inputs make sense**. Data should also be from credible sources such as the IPCC for physical risks and IEA/NGFS for transition risk inputs.
- **Data might not be perfect** and you would need to leverage your "A-team" members to obtain it and improve on it over the years (e.g. completeness of energy usage across all sites).

Other considerations

- **Disclosures in TCFD report should be connected to the other information** in the annual report to explain the links between particularly the governance, risk management and environmental results.
- **Perform a disclosure gap analysis and thereafter develop a 2-3 year plan.** The disclosure gap analysis should analyse the disclosures and other information related to the financial statements, annual report against the SGX (TCFD requirements), or any other climate-related requirements (e.g. the MAS environmental risk management guidelines), including an acknowledgement of expectations in timelines and contents thereof.
- It might also be useful to **understand the expectations of key stakeholders** as you present the TCFD reporting plan and incorporate their feedback/expectations into the plan.
- Leverage on **internal reviews and/or external assurance to enhance confidence over your reporting processes**. Develop an assurance plan with a view to expand the scope of coverage over time. An example of assurance roadmap is illustrated below:
  - Year 1: Assurance over selected quantitative metrics including Scope 1 and 2 emissions
  - Year 2: Assurance over a broader set of quantitative metrics including Scope 3 emissions
  - Year 3: Assurance over quantitative metrics and qualitative disclosures under the TCFD recommendations (e.g. description of the organisation's processes for identifying and assessing climate-related risks, and how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management)

City Developments Limited (CDL)

Esther An, Chief Sustainability Officer

A pioneer in sustainability

CDL is well-regarded as a pioneer in sustainability with their first Global Reporting Initiative (GRI) Standards report published in 2008. In 2010, CDL became the first Singapore company to report to CDP, first with carbon-related disclosures, followed by water security in 2020. When TCFD published its final recommendations on climate-related financial disclosures in June 2017, CDL pledged its support immediately, becoming one of the four pioneering companies in Singapore to do so. "For CDL, it was a natural progression," said Esther.

Esther further shared that CDL views the TCFD framework as a very useful approach, with the 4 pillars – governance, strategy, risk management, and metrics and targets – being complementary to CDL's reporting model that has evolved over the years to harmonise various international reporting frameworks. She added that CDL adopted TCFD "because climate reporting has always been our priority as we believe that climate change has huge financial impact on businesses". In this regard, she believes that the strategy pillar in TCFD is the most important one out of the four – as compared to other reporting frameworks which tend to focus more on data collection. TCFD's strong focus on a company's forward-looking strategic resilience is most timely in the decade of climate emergency.

Sustainability reporting is a tool to enhance companies' strategy

Esther said, "A sustainability report is a strategic report, not an operational performance report. The data collected and reported supports the development of CDL's strategy and responses. The benefits of reporting are not about only cost savings or alignment (with standards), but about strategic resilience, being forward-looking and planning towards how to future-proof our business." For example, TCFD provides a very clear framework for gap analysis that will help drive the strategic efforts required to plug any identified gaps and capture opportunities through risk adaptation.

Esther added that among other benefits, the adoption of TCFD has allowed CDL to better align its practices and expectations with their ecosystem of stakeholders such as their supply chain, vendors, business associates and investees. This was achieved by charting a clear direction and clearly articulating their climate-related targets and goals to stakeholders.

Noting the significant increase in the adoption of the TCFD reporting framework from 2020, Esther said that it is important to clearly demonstrate how the framework has been integrated within the organisation, including at the board-level, show evidence of applying the four pillars in the company's business processes and operations, and give examples of what has been done as a company. This will help corporates to avoid potential charges of greenwashing and reputational risk.

Upskilling needed

Replying to a question on the skillsets that were important for CDL in their sustainability journey, Esther said that with the fast0evolving sustainability landscape, one important skill is systemic thinking. There is a need for well-organised, strategic thinkers who can seek out a pathway through the metaphorical ESG jungle. Companies also need analytical individuals who can independently scout for data and sift through voluminous data points to derive key insights that support climate governance. One would also need to be able to measure impact reliably and consistently to assess the company's progress in implementing certain ESG initiatives.

In addition to coming up with technical solutions, engineers will also need people skills to be able to convince internal stakeholders. In addition to these skill sets, finance-related and marketing skill sets help to bolster sustainable finance and corporate branding, as ESG investing come to the fore.

Esther also touched on the importance of attaining buy-in from internal stakeholders and getting alignment with, and a mandate from, the company's leadership. Over the past decade, CDL has been conducting sustainability-related training for its group's directors and senior management. With SGX's latest sustainability reporting requirements, CDL's sustainability team are now being consulted proactively by its business units.

Looking ahead, CDL, in partnership with Global Green Connect (GGC), launched the Sustainability Connect in January 2022, a platform to connect and empower sustainability professionals amidst growing demand for ESG training, including expertise in TCFD. Leveraging their combined global network of experienced sustainability professionals from diverse sectors and industries, it aims to equip practitioners with the necessary skills to transform and future-proof businesses for long-term success through workshops, panels, and other training initiatives on a wide range of key sustainability issues such as green finance, sustainability reporting, stakeholder engagement, impact investing and innovation.

Olam Food Ingredients (ofi)

Rishi Kalra, Executive Director and Group Chief Financial Officer

TCFD not an "A-ha" moment, but very useful

Olam has been measuring GHG emissions for over a decade since 2011 under the Carbon Disclosure Project (CDP). Therefore, the adoption of TCFD was not an "A-ha" moment but a natural development of what was done in the past.

The adoption of TCFD brings about many important benefits. Before the advent of TCFD, it was challenging even for an advanced adopter like Olam to explain issues such as climate risks and how they were measured. TCFD was instrumental in providing a common framework to build traction, understanding and awareness among various stakeholders such as investors and board members. By having to adopt only one common framework, it also cuts through the complexity of needing to follow multiple frameworks, especially when climate reporting is already a challenging topic on its own.

The benefits of having a common framework are not limited to reporting. It also facilitates decision-making around investments and operations. For example, it allows Olam to perform a full-scale climate assessment of all upstream and processing plants by aligning the different businesses and functions, including the finance and natural capital evaluation departments. As a result, the organisation becomes more aware and gains deeper insights about climate risks. Also, by using and leveraging a monetary language to engage various stakeholders, including internal ones, and communicating needs, it gets easier to put forward and assess climate risks and associated financial implications.

Being able to quantify the impact of climate change using the TCFD framework has been a very useful exercise for Olam. Aligned with the TCFD framework, Olam developed tools to measure its natural capital across select value chains, at farmer group level. These tools such as the 'Integrated Impact Statement' (IIS) enable Olam to measure and compare the impact of its on-ground initiatives and in doing so, identify where to target further positive change, for example by probing into areas which indicate high emissions intensities. This process has paid off for Olam, with a year-on-year decrease in emissions from farmer groups that were focused on, reducing emission hotspots.

TCFD brings about the right focus by providing guidance on specific areas. The pillars of TCFD – from governance to metrics and targets – are interrelated and provide a good framework to address climate-related issues and integrate them into the company's *modus operandi*.

Rishi believes, "The focus is only increasing on TCFD, even from an accounting or reporting standpoint. The IFRS Sustainability Disclosure Standards by the IFRS Foundation's International Sustainability Standards Board will be anchored upon TCFD.

This clearly showcases the journey that TCFD is on and the importance that has been put to it."

Where do I start?

Olam's experience is unique. As an adopter of climate reporting even before the development of TCFD, the implementation of TCFD actually simplified the required processes for Olam as it standardised the way things are done and communicated across its various functions. This demonstrates the usefulness of TCFD as a starting point to build on in addressing climate-related issues, even if most other companies may find the learning curve to adopt TCFD steeper than Olam did.

For a start, a company should look into its existing processes and reporting to fit the available pieces into the TCFD framework. For Olam, it already had established processes to collect relevant data, and these metrics were the natural first step to incorporate into the TCFD framework. After that, it was a matter of linking the governance, strategy and risk management pieces alongside the critical metrics. In this manner, it also helped its board of directors to better appreciate the incorporation of climate-related issues in the company's strategy and spurred action at all levels across the value chain and geographical regions. It also helped to align risk management on a global level.

Instead of being concerned with conforming to what other companies are doing, it is important for companies to understand how TCFD relates to them and adapt to their own requirements, as they possess different goals, metrics and data points. "There is a standard framework, but there is no standard template for every company," Rishi observes. As a guide, companies will need to independently compare the relevant metrics across the years to assess whether they are taking the right data points or making the right decisions or are on the right track in general.

A key challenge of adopting TCFD lies in collecting the underlying data - operational & financial. In this regard, companies can consider starting with a pilot, instead of starting big. Companies need not be intimidated by aspirations such as +1.5°C or net zero targets and should instead start with actionable changes within their control where there is potential material risk and expand the approach from there. These changes could include the use of renewable energy and enhancing measurement systems. By starting small, appreciation of the data underpinning these areas becomes much easier. Momentum will also be gained once the companies embark on the journey and begin to see the value gained from the process.

The right interpretation of the collected data is also crucial. At agriculture plantations in certain drought-prone regions, Olam has sensors attached to every tree in the orchard, which ensure that each tree receives the precise amount of water and nutrients that it needs at that point in time. It is important to properly consider the upfront investment of some capital expenditure together with the improved profitability arising from better yield and productivity and lower water and nutrients usage and come to the appropriate conclusions.

TCFD reporting does take time, and it is important to start as early as possible. While it was quite a lonely exercise in the past, there are more corporate examples now, and lessons across the world have been incorporated into the framework. Therefore, there is little reason for companies to find it complex and choose not to embark on it.

It is a journey still in the making and there is still so much to learn for everyone. Anyone starting now can gain from the learnings of the past. "With more people joining along, all of us will learn together," Rishi is hopeful.

Assembling the team

"Having the right leadership support was important. Sunny [Co-founder and Group CEO of Olam] and I were fully on board with the understanding that the potential physical & transition risks could disrupt the value chain for Olam," Rishi reflects.

In 2018, Rishi initiated a cross functional team called Integrated Reporting <IR> Task Force. Rishi was clear about the benefits of having the leaders of businesses, operating units and finance functions driving the climate reporting process. While sustainability teams, be it in-house functions or external experts, could provide the concepts and ideation, business teams are better placed to bridge the relevance of these concepts to the business reality with their deep understanding of the business and operations.

Once the company becomes a believer, its progress in developing meaningful climate-related disclosures will be accelerated. Accountants are key to driving this, as they are able to perceive value in dollars and cents and are positioned to communicate across the company the value of addressing climate-related risks and opportunities, as recommended under the TCFD.

"Doing good can create value. It goes very deep in the company," Rishi believes. Only an accountant can support such bold statements, and it is a perfect opportunity for a finance leader or executive to get involved.

Singapore Telecommunications Limited (Singtel)

Andrew Buay, Vice President,
Group Sustainability
Hui Mien Lee, Senior Director,
Group Environmental Sustainability

A progressive, iterative journey

Singtel's journey towards TCFD started back in 2014 when climate change first came up as a material topic in its stakeholder engagement and materiality assessment of environmental issues across the organisation. Since then, Singtel began looking into the impact of climate change on its operations and businesses, focusing mainly on physical risks for a start. In 2016 and 2017, Singtel leveraged climate scenario data from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia to conduct its very first climate risk analysis on its operations and infrastructure in Singapore and Australia to identify mitigations and adaptation opportunities. In 2017, the year TCFD published the final recommendations on climate-related financial disclosures, Singtel formally endorsed the TCFD framework and became among the first companies globally to do so.

Singtel saw the TCFD framework as a useful, structured way to guide Singtel's approach and thinking in managing climate risk. "Singtel's past efforts and initiatives, which used to be more fragmented in approach, somehow just fell nicely into the four pillars.", according to Andrew.

What began as a "rudimentary" way of classifying Singtel's initiatives and a more qualitative assessment of climate risks progressively developed into something more data driven over the past few years. In 2019, Singtel embarked on building analytical models to better understand the financial materiality of the impact of climate risks on its business. As part of this initiative, Singtel completed a detailed pilot study in northern New South Wales, using a data-driven approach to identify and link the key business drivers to climate risks, in order to understand its physical and transition risks from different climate change scenarios. This pilot analysis provided Singtel with insights and learnings of material risk drivers and indicators, in preparation for a nation-wide TCFD exercise in Singapore and Australia which was ongoing at the time of this report.

How did Singtel make a start?

In the initial years, Singtel's climate risk assessment focused on physical risks. This was a risk area more apparent to the organisation at the beginning, as natural disasters such as cyclones and bushfires had been impacting Singtel's operations in Australia. Given these events have already been part and parcel of Singtel's business-as-usual risk management framework and business continuity management programs, it was easier for the business to connect the issue with climate risks.

"As climate is a complex topic, companies sometimes get too overwhelmed trying to look at too many things." Reflecting on Singtel's "iterative learning journey", Andrew recommends that companies can start with something they can better comprehend. "Start by reflecting on the business logic or hypotheses of how climate can impact the business. Knowing your business, and where the risks could lie, is important otherwise you could be dealing with too much data analysis."

At the start, one key challenge that Singtel faced was finding the right data, as climate risk analysis can be a data-intensive bottom-up exercise. To overcome this, Singtel adopted a "funnel approach" by identifying the top risk drivers in order to narrow down and focus on data that matters. It also ensured that it had the right data cut, with significant involvement of business units to reflect and validate the business logic behind the data used. This was why a pilot analysis was initially undertaken before extending to the nationwide analysis. Also key was to identify the right stakeholders who have access to the relevant data.

Why is Singtel pushing the TCFD agenda?

For Singtel, its TCFD efforts have empowered the organisation with a better understanding of its own position and the risks it faces in light of climate change. This way, it stands more ready to engage investors and other stakeholders in a meaningful dialogue on the topic. Given climate risk assessment is still a relatively new concept, investors may sometimes evaluate the company based on inaccurate assumptions which may adversely impact the company's perceived value. Therefore, having the knowledge and data allows Singtel to provide better information and guidance to investors and other external stakeholders.

For Andrew and Hui Mien, internal stakeholders within Singtel are also increasingly seeing the benefits of TCFD and becoming interested in this topic. For instance, given the tangible impact of physical risks, business units can now better appreciate the benefits of design and adaption measures in response to the risks. With the Finance department, TCFD was a common language to communicate with, as issues such as capital allocation decisions and their financial impact speak to them, and they could identify where and how Finance can play a role.

Who should drive TCFD internally?

For Hui Mien, TCFD does not necessarily have to be driven by someone well-versed in sustainability. Instead, it is more important to have someone with a good understanding of the organisation, the dynamics and the operations within, as implementation of TCFD is a cross-functional effort which requires the involvement of multiple stakeholders across businesses and functions. In her view, it is about integrating sustainability into everyday business of the organisation.

What's next?

So far, Singtel's modelling and analytical efforts have focused on the financial and material impacts of climate risks. Going forward, as this area becomes more mature and the necessary risk mitigating actions have been put in place sufficiently, Singtel aims to focus more on modelling the opportunities arising from climate change.

As TCFD reporting continues to mature, Andrew believes there is room for greater consistency and comparability of disclosures, given the lack of standardised metrics and assumptions currently. For now, many companies tend to be quite selective about what they disclose externally, as more disclosures may necessarily not translate into higher practical value of information disclosed depending on who the external stakeholder is.

Meanwhile, as climate risks start to become increasingly intertwined with financial risks and financial reporting, Andrew believes that this is an area which has to be treated with the same rigour as financial reporting, and sees the internal audit function playing an increasingly key role in ensuring the integrity of such information.

Disclosure examples

SGX suggests the following phased implementation approach to issue climate-related disclosures consistent with the TCFD Recommendations in its *Sustainability Reporting Guide*. **However, as noted above, issuers prioritised for mandatory climate reporting should note that they may need to adopt the TCFD recommendations fully in two years instead of the suggested three years in the Sustainability Reporting Guide.**

Year 1	Year 2	Year 3
Describe the governance structures, including Board oversight and management's role Identify the climate-related risks and opportunities Describe the processes for identifying and managing climate-related risks Impacts in qualitative terms Disclose Scope 1 and Scope 2 GHG emissions	Include metrics for assessment Targets in qualitative terms Impacts in more quantitative terms Disclose Scope 3 GHG emissions Conduct qualitative scenario analysis	Scenario analysis with more quantitative outcomes Targets in quantitative terms

It is recognised that making good disclosures is a journey, and organisations may differ in breadth and scope of reporting currently.

Recommended disclosures

In implementing climate reporting requirements and depending on the timing of SGX's mandatory reporting requirements for the specific industry, reporters can also take inspiration from the following examples of three-year implementation maturity pathway to progressively enhance the level of disclosures. For example, whilst reporters are all required to disclose its governance structures, including Board oversight and management's role, in the first year, as highlighted in the above table, the level of detail associated with such disclosures may increase over time.

For each recommended disclosure under the TCFD Recommendations, three levels of reporting maturity are identified where possible to propose a pathway for reporting excellence. **The pathway is represented by Year 1, Year 2 and Year 3 disclosures, in order of increasing reporting maturity.** Year 1 disclosures generally represent disclosures that organisations should take as a first step in reporting. Year 2 disclosures generally comprise more extensive or involved disclosures. Year 3 disclosures generally represent "best in class" reporting to date, which organisations may aim to achieve over time. However, organisations that are required to report under mandatory climate disclosures should report on disclosures which satisfy the TCFD recommendations by the mandated timing.

The examples below are a good starting point for organisations to explore climate-related disclosures. Organisations should tailor these examples to their own sustainability context by considering their business, industry, geographical area of operations, etc. and build on them as necessary. Financial institutions may also refer to the *Financial Institutions Climate-Related Disclosure Document* produced by the MAS Green Finance Industry Task Force for disclosure examples on banks, asset managers and insurance companies. Refer to Appendix B for excerpts of these disclosure examples.

Abbreviations

CapitaLand	CapitaLand Limited
CDL	City Developments Limited
Frasers	Frasers Property Limited
Keppel	Keppel Corporation Limited
Olam	Olam International Limited
PSA	PSA International
SATS	SATS Ltd.
Sembcorp	Sembcorp Industries Ltd
Singtel	Singapore Telecommunications Limited
Temasek	Temasek Holdings (Private) Limited
ThaiBev	Thai Beverage Public Company Limited
BHP	BHP Group Ltd
Burberry	Burberry Group plc
Lendlease	Lendlease Group
Mondi	Mondi plc
Rio Tinto	Rio Tinto Limited
Severn Trent	Severn Trent plc
United Utilities	United Utilities Group PLC
Unilever	Unilever plc

Governance Disclose the organisation's governance around climate-related risks and opportunities.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure a) Describe the board's oversight of climate-related risks and opportunities.	Describe the processes and frequency by which the board and/or board committees (e.g., audit, risk, or other committees) are informed about climate-related issues	Describe whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, major plans of action, risk management policies, annual budgets, and business plans as well as setting the organisation's performance objectives, monitoring implementation and performance, and overseeing major capital expenditures, acquisitions, and divestitures	Describe how the board monitors and oversees progress against goals and targets for addressing climate-related issues Present a skills matrix for board members, which includes climate change
	Examples for Reference		
	CDL, SATS, Unilever, Mondi	Keppel, SATS, Sembcorp	CDL, SATS, Severn Trent

Governance Disclose the organisation's governance around climate-related risks and opportunities.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure b) Describe management's role in assessing and managing climate-related risks and opportunities.	Describe whether the organisation has assigned climate-related responsibilities to management-level positions or committees; and, if so, whether such management positions or committees report to the board or a committee of the board and whether those responsibilities include assessing and/or managing climate-related issues Describe whether there is a subject matter expert in key functional/ managerial roles	Describe the associated organisational structure(s), including climate-dedicated committees where applicable Describe processes by which management is informed about climate-related issues, including reporting matrices	Describe how management (through specific positions and/or management committees) monitors climate-related issues Describe how climate-related risks and opportunities are embedded into the management function across the organisation
	Examples for Reference		
	Keppel, SATS, Mondi	Keppel, SATS, Mondi	Keppel, SATS, Mondi

Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure a) Describe the climate-related[26] risks and opportunities the organisation has identified over the short, medium, and long term.	Describe what the organisation considers to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organisation's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms	Describe the specific climate-related issues potentially arising in each time horizon (short, medium, and long term) that could have a material financial impact[27] on the organisation	Describe the process(es) used to determine which risks and opportunities could have a material financial impact on the organisation Describe the risks and opportunities by sector and/or geography, as appropriate Provide further context on how these risks are mapped across the value chain
	Examples for Reference		
	Singtel, ThaiBev, Mondi	Singtel, ThaiBev, Mondi	SATS, Singtel, Burberry

[26] In describing climate-related issues and related processes for managing them, organisations should refer to Tables A1.1 and A1.2 of *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* or Appendix A of this guide.
[27] Refer to Table A1.3 of *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures* or Appendix A of this guide.

Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.	Describe how identified climate-related issues have affected the organisation's businesses, strategy, and financial planning	Describe the impact on the organisation's businesses, strategy, and financial planning in the following areas: – 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) – Acquisitions or divestments – Access to capital	Describe how climate-related issues serve as an input to the organisation's financial planning process, the time period(s) used, and how these risks and opportunities are prioritised. Disclosures should reflect a holistic picture of the interdependencies among the factors that affect the organisation's ability to create value over time, as well as the reiterative nature of the monitoring, tracking and review process Describe the impact of climate-related issues on the organisation's financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities)[28] Describe the climate-related scenarios if they were used to inform the organisation's strategy and financial planning

[28] These impacts may be described in qualitative, quantitative, or a combination of both qualitative and quantitative terms.

Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
			Describe the organisation's plans for transitioning to a low-carbon economy, which could include: – GHG emissions targets and specific activities intended to reduce GHG emissions in its operations and value chain or to otherwise support the transition – GHG emissions reduction commitments, operates in jurisdictions that have made such commitments, or has agreed to meet investor expectations regarding GHG emissions reductions
	Examples for Reference		
	SATS, Singtel, ThaiBev	SATS, Singtel, ThaiBev, Mondi	SATS, Singtel, Temasek, ThaiBev, Mondi

Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Describe where the organisation believes its strategies may be affected by climate-related risks and opportunities	Describe how the strategies might change to address such potential risks and opportunities Describe the potential impact of climate-related issues in different scenarios on financial performance (e.g., revenues, costs) and financial position (e.g., assets, liabilities)[28] Describe the climate-related scenarios and associated time horizon(s) considered	Describe how resilient the strategies are to climate-related risks and opportunities, taking into consideration a transition to a low-carbon economy consistent with a 2°C or lower scenario and, where relevant to the organisation, scenarios consistent with increased physical climate-related risks
	Examples for Reference		
	CDL, SATS, ThaiBev	CDL, Singtel, SATS, ThaiBev, Unilever	CDL, Lendlease

Risk Management Disclose how the organisation identifies, assesses, and manages climate-related risks.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure a) Describe the organisation's processes for identifying and assessing climate-related risks.	Describe whether the organisation considers existing and emerging regulatory requirements related to climate change (e.g., limits on emissions) as well as other relevant factors considered Describe risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how the organisation determines the relative significance of climate-related risks in relation to other risks	Disclose definitions of risk terminology used or references to existing risk classification frameworks used Describe any risk classification frameworks used	Disclose processes for assessing the potential size and scope of identified climate-related risks
	Examples for Reference		
	CapitaLand, Olam; SATS (under Strategy), United Utilities	Temasek (under Strategy), United Utilities	Olam, PSA, Singtel
Recommended Disclosure b) Describe the organisation's processes for managing climate-related risks[26].	Describe processes for prioritising climate-related risks, including how materiality determinations are made within the organisation	Describe processes for managing climate-related risks, including how the organisation makes decisions to mitigate, transfer, accept, or control those risks	Provide further detail on the processes around management and mitigation efforts in response to managing climate-related risks
	Examples for Reference		
	SATS (under Strategy), Singtel	Sembcorp, Temasek, Mondi (under Strategy), United Utilities	Mondi (under Strategy)

Risk Management Disclose how the organisation identifies, assesses, and manages climate-related risks.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.	Acknowledge that climate-related risks should be integrated into the organisation's overall risk management framework	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management	Provide further detail on processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management, including any extension of scope to include other risk types and/or business segments from initial phase or pilots conducted
	Examples for Reference		
	Mondi	Sembcorp, Temasek	BHP

Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.	Describe the process in conducting a materiality assessment to identify the material climate-related metrics that are relevant to the business	Provide the key metrics[29] used to measure and manage climate-related risks and opportunities[26] as well as metrics consistent with the cross-industry, climate-related metric categories[30]. The organisation should consider including metrics on climate-related risks associated with water, energy, land use, and waste management where relevant and applicable Provide metrics for historical periods to allow for trend analysis	Where climate-related issues are material, describe whether and how related performance metrics are incorporated into remuneration policies Where relevant, provide the internal carbon prices as well as climate-related opportunity metrics such as revenue from products and services designed for a low-carbon economy Where appropriate, provide forward-looking metrics for the cross-industry, climate-related metric categories[30], consistent with the organisation's business or strategic planning time horizons
	Examples for Reference		
	–	CDL, Keppel	CDL (under Governance), Temasek (under Risk Management), Unilever

[29] Where not apparent, provide a description of the methodologies used to calculate or estimate climate-related metrics.
[30] Refer to Table A2.1 of *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*.

Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Provide Scope 1 and Scope 2 GHG emissions[31] independent of a materiality assessment and the related risks As appropriate, provide related, generally accepted industry-specific GHG efficiency ratios[32]	Provide Scope 3 GHG emissions[31], if appropriate, and the related risks. All organisations should consider disclosing Scope 3 GHG emissions	Provide GHG emissions and associated metrics[29] for historical periods to allow for trend analysis Provide Scope 3 GHG emissions disclosures for an expanded scope of categories, if appropriate
	Examples for Reference		
	CDL, Olam, BHP, Mondi, Unilever	CDL, Olam, BHP, Mondi, Unilever	CDL, Olam, BHP, Mondi, Unilever

[31] GHG emissions should be calculated in line with the GHG Protocol methodology to allow for aggregation and comparability across organisations and jurisdictions.
[32] For example, emissions per unit of economic output (such as unit of production, number of employees, or value-added) is widely used.

Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
Recommended Disclosure c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.	Describe the organisation's plans and progress in setting targets, including any long-term aspirational targets as applicable	Describe **in qualitative terms** key climate-related targets such as those related to GHG emissions, water usage, energy usage, etc. Include the following: – whether the target is absolute or intensity based; – time frames over which the target applies; – base year from which progress is measured; and – key performance indicators used to assess progress against targets	Describe **in quantitative terms** key climate-related targets[29] such as those related to GHG emissions, water usage, energy usage, etc., consistent with the cross-industry, climate-related metric categories[30], where relevant, and in line with anticipated regulatory requirements or market constraints or other goals. Other goals may include efficiency or financial goals, financial loss tolerances, avoided GHG emissions through the entire product life cycle, or net revenue goals for products and services designed for a low-carbon economy Include the following: – whether the target is absolute or intensity based; – time frames over which the target applies; – base year from which progress is measured; and – key performance indicators used to assess progress against targets

Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.			
	Example of Maturity Pathway		
	Year 1	**Year 2**	**Year 3**
			Where available, disclose interim targets in aggregate or by business line associated with medium-term or long-term targets
	Examples for Reference		
	Frasers; PSA	Keppel, BHP, Mondi, Unilever	CDL, Keppel, Olam, BHP, Mondi, Rio Tinto, Unilever

Acknowledgements

Ms Esther An, Chief Sustainability Officer, City Developments Limited

Mr Andrew Buay, Vice President, Group Sustainability, Singapore Telecommunications Limited

Ms Ina Dimova, Senior Consultant, Sustainability and Climate Change, PwC Singapore

Mr Rishi Kalra, Executive Director and Group Chief Financial Officer, Olam Food Ingredients

Ms Kok Moi Lre, Partner, PwC Singapore

Mr Lee Bing Yi, Director, ESG and Financial Services, PwC Singapore

Dr Lee Hui Mien, Senior Director, Group Environmental Sustainability, Singapore Telecommunications Limited

Ms Lim Lay Hsiah, Senior Manager, PwC Singapore

Mr Ong Tze Haung, Director, Sustainability and Climate Change, PwC Singapore

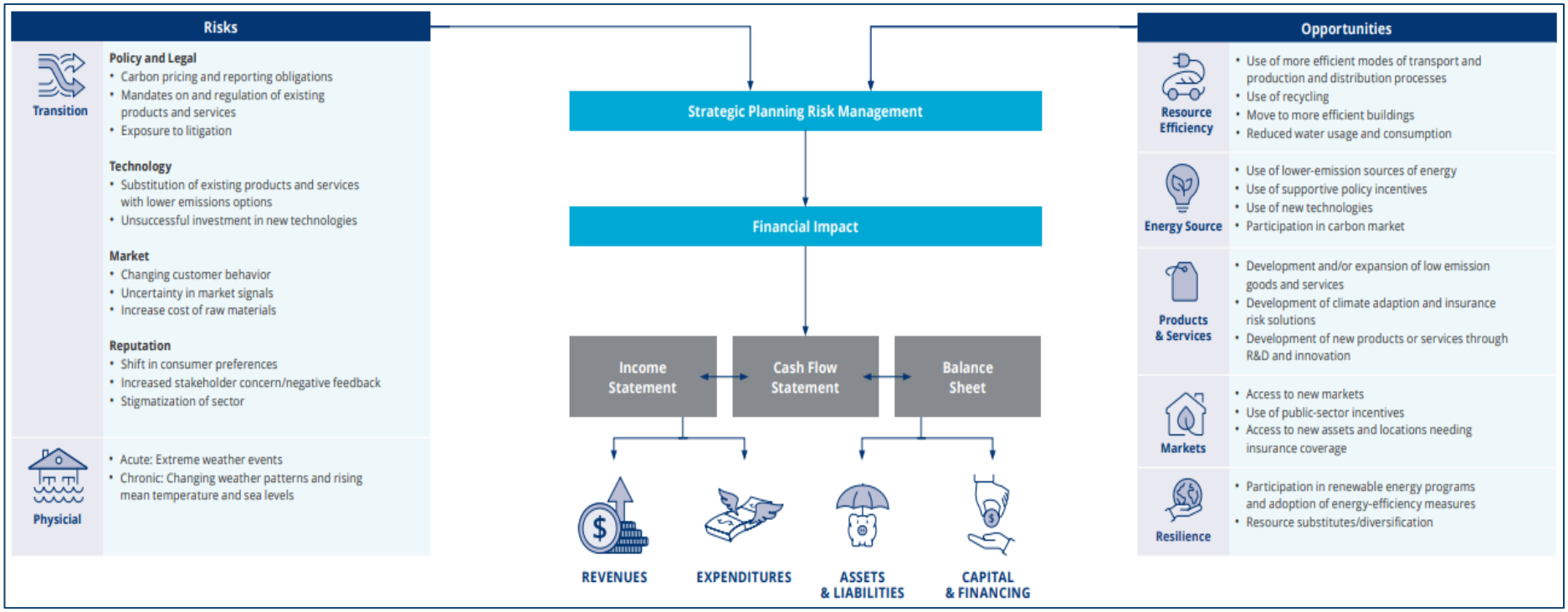
Singapore Exchange Regulation

Workstream 2 of the Monetary Authority of Singapore's Green Finance Industry Taskforce which is tasked to recommend improvements to measures and disclosures across Singapore's financial industry

Every company that has its disclosures featured in the guide

Appendix A –
Climate-related risks, opportunities, and financial impact

Climate-related risks, opportunities, and financial impact



Source: *TCFD Overview Booklet*

Examples of climate-related risks and potential financial impacts

Type	Climate-Related Risks	Potential Financial Impacts
Transition Risks	**Policy and Legal**	
	– Increased pricing of GHG emissions – Enhanced emissions-reporting obligations – Mandates on and regulation of existing products and services – Exposure to litigation	– Increased operating costs (e.g., higher compliance costs, increased insurance premiums) – Write-offs, asset impairment, and early retirement of existing assets due to policy changes – Increased costs and/or reduced demand for products and services resulting from fines and judgments
	Technology	
	– Substitution of existing products and services with lower emissions options – Unsuccessful investment in new technologies – Costs to transition to lower emissions technology	– Write-offs and early retirement of existing assets – Reduced demand for products and services – Research and development (R&D) expenditures in new and alternative technologies – Capital investments in technology development – Costs to adopt/deploy new practices and processes
	Market	
	– Changing customer behavior – Uncertainty in market signals – Increased cost of raw materials	– Reduced demand for goods and services due to shift in consumer preferences – Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) – Abrupt and unexpected shifts in energy costs – Change in revenue mix and sources, resulting in decreased revenues – Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)
	Reputation	
	– Shifts in consumer preferences – Stigmatization of sector – Increased stakeholder concern or negative stakeholder feedback	– Reduced revenue from decreased demand for goods/services – Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) – Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) – Reduction in capital availability

Type	Climate-Related Risks[1]	Potential Financial Impacts
Physical Risks	**Acute**	
	– Increased severity of extreme weather events such as cyclones and floods	– Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) – Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) – Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) – Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) – Increased capital costs (e.g., damage to facilities) – Reduced revenues from lower sales/output – Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations
	Chronic	
	– Changes in precipitation patterns and extreme variability in weather patterns – Rising mean temperatures – Rising sea levels	

Source: *Final Report on the Recommendations of the Task Force on Climate-related Financial Disclosures*

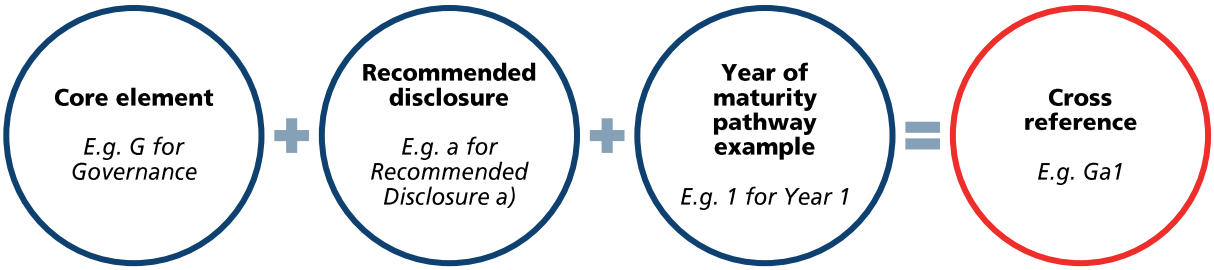
Examples of climate-related opportunities and potential financial impacts

Type	Climate-Related Opportunities	Potential Financial Impacts
Resource Efficiency	– Use of more efficient modes of transport – Use of more efficient production and distribution processes – Use of recycling – Move to more efficient buildings – Reduced water usage and consumption	– Reduced operating costs (e.g., through efficiency gains and cost reductions) – Increased production capacity, resulting in increased revenues – Increased value of fixed assets (e.g., highly rated energy-efficient buildings) – Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	– Use of lower-emission sources of energy – Use of supportive policy incentives – Use of new technologies – Participation in carbon market – Shift toward decentralized energy generation	– Reduced operational costs (e.g., through use of lowest cost abatement) – Reduced exposure to future fossil fuel price increases – Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon – Returns on investment in low-emission technology – Increased capital availability (e.g., as more investors favor lower-emissions producers) – Reputational benefits resulting in increased demand for goods/services
Products and Services	– Development and/or expansion of low emission goods and services – Development of climate adaptation and insurance risk solutions – Development of new products or services through R&D and innovation – Ability to diversify business activities – Shift in consumer preferences	– Increased revenue through demand for lower emissions products and services – Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) – Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	– Access to new markets – Use of public-sector incentives – Access to new assets and locations needing insurance coverage	– Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) – Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	– Participation in renewable energy programs and adoption of energy-efficiency measures – Resource substitutes/diversification	– Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) – Increased reliability of supply chain and ability to operate under various conditions – Increased revenue through new products and services related to ensuring resiliency

Source: *Final Report on the Recommendations of the Task Force on Climate-related Financial Disclosures*

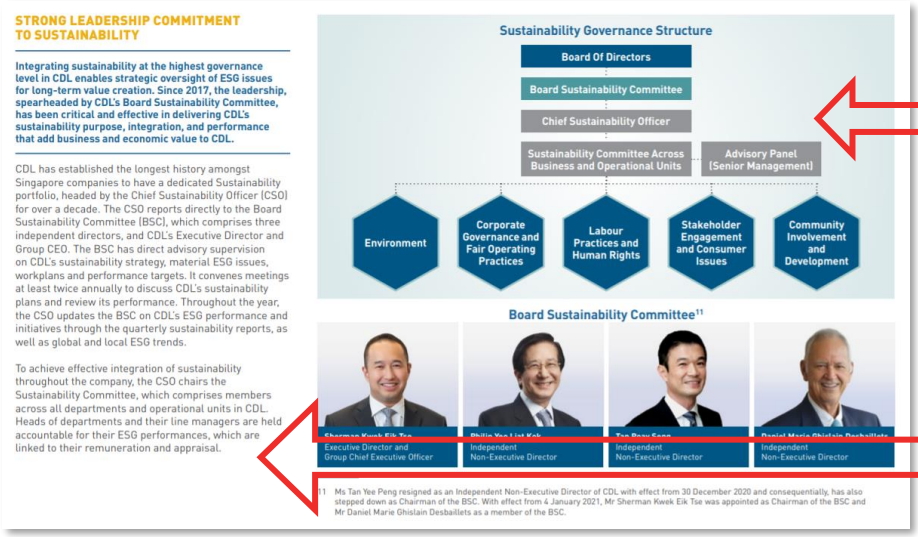
Appendix B –
Excerpts of disclosure examples

The excerpts below are referenced in the following manner:



Governance

CDL



STRONG LEADERSHIP COMMITMENT TO SUSTAINABILITY

Integrating sustainability at the highest governance level in CDL enables strategic oversight of ESG issues for long-term value creation. Since 2017, the leadership, spearheaded by CDL's Board Sustainability Committee, has been critical and effective in delivering CDL's sustainability purpose, integration, and performance that add business and economic value to CDL.

CDL has established the longest history amongst Singapore companies to have a dedicated Sustainability portfolio, headed by the Chief Sustainability Officer (CSO) for over a decade. The CSO reports directly to the Board Sustainability Committee (BSC), which comprises three independent directors, and CDL's Executive Director and Group CEO. The BSC has direct advisory supervision on CDL's sustainability strategy, material ESG issues, workplans and performance targets. It convenes meetings at least twice annually to discuss CDL's sustainability plans and review its performance. Throughout the year, the CSO updates the BSC on CDL's ESG performance and initiatives through the quarterly sustainability reports, as well as global and local ESG trends.

To achieve effective integration of sustainability throughout the company, the CSO chairs the Sustainability Committee, which comprises members across all departments and operational units in CDL. Heads of departments and their line managers are held accountable for their ESG performances, which are linked to their remuneration and appraisal.

ESG-linked Remuneration. CDL recognises that the inclusion of appropriate ESG issues within executive management goals and incentive schemes is an important factor in promoting greater recognition of and accountability in our sustainability practices. Since 2015, CDL established stronger linkages between employee and executive remuneration and our ESG performance. Performance indicators that are aligned with global standards such as ISO 26000, ISO 14001, GRI Standards and SDGs, to name a few, have been incorporated in the individual goals setting of all employees, including CDL's senior management.

Graphical presentation of governance structure [Gb2]

Processes by which the Board are informed about climate-related issues and oversees progress in addressing them [Ga1; Ga3]

Incorporation of performance indicators relating to climate-related issues into remuneration policies [Ma3]

SATS

Governance Structure

Building a sustainable business requires a collective, coordinated effort across all levels of the organisation, from leaders to individual employees. Our sustainability governance structure sets out accountabilities and responsibilities for SATS to deliver on our sustainability priorities.

We are committed to engaging staff on sustainability across all levels of the organisation. Our Board has oversight of our sustainability strategy and performance, in addition to the adequacy and effectiveness of the Group's internal control and risk management system. While the board makes certain that sustainability goals are integrated into all programmes and business imperatives, executive management at SATS provides stewardship and ensures that our business and strategy are aligned with our sustainability goals. They are supported by a Sustainability Council that was set up this year, comprising sustainability champions from the business units and staff representatives across 10 key departments as well as representatives from our overseas subsidiaries.

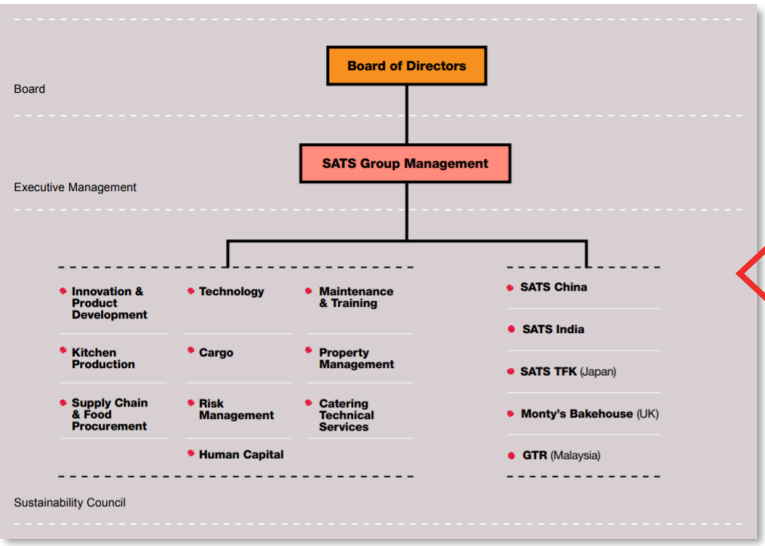
The Sustainability Council evaluates the effectiveness of our sustainability programmes together with key performance metrics each month, shares best practices between Singapore and our overseas operations, and governs the proceeds from the sale of our Renewable Energy Certificates by channelling them towards meaningful sustainability initiatives. The Chief Strategy & Sustainability Officer (CSO) chairs the Sustainability Council.

For more details about our Board of Directors, risk management and corporate culture, please refer to our full corporate governance report as laid out in SATS Annual Report 2020-21.

Processes by which the Board and management are informed about climate-related issues and oversee progress in addressing them [Ga1; Ga3; Gb1; Gb2]

Consideration of climate-related issues in overseeing business and strategy [Ga2]

How the Sustainability Council monitors climate-related issues [Gb3]



Graphical presentation of governance structure [Gb2]

Sembcorp

Climate-related issues are managed through our Climate Change Working Committee (CCWC), led by the Executive Vice President, Group President & CEO Office. The CCWC reports to the Sustainability Steering Committee (SSC), which in turn reports to the board's Risk Committee on sustainability issues including climate change. The achievement of our climate change targets is monitored and incentivised via the performance scorecards of our Group President & CEO and other relevant senior executives. The CCWC oversees key initiatives on risk mitigation, opportunities, greenhouse gas (GHG) mitigation, GHG accounting, and engagements and disclosures.

Processes for the board to consider climate-related issues [Ga2]

Unilever

Governance

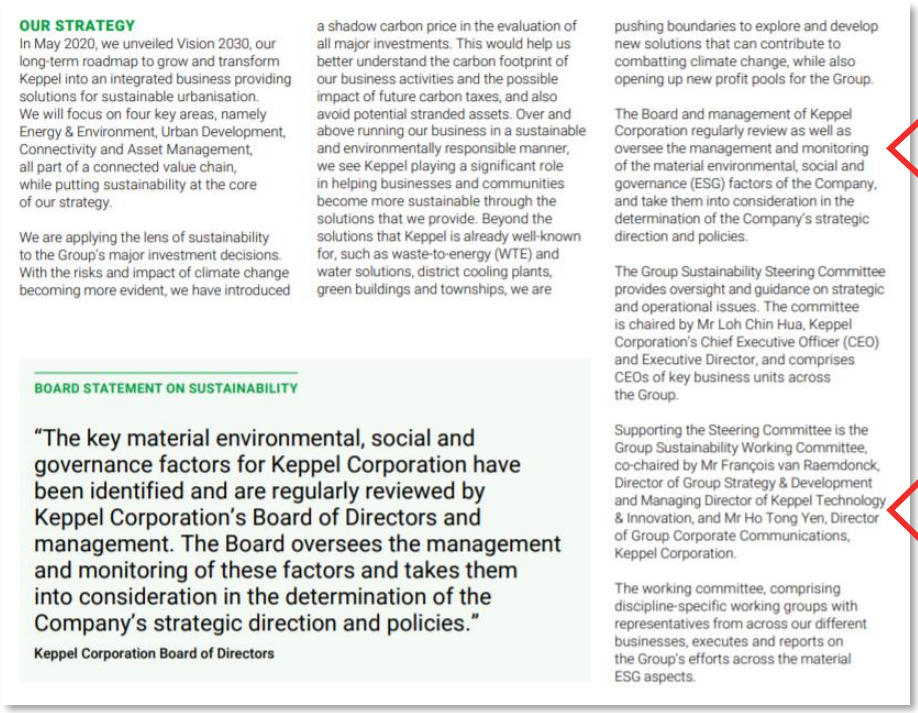
The Board take overall accountability for the management of all risks and opportunities, including climate change (see page 44). Our CEO and Executive Board member, Alan Jope, is ultimately responsible for oversight of our climate change agenda. The Corporate Responsibility Committee and Audit Committee review our climate reporting and receive presentations from sustainability experts, including the Sustainability Advisory Council. The Board is supported by the ULE. The ULE meet monthly to discuss key strategic matters and during 2020, several agenda items related to climate change were discussed, including progress against our USLP climate goals and our new Compass climate goals.

Additional specialist governance groups are in place to support our climate agenda and ULE decision making, including:

- Carbon Neutral Board: Drives delivery of our carbon ambition at corporate and country level and leads strategic partnerships and policy on renewables. Chaired by our Chief Supply Chain Officer, Marc Engel.
- Sustainable Sourcing Steering Group: Supports our strategy focusing on long-term, sustainable access to our key crops. Chaired by our Chief Procurement Officer, David Ingram.

Overview of its governance structure and describes the process and frequency on discussion of matters related to climate change [Ga1]

Keppel



OUR STRATEGY

In May 2020, we unveiled Vision 2030, our long-term roadmap to grow and transform Keppel into an integrated business providing solutions for sustainable urbanisation. We will focus on four key areas, namely Energy & Environment, Urban Development, Connectivity and Asset Management, all part of a connected value chain, while putting sustainability at the core of our strategy.

We are applying the lens of sustainability to the Group's major investment decisions. With the risks and impact of climate change becoming more evident, we have introduced a shadow carbon price in the evaluation of all major investments. This would help us better understand the carbon footprint of our business activities and the possible impact of future carbon taxes, and also avoid potential stranded assets. Over and above running our business in a sustainable and environmentally responsible manner, we see Keppel playing a significant role in helping businesses and communities become more sustainable through the solutions that we provide. Beyond the solutions that Keppel is already well-known for, such as waste-to-energy (WTE) and water solutions, district cooling plants, green buildings and townships, we are pushing boundaries to explore and develop new solutions that can contribute to combatting climate change, while also opening up new profit pools for the Group.

The Board and management of Keppel Corporation regularly review as well as oversee the management and monitoring of the material environmental, social and governance (ESG) factors of the Company, and take them into consideration in the determination of the Company's strategic direction and policies.

The Group Sustainability Steering Committee provides oversight and guidance on strategic and operational issues. The committee is chaired by Mr Loh Chin Hua, Keppel Corporation's Chief Executive Officer (CEO) and Executive Director, and comprises CEOs of key business units across the Group.

Supporting the Steering Committee is the Group Sustainability Working Committee, co-chaired by Mr François van Raemdonck, Director of Group Strategy & Development and Managing Director of Keppel Technology & Innovation, and Mr Ho Tong Yen, Director of Group Corporate Communications, Keppel Corporation.

The working committee, comprising discipline-specific working groups with representatives from across our different businesses, executes and reports on the Group's efforts across the material ESG aspects.

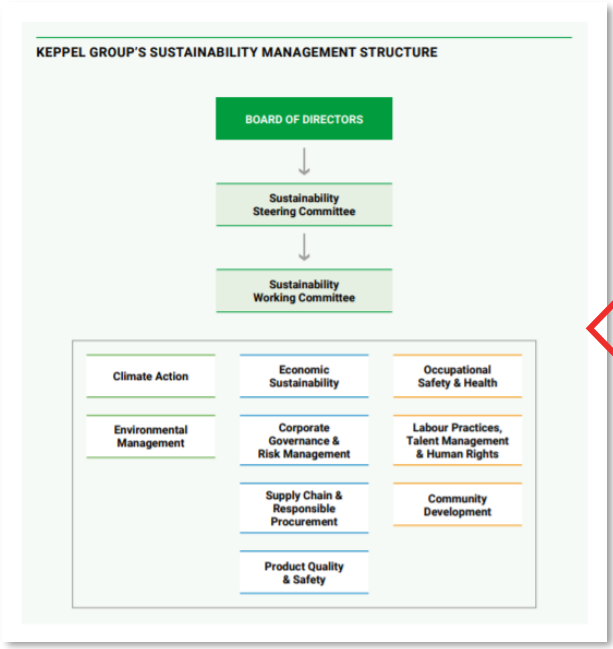
BOARD STATEMENT ON SUSTAINABILITY

"The key material environmental, social and governance factors for Keppel Corporation have been identified and are regularly reviewed by Keppel Corporation's Board of Directors and management. The Board oversees the management and monitoring of these factors and takes them into consideration in the determination of the Company's strategic direction and policies."

Keppel Corporation Board of Directors

Consideration of climate-related issues in strategy [Ga2]

Roles of Board, Group Sustainability Steering Committee and working committee [Gb1; Gb3]



Graphical presentation of governance structure [Gb2]

Mondi

Sustainability governance

Operating responsibly

Strong governance is fundamental to building a resilient and successful organisation in which sustainability is embedded at all levels. We engage openly and transparently with stakeholders across the value chain for a fair and inclusive business. Robust policies, standards and management systems guide our operations to address risks and opportunities and enable us to measure our performance and meet our commitments.

The Board and committees provide the leadership necessary to implement the principles of good corporate governance across the Group, ensuring all decisions and actions are based on integrity, responsibility, accountability, fairness and transparency. The Board reviews the performance approach and outcomes. Our Board members bring a wealth of experience and expertise to the Group. They are diverse in origin, gender, race, education and experience, and reflect the broad nature of our activities and our operational territories. At the end of 2020, we had two female directors (representing 25% of the composition of the Board) and one director of colour.

The Board delegates specific areas of responsibility to a number of committees. These have authority to make decisions according to their terms of reference. We have developed robust internal and external mechanisms to evaluate and report on performance and the effectiveness of management approach and systems. These mechanisms include reporting systems, benchmarks and stakeholder engagement and collaboration at various levels.

The results can lead to adjustments in our management approach, subject to the approval of relevant executives and, ultimately, the Board. Examples of such adjustments may be found throughout this report.

While the Board is ultimately responsible, accountability for sustainable development policies, systems, practices, commitments and actions, and the effectiveness of our approach to managing all aspects of sustainability, is monitored at three levels:

- The Sustainable Development (SD) Committee chaired by an independent non-executive director
- The Executive Committee chaired by the Group CEO
- The operational management team consisting of senior executives from across Group operations

Seven global specialist network groups provide expert insight and support to the business on specific sustainable development issues.

Acknowledgement that strong governance is fundamental for sustainability to be embedded in all levels of the organisation [Rc1]

Overview of its governance structure and describes the process and frequency on discussion of matters related to climate change [Ga1; Gb1; Gb3]

Mondi's Group Sustainable Development (SD) function

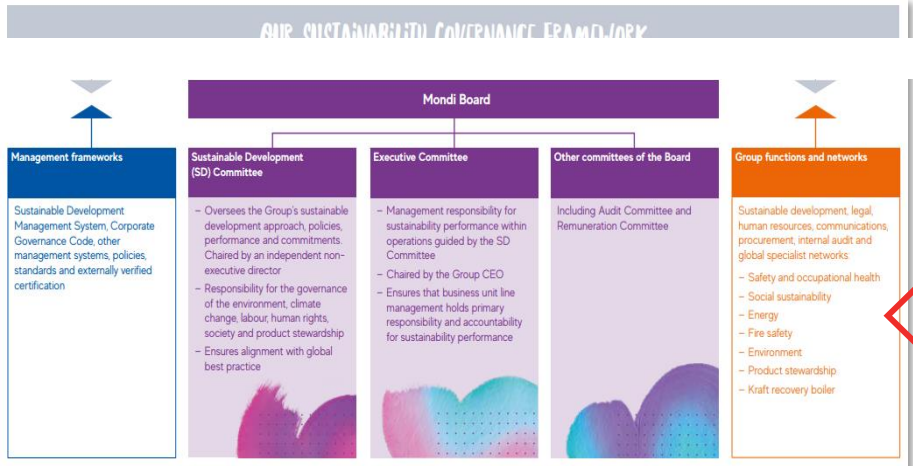
The Group SD function provides guidance and defines actions required to achieve our SD goals. This includes monitoring and assessing risks and opportunities along with emerging changes to the regulatory environment, developments in our social and environmental operating context, and evolving stakeholder needs and expectations. It informs, challenges and supports our businesses to respond to stakeholder needs and expectations and shapes our long-term response to global trends.

The SD function oversees the management of the Sustainable Development Management System (SDMS) and facilitates sustainability reporting, external assurance and internal and external engagement.

Our Sustainable Development Management System (SDMS)

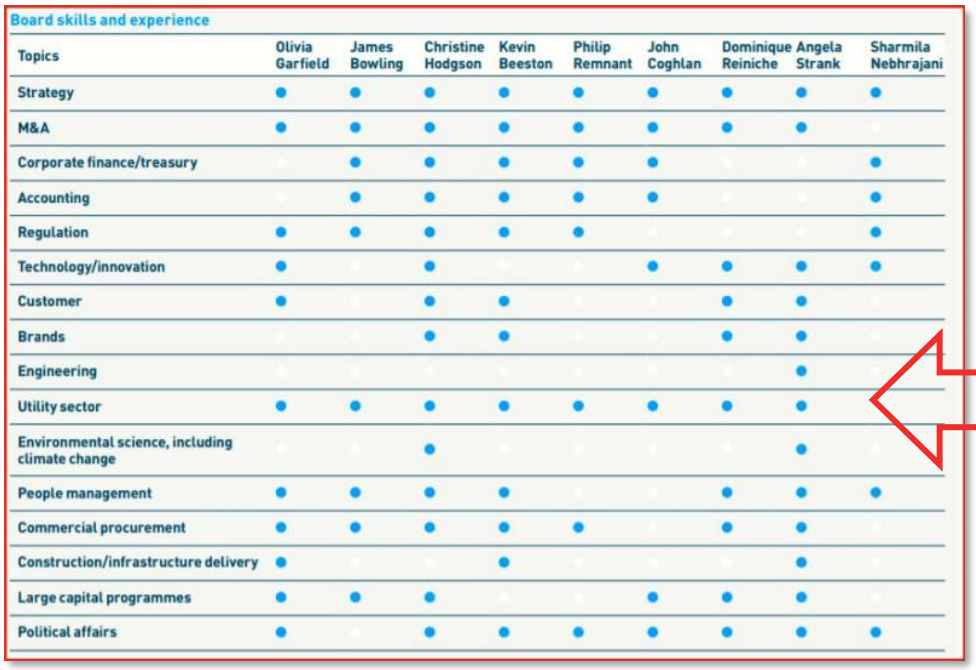
Policies, procedures and management systems enable us to apply a consistent and standard approach to sustainability throughout our operations. We consider the environmental, social and governance implications of our business decisions. Our SDMS guides effective governance of our activities and implementation of our policies and standards. It covers all facilities and activities that we manage and operate (including those in which we hold a controlling interest), new developments, and mergers and acquisitions. Activities undertaken by contractors, either on Mondi sites or while under our management, are incorporated into the SDMS and they are required to comply with our policies, standards and requirements.

How the Group Sustainable Development function monitors climate-related issues [Gb3]



Graphical presentation of governance structure and roles of various committees [Gb2]

Severn Trent



Board skills and experience

Topics	Olivia Garfield	James Bowling	Christine Hodgson	Kevin Beeston	Philip Remnant	John Coghlan	Dominique Reiniche	Angela Strank	Sharmila Nebhrajani
Strategy	●	●	●	●	●	●	●	●	●
M&A	●	●	●	●	●	●	●	●	
Corporate finance/treasury		●	●	●	●	●			●
Accounting		●	●	●	●	●			●
Regulation	●	●	●	●	●				●
Technology/innovation	●		●			●	●	●	●
Customer	●		●	●			●	●	
Brands			●	●			●	●	
Engineering								●	
Utility sector	●	●	●	●	●	●	●	●	
Environmental science, including climate change			●					●	
People management	●	●	●	●			●	●	●
Commercial procurement	●	●	●	●	●		●	●	
Construction/infrastructure delivery	●			●				●	
Large capital programmes	●	●	●			●	●	●	
Political affairs	●		●	●	●	●	●	●	●

Provided a skills matrix for board members, which included climate change [Ga3]

Strategy

SATS

Scenario Analysis

In FY2020-21, in response to the increasingly urgent need to transition to a low-carbon economy to mitigate the consequences of climate change, SATS committed to building our climate risk resilience in line with the TCFD's recommendations.

Following the TCFD's process, we developed climate scenarios that aim to assess the physical and transition[1] risks and opportunities that our businesses face. A series of workshops involving senior management and members from various departments were conducted to determine our exposure to climate-related impacts, assess the relative significance of key risks and opportunities, examine mitigating actions, and identify ways to build climate resilience. We remain dedicated to transparent disclosures and addressing climate-related risks and opportunities, which enables us to build climate resilience into our business and strategy.

To better understand how the changing climate may affect our direct operations and its value chain, we used what we term a "business as usual" scenario (4°C) and a strong mitigation scenario (1.5°C - 2°C) to assess our risks and opportunities in each. In the former scenario, greater focus is placed on assessing potential physical risks to our businesses as a result of events brought about by or related to climate change such as extreme weather, rising sea levels, drought, water stress and flooding. In comparison, the strong mitigation scenario placed greater emphasis on transition risks. In order to meet the goals laid out in the Paris Agreement regarding reductions in global levels of greenhouse gas (GHG) emissions and successfully transition to a more sustainable, low-carbon world, there needs to be radical changes in regulations, individual and organisational behaviour, and technological breakthrough.

[1] Transitioning to a low-carbon economy may entail extensive policy, legal, technology and market changes to address mitigation and adaptation requirements related to climate change.

Climate scenarios as a process to assess and prioritise climate-related issues [Sa3; Sb3; Ra1; Rb1]

The risks and opportunities discussed in each of the scenarios are listed below:

Business as usual scenario (4°C)	Strong mitigation scenario (1.5-2°C)
• Water stress • Raw material availability and prices • Extreme weather events (that result in property damage and loss of productivity) • Disruption to supply chain	• Changes in the aviation sector • Raw material costs (due to changes in the agriculture sector) • Changes in diets (with the growing availability and popularity of alternative proteins) • Carbon prices • Energy efficiency and renewable energy • Waste management

Description and potential impact	Mitigating actions
Physical risk: Extreme heat causing health hazards to workers, especially those working outdoors such as the tarmac, where there is direct exposure to weather elements. Heat-related illnesses among staff may lead to manpower shortage, disruption to operations and higher operational costs.	• Redesign uniforms using dry-fit material for staff exposed to long periods of heat and provide ample water breaks for hydration • Provide personal protection equipment (PPE) or cooling vests to staff (Ramp Operations)
Physical risk: Extreme weather may result in volatility in raw material prices, damage to physical assets, depressed market for air travel leading to loss in revenue and higher maintenance costs. Operational services such as flight scheduling and loading/off-loading services may also be affected.	• Develop local supply base and strategic partners • Develop preemptive supply chain strategy for higher risk areas (local and foreign) • Reduce wastage • Improve demand planning • Produce meals with longer shelf-life • Work with the relevant authorities to provide necessary infrastructure to ensure continuation of services
Transition risk: The lack of a robust sustainable procurement framework may lead to reputational risk and loss of market share for subsidiaries like Country Foods.	• Implement supplier onboarding checklist and process • Conduct regular engagements and audits to ensure that suppliers adopt sustainable practices
Transition risk: Regulatory changes such as the implementation of carbon tax, diesel tax, climate bond and legislation, fines and penalties, and higher insurance premiums, higher operational and facilities maintenance costs incurred in the transition towards becoming a low-carbon or carbon-neutral business	• Adopt the use of energy-efficient equipment • Implement heat recovery and renewable energy systems • Explore how circularity framework can be implemented • Replace internal combustion engine vehicles with electric vehicles • Increase natural lighting and the use of energy efficient equipment • Implement a sensor system to regulate lighting and air-conditioning • Replace parts with recyclable materials, where possible • Continual process optimisation • Concerted efforts to encourage and educate our people to reduce, reuse and recycle

How climate-related issues may affect its business and their impact on its business, strategy, operations, financial performance and value creation [Sc1; Sc2]

Singtel

Preparing for Enhanced TCFD

What : A pilot exercise for TCFD scenario analysis
Where : Northern Rivers region, New South Wales, Australia
Why : To update our Physical Risks from climate change and establish our first view of Transitional Risks to a low carbon economy

In the second half of FY2021, we undertook a detailed and bottom-up pilot programme to conduct a financial driver and materiality modelling assessment of both physical and transition climate impacts on the Northern Rivers and other regions in New South Wales, Australia.

The outcomes would enable us to improve our understanding of the business' overall risk profile in relation to Optus and Singtel Group's financials. We can then use the knowledge and implement specific actions to improve our resilience to climate change within the Northern Rivers region where we have seen major changes in climatic patterns over the past decade.

More importantly, the exercise helped us to identify key climate scenarios and design and planning parameters in network deployment which will be applied to an Australian nationwide exercise next year. We also identified the most material transitional risks under extreme scenarios and over different time periods, which will inform our strategy in managing and mitigating transitional risks related to transition to a low carbon economy across the Singtel Group.

Methodology
We carried out climate scenario and risk analysis using three different climate scenarios:
Scenario 1: Orderly transition with warming limited to 2°C by 2100 (RCP 2.6)
Scenario 2: Disruptive decarbonisation with warming limited to 2°C by 2100 (RCP 2.6)
Scenario 3: Delayed action with warming exceeding 4°C by 2100 (RCP 8.5)

Climate scenarios to determine climate-related issues [Sa3]

Scenarios and Time Horizons
We looked at the possible impact over three time-horizons: short (2030), medium (2040), and **long-term (2050 and beyond)** to better understand the following: (a) Alternative views of future climate trajectories (b) Key areas in our value chain likely to be affected (c) Robustness of our existing strategies and (d) Opportunities to proactively undertake mitigations.

We used scenarios 1 and 2 to stress test the transition impact on our business, as they presented policy transitions with the greatest business impact. We used scenarios 1 and 3 to stress test the physical impact on our business, as they presented a range of physical climate impact on our business. We then assessed each scenario over the three time-horizons.

Scenario		Description
Scenario One: Orderly transition *Warming limited to 2°C by 2100 RCP 2.6*		The global community agrees on the need to decarbonise. Global harmony achieves warming limited to 2°C in an orderly transition. This glide path, which is the least-cost option, will best protect economically sensitive regions from the physical and financial implications of climate change.
Scenario Two: Disruptive decarbonisation *Warming limited to 2°C by 2100 RCP 2.6*		Decarbonisation occurs in the same timeframe as the orderly transition scenario. However, the path is different, less cost effective and more disruptive. The lack of an early and clear pathway from the Australian and other governments on climate policy results in status quo followed by a series of policy shocks from 2030 to accelerate the progress of climate action.
Scenario Three: Delayed action *Warming exceeds 4°C by 2100 RCP 8.5*		No policy implementation or intervention to support an economical transition towards decarbonisation within the Australian economy. Physical impact of climate change and natural disasters are the most prominent under this scenario.

Relevant time horizons for the identification of climate-related issues [Sa1]

Key insights from pilot exercise

*(A) Transition risks and opportunities**

**The transition impact assessment was based on best available information, subject to certain assumptions and limitations. For example, as the Earnings Before Interest and Tax (EBIT) specific to Northern Rivers region was limited, the Northern Rivers revenue as a percentage of total Singtel Group revenue was used as a proxy before factoring new 5G rollout and Data Centres to calculate the apportionment of EBIT to establish an initial baseline for downstream refinement.*

Based on qualitative and quantitative assessment, we identified three transition risk levers that potentially would have the most impact on our business without any intervention or mitigation. We then outlined our strategic response to each risk lever. Overall, early action poses a lower level of economic disruption, especially over the next ten years (see Table 2 on page 22).

*(B) Physical risks and opportunities**

**The physical impact assessment was based on best available information, subject to certain assumptions and limitations. For example, the assessment focused on current assets and did not account for planned assets for 5G rollout and new data centres which we have the opportunity to factor in updated adaptation and design principles.*

We performed this assessment at an asset level, overlaying local climate hazards, asset costs and our business assets' cross-dependencies. We analysed 2,500 assets across six physical hazards: coastal inundation, forest fire, riverine flooding, extreme heat, extreme wind (storms) and soil contraction (drought).

1) Overall, forest fires, and coastal and riverine inundation are critical hazards we should focus our resilience efforts on.
   - Forest fires are projected to have the highest financial impact on capital expenditure for asset repair or replacement in 2030 and 2050.
   - Risks from coastal and riverine inundation are expected to moderately increase in 2030 and 2050, with the highest financial impact projected in 2100.
2) Site towers and site shelters are the asset types projected to incur the highest average Technical Insurance Premium due to physical climate change, increasing from about A$2,000 to A$4,000 per asset from 2030 to 2050 without proactive and adaptive network design and deployment.
3) Capital expenditure should be focused on network design and standards, and infrastructure resilience of site shelters and towers against forest fires in the near to medium term, and against coastal inundation in the long-term. We have since identified three critical sites due to their coastal locations, forest fire risk or high dependencies of the business on these sites.

Climate-related issues and their impact in the related time horizons [Sa2]

Table 2: Transition Risk Levers, Business Impact and Response

Lever	Risk level of findings*	Potential impact on business without mitigation	Singtel Group's strategic response and mitigation
Capital allocation Impact due to early retirement of energy intensive network and data centre assets to facilitate the transition to a low-carbon economy.	**Material risk:** Under scenarios 1 and 2, capital allocation poses the most material downside risk out of the three levers due to policy uncertainty leading to abrupt retirement of less energy-efficient network assets under a scenario of extreme policy shock.	Policy uncertainty over energy efficiency requirements may lead to abrupt retirement of less energy-efficient network assets in a policy shock, causing material financial impact at the EBIT level around FY2030.	We regularly conduct early planning into capital upgrades and always adopt the most energy efficient technologies in our networks and data centres to minimise the need for early retirement of our network assets. We are well advanced in our legacy chiller replacement programme, resulting in significant carbon abatement.
Counterparty risk Impact due to other parties within Optus'	**Minor to Moderate risk:** Counterparty risk poses the smallest risk to our business,	Net impact on EBIT is minor in the orderly transition scenario, and moderate in the disruptive	We will continue to be proactive in our climate ambitions and encourage

How resilient the strategies are to identified risks [Sc3]

How strategies change to address identified risks [Sc2]

Not without risks in Australia:
Too fast too soon into renewable energy!

As companies look to accelerate their transition to low carbon, this is not without its share of transitional risks. In Australia, these risks include:

a. Reliable energy generation from wind and solar farms due to variable weather conditions
b. Lack of economical battery storage to guarantee supply given that critical telecommunications infrastructure requires reliable and consistent energy supply 24/7
c. Legacy power transmission grid constraints limit full generation capacity of renewable energy projects
d. Signing energy pricing contracts at a higher price with falling wholesale market or future price of renewable energy

For example in 2015, extreme fluctuations of wind and solar supply in South Australia combined with coal power plants shutdown led to critical shortage of energy supply and skyrocketing wholesale energy prices. In 2020, COVID-19 led to the collapse of world oil and gas prices resulting in significant reduction in wholesale energy prices. Some Australian companies that entered early into PPAs had to write down legacy renewable energy assets and account for derivative losses.

How an identified climate issue has affected the business and its impact [Sb2]

Example of Transitional Risks in Singapore:
Carbon Neutral Data Centres?

A Singapore government moratorium was earlier issued that new data centre developments would be considered only from 2021. Data centres consume a huge amount of energy and are a key energy growth driver in Singapore given the increased in cloud services and the country's position as a regional data centre hub (Singapore is the second most attractive city globally according to Arcadis Data Centre Location Index 2021). Should a decision be made at a policy level that all new data centres must be fully carbon neutral, it could be an example of transitional risk to a low carbon economy.

ThaiBev

STRATEGY

Each of ThaiBev's product groups, together with Sustainability Development Working Team (SDWT) and the Corporate Risk Management Working Team, conducted:

- A natural hazard and physical risk assessment of their production sites to identify climate-related risks. ThaiBev also extended this assessment to suppliers, to identify areas of water stress and other climate-related risks, with the end goal to improve resilience and resource efficiency in the supply chain.
- Risks and opportunities assessment related to a low carbon economy transition, as well as potential measures to address such risks, e.g., through using renewable energy, improving energy efficiency, and capacity building.

ThaiBev has identified a timeframe of climate-related physical and transition risks as follows; Short term (1-3 years), Medium term (3-10) years, and Long-term >10 years. Identified climate-related risk and opportunity are presented below in Table 2 and Table 3.

Relevant time horizons for the identification of climate-related issues [Sa1]

TABLE 2: THAIBEV'S CLIMATE TRANSITION AND PHYSICAL RISKS

The following table summarizes climate-related financial risks that have been identified by ThaiBev.

TRANSITION RISKS	PHYSICAL RISKS
POLICY AND LEGAL COMPLIANCE **1. Water Tariff** Possibility of increased production costs of beverage products caused by an increased water tariff in Thailand, from the endorsement of a new National Water Resources Act in December 2018. **Timeframe:** Short term 0-3 years **2. Carbon Pricing** Carbon-pricing policies may be applied in Thailand in the future, which will affect ThaiBev's	**ACUTE** Natural disasters and increasing occurrence of extreme weather events, such as floods, storms and landslides can cause damage to ThaiBev's production plants causing delays or stopping production and supply chain disruptions, including increasing costs of operation and damage compensation. ***Timeframe:*** Long term >10 years

Organisation of risks into transition risks and physical risks

How each climate-related issue affects ThaiBev [Sb1; Sb2]

TABLE 3: THAIBEV'S CLIMATE TRANSITION OPPORTUNITIES

Climate-related financial opportunities for ThaiBev are presented in the table below.

CLIMATE OPPORTUNITIES	DESCRIPTION
TRANSITION TO CIRCULAR ECONOMY	ThaiBev utilizes a significant amount of resources for the manufacture of its products. In the future, a greater proportion of those resources can be produced using the circular economy concept. This could be a financial opportunity if there is recycling in the countries ThaiBev operates in and if the cost of technology makes it financially feasible. It could be an opportunity once recycled materials become cheaper than virgin materials. Example of recyclable materials include PET, aluminum, and paper; composting food waste; and potential materials produced by future technology. ***Timeframe:*** Short term 1-3 years

Financial impact of each climate-related issue [Sa2]

Time horizon for each climate-related issue [Sa2]

PILLAR 2: TRANSITION RISKS/GHG MITIGATION

Mitigate the risks towards a low carbon transition:
take transformative steps to mitigate GHG emissions, invest in low carbon solutions, and foster sustainable product development to meet the future market demands and address transition risks.

HIGHLIGHTS:

Renewable Energy and Operation Efficiency

Solar Rooftop Project:
installation of solar plant, with a total capacity of 20 megawatts (MWh) on the rooftop of 27 factories in Thailand and one in Myanmar which will be completed by 2025.

Biogas Plants Investment:
ThaiBev invested in two biogas plants (generate energy with by-product of alcohol distillation) in Nakhon Sawan and Nong Khai Provinces, in addition to five existing biogas plants. The new projects are expected to reduce GHG emission by 76,000 tCO2e per year.

Low Carbon Products:
ThaiBev currently has 22 products from beer and non-alcoholic beverage (64% of total income) that have received approval for the Thailand Greenhouse Gas Management Organization (TGO) Carbon Footprint of Products (CFP)[1] and Carbon Footprint Reduction (CFR)[2] certification.

Packaging & Circular Economy:
ThaiBev worked with business partners to develop innovation e.g. low carbon plastic shrink film, using recycle polyethylene (PE), which helps reduce plastic waste by 45 tons and reduce GHG emission by 53 tCO_2e per year.

[1] *Carbon Footprint of Product certification is defined as Greenhouse Gas emissions (GHG) of a product through its life cycle stages. The CFP could be used as labeling information disclosed on products and services for facilitating decision in choosing products and services. (TGO, 2020)*

[2] *Carbon Footprint Reduction certification is a label that demonstrates a certified Carbon Footprint of Product (CFP) and its emissions reduction based on the TGO eligible reduction criteria. (TGO, 2020)*

PILLAR 3: COMMUNITY

Communities:
Supporting climate action and sustainable livelihoods of local communities connected to its operations.

HIGHLIGHTS:

ThaiBev focuses on educating and training farmers as well as encouraging communities to help conserve forests, resources, and prepare for natural disasters. ThaiBev also collaborates with partner organizations to initiate projects aiming to improve communities' quality of life, stimulating local economies, and protecting

Impact of climate-related issues on ThaiBev's business and strategy [Sc1; Sc2]

Key steps towards a low carbon transition [Sb3]

Mondi

We identify and assess climate-related risks using our Group-wide risk management framework. We evaluate and report on our short- (up to 3 years), medium- (3–7 years) and long-term (more than 7 years) climate-related transition and physical risks and opportunities, and their financial implications. 'Transition risks' may occur when moving towards a less polluting, greener economy. Such transitions could mean that some sectors of the economy face big shifts in asset values or higher costs of doing business. Climate change means we may face more frequent or severe weather events like flooding, droughts and storms. These events bring 'physical risks' that impact our society directly and have the potential to affect the economy.

We are committed to adhering to internationally accepted recommendations – such as the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) – to investigate and report our climate-related risks and opportunities. The TCFD recommends applying widely-used reference scenarios that are publicly available and peer reviewed. We assess the financial implications of climate-related risks according to the TCFD recommendations[3], considering a 2°C scenario[4] and a business-as-usual scenario.[5] We revised our climate-related risks and opportunities in 2020.

As part of this revision, we have quantified the potential financial impacts of climate change on certain parts of our business. The tables on the next two pages provide more detail on the risks and opportunities that we have evaluated.

We continue to develop and improve our understanding of these risks and will update our reporting accordingly.

Read more about our risk management in our Integrated report on pages 74–75

For a full index of where to find our climate-related financial disclosures, please see page 59 **in our Integrated report**

Disclosure of climate-related risks and opportunities, time horizons and impact [Sa1; Sa2]

Climate change

5 **Understanding what the climate crisis means for our business**

Our climate-related risks[6]

	Risk description and impact	How we manage and mitigate the risk
GHG regulatory changes Regulatory induced costs for GHG emissions may increase due to carbon tax and emission trading schemes Timeframe: medium-term	Nine of Mondi's 13 pulp and paper mills fall under the EU Emissions Trading Scheme (EU ETS). While most of these mills have sufficient ETS allowances, there is potential that four will face a deficit in the period beyond 2020. In addition, the South African government charges a carbon tax on emissions from fossil fuels, which includes fossil fuel combustion at our Richards Bay and Merebank operations. 1.6 million tonnes or 45% of Mondi's total Scope 1 GHG emissions are covered by carbon tax or emission trading schemes. We estimate the potential impact of carbon or similar taxes on our business to be around €10 million per annum.	We collect detailed information on GHG emissions from our mills and ensure the cost of carbon is factored into our investments. Our science-based GHG reduction target is based on the energy efficiency (e.g. modernisation of our manufacturing and energy generation equipment) and low carbon energy investments we expect to implement to reach our targets by 2025. Our ongoing investment in low carbon technology and energy efficiency will reduce the regulatory risk of insufficient CO_2 allowances, especially at our EU-based operations.
Chronic changes in precipitation Water supply must be maintained to sustain operations in water scarce regions Timeframe: long-term	Extended water shortages are a concern as they could disrupt production at our operations. This is relevant in water scarce regions such as South Africa. Water supply to our Richards Bay mill is already under pressure from urban development. The potential effect of reduced production due to water shortages at our Richards Bay mill is estimated at up to €10 million per annum.	During the recent drought in South Africa, we significantly reduced specific contact water consumption at our Richards Bay mill by implementing closed loops and recycling water used in our processes. We are working with local authorities and other industries to identify solutions to enhance water stewardship across the entire water catchment surrounding Richards Bay. We have conducted water stewardship assessments at our Richards Bay mill and two plantations in South Africa to understand their water use and impacts. We are now using the outcomes to investigate cost-effective improvements to local water management systems.
Supply chain impacts Climate change may result in fibre yield losses in Mondi's forests Timeframe: medium-term	Increased severity and frequency of extreme weather events may result in disruptions and decreased harvesting capacity of our managed forests. Extreme weather conditions may impact forests and plantations through sustained higher temperatures, which can lead to stronger winds and increased windfalls. Plantations may be vulnerable to changes in rainfall patterns and erosion. Higher temperatures may increase vulnerability of forests to pests and diseases. Exacerbated by drought conditions, fire remains a challenge for our South African plantations, which we believe are more vulnerable to fibre yield losses than our Russian forests. We estimate the financial impact due to potential yield losses in our South African plantations could be up to €15 million per annum.	Our tree improvement programme aims to produce stronger, more robust hybrids that can resist disturbances such as drought, pests and diseases. We mitigate fire risks with naturally vegetated open corridors acting as fire-breaks between forest plantations. We have invested in a firefighting fleet at our South African plantations. We also minimise combustible material that remains behind at logging sites after harvesting operations. We have improved pre- and post-burning assessments at harvesting sites. These assessments aim to mitigate the risks of erosion and nutrient loss after prescribed burning to ensure healthy soils, which are critical for productive plantation forests.
Supply chain impacts We may face higher costs for externally procured fibre Timeframe: long-term	Temperature increase, changes in rainfall patterns and windstorms can result in large-scale forest damage in central Europe. At lower altitudes, fibre losses from bark beetle damage to spruce stands are expected to continue unless precipitation increases. Our mills in Europe are sensitive to the economic development of the sawmill industry. A reduction in the cutting capacity of the sawmilling industry due to a lack of spruce saw logs could lead to a change in the mix of available pulpwood and sawmill chips. Increasing competition for wood is being driven by demand for renewable raw materials and timber for green energy generation to achieve EU GHG reduction and Net Zero targets. At the same time, there is a call to increase forest areas set aside for conservation. All of this may contribute to increased pricing for wood, resulting in a potential risk of €20–70 million per annum in the long term.	In mountainous regions, we expect an increase in yearly forest growth due to rising temperatures. At lower altitudes, spruce will be mainly replaced with other softwood species. We are investigating alternatives to support flexibility in species mix for our future pulp production. We invest in research and development (R&D) projects and are building strategic partnerships with forest owners and industries, NGOs and scientific institutions to foster sustainable forest management. This is supported by the sustainable working forest model and fit-for-purpose certification concepts, which we developed and promote with our partners. We have started to explore approaches to climate-fit forestry to enhance forest ecosystems' resilience. We also promote the cascading use of wood nationally and via Cepi on a European level.
Risk of flooding Stricter flood protection needed according to revised flooding plans Timeframe: long-term	Our mills use large volumes of water and are often located close to rivers. The risk of flooding may increase due to surface water flooding (e.g. after extreme rainfall or rapid snow melting) or flooding of low-lying coastal regions (due to sea level rise). We have invested to mitigate the potential impact of flooding and have assumed we should not have a prolonged shut. In the event of flooding at one of our mills which are in higher risk areas, the cost is estimated at up to €10 million.	Our mills have revised their flood prevention plans and invested in flood protection, in some instances with government and energy companies running hydropower plants in adjacent areas. Detailed flooding plans consider potential flooding events caused by relevant sources of water and the topography and hydrogeology of the mills. Current assessments show the measures taken are generally sufficient and only a few additional smaller measures are required (e.g. elevation of motors and vulnerable equipment, additional pumps, water level sensors).
Stricter regulation Evolving requirements on effluent water temperature Timeframe: medium-term	Climate change may increase annual mean temperatures and the temperature of river water. We use surface water, including river water, in production and for cooling at our mills and energy plants. Higher water temperatures increase the amount of water needed for cooling and may lead to critical temperatures in the wastewater treatment plants. Our mills have permits for water withdrawal. In most cases, the permits contain water temperature limits for water discharge. We see a potential impact of €5 million per annum for measures to prevent exceeding water permission limits.	To mitigate the risk of increasing administrative expenses and fines, we are investigating investments in additional water-cooling equipment (e.g. cooling tower, heat exchanger) at some of our mills. For example, we are considering the construction of wastewater cooling towers at some of our mills.
Changing customer behaviour Trend towards recyclable, low carbon, renewable (fibre-based) products instead of plastic Timeframe: short- to long-term	The drive to replace plastic packaging with fibre-based alternatives is a significant opportunity for our business. However, certain plastic-based products within our portfolio could face lower demand due to this shift from plastic to paper. A significant proportion of the Group's flexible plastic-based packaging is focused on value-added segments, serving mainly food, pet food and other consumer end-users. There are currently limited paper-based alternatives for a significant proportion of these products, which contain barrier properties (such as moisture, grease, gas properties, etc.) to preserve and protect products. We estimate the potential operating profit impact due to loss of some commodity plastic business at around €5 million per annum.	We're leading the industry in researching innovative design for our products, including flexible plastic-based sustainable packaging solutions. We believe in using paper where possible, plastic when useful to create high-quality products with a focus on circularity. A significant proportion of our flexible plastic-based packaging products is focused on value-added segments, mainly serving food, pet food and other consumer end-users, where packaging requires barriers or functionality to protect the product from farm to fork and avoid food waste. We are developing a range of recyclable barrier paper solutions to replace plastic, as well as a range of recyclable flexible plastic solutions for applications requiring plastic barrier functionalities.
Our climate-related risk	**We estimate the potential impact of climate change risks on our business could be up to €125 million per annum**	

Details the impact of climate change that includes non-financial capitals such as access to raw materials and supply chain impacts [Sb2]

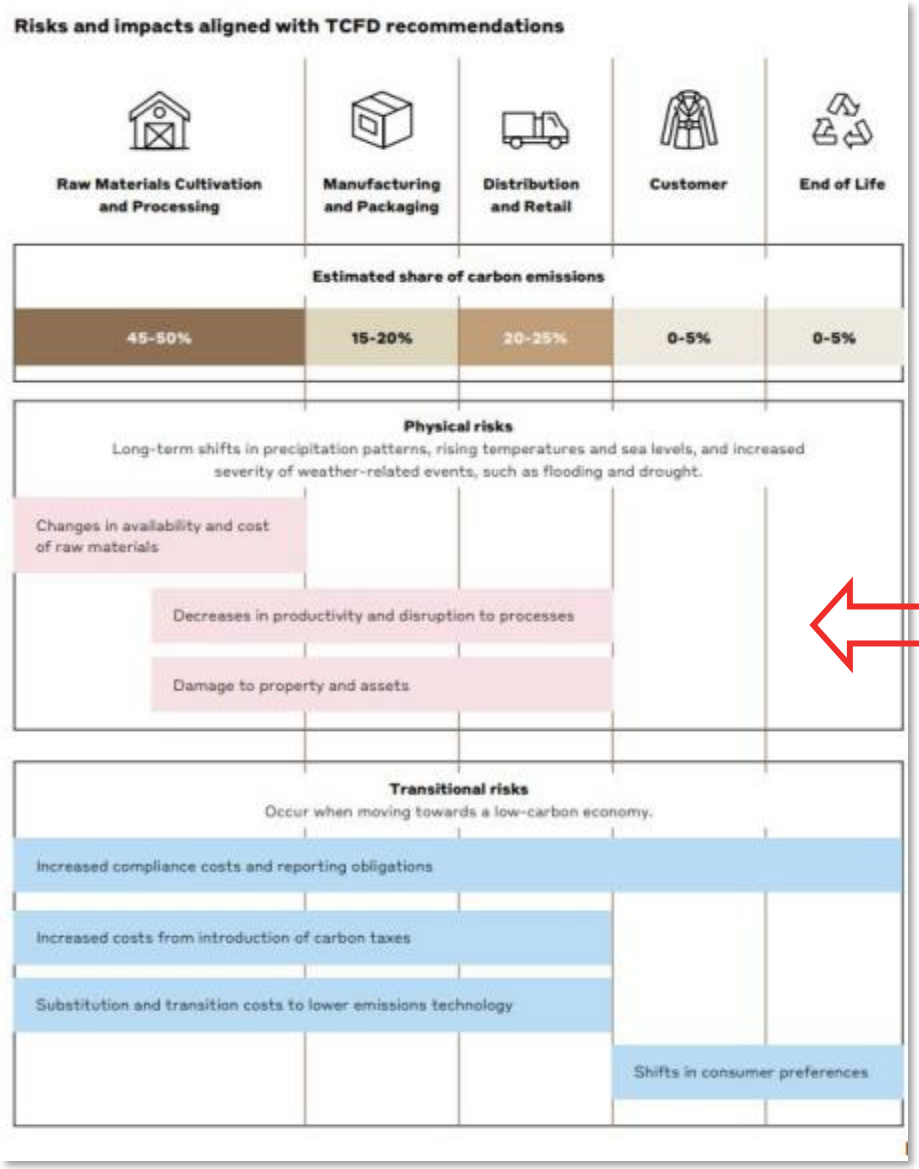
Further details are also provided on the impacts on the business, and management and mitigation efforts in response [Sb2; Rb2; Rb3]

Our climate-related opportunities

	Description of the opportunity	How we realise the opportunity
Avoided GHG emissions and secondary raw materials Instead of incinerating by-products from pulp production, low-carbon, biomass-based chemicals can be sold as secondary raw materials Timeframe: short-term	By-products of the kraft pulping process include turpentine and tall oil. These renewable by-products are highly valued as a substitute for fossil fuel-based materials. They can be used internally for energy generation or extracted, purified and sold as higher secondary raw materials. We are investigating opportunities to use other by-products (e.g. lignin from black liquor and Eucalyptol extraction) to create additional revenue streams. The potential additional income from this opportunity is estimated at around €30 million per annum.	The extraction and sale of renewable by-products from the kraft pulping process is part of our circular economy approach. We are exploring options to further utilise these renewable by-products. Additional investment is needed to extract and purify these by-products. For example, we have upgraded our tall oil extraction plant at our mill in Syktyvkar, which has enabled us to increase the volumes and improve our efficiency. Depending on the existing infrastructure at our other mills, further investments may be required. See case study on page 46.
Reduced operating costs through energy efficiency Identify and realise energy savings using global experts across our energy network Timeframe: medium-term	The production of pulp, paper and packaging is energy-intensive and energy generation is the major source of our GHG emissions. By improving the energy efficiency of our energy plants and manufacturing operations, we estimate potential energy cost savings of around €15 million per annum.	Investing in optimising energy and process efficiencies in our operations has been a long-standing focus. Since 2015, we have invested around €500 million in energy efficiency measures and in increasing biomass-based energy in our mills. We plan further investment projects to meet our science-based GHG reduction targets over the coming years. They will reduce our specific energy costs and allow the utilisation of materials with high energy content, which are currently treated as waste.
Substitution of natural gas with biogas Reduced energy costs by using biogas from the anaerobic wastewater process Timeframe: short- to medium-term	Biogases – such as methane and hydrogen – are the end-products of anaerobic wastewater treatment and can be used as a fuel. Anaerobic wastewater treatment plants are used when the chemical oxygen demand (COD) load of waste water is high and fairly constant, conditions which are typical in the recycled pulp process. By introducing further anaerobic wastewater treatment plants at our mills, we estimate potential savings of about €2 million per annum.	In 2020, we avoided 7,798 tonnes of CO_2e by substituting natural gas with 0.14 million GJ biogas generated in anaerobic wastewater treatment plants at our mills. To realise the full potential of this opportunity, we would need to install new anaerobic wastewater treatment plants (where feasible).
Changing customer behaviour Trend towards recyclable, low carbon, renewable (fibre-based) products instead of plastic Timeframe: short- to long-term	The drive to replace plastic packaging with recyclable, low carbon and renewable fibre-based alternatives is creating significant opportunities for fibre-based packaging producers. Mondi, as a leading packaging paper producer, is strongly positioned to benefit from the increased demand for fibre-based solutions that are renewable and recyclable by design. Based on third-party reports, the Group has estimated that the market opportunity in Europe for fibre-based packaging solutions to replace plastic could potentially be in the region of €4–€8 billion over the next decade. The Group has not quantified the specific opportunity to Mondi but believes it is well positioned to take advantage of this opportunity.	As a leading producer of both paper and flexible plastic-based packaging, Mondi is in a unique position to leverage the Group's innovation capabilities, leading market positions and strong customer base. We actively collaborate with customers using our EcoSolutions customer-centric approach to develop innovative solutions that are Sustainable by Design. This includes developing our range of recyclable functional barrier papers as an alternative to plastic-based solutions. We are investing in our asset base and increasing our cost-advantaged paper capacity to meet growing demand. Initiatives include a €67 million investment to convert a containerboard machine at our Štětí mill to produce speciality kraft paper for shopping bags and a €370 million investment in a new kraft top white machine and related pulp mill upgrade at our Ružomberok mill. See case study on page 58. We are leveraging strong partnerships to bring about positive change and drive the transition to a circular economy.
Transition of plastic-based products The growing customer demand for recyclable plastic-based products and/or the amount of recycled content contained within these solutions Timeframe: medium- to long-term	The growing focus on sustainable packaging is driving investment, collaboration and innovation by producers to meet evolving customer needs. This is increasing the focus on recyclability of plastic packaging and/or amount of recycled content contained within solutions. Our flexible plastic-based packaging offering is focused on delivering sustainable solutions to customers, developing innovative products through R&D and technical know-how, and extending our leading market positions. We are strongly positioned to preserve our current portfolio and gain market share from other producers unable to transition and develop fit-for-purpose, recyclable flexible-plastic based products or products made from sufficient recycled content. We believe we are well positioned to take advantage of that opportunity.	The Group has a strong focus on developing sustainable plastic-based flexible packaging to drive the development of recyclable products and those that contain a sufficient proportion of recycled content. To realise the opportunity, we will continue to partner with our customers, collaborate with other industry players and invest in strategic initiatives.
Our climate-related opportunities	Around **€50 million per annum** (excludes the potential opportunity from changing customer behaviour and the transition to plastic-based products, which have not yet been quantified)	

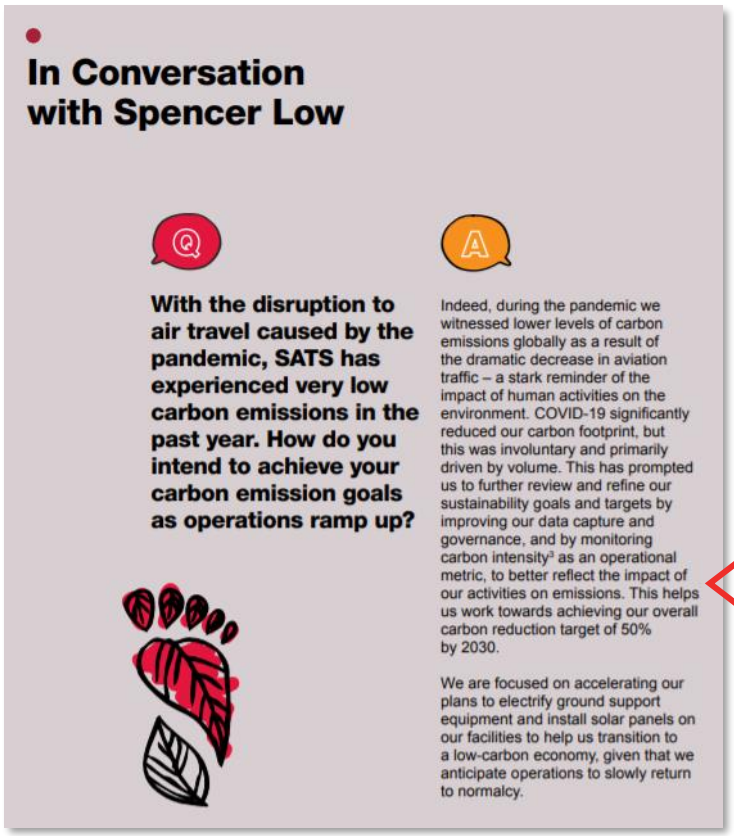
Disclosure of financial impact of climate-related risk and opportunity [Sb3]

Burberry



Identified multiple physical and transition-related risks, contextualising them throughout their value chain and with an estimated share of carbon emissions for each stage [Sa3]

SATS



In Conversation with Spencer Low

With the disruption to air travel caused by the pandemic, SATS has experienced very low carbon emissions in the past year. How do you intend to achieve your carbon emission goals as operations ramp up?

Indeed, during the pandemic we witnessed lower levels of carbon emissions globally as a result of the dramatic decrease in aviation traffic – a stark reminder of the impact of human activities on the environment. COVID-19 significantly reduced our carbon footprint, but this was involuntary and primarily driven by volume. This has prompted us to further review and refine our sustainability goals and targets by improving our data capture and governance, and by monitoring carbon intensity[3] as an operational metric, to better reflect the impact of our activities on emissions. This helps us work towards achieving our overall carbon reduction target of 50% by 2030.

We are focused on accelerating our plans to electrify ground support equipment and install solar panels on our facilities to help us transition to a low-carbon economy, given that we anticipate operations to slowly return to normalcy.

How an identified climate issue has affected the business and its impact on adaptation and mitigation activities [Sb1; Sb2]

Singtel

Figure 2: Singtel Group's Climate Action Journey Towards Net Zero by 2050

FY2015 Climate Change identified in Singtel Group's stakeholder engagement and materiality review	**FY2020** • Only Southeast Asian company among a pioneer group of 28 global companies in July 2019 that committed to keeping global temperature increase within 1.5°C and net zero emissions by 2050 • Signed our first renewable energy Power Purchase Agreement (PPA) for our Singapore operations
FY2016 Life Cycle Assessment (LCA) performed to advise on material environmental issues in our extended value chain	**FY2021** Completed TCFD pilot study of physical and transitional climate risks of our operations in northern NSW, Australia
FY2017 Climate Change rose in impact and importance in stakeholder and materiality assessment	**FY2022** Launched Singtel Group's first and largest Singapore-dollar denominated sustainability-linked loan
FY2018 Among first companies globally to endorse the TCFD Framework	**FY2030** SBTi target to reduce absolute Scope 1 and 2 carbon by 42%, and Scope 3 by 30% from 2015 baseline
FY2018 Singtel Group's science-based carbon targets approved in October 2017, first in Asia ex-Japan	**FY2050** Towards net zero by 2050 in support of GSMA's pathway for the ICT and mobile industry

FY2015 FY2016 FY2017 FY2018 FY2019 FY2020 ****** FY2030 ****** FY2050

Achieved A- leadership rating for CDP 2017-2020

Achieved carbon emissions intensity reduction of 70% in FY2020 since FY2015

Progressive granular understanding, tracking and reporting of carbon footprint

Internal energy efficiency initiatives to level carbon growth

Renewable Energy Power Purchase Agreement

Ongoing design and implementation of infrastructure adaptation and resilience, including research for public policy advocacy

• Group climate scenario (<2°C and 4°C) and adaptation exercise conducted
• TCFD drivers Identified

TCFD data collection, assessment, stakeholder discussions and disclosures

Full Scope 3 carbon assessment

Actions
Achievements
Aspirations

Graphical presentation of past actions and current plans to reach Net Zero by 2050 [Sb3]

ThaiBev

Insight

BJC Glass has been using cullet in our production process since 1951. A strategic partnership with ThaiBev started in 2016 through a supplier and customer collaboration. With existing ThaiBev infrastructure across Thailand, the 2 companies have formed a partnership in the cullet supply chain, resulting in benefits to both parties. The partnership has so far led to 334,000 tonnes of cullet being recycled, or an equivalent to 18% of annual recycled cullet used by BJC Glass. BJC Glass is able to use up to 50% cullet in the smelting process, compared to 25% typically used in European glass factories. Using cullet helps to reduce energy consumption in the melting process, and avoids waste being sent to landfills. Glass produced from cullet has no reduction in strength or other properties, so it is a truly circular process. An estimated 0.24 $kgCO_2e$ per bottle is avoided per kg of recycled cullet used in the production process. In wider sustainability, BJC Glass is able to realize economic benefits such as reduced raw material price and streamlined supply chain operations. In the social field, we see opportunities being provided through additional income for communities in collecting and selling cullet to Thai Beverage Recycle or BJC Glass. We also have established campaigns and promotional materials to increase awareness around the opportunities and benefits to society of glass recycling. As a supplier to ThaiBev, we also collaborate on initiatives such as lightweight packaging design for glass bottles. Bottle weight reduction can reduce the carbon footprint of ThaiBev products, as lightweight bottles save emissions in the production process and logistic operations.

Vichien Rungwattanakit
President of Packaging
and Engineering Business
Berli Jucker Public Co., Ltd.

How an identified climate issue has affected the business and its impact on ThaiBev's supplier and its collaboration with ThaiBev [Sb1; Sb2]

Temasek

Given the nascent nature of this field and the uncertain path ahead, we adopt a scenario-based approach to ascertain the potential impact of different temperature pathways. In our analysis, we cater for varying response from corporates, governments and households to mitigate climate-related risk. By doing so, this enhances the dynamism of our approach.

We incorporate the climate scenario analysis, alongside other macroeconomic or geopolitical events, within our Temasek Geometric Expected Return Model (T-GEM), which uses a scenario-based approach to simulate our 20-year long term expected returns.

We use a Medium Ambition climate scenario in our baseline, which assumes all countries follow through with the key commitments adopted in the Paris Agreement. More specifically, we apply the Shared Socioeconomic Pathway 2 (SSP2) with RCP (Representative Concentration Pathway) 4.5.

Given the inherent uncertainty of the global trajectory and returns, in T-GEM, we simulate our 20-year expected returns under different alternate scenarios. We model two alternate scenarios: 1) one of Low Ambition, with zero transition impact but high physical costs expected in the longer term; and 2) one of High Ambition, with much higher nearer term transition costs to avert or reduce the longer term physical costs.

The table below summarises the scenarios:

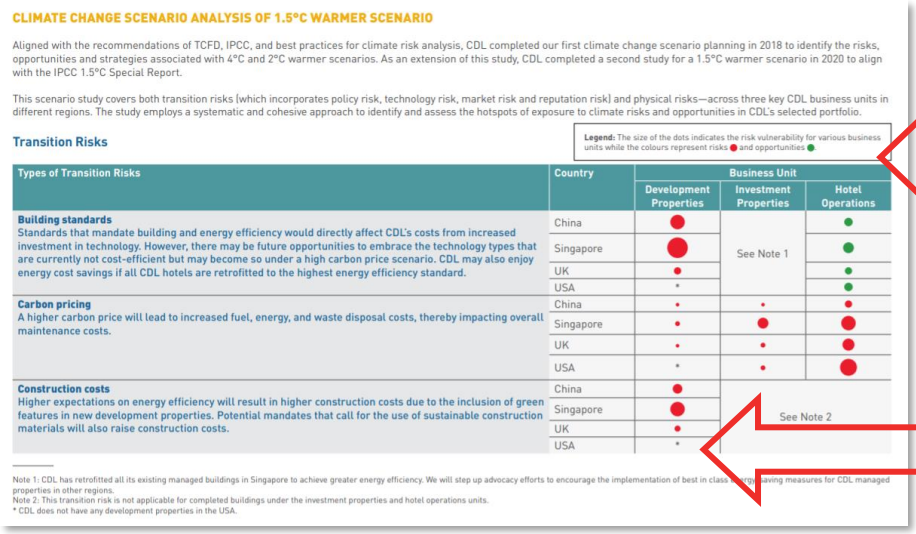
Name	Scenario	Description	Temperature increase (by 2100)
Low Ambition	SSP2-Baseline	Business as usual (BAU) scenario reflecting only existing climate policies and predicted technology cost trends, with no further policy changes.	4.0°C
Medium Ambition	SSP2-45	Assumes immediate policy action with gradual adaptation and relatively less disruption; full availability of carbon dioxide removal technologies is also assumed.	2.0 - 2.2°C
High Ambition	SSP2-26, FPS	Incorporates likely effects of more ambitious climate policies to limit global warming below 2°C, which involves much greater near-term transition costs and a reliance on negative emissions technologies.	1.7°C

We expect this to be an iterative process as we gain further insights into climate science, regulatory developments and actions from various key stakeholders. Therefore, we seek to evolve and enhance our analysis moving forward, through regular engagement with leading experts in this field.

Relevant links to understand risk terminologies and frameworks [Ra2]

Climate-related scenarios and analysis [Sb3]

CDL



CLIMATE CHANGE SCENARIO ANALYSIS OF 1.5°C WARMER SCENARIO

Aligned with the recommendations of TCFD, IPCC, and best practices for climate risk analysis, CDL completed our first climate change scenario planning in 2018 to identify the risks, opportunities and strategies associated with 4°C and 2°C warmer scenarios. As an extension of this study, CDL completed a second study for a 1.5°C warmer scenario in 2020 to align with the IPCC 1.5°C Special Report.

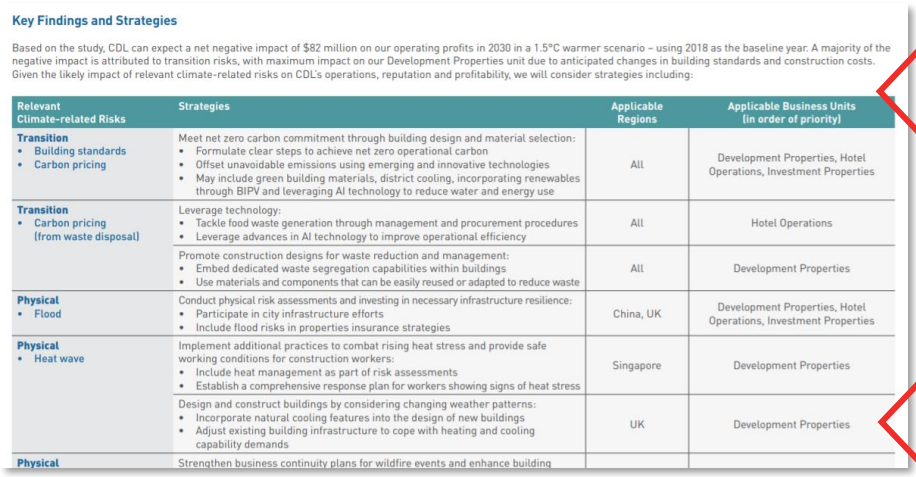
This scenario study covers both transition risks (which incorporates policy risk, technology risk, market risk and reputation risk) and physical risks—across three key CDL business units in different regions. The study employs a systematic and cohesive approach to identify and assess the hotspots of exposure to climate risks and opportunities in CDL's selected portfolio.

Transition Risks

Legend: The size of the dots indicates the risk vulnerability for various business units while the colours represent risks ● and opportunities ●

Types of Transition Risks	Country	Business Unit		
		Development Properties	Investment Properties	Hotel Operations
Building standards Standards that mandate building and energy efficiency would directly affect CDL's costs from increased investment in technology. However, there may be future opportunities to embrace the technology types that are currently not cost-efficient but may become so under a high carbon price scenario. CDL may also enjoy energy cost savings if all CDL hotels are retrofitted to the highest energy efficiency standard.	China	●	See Note 1	●
	Singapore	●		●
	UK	●		●
	USA	*		●
Carbon pricing A higher carbon price will lead to increased fuel, energy, and waste disposal costs, thereby impacting overall maintenance costs.	China	●	●	●
	Singapore	●	●	●
	UK	●	●	●
	USA	*	●	●
Construction costs Higher expectations on energy efficiency will result in higher construction costs due to the inclusion of green features in new development properties. Potential mandates that call for the use of sustainable construction materials will also raise construction costs.	China	●	See Note 2	
	Singapore	●		
	UK	●		
	USA	*		

Note 1: CDL has retrofitted all its existing managed buildings in Singapore to achieve greater energy efficiency. We will step up advocacy efforts to encourage the implementation of best in class energy saving measures for CDL managed properties in other regions.
Note 2: This transition risk is not applicable for completed buildings under the investment properties and hotel operations units.
* CDL does not have any development properties in the USA.



Key Findings and Strategies

Based on the study, CDL can expect a net negative impact of $82 million on our operating profits in 2030 in a 1.5°C warmer scenario – using 2018 as the baseline year. A majority of the negative impact is attributed to transition risks, with maximum impact on our Development Properties unit due to anticipated changes in building standards and construction costs. Given the likely impact of relevant climate-related risks on CDL's operations, reputation and profitability, we will consider strategies including:

Relevant Climate-related Risks	Strategies	Applicable Regions	Applicable Business Units (in order of priority)
Transition • Building standards • Carbon pricing	Meet net zero carbon commitment through building design and material selection: • Formulate clear steps to achieve net zero operational carbon • Offset unavoidable emissions using emerging and innovative technologies • May include green building materials, district cooling, incorporating renewables through BIPV and leveraging AI technology to reduce water and energy use	All	Development Properties, Hotel Operations, Investment Properties
Transition • Carbon pricing (from waste disposal)	Leverage technology: • Tackle food waste generation through management and procurement procedures • Leverage advances in AI technology to improve operational efficiency	All	Hotel Operations
	Promote construction designs for waste reduction and management: • Embed dedicated waste segregation capabilities within buildings • Use materials and components that can be easily reused or adapted to reduce waste	All	Development Properties
Physical • Flood	Conduct physical risk assessments and investing in necessary infrastructure resilience: • Participate in city infrastructure efforts • Include flood risks in properties insurance strategies	China, UK	Development Properties, Hotel Operations, Investment Properties
Physical • Heat wave	Implement additional practices to combat rising heat stress and provide safe working conditions for construction workers: • Include heat management as part of risk assessments • Establish a comprehensive response plan for workers showing signs of heat stress	Singapore	Development Properties
	Design and construct buildings by considering changing weather patterns: • Incorporate natural cooling features into the design of new buildings • Adjust existing building infrastructure to cope with heating and cooling capability demands	UK	Development Properties
Physical	Strengthen business continuity plans for wildfire events and enhance building		

Applicable countries of operations and business units for each climate-related issue [Sc1]

Resilience of business to each climate-related issue in a 1.5°C warmer scenario [Sc3]

Potential financial impact of climate-related issues is described [Sc2]

Consideration of possible strategies to address each risk, with applicable regions and business units stated [Sc2]

Unilever

Climate-related scenarios with time horizons and analysis of potential financial impact [Sa1; Sa2]

Understanding financial impact: scenario analysis

Scenario analysis helps us to understand the potential impact of climate change on our business in 2030 to inform our strategy and financial planning. We used two types of scenario analysis:

1. Modelling the potential financial impact of average global temperature increases of 2°C and 4°C on our business in 2030.
2. Deep-dive analysis of the potential financial impact of climate change on three of our key agricultural commodities: soy, black tea and palm oil.

We plan to extend our scenario analysis to assess the impact of 1.5°C temperature increases to reflect the latest science and our commitment to limit global temperature increases, to well below 2°C and ideally no more than 1.5°C above pre-industrial levels.

1. Modelling the potential financial impact of 2°C and 4°C temperature increases on our business

We have made a high-level assessment of the impact of 2°C and 4°C temperature increases due to climate change by 2100. Carried out in 2017, the assessment focused on the material impacts on our business in the year 2030. The modelling assumed that our business activities are the same as they are today. The scenarios were based on existing internal and external data.

While we understand that policy risk and physical impact can happen simultaneously, we made the following simplifying assumptions:

- In the 2°C scenario, we assumed that in the period to 2030 society acts rapidly to limit greenhouse gas emissions and puts in place measures to restrain deforestation and discourage emissions (for example implementing carbon pricing at $75-$100 per tonne, taken from the International Energy Agency's 450 scenario). We have assumed that there will be no significant impact to our business from the physical ramifications of climate change by 2030 – i.e. from greater scarcity of water or increased impact of severe weather events. The scenario assesses the impact on our business from regulatory changes.
- In the 4°C scenario, we assumed climate policy is less ambitious and emissions remain high so the physical manifestations of climate change are increasingly apparent by 2030. Given this we have not included impacts from regulatory restrictions but focus on those resulting from the physical impacts.

We identified the material impacts on Unilever's business arising from each of these scenarios based on existing internal and external data. The impacts were assessed without considering any actions that Unilever might take to mitigate or adapt to the adverse impacts or to introduce new products which might offer new sources of revenue as consumers adjust to the new circumstances.

The main elements of the 2°C scenario are as follows:

- Carbon pricing is introduced in key countries and hence there are increases in both manufacturing costs and the costs of raw materials such as dairy ingredients and the metals used in packaging.
- Zero net deforestation requirements are introduced and a shift to sustainable agriculture e.g. Climate Smart Agriculture, puts pressure on agricultural production, raising the price of certain raw materials.

The main impacts of the 4°C scenario are as follows:

- Chronic and acute water stress reduces agricultural productivity in some regions, raising prices of raw materials.
- Increased frequency of extreme weather (storms and floods) causes increased incidence of disruption to our manufacturing and distribution networks.
- Temperature increase and extreme weather events reduce economic activity, GDP growth and hence sales levels fall.

Our analysis shows that, without action, both scenarios present financial risks to Unilever by 2030, predominantly due to increased costs. However, while there are financial risks which would need to be managed, we would not have to materially change our business model. The most significant impacts of both scenarios are on our supply chain where costs of raw materials and packaging rise, due to carbon pricing and rapid shift to sustainable agriculture in a 2°C scenario and due to chronic water stress and extreme weather in a 4°C scenario. The impacts on sales and our own manufacturing operations in the scenarios tested are relatively small.

Scenario: Potential impact of a 2°C temperature increase by 2100 (transition impacts)

Scenario drivers	Potential financial impact in 2030 if no actions to mitigate risks are taken
Increased costs due to carbon pricing.	Turnover: **Not material** Expenditure: Estimated increase of **€0.8bn**
Increased raw material costs from zero net deforestation policies and a shift to sustainable agriculture.	Turnover: **Not material** Expenditure: Estimated increase of **€0.9bn**

Scenario: Potential impact of a 4°C temperature increase by 2100 (physical impacts)

Scenario drivers	Potential financial impact in 2030 if no actions to mitigate risks are taken
Chronic and acute water stress reduces agricultural productivity in some regions, raising prices of raw materials.	Turnover: **Not material** Expenditure: Estimated increase of **€2.7bn**
Increased frequency of extreme weather (storms and floods) causes increased incidence of disruption to our manufacturing and distribution networks.	Turnover: Estimated reduction of **€0.4bn** Expenditure: **Not material**
Temperature increase and extreme weather events reduce economic activity, GDP growth and hence sales levels fall.	Turnover: Estimated reduction of **€2.1bn** Expenditure: **Not material**

Lendlease

Describe potential climate-related scenarios (including a lower than 2°C scenario) and disclose sensitivity and types of impact on the various business units [Sc3]

Our strategic resilience to climate related impacts

The assessment of the five CRIs per scenario most likely to appear in the medium term has indicated a greater resilience (higher residual positive sensitivity) in our business strategy to our Paris Aligned scenario, a world that sees continued global commitment to the Paris Agreement. Our recent commitment to being a 1.5°C aligned business has created positive sensitivities to our Transformation scenario. As with all real estate companies, we have negative sensitivities to the physical impact of climate change in a more than 3°C warmed world, our Polarisation scenario. The integration of climate risk assessments into our investment decision making processes has seen reduced residual sensitivities to climate impacts.

Scenario	Climate Related Impact	Residual Sensitivity		
		Development	Construction	Investment
Polarisation scenario (>3°C) Our Polarisation Scenario sees a world where climate action is delayed by the polarisation of climate action. This delay results in a world where physical climate change risks are the greatest across our three scenarios. The integration of 'Leadership in Sustainability' as a strategic priority and our Net and Absolute Zero Carbon targets sees high levels of positive sensitivity in both leadership in decarbonisation and a shift in consumer preference to secure and create resilient communities. Continued integration of physical climate risk assessments into our investment and business processes is essential to reducing negative sensitivities and building resilience to physical climate change risk.	Impact of climate change on assets and communities			
	Impact of climate change on the way we work			
	Shift in consumer preference toward secure and resilient communities			
	Industry leadership in decarbonisation valued			
	Impact of climate change on cities			
Paris Alignment scenario (2–3°C) Our Paris Alignment Scenario sees a market led transition to a lower carbon future through global government commitments to the Paris Agreement, resulting in higher regulation to climate action and with lower physical impacts of climate change compared to our Polarisation scenario. There are many 'difficult to decarbonise' products and materials in our supply chain, including cement, steel and aluminium. The cost of decarbonisation in our supply chain creates negative sensitivities for future development opportunities. Our commitment to Absolute Zero Scope 3 emissions will drive action in our supply chain, creating resilience in our strategy. Our leadership in sustainability and carbon targets creates similar positive sensitivities to decarbonisation as per our Polarisation scenario.	Increase speed of change in climate related impacts			
	Increase cost of carbon			
	Demand for decarbonisation of supply chain			
	Increased scrutiny over actions versus branding			
	Industry leadership in decarbonisation valued			
Transformation scenario (<2°C) Our Transformation Scenario sees a rapid decarbonisation pathway, where global emissions peak in 2020 and are close to zero in 2040. The speed of change that is needed to limit global warming to 1.5°C is likely to create negative sensitivities in our supply chain as suppliers try to keep pace with decarbonisation demands and shifting preferences towards localisation. Our leadership in sustainability and carbon targets create similar positive sensitivities to decarbonisation, as per our Polarisation and Paris Alignment scenarios.	Increase speed of change in climate related impacts			
	Local companies preferenced over global ones			
	Shifting social licence to operate expectations			
	Industry leadership in decarbonisation valued			
	Shifting consumer preferences towards lower impact living			

Higher negative sensitivity — Higher positive sensitivity

Risk Management

CapitaLand

representatives from all business units.

ii and iii. Strategy and Risk Management	**Physical Risks** Climate change brings about different effects in different geographies including rising sea levels, violent storms, long intense heat waves, flash floods and fresh water depletion. 2020 was the second hottest year on record according to NASA (National Aeronautics and Space Administration of the United States) data. The ways in which CapitaLand's portfolio could be impacted by such physical risks are diverse, complex and uncertain. **Transitional Risks** The challenge for each nation is to strengthen its resilience against climate change risks, manage its GHG emissions and achieve economic growth in a sustainable manner. More stringent regulations may be expected, and companies may be faced with increased expectations from stakeholders. • The Singapore government imposed a carbon tax of S$5 per tonne of GHG on facilities producing 25,000 tonnes or more of GHG in a year and will review the carbon tax rate by 2023, with plans to increase it to between S$10 and S$15 per tonne of emissions by 2030. The Singapore government submitted its enhanced Nationally Determined Contribution (NDC) under the Paris Agreement, and committed to peak its absolute emissions at 65 million tonnes of carbon dioxide equivalent (tonnes CO_2e) around 2030, aspiring to halve emissions from its peak to 33 million tonnes CO_2e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century. Singapore aims to review the trajectory and level of its carbon tax and review its outcome in Singapore's Budget 2022. In 2021, Singapore unveiled the SG Green Plan 2030[2]. Under the Energy Re-set segment, built environment targets were set including 80% of new buildings to achieve a 'Super Low Energy' green rating by 2030. • In 2020, China announced its plan to peak emissions before 2030 and achieve carbon neutrality by 2060. There will be an estimated 75% increase in the demand for green energy in efforts to replace the gaps left by fossil fuels. It has given priority to solar, wind, storage and nuclear power projects to help achieve its targets. In its five-year target, China has also prioritised green finance and will strengthen information disclosure on climate issues to encourage financial institutions to cut emissions and strengthen international cooperation to meet global targets. • India has announced its plan to achieve net zero by 2050. The country aims to increase renewable power to 450 GW by 2030 through its investment in the solar and agricultural sectors. Targets have also been set to reduce emissions intensity of GDP by 33-35% by 2030. • Europe has set its plan to reduce GHG by at least 55% by 2030 and achieve climate neutrality by 2050. Targets are currently being drafted on revising and expanding the EU Emission Trading System, adapting the Effort Sharing Regulation and the framework for land use emissions, reinforcing energy efficiency and renewable energy policies. Transitional risks towards a low-carbon economy will see increase carbon costs to businesses through the implementation of carbon tax and higher energy costs, higher expectations on energy efficiency due to change in regulations and increasing expectations from stakeholders. It is expected that such regulations will increase over time and will impact inefficient end users with increased operational costs.

Consideration of regulatory requirements and other relevant factors in its risk management [Ra1]

Olam

As a leading agri-business committed to ensuring transparency and action around climate-related risks and opportunities, we support the voluntary recommendations of the Financial Stability Board TCFD. The identification, assessment and management of climate-related risks and opportunities are fully embedded in our risk management process, and subject to continuous improvement.

There is now TCFD guidance for the agri-business sector. Olam, along with fellow members from the World Business Council for Sustainable Development – Storo Enso, Nestlé, Unilever, Syngenta, Mondi, and PwC – produced a guidance document called the 'Food, Agriculture and Forest Products TCFD Preparer Forum'. The report "aims to advance the implementation of the recommendations of the TCFD by providing commentary on members' individual experiences, supported by examples of effective practices". Implementing the recommendations of the TCFD will enable not just Olam but our wider stakeholders and peers to better understand, assess and act on climate-related risks.

One of the TCFD recommendations is to consider scenario analysis. In late 2020, we therefore initiated a Climate Change Scenario Analysis project. The scope covers our owned Plantations (Phase 1) and associated Processing and Transportation.

The objectives of this project are three-fold:

1. To assess climate change-related risks and opportunities to Olam in three climate scenarios – 1.5-, 2- and 4-degree scenario, at different timeframes (2030, 2050 and 2080).
2. To establish climate change resilience across the portfolio, through the provision of insights on potential financial implications to businesses across different commodities, geographies and business units.
3. To support future disclosures in line with the recommendations of the TCFD.

In this project, with the help of third-party consultants, we will develop a range of transition and physical risk scenarios, and quantify how they affect supply and demand conditions. From a business implications perspective, the project will help us understand and assess implications at an income statement and balance sheet level.

From the findings, we hope to identify key risks and opportunities; develop a set of strategic recommendations for Olam to mitigate identified risks; adapt to physical impacts; and capitalise on emerging opportunities. We will be supported by our tools such as AtSource and the Olam Integrated Impact Statement, as well as the multiple collaborative partnerships we have on the ground. Refer to the Natural Capital section of this report for more information. In the table below we map where the recommended TCFD disclosures can be found in our mainstream reports. We will continue to enhance our disclosures in future reporting cycles.

Climate-related scenarios

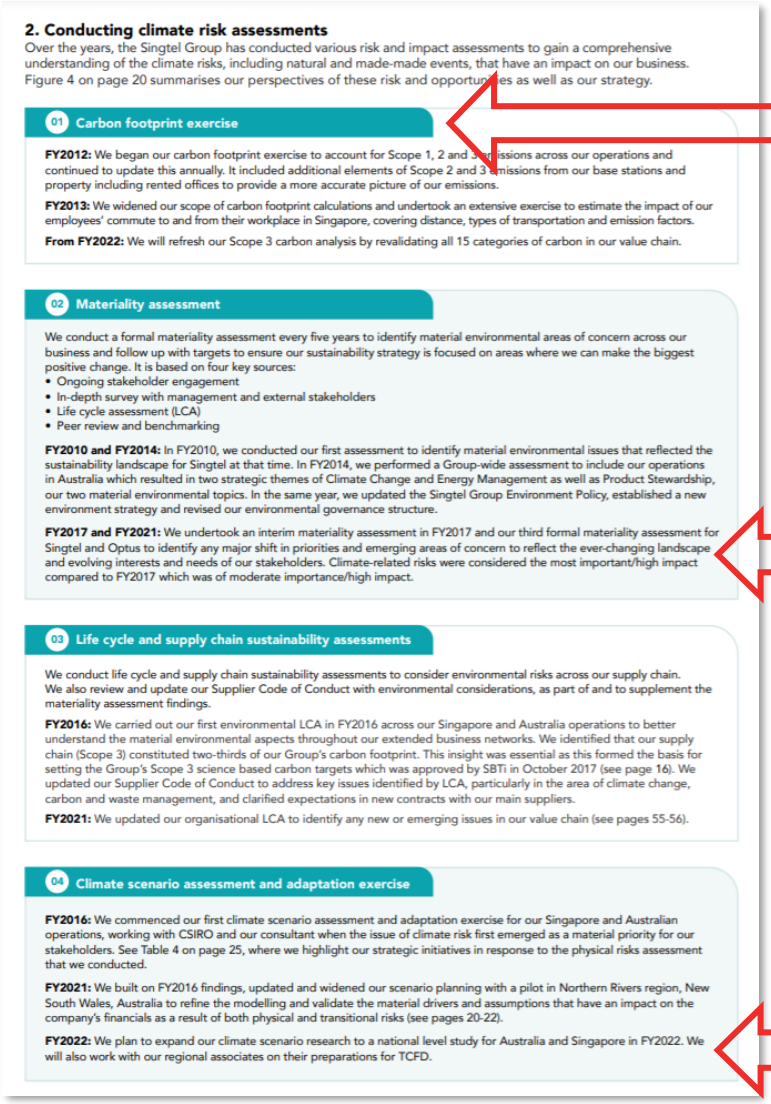
Process to identify, assess and quantify the size of risks [Ra3]

The Climate Transition: examples of risks and opportunities for Olam

Risk type[1]	Risk	Opportunity
Policy/ Legal Risk	Increased pricing of greenhouse gas emissions and other costs to comply with regulation (e.g. taxes on waste) leads to increase in operating costs, capital investment etc.	Diverse landscapes in Olam farming, supply chain and forestry operations offer carbon trading sustainable landscapes investment platform opportunities (new engine for growth).
	Requirements to provide detailed environmental information at product level (e.g. Scope 3 emissions or sequestered carbon) in different jurisdictions.	Integrated Impact Statement (IIS) enables Olam to identify Natural Capital stocks and flows (page 129[2]). AtSource enables Olam to provide customers with Scope 3 emissions, which leads to preferred supplier status (page 95).
	Regulations that promote biomass-based energy production and green building materials. Regulations to drive reforestation and afforestation of degraded areas.	Processing facilities using cocoa husks and other biomass waste, reduces emissions and energy costs. Olam Palm Gabon enabling government to partially replace fossil fuels through biofuel (page 58). Olam Purpose outcome is to Re-generate the Living World: focus of AtSource Plus and Infinity programmes. Reforestation supports ecosystem services which benefit pollination etc. – improved crop quality, and reduction of bought-in services.
Physical Risk	Increased incidence and severity of extreme weather events, such as cyclones and floods, impact crop volume and quality as well as assets e.g. warehousing.	Local, national and sector initiatives open up new partnerships to share/increase resources and develop new tools e.g. ~60 partnerships to deliver sustainability programmes; supporting the development of the Cool Farm Tool and Food Loss and Waste Calculator; participating in the Sustainable Rice Landscapes Initiative.
	Failure of farmers to adapt to climate change and	Training and support for farmers secures volumes and

Consideration of existing and emerging regulatory requirements related to climate change and other relevant factors [Ra1]

Singtel



2. Conducting climate risk assessments

Over the years, the Singtel Group has conducted various risk and impact assessments to gain a comprehensive understanding of the climate risks, including natural and made-made events, that have an impact on our business. Figure 4 on page 20 summarises our perspectives of these risk and opportunities as well as our strategy.

01 Carbon footprint exercise

FY2012: We began our carbon footprint exercise to account for Scope 1, 2 and 3 emissions across our operations and continued to update this annually. It included additional elements of Scope 2 and 3 emissions from our base stations and property including rented offices to provide a more accurate picture of our emissions.

FY2013: We widened our scope of carbon footprint calculations and undertook an extensive exercise to estimate the impact of our employees' commute to and from their workplace in Singapore, covering distance, types of transportation and emission factors.

From FY2022: We will refresh our Scope 3 carbon analysis by revalidating all 15 categories of carbon in our value chain.

02 Materiality assessment

We conduct a formal materiality assessment every five years to identify material environmental areas of concern across our business and follow up with targets to ensure our sustainability strategy is focused on areas where we can make the biggest positive change. It is based on four key sources:

- Ongoing stakeholder engagement
- In-depth survey with management and external stakeholders
- Life cycle assessment (LCA)
- Peer review and benchmarking

FY2010 and FY2014: In FY2010, we conducted our first assessment to identify material environmental issues that reflected the sustainability landscape for Singtel at that time. In FY2014, we performed a Group-wide assessment to include our operations in Australia which resulted in two strategic themes of Climate Change and Energy Management as well as Product Stewardship, our two material environmental topics. In the same year, we updated the Singtel Group Environment Policy, established a new environment strategy and revised our environmental governance structure.

FY2017 and FY2021: We undertook an interim materiality assessment in FY2017 and our third formal materiality assessment for Singtel and Optus to identify any major shift in priorities and emerging areas of concern to reflect the ever-changing landscape and evolving interests and needs of our stakeholders. Climate-related risks were considered the most important/high impact compared to FY2017 which was of moderate importance/high impact.

03 Life cycle and supply chain sustainability assessments

We conduct life cycle and supply chain sustainability assessments to consider environmental risks across our supply chain. We also review and update our Supplier Code of Conduct with environmental considerations, as part of and to supplement the materiality assessment findings.

FY2016: We carried out our first environmental LCA in FY2016 across our Singapore and Australia operations to better understand the material environmental aspects throughout our extended business networks. We identified that our supply chain (Scope 3) constituted two-thirds of our Group's carbon footprint. This insight was essential as this formed the basis for setting the Group's Scope 3 science based carbon targets which was approved by SBTi in October 2017 (see page 16). We updated our Supplier Code of Conduct to address key issues identified by LCA, particularly in the area of climate change, carbon and waste management, and clarified expectations in new contracts with our main suppliers.

FY2021: We updated our organisational LCA to identify any new or emerging issues in our value chain (see pages 55-56).

04 Climate scenario assessment and adaptation exercise

FY2016: We commenced our first climate scenario assessment and adaptation exercise for our Singapore and Australian operations, working with CSIRO and our consultant when the issue of climate risk first emerged as a material priority for our stakeholders. See Table 4 on page 25, where we highlight our strategic initiatives in response to the physical risks assessment that we conducted.

FY2021: We built on FY2016 findings, updated and widened our scenario planning with a pilot in Northern Rivers region, New South Wales, Australia to refine the modelling and validate the material drivers and assumptions that have an impact on the company's financials as a result of both physical and transitional risks (see pages 20-22).

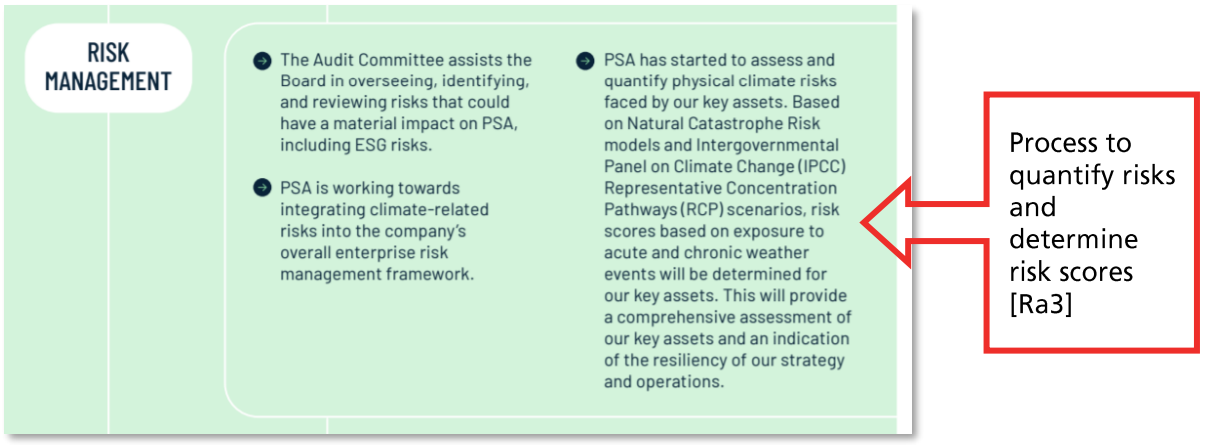
FY2022: We plan to expand our climate scenario research to a national level study for Australia and Singapore in FY2022. We will also work with our regional associates on their preparations for TCFD.

Processes to determine the climate-related issues that could have a material financial impact and their potential sizes and scopes [Ra3]

Processes for prioritising risks and materiality assessment [Rb1]

Description of future plans in addition to what had been done

PSA



Sembcorp

We evaluated our key climate-related risks (as mentioned above) and opportunities using near-term (2020 to 2022), medium-term (2023-2030) lenses, and also considered long-term (2031-2050) trends.

In 2019, we conducted a high level physical risk assessment of our energy and water operations. In 2020, we established a priority list for review of high risk assets.

We manage climate related risks and opportunities through the:

a) Inclusion of climate-related metrics in our Group President & CEO's performance scorecard
b) Transparent accounting and reporting of performance against climate-related metrics and set targets including responding to the CDP climate change programme and alignment of climate-related disclosures to TCFD recommendations

We have an Integrated Assurance Framework (IAF) which puts emphasis on the three lines of defence (LOD) model. Through the IAF structure, the respective LOD work together to ensure that key financial, operational, compliance and IT risks are reviewed and tested using a robust assurance process. We have commenced incorporating elements of climate risks in our IAF. In addition, the CCWC defined climate change topics and identified topic owners who have specific roles and responsibilities to establish and maintain a framework, process and workplan to identify, assess and manage climate-related risks and opportunities.

Integration of climate risk management into the organisation's overall risk management [Rc2]

Processes to manage climate-related issues [Rb2]

Temasek

Risk Management

Identification, assessment and management of climate-related risks form an integral part of overall risk assessment for new investments that we make, and across our portfolio. Over the long term, an understanding of climate-related risks will be embedded in our systems and processes.

The consideration of ESG-related risks, including climate risks, both transition and physical, is part of our overall investment analysis and is taken into account by the SDIC when it makes investment decisions. For example, we include a current internal carbon price of US$42 per tonne of carbon dioxide equivalent (tCO_2e), to assess the possible climate transition impact and to further guide our investment decisions.

Depending on the size or risk significance, these proposals may be escalated to our Executive Committee or Board for a final decision. Functional teams, including the Sustainability team and Risk Management Unit, provide additional specialist perspectives to SDIC and to the Executive Committee or Board.

For the success of our portfolio over the long term, we continuously track and manage climate-related risks to our portfolio, including at the individual asset level. We periodically update our overall ESG / climate-related risk exposure of our portfolio to Senior Management and our Board.

To read more on our Risk Management approach, please see Managing Risk.

Processes for managing risks and how they are integrated into overall risk management risks, including the use of an internal carbon price

United Utilities

RISK MANAGEMENT

We have a strong track record of risk management and of climate change disclosure. We continually mature our capacity and capability to manage risk and uncertainty to build and maintain long-term resilience across the corporate, financial and operational structures of the group.

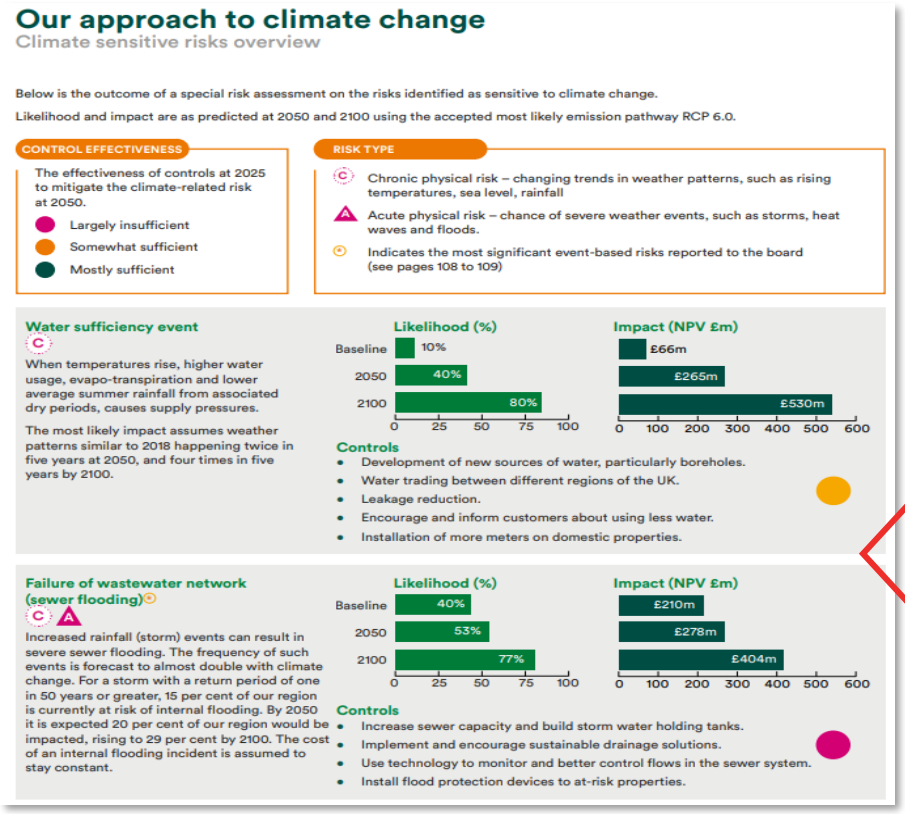
Our company risk management framework follows an enterprise-wide approach and covers all principal risk areas such as water service, supply chain and programme delivery.

Climate-related risks are identified, assessed and managed in the same way as any other risk through our embedded risk management framework which is described on pages 100 to 101. Having been identified, each business risk is assessed in two ways. First, we consider the likelihood of the event occurring based on multiple causal factors; secondly, we examine the full range of potential impacts and their severity should the event occur, from a minimum (best case) to a maximum (worst case) scenario.

We take a variety of approaches to identify and assess risks, including using risk breakdown structures and tools such as PESTLE to formalise horizon scanning, as well as complex modelling of the physical impacts of climate change on our water resources and wastewater management.

Horizon scanning such as tracking legal and regulatory changes, emerging technologies and comparison of our strategies with other companies is particularly useful when considering transitional risks. We have found risk breakdown structures and detailed modelling are better suited to acute or chronic physical risks.

Process to identify and assess risks, including the approaches and tools used [Ra1; Ra2]



Our approach to climate change

Climate sensitive risks overview

Below is the outcome of a special risk assessment on the risks identified as sensitive to climate change.

Likelihood and impact are as predicted at 2050 and 2100 using the accepted most likely emission pathway RCP 6.0.

CONTROL EFFECTIVENESS

The effectiveness of controls at 2025 to mitigate the climate-related risk at 2050.

- Largely insufficient
- Somewhat sufficient
- Mostly sufficient

RISK TYPE

- C — Chronic physical risk – changing trends in weather patterns, such as rising temperatures, sea level, rainfall
- A — Acute physical risk – chance of severe weather events, such as storms, heat waves and floods.
- Indicates the most significant event-based risks reported to the board (see pages 108 to 109)

Water sufficiency event

C

When temperatures rise, higher water usage, evapo-transpiration and lower average summer rainfall from associated dry periods, causes supply pressures.

The most likely impact assumes weather patterns similar to 2018 happening twice in five years at 2050, and four times in five years by 2100.

Likelihood (%)

Impact (NPV £m)

Controls

- Development of new sources of water, particularly boreholes.
- Water trading between different regions of the UK.
- Leakage reduction.
- Encourage and inform customers about using less water.
- Installation of more meters on domestic properties.

Failure of wastewater network (sewer flooding)

C A

Increased rainfall (storm) events can result in severe sewer flooding. The frequency of such events is forecast to almost double with climate change. For a storm with a return period of one in 50 years or greater, 15 per cent of our region is currently at risk of internal flooding. By 2050 it is expected 20 per cent of our region would be impacted, rising to 29 per cent by 2100. The cost of an internal flooding incident is assumed to stay constant.

Likelihood (%)

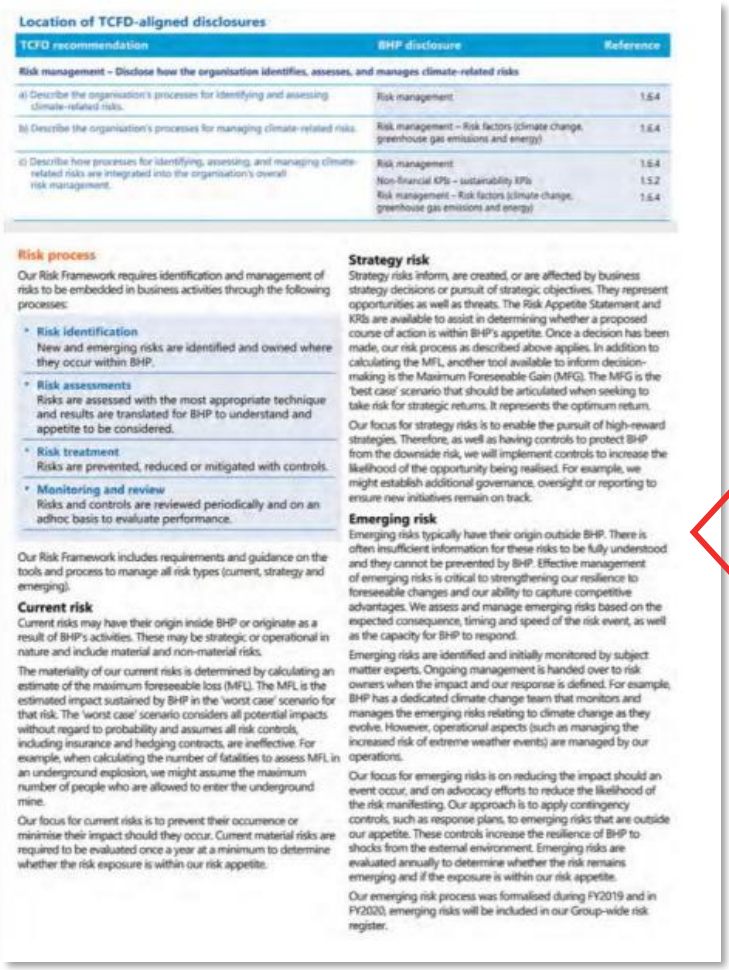
Impact (NPV £m)

Controls

- Increase sewer capacity and build storm water holding tanks.
- Implement and encourage sustainable drainage solutions.
- Use technology to monitor and better control flows in the sewer system.
- Install flood protection devices to at-risk properties.

Provides a graphical representation of its assessment of risks sensitive to climate change, which includes the likelihood and impact of the risks for two time periods and also highlights the controls in place to mitigate those risks [Rb2]

BHP



Location of TCFD-aligned disclosures

TCFD recommendation	BHP disclosure	Reference
Risk management – Disclose how the organisation identifies, assesses, and manages climate-related risks		
a) Describe the organisation's processes for identifying and assessing climate-related risks.	Risk management	1.6.4
b) Describe the organisation's processes for managing climate-related risks.	Risk management – Risk factors (climate change, greenhouse gas emissions and energy)	1.6.4
c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.	Risk management Non-financial KPIs – sustainability KPIs Risk management – Risk factors (climate change, greenhouse gas emissions and energy)	1.6.4 1.5.2 1.6.4

Risk process

Our Risk Framework requires identification and management of risks to be embedded in business activities through the following processes:

- **Risk identification**
  New and emerging risks are identified and owned where they occur within BHP.
- **Risk assessments**
  Risks are assessed with the most appropriate technique and results are translated for BHP to understand and appetite to be considered.
- **Risk treatment**
  Risks are prevented, reduced or mitigated with controls.
- **Monitoring and review**
  Risks and controls are reviewed periodically and on an adhoc basis to evaluate performance.

Our Risk Framework includes requirements and guidance on the tools and process to manage all risk types (current, strategy and emerging).

Current risk

Current risks may have their origin inside BHP or originate as a result of BHP's activities. These may be strategic or operational in nature and include material and non-material risks.

The materiality of our current risks is determined by calculating an estimate of the maximum foreseeable loss (MFL). The MFL is the estimated impact sustained by BHP in the 'worst case' scenario for that risk. The 'worst case' scenario considers all potential impacts without regard to probability and assumes all risk controls, including insurance and hedging contracts, are ineffective. For example, when calculating the number of fatalities to assess MFL in an underground explosion, we might assume the maximum number of people who are allowed to enter the underground mine.

Our focus for current risks is to prevent their occurrence or minimise their impact should they occur. Current material risks are required to be evaluated once a year at a minimum to determine whether the risk exposure is within our risk appetite.

Strategy risk

Strategy risks inform, are created, or are affected by business strategy decisions or pursuit of strategic objectives. They represent opportunities as well as threats. The Risk Appetite Statement and KRIs are available to assist in determining whether a proposed course of action is within BHP's appetite. Once a decision has been made, our risk process as described above applies. In addition to calculating the MFL, another tool available to inform decision-making is the Maximum Foreseeable Gain (MFG). The MFG is the 'best case' scenario that should be articulated when seeking to take risk for strategic returns. It represents the optimum return.

Our focus for strategy risks is to enable the pursuit of high-reward strategies. Therefore, as well as having controls to protect BHP from the downside risk, we will implement controls to increase the likelihood of the opportunity being realised. For example, we might establish additional governance, oversight or reporting to ensure new initiatives remain on track.

Emerging risk

Emerging risks typically have their origin outside BHP. There is often insufficient information for these risks to be fully understood and they cannot be prevented by BHP. Effective management of emerging risks is critical to strengthening our resilience to foreseeable changes and our ability to capture competitive advantages. We assess and manage emerging risks based on the expected consequence, timing and speed of the risk event, as well as the capacity for BHP to respond.

Emerging risks are identified and initially monitored by subject matter experts. Ongoing management is handed over to risk owners when the impact and our response is defined. For example, BHP has a dedicated climate change team that monitors and manages the emerging risks relating to climate change as they evolve. However, operational aspects (such as managing the increased risk of extreme weather events) are managed by our operations.

Our focus for emerging risks is on reducing the impact should an event occur, and on advocacy efforts to reduce the likelihood of the risk manifesting. Our approach is to apply contingency controls, such as response plans, to emerging risks that are outside our appetite. These controls increase the resilience of BHP to shocks from the external environment. Emerging risks are evaluated annually to determine whether the risk remains emerging and if the exposure is within our risk appetite.

Our emerging risk process was formalised during FY2019 and in FY2020, emerging risks will be included in our Group-wide risk register.

Comprehensive governance and risk management processes that address climate-related issues as well as a wide range of other issues discloses information in alignment with TCFD recommendations [Rc3]

Metrics and Targets

CDL

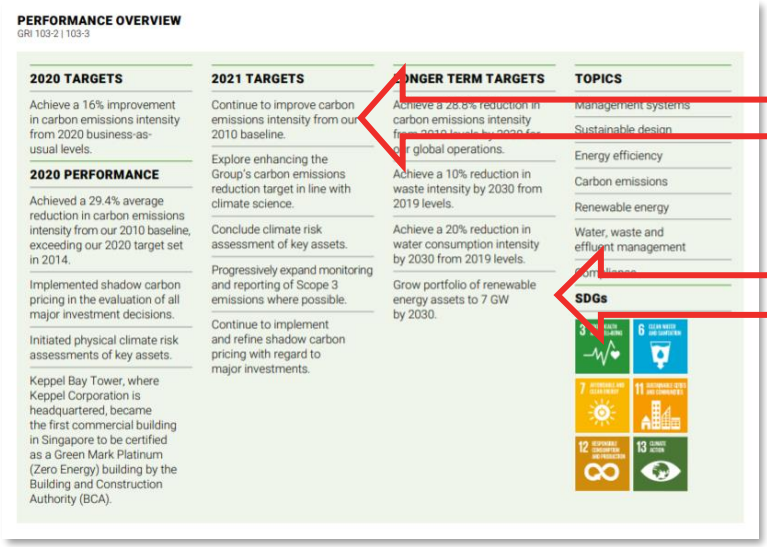
Indicator	Unit of Measurement	2016	2017	2018	2019	2020
Subsidiaries[6]						
CDLHT	m^3	459,072	493,028	514,207	353,202	**239,622**
Le Grove[7]	m^3	15,344	–	11,638	31,229	**19,002**
Tower Club	m^3	8,176	7,235	7,692	8,860	**5,685**
M&C	m^3	6,092,639	4,582,223	4,445,746	4,441,932	**2,888,659**
III. Waste Disposed						
Corporate Office	tonnes	13	17	17	15	**7**
Managed Buildings[8]	tonnes	4,419	4,425	4,220	3,929	**2,930**
Construction Sites	tonnes	13,523	3,796	1,345	2,995	**3,452**
IV. Waste Recycled						
Corporate Office	tonnes	n/a	n/a	n/a	3	**2**
Managed Buildings[8]	tonnes	2,457	730	693	739	**567**
Construction Sites	tonnes	2,426	1,350	1,180	5,160	**2,808**
V. GHG Emissions[9]						
Corporate Office						
Scope 1	tonnes CO_2e	39	31	22	19	**6**
Scope 2	tonnes CO_2e	262	224	0	0	**0**
Scope 3	tonnes CO_2e	543	492	410	459	**155**
Managed Buildings						
Scope 1	tonnes CO_2e	741	599	1,524	383	**1,449**
Scope 2	tonnes CO_2e	23,239	18,682	17,488	15,715	**12,405**
Scope 3	tonnes CO_2e	658	3,614	3,112	2,973	**2,330**
Construction Sites						
Scope 1	tonnes CO_2e	0	0	0	0	**0**
Scope 2	tonnes CO_2e	0	0	0	0	**0**
Scope 3	tonnes CO_2e	6,132	2,147	1,277	2,780	**2,405**

6 CBM and CSO are tenants within a building and water provided by their landlords is not metered separately.
7 Le Grove Serviced Residences was closed for renovation from December 2016 to July 2018.
8 Since corporate office waste data is reported separately, the waste figures for corporate office have been separated from managed buildings to avoid duplication.
9 Scope 2 GHG emissions reflected from 2018 onwards are reported using a market-based method to account for the procured energy attribute certificates. Carbon emissions arising from the construction activity carried out by builders are under Scope 3 carbon emissions to align with sector classification of GRI Business Activity Group Descriptions as recommended by the SBTi.

Key metrics categorised and disaggregated as appropriate for current and historical periods [Ma1]

Explanatory footnotes

Keppel



PERFORMANCE OVERVIEW
GRI 103-2 | 103-3

2020 TARGETS

Achieve a 16% improvement in carbon emissions intensity from 2020 business-as-usual levels.

2020 PERFORMANCE

Achieved a 29.4% average reduction in carbon emissions intensity from our 2010 baseline, exceeding our 2020 target set in 2014.

Implemented shadow carbon pricing in the evaluation of all major investment decisions.

Initiated physical climate risk assessments of key assets.

Keppel Bay Tower, where Keppel Corporation is headquartered, became the first commercial building in Singapore to be certified as a Green Mark Platinum (Zero Energy) building by the Building and Construction Authority (BCA).

2021 TARGETS

Continue to improve carbon emissions intensity from our 2010 baseline.

Explore enhancing the Group's carbon emissions reduction target in line with climate science.

Conclude climate risk assessment of key assets.

Progressively expand monitoring and reporting of Scope 3 emissions where possible.

Continue to implement and refine shadow carbon pricing with regard to major investments.

LONGER TERM TARGETS

Achieve a 28.8% reduction in carbon emissions intensity from 2010 levels by 2030 for our global operations.

Achieve a 10% reduction in waste intensity by 2030 from 2019 levels.

Achieve a 20% reduction in water consumption intensity by 2030 from 2019 levels.

Grow portfolio of renewable energy assets to 7 GW by 2030.

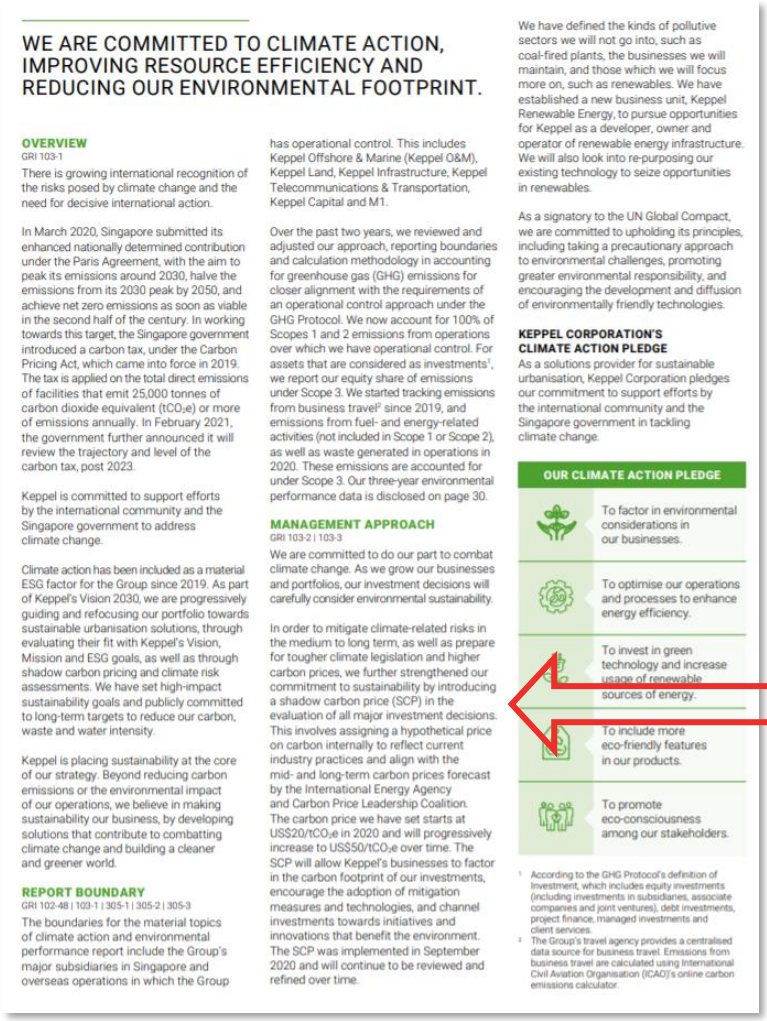
TOPICS

Management systems
Sustainable design
Energy efficiency
Carbon emissions
Renewable energy
Water, waste and effluent management
Compliance

SDGs

Qualitative interim targets [Mc2; Mc3]

Quantitative targets [Mc3]



WE ARE COMMITTED TO CLIMATE ACTION, IMPROVING RESOURCE EFFICIENCY AND REDUCING OUR ENVIRONMENTAL FOOTPRINT.

OVERVIEW
GRI 103-1

There is growing international recognition of the risks posed by climate change and the need for decisive international action.

In March 2020, Singapore submitted its enhanced nationally determined contribution under the Paris Agreement, with the aim to peak its emissions around 2030, halve the emissions from its 2030 peak by 2050, and achieve net zero emissions as soon as viable in the second half of the century. In working towards this target, the Singapore government introduced a carbon tax, under the Carbon Pricing Act, which came into force in 2019. The tax is applied on the total direct emissions of facilities that emit 25,000 tonnes of carbon dioxide equivalent (tCO_2e) or more of emissions annually. In February 2021, the government further announced it will review the trajectory and level of the carbon tax, post 2023.

Keppel is committed to support efforts by the international community and the Singapore government to address climate change.

Climate action has been included as a material ESG factor for the Group since 2019. As part of Keppel's Vision 2030, we are progressively guiding and refocusing our portfolio towards sustainable urbanisation solutions, through evaluating their fit with Keppel's Vision, Mission and ESG goals, as well as through shadow carbon pricing and climate risk assessments. We have set high-impact sustainability goals and publicly committed to long-term targets to reduce our carbon, waste and water intensity.

Keppel is placing sustainability at the core of our strategy. Beyond reducing carbon emissions or the environmental impact of our operations, we believe in making sustainability our business, by developing solutions that contribute to combatting climate change and building a cleaner and greener world.

REPORT BOUNDARY
GRI 102-48 | 103-1 | 305-1 | 305-2 | 305-3

The boundaries for the material topics of climate action and environmental performance report include the Group's major subsidiaries in Singapore and overseas operations in which the Group has operational control. This includes Keppel Offshore & Marine (Keppel O&M), Keppel Land, Keppel Infrastructure, Keppel Telecommunications & Transportation, Keppel Capital and M1.

Over the past two years, we reviewed and adjusted our approach, reporting boundaries and calculation methodology in accounting for greenhouse gas (GHG) emissions for closer alignment with the requirements of an operational control approach under the GHG Protocol. We now account for 100% of Scopes 1 and 2 emissions from operations over which we have operational control. For assets that are considered as investments[1], we report our equity share of emissions under Scope 3. We started tracking emissions from business travel[2] since 2019, and emissions from fuel- and energy-related activities (not included in Scope 1 or Scope 2), as well as waste generated in operations in 2020. These emissions are accounted for under Scope 3. Our three-year environmental performance data is disclosed on page 30.

MANAGEMENT APPROACH
GRI 103-2 | 103-3

We are committed to do our part to combat climate change. As we grow our businesses and portfolios, our investment decisions will carefully consider environmental sustainability.

In order to mitigate climate-related risks in the medium to long term, as well as prepare for tougher climate legislation and higher carbon prices, we further strengthened our commitment to sustainability by introducing a shadow carbon price (SCP) in the evaluation of all major investment decisions. This involves assigning a hypothetical price on carbon internally to reflect current industry practices and align with the mid- and long-term carbon prices forecast by the International Energy Agency and Carbon Price Leadership Coalition. The carbon price we have set starts at US$20/$tCO_2e$ in 2020 and will progressively increase to US$50/$tCO_2e$ over time. The SCP will allow Keppel's businesses to factor in the carbon footprint of our investments, encourage the adoption of mitigation measures and technologies, and channel investments towards initiatives and innovations that benefit the environment. The SCP was implemented in September 2020 and will continue to be reviewed and refined over time.

We have defined the kinds of pollutive sectors we will not go into, such as coal-fired plants, the businesses we will maintain, and those which we will focus more on, such as renewables. We have established a new business unit, Keppel Renewable Energy, to pursue opportunities for Keppel as a developer, owner and operator of renewable energy infrastructure. We will also look into re-purposing our existing technology to seize opportunities in renewables.

As a signatory to the UN Global Compact, we are committed to upholding its principles, including taking a precautionary approach to environmental challenges, promoting greater environmental responsibility, and encouraging the development and diffusion of environmentally friendly technologies.

KEPPEL CORPORATION'S CLIMATE ACTION PLEDGE

As a solutions provider for sustainable urbanisation, Keppel Corporation pledges our commitment to support efforts by the international community and the Singapore government in tackling climate change.

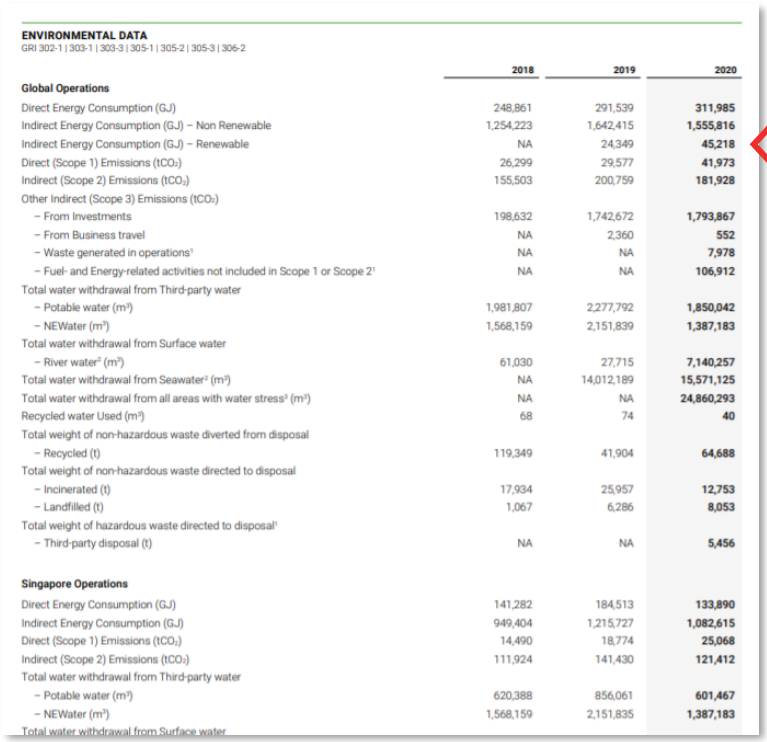
OUR CLIMATE ACTION PLEDGE

- To factor in environmental considerations in our businesses.
- To optimise our operations and processes to enhance energy efficiency.
- To invest in green technology and increase usage of renewable sources of energy.
- To include more eco-friendly features in our products.
- To promote eco-consciousness among our stakeholders.

[1] According to the GHG Protocol's definition of investment, which includes equity investments (including investments in subsidiaries, associate companies and joint ventures), debt investments, project finance, managed investments and client services.

[2] The Group's travel agency provides a centralised data source for business travel. Emissions from business travel are calculated using International Civil Aviation Organisation (ICAO)'s online carbon emissions calculator.

Shadow carbon price and its application within the organisation [Ma3]



ENVIRONMENTAL DATA

GRI 302-1 | 303-1 | 303-3 | 305-1 | 305-2 | 305-3 | 306-2

	2018	2019	2020
Global Operations			
Direct Energy Consumption (GJ)	248,861	291,539	**311,985**
Indirect Energy Consumption (GJ) – Non Renewable	1,254,223	1,642,415	**1,555,816**
Indirect Energy Consumption (GJ) – Renewable	NA	24,349	**45,218**
Direct (Scope 1) Emissions (tCO_2)	26,299	29,577	**41,973**
Indirect (Scope 2) Emissions (tCO_2)	155,503	200,759	**181,928**
Other Indirect (Scope 3) Emissions (tCO_2)			
– From Investments	198,632	1,742,672	**1,793,867**
– From Business travel	NA	2,360	**552**
– Waste generated in operations[1]	NA	NA	**7,978**
– Fuel- and Energy-related activities not included in Scope 1 or Scope 2[1]	NA	NA	**106,912**
Total water withdrawal from Third-party water			
– Potable water (m^3)	1,981,807	2,277,792	**1,850,042**
– NEWater (m^3)	1,568,159	2,151,839	**1,387,183**
Total water withdrawal from Surface water			
– River water[2] (m^3)	61,030	27,715	**7,140,257**
Total water withdrawal from Seawater[2] (m^3)	NA	14,012,189	**15,571,125**
Total water withdrawal from all areas with water stress[3] (m^3)	NA	NA	**24,860,293**
Recycled water Used (m^3)	68	74	**40**
Total weight of non-hazardous waste diverted from disposal			
– Recycled (t)	119,349	41,904	**64,688**
Total weight of non-hazardous waste directed to disposal			
– Incinerated (t)	17,934	25,957	**12,753**
– Landfilled (t)	1,067	6,286	**8,053**
Total weight of hazardous waste directed to disposal[1]			
– Third-party disposal (t)	NA	NA	**5,456**
Singapore Operations			
Direct Energy Consumption (GJ)	141,282	184,513	**133,890**
Indirect Energy Consumption (GJ)	949,404	1,215,727	**1,082,615**
Direct (Scope 1) Emissions (tCO_2)	14,490	18,774	**25,068**
Indirect (Scope 2) Emissions (tCO_2)	111,924	141,430	**121,412**
Total water withdrawal from Third-party water			
– Potable water (m^3)	620,388	856,061	**601,467**
– NEWater (m^3)	1,568,159	2,151,835	**1,387,183**
Total water withdrawal from Surface water			

Key metrics for current and historical periods [Ma2; Mb1; Mb2; Mb3]

Olam

(0.13 TCO_2e/T product, vs 0.19 in 2019), due to divestment of a high intensity Indonesian sugar plant, an increase in the renewable energy share, and increased volumes of low-energy grains processing.

However, this was balanced by an increase in the GHG intensity for own farms and estates (1.91 T CO_2e/T product vs 1.22 in 2019), due to the increased volume production of high-intensity crops such as almonds. For third-party (Scope 3) volumes, which account for 95% of the total emissions (Scope 1, 2 and 3) of 72.3m MT of CO_2e in 2020, achieved a significant reduction in GHG intensity in 2020 from 2.0 to 1.7 TCO_2e/MT and an absolute reduction of 14.3m MT CO_2e (from 82.9m MT in 2019 to 68.6m MT in 2020). This was partly due to an increase in the proportion of low-intensity crops in our total volumes. Our supported farmer programmes are being assessed for GHG reductions pathways that will be implemented systematically across Olam.

Plantations, concessions and farms emissions in scope
(in million tonnes of CO_2e)

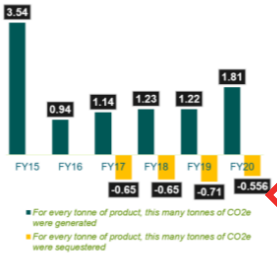
	FY15	FY16	FY17	FY18	FY19	FY20
Scope 1	1.76	0.67	0.89	1.035	1.282	2.44
Scope 2	0.08	0.06	0.05	0.03	0.201	0.002
Scope 1, 2	1.84	0.73	0.94	1.065	1.483	2.4418
Sequester			0.54	0.56	0.754	0.75

GHG intensity has increased
Due to increase in volumes from products with higher emissions intensity (almonds and coffee)

2020 results: GHG intensity

1.34 OFI | 4.1 OGA | 2.1 OIL

Plantations, concessions and farms emissions intensity
(in tonnes of CO_2e/ tonne of a product)



Processing emissions in scope
(in million tonnes of CO_2e)

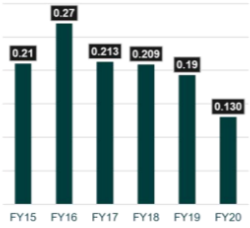
	FY15	FY16	FY17	FY18	FY19	FY20
Scope 1	0.33	0.67	0.66	0.661	0.695	0.471
Scope 2	0.12	0.19	0.17	0.19	0.259	0.186
Scope 1, 2	0.45	0.86	0.83	0.851	0.942	0.657

Intensity decreased
While Grains have acquired new facilities, the product has low GHG intensity (so its volume increase therefore significantly reduced GHG intensity). Plus, as the Sugar facilities were divested/sold, this has led to a further drop in the GHG intensity

2020 results: GHG intensity

0.27 OFI | 0.06 OGA | 0.11 OIL

Processing emissions intensity
(In tonnes of CO_2e/ tonne of production)



Supply chain GHG emissions
(in tonnes of CO_2e/ tonne of a product)

2020 results: GHG intensity by operating group

10.7 OFI | 0.88 OGA | 0.25 OIL

GHG intensity has decreased
Due to increase in volumes procured from products with low GHG intensity, particularly grains

Methodologies: In general the GHG Protocol Suite of Standards are used to calculate corporate GHG emissions.

For Plantations, Concessions and Farms:

- Primary Data on inputs and volumes harvested is collected from the origin operations team
- GHG & Water intensity values are extrapolated from AtSource, which uses crop specific models and Eco-Invent data on emission factors
- Absolute value = Intensity X Produced Volume

For Processing:

- Primary input data collected by the Manufacturing and Technical Services teams from global processing facilities
- GHG emissions calculated using Global Emission factors with guidance from Scope 2 GHG Protocol Standard
- Scope 1 & 2 categorised as per GHG Protocol Corporate Accounting Standard

For supply chain:

- Purchase volumes from each entity are audited and supplied by the Global finance team
- Eco-Invent database version 3, global emissions factors for each product are used to calculate Absolute Supply chain GHG emissions.

Scope 3 emissions and explanation for the change from prior year [Mb2; Mb3]

Graphical presentation for emissions for historical and current periods and supporting explanations, disaggregated as appropriate [Mb1]

Emissions calculation and data collection methodology [Mb1]

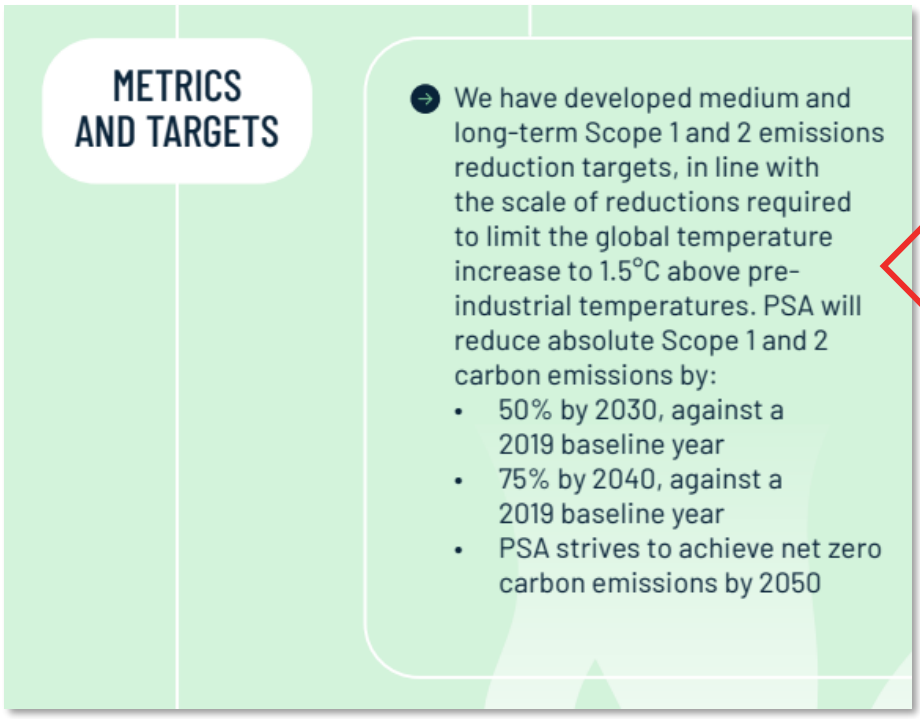
Frasers

Key Aspect	Where we are today	Priorities in 2021-2022
Governance	• Our Board of Directors provides oversight on broader sustainability trends, risks and opportunities to connect sustainability with corporate purpose and strategy of the Group. • Our management, through the Sustainability Steering Committee, monitors the Group's sustainability performance against key material topics. • The Global Sustainability Taskforce and Project Management Office carry out detailed climate risk assessment and develop resilience plans.	• Continue to strengthen and improve governance over sustainability and climate risk.
Strategy	• Our initial assessment identified physical and transition risks as most significant to our business. The impact of climate change and regulatory changes would lead to increased costs, especially in operations, maintenance and procurement of materials. • We determine opportunities, from the identified risks, to create greater value for our existing portfolio and new projects. We integrate innovative and smart solutions into our properties to improve efficiencies and develop first-in-market products for our customers. Furthermore, we are able to tap into new sources of funding from financial institutions.	• Develop a carbon roadmap towards net-zero carbon by 2050 aligned with Science Based Targets for all business units. • Develop a Group-level climate risk assessment disclosure and framework aligned with the TCFD. • Conduct climate-related training for the business units to implement the recommendations and targets identified from the assessment.
Risk Management	• We developed our Sustainability Framework in 2018. It sets out the Group's 13 sustainability focus areas through to 2030, of which 'Resilient Properties' is one of the focus areas. • We implemented an Environmental, Health & Safety Policy and an Environmental, Health & Safety Management System aligned to ISO14001 standard in key operating regions. • We announced the Group's five priority focus areas in FY20 and set tangible goals for each. This includes the aspiration of sustainable financing of our asset portfolio by FY24. • We started a global process of identifying risks and opportunities for our businesses at the asset-level. We plan to use the results to inform our business decision-making in the coming year. • We included climate change issues in our environmental risk identification and started assessing environmental impact for any risk event.	
Metrics and Targets	• We have set climate-related targets as a Group to be net-zero carbon by 2050. All business units will complete climate risk assessments and commence implementation of asset-level climate risk adaptation and mitigation plans by 2024. • Frasers Property Australia had its GHG emissions reduction targets approved by the Science Based Targets initiative in FY19. • We have been disclosing our energy, water and waste performance through our annual Sustainability Report since 2015. Our year-on-year energy intensity and Scope 2 GHG intensity from electricity consumption has decreased by 13.9% and 15.3% respectively in FY20. However, this is expected due to the impact of COVID-19 across all our business operations. • We generated a total of 4.4 GWh of renewable energy across our Singapore, Australia and Hospitality portfolios in FY20, equivalent to 3,655 tCO_2e of avoided emissions. In the UK, we also procured 18.1 GWh of renewable energy, equivalent to a reduction of 4,224 tCO_2e in Scope 2 emissions by our business parks. • We started collecting embodied carbon emissions data from material use in our Singapore residential projects from FY19. In FY20, Scope 3 GHG emissions arising from the production of construction materials for two projects amounted to 10,251 tCO_2e. • We started collecting gas consumption data from our commercial and industrial properties in Australia and the UK, which totalled 19.2 GWh, equivalent to 3,535 tCO_2e in FY20.	

How quantitative targets will be identified and implemented [Mc1]

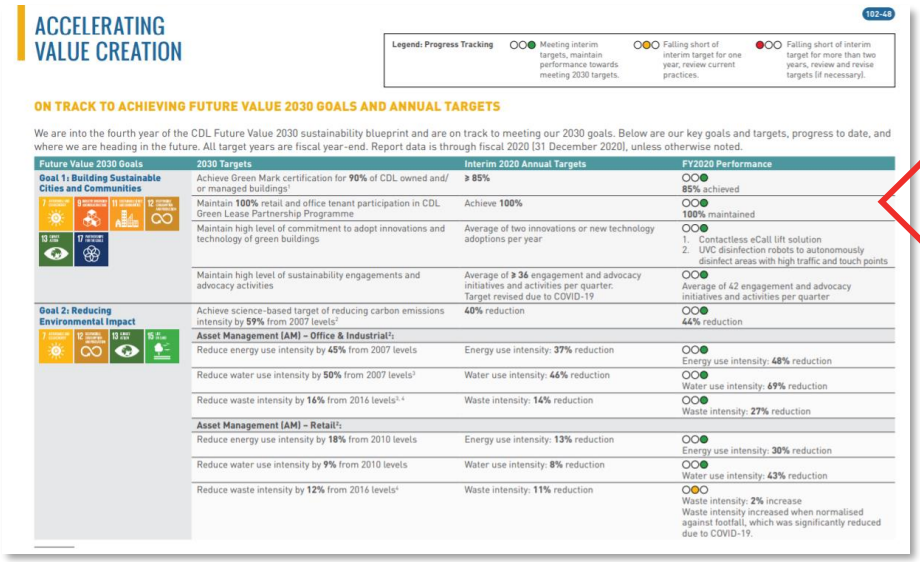
Plans and progress in setting targets, including net-zero carbon by 2050 [Mc1]

PSA



Plans and progress in setting targets, including global temperature increase to 1.5 above pre-industrial temperatures and net zero carbon emissions by 2050 [Mc1]

CDL



ACCELERATING VALUE CREATION

102-48

Legend: Progress Tracking — ○○● Meeting interim targets, maintain performance towards meeting 2030 targets. ○○○ Falling short of interim target for one year, review current practices. ●○○ Falling short of interim target for more than two years, review and revise targets (if necessary).

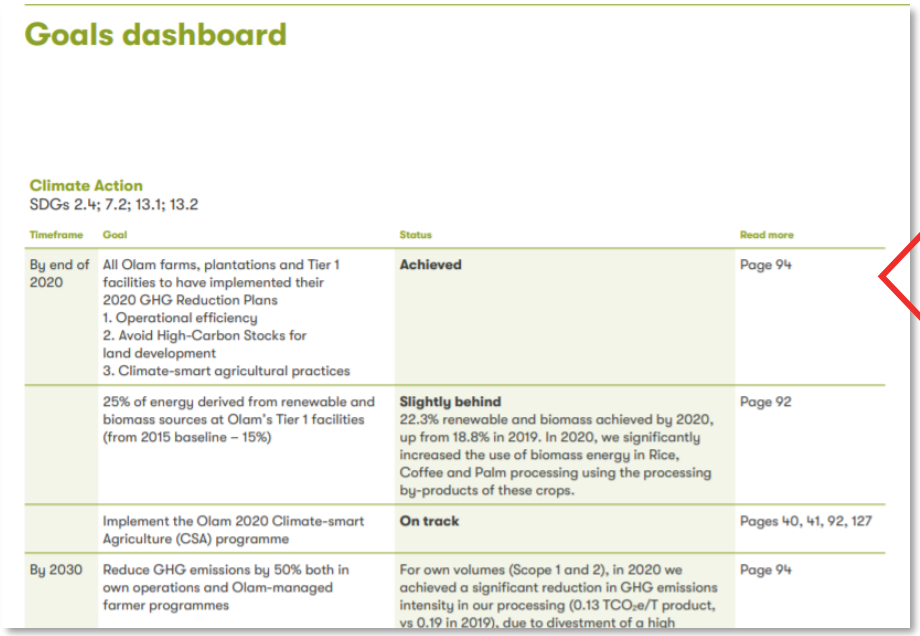
ON TRACK TO ACHIEVING FUTURE VALUE 2030 GOALS AND ANNUAL TARGETS

We are into the fourth year of the CDL Future Value 2030 sustainability blueprint and are on track to meeting our 2030 goals. Below are our key goals and targets, progress to date, and where we are heading in the future. All target years are fiscal year-end. Report data is through fiscal 2020 (31 December 2020), unless otherwise noted.

Future Value 2030 Goals	2030 Targets	Interim 2020 Annual Targets	FY2020 Performance
Goal 1: Building Sustainable Cities and Communities	Achieve Green Mark certification for **90%** of CDL owned and/or managed buildings[1]	⩾ **85%**	○○● **85%** achieved
	Maintain **100%** retail and office tenant participation in CDL Green Lease Partnership Programme	Achieve **100%**	○○● **100%** maintained
	Maintain high level of commitment to adopt innovations and technology of green buildings	Average of two innovations or new technology adoptions per year	○○● 1. Contactless eCall lift solution 2. UVC disinfection robots to autonomously disinfect areas with high traffic and touch points
	Maintain high level of sustainability engagements and advocacy activities	Average of ⩾ **36** engagement and advocacy initiatives and activities per quarter. Target revised due to COVID-19	○○● Average of 42 engagement and advocacy initiatives and activities per quarter
Goal 2: Reducing Environmental Impact	Achieve science-based target of reducing carbon emissions intensity by **59%** from 2007 levels[2]	**40%** reduction	○○● **44%** reduction
	Asset Management (AM) – Office & Industrial[2]:		
	Reduce energy use intensity by **45%** from 2007 levels	Energy use intensity: **37%** reduction	○○● Energy use intensity: **48%** reduction
	Reduce water use intensity by **50%** from 2007 levels[3]	Water use intensity: **46%** reduction	○○● Water use intensity: **69%** reduction
	Reduce waste intensity by **16%** from 2016 levels[3, 4]	Waste intensity: **14%** reduction	○○● Waste intensity: **27%** reduction
	Asset Management (AM) – Retail[2]:		
	Reduce energy use intensity by **18%** from 2010 levels	Energy use intensity: **13%** reduction	○○● Energy use intensity: **30%** reduction
	Reduce water use intensity by **9%** from 2010 levels	Water use intensity: **8%** reduction	○○● Water use intensity: **43%** reduction
	Reduce waste intensity by **12%** from 2016 levels[4]	Waste intensity: **11%** reduction	○○○ Waste intensity: **2%** increase Waste intensity increased when normalised against footfall, which was significantly reduced due to COVID-19.

Disclosure of FY2020 performance even if progress is behind track [Mc3]

Olam



Goals dashboard

Climate Action

SDGs 2.4; 7.2; 13.1; 13.2

Timeframe	Goal	Status	Read more
By end of 2020	All Olam farms, plantations and Tier 1 facilities to have implemented their 2020 GHG Reduction Plans 1. Operational efficiency 2. Avoid High-Carbon Stocks for land development 3. Climate-smart agricultural practices	**Achieved**	Page 94
	25% of energy derived from renewable and biomass sources at Olam's Tier 1 facilities (from 2015 baseline – 15%)	**Slightly behind** 22.3% renewable and biomass achieved by 2020, up from 18.8% in 2019. In 2020, we significantly increased the use of biomass energy in Rice, Coffee and Palm processing using the processing by-products of these crops.	Page 92
	Implement the Olam 2020 Climate-smart Agriculture (CSA) programme	**On track**	Pages 40, 41, 92, 127
By 2030	Reduce GHG emissions by 50% both in own operations and Olam-managed farmer programmes	For own volumes (Scope 1 and 2), in 2020 we achieved a significant reduction in GHG emissions intensity in our processing (0.13 TCO_2e/T product, vs 0.19 in 2019), due to divestment of a high	Page 94

Disclosure of current status even if progress is behind track [Mc3]

Unilever

Comprehensive climate targets are included for Scopes 1, 2 and 3 across short, medium and long-term horizons [Ma3]

Performance in previous years is included to demonstrate year-on-year progression

Reducing environmental impact	Target	2020	2019	2018
Greenhouse gases Target: Halve the greenhouse gas impact of our products across the lifecycle (from the sourcing of the raw materials to the greenhouse gas emissions linked to people using our products) by 2030 (greenhouse gas impact per consumer use; 2010 baseline)	(50%)	(10%)	(8%)	(3%)
Target: By 2020 CO_2 emissions from energy from our factories will be at or below 2008 levels (≤145.92) despite significantly higher volumes (reduction in CO_2 from energy in kg per tonne of production since 2008)*	≤145.92	36.94	50.76	70.46

Our Climate Targets

Unilever has three principal targets that guide our actions:*

- a **Short-term Emissions Reduction Target:** to reduce in absolute terms our operational (Scope 1 & 2) emissions by 70% by 2025 against a 2015 baseline;
- a **Medium-term Emissions Reduction Target:** to reduce in absolute terms our operational emissions (Scope 1 & 2) by 100% by 2030 against a 2015 baseline; and
- a **Long-term Net Zero Value Chain Target:** to achieve net zero emissions covering Scope 1, 2 and 3 emissions by 2039.*

How our targets guide our action

Our suite of targets is designed to guide our approach, which we propose will be as follows:

- In the 2020s and 2030s, our primary focus will be emissions reduction across our value chain, consistent with the 1.5-degree ambition of the Paris Agreement.
- We will not seek to meet our emissions reduction targets through the practice of purchasing and retiring carbon credits, known as offsetting.
- By 2039, and from then onwards, we will ensure that any residual emissions are balanced with carbon removals to achieve and maintain our net zero emissions target.

	2020	2019	2018
Unilever operations (Scope 1 and 2)			
Total Scope 1 and 2 (tonnes CO_2e)	778,677	1,102,925	1,652,057
Scope 1 (tonnes CO_2e)	606,771	659,028	758,232
Scope 2 (tonnes CO_2)	171,906	443,897	893,825
Reduction in Scope 1 and 2 GHG emissions from energy and refrigerant use in our operations since 2015 baseline (%)	60%	44%	16%
Upstream and downstream of Unilever operations (Scope 3)			
Total Scope 3 (tonnes CO_2e)	60,388,592	61,020,357	62,017,585
Consumer use (tonnes CO_2e)	42,093,341	41,743,454	42,281,468
Ingredients and packaging (tonnes CO_2e)	14,239,918	14,897,174	15,367,491
Distribution and retail (tonnes CO_2e)	4,055,333	4,379,729	4,368,626

Remuneration linked to achievement of sustainability and climate change targets is a key part of our reward framework. For management employees – up to and including the ULE – reward packages include fixed pay, a bonus as a percentage of fixed pay and eligibility to participate in a long-term management co-investment plan (MCIP) linked to financial and sustainability performance. The Sustainability Progress Index accounts for 25% of the total MCIP award. It includes amongst others consideration of progress against our manufacturing Scope 1 and 2 greenhouse gas target and a deforestation goal covering palm oil. Subject to shareholder approval at the 2021 AGM the MCIP will be replaced by a Performance Share Plan (PSP) and the performance measures for the PSP will continue to include the Sustainability Progress Index. See pages 92 to 93 for more on MCIP including the role of the Board's Compensation Committee and Corporate Responsibility Committee in determining the Sustainability Progress Index outcome each year and changes related to the PSP.

Incorporation of performance indicators relating to climate-related issues into remuneration policies [Ma3]

Mondi

We support the transition to a low-carbon economy. In 2019, our science-based GHG reduction targets were approved by the Science Based Targets initiative (SBTi). The two targets together cover more than 95% of Mondi's total Scope 1 and 2 emissions.[8]

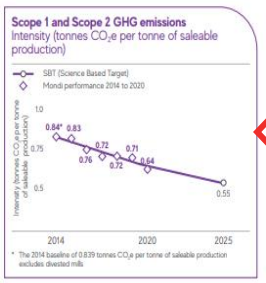
Target 1:
Reduce Scope 1 and 2 GHG emissions by 34% per tonne of saleable production by 2025 and by 72% per tonne of saleable production by 2050 from a 2014 base year.

This target covers total Scope 1 and 2 emissions of our pulp and paper mills and aligns with the pulp and paper sector reduction pathway under a 2°C scenario within the Sectoral Decarbonisation Approach.

Target 2:
Reduce Scope 2 GHG emissions by 39% per MWh by 2025 and by 86% per MWh by 2050 from a 2014 base year.

This covers the Group's total Scope 2 emissions and aligns with a 2°C scenario within the Absolute Contraction Approach.

We are exploring a science-based GHG reduction target for our Scope 3 emissions, which takes into account the GHG emissions in our value chain. Mondi has also committed to support the global transition to a low-carbon economy by positively influencing the sector and policy makers through responsible engagement on climate policy. Read more on the We Mean Business homepage.[9]



Climate-related targets (e.g. GHG emissions) in quantitative terms [Mc3]

GHG emissions

	2020	2019	2014 baseline[10]	% change 2019–2020
Absolute Scope 1 emissions of mills	**3.5 million tonnes CO_2e**	3.9 million tonnes CO_2e	4.3 million tonnes CO_2e	-9.7%
Absolute Scope 2 emissions of mills	**0.43 million tonnes CO_2e**	0.46 million tonnes CO_2e	1.0 million tonnes CO_2e	-6.0%
Specific GHG emissions of our mills (per tonne of saleable production)[12]	**0.64 tonnes CO_2e**	0.71 tonnes CO_2e	0.84 tonnes CO_2e	-9.6%
Specific Scope 1 emissions of our mills (per tonne of saleable production)	**0.57 tonnes CO_2e**	0.64 tonnes CO_2e	0.69 tonnes CO_2e	-9.9%
Specific Scope 2 emissions of our mills (per tonne of saleable production)	**0.07 tonnes CO_2e**	0.07 tonnes CO_2e	0.15 tonnes CO_2e	-6.2%

Key metrics for current year, prior year and baseline year for comparison [Mb1; Mb3]

Scope 3 emissions
(thousand tonnes CO_2e)

Fuel and energy-related activities	614
Purchased goods and services	1,854
Employee commuting	49
Upstream transportation and distribution	477
Downstream transportation and distribution	257
Business travel	2

Scope 3 GHG emissions [Mb2]

BHP

Operational energy consumption by source (TWh)[1][2]

Year ended 30 June	2021	2020	2019
Consumption of fuel	**32.6**	31.6	31.7
– Coal and coke	**0.2**	0.2	0.2
– Natural gas	**6.3**	5.8	6.6
– Distillate/gasoline	**25.5**	25.0	24.2
– Other	**0.6**	0.7	0.7
Consumption of electricity	**10.3**	10.1	9.6
Consumption of electricity from grid	**9.1**	8.9	8.5
Total operational energy consumption	**42.9**	41.7	41.3
Operational energy consumption from renewable sources[3]	**0.1**	0.0	0.0

Operational GHG emissions by source ($MtCO_2$-e)[1][2][4][5][11]

	2021	2020	2019
Scope 1 GHG emissions[6]	**10.0**	9.6	9.7
Scope 2 GHG emissions[7]	**6.2**	6.3	6.2
Total operational GHG emissions	**16.2**	15.9	15.9
Total operational GHG emissions (adjusted for Discontinued operations)[8]	**16.2**	15.9	15.5
Operational GHG emissions intensity (tonnes CO_2-e per tonne of copper equivalent production)[9]	**2.2**	2.0	2.4
Percentage of Scope 1 GHG emissions covered under an emissions-limiting regulation[10]	**81%**	80%	75%
Percentage of Scope 1 GHG emissions from methane	**21%**	19%	19%
Scope 2 GHG emissions (location based)[7]	**5.0**	5.1	5.1
Carbon offsets retired[12]	**0.3**		
Total operational GHG emissions (including carbon offsets)[12]	**15.9**		

Climate-related metrics (e.g. energy consumption, Scope 1 and 2 GHG emissions) [Mc3]

Scope 3 GHG emissions by category ($MtCO_2$-e)[1]

Year ended 30 June	2021	2020	2019
Upstream			
Purchased goods and services (including capital goods)[2]	**8.9**	8.8	8.7
Fuel and energy related activities[3]	**1.1**	1.2	1.2
Upstream transportation and distribution[4]	**3.8**	3.8	3.6
Business travel[2]	**0.1**	0.1	0.2
Employee commuting[2]	**0.4**	0.2	0.2
Downstream			
Downstream transportation and distribution[5]	**3.8**	4.0	4.0
Investments (i.e. our non-operated assets)[6]	**2.5**	2.6	3.1
Processing of sold products[7]			
GHG emissions from steelmaking[8]	**300.5**	292.9	283.7
– Iron ore processing to crude steel	**260.7**	252.8	242.4
– Metallurgical coal processing to crude steel	**39.8**	40.1	41.3
Copper processing	**5.0**	5.2	5.1
Total processing of sold products	**305.5**	298.1	288.8
Use of sold products			
Energy coal[9]	**38.3**	56.4	67.0
Natural gas[9]	**19.5**	20.6	28.3
Crude oil and condensates[9]	**16.8**	17.9	23.3
Natural gas liquids[9]	**1.8**	1.9	2.8
Total use of sold products	**76.4**	96.8	121.4
Total Scope 3 GHG emissions[10]	**402.5**	415.7	431.1

(1) Scope 3 GHG emissions have been calculated using methodologies consistent with the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3 Standard). Scope 3 GHG emissions reporting necessarily requires a degree of overlap in reporting boundaries due to our involvement at multiple points in the life cycle of the commodities we produce and consume. More information on the calculation methodologies, assumptions and key references used in the preparation of our Scope 3 GHG emissions data can be found in the BHP Scope 1, 2 and 3 GHG Emissions Calculation Methodology, available at bhp.com/climate.

(2) In FY2021, we have made improvements in how we calculate Scope 3 GHG emissions associated with the purchased goods and services category by assigning more accurate emission factors to some procurement categories and improving the accuracy of spend data. Previously reported GHG emissions for the 'Purchased goods and services (including capital goods)' category are 16.9 $MtCO_2$-e in FY2020 and 17.3 $MtCO_2$-e in FY2019. Previously reported GHG emissions for FY2019 are 0.1 $MtCO_2$-e in the 'Business travel' category and <0.1 $MtCO_2$-e for the 'Employee commuting' category. Emissions in FY2020 did not materially change as a result of the improved methodology.

(3) In FY2021, we have made improvements in how we calculate Scope 3 GHG emissions associated with the Fuel and Energy related activities by removing the Scope 3 GHG emissions associated with natural gas consumption at our Petroleum operations as the majority of those GHG emissions would be captured in our Scope 1 GHG emissions. Previously reported GHG emissions for the 'Fuel and Energy related activities' category are 1.3 $MtCO_2$-e in FY2020 and also in FY2019.

Disclosure of Scope 3 GHG emissions [Mb2]

Emissions calculation methodologies [Mb1]

Operational greenhouse gas emissions and energy consumption

Our long-term goal is to achieve net zero[1] operational GHG emissions by 2050. We have also set a medium-term target to reduce operational GHG emissions by at least 30 per cent from FY2020 levels[2] by FY2030.[3] This reflects our commitment to decarbonising BHP's operations and a recognition that we have a part to play in accelerating the global pathway to decarbonisation.

We are also working to achieve our short-term target for FY2022 to maintain our total operational GHG emissions at or below FY2017 levels[4] while continuing to grow our business.

Our operational GHG emissions are measured against our target performance based on an operational control, market-based methodology. We also disclose operational GHG emissions by equity share and financial control in section 4.8.5.

In FY2021, total operational energy consumption increased 3 per cent from FY2020 due to increased drilling activity in our Trinidad and Tobago operations, the use of diesel generators to provide power to our Angostura facility during the Ruby project tie-in and increased diesel usage at our Queensland Coal operated assets. Building on our Light Electric Vehicle (LEV) trials at Olympic Dam and Queensland Coal, we have commenced LEV trials at Nickel West using onboard battery power. This trial is anticipated to reduce noise, heat and diesel particulate matter, as well as consumption of fossil fuel. We have increased the renewable component of our energy consumption in FY2021 due to the start of the renewable power purchasing agreement (PPA) at Queensland Coal.

In FY2021, operational GHG emissions were 11 per cent higher than the adjusted FY2017 baseline of 14.6 $MtCO_2$-e on a Continuing operations basis, reflecting increased production at our Minerals Australia operated assets since FY2017. However, as a result of actions taken in FY2020 and FY2021, particularly securing the supply of renewable energy at some operations, our forecasted operational GHG emissions are currently tracking in line with our FY2022 and FY2030 targets (see Progress on decarbonisation, below).

Progress on decarbonisation

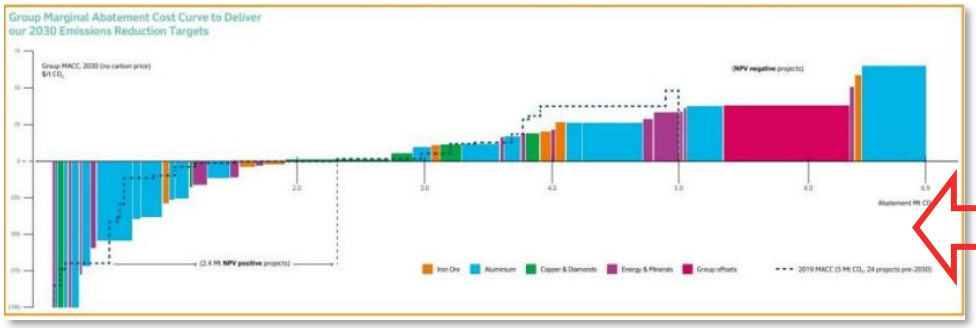
In FY2021:

- We signed a renewable PPA to supply up to 50 per cent of our electricity needs at the Nickel West Kwinana Refinery from the Merredin Solar Farm.
- We secured firm renewable electricity via a PPA to meet half of the electricity needs across Queensland Coal mines from low-emissions sources.

Description of long-term goal to achieve net zero operational GHG emissions by 2050 [Mc2]

Update on the progress of decarbonisation plans [Mc3]

Rio Tinto



Marginal Abatement Cost Curve (MACC) for reaching the company's 2030 climate targets [Mc3]