

Implementation Guidance for Climate Disclosures under HKEX ESG reporting framework



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Introduction

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Introduction

In June 2023, the IFRS Foundation’s International Sustainability Standards Board (“ISSB”) published the IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information (“IFRS S1”) and the IFRS S2 Climate-related Disclosures (“IFRS S2”), together, the IFRS Sustainability Disclosure Standards (“ISSB Standards”).

In July 2023, the International Organisation of Securities Commissions (“IOSCO”) determined that the ISSB Standards are appropriate to serve as a global framework for capital markets to develop sustainability-related financial information and help globally integrated financial markets accurately assess relevant sustainability risks and opportunities.

As a member of the Green and Sustainable Finance Cross-Agency Steering Group, HKEX is committed to enhance listed issuers’ climate-related disclosures with reference to IFRS S2, being the global baseline for sustainability disclosures.

With effect from 1 January 2025, HKEX’s Environmental, Social and Governance Reporting Code¹ (“ESG Code”) require issuers to make climate-related disclosures in phases.

The enhancement of climate-related disclosures under the ESG Code reflects HKEX’s commitment to drive ESG and sustainability agenda amongst listed issuers, and to prepare listed issuers for sustainability and climate reporting in accordance with the local sustainability standards to be developed for Hong Kong based on the ISSB Standards².

This Implementation Guidance has been developed to provide practical guidance with explanations and interpretations to assist issuers in understanding the new climate disclosure requirements under paragraph Part D of the ESG Code (“New Climate Requirements”) and preparing relevant disclosures³.

Table 1 provides an overview of the disclosure obligation and effective date of the New Climate Requirements. For more details regarding the disclosure obligations with regard to different types of issuers, please refer to paragraphs 16-17 of Part D of the ESG Code.

¹ Appendix C2 of the Main Board Listing Rules / GEM Listing Rules, formerly known as the “Environmental, Social and Governance Reporting Guide”.

² In March 2024, the Hong Kong Government’s Financial Services and the Treasury Bureau announced the appointment of the Hong Kong Institute of Certified Public Accountants as the local standard setter to develop sustainability reporting standards for Hong Kong based on the ISSB Standards. When the local sustainability reporting standards are available, HKEX will consider whether and how to transition towards sustainability reporting in accordance with the locally adopted ISSB Standards.

³ PricewaterhouseCoopers Limited in Hong Kong was engaged as the technical consultant to assist HKEX in preparing the Implementation Guidance.

Table 1: Disclosure obligation and effective date for the New Climate Requirements

	New Climate Requirements effective date	
	Disclosure on Scope 1 and 2 GHG emissions	Disclosures other than Scope 1 and 2 GHG emissions
LargeCap Issuers^(Note)	Mandatory disclosure: Financial years commencing on or after 1 January 2025	<ul style="list-style-type: none"> • “Comply or explain”: Financial years commencing on or after 1 January 2025 • Mandatory disclosure: Financial years commencing on or after 1 January 2026
Main Board Issuers (other than LargeCap Issuers)		<ul style="list-style-type: none"> • “Comply or explain”: Financial years commencing on or after 1 January 2025
GEM Issuers		<ul style="list-style-type: none"> • Voluntary disclosure: Financial years commencing on or after 1 January 2025

Note: Under the ESG Code, issuers that are Hang Seng Composite LargeCap Index (HSCLI) constituents throughout the year immediately prior to the reporting year in respect of the ESG Report in question will need to make mandatory disclosures from 2026 onwards. Accordingly, issuers that are constituents of the HSCLI throughout their entire financial year 2025 will be required to make mandatory climate disclosure in respect of their ESG reports for the financial year 2026, and such ESG reports will be published in 2027. For the avoidance of doubt, once an issuer becomes subject to mandatory disclosure of the New Climate Requirements, it must continue to disclose information in accordance with the New Climate Requirements even if it subsequently ceases to be a HSCLI constituent.

Issuers subject to the “comply or explain” regime are reminded to provide considered reasons for non-disclosure (including the application of any implementation relief) of information called for under the ESG Code.

In addition, where an issuer has yet to disclose information required under any of the New Climate Requirements, regardless of whether an issuer has (i) opted to “explain” why it has not made a particular disclosure or (ii) chosen to adopt any implementation relief available under the ESG Code (whether it is required to report on a mandatory or “comply or explain” basis), it is encouraged to provide information on the work plan, progress and timetable for making the required disclosure.





Work process set out in the Implementation Guidance

Issuers tend to undertake some common steps when identifying, monitoring and managing their climate-related risks and opportunities, and developing their climate-related disclosures. This Implementation Guidance is divided into five chapters and sets out the recommended workflow in eight steps to support issuers in complying with Part D of the ESG Code. The recommended workflow is only a suggested approach. Issuers are free to use an alternative workflow depending on their industry practices or their own circumstances.

Ch1: Key concepts for preparing climate disclosures	Reporting principles	
	Principles from the ESG Code underpinning the preparation of an ESG report.	
	IFRS S1 conceptual foundations and general requirements	
	Key IFRS S1 concepts and approaches for decision-useful and comparable climate-related disclosures.	
	Recommended workflow	
	to aid issuers' monitoring and managing of climate-related risks and opportunities and reporting.	
Ch2: Governance	01	Determine suitable governance structure
	02	Identify the effects posed by material climate-related risks and opportunities on the business
	03	Incorporate climate-related risks and opportunities into planning and business strategies
Ch3: Strategy	04	Select suitable scenarios and parameters under a confirmed scope and boundary
	05	Assess the financial effects from climate-related risks and opportunities
	06	Implement actions and targets and provide information on the effects of climate-related risks and opportunities on its strategy and decision-making
Ch4: Risk Management	07	Identify management processes to prioritise, manage and monitor climate-related risks and opportunities
Ch5: Metrics and Targets	08	Develop specific metrics and indicators to monitor climate-related risks and opportunities
Implementation reliefs to address issuers' challenges in climate reporting		

Navigation throughout this guidance

Throughout the Implementation Guidance, you will find various keys to guide you through the content, including:

Keys	Purpose
<div>Paragraph 1(a)</div>	Paragraph(s) under HKEX ESG Code requirements
<div></div>	References to the implementation reliefs available for issuers in preparing climate-related disclosures
<div>S1 20</div>	References to relevant paragraph(s) of IFRS S1
<div>S2 B1</div>	References to relevant paragraph(s) of IFRS S2
<div>C2 19</div>	References to HKEX ESG Code requirements
<div></div>	Further guidance Useful links to reference materials
<div></div>	Important note Clarifications and key reminders
<div></div>	Insights Insights and recommendations from real life situations
<div></div>	Practical application Examples to support the application of Part D of the ESG Code



Chapter 1 – Key concepts for preparing climate disclosures

IFRS S1 key concepts

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Implementation reliefs

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IFRS S1 establishes a basis for decision-useful and comparable reporting of sustainability-related financial information that complements an issuer’s financial statements. It therefore requires the application of some established practices from financial reporting.

Issuers are strongly encouraged to prepare climate-related disclosures under Part D of the ESG Code following the conceptual foundations and general requirements (“key concepts”) set out under IFRS S1.

While this section endeavours to provide a high-level overview of the applicable IFRS S1 key concepts, issuers should refer to the relevant paragraphs of IFRS S1 for further details.

IFRS S1 key concepts

i. Quality of information

Climate-related information is expected to possess the following qualitative characteristics in order to be useful:

- **Relevance:** S1 D4-D7
Disclosures that are relevant should be capable of making a difference in the decisions made by users, for example, they may have predictive value, confirmatory value or both. Disclosures that have predictive value can be used as an input to processes employed by primary users to predict future outcomes, whilst those that have confirmatory value provide feedback about previous evaluations.

- **Faithful representation:** S1 D9-D15

Disclosures should provide a complete, neutral and accurate depiction. A complete depiction includes all material information necessary for primary users to understand the issuer's risk or opportunity, while a neutral depiction is one without bias in the selection or disclosure of information. Issuers should note that an accurate depiction can be accurate without being perfectly precise in all respects. The precision needed and attainable, and the factors that make information accurate, depend on the nature of the information and matters to which it relates.

- **Comparability:** S1 D17-D20

Disclosures should enable users to identify and understand similarities in, and differences among items. A comparison requires at least two items and information is more useful if it is compared with: (a) information provided by the issuer in previous periods; and (b) information provided by other issuers, in particular those with similar activities or operating within the same industry.

- **Verifiability:** S1 D21-D24

Disclosures should provide users with confidence that the information is complete, neutral and accurate. Information is verifiable if it is possible to corroborate either the information itself or the inputs used to derive it.

- **Timeliness:** S1 D25

Disclosures should provide information to decision-makers in a timely manner for such information to be capable of influencing their decisions. In general, the older the information, the less decision-useful it is. However, some information may continue to be timely long after the end of a reporting period.

- **Understandability:** S1 D26-D33

Disclosures should provide clear and concise information. Avoid generic information that is not specific to the issuer, and avoid duplication of information. Use clear language and clearly structured sentences and paragraphs.

In particular, relevance and faithful representation are fundamental qualitative characteristics of useful climate-related information. The usefulness of relevant disclosures is enhanced if the information is comparable, verifiable, timely and understandable (i.e. comparability, verifiability, timeliness and understandability are enhancing characteristics of useful climate-related information).

ii. Reporting entity **S1 20, B38**

Under IFRS S1, the issuer's sustainability-related financial disclosures shall be for the same reporting entity as the related financial statements. An issuer is encouraged to observe this principle in preparing climate-related disclosures under Part D of the ESG Code.

iii. Timing of reporting **S1 64-69**

Under IFRS S1, the issuer's sustainability-related financial disclosures shall be reported at the same time as its related financial statements, in line with the ESG Code's requirements. Issuers are reminded to publish their ESG report on an annual basis and regarding the same period covered in their annual report⁴, and at the same time as their annual reports⁵.

iv. Location of disclosures **S1 60-63**

Under IFRS S1, an issuer is required to provide disclosures required by IFRS Sustainability Disclosure Standards as part of its general purpose financial reports. Climate-related disclosures could be located in an issuer's ESG report (whether as a standalone report or a part of the annual report). As climate-related risks and opportunities affect an issuer's operations, financial performance and financial position, an issuer may also include relevant disclosures in the business review of its directors' report⁶ to facilitate investors' understanding of the development, performance or position of the issuer's business. There should be appropriate cross-referencing (or links) to facilitate readers navigating through various sections of the same or different documents.

v. Materiality **S1 17-19, B13-B28, D8**

For the purpose of making climate-related disclosures under Part D of the ESG Code, where the board determines that a climate-related risk or opportunity is reasonably expected to affect the issuer's cash flows, its access to finance or cost of capital over the short, medium or long term, the issuer must disclose information about such climate-related risk or opportunity⁷.

Under IFRS S1, materiality of information is judged in relation to whether omitting, misstating or obscuring that information could reasonably be expected to influence decisions that primary users of general purpose financial reports make on the basis of those reports, which provide information about a specific reporting entity.

Therefore, an issuer should disclose material information about sustainability-related risks and opportunities that could reasonably be expected to affect its cash flows, its access to finance or cost of capital over the short, medium or long term. For the avoidance of doubt, information that has been determined to be not material to the issuer need not be disclosed under IFRS S1 or IFRS S2.

⁴ Paragraph 4(1) of the ESG Code.

⁵ Paragraph 4(2) of the ESG Code.

⁶ Paragraph 12 of the ESG Code.

⁷ Issuers may disclose information that is material to investors (based on financial materiality) as well as information that is material to other stakeholders (based on other materiality considerations) in their ESG report. Where they do so, issuers must ensure that the material information for investors is not obscured and is clearly identified and distinguishable from the information provided for other stakeholders.

Insights: How can an issuer assess whether a climate-related risk or opportunity could reasonably be expected to affect its cash flows, its access to finance or cost of capital over the short, medium or long term?

An issuer shall consider both quantitative and qualitative factors, and assess the nature or magnitude of the climate-related risk or opportunity.

See illustrative examples below:

- Disruption of supplier operations due to wildfire will affect a manufacturing company's ability to fulfil customer orders, which is likely to reduce its revenue by 8%.
- Occurrence of flooding caused damage to a real estate company's properties, which resulted in a 10% decrease of its asset value.
- Expected increase in fuel price is likely to affect the operating costs of a logistics company, and may decrease its profit before tax by approximately 6-8%.



vi. Value chain concepts S1 32, B2, B5 S2 13

The ISSB Standards require an entity to disclose information that enables an understanding of the current and anticipated effects of sustainability-related risks on the entity's value chain.

A value chain describes the chain of business activities required to create a product or services. A value chain encompasses the interactions (direct or indirect), resources and relationships an issuer uses and depends on to create its products or services from conception to delivery, consumption and end-of-life. It also includes interactions, resources and human resources along its supply chain, marketing and distribution channels (such as materials and service sourcing, product and service sale and delivery); and the financing, geographical, geopolitical and regulatory environments in which the issuer operates.

vii. Statement of compliance S1 72-73

Under IFRS S1, an issuer whose sustainability-related financial disclosures comply with all the requirements of the IFRS Sustainability Disclosure Standards shall make an explicit and unreserved statement of compliance.

The ESG Code allows an issuer to adopt international ESG reporting guidance, including the ISSB Standards, so long as it includes comparable disclosures to those required under the Code. To encourage the preparation of ESG reports in accordance with the ISSB Standards, ESG reports prepared in compliance with IFRS S1 and S2 are considered to have complied with Part D of the ESG Code⁸.

⁸ Paragraph 8 of the ESG Code.

viii. Judgments and measurement uncertainty **S1 74-76**

In the process of preparing climate-related disclosures, an issuer may make various judgments, apart from those involving estimations, that can significantly affect the information reported in those disclosures. Issuers should disclose information to enable an understanding of the judgments made.

For example, an issuer may make judgments in:

- identifying climate-related risks and opportunities that could be reasonably expected to affect the issuer's prospects;
- identifying material information to include in the disclosure on current and anticipated financial effects; and
- assessing whether an event or change in circumstances is significant and requires reassessment of the scope of all affected climate-related risks and opportunities throughout the issuer's value chain.

Where amounts reported cannot be measured directly and can only be estimated, measurement uncertainty arises. In cases where the uncertainty affecting the amounts reported relates to the estimates that require the issuer's most difficult, subjective or complex judgements, issuers should: **S1 77-82**

- identify the amounts it has disclosed that are subject to a high level of measurement uncertainty; and
- in relation to each amount identified, disclose information about:
 - the sources of measurement uncertainty, e.g. the dependence of the amount on the outcome of a future event, on a measurement technique or on the availability and quality of data from the entity's value chain; and
 - the assumptions, approximations and judgements made in measuring the amount.

ix. Interaction with law or regulation **S1 B31-B33**

Law or regulation might specify requirements for an issuer to disclose specific climate-related information in its general purpose financial reports. In such circumstances, the issuer is permitted to include in its climate-related disclosures the required information to comply with relevant applicable legal or regulatory requirements, even if that information is not material.

However, such information shall not obscure material information. An issuer shall disclose material climate-related information, even if there is no specific legal or regulatory requirement for the issuer to disclose such information.

An issuer need not disclose information otherwise required by Part D of the ESG Code if it is prohibited by applicable laws or regulations from disclosing that information. If an issuer omits material information for that reason, it shall identify the type of information omitted and explain the source of such restriction.

x. Aggregation and disaggregation S1 B29-B30

An issuer shall consider all facts and circumstances and decide how to aggregate and disaggregate information in its climate-related disclosures.

Aggregation of information should not reduce the understandability of climate-related disclosures. An issuer shall not aggregate information if doing so would obscure information that is material. Information shall be aggregated if items of information have shared characteristics, and shall not be aggregated if they are dissimilar to each other.

In certain circumstances, an issuer might need to disaggregate information about climate-related risks and opportunities, such as by geographical location or in consideration of the geopolitical environment. For example, to ensure that material information is not obscured, an issuer might need to disaggregate information about GHG emissions of the consolidated accounting group and that of its other investees.

xi. Comparative information S1 52, 70, B49-B54

Issuers are expected to disclose comparative information in respect of the previous period for all metrics disclosed in the current period.

Where relevant, the issuer shall also disclose comparative information for narrative and descriptive climate-related disclosures.

In some cases, the amount disclosed for a metric is an estimate. If the issuer (1) identifies new information in relation to the estimated amount disclosed in the preceding period and the new information provides evidence of circumstances that existed in that period; and/ or (2) redefines or replaces a metric, the issuer shall:

- disclose a revised comparative amount that reflects that new information or metric;
- disclose the difference between the amount disclosed in the preceding period and the revised comparative amount/ metric; and
- explain the reasons for revising the comparative amount/ metric.

Where it is impracticable to do so or if the metric is forward-looking, the issuer need not disclose a revised comparative amount.

Under IFRS S1, an issuer is not required to disclose comparative information in the first annual reporting period in which it applies the ISSB Standards⁹. S1 E3

⁹ Pursuant to paragraph 11(ii) of the ESG Code, the “Quantitative” reporting principle provides that quantitative information should, among other things, be accompanied by comparative data where appropriate. As such, where comparative data is not available for the first annual reporting period in which an issuer applies the ESG Code, the issuer is not required to disclose comparative information.

xii. Estimates and errors S1 83-86, B55-B59

Where errors are present, such as mathematical mistakes, mistakes in applying the definitions for metrics or targets, oversights or misinterpretations of facts, and fraud, issuers should correct prior period errors by restating the comparative amounts for the prior period(s) disclosed unless it is impracticable to do so.

If the issuer identifies a material error in its prior period climate-related disclosures, it shall disclose:

- the nature of the prior period error;
- the correction, to the extent practicable, for each prior period disclosed; and
- if correction of the error is impracticable, the circumstances that led to the existence of that condition and a description of how and from when the error has been corrected.

xiii. Connected information S1 21-24, 63, B39-B47

Connected information enables an understanding of the connections both between the items to which the information relates and between disclosures provided by the issuer in its financial reports.

Connected information can include:

- connections between various types of information about a particular climate-related risk or opportunity, such as:
 - between disclosures on governance, strategy and risk management; and
 - between narrative information and quantitative information (including related metrics and targets and information in the related financial statements).
- connections between disclosures about various climate-related risks and opportunities.

Drawing connections between disclosures involves, but is not limited to, providing necessary explanations and cross-references and using consistent data, assumptions, and units of measurement. In providing connected information, an issuer shall:

- explain connections between disclosures in a clear and concise manner;
- avoid unnecessary duplication if the IFRS Sustainability Disclosure Standards require the disclosure of common items of information; and
- disclose information about significant differences between the data and assumptions used in preparing the issuer's sustainability-related financial disclosures and the data and assumptions used in preparing the related financial statements.

To facilitate issuers' comparison of IFRS S1 with the Exchange's current ESG reporting framework, please refer to the location map set out in [Appendix 1](#).

Implementation reliefs

The ESG Code provides reliefs (hereinafter referred to as “Implementation Relief”) to address issues around issuers’ readiness and concerns in data availability when preparing climate-related disclosures for certain disclosure requirements. These include the Reasonable Information Relief, the Capabilities Relief and the Commercial Sensitivity Relief.

Reasonable Information Relief S1 B8-B10

Acknowledging that certain disclosure requirements may involve a high level of outcome or measurement uncertainty, the ESG Code allows issuers to make such disclosures based on:

Reasonable and supportable information that is available at the reporting date without undue cost or effort

Reasonable and supportable information

Reasonable: information that is reasonably available, including information that the issuer already has. In particular, an issuer cannot disregard any known information

Supportable: the issuer must have a reasonable basis for using the information

Reasonable and supportable information may include external data (e.g. rating agency’s ESG ratings, sustainability disclosures and economist’s forecasts) and internal data (e.g. the issuer’s risk management response, climate-risk assessments).

Available at the reporting date without undue cost or effort

Without undue cost or effort: the issuer need not undertake an exhaustive search for information. The assessment of what constitutes undue cost or effort depends on the issuer’s circumstances and requires a balanced consideration of the costs and efforts for the issuer and the benefits of the resulting information for stakeholders. For example, undue cost or effort may occur if the incremental cost or additional effort substantially exceed the benefits associated with the disclosure

Available at the reporting date: information about past events, current conditions, and forecast of future economic conditions that is available at the reporting date

Capabilities Relief S2 B6-B7

Acknowledging that issuers are at different stages of their sustainability journey, the ESG Code allows issuers to use an approach that is informed by or commensurate with their available skills, capabilities and resources at a particular point in time in preparing disclosures on climate-related scenario analysis and anticipated financial effects.

“Available skills, capabilities and resources” may include both internal and external skills, capabilities and resources. For the avoidance of doubt, issuers are expected to develop their skills and capabilities and strengthen their disclosures over time through a process of learning and iteration.

Commercial Sensitivity Relief S1 B34-B37

To address issuers’ challenges on divulging confidential and commercially sensitive information, the Commercial Sensitivity Relief is applicable to all disclosure requirements regarding climate-related opportunities under Part D of the ESG Code if:

- information about the climate-related opportunity is not already publicly available;
- disclosure of such information could reasonably be expected to seriously prejudice the economic benefits the issuer would otherwise be able to realise in pursuing the opportunity; and
- it is not possible to disclose such information in a manner, for example, at an aggregated level, that would enable the issuer to meet the objectives of the disclosure requirements without seriously prejudicing the economic benefits the issuer would otherwise be able to realise in pursuing the opportunity.

Where an issuer elects to use the Commercial Sensitivity Relief, it shall, for each non-disclosed item omitted:

- disclose the fact that it has used the exemption; and
- reassess, at each reporting date, whether the information qualifies for the exemption.

Table 2: Climate-related disclosure requirements where Implementation reliefs are available

Relevant climate-related disclosure requirement	Reasonable Information Relief	Capabilities Relief	Commercial Sensitivity Relief	Financial Effects Relief
All paragraphs with respect to climate-related opportunities			10 ●	
Identification of climate-related risks and opportunities	11 ●			
Determination of the scope of the value chain	12 ●			
Quantification of current and anticipated financial effects		13 ● (anticipated financial effects only)		14 ●
Preparation of disclosures on anticipated financial effects	15 ●	16 ●		
Use of climate-related scenario analysis	17 ●	18 ●		
Measurement approach, inputs and assumptions for Scope 3 GHG emissions	19 ●			
Calculation of metrics in particular cross-industry metric categories ²⁰	21 ●			

10 Note 2 to paragraph 20 of the ESG Code.

11 Note 1(a) to paragraph 20 of the ESG Code.

12 Note to paragraph 21 of the ESG Code.

13 Note 4 to paragraph 25 of the ESG Code.

14 Notes 3 and 5 to paragraph 25 of the ESG Code allows disclosure of qualitative instead of quantitative financial information where certain conditions are met.

15 Note 2(a) to paragraph 25 of the ESG Code.

16 Note 2(b) to paragraph 25 of the ESG Code.

17 Note to paragraph 26 of the ESG Code.

18 Note to paragraph 26 of the ESG Code.

19 Note 1 to paragraph 29 of the ESG Code.

20 Cross-industry metrics in respect of climate-related transition risks, climate-related physical risks and climate-related opportunities.

21 Note to paragraph 32 of the ESG Code.

Important note

Issuers should note that ISSB updates its guidance and resources in respect of the application of the ISSB Standards on a regular basis. The ISSB has also established a Transition Implementation Group (TIG) to discuss potential questions arising from the implementation of the ISSB Standards submitted by stakeholders and post discussion summaries online. Issuers should visit the IFRS website to keep track of the latest updates.

Useful sources:

IFRS [Knowledge hub](#)

Resources from [Transition Implementation Group on IFRS S1 and IFRS S2](#)

Issuers are also reminded to refer to the application guidance set out in Appendix B of IFRS S2 when preparing disclosures pursuant to the provisions of Part D of the ESG Code²².

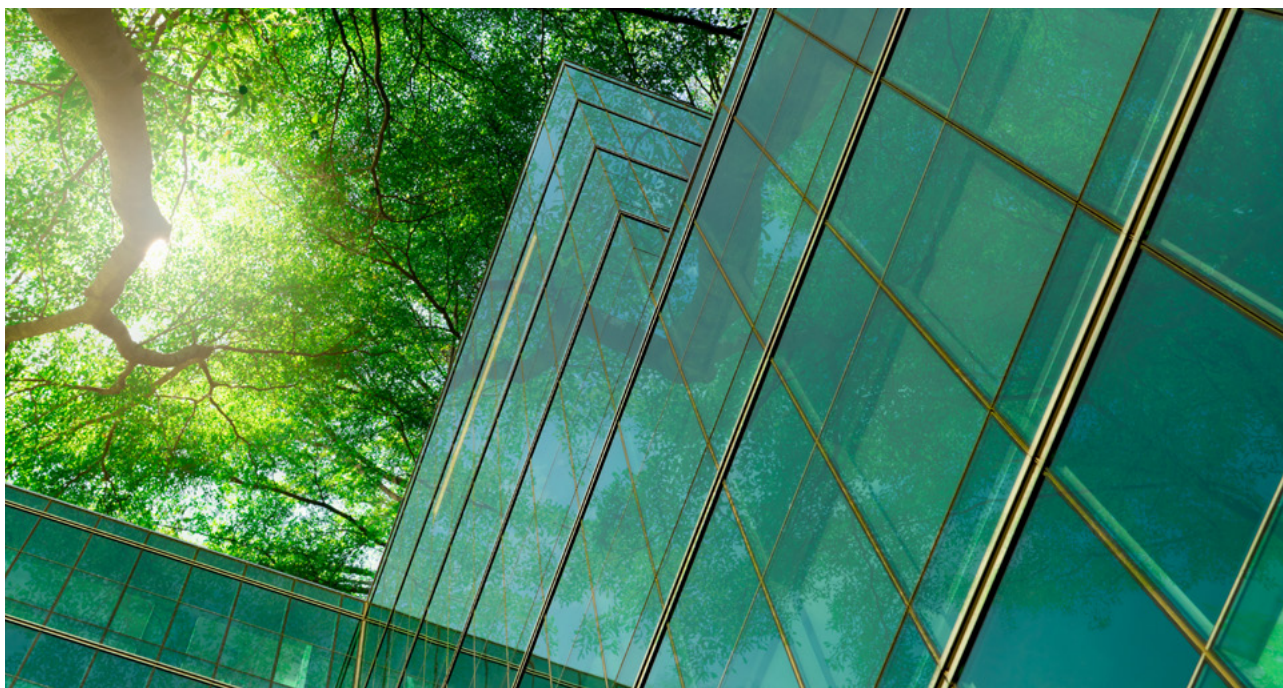


²² Paragraph 18(2) of the ESG Code.



Chapter 2 – Governance

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Objective

The objective of this chapter is to discuss the approach and considerations for issuers when developing the governance processes, controls and procedures to monitor, manage and oversee climate-related risks and opportunities.

Paragraph 19(a) S2 6(a)

An issuer shall disclose information about: the governance body(s) (which can include a board, committee or equivalent body charged with governance) or individual(s) responsible for oversight of climate-related risks and opportunities.

In general, the board is ultimately responsible for oversight of the issuer. Issuers should also disclose whether other committee(s) (such as the Audit Committee, the Sustainability Committee or the Risk Committee) or individual(s) (such as the Chief Sustainability Officer) are responsible for decision-making and for overseeing the management of the issuer's climate-related risks and opportunities.

The responsibilities of such governance body(s) or individual(s) should be reflected in the terms of reference, mandates, role descriptions and other related policies applicable to that body(s) or individual(s)²³. For example, it could be an internal memorandum setting out the role of the Chief Sustainability Officer or the Sustainability team. S2 6(a)(i)

²³ Note to paragraph 19(a) of the ESG Code.

Skills and competencies

Paragraph 19(a)(i) S2 6(a)(ii)

Specifically, the issuer shall identify that body(s) or individual(s) and disclose information about: how the body(s) or individual(s) determines whether appropriate skills and competencies are available or will be developed to oversee strategies designed to respond to climate-related risks and opportunities.

Appropriate skills and competencies are important to ensure that the company could develop strategies in response to climate-related risks and opportunities, and have the competence to oversee the implementation of such strategies. Issuers should ensure that members of the board possess sufficient awareness and understanding of how climate change may impact on the issuer, and make relevant disclosures.

For example, the issuer could disclose mechanisms or processes in place to select eligible individuals as board members and to ensure availability and retention of such competence. The issuer may also disclose its plans to upskill the board on climate-related matters.

Examples include:

- arrange climate-related training for the board and management (e.g. internal training/ sharing sessions, continuing professional development training sessions, regular sharing sessions by subject matter experts or relevant advisors on climate-related topics); and
- develop plans for building skills and competencies of the board and management.

Processes and frequency

Paragraph 19(a)(ii) S2 6(a)(iii)

Specifically, the issuer shall identify that body(s) or individual(s) and disclose information about: how and how often the body(s) or individual(s) is informed about climate-related risks and opportunities.

Issuers should provide insight into the mechanism and frequency to which the relevant governance body(s) or individual(s) are informed of climate-related risks and opportunities. Disclosures may include:

- scope of oversight on climate-related risks and opportunities;
- governance mechanisms into which climate-related risks and opportunities are integrated;
- frequency of relevant meetings;
- number of meetings allocated to climate-related risks and opportunities during the year; and
- proportion of regular board/ committee meetings where climate-related risks and opportunities are discussed.

Roles and responsibilities of the board

Paragraph 19(a)(iii) S2 6(a)(iv)

Specifically, the issuer shall identify that body(s) or individual(s) and disclose information about: how the body(s) or individual(s) takes into account climate-related risks and opportunities when overseeing the issuer's strategy, its decisions on major transactions, and its risk management processes and related policies, including whether the body(s) or individual(s) has considered trade-offs associated with those risks and opportunities.

The board's role is to approve and monitor policies and mechanisms to manage climate-related issues and to ensure the adequacy of resources. Stakeholders expect to understand the extent to which climate-related risks and opportunities are incorporated into the board's oversight, as well as how the strategic direction of the board is implemented by management. Where appropriate, issuers may use a figure or diagram to demonstrate the organisational structure, providing a clear demonstration of the relationship and segregation of roles and responsibilities.

Further guidance on board responsibilities

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 1 Governance Structure

HKEX (2020) [Making inroads into good Corporate Governance and ESG management](#) Chapter 1



Progress monitoring

Paragraph 19(a)(iv) S2 6(a)(v)

Specifically, the issuer shall identify that body(s) or individual(s) and disclose information about: how the body(s) or individual(s) oversees the setting of, and monitors progress towards, targets related to climate-related risks and opportunities (see paragraphs 37 to 40), including whether and how related performance metrics are included in remuneration policies (see paragraph 35).

Disclosure of the board and committee's progress monitoring approach provides stakeholders with an understanding of the effort that the issuer puts into setting climate-related metrics and targets, monitoring and reviewing progress, and overseeing their achievement. The use of performance metrics within remuneration policies also provides transparency on how the issuer incentivises management to fulfil relevant climate-related metrics and targets.

Please refer to [Chapter 5 > Metrics and Targets > Climate-related targets](#) and [Remuneration](#) for further discussion on target setting and the integration of performance metrics into remuneration policies.

Roles and responsibilities of management

Paragraph 19(b) S2 6(b)

An issuer shall disclose information about management's role in the governance processes, controls and procedures used to monitor, manage and oversee climate-related risks and opportunities, including information about:

- i. whether the role is delegated to a specific management-level position or management-level committee and how oversight is exercised over that position or committee; and
- ii. whether management uses controls and procedures to support the oversight of climate-related risks and opportunities and, if so, how these controls and procedures are integrated with other internal functions.

Management's responsibilities and duties usually lie in the actual implementation of policies and mechanisms to manage climate-related issues in an efficient and effective manner. The exact scope of such responsibilities should be clearly disclosed.

As the board retains ultimate responsibility for overseeing climate-related risks and opportunities, issuers are required to provide information on how the board delegates and oversees responsibilities to management-level positions or committees. Disclosures may include:

- mechanisms in place to oversee the delegation of management-level position(s) or committee(s);
- periodic review of mechanisms and arrangements to ensure that they remain appropriate to the issuer's needs; and
- scope of management's powers, in particular, circumstances where management should report back and obtain prior board approval before making decisions or entering into any commitments on the issuer's behalf.

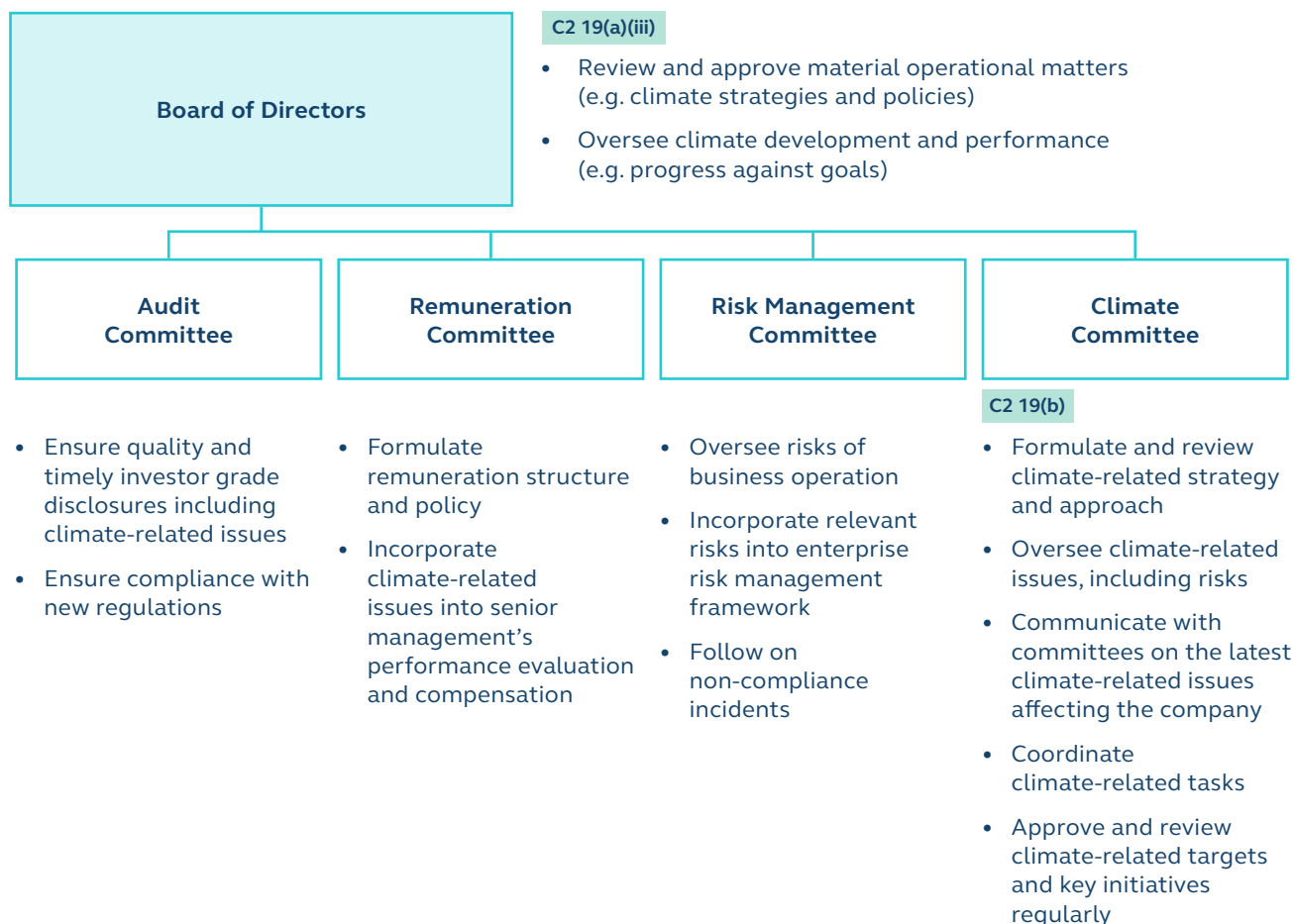
Further guidance on management responsibilities

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 1 Governance Structure

HKEX (2020) [Making inroads into good Corporate Governance and ESG management](#) Chapter 1



Illustrative disclosure 1: Governance structure



Our Board oversees climate-related risks and opportunities **C2 19(a)** during board meetings on a bi-annual basis **C2 19(a)(ii)** to ensure that our climate development and performance are on track.

The Board is supported by our four Committees in different aspects to address Climate Change. Specifically, our Climate Committee is appointed by our Board and chaired by an Independent Non-Executive Director. **C2 19(a)** It comprises senior management from different business functions **C2 19(b)** and is responsible for formulating and reviewing climate-related strategy, coordinating climate-related tasks and communicating with the Board and committees on the latest climate-related issues affecting the company on a bi-annual basis.

To oversee duties performed by the Climate Committee, climate-related performance target are set at the management level to assist our Board in evaluating the effectiveness of its climate strategy and measures on an annual basis. **C2 19(a)(iv)**

To ensure our Board keeps up with the latest trend of climate-related risks and opportunities, we provide the Board with annual climate-related training where external subject matter experts are invited to share on climate-related topics. **C2 19(a)(i)**

Commentaries

- C2 19(a)** Stated that the Board and the Climate Committee are responsible for oversight of climate-related risks and opportunities.
- C2 19(a)(i)** Disclosed the availability of annual climate-related trainings with external subject matter experts to ensure competence in the Board in overseeing strategies to respond to climate-related risks and opportunities.
- C2 19(a)(ii)** Disclosed that board meetings are arranged on a bi-annual basis to keep the Board informed of the company's climate developments and performances.
- C2 19(a)(iii)** Disclosed how the board and its committees takes into account climate-related risks and opportunities in its operations, supported by a diagram demonstrating the organisational structure and segregation of roles and responsibilities, demonstrating each Committee's role in integrating climate-related risks and opportunities.
- C2 19(a)(iv)** Disclosed the use of climate-related performance target, which is monitored by the Board on an annual basis.
- C2 19(b)** Explained that management from different business functions also takes part in managing climate-related risks and opportunities, and are overseen by the Board with performance monitored by climate-related performance targets.

Important note **S2.7**

In preparing governance disclosures under Part D of the ESG Code, an issuer shall avoid unnecessary duplication with the other governance disclosures made pursuant to paragraph 13 of the ESG Code. For example, if oversight of ESG-related (including climate-related) risks and opportunities is managed on an integrated basis, the issuer should avoid duplication by providing integrated governance disclosures instead of separate disclosures for each ESG-related risk and opportunity²⁴.



²⁴ Note to paragraph 19 of the ESG Code.



Chapter 3 – Strategy

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Objective

The objective of this chapter is to discuss the approach and strategy in managing climate-related issues, and to assist issuers in understanding how climate change impacts or may potentially impact them.

The sections in this chapter will explore how climate-related risks and opportunities identified can result in business and financial effects, how issuers may use a scenario analysis to assess climate resilience, and how issuers may consolidate their responses to such risks and opportunities, which may form part of their overall plan for transitioning towards a lower-carbon economy.



Issuers may adopt different thinking processes to incorporate climate-related risks and opportunities into their strategy and prepare for disclosures. Please refer to [Appendix 2 > Illustrative cases](#), where three illustrative cases of **1** a real estate company, **2** a logistics company and **3** a manufacturing company are provided.

Important note

Both cross-industry metrics and industry-based metrics are common indicators to enable investors and stakeholders to assess an issuer's performance in relation to a particular climate-related risk or opportunity. Instead of disclosure on a standalone basis, disclosing metrics together with qualitative information regarding a climate-related risk or opportunity (e.g. disclose percentage of business activities or assets vulnerable to a climate-related risk when discussing the relevant climate-related risk) could provide insight into the company's exposure to the relevant climate-related risk or opportunity, thereby allowing a more thorough understanding of the risk or opportunity in question.

Therefore, in preparing disclosures under the requirements discussed in this chapter, issuers shall refer to and consider the applicability of cross-industry metrics (paragraphs 28 to 35 of the ESG Code) and industry-based metrics (paragraph 36 of the ESG Code)²⁵.



Climate-related risks and opportunities

Paragraph 20 S2 10

An issuer shall disclose information to enable an understanding of climate-related risks and opportunities that could reasonably be expected to affect the issuer's cash flows, its access to finance or cost of capital over the short, medium or long term. Specifically, the issuer shall:

- (a) describe climate-related risks and opportunities that could reasonably be expected to affect the issuer's cash flows, its access to finance or cost of capital over the short, medium or long term;
- (b) explain, for each climate-related risk the issuer has identified, whether the issuer considers the risk to be a climate-related physical risk or climate-related transition risk;
- (c) specify, for each climate-related risk and opportunity the issuer has identified, over which time horizons – short, medium or long term – the effects of each climate-related risk and opportunity could reasonably be expected to occur; and
- (d) explain how the issuer defines 'short term', 'medium term' and 'long term' and how these definitions are linked to the planning horizons used by the issuer for strategic decision-making.

²⁵ Paragraph 41 of the ESG Code.



Climate-related risks are typically classified into two major categories:

- **Climate-related physical risks:** Risks related to physical impacts of climate change, which can be event-driven (acute risks) or caused by longer-term shifts in climate patterns (chronic risks)
- **Climate-related transition risks:** Risks related to the transition to a lower-carbon economy, which may entail policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change

Climate-related opportunities refer to potential positive effects arising from climate change for an issuer. Efforts to mitigate and adapt to climate change can also present climate-related opportunities for issuers.

Climate-related risks and opportunities may differ depending on the issuer's industry sector and geographical location. Issuers are encouraged to refer to and consider the applicability of the industry-based disclosure topics defined in IFRS S2 Industry-based Guidance on implementing Climate-related Disclosures²⁶. Under the ESG Code, issuers are required to disclose climate-related risks and opportunities that are reasonably expected to affect their cash flows, access to finance or cost of capital over the short, medium or long term. Where appropriate, issuers may include cross-references to other sections of their annual report for such disclosure.

Further guidance on identifying material climate-related risks

IFRS (2023) [IFRS S2 Climate-related Disclosures Industry-based Guidance](#)

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 3 Identify and Prioritise Climate-related Risks



²⁶ Note 1(b) to paragraph 20 of the ESG Code.

Time horizons

Issuers should disclose the time horizons they selected to assess climate-related risks and opportunities, and the extent to which these align with their planning horizons (i.e. short, medium and long term) used for strategic decision-making. The following factors can be considered when determining the time horizon:

- **Industry nature:** property developers may use a longer time horizon as real estate and infrastructure project planning typically spans a decade, whereas consumer or services-based industries such as telecommunications and software development may have a shorter planning time horizon.
- **Investment cycle and capital allocation:** issuers may consider their usual investment holding period and align their time horizons with their investment cycle.
- **Relevant policy jurisdictions:** issuers may consider the jurisdictions that they operate e.g. issuers operating in Hong Kong may consider achieving carbon neutrality by 2050 to align with Hong Kong's Climate Action Plan 2050, and those with significant presence in China may also take into account China's 3060 target, i.e. to peak carbon emissions before 2030 and achieve carbon neutrality by 2060.
- **Nature of climate-related risks:** issuers may determine the time horizon based on the type of risks they would like to analyse, e.g. most climate-related physical risks tend to manifest over medium and long terms, longer time horizons may be necessary to capture the effects of chronic climate-related physical risks such as sea level rise and basin water scarcity.
- **Strategic objectives:** issuers may refer to their existing climate-related targets e.g. science-based greenhouse gas reduction target.
- **Asset useful life:** issuers with assets may consider setting time horizons that match the useful life of their assets.

Implementation reliefs S2 11-12

In identifying climate-related risks and opportunities, issuers shall use all reasonable and supportable information that is available to it at the reporting date without undue cost or effort (i.e. the [Reasonable Information Relief](#))²⁷.

Understanding that some issuers may consider information about future opportunities to be commercially sensitive, the [Commercial Sensitivity Relief](#) is also available to allow non-disclosure of information about a climate-related opportunity under limited circumstances²⁸.

²⁷ Note 1(a) to paragraph 20 of the ESG Code.

²⁸ Note 2 to paragraph 20 of the ESG Code.

Business model and value chain

Paragraph 21 S2 13

An issuer shall disclose information that enables an understanding of the current and anticipated effects of climate-related risks and opportunities on the issuer's business model and value chain. Specifically, the issuer shall disclose:

- (a) a description of the current and anticipated effects of climate-related risks and opportunities on the issuer's business model and value chain; and
- (b) a description of where in the issuer's business model and value chain climate-related risks and opportunities are concentrated (for example, geographical areas, facilities and types of assets).

Effects of climate-related risks

To assess the effect of climate-related risks and opportunities over the time horizon, issuers are expected to review their business model and value chain to identify areas where the impacts of climate-related risks are expected to be the most severe. Please refer to [Chapter 1 > IFRS S1 key concepts > \(vi\) Value chain concepts](#) for further discussion regarding an issuer's value chain.

Further guidance on mapping business with material risks and evaluation of climate-related impacts

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 4 Business Mapping with Material Risks



When disclosing the current and anticipated effects of climate-related risks and opportunities on the issuer's business model and value chain, an issuer should also describe where such risks and opportunities are concentrated, where applicable (e.g. geographical areas, facilities and types of assets).

Implementation relief S2 B36

For the determination of scope of their value chain, issuers should refer to the Note to paragraph 21 and [Reasonable Information Relief](#) when preparing the disclosures.

Practical application 1: Common climate-related risks and their potential effects on an issuer's business model and value chain²⁹



Types of risks	Climate-related risks	Effects on business model	Effects on value chain
Climate-related physical risks			
Acute risk	Increased severity of extreme weather events such as: <ul style="list-style-type: none"> • Tropical cyclones • Riverine flooding • Storms • Wildfires 	<ul style="list-style-type: none"> • Anticipated damage to property and assets in “high-risk” locations • Negative impacts on the workforce (e.g. health, safety, absenteeism) • Inadequate utilities supply (e.g. water, energy) for plants and facilities 	<ul style="list-style-type: none"> • Decreased production capacity (e.g. transport difficulties, supply chain interruptions) • Anticipated reduction in availability of insurance on assets in “high-risk” locations
Chronic risk	<ul style="list-style-type: none"> • Changes in precipitation patterns and extreme variability in weather patterns • Rising mean temperatures • Rising sea levels 		<ul style="list-style-type: none"> • Lower sales/ output due to business disruption
Climate-related transition risks			
Policy and legal risk	<ul style="list-style-type: none"> • Increased carbon pricing • Enhanced emissions reporting obligations • Mandatory regulation of existing products and services • Exposure to litigation 	<ul style="list-style-type: none"> • Increased regulatory requirements on carbon pricing • Early retirement of existing assets due to policy changes • Anticipated change in energy efficiency standards • Adoption or deployment of new practices and processes for compliance 	<ul style="list-style-type: none"> • Anticipated reduction in demand for high emissions products and services
Technology risk	<ul style="list-style-type: none"> • Substitution of existing products and services with lower emissions options • Unsuccessful investment in new technologies • Costs to transition to lower emissions technology 	<ul style="list-style-type: none"> • Early retirement of existing assets (e.g. stranded assets) • Increased research and development (“R&D”) in new and alternative technologies • New technology development • Adoption or deployment of new practices and processes 	<ul style="list-style-type: none"> • Anticipated reduction in demand for high emissions goods/ services

²⁹ Adapted from HKEX (2021) [Guidance on Climate Disclosures](#) p.26 and TCFD (2017) [Recommendations of the Task Force on Climate-related Financial Disclosures](#) p.10.



Types of risks	Climate-related risks	Effects on business model	Effects on value chain
Climate-related transition risks			
Market risk	<ul style="list-style-type: none">• Changing customer behaviour• Uncertain market signals• Increased cost of raw materials	<ul style="list-style-type: none">• Changing input prices (e.g. raw material, energy, water) and output requirements (e.g. waste treatment)• Abrupt and unexpected shifts in energy costs• Re-pricing of assets (e.g. fossil fuel reserves, land valuations, securities valuations)	<ul style="list-style-type: none">• Anticipated shift in consumer preferences• Change in revenue mix and sources
Reputation risk	<ul style="list-style-type: none">• Shifts in consumer preference• Stigmatisation of industry sector• Increased stakeholder concern or negative stakeholder feedback	<ul style="list-style-type: none">• Negative impacts on workforce management and planning (e.g. employee attraction and retention)• Reduction in capital availability	<ul style="list-style-type: none">• Anticipated reduction in demand for high emissions goods/ services• Decreased production capacity from stigmatised suppliers (e.g. delayed planning approvals, supply chain interruptions)

Effects of climate-related opportunities

Issuers who have disclosed their climate-related opportunities should disclose the effects of such opportunities on their business model and value chain.

Practical application 2: Common climate-related opportunities and their potential effects on an issuer's business model and value chain³⁰



Types of opportunities	Climate-related opportunities	Effects on business model	Effects on value chain
Resource efficiency	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Efficiency gains • Benefits to workforce management and planning (e.g. improved health and safety, employee satisfaction, productivity) 	<ul style="list-style-type: none"> • Increased production capacity
Energy source	<ul style="list-style-type: none"> • Use of lower-emission sources of energy • Use of supportive policy incentives • Use of new technologies • Participation in carbon market • Shift toward decentralised energy generation 	<ul style="list-style-type: none"> • Use of lowest-cost abatement • Reduced exposure to future fossil fuel price increases (e.g. through change in energy mix) • Reduced exposure to GHG emissions • Increased capital availability (e.g. as more investors favour lower-emissions producers) 	<ul style="list-style-type: none"> • Anticipated reputational benefits resulting in increased demand for goods/ services
Markets	<ul style="list-style-type: none"> • Access to new markets • Use of public-sector incentives • Access to new assets and locations needing insurance coverage 	<ul style="list-style-type: none"> • Access to new and emerging markets (e.g. partnerships with governments and development banks) • Diversification of financial assets (e.g. green bonds and infrastructure) 	<ul style="list-style-type: none"> • Access to new and more efficient suppliers

³⁰ Adapted from TCFD (2017) [Recommendations of the Task Force on Climate-related Financial Disclosures](#) p.11.

Types of opportunities	Climate-related opportunities	Effects on business model	Effects on value chain
Resilience	<ul style="list-style-type: none"> Participation in renewable energy programmes and adoption of energy-efficiency measures Use of resource substitutes/ diversification 	<ul style="list-style-type: none"> Increased resilience planning (e.g. infrastructure, land, buildings) 	<ul style="list-style-type: none"> New products and services related to ensuring resiliency Increased reliability of supply chain and ability to operate under various conditions

Important note: Are issuers required to re-assess the climate-related risks and opportunities in the value chain at every reporting date? S2 B34

No. However, issuers should re-assess climate-related risks and opportunities in the value chain where there are significant event(s) or changes in circumstances. Examples include:

- a significant change in the value chain, e.g. change of suppliers;
- a significant change in the business model, business activities or corporate structure, e.g. due to a merger or acquisition; and
- a significant change in the issuer's exposure to climate-related risks and opportunities e.g. policy change such as adjustment in the country-level target.



Please refer to [Chapter 5 > Metrics and Targets](#) for further discussion on the development of metrics in assessing climate-related risks and opportunities.

Further guidance on climate-related risks and opportunities

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 3 Identify and Prioritise Climate-related Risks

TCFD (2017) [Recommendations of the Task Force on Climate-related Financial Disclosures](#)



Climate resilience

Paragraph 26 S2 22

An issuer shall disclose information that enables an understanding of the resilience of the issuer's strategy and business model to climate-related changes, developments and uncertainties, taking into consideration the issuer's identified climate-related risks and opportunities. An issuer shall use climate-related scenario analysis to assess its climate resilience using an approach that is commensurate with an issuer's circumstances. In providing quantitative information, the issuer may disclose a single amount or a range. Specifically, the issuer shall disclose:

- (a) the issuer's assessment of its climate resilience as at the reporting date, which shall enable an understanding of:
 - (i) the implications, if any, of the issuer's assessment for its strategy and business model, including how the issuer would need to respond to the effects identified in the climate-related scenario analysis;
 - (ii) the significant areas of uncertainty considered in the issuer's assessment of its climate resilience; and
 - (iii) the issuer's capacity to adjust, or adapt its strategy and business model to climate change over the short, medium or long term;
- (b) how and when the climate-related scenario analysis was carried out, including:
 - (i) information about the inputs used, including:
 - (1) which climate-related scenarios the issuer used for the analysis and the sources of such scenarios;
 - (2) whether the analysis included a diverse range of climate-related scenarios;
 - (3) whether the climate-related scenarios used for the analysis are associated with climate-related transition risks or climate-related physical risks;
 - (4) (whether the issuer used, among its scenarios, a climate-related scenario aligned with the latest international agreement on climate change;
 - (5) (why the issuer decided that its chosen climate-related scenarios are relevant to assessing its resilience to climate-related changes, developments or uncertainties;
 - (6) time horizons the issuer used in the analysis; and
 - (7) what scope of operations the issuer used in the analysis (for example, the operation locations and business units used in the analysis);
 - (ii) the key assumptions the issuer made in the analysis; and
 - (iii) the reporting period in which the climate-related scenario analysis was carried out.

Climate resilience of strategy

Climate resilience is the capacity of an issuer to adjust its strategy and business model to uncertainties related to climate change, and encompasses the capacity to manage climate-related risks and benefits from climate-related opportunities, including the ability to respond and adapt to climate-related transition risks and climate-related physical risks.

To enable investors and stakeholders to understand the issuer's climate resilience, an issuer should disclose information on its assessment of climate resilience as at the reporting date, which shall contain the following elements:

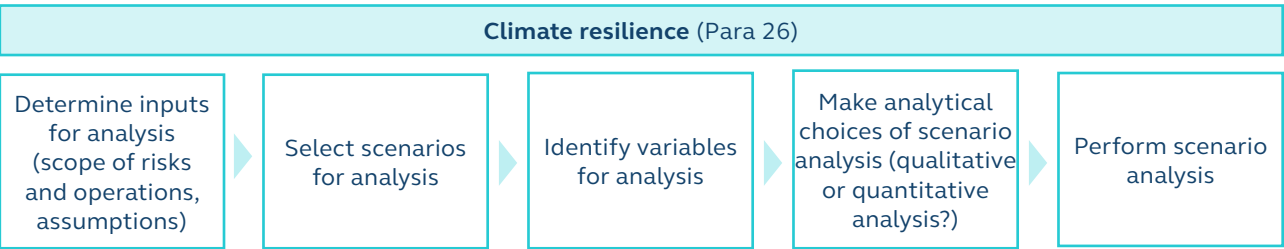
- **Implications of climate-related changes on strategy and business model:** this may include disclosure on how the issuer decides to respond to effects identified in the climate-related scenario analysis (e.g. increase investment in R&D of more climate-resilient infrastructures, or acquire assets located in areas with lower exposure to climate-related physical risks to strengthen climate resilience).
- **Areas of uncertainty:** for example, uncertainty may arise when assessing the vulnerability of assets to flooding risks due to the estimates involved in forecasting the frequency and magnitude of floods. Issuers should disclose the source of measurement methodologies, assumptions, approximations and judgments made in making relevant assessments when disclosing relevant information.
- **Ability of adjustment or adaptation:** issuers should also disclose their capacity to adjust or adapt their strategy and business model, for example: S2 22(a)(iii)
 - the availability of, and flexibility in, the issuer's existing financial resources to respond to the effects identified in the climate-related scenario analysis, including to address climate-related risks and to take advantage of climate-related opportunities;
 - the issuer's ability to redeploy, repurpose, upgrade or decommission existing assets; and
 - the effect of the issuer's current and planned investments in climate-related mitigation, adaptation and opportunities for climate resilience.

Climate-related scenario analysis

The ESG Code requires issuers to assess their resilience to climate-related risks and opportunities using a method of climate-related scenario analysis that is commensurate with the issuer’s circumstances, and disclose information about the inputs used.

Scenario analysis is a tool that allows an issuer to understand the risks and uncertainties it may face under different hypothetical futures and how those conditions may affect its performance, contributing to the development of greater strategy resilience and flexibility.

The workflow below sets out the steps that issuers can consider taking when preparing for a scenario analysis:



Determine inputs for analysis

(i) Scope of risks and operations

In determining the scope and boundaries in their scenario analysis, issuers can prioritise the material climate-related risks and opportunities that they have previously identified, for example through stakeholder engagement or materiality assessment.

With the scope of risks identified, issuers should determine the scope of operations to be covered in the scenario analysis, which typically encompass the issuer as a whole. However, issuers can take a phased approach or consider the following factors when determining the scope of analysis:

Practical application 3: Key factors for consideration when determining the scope of climate-related scenario analysis



Factors for consideration	Examples
Business nature and operations (e.g. product line, asset expected to be highly impacted by climate-related risks and opportunities)	Issuers may determine whether the analysis should focus on major operations or cover the whole group e.g. issuers may consider an initial analysis covering direct operations only, whilst more experienced issuers may consider expanding the analysis to their entire value chain including their supply chain and customers.
Geography	Issuers may determine the scope of analysis based on the major geographical locations they operate in.
Data availability	Issuers with limited baseline and projection data, e.g. current and future Scope 3 GHG emissions, may first focus the analysis on parameters where data is available, or make simplified assumptions and estimations regarding the potential baseline or projections.

Over time, as an issuer gains experience, it should consider expanding the scope of operations and risks covered by the scenario analysis.

(ii) Assumptions for scenario analysis S2 22(b)(ii)

Issuers should disclose relevant assumptions that they have made in the scenario analysis. Such assumptions may be about:

- macroeconomic trends;
- national- or regional-level variables (e.g. exposure to local climate conditions, demographics, land use, infrastructure and availability of natural resources);
- climate-related policies in the jurisdictions in which the issuer operates;
- company-level variables (e.g. business growth, workforce location);
- energy usage and mix; and
- developments in technology.

Select scenarios for analysis

Table 3 sets out certain commonly used publicly available scenarios, which are not meant to be exhaustive.

Table 3: Overview of publicly available scenario sources³¹

	IPCC (Sixth Assessment Report AR6)	IEA (GEC Model 2022)	NGFS (Phase IV Scenario)
Remit	<ul style="list-style-type: none"> Scientific and academic perspectives to assess the climate response to five illustrative scenarios that cover the range of possible future development of anthropogenic drivers of climate change 	<ul style="list-style-type: none"> Energy system perspective to explore various scenarios, each of which is built on a different set of underlying assumptions about how the energy system might respond to the current global energy crisis and evolve thereafter 	<ul style="list-style-type: none"> Convened by a group of central banks and supervisors to bring together a global, harmonised set of transition pathways, physical climate change impacts and economic indicators
Characteristics	<ul style="list-style-type: none"> Focuses on the physical science of climate change but also addresses transition risks associated with climate change 	<ul style="list-style-type: none"> Focuses on transition risks and opportunities e.g. energy and emissions scenarios describing the future energy mix 	<ul style="list-style-type: none"> Focuses on macro-financial impacts from physical risks, transition risks and opportunities
Scenarios	>3°C	<ul style="list-style-type: none"> SSP5-8.5 SSP3-7.0 	<ul style="list-style-type: none"> N/A Current Policies
	>1.5°C and <3°C	<ul style="list-style-type: none"> SSP2-4.5 SSP1-2.6 	<ul style="list-style-type: none"> Stated Policies Scenario (STEPS) Announced Pledges Scenario (APS) Below 2°C Delayed Transition National Determined Contributions (NDCs) Fragmented World
	≤ 1.5°C	<ul style="list-style-type: none"> SSP1-1.9 	<ul style="list-style-type: none"> Net Zero Emissions by 2050 Scenario (NZE) Net Zero 2050 Low Demand
Timeframe	<ul style="list-style-type: none"> Until 2100, granularity depending on data sources 	<ul style="list-style-type: none"> Until 2050, granularity depending on data sources 	<ul style="list-style-type: none"> 5 year interval until 2050, some indicators depending on model are available up to 2100
Geographic coverage	<ul style="list-style-type: none"> Global Regional data for North America, Europe, Asia, Small Islands, Central and South America, Africa, Australasia Selected country data 	<ul style="list-style-type: none"> Global Regional data for North America, Central and South America, Europe, Africa, Middle East, Eurasia and Asia Pacific Selected country data 	<ul style="list-style-type: none"> Global Country data for ~200 countries, incl. Mainland China, Hong Kong SAR

31 The list of scenarios included are non-exhaustive, extracted as of March 2024.

Issuers should select scenarios with high contrast to provide diversity in pathways and outcomes, for example, a 1.5 degrees Celsius warming scenario (in line with the Paris Agreement to limit the global temperature increase in this century to 1.5 degrees Celsius) and a 3 or more degrees Celsius warming scenario. The use of a diverse range of climate-related scenarios facilitates discussion and analysis on the potential impacts of climate-related risks and opportunities under different conditions.

The issuer should have a reasonable and supportable basis for selecting and using scenarios, variables and other parameters in a climate-related scenario analysis. For example: **S2 B12**

- An issuer with operations concentrated in a jurisdiction where emissions are regulated or are likely to be regulated in the future may use a scenario consistent with an orderly transition to a lower-carbon economy, or consistent with relevant jurisdictional commitments to the latest international agreement on climate change; and
- An issuer with heightened exposure to physical climate-related risks may use a localised climate-related scenario that takes into account potential impacts under a pathway where emissions are unmitigated.

Practical application 4: Key factors for consideration when selecting sources of scenarios



Factors	Rationale
Industry sector	Different industry sectors have different characteristics, and certain sources better suit the characteristics and needs of a particular sector, e.g. issuers in the energy sector may refer to IEA or other energy-specific sources that focus on transition risks. Sources such as the NGFS provide a broad range of metrics which may be applicable to many sectors.
Type of risks to be assessed	Different sources focus on different climate-related risks. Issuers may select sources depending on the type of risks being assessed, e.g. issuers analysing the effects of climate-related physical risks may select IPCC due to its credibility and focus on physical science impacts.
Jurisdiction of operation	Issuers may select sources with the most comprehensive coverage of global, regional or local climate models over the jurisdictions that the issuer operates in.
Time horizon determined	Issuers may select sources which cover the timeframes that match their determined time horizons, e.g. the NGFS and IPCC typically provide projections for a longer time horizon, up to 2100.

To enhance the decision-usefulness of scenarios developed in business context, issuers should look into multiple sources (e.g. IPCC, IEA and NGFS) to understand each scenario's characteristics and select scenarios most aligned with their circumstances. Where applicable, issuers may combine variables from different sources and develop their own scenarios to ensure the resulting analysis is best suited for their business' use.

Important note: Are issuers expected to only select the scenario sources in Table 3?

No, Table 3 serves as a reference for issuers to understand the common sources of scenarios that issuers may use to conduct their scenario analysis. Since the scenario sources in Table 3 are updated on a regular basis, issuers should visit the official websites to keep track of the latest datasets available.

Public data sources:

The Intergovernmental Panel on Climate Change (IPCC) [Sixth Assessment Report, SSP database](#)

International Energy Agency (IEA) [Global Energy and Climate Model](#)

Network for Greening the Financial System (NGFS) [Climate Scenarios for central banks and supervisors](#)

To facilitate scenario analysis on specific risk areas, issuers can also consider referring to other publicly available tools that have a focus on selected risks³², noting their assumptions and limitations.

Publicly available tools:

Aqueduct [Water Risk Mapping Tool](#), [Aqueduct Floods](#)

Climate Central [Coastal Risk Screening Tool](#)

NGFS Climate Analytics [Climate Impact Explorer](#)



Further guidance on developing climate scenarios

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 2 Formulate Climate Scenarios



³² Tools identified are for reference only, and are not intended to be exhaustive.



Identify variables for scenario analysis

An issuer should understand its business nature and relevant climate-related risks and opportunities in order to prioritise variables that will be most impactful for its scenario analysis.

For example, a construction company and a data centre operator may both consider rising mean temperatures as a material climate-related risk, but the variables that they use to assess the risk impact may be different. The construction company may select variables related to heat and labour productivity as it expects material financial effect from the decrease in construction workers' productivity, whereas a data centre operator may consider the electricity price as the relevant variable as it expects the increase of cooling demand to significantly impact its operating expenses.

An issuer needs to exercise judgment to determine the relevant variables, and the degree of judgment required depends on the availability of detailed information. As the time horizon increases and the availability of detailed information decreases, the degree of judgment required increases. **S2 B10**

For example, when location-specific (e.g. cities such as Hong Kong) climate data is not available, an issuer may consider the use of substitute data points or proxy data such as country-level data (e.g. China) or other available city-level data of the closest proximity (e.g. Shenzhen) to conduct scenario analysis. Please refer to the important note on [p.44](#) for a list of publicly available tools that can support issuers in conducting scenario analysis.

Practical application 5: Variables of selected climate-related risks and opportunities³³



Types of risks	Impact of risk	Examples of variables
Climate-related physical risks		
Increased severity of flooding	<ul style="list-style-type: none"> Increase in frequency and severity of flooding may cause damage to properties and equipment, contributing to an increase in cost of operations and depreciation of equipment Staff productivity may decrease as the traffic situation will be affected, impacting the working hours 	<ul style="list-style-type: none"> Chance of flooding occurrence Expected damage from flooding Expected operating losses from business interruptions
Rising mean temperatures	<ul style="list-style-type: none"> Rising mean temperatures can lower labour productivity, especially for those working outdoors Increase in cooling costs required to provide a safe working condition for workers 	<ul style="list-style-type: none"> Change in number of cooling degree days (e.g. days with temperature over 25°C) Impact of heat on labour productivity
Climate-related transition risks		
Increased carbon pricing	<ul style="list-style-type: none"> Implementation of carbon tax may increase cost of financing 	<ul style="list-style-type: none"> Carbon price GHG emissions
Use of lower-emission sources of energy	<ul style="list-style-type: none"> Transition to lower emissions sources may increase the needs to upgrade existing equipment Shift of energy use may affect existing energy costs 	<ul style="list-style-type: none"> Energy prices Energy mix

³³ Adapted from HKEX (2021) [Guidance on Climate Disclosures](#) p.20 (Table 2.4).

Make analytical choices of scenario analysis: quantitative or qualitative analysis?

Conducting a climate-related scenario analysis is often a journey for issuers. An issuer may start with qualitative scenario narratives or storylines to explore the potential range of climate change implications. As the issuer gains experience, it should start using quantitative information to illustrate potential pathways and outcomes. An issuer's skills and capabilities, as well as disclosures, would be strengthened through a process of learning and iteration. Over time, an issuer should apply greater rigour and sophistication to analyse more material risks and opportunities by, for example, increasing the scope of operations and risks assessed and conducting quantitative modelling or simulations of climate-related risks.

Implementation reliefs

Acknowledging the challenges that issuers may face in conducting a climate-related scenario analysis, both the [Reasonable Information Relief](#) and the [Capabilities Relief](#) are available for the determination of approach to climate-related scenario analysis³⁴.

An issuer should select an approach that is commensurate with its circumstances as at the time it carries out the scenario analysis. This envisages considering: **S2 B10**

- the issuer's exposure to climate-related risks and opportunities; and
- the skills, capabilities and resources available to the issuer (i.e. the Capabilities Relief).

An issuer will need to exercise judgment to determine the mix of variables and analytical choices that enables it to consider all reasonable and supportable information available to it at the reporting date without undue cost or effort (i.e. the Reasonable Information Relief).

Exposure to climate-related risks and opportunities **S2 B4-B7, B14-B15**

Quantitative information will often enable an issuer to carry out a more robust assessment of its climate resilience. However, in the absence of robust quantitative information, qualitative information (including scenario narratives), either alone or combined with other quantitative assumptions, can also provide a reasonable and supportable basis for an issuer's resilience assessment.

An issuer with a high degree of exposure to climate-related risk may benefit from a more quantitative or technically sophisticated approach to climate-related scenario analysis, compared to an issuer who is exposed to few or relatively less severe climate-related risks and opportunities.

³⁴ Note to paragraph 26 of the ESG Code.



Starting the climate-related scenario analysis journey

Issuers who have just started implementing climate-related scenario analysis may find it difficult to use a quantitative or technically sophisticated approach without undue cost or effort.

For example, an issuer who has identified change in consumer demand or stigmatisation of industry as material climate-related risks may find it challenging to quantify the potential impact of these risks. In this case, it may start with developing qualitative scenario narratives to allow the board and management to play out the potential impact without attributing absolute figures.

Further guidance on scenario analysis approach commensurate with the issuer's circumstance

IFRS (2023) [IFRS S2 Climate-related Disclosures](#) Appendix B: Application Guidance, paragraphs B1-B18



Perform scenario analysis

Based on the inputs, scenarios, variables and analytical choices determined at the earlier stages, an issuer can perform its scenario analysis. Illustrative disclosure 2 provides an example of scenario analysis disclosure where (i) qualitative narrative and (ii) quantitative modelling / simulation are used respectively.

Illustrative disclosure 2: Scenario analysis – disclosures of a real estate company leveraging qualitative narratives vs quantitative modelling / simulation

Inputs and approach of scenario analysis

Scope of analysis	C2 26(b)(i)(7)
<ul style="list-style-type: none"> 50 assets owned and managed in Hong Kong Including Headquarter and operating offices 30 assets in China not currently included in the assessment 	
Scenarios used	C2 26(b)(i)(1)-(5)
Physical risks	IPCC AR6 SSP2-4.5, SSP5-8.5
Transition risks	NGFS Current Policies, Net Zero 2050
Rationale	<ul style="list-style-type: none"> The scenarios developed take reference from IPCC (physical risks) and NGFS (transition risks) The sources selected provide time frames that align with our strategic planning time horizon and aligns with Paris Agreement The scenarios chosen will help the company assess the level of exposure from physical and transition risks, and support our future strategic planning (e.g. whether to decommission and relocate assets)
Time horizons	C2 26(b)(i)(6)
Short-term	2030
Medium-term	2050
Long-term	2080
Assumptions	C2 26(b)(ii)-(iii)
<ul style="list-style-type: none"> Analysis conducted in 2023, expect asset locations to remain the same over the time horizon Mitigation measures will remain the same Absolute zero Scopes 1 and 2 GHG emissions by 2030 	



Qualitative narratives

Physical risk	Relevance and assumptions	IPCC AR6 SSP2-4.5			IPCC AR6 SSP5-8.5		
		Percentage of value at risk (%)			Percentage of value at risk (%)		
C2 31		2030	2050	2080	2030	2050	2080
Extreme cold	We assessed how extreme weather events can impact our asset locations and the potential asset value at risk.	●	●	●	●	●	●
Coastal flooding		●	●	●	●	●	●
Tropical cyclone		●	●	●	●	●	●
Transition risk	Relevance and assumptions	NGFS Net Zero 2050			NGFS Current Policies		
		Percentage of total cost (%)			Percentage of total cost (%)		
C2 30		2030	2050	2080	2030	2050	2080
Increasing cost from carbon offsets	We expect higher carbon price may lead to increased fuel and energy costs.	●	●	●	●	●	●
Increasing electricity costs	We assessed how electricity and price increases could impact our energy spend.	●	●	●	●	●	●
Increasing cost to upgrade assets to “green”	We expect increasing regulations related to increasing building efficiency will translate into higher costs.	●	●	●	●	●	●

Quantitative modelling / simulation

Physical risk	Relevance and assumptions	IPCC AR6 SSP2-4.5			IPCC AR6 SSP5-8.5		
		Percentage of value at risk(%) (Asset value at risk (HKD))			Percentage of value at risk(%) (Asset value at risk (HKD))		
C2 31		2030	2050	2080	2030	2050	2080
Extreme cold	We quantified how extreme weather events can impact our asset locations and therefore the potential asset value at risk.	<1% (<0.5m)	<1% (<0.5m)	<1% (<0.5m)	<1% (<0.5m)	<1% (<0.5m)	2-5% (0.5-3m)
Coastal flooding		<1% (<0.5m)	<1% (<0.5m)	2-5% (0.5-3m)	<1% (<0.5m)	2-5% (0.5-3m)	6-10% (3-5m)
Tropical cyclone		2-5% (0.5-3m)	2-5% (0.5-3m)	6-10% (3-5m)	2-5% (0.5-3m)	6-10% (3-5m)	10-15% (5-10m)
Transition risk	Relevance and assumptions	NGFS Net Zero 2050			NGFS Current Policies		
		Percentage of total cost (%) (Potential financial effect(HKD))			Percentage of total cost (%) (Potential financial effect(HKD))		
C2 30		2030	2050	2080	2030	2050	2080
Increasing cost from carbon pricing	We quantified how carbon price (e.g. carbon tax) for our Scopes 1 & 2 emissions might impact our construction costs.	<1% (<0.5m)	6-10% (3-5m)	10-15% (5-10m)	<1% (<0.5m)	<1% (<0.5m)	<1% (<0.5m)
Increasing electricity costs	We quantified how the electricity price is expected to change and how this may impact our electricity costs if our consumption remains the same.	2-5% (0.5-3m)	2-5% (0.5-3m)	6-10% (3-5m)	2-5% (0.5-3m)	2-5% (0.5-3m)	6-10% (3-5m)
Increasing cost to upgrade assets to “green”	We quantified the potential costs to upgrading assets anticipating increasingly stringent building regulations.	2-5% (0.5-3m)	2-5% (0.5-3m)	6-10% (3-5m)	2-5% (0.5-3m)	6-10% (3-5m)	6-10% (3-5m)

Lower risk

Medium risk

Higher risk

Commentaries

C2 26(b)(i)(1)-(5)

Disclosed the use of SSP2-4.5, SSP5-8.5 from IPCC AR6 (associated with physical risks) and Net Zero 2050 and Current Policies scenarios from NGFS (associated with transition risks) in the scenario analysis, and the rationale for choosing the scenarios to match with the company's strategic planning time horizon.

C2 26(b)(i)(6)

Disclosed the time horizons selected for short, medium and long-term.

C2 26(b)(i)(7)

Described the scope of risks and operations included in the scenario analysis, which is limited to assets in Hong Kong.

C2 26(b)(ii)-(iii)

Disclosed assumptions made for conducting a scenario analysis as well as the reporting period when the analysis was carried out.

C2 30-31

Qualitative narratives

Indicates the percentage of value at risk/ percentage of total cost vulnerable to climate-related transition risks/ physical risks using a risk scale. No data points provided at the moment after the issuer considers all reasonable and supportable information available at the reporting date without undue cost or effort.

Quantitative modelling / simulation:

Discloses the range for both the percentage and amount of total costs/ total asset value vulnerable to climate-related transition risks/ physical risks.

Important note: Are issuers required to refresh their climate-related scenario analysis annually?

An issuer should, at a minimum, update its climate-related scenario models in line with its strategic planning cycle. Although an issuer is not required to refresh its climate-related scenario analysis annually, it should consider the indicators in Practical application 6.

An issuer should still assess its climate resilience annually to ensure the relevance and timeliness of the analysis before determining no refreshment is required, and reflect updated insights (if any) on the implications of its assessment for its strategy and business model.



Practical application 6: Indicators to refresh scenario analysis³⁵



Indicators	Examples
A significant change in business model	<ul style="list-style-type: none"> • Merger and acquisition in the business • Changes in energy mixes
A discrepancy in previous assessment and current situation	<ul style="list-style-type: none"> • Percentage of carrying value of the operation / assets covered in the previous assessment has fallen below a certain threshold • Change in number of assets owned by the business • Change in asset value estimates
Previous assumption is no longer valid	<ul style="list-style-type: none"> • Change in carbon price as estimated by scenario sources • Change in frequency and intensity of storms, droughts, and floods • Change in climate policy developments • Change in costs of renewable energy sources (e.g. wind, solar, biofuels) • Change in carbon capture developments (e.g. carbon dioxide removal, carbon capture and storage, deforestation, reforestation)

Further guidance on scenario analysis

TCFD (2020) [Guidance on Scenario Analysis for Non-Financial Companies](#)

TCFD (2017) [The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities](#)



³⁵ Adapted from TCFD (2020) [Guidance on Scenario Analysis for Non-Financial Companies](#) p.41.

Financial position, financial performance and cash flows

Climate-related risks and opportunities can affect several aspects of an issuer's financial situation. Examples include³⁶: **S2 16**

- Changes in financial position and impacts on cash flows
 - current and committed investment plans;
 - planned sources of funding to implement and to finance/ re-finance climate strategy; and
 - costs arising from physical damage to assets from climate events.
- Changes in financial performance and impacts on cash flows
 - impact on revenue from products and services aligned with a lower-carbon economy; and
 - impact on operating costs associated with climate adaptation or mitigation.

Issuers should disclose the effects of climate-related risks and opportunities on their financial position, financial performance and cash flows as such information can support stakeholders in making more informed investment decisions.

Current financial effects

Paragraph 24 **S2 16(a)-(b)**

An issuer shall disclose qualitative and quantitative information about:

- (a) how climate-related risks and opportunities have affected its financial position, financial performance and cash flows for the reporting period; and
- (b) the climate-related risks and opportunities identified in paragraph 24(a) for which there is a significant risk of a material adjustment within the next annual reporting period to the carrying amounts of assets and liabilities reported in the related financial statements.

To provide transparency as to how the issuer is managing its current climate-related risks and opportunities, an issuer should disclose the current financial sensitivity and how its financial situation has been impacted.

36 Adapted from Task Force on Climate-related Financial Disclosures (2021) [Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#) p.10 (Figure 4).

Practical application 7: Examples of current financial effects from climate-related risks and opportunities



Types	Examples
Changes in financial position and impacts on cash flows	<ul style="list-style-type: none"> Change in capital expenditure for major acquisition and divestments of assets Change in capital expenditure to invest in a new production line Change in asset valuation due to damage from climate events Change in revenue due to shut down of malls / facilities after severe typhoon
Changes in financial performance and impacts on cash flows	<ul style="list-style-type: none"> Change in revenue associated with new products introduced to align with a lower-carbon economy Change in operational expenses associated with energy or water efficiency in response to climate-related risks Change in severance expenses due to shut down of production facility triggered by the government's ban of gas-powered hot water heating

Issuers should account for climate-related matters in the financial statements in accordance with the requirements under HKFRS, IFRS, CASBE or the alternative overseas financial reporting standard acceptable to the Exchange³⁷.

Where the quantitative information disclosed pursuant to paragraph 24 is not expressed as a line item in the financial statements, the issuer shall explain how such information is reflected in its financial statements (e.g. identifying the relevant line item in the financial statements).

Illustrative disclosure 3 provides an example of how current financial effects can be disclosed. Issuers can also refer to [Chapter 1 > IFRS S1 key concepts > \(iv\) Location of disclosures](#) and [\(xiii\) Connected information](#) for discussions on disclosing climate-related matters in other locations and making cross-references³⁸.

³⁷ Note 1 to paragraph 24 of the ESG Code.

³⁸ Note 2 to paragraph 24 of the ESG Code.

Illustrative disclosure 3: Current financial effects of a real estate company

In response to an increasing risk of coastal flooding in the long-run, we have installed flood protection equipment and constructed additional flood gates and sump pumps in most of our assets located in the coastal area during the year. **C2 24** The installation is expected to protect our properties from damages of water rising and seeping.

The cost was approximately HKD20 million which has been capitalised during the year. **C2 24** Refer to note X Properties, plant and equipment of our consolidated financial statements for more information. **C2 Notes to 24**

Commentaries

C2 24

Disclosed the issuer's response to coastal flooding in installing flood protection equipment and additional flood gates and sump pumps, which affects the financial line item Properties, plant and equipment for the reporting period.

C2 Notes to 24

Explained how financial effect of climate-related risks are accounted for in the financial statements, and made cross-reference to disclosures contained as a note to its financial statements.

Anticipated financial effects

Paragraph 25 **S2 16(c)-(d)**

The issuer shall provide qualitative and quantitative disclosures about:

- (a) how the issuer expects its financial position to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities, taking into consideration:
 - (i) its investment and disposal plans; and
 - (ii) its planned sources of funding to implement its strategy; and
- (b) how the issuer expects its financial performance and cash flow to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities.

Issuers should disclose the potential scope and scale of anticipated financial effects to their investment and disposal plans (e.g. plans for capital expenditure, major acquisitions and divestments, joint ventures, business transformation, innovation, new business areas, and asset retirements), and planned sources of funding to implement the relevant strategies.

S2 16(c)(i)

Practical application 8: Examples of anticipated financial effects from climate-related risks and opportunities



Types	Examples
Changes in financial position and impacts on cash flows	<ul style="list-style-type: none"> Changes in capital expenditure to acquire a new sustainable packaging machinery in the next year Changes in capital expenditure to replace vehicles of internal combustion engine with a fully electric model over the next 5 years Changes in liabilities of sustainability-linked financing arrangements to support green building construction over the next 3 years
Changes in financial performance and impacts on cash flows	<ul style="list-style-type: none"> Changes in revenue from an anticipated introduction of new product aligned with net zero target in the next 5 years Changes in operational expenses from physical damage to assets from climate events or an anticipated disposal of machinery in the next year Changes in operating costs associated with climate adaptation or mitigation (e.g. purchase of energy-efficient office equipment such as LED lights in the next 3 years)

Issuers should also disclose key underlying assumptions and methodologies used, and material judgments made in determining the anticipated effects on future financial position and performance.

Issuers should note that in providing quantitative information about current or anticipated financial effects, an issuer may disclose a single amount or a range³⁹. **S2 17**

³⁹ Note 1 to paragraph 25 of the ESG Code.

Implementation reliefs

1. The [Reasonable Information Relief](#) and [Capabilities Relief](#) are available for preparing disclosures about anticipated financial effects of a climate-related risks or opportunities⁴⁰. **S2 18**
2. Understanding that issuers may face challenges in providing quantitative information about current or anticipated financial effects, where an issuer determines that: **S2 19**
 - (a) the current or anticipated financial effects of a climate-related risk or opportunity are not separately identifiable; or
 - (b) the level of measurement uncertainty involved in estimating those effects is so high that the resulting quantitative information would not be useful,

the issuer need not provide quantitative information about such effects⁴¹.
3. In addition, an issuer need not provide quantitative information about the anticipated financial effects of a climate-related risk or opportunity if the issuer does not have the skills, capabilities or resources to provide that quantitative information⁴². **S2 20**
4. Where an issuer determines that it need not provide quantitative information about the current or anticipated financial effects of a climate-related risk or opportunity applying the criteria set out above, the issuer shall: **S2 21**
 - (a) explain why it has not provided quantitative information;
 - (b) provide qualitative information about those financial effects, including identifying line items, totals and subtotals within the related financial statements that are likely to be affected, or have been affected, by that climate-related risk or opportunity; and
 - (c) provide quantitative information about the combined financial effects of that climate-related risk or opportunity with other climate-related risks or opportunities and other factors unless the issuer determines that quantitative information about the combined financial effects would not be useful⁴⁴.

Example

A real estate company's cost of procuring construction material is affected by increasingly stringent regulations to restrict the amount of embodied carbon. However, while those regulations have affected its procurement costs, which would in turn affect its gross margin and profits, the company may not be able to separately identify the effect of such regulations from other market factors (e.g. the availability and the cost of R&D to move to lower-carbon construction material). As a result, it is unable to quantify the anticipated financial effects attributable to this particular climate-related risk.

In such case, the company should (i) identify the relevant regulations that are expected to affect its cost of construction materials, (ii) identify the items, totals and subtotals within the related financial statements that are likely to be affected (i.e. gross margin and profits), (iii) explain why it cannot separately identify the financial effects of such climate-related risk, and (iv) provide quantitative information about the combined financial effects of such climate-related risk and other factors.

40 Note 2 to paragraph 25 of the ESG Code.

41 Note 3 to paragraph 25 of the ESG Code.

42 Note 4 to paragraph 25 of the ESG Code. Please refer to discussions on the [Capabilities Relief](#) in Chapter 1 of this guidance.

43 Note 5 of paragraph 25 of the ESG Code.



Illustrative disclosure 4 provides an example of how anticipated financial effects may be reported.

Illustrative disclosure 4: Anticipated financial effect of a real estate company

In view of our dedication to sustainability, we have prioritised addressing climate risk and spearheading our net-zero transition plan. Over the past year, we have significantly increased our investments in renewable energy, while simultaneously phasing out fossil fuel equipment across our operations. These strategic decisions not only align with our commitment to reducing greenhouse gas emissions, but also position us as leaders in the transition to a low-carbon economy.

To support these efforts, we have allocated a budget of HKD50 million over the next five years. A significant portion of the budget will be allocated towards upgrading existing infrastructure and constructing new facilities to support our renewable energy initiatives. It also encompasses professional fees to engage consultants in planning and implementing our net-zero transition plan. **c2 25**

Commentaries

c2 25

Disclosed the issuer's investment and spending plan over the next five years to manage its climate-related risks and opportunities for the cost of infrastructure and facilities as well as consultancy services.

Further guidance on determining and disclosing financial effects

IFRS (2023) Effects of climate-related matters on financial statements

The IFRS provides guidance to support companies' consistent application of requirements in the IFRS Standards, with non-exhaustive examples illustrating when companies are required to consider the effects of climate-related matters in applying the principles in the relevant IFRS Standards.



Strategy and decision-making

Paragraph 22 S2 14

An issuer shall disclose information that enables an understanding of the effects of climate-related risks and opportunities on its strategy and decision-making. Specifically, the issuer shall disclose:

- (a) information about how the issuer has responded to, and plans to respond to, climate-related risks and opportunities in its strategy and decision-making, including how the issuer plans to achieve any climate-related targets it has set and any targets it is required to meet by law or regulation. Specifically, the issuer shall disclose information about:
 - (i) current and anticipated changes to the issuer's business model, including its resource allocation, to address climate-related risks and opportunities;
 - (ii) current and anticipated adaptation and mitigation efforts (whether direct or indirect);
 - (iii) any climate-related transition plan the issuer has (including information about key assumptions used in developing its transition plan, and dependencies on which the issuer's transition plan relies), or an appropriate negative statement where the issuer does not have a climate-related transition plan;
 - (iv) how the issuer plans to achieve any climate-related targets (including any greenhouse gas emissions targets (if any)), described in accordance with paragraphs 37 to 40; and
- (b) information about how the issuer is resourcing, and plans to resource, the activities disclosed in accordance with paragraph 22(a).

Paragraph 23

An issuer shall disclose information about the progress of plans disclosed in previous reporting periods in accordance with paragraph 22(a).

Responses to climate-related risks and opportunities

Practical application 9: Examples of responses to climate-related risks and opportunities



Areas	Examples
Changes to business model, strategy and resource allocation S2 14(a)(i)	<ul style="list-style-type: none"> Replace distribution fleet of internal combustion engine with electric vehicles to reduce emissions Incorporate exclusion policy and avoid investing in carbon-intensive industries such as fossil fuels and oil and gas Reduce financing to carbon-intensive businesses (e.g. coal industry) Develop a new verification process for contracted suppliers to audit their climate-resilience practices and shortlist qualified suppliers Plans to retire, manage or decommission carbon-, energy- or water-intensive operations Resource allocations resulting from demand or supply-chain changes Resource allocations arising from business development through capital expenditure or additional expenditure on research and development Conduct acquisitions of low-carbon businesses or divestments of carbon-intensive businesses
Direct adaptation and mitigation efforts S2 14(a)(ii)	<ul style="list-style-type: none"> Install flood walls in assets located in high-risk locations (e.g. fluvial flood plain) to reduce chance of disruption Change production processes or equipment through improving machinery resilience and business continuity procedures and revisiting product packaging Develop critical planning assumptions around legacy assets and other controlled assets located in high-risk locations (e.g. strategies to lower carbon, energy-, water-intensive operations) Change product specifications Relocate facilities in high-risk locations and adjust workforce
Indirect adaptation and mitigation efforts S2 14(a)(iii)	<ul style="list-style-type: none"> Engage with customers through providing training sessions to increase their awareness of climate change Work with suppliers to increase adoption of climate-resilient practices to improve their productivity and strengthen their resilience to extreme weather
Resourcing of plans to support the above actions S2 14(b)	<ul style="list-style-type: none"> Hiring of dedicated headcount to address climate-related risks and opportunities Expansion of existing employees' roles and responsibilities to cover climate-related risks and opportunities

Climate-related transition plan

A climate-related transition plan is an aspect of an issuer's overall strategy that lays out the issuer's targets, actions or resources for its transition towards a lower-carbon economy, including actions such as reducing its greenhouse gas emissions.

Where an issuer has a transition plan in place, it should describe the plan, the assumptions made and dependencies identified, particularly around transition pathway uncertainties and implementation challenges. The assumptions should be consistent with those used by the issuer in its financial accounts, capital expenditures, and investment decisions. Some examples may include:

- **Target achievability:** an issuer may assume that its climate-related target of reaching net zero by 2050 can be achieved.
- **Regulatory environment:** an issuer may assume that the climate policies and regulations will remain a similar stringency in 2050 as compared to today.
- **Available financial resources:** the implementation of the transition plan may depend on the level of financial resources available, and whether they can be allocated to achieve the desired outcomes.

Please refer to [Chapter 5 > Metrics and Targets > Climate-related targets](#) for further details in relation to target-setting.

Important note:

Issuers who have already disclosed their climate-related transition plan in documents other than the ESG reports to comply with other regulatory requirements may cross-reference to disclosures in those documents to avoid duplication.



Further guidance on transition plans

CDP (2023) [CDP Technical Note: Reporting on Climate Transition Plans](#)

Investor Group on Climate Change (2022) [Corporate Climate Transition Plans: A guide to investor expectations](#)

TCFD (2021) [Guidance on Metrics, Targets, and Transition Plans](#) Chapter E





Chapter 4 – Risk Management

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Objective

The objective of this chapter is to discuss the steps issuers can take in identifying, assessing, prioritising and managing their climate-related risks. It also explores approaches for issuers to integrate climate-related risks into their existing risk management processes.

Paragraph 27 S2 25

An issuer shall disclose information about:

- (a) the processes and related policies it uses to identify, assess, prioritise and monitor climate-related risks, including information about:
 - (i) the inputs and parameters the issuer uses (for example, information about data sources and the scope of operations covered in the processes);
 - (ii) whether and how the issuer uses climate-related scenario analysis to inform its identification of climate-related risks;
 - (iii) how the issuer assesses the nature, likelihood and magnitude of the effects of those risks (for example, whether the issuer considers qualitative factors, quantitative thresholds or other criteria);
 - (iv) whether and how the issuer prioritises climate-related risks relative to other types of risks;
 - (v) how the issuer monitors climate-related risks; and
 - (vi) whether and how the issuer has changed the processes it uses compared with the previous reporting period;
- (b) the processes the issuer uses to identify, assess, prioritise and monitor climate-related opportunities (including information about whether and how the issuer uses climate-related scenario analysis to inform its identification of climate-related opportunities); and
- (c) the extent to which, and how, the processes for identifying, assessing, prioritising and monitoring climate-related risks and opportunities are integrated into and inform the issuer's overall risk management process.

A risk management process will generally cover the following elements: risk identification, risk assessment, risk prioritisation and risk management, which are key aspects to inform risk integration. Issuers should note that climate-related opportunities are as equally important and the execution of risk management processes may facilitate the identification of opportunities. For more details of climate-related opportunities, please refer to [Chapter 3 > Strategy > Climate-related risks and opportunities](#).



Risk identification

An issuer should first identify climate-related risks relevant to its business. For details related to the identification of climate-related risks, please refer to [Chapter 3 > Strategy > Climate-related risks and opportunities](#).

Risk assessment

To facilitate an efficient use of resources to manage its most material risks, an issuer should set criteria to assess climate-related risks, such as the likelihood of occurrence, expected impact on the issuer, its adaptability to such risks and the resources and time required to recover from such risks.

Risk prioritisation

After determining the risk assessment criteria, an issuer can conduct qualitative evaluation or quantitative scoring to prioritise the most relevant and material risks before deciding how to monitor and manage such risks.

Insights: Materiality judgments of climate-related risks S1 B23

Generally, risks are more likely to be material if the potential effects are significant and the likelihood of occurrence is high. However, risks of low-probability and high-impact might also be material either individually or in combination with other risks of low-probability and high-impact outcomes.

For example, an issuer might be exposed to several climate-related risks, each of which could cause the same type of disruption to the issuer's business, such as disruption to the issuer's supply chain. Information about an individual source of risk might not be material if disruption from that source is highly unlikely to occur. However, information about the aggregate risk, such as the risk of supply chain disruption from all sources, might be material.



Further guidance on the approach to climate-related risk assessment and prioritisation

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 3 Identify and Prioritise Climate-related Risks



Risk management

After assessing and prioritising climate-related risks, issuers should consider how to monitor and manage such risks. Depending on its risk appetite and ESG management approach, issuers' responses to the same climate-related risk may differ.

Practical application 10: Common risk management approaches and examples⁴⁴



Approach	Definition	Examples
Risk control	Implement measures to control exposures to climate-related risks/ chances of occurrences	An issuer in the real estate sector incorporates climate considerations during its due diligence process to identify climate-related risks and opportunities in potential asset acquisitions.
Risk transfer	Shift risk from the company to another party	An issuer in the real estate sector purchases insurance to cover potential risks from river flooding, thereby transferring some of the potential financial impact to the insurance company.
Risk acceptance	Take no action to change severity of the risk	An issuer in the manufacturing sector accepts potential climate-related risk in supply chain as within its risk appetite. However, the issuer will closely monitor the situation to ensure that the risk level continues to remain stable.
Risk mitigation	Implement measures to minimise the impact of climate-related risks	An issuer in the banking sector reduces its financial exposure to clients who do not fulfil requirements in their climate risk policy.

⁴⁴ Adapted from COSO/ WBCSD (2018) [Enterprise Risk Management Applying enterprise risk management to environmental, social and governance-related risks](#) p.68-71 and HKMA (2020) [Range of practices for management of climate risks](#) p.8.

Risk integration

Disclosure about risk integration should summarise the issuer's process of assessing, prioritising and managing risks in a coordinated and holistic manner. The goal of integrating climate-related risk management into an issuer's existing overall risk management process is to ensure that the issuer is able to assess and prioritise climate-related risks in a timely manner in order to monitor and manage them.

To achieve such integration, issuers should consider the following aspects:

- **Climate governance:** general understanding across the company of climate change concepts and its potential impacts (see below and [Chapter 2 > Governance](#));
- **Risk inventories alignment:** adjustment of risk inventories and management processes for the integration of climate-related risks and the accountability of relevant functions and departments (see below and [Chapter 3 > Strategy > Climate-related risks and opportunities](#));
- **Risk appetite:** possible incorporation of climate-related risks into existing risk categories and risk appetite adjustment (see below and [Chapter 3 > Strategy > Climate resilience](#));
- **Tools and reporting:** need for new or adapted risk management tools or processes to support management of climate-related risks and the use of metrics to assess climate-related risks. (see below and [Chapter 5 > Metrics and Targets](#)).

Climate governance

Obtaining board and management buy-in is essential in order to integrate climate-related risks into an issuer's existing risk management processes. It is important for the board and management to first understand the concepts of climate change and the unique characteristics of climate-related risks (see Table 4), which would in turn enable them to appreciate the effects of relevant risks and integrate them into the risk management processes.

Table 4: Characteristics of climate-related risks⁴⁵

Characteristics	Description
Different effects based on geography and activities	The effects of climate change and climate-related risks vary significantly depending on the issuer's location of operations, industry sector and business activity along its value chain.
Longer time horizons and long-lived effects	Some climate-related risks exist and play out over time horizons that stretch beyond traditional business planning and investment cycles. These risks and related impacts may occur as a result of decades-long changes in driving forces (e.g. greenhouse gas concentrations in the atmosphere) leading to climate-related physical or transition risk changes over the short, medium, and long term.
Novel and uncertain nature	Many effects of climate change have no precedent, therefore limiting the issuer's ability to apply statistical and trend analysis based on historical data. Climate change is a dynamic and uncertain phenomenon and possible mitigation responses are also complex, with many unknowns (e.g. the development and deployment of critical technologies and adaptation strategies, changing market and consumer behaviours).
Changing magnitude and non-linear dynamics	Climate-related risks may manifest at different scales over time, with increasing severity and scope of impacts. Climate systems may exhibit thresholds and tipping points that result in large, long term, abrupt, and possibly irreversible changes. Understanding the sensitivities of tipping points in the physical climate ecosystem and society is essential for understanding climate-related risks.
Complex relationships and systemic effects	Risks associated with climate change are interconnected across socioeconomic and financial systems. Interconnected risks are often characterised by knock-on effects and systemic effects, requiring a multi-dimensional perspective to assess the short, medium, and long term implications for a company.

Issuers should also understand how risk management and strategic planning are tied together and identify the key stakeholders involved in such processes. This could facilitate the assignment of accountability in the risk management process for climate-related risks.

Risk inventories alignment

With the recognition of how climate-related risks may affect the business, issuers can consider ways to integrate such risks into existing processes. In most situations, climate-related risks are drivers or amplifiers of existing risks. As a start, issuers may map climate-related risks against existing risk categories and inventories. For example, changing weather patterns may increase the cost of raw materials, which is an existing operational risk for many issuers.

⁴⁵ TCFD (2020) [Guidance on Risk Management Integration and Disclosure](#) p.5 (Table C1).

Practical application 11: Examples of climate-related risks mapping to existing risk categories⁴⁶



Category	Sub-category	Climate-related risk
Operational	<ul style="list-style-type: none"> Supply Chain Raw Material Availability Business Continuity 	<ul style="list-style-type: none"> Supply chain disruptions occur because of droughts or extreme weather impacts in supplier regions Costs increase on raw materials due to sustainable forestry practice requirements Changing weather patterns and increased natural disasters disrupt operations
Financial	<ul style="list-style-type: none"> Credit Risk Liquidity Risk Tax Strategy 	<ul style="list-style-type: none"> Creditworthiness is eroded and interest rates rise as lenders consider escalating business risks related to climate change Costs increase due to additional taxes or fees on carbon emissions
Strategic	<ul style="list-style-type: none"> Competition Changing Customer Preferences 	<ul style="list-style-type: none"> Shift in customer preferences towards products that are produced with lower emissions or that produce lower emissions

Risk appetite

An issuer should assess how climate-related risks and opportunities may affect its existing strategic planning and its willingness to accept these risks and opportunities. Depending on its acceptance level, the integration of climate-related risks and opportunities may result in an adjustment in the issuer's risk appetite.

Tools and reporting

Issuers may use different methods to achieve integration depending on the identified risk, e.g. fully-integrated enterprise risk management processes, or risk management processes that focus on individual hazards.

Issuers can refer to [Appendix 3](#) for an overview of various tools that may be employed to support the identification, assessment and management of climate-related risks depending on the unique characteristics of the relevant climate-related risk.

Illustrative disclosure 5 provides suggestions on how issuers may disclose their climate risk management process.

⁴⁶ TCFD (2020) [Guidance on Risk Management Integration and Disclosure](#) p.11 (Table D5).

Illustrative disclosure 5: Risk management process and integration of climate-related risks

Climate-related risks are addressed as part of our integrated risk management model, which outlines guidelines for risk management to ensure key corporate risks are properly identified and adequately assessed, managed and monitored. [C2 27\(c\)](#) The model presents findings to our management on a quarterly basis. [C2 27\(a\)\(v\)](#)

To identify and assess the climate-related risks, our model includes pre-determined risk appetite limits which take into account the likelihood and impact of risks. Risks that exceed limits based on analysis leveraging in-house tools such as natural hazard models will be prioritised and reported to our management through the quarterly updates. [C2 27\(a\)\(i\)](#) [C2 27\(a\)\(iii\)](#)

We identified six physical and transition risks material to our business with the use of a climate-related scenario analysis. [C2 27\(a\)\(ii\)](#) Our most material climate-related risks typically arise from our asset exposure to locations of high climate-related physical risks, including assets locating in coastal areas subject to coastal flooding. Under our risk management framework, our material risk category of Operational Risk incorporates the risks associated with such climate-related physical risks and ensure climate change adaptation or mitigation policies are in place. [C2 27\(a\)\(iv\)](#)

Our integrated risk management model also ensures periodic risk assessment and monitoring cycles are in place to understand the relevant risks and assess the needs to refresh our risk appetite. [C2 27\(a\)\(v\)](#) As a next step, we will begin identifying and assessing climate-related opportunities and disclose when the analysis is completed. [C2 27\(b\)](#)

Commentaries

- [C2 27\(a\)\(i\)](#) Described the use of in-house tools to inform the identification and assessment climate-related risks.
- [C2 27\(a\)\(ii\)](#) Disclosed the use of scenario analysis to inform the identification of 6 relevant climate-related risks.
- [C2 27\(a\)\(iii\)](#) Explained that risks are assessed based on a pre-determined risk appetite limits leveraging other in-house tools.
- [C2 27\(a\)\(iv\)](#) Explained that climate-related risks are treated as a cross-cutting risk that impacts its existing operational risks, and describes that risk mitigation measures are in place to manage such risks.
- [C2 27\(a\)\(v\)](#) Disclosed that the integrated risk management model findings are reviewed by the management quarterly and the model methodology is periodically reviewed to assess the needs to refresh.
- [C2 27\(a\)\(vi\)](#) No disclosures are provided as no changes were made to the processes used.
- [C2 27\(b\)](#) Explained that climate-related opportunities are not currently identified or assessed, but will be analysed as a next step.
- [C2 27\(c\)](#) Described its integrated risk management model and confirmed that climate-related risks are integrated into the overall risk management process as a sub-category of the issuer's operational risk category.

Important note S2 26

In preparing risk management disclosures under Part D of the ESG Code, an issuer shall avoid unnecessary duplication with disclosures made pursuant to paragraphs 13(ii) and 14 (Materiality) of the ESG Code. For example, if oversight of ESG-related (including climate-related) risks and opportunities is managed on an integrated basis, the issuer should provide integrated risk management disclosures instead of separate disclosures for each ESG-related risk and opportunity⁴⁷.



Further guidance on risk management

TCFD (2020) [Guidance on Risk Management Integration and Disclosure](#)

COSO/ WBCSD (2018) [Enterprise Risk Management Applying Enterprise Risk Management to Environmental, Social and Governance-related Risks](#)



⁴⁷ Note to paragraph 27 of the ESG Code.



Chapter 5 – Metrics and Targets

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Objective

The objective of this chapter is to discuss how an issuer can measure its climate-related risks and opportunities to inform stakeholders of its progress in managing climate-related risks and opportunities, and how its performance compares with peers within the same sector or industry.

Greenhouse gas emissions

Paragraph 28 S2 29(a)(i)

An issuer shall disclose its absolute gross greenhouse gas emissions generated during the reporting period, expressed as metric tons of CO₂ equivalent, classified as:

- (a) Scope 1 greenhouse gas emissions;
- (b) Scope 2 greenhouse gas emissions; and
- (c) Scope 3 greenhouse gas emissions.

Paragraph 29

An issuer shall:

- (a) measure its greenhouse gas emissions in accordance with the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) unless required by a jurisdictional authority or another exchange on which the issuer is listed to use a different method for measuring greenhouse gas emissions; **S2 29(a)(ii)**
- (b) disclose the approach it uses to measure its greenhouse gas emissions including: **S2 29(a)(iii)**
 - (i) the measurement approach, inputs and assumptions the issuer uses to measure its greenhouse gas emissions;
 - (ii) the reason why the issuer has chosen the measurement approach, inputs and assumptions it uses to measure its greenhouse gas emissions; and
 - (iii) any changes the issuer made to the measurement approach, inputs and assumptions during the reporting period and the reasons for those changes;
- (c) for Scope 2 greenhouse gas emissions disclosed in accordance with paragraph 28(b), disclose its location-based Scope 2 greenhouse gas emissions, and provide information about any contractual instruments that is necessary to enable an understanding of the issuer's Scope 2 greenhouse gas emissions; and **S2 29(a)(v)**
- (d) for Scope 3 greenhouse gas emissions disclosed in accordance with paragraph 28(c), disclose the categories included within the issuer's measure of Scope 3 greenhouse gas emissions, in accordance with the Scope 3 categories described in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011). **S2 29(a)(vi)(1)**

Greenhouse gas emissions ("GHG emissions") can be categorised into three scopes as per the Greenhouse Gas Protocol ("GHG Protocol")⁴⁸.

- **Scope 1 GHG emissions:** direct emissions from sources that are owned or controlled by the issuer;
- **Scope 2 GHG emissions:** "energy indirect" emissions resulting from the generation of purchased or acquired electricity, heating, cooling and steam consumed within the issuer; and
- **Scope 3 GHG emissions:** all other indirect emissions which are a consequence of the activities of the company, but occur from sources not owned or controlled by the issuer.

⁴⁸ For details related to the GHG sources and activities along the value chain by scopes for various industry sectors, issuers can refer to GHG Protocol (2004) [A Corporate Accounting and Reporting Standard](#) p.92-94 (Appendix D).

The GHG Protocol

The GHG Protocol is one of the most commonly used global frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.

To ensure a true and fair representation of the issuer's GHG emissions, the GHG Protocol defines five key principles⁴⁹ for greenhouse gas accounting and reporting:

- **Relevance:** ensure the GHG inventory appropriately reflects the GHG emissions of the issuer and serves the decision-making needs of both internal and external users.
- **Completeness:** account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
- **Consistency:** use consistent methodologies to allow for meaningful comparisons of emissions over time. Document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- **Transparency:** address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy:** ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

Important note: Are issuers expected to only refer to the GHG Protocol (2004) when preparing GHG emissions?

No, issuers should refer to the [GHG Protocol](#) website to locate the latest guidance for up-to-date standards in measuring and managing emissions.

The first edition of the Corporate Standard was published in 2001 and has since been updated with additional guidance to support companies in measuring emissions from electricity and other energy purchases, as well as throughout its value chains.

Issuers can refer to [Appendix 5](#) for an overview of useful standards and guidance from GHG Protocol for issuers to measure their GHG emissions.



⁴⁹ GHG Protocol (2004) [A Corporate Accounting and Reporting Standard](#) p.7.

The ESG Code requires issuers to measure their GHG emissions in accordance with the GHG protocol, unless the issuer is required to use a different measurement method by a jurisdictional authority or another exchange on which the issuer is listed. For the avoidance of doubt, this provision exempts the need to use a particular measurement method but not the disclosure itself. **S2 B25**

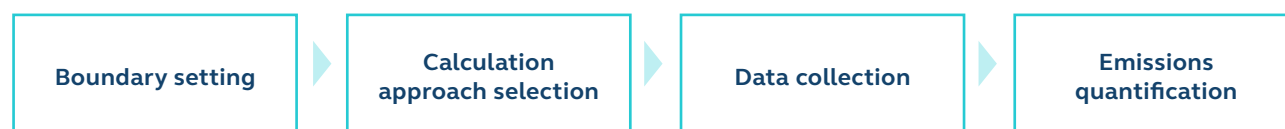
Further guidance on The GHG Protocol

GHG Protocol (2004): [A Corporate Accounting and Reporting Standard](#)

GHG Protocol (2011): [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#)



To measure GHG emissions, issuers may follow the workflow below:



Boundary setting

Organisational boundaries and measurement approach

Organisational boundaries determine which company operations to be included in an issuer's GHG inventory. An issuer should adopt a measurement approach for GHG emissions and consistently apply the selected approach to define the issuer's businesses and operations for the purpose of accounting and reporting its GHG emissions.

There are two types of GHG emissions measurement approaches: the control approaches (financial control or operational control) and the equity share approach⁵⁰.

⁵⁰ GHG Protocol (2004) [A Corporate Accounting and Reporting Standard](#) p.17-18.

Table 5: Different measurement approaches⁵¹

Approach	Definition	Features of approach
1(a). Financial Control	An issuer accounts for 100% of the GHG emissions from operations if it has financial control over the operation i.e. the former has the ability to direct the financial and operating policies of the latter with a view to gaining economic benefits from its activities	<ul style="list-style-type: none"> • Suitable if the issuer takes full ownership of all GHG emissions it can directly influence and reduce • More comprehensive coverage of liability and risks as ultimate financial liability often rests with an issuer that holds an equity share • Closer alignment between GHG accounting and financial accounting • Facilitate performance tracking by holding managers accountable • Likely to have better access to operational data • Less common for government reporting and emissions trading programmes where monitoring and compliance enforcement is required, with responsibility falling on the operator
1(b). Operational Control	An issuer accounts for 100% of the GHG emissions from operations if the former or one of its subsidiaries ⁵² has the full authority to introduce and implement its operating policies at the operation	<ul style="list-style-type: none"> • Suitable if the issuer takes full ownership of all GHG emissions it can directly influence and reduce • Generally preferred by governments as compliance responsibility generally falls on the operator • Facilitate performance tracking by holding managers accountable • Likely to have better access to operational data • More difficult to demonstrate completeness of reporting due to lack of list of financial assets to verify operations included in the organisational boundary
2. Equity share	An issuer accounts for GHG emissions from operations according to its share of equity in the operation	<ul style="list-style-type: none"> • Assign ownership for GHG emissions on the basis of economic interest • More comprehensive coverage of liability and risks as ultimate financial liability often rests with an issuer that holds an equity share • Closer alignment between GHG accounting and financial accounting • Higher administrative costs due to data collection from entities not under the issuer's control e.g. where the issuer conducts frequent mergers and acquisitions • Less common for government reporting and emissions trading programmes where monitoring and compliance enforcement is required, with responsibility falling on the operator

⁵¹ Adapted from GHG Protocol (2004) [A Corporate Accounting and Reporting Standard](#) p.20-21.

⁵² Depending on the financial accounting categories (e.g. group companies, associated companies, non-incorporated joint ventures), the treatment of GHG Protocol could differ. For more illustrative examples, please refer to GHG Protocol (2004) [A Corporate Accounting and Reporting Standard](#) p.19.

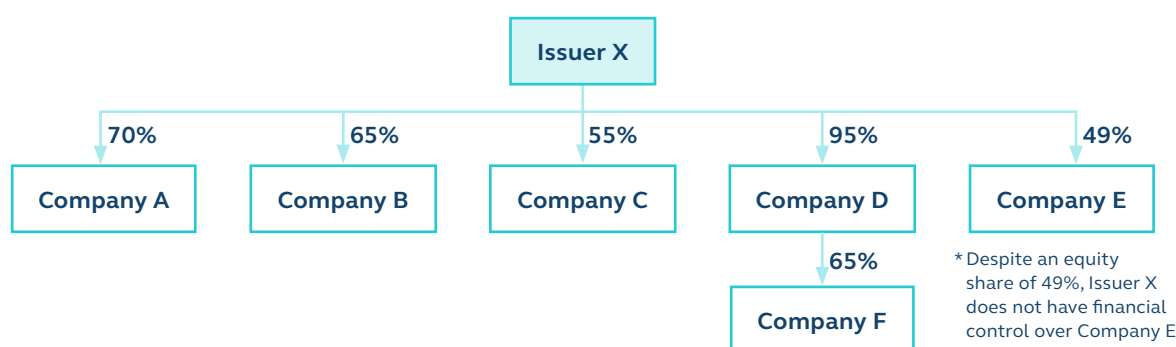
Depending on the measurement approach selected, the organisational boundary may vary. For issuers who wholly-own all their operations, the organisational boundary will be the same regardless of the approach adopted. On the other hand, for issuers with joint operations, the choice of approach may affect the organisational boundary and resulting GHG emissions (including how GHG emissions are categorised).

Operational boundaries

Operational boundaries determine which GHG emission sources to be included and how to categorise GHG emissions. The operational boundary (i.e. Scopes 1, 2 and 3) is decided at the corporate level after setting the organisational boundary. The selected operational boundary should be uniformly applied to identify and categorise direct and indirect GHG emissions at each operational level⁵³.

Insights: Relationship between organisational and operational boundaries

Issuer X has direct and indirect subsidiaries as below.



Setting organisational boundary: The issuer assesses how GHG emissions can be accounted for via the equity share and the control approach.

Entity	Classification in Issuer X's financial statements	Economic interest held by Issuer X	Control of financial policies	Emissions accounted for	
				Equity share	Control approach
Company A	Subsidiary	70%	Issuer X	70%	100%
Company B	Subsidiary	65%	Issuer X	65%	100%
Company C	Subsidiary	55%	Issuer X	55%	100%
Company D	Subsidiary	95%	Issuer X	95%	100%
Company E	Associated company	49%	Company E	49%	0%
Company F	Subsidiary of Company D	65% by Company D	Company D	61.75% (95% x 65%)	100%



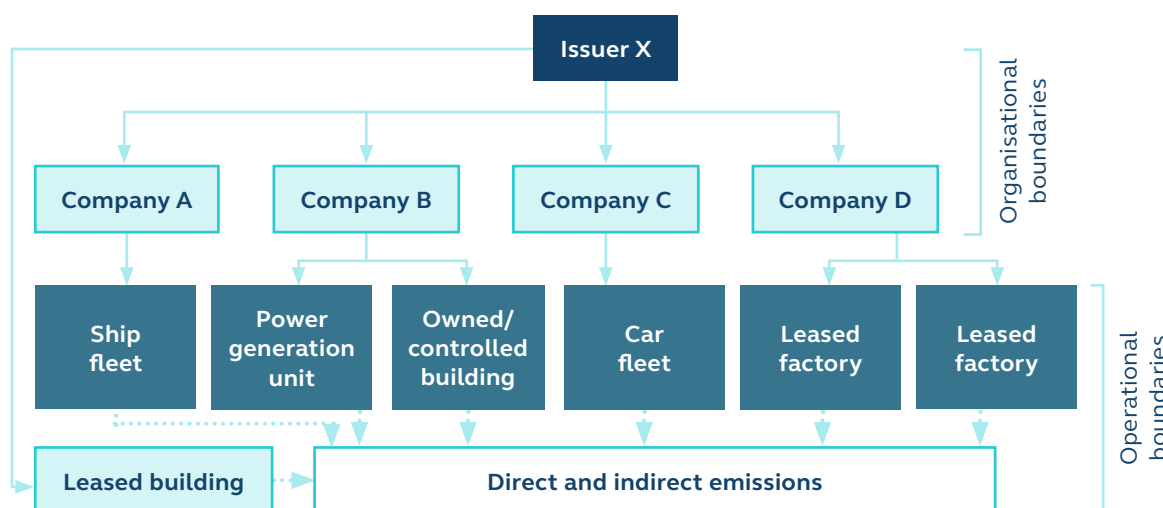
53 GHG Protocol (2011) *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* p.28-29.

Issuer X decided to account for its GHG emissions using the financial control approach. In this case, Issuer X will include 100% of the GHG emissions from Companies A, B, C and D. As Company F is a subsidiary of Company D and is financially controlled by Company D, its GHG emissions will be accounted for via Company D. As Issuer X does not have financial control over Company E, it will not include Company E's GHG emissions.

Setting operational boundary: Once the organisational boundary is set, Issuer X determines the scope of GHG emissions (i.e. Scope 1, 2 and 3).

Entity	Activities	Scope of emissions
Issuer X	Leases out a building as a lessor with emissions associated with lessees' use of energy on the premise	Scope 3
Company A	Owns and operates a ship fleet with emissions from mobile combustion	Scope 1
Company B	Owns a power generation unit with emissions from stationary combustion	Scope 1
	Owns a building with use of purchased electricity	Scope 2
Company C	Owns and operates a car fleet with emissions from mobile combustion	Scope 1
Company D	Leases and operates a factory as lessee with use of purchased electricity	Scope 2
	Owns a building with use of purchased electricity	Scope 2

Organisational and operational boundaries of Issuer X⁵⁴



54 GHG Protocol (2004) *A Corporate Accounting and Reporting Standard* p.25 (Figure 2).

Calculation approach selection

After setting the boundaries, an issuer should determine its calculation approach for quantifying GHG emissions. Depending on data maturity, issuers may quantify GHG emissions via (1) direct measurement or (2) estimation.

- **(1) Direct measurement:** Quantifies GHG emissions using direct monitoring, mass balance or stoichiometry

$$\text{GHG emissions} = \text{Emission Data} \times \text{Global Warming Potential (GWP) Values}$$

- **(2) Estimation:** Quantifies GHG emissions by multiplying activity data by an emission factor

$$\text{GHG emissions} = \text{Activity Data} \times \text{Emission Factor} \times \text{GWP Values}$$

- **Activity data:** data associated with an activity that generates GHG emissions, such as gallons of gasoline consumed from company cars.
- **Emission data:** data generated by monitoring concentration and flow rate.
- **Emission factor:** a factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions. For more details of GHG emission factor sources, please refer to [Appendix 4](#).

Important note

Emission factors are subject to change and issuers should refer to the latest grid emission factors available in the relevant region(s).



- **GWP Values:** a factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG emission relative to one unit of CO₂. Issuers should refer to the latest GWP values provided by the IPCC based on a 100-year time horizon⁵⁵. For more details of the GWP Value sources, please refer to [Appendix 4](#).

Where expertise is unavailable or where cost of direct measurement is high, an issuer may use the method of estimation to estimate its GHG emissions. However, where possible, issuers should use the method of direct measurement as it provides the most accurate source of data.

⁵⁵ The latest GWP values as of May 2023 are defined in the IPCC Sixth Assessment Report ("AR6"), IPCC [AR6 WGI Report Chapter 7 Supplementary Material](#) P.24-35 (Table 7.SM.7).

Data collection

Once the calculation approach is selected, issuers can proceed to collect the relevant data e.g. activity data and emission data from data owners, business units and departments. Please refer to [Chapter 5 > Metrics and Targets > GHG emissions quantification](#) for further information relating to Scope 1, 2 and 3 GHG emissions data collection.

During the data collection process, an issuer should clearly communicate the data requirements to relevant parties e.g. scope of data collection and units, as these can affect the quality of data disclosures. The issuer can also put in place guidelines and procedures to ensure data quality e.g. requirement to document relevant evidence of data inputs, version control procedures for electronic files.

GHG emissions quantification

The following sections provide more details around the calculation of gross Scope 1, 2 and 3 GHG emissions and include step-by-step examples for quantifying GHG emissions using the method of estimation.

Important note: Can issuers use other units when disclosing their gross GHG emissions?

No, issuers should express their gross GHG emissions as metric tons of CO₂ equivalent. Issuers should be aware that the units used for GHG emission factors may differ depending on the source used. If so, conversion should be done before applying such emission factors.



Scope 1 GHG emissions quantification

Practical application 12: Overview of inputs to derive Scope 1 GHG emissions



Input	Methodology	Example
Activity data	<p>Issuers should collect respective activity data based on the purchased quantities of commercial fuels (such as natural gas and heating oil) and the substance that leads to GHG leakage (such as refrigerant). Common activity data include:</p> <ul style="list-style-type: none"> Amount of fuel consumed from stationary combustion sources e.g. boilers, furnaces, turbines to generate electricity, heat, or steam Amount of fuel consumed from mobile combustion sources e.g. trucks, trains, ships, airplanes, buses, and cars Amount of refrigerant derived from fugitive emissions from intentional or unintentional release: <ul style="list-style-type: none"> Inventory at beginning of reporting period Inventory added during the reporting period Inventory disposed during the reporting period Inventory storage at end of reporting period 	<p>A Hong Kong-based manufacturing company has consumed 100,000 litres of diesel oil from a generator.</p> <p>Emission factors of CO₂, CH₄ or N₂O per litre of diesel oil are obtained from Cross-Sector Tools of GHG Protocol:</p> <ul style="list-style-type: none"> 2.68 kg CO₂/litre 0.00036 kg CH₄/litre 0.000022 kg N₂O/litre <p>To convert greenhouse gases into CO₂e, the company has identified GWP for 100-year time horizon of CO₂, CH₄ or N₂O in IPCC AR6 to be 1, 28 and 273 respectively.</p>
Emission factor	<p>Emission factor by fuel type will be required to quantify GHG emissions. Depending on the source of emissions e.g. stationary combustion and mobile combustion, the emission factors can differ.</p> <p>Issuers can refer to public sources for the respective emission factors. Common sources include⁵⁶:</p> <ul style="list-style-type: none"> Greenhouse Gas Protocol National database for issuers operating in other countries such as the United Kingdom and New Zealand <p>GWP, CH₄ or N₂O are commonly accounted for in Hong Kong regarding emissions from stationary combustion and mobile combustion.</p>	<p>Scope 1 emissions:</p> $= (100,000 \text{ L} \times 2.68 \text{ kg CO}_2/\text{litre} \times 1) + (100,000 \text{ L} \times 0.00036 \text{ kg CH}_4/\text{litre} \times 28) + (100,000 \text{ L} \times 0.000022 \text{ kg N}_2\text{O}/\text{litre} \times 273) \times 0.001 \text{ MT/kg}$ $= 269,609 \text{ kg CO}_2\text{e} \times 0.001 \text{ MT/kg}$ $= 269.6 \text{ MTCO}_2\text{e}$

⁵⁶ See details of GHG emission factor sources in [Appendix 4](#).

Scope 2 GHG emissions quantification

For Scope 2 GHG emissions, there are two approaches (location-based and market-based approach) per the GHG Protocol for allocation of GHG emissions created by electricity generation to the end consumers of a given grid.

- **Location-based method:** relevant to issuers in all locations.
- **Market-based method:** relevant to issuers with any operations in markets providing consumer choice of differentiated electricity products or supplier-specific data, in the form of contractual instruments. The market-based method quantifies Scope 2 GHG emissions based on GHG emissions emitted by generators or suppliers from which the issuer contractually purchases electricity bundled with contractual instruments (e.g. renewable energy certificates (“RECs”) purchase bundled with electricity), or contractual instruments on their own (e.g. RECs purchase not bundled with electricity).

The ESG Code requires issuers to disclose their Scope 2 GHG emissions using the location-based method. In the event where issuers have entered into contractual instruments such as RECs and power purchase agreements (“PPAs”), they will need to provide information about the contractual instruments. See Practical application 13 below for an overview of key inputs to derive Scope 2 GHG emissions using a location-based method. S2 B31

For issuers who opt to disclose information using the market-based method in addition to the location-based method, please refer to GHG Protocol (2015) [GHG Protocol Scope 2 Guidance](#) for more details.

Practical application 13: Overview of inputs to derive Scope 2 GHG emissions



Input	Methodology	Example
Location-based		
Activity data	Activity data related to all energy purchased/ acquired and electricity, heat, steam or cooling e.g. energy uses from utility bills and metered energy consumption at facilities within the inventory boundary.	<div>A Hong Kong company has consumed 2,500 MWh electricity during 2022: The issuer identifies an emission factor with respect to the territory it operates. As the issuer operates in New Territories, it has identified the emission factor provided by CLP Power Hong Kong (“CLP”), the only energy supplier and grid operator in the service territory, in its 2022 Sustainability Report⁵⁷.</div> <div>CO₂e emissions intensity of electricity sold by CLP (kg CO₂e/kWh)⁵⁸0.39</div>

57 Issuers are expected to locate the grid average emission factor with respect to their location, and can refer to other territory-wide emission factors where grid average emission factors are not available. Example sources may include the International Energy Agency, the Environmental Protection Department of Hong Kong, and the Ministry of Ecology and Environment of China.

58 CLP Holdings (2022) [2022 Sustainability Report](#) p.146.



Input	Methodology	Example
Emission factor	<p>Average energy generation emission factor for the geographic location will be required to quantify GHG emissions.</p> <p>Emission factors for purchased electricity are usually presented in the unit of CO₂e per unit electricity used. In this case, the emission factors have already converted the constituent gases into CO₂ equivalent values and the issuer can use such emission factors to calculate Scope 2 GHG emissions directly.</p> <p>However, there may be cases where the emission factors are not converted into CO₂ equivalent values, e.g. electricity emission factors are presented as CO₂, CH₄, and N₂O per unit electricity used. In this case, issuers will be required to convert the values into CO₂ equivalent values using global warming potential values based on a 100-year time horizon from the latest IPCC assessment available at the reporting date.</p>	<p>Scope 2 (location-based) GHG emissions:</p> $= 2,500 \text{ MWh} \times 1,000 \text{ kWh/MWh} \times 0.39 \text{ kg CO}_2\text{e/kWh} \times 0.001 \text{ MT/kg}$ $= 975,000 \text{ kg CO}_2\text{e} \times 0.001 \text{ MT/kg}$ $= 975 \text{ MTCO}_2\text{e}$ <p>During the year, the issuer also purchased renewable energy certificates from CLP for 1,200 MWh of its electricity consumption.</p>

Important note S2 29(a)(iv)

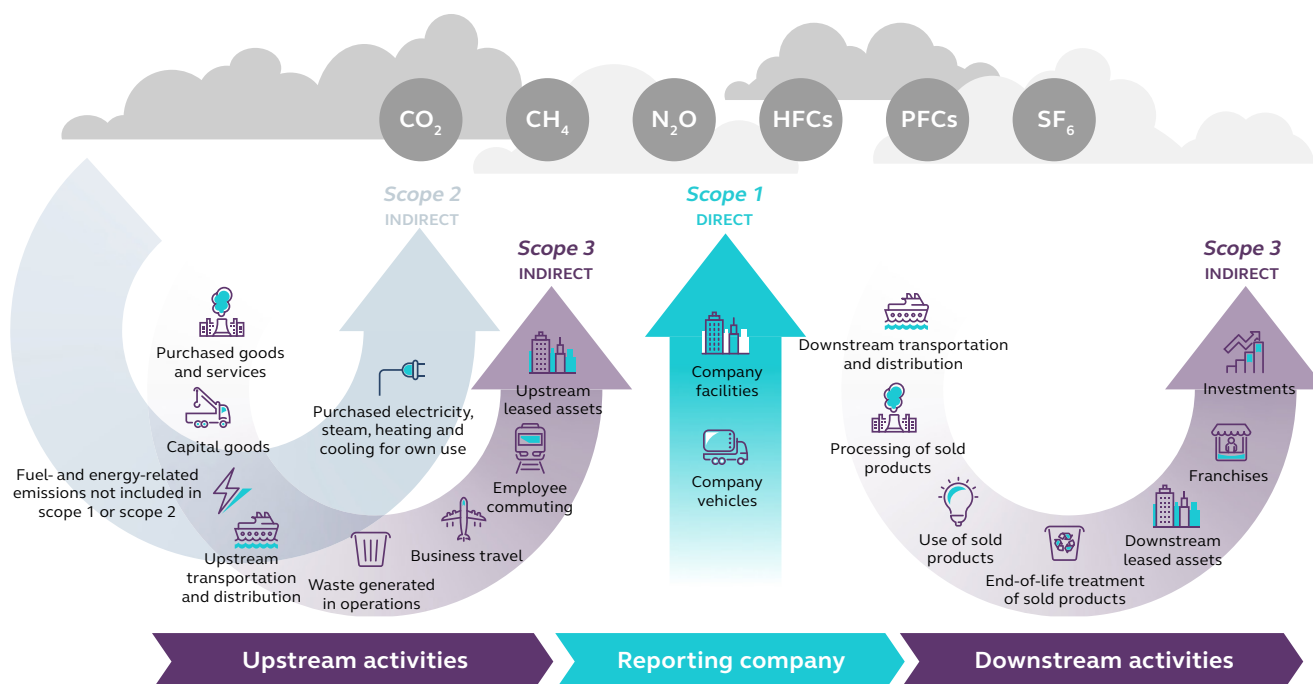
For Scope 1 and 2 GHG emissions, if the emissions for unconsolidated investees are included in the issuer's GHG emission inventory, IFRS S2 requires disclosure of Scope 1 and 2 GHG emissions to be disaggregated separately for (a) the consolidated accounting group, and (b) other investees excluded from (a) (e.g. associates, joint ventures and unconsolidated investees for issuers applying IFRS Accounting Standards) (see Illustrative disclosure 6.2). Issuers are encouraged to follow such requirement under IFRS S2.



Scope 3 GHG emissions quantification

Scope 3 GHG emissions refer to all other indirect emissions that are a consequence of an issuer's activities, but arising from sources not owned or controlled by the issuer. GHG Protocol identifies 15 categories from upstream and downstream activities⁵⁹:

Overview of GHG Protocol scopes and emissions across the value chain



Mapping business activities in value chain

To identify Scope 3 activities that are included in the inventory, an issuer should map its value chain as the first step. Issuers should refer to the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011), account for all 15 categories of Scope 3 GHG emissions and disclose the categories included in its Scope 3 GHG emissions⁶⁰.

Where there are exclusions, issuers should justify and explain such exclusions. Examples of exclusions may include:

- some issuers may not have any leased assets, thus Scope 3 Category 8 (Upstream Leased Assets) and Category 13 (Downstream Leased Assets) are not applicable; and
- some issuers may expect their Scope 3 activities to be insignificant in size compared to other sources of emissions and determine their ability to collect data and influence GHG reductions to be limited.

⁵⁹ GHG Protocol (2011) [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) p.5 and p.34-36.

⁶⁰ In addition to the GHG Protocol, issuers can refer to sector-specific guidance for more detailed guidance.

An issuer who is required by a jurisdictional authority or another exchange on which it is listed to use a different method for measuring its GHG emissions is permitted to adopt such measurement method, as long as the jurisdictional or exchange requirement applies to the issuer.

S2 24

Important note: Are issuers expected to disclose the relevant categories in its value chain if the GHG Protocol is not used for measuring its GHG emissions?

S2 B33

Yes, irrespective of whether the measurement of GHG emissions is in accordance with the GHG Protocol, the issuer should disclose which of the 15 Scope 3 GHG emissions categories described in the [Greenhouse Gas Protocol Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard \(2011\)](#) are included within its measure of Scope 3 GHG emissions.



Identifying relevant Scope 3 GHG emissions

When identifying activities to be included in the Scope 3 GHG emissions inventory, issuers should follow the principles of Relevance, Completeness, Consistency, Transparency and Accuracy (please refer to [Chapter 5 > Metrics and Targets > Greenhouse Gas Emissions](#) p.74 for more details).

Practical application 14: Criteria for identifying relevant Scope 3 GHG categories⁶¹



Criteria	Description
Sector guidance	They have been identified as significant by sector-specific guidance (e.g. Partnership for Carbon Accounting Financials (“PCAF”) for financial institutions).
Stakeholders	They are deemed critical by key stakeholders (e.g. customers, suppliers, investors, or civil society).
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the issuer that are typically performed in-house by other companies in the issuer’s sector.
Influence	There are potential GHG emissions reductions that could be undertaken or influenced by the issuer.
Risk	They contribute to the issuer’s risk exposure (e.g. climate change related risks such as financial, regulatory, supply chain, product and customer, litigation, and reputational risks).
Size	They contribute significantly to the issuer’s total anticipated Scope 3 GHG emissions e.g. they are large relative to the issuer’s Scope 1 and 2 GHG emissions.
Other	They meet any additional criteria for determining relevance developed by the issuer or industry sector.

61 GHG Protocol (2011) [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) p.61.

Insights: How should double counting in GHG emissions be addressed?

1. Exclude from reporting the same GHG emissions under different scopes, for example, any Scope 3 GHG emissions that are already reported as Scopes 1 and 2 GHG emissions by other facilities.
2. If the issuer identifies any potential double counting of GHG emissions between Scope 3 categories or within a Scope 3 category, the issuer should avoid double counting by only reporting Scope 3 GHG emissions from the activity once, clearly explaining where the emissions are reported, and providing cross-references, if needed⁶².



Important note: Are issuers required to re-assess the scope of Scope 3 categories at every reporting date? S2 B34

Issuers are not required to re-assess the scope of Scope 3 categories at every reporting date.

Instead, issuers should re-assess the scope when there are significant event(s) or changes in circumstances. An event or change in circumstances can occur without the issuer being involved. Examples include:

- a significant change in the value chain, e.g. change of suppliers;
- a significant change in the business model, business activities or corporate structure, e.g. due to a merger or acquisition; and
- a significant change in the issuer's exposure to climate-related risks and opportunities e.g. a significant change in the macro-policy environment such as adjustment in the country-level target.



⁶² GHG Protocol (2011) Corporate Value Chain (Scope 3) Accounting and Reporting Standard p.57 (Endnotes 3).

Collecting data for Scope 3 GHG emissions

The GHG Protocol allows the use of two types of data – primary data and secondary data – to calculate Scope 3 GHG emissions. Issuers should understand the differences between primary data and secondary data, as well as their associated features.

Table 6: Primary and secondary data and their features⁶³

Type of data	Definition	Features
Primary	Data from specific activities within an issuer's value chain e.g. data provided by suppliers or other value chain partners related to specific activities in the issuer's value chain	<ul style="list-style-type: none"> Provides better representation of the issuer's specific value chain activities Enables performance tracking and benchmarking of individual value chain partners – issuers can track operational changes from actions taken to reduce emissions at individual facilities/ companies and distinguish between suppliers in the same sector based on GHG performance Expands GHG awareness, transparency, and management throughout the supply chain to the issuer that has direct control over emissions Allows issuers to better track progress toward GHG reduction targets May be costly May be difficult to determine or verify the source and quality of data supplied by value chain partners
Secondary	Data that is not from specific activities within an issuer's value chain such as industry-average data, financial data, proxy data ⁶⁴ , and other generic data	<ul style="list-style-type: none"> Allows issuers to calculate emissions when primary data is unavailable or of insufficient quality Can be useful to account for emissions from minor activities Can be more cost-effective and easier to collect Allows issuers to more readily understand the relative magnitude of various Scope 3 activities, identify hot spots, and prioritise efforts in primary data collection, supplier engagement, and GHG reduction efforts Data may not be representative of the issuer's specific activities Does not reflect operational changes undertaken by value chain partners to reduce emissions Could be difficult to quantify GHG reductions from actions taken by specific facilities or value chain partners May limit the ability to track progress toward GHG reduction targets

⁶³ GHG Protocol (2011) [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) P.74 (Table [7.5]).

⁶⁴ Proxy data is data from a similar activity that is used as a stand-in for the given activity. Proxy data can be extrapolated, scaled up, or customised to be more representative of the given activity (e.g. partial data for an activity can be extrapolated or scaled up to represent 100% of the activity).

Sources of primary and secondary data can vary in quality. Issuers should prioritise obtaining the highest quality data available for a given activity. Table 7 provides a list of identifying characteristics that issuers should consider when prioritising inputs and assumptions to measure their Scope 3 GHG emissions.

Table 7: Identifying characteristics for Scope 3 GHG emissions data S2 B40-B54

Identifying characteristics	Description
Data based on direct measurement	<ul style="list-style-type: none"> Direct measurement provides the most accurate evidence in theory, but due to challenges associated with direct measurement, it is expected that Scope 3 GHG emissions data will include estimation. For more details, issuers can refer to Chapter 5 > Metrics and Targets > Calculation approach selection (p.79).
Data from specific activities within the issuer's value chain	<ul style="list-style-type: none"> Measurement of Scope 3 GHG emissions can be based on primary data, secondary data, or a combination of both. Primary data should be prioritised as it provides a more accurate representation of the issuer's value chain activities. If the issuer uses secondary data to measure its Scope 3 GHG emissions, it shall consider the extent to which the data faithfully represents its activities.
Timely data that faithfully represents the jurisdictions of and the technology used for, the value chain activity and its GHG emissions	<ul style="list-style-type: none"> The degree to which the data set reflects the actual technology(ies) used. For example, an issuer might obtain primary data from its activities (e.g. the specific aircraft model, distance travelled and travel-class used by employees when travelling) and then use secondary data that represents the GHG emissions arising from those activities to convert the primary data into an estimate of its GHG emissions from air travel. The degree to which the data set reflects the actual time (e.g. year) or age of the activity. The degree to which the data set reflects the actual geographic location of the activity (e.g. country or site). For example, an issuer shall prioritise emission factors that relate to the jurisdiction in which the issuer operates or in which the activity has taken place.
Verified data	<ul style="list-style-type: none"> The degree to which sources, data collection methods and verification procedures used to obtain the data are dependable. Verified data should be prioritised. Verification can be conducted internally or externally through several ways, including on-site checking, reviewing calculations, or cross-checking of data against other sources. However, in some cases an issuer might be unable to verify its Scope 3 GHG emissions without undue cost or effort. For example, the issuer might be prevented from obtaining a complete set of verified data due to the volume of data, or where data is obtained from companies in the value chain that the issuer does not interact with directly. In such cases, an issuer might need to use unverified data.

Further guidance on Scope 3 measurement framework

IFRS (2023) [IFRS S2 Climate-related Disclosures](#) – Appendix B: Application Guidance, paragraphs B38-B57



As Scope 3 GHG emissions data collection can be challenging and time-consuming, challenges may arise during the collection process. The below provides an overview of potential challenges that issuers may encounter and guidance on addressing these challenges.

Insights: Common challenges when collecting Scope 3 GHG emissions data⁶⁵



Potential challenges

Guidance to address challenges

Large number of suppliers



- Target the most relevant suppliers based on spend (e.g. suppliers that contribute to most of the issuer's total spend) and/ or anticipated emissions impact
- Target suppliers over whom the issuer has a higher degree of influence (e.g. contract manufacturers or suppliers where the issuer accounts for a significant share of the supplier's total sales)

Lack of supplier knowledge and experience with GHG inventories and accounting



- Target suppliers with prior experience in developing GHG inventories
- Identify the correct subject-matter expert at the supplier
- Explain the business value of investing in GHG accounting and management (e.g. procurement policy favours suppliers that produce GHG emissions data)
- Request data that suppliers already collect, such as energy-use data, rather than emissions data
- Provide clear instructions and guidance with the data request
- Provide training, support, and follow-up

Lack of transparency in the quality of supplier data



- Request documentation on methodology and data sources used, inclusions, exclusions, and assumptions made, etc.
- Minimise errors by requesting activity data (e.g. kWh electricity used, kg of fuels used), calculating GHG emissions separately (e.g. calculate GHG emissions for each supplier) and comparing suppliers' performances to check for data reasonableness and spot potential discrepancies
- Consider third party assurance

⁶⁵ GHG Protocol (2011) [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) p.82 (Table 7.8) and GHG Protocol (2022) [Scope 3 Frequently Asked Questions](#) p.9-10.

Potential challenges

Guidance to address challenges

Confidentiality concerns of suppliers



- Protect suppliers' confidential and proprietary information (e.g. through non-disclosure agreements, firewalls, etc.)
- Ask suppliers to obtain third party assurance rather than submitting detailed activity data to avoid providing confidential information

Operations in multiple industry sectors or jurisdictions



- Prioritise data collection efforts on the activities expected to have the most significant GHG emissions, offer the most significant GHG reduction opportunities and are the most relevant to the company's business goals
- Use a combination of approaches and criteria to identify priority activities e.g. seek higher quality data for activities significant in size, activities that present the most significant risks and opportunities in the value chain, and activities where more accurate data can be easily obtained

Reporting period of value chain entities may be different from the issuer's own reporting period



- Make use of the exception under note 2 to paragraph 29 of the ESG Code, which permits an issuer to measure its GHG emissions using information for reporting periods that are different from its own reporting period, if that information is obtained from entities in its value chain with reporting periods that are different from the issuer's reporting period.
- The above relief is subject to the following conditions:
 - the issuer must use the most recent data available from those entities in its value chain without undue cost or effort to measure and disclose its greenhouse gas emissions;
 - the length of the reporting periods is the same; and
 - the issuer discloses the effects of significant events and changes in circumstances (relevant to its greenhouse gas emissions) that occur between the reporting dates of the entities in its value chain and the date of the issuer's ESG report.

If issuers encounter challenges in measuring its Scope 3 GHG emissions, issuers should disclose:

- to the extent material and as applicable, any gaps in the data when calculating GHG emissions, whether proxy data or other methods are used to address such gaps, and how such data gaps affect the accuracy or completeness of its GHG emissions;
- an explanation (including the reasons) if an issuer determines that it is impracticable to estimate its Scope 3 GHG emissions; and
- any changes in the methodology, estimation or assumptions used to measure GHG emissions during the reporting year.

Practical application 15: Overview of inputs to calculate Scope 3 GHG emissions



Input	Methodology	Example ⁶⁶
Activity data	<p>For Scope 3 GHG emissions, the activity data for collection and its granularity will vary depending on the Scope 3 categories identified⁶⁷, and examples include fuel use or passenger miles.</p> <p>GHG Protocol suggests different methods (e.g. supplier-specific, average-based, spend-based methods) to account for Scope 3 GHG emissions, therefore the activity data to be collected may vary.</p> <p>Issuers should determine the extent of the use of primary and secondary data to calculate Scope 3 GHG emissions based on their business goals, relative significance of Scope 3 activities, data availability and data quality. (See Table 6 for the use of different input data.)</p>	<p>A Hong Kong construction company purchased materials (cement, timber and concrete) for its operations and will be required to calculate its Scope 3 GHG emissions from Category 1 (Purchased Goods and Services). Using its internal IT system, the company is able to determine the total weight (kg) purchased for each material.</p> <ul style="list-style-type: none"> Cement: 200,000 kg Timber: 100,000 kg Concrete: 50,000 kg <p>The company collects product-specific emission factors from the supplier for the purchased goods, which were produced as part of the suppliers' lifecycle assessment reports⁶⁸.</p> <ul style="list-style-type: none"> Cement: 0.15 kg CO₂e/kg Timber: 0.25 kg CO₂e/kg Concrete: 0.20 kg CO₂e/kg <p>The supplier-specific emission factor has already converted relevant GHGs into CO₂e, so no recalculation is required on the emission factors using GWP values.</p> <p>Estimated Scope 3 Category 1 emissions:</p> $= (200,000\text{kg} \times 0.15 \text{ kg CO}_2\text{e/kg}) + (100,000 \text{ kg} \times 0.25 \text{ kg CO}_2\text{e/kg}) + (50,000\text{kg} \times 0.20\text{kg CO}_2\text{e/kg}) \times 0.001 \text{ MT/kg}$ $= 65,000\text{kg CO}_2\text{e} \times 0.001 \text{ MT/kg}$ $= 65 \text{ MTCO}_2\text{e}$
Emission factor	<p>Depending on the Scope 3 categories identified and the corresponding activity data, issuers may refer to source- or facility-specific emission factors available in the operating location. Where location-specific emission factors are not available, issuers should refer to those published by other regions.</p> <p>Depending on the Scope 3 categories identified and the corresponding activity data, the GHG involved may be different, affecting the application of GWP values. For example, for Category 11 (Use of Sold Products), depending on the products sold, different GHGs may be released. Issuers should account for all the different types of GHGs contained in a product, then aggregate for all products.</p>	

⁶⁶ Adapted from GHG Protocol (2013) [Technical Guidance for Calculating Scope 3 Emissions \(version 1.0\)](#) p.25 (Example [1.1]).

⁶⁷ To identify the activity data to be collected for each of the 15 Scope 3 categories and the approach to quantify Scope 3 GHG emissions, issuers can refer to GHG Protocol (2011) [Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) and GHG Protocol (2013) [Technical Guidance for Calculating Scope 3 Emissions \(version 1.0\)](#).

⁶⁸ Where supplier-specific lifecycle assessment reports are not available, the company may select other methods to derive its Scope 3 GHG emissions (e.g. spend-based or average-data method) and refer to other sources for emission factors (e.g. environmentally-extended input-output databases for spend-based method and process life cycle databases for average-data method). For more details of emission factors for each category, issuers can refer to GHG Protocol (2013) [Technical Guidance for Calculating Scope 3 Emissions \(version 1.0\)](#).

Implementation relief S2 B39

The selection of measurement approach, inputs and assumptions used in measuring Scope 3 GHG emissions is subject to the [Reasonable Information Relief](#)⁶⁹.

Where reasonable estimates may be used, issuers should describe the underlying assumptions, the reasons for using such assumptions and the estimates. In addition, when third party data is used, issuers should identify the source of such data and the process it undertook to obtain and assess such data.

For the avoidance of doubt, all issuers are required to disclose Scope 3 GHG emissions that include financed emissions (category 15 activity), subject to the Reasonable Information Relief⁷⁰. Specifically, issuers engaged in asset management, commercial banking or insurance activities are encouraged to refer to and disclose additional information about their financed emissions with reference to IFRS S2 Climate-related Disclosures – Appendix B: Application Guidance (paras. B58-B63)⁷¹. Where such disclosures are contained in a document other than the ESG report (for example, where specific disclosures on financed emissions are required by other regulators), relevant issuers should include a cross-reference to such document in the ESG report. S2 29(a)(vi)(2), B37

Illustrative disclosure 6 provides examples of Scope 3 GHG emissions disclosures made by three issuers at varying levels of maturity in terms of Scope 3 GHG emissions data collection and reporting. Issuers are encouraged to conduct a data review to identify any data gaps and understand potential areas of improvement. Issuers are also encouraged to engage with their value chain partners to explore ways to improve data quality and granularity.

⁶⁹ Note 1 to paragraph 29 of the ESG Code.

⁷⁰ Paragraph 29 of the ESG Code.

⁷¹ Note 3 to paragraph 29 of the ESG Code.

Illustrative disclosure 6: Scope 3 GHG emissions

6.1 Just beginning – Manufacturing company

- Identifies relevant Scope 3 GHG emission categories
- Describes the work plan, progress and timetable for making the required disclosure

Data table C2 28(a)-(c)

Scope	Source of emission factor	Unit	2023	2022	2021
Scope 1	GHG Protocol Emission Factors from Cross-Sector Tools	MtCO ₂ e	22,658	22,982	21,879
Scope 2 (Location-based) C2 29(c)	<ul style="list-style-type: none"> CLP Power Hong Kong Limited: Latest sustainability report Ministry of Ecology and Environment: Greenhouse Gas Emissions Reporting and Management of Power Generation Enterprises 	MtCO ₂ e	35,951	38,659	38,577

Our approach

Our approach		
Standard used	C2 29(a)	GHG Protocol Corporate and Reporting Standard (2004) GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard (2011)
Consolidation approach	C2 29(b)	Operational control due to the access to operational data
Operational boundary		<ul style="list-style-type: none"> 3 manufacturing plants in Hong Kong, 1 in China

Our progress C2 29(d)

We have begun mapping our Scope 3 GHG emissions and have identified 3 relevant upstream or downstream activities along the value chain that account for over 80% of Scope 3 GHG emissions.

These include:

- Category 1: Purchased goods & services
- Category 5: Waste generated in operations
- Category 12: End-of-life treatment of sold products

We are in the process of collecting data with regards to the material categories to compile our Scope 3 GHG emissions inventory and will aim to share by FY2025.



Commentaries

- C2 28(a)-(c)

Disclosed absolute gross Scopes 1 and 2 GHG emissions generated during the reporting period with sources of emission factors.
- C2 29(a)

Disclosed that GHG Protocol is used to measure GHG emissions.
- C2 29(b)

Disclosed the measurement approach used to measure GHG emissions is operational control approach and the reason for the measurement approach, as well as the inputs of data from 3 manufacturing plants in HK and 1 in China.
- C2 29(c)

Disclosed Scope 2 GHG emissions using location-based approach, no contractual instruments are used and no relevant disclosures are made.
- C2 29(d)

As absolute gross Scope 3 GHG emissions generated is not yet ready for disclosure, the issuer disclosed the categories of relevant Scope 3 GHG emissions included in the calculation according to GHG Protocol, as well as the work plan for making the required disclosure by FY2025.

6.2 Progressing – Financial services company

- Quantifies absolute gross GHG emissions for selected Scope 3 GHG emissions categories
- Describes the work plan, progress and timetable for making the required disclosure

Data table

C2 28(a)-(c)

C2 29(b)

Scope	Source of emission factor	Unit	2023	2022	2021
Scope 1 (consolidated accounting group)	GHG Protocol Emission Factors from Cross-Sector Tools	MtCO ₂ e	22,658	22,982	21,879
Scope 1 (joint venture)		MtCO ₂ e	1,500	1,000	890
Total Scope 1		MtCO₂e	24,158	23,982	22,769
Scope 2 - Location-based (consolidated accounting group)	IEA Emissions Factors	MtCO ₂ e	35,951	38,659	38,577
Scope 2 - Location-based (joint venture)		MtCO ₂ e	2,500	2,300	2,200
Total Scope 2		MtCO₂e	38,451	40,959	40,777
Scope 3 (Category 3: Fuel- and energy-related activities)	IEA Emissions Factors	MtCO ₂ e	1,890	1,560	N/A
Scope 3 (Category 5: Waste generated in operations)	No local source available, referred to UK Defra for proxy for factor: Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions	MtCO ₂ e	4,900	4,700	N/A
Scope 3 (Category 6: Business travel)	Third-party travel provider data	MtCO ₂ e	980	400	N/A
Scope 3 (Category 15: Investments)	Emission data from investees	MtCO ₂ e	4,200	N/A	N/A

Our approach

Our approach		
Standard used	C2 29(a)	GHG Protocol Corporate and Reporting Standard (2004) GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard (2011) Partnership for Carbon Accounting Financials (PCAF)
Measurement approach	C2 29(b)	Equity share
Operational boundary		8 offices in Hong Kong, China, Japan, Korea, Vietnam, Singapore, Malaysia, Thailand

Scope 3 reporting boundary

Scope 3 category	Basis for selection	C2 29(d)	Included?
1 Purchased goods and services	Emissions associated with embodied carbon from development projects, which takes into account Life Cycle Assessment (LCA) analysis		No
2 Capital goods	Emissions associated with equipment and hardware we purchase for operations		No
3 Fuel- and energy-related activities	Emissions associated with the extraction, production and distribution of the fuels and electricity that we purchase		Yes
5 Waste generated in operations	Disposal and treatment of waste in our operations (including our headquarters)		Yes
6 Business travel	Flights and land transport for business-related activities		Yes
7 Employee commuting	Emissions associated with our employees' commuting and travelling		No
15 Investments	Financial investments which generate emissions		Yes

Our progress

C2 29(d)

In 2022, we identified our Scope 3 GHG emissions amongst the 15 Scope 3 categories. Amongst the 15 categories, we have identified 7 categories relevant to our business. The other categories are not included as they are irrelevant to our business or data are unavailable and unreliable for quantification. We have also disclosed our Scope 3 GHG emissions for selected categories (i.e. Categories 3, 5 and 6).

In 2023, we expanded our Scope 3 GHG emissions disclosure as follows:

Category 6

We accounted for business travel in additional locations (i.e. Japan and Vietnam). The GHG emissions are derived from activity data related to distances travelled and are provided by our travel management agencies.

Category 15

We compiled data relating to our financed emissions (i.e. our assets in the investment portfolio) for disclosure for the first time in 2023.

We recognise that there are still data gaps within the data reported and aim to expand our data disclosure for other categories such as Categories 1, 2 and 7 by FY2024. We also plan to seek assurance from FY2024 to improve data quality going forward.

Commentaries

- C2 28(a)-(c)** Disclosed absolute gross Scope 1, Scope 2 and selected Scope 3 GHG emissions generated during the reporting period and the source of respective emission factors. As the issuer holds operational control in one joint venture, it disclosed its disaggregated Scope 1 and Scope 2 GHG emissions.
- C2 29(a)** Disclosed that GHG Protocol and PCAF are used to measure GHG emissions.
- C2 29(b)** Explained the measurement approach used to measure GHG emissions is equity share approach, as well as the rationale for selection of Scope 3 categories and emission factors to calculate GHG emissions.
- C2 29(c)** Disclosed its Scope 2 GHG emissions under a location-based approach.
- C2 29(d)** Disclosed the categories of relevant Scope 3 GHG emissions included in the calculation according to the GHG Protocol, the issuer also notes that data related to Categories 1, 2 and 7 are not yet disclosed, and set a timeline of disclosure by FY2024.

6.3 Advanced – Real estate company

- Quantifies absolute gross GHG emissions for all Scope 3 categories

Data table

C2 28(a)-(c)

C2 29(b)

Scope	Source	Unit	2023	2022	2021
Scope 1	GHG Protocol Emission Factors from Cross-Sector Tools	MtCO ₂ e	15,375	10,294	11,396
Scope 2	C2 29(c) CLP Power Hong Kong Limited and Hongkong Electric (Location-based) Sustainability Reports	MtCO ₂ e	38,734	39,081	38,903
Scope 3	See Scope 3 reporting boundary	MtCO ₂ e	256,153	257,496	259,210

Our approach

Our approach		
Standard used	C2 29(a)	GHG Protocol Corporate and Reporting Standard (2004) GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard (2011)
Measurement approach	C2 29(b)	Operational control due to the ability to take full ownership of all GHG emissions we can directly influence and reduce
Operational boundary		<ul style="list-style-type: none"> 80 assets that are owned and managed in Hong Kong Including Headquarter and operating offices



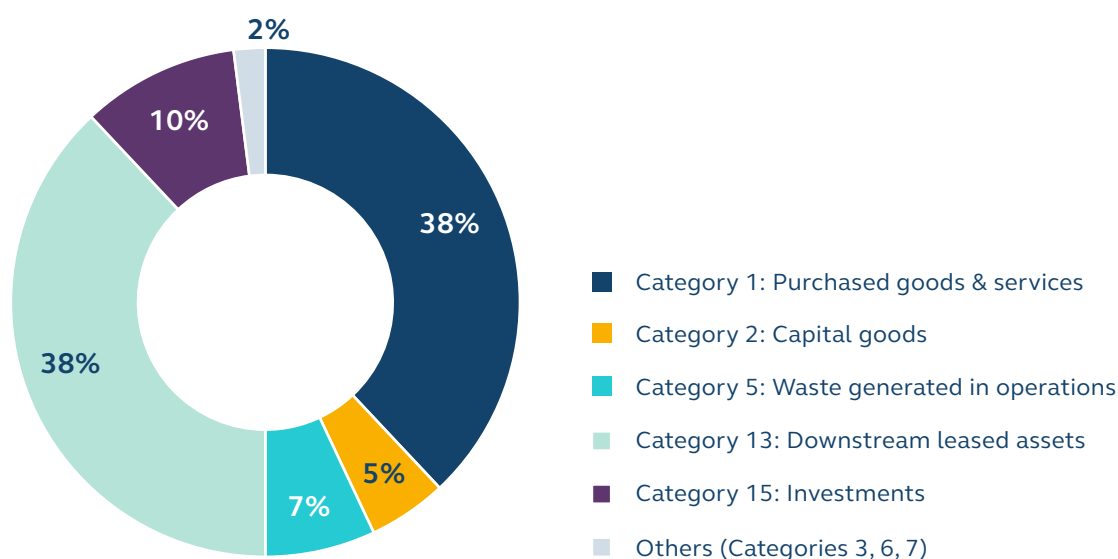
Scope 3 reporting boundary

C2 29(b)

C2 29(d)

Scope 3 category	Source of emission factor	Basis for selection
1 Purchased goods & services	Data collected directly from suppliers	Extraction, production and transportation of goods and services purchased as well as purchase of materials with recycled content
2 Capital goods	No local source available, proxy for factor referred to UKGOV: Conversion factors (KgCO ₂ per £ spent, by SIC code 2020)	Emissions associated with the production and use of fixtures, vehicles and equipment used in the construction and operations of properties
5 Waste generated in operations	No local source available, proxy for factor referred to UK Defra: Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions	Waste generated through construction and maintenance of properties
13 Downstream leased assets	Data collected directly from tenants and applying the same emission factor for Scope 1 and 2 emissions	Operations (e.g. electricity usage) of owned assets leased out to tenants
15 Investments	Emission data from investees	Equity investments made using the company's own capital and balance sheet
Others	IEA Emissions Factors	Extraction, production and transportation of fuels and energy purchased not accounted for in Scope 1 and 2
3 Fuel- and energy-related activities	No local source available, proxy for factor referred to UK Defra: Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions	Emissions associated with our employees business air travel as well as the transportation between homes and offices
6 Business travel		
7 Employee commuting		

Scope 3 GHG emissions breakdown (2023)



Commentaries

- C2 28(a)-(c)** Disclosed absolute Scopes 1, 2 and 3 GHG emissions generated during the reporting period.
- C2 29(a)** Disclosed the use of GHG Protocol to measure GHG emissions.
- C2 29(b)** Disclosed the use of operational control as the measurement approach to measure GHG emissions due to its ability to directly influence and reduce GHG emissions. In addition, information related to the emission factor sources and basis for selection are included to provide transparency in the approach the issuer uses.
- C2 29(c)** Disclosed Scope 2 GHG emissions with the use of location-based method.
- C2 29(d)** Provided a breakdown of the Scope 3 GHG emissions in scope under Scope 3 categories in the GHG Protocol.

Further guidance on GHG emissions measurement

IFRS (2023) [IFRS S2 Accompanying Guidance on Climate-related Disclosures](#)

HKEX (2022) [How to prepare an ESG Report Appendix 2: Reporting Guidance on Environmental KPIs](#)

Partnership for Carbon Accounting Financials (2022) [The Global GHG Accounting & Reporting Standard Part A – Financed Emissions](#)

GHG Protocol provides both Standard and Supplemental Guidance that are helpful for issuers to measure their GHG emissions. Issuers can refer to [Appendix 5 > Useful standards and guidance from the GHG Protocol](#) for a description of each document.



Cross-industry metrics

Paragraph 30-33

Climate-related transition risks S2 29(b)

30. An issuer shall disclose the amount and percentage of assets or business activities vulnerable to climate-related transition risks.

Climate-related physical risks S2 29(c)

31. An issuer shall disclose the amount and percentage of assets or business activities vulnerable to climate-related physical risks.

Climate-related opportunities S2 29(d)

32. An issuer shall disclose the amount and percentage of assets or business activities aligned with climate-related opportunities.

Capital deployment S2 29(e)

33. An issuer shall disclose the amount of capital expenditure, financing or investment deployed towards climate-related risks and opportunities.

Cross-industry metrics under paragraphs 30-33 of Part D of the ESG Code are metrics relevant to all issuers regardless of industry sector and business model. Designing cross-industry metrics will involve judgment and measurement uncertainty may arise.

Implementation relief

The Reasonable Information Relief is available for the disclosure of cross-industry metrics pursuant to paragraphs 30-32 of the ESG Code. S2 18

IFRS S2 provides that in making relevant disclosures, issuers should consider: S2 B65

- time horizons over which the effects of climate-related risks and opportunities could reasonably be expected to occur;
- where in the issuer's business model and value chain climate-related risks and opportunities are concentrated (e.g. geographical areas, facilities or types of assets);
- information disclosed in relation to the effects of climate-related risks and opportunities on the issuer's financial position, financial performance and cash flows for the reporting period;
- whether industry-based metrics could be used to satisfy the requirements in whole or in part;
- connections between the information disclosed to fulfil requirements in paragraphs 30-35 with the information disclosed in the related financial statements (e.g. consider whether the carrying amount of assets used is consistent with amounts included in the financial statements and explain the connections between information in these disclosures and amounts in the financial statements).

An issuer may design different metrics depending on its industry and exposure to climate-related matters.

Practical application 16: Examples of cross-industry metrics⁷²



Type	Example metrics	
	Financial performance	Financial position
Transition risks (amount and percentage)	<ul style="list-style-type: none"> Percentage of revenue from coal mining Percentage of revenue passenger kilometres not covered by the Carbon Offsetting and Reduction Scheme for International Aviation 	<ul style="list-style-type: none"> Volume of real estate collaterals highly exposed to transition risk Concentration of credit exposure to carbon-related assets
Physical risks (amount and percentage)	<ul style="list-style-type: none"> Revenue associated with water withdrawal and consumption in regions of high or extremely high baseline water stress 	<ul style="list-style-type: none"> Proportion of property, infrastructure or other alternative asset portfolios in areas subject to flooding, heat stress or water stress Proportion of real assets exposed to climate-related hazards Number and value of mortgage loans in 100-year flood zones Wastewater treatment capacity located in 100-year flood zones
Climate-related opportunities (amount and percentage)	<ul style="list-style-type: none"> Revenue from products or services that support the transition to a lower-carbon economy 	<ul style="list-style-type: none"> Net premiums written related to energy efficiency and lower-carbon technology Number of (1) zero-emissions vehicles, (2) hybrid vehicles and (3) plug-in hybrid vehicles sold Proportion of homes delivered certified to a third-party, multi-attribute, green-building standard
Capital deployment (amount)	<ul style="list-style-type: none"> Annual revenue invested in research and development of lower-carbon products/services 	<ul style="list-style-type: none"> Investment in climate adaptation measures (e.g. soil health, irrigation and technology)

Important note

Amounts used in the calculations of cross-industry metrics should be cross-referenced to, or reconciled with, the related line items in the financial statements, where practicable.



⁷² IFRS (2023) [Accompanying Guidance on Climate-related Disclosures](#) [IG1]

Internal carbon prices

Paragraph 34 S2 29(f)

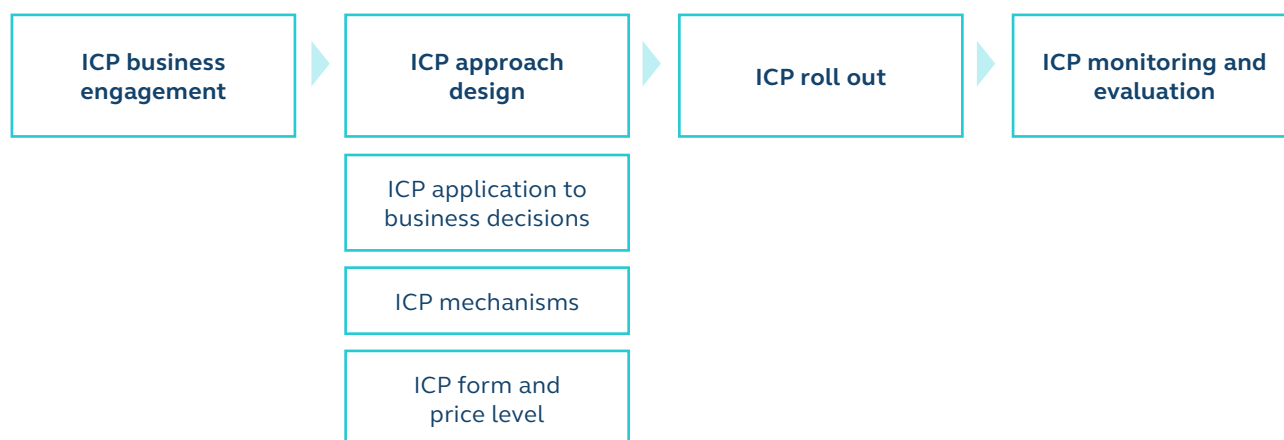
An issuer shall disclose:

- (a) an explanation of whether and how the issuer is applying a carbon price in decision-making (for example, investment decisions, transfer pricing, and scenario analysis); and
- (b) the price of each metric tonne of greenhouse gas emissions the issuer uses to assess the costs of its greenhouse gas emissions;

or an appropriate negative statement that the issuer does not apply a carbon price in decision-making.

The ESG Code does not require an issuer to maintain an internal carbon price (“ICP”). Issuers who have yet to maintain or use ICP for decision-making should make an appropriate negative statement in their ESG reports.

Nonetheless, since ICP can help issuers better understand the financial implications of their carbon footprint and make more informed decisions about how to manage and reduce it, we encourage issuers to consider developing an ICP. Set out below is a workflow for the development of an ICP⁷³:



73 Adapted from Carbon Pricing Unlocked (2017) [How-To Guide to Corporate Internal Carbon Pricing](#) p.7.

ICP business engagement

It is crucial for the issuer to obtain early support and buy-in from relevant business units, the board and management. This will allow the issuer to build an understanding of ICP, gather necessary insights for ICP mechanism design and create ownership of the ICP approach.

Issuers can consider establishing a committee or working group to monitor the development of ICP. The working group may comprise representatives with different competencies from departments such as the Sustainability and Finance departments.

ICP approach design

After outlining a clear business case, the issuer can design its ICP approach, which involves evaluating which business decisions to apply ICP, selecting the ICP mechanism and identifying the price level.

ICP application to business decisions

A large part of the ICP approach design involves gathering existing information such as⁷⁴:

- GHG emissions profile → provides the issuer with an understanding of how GHG emissions are divided over Scope 1, 2 and 3 and the sources of larger share emissions.
- Drivers and actors responsible for GHG emissions (e.g. sectors where value chain partners are active, type of relationship with value chain partners) → allows the issuer to design an ICP approach that can influence decisions.
- Types of business decisions that influence the GHG emissions profile and relevant decision-makers → allows the issuer to determine the business decisions where ICP may contribute the most and the stakeholders to obtain buy-in from.
- Existing initiatives and approaches influencing value chain GHG emissions → provides the issuer with an understanding of GHG emissions that are already covered by existing external regulations or internal approaches and strategies which should be e.g. excluded from the scope of the ICP approach.

The above information provides insights for selecting the most appropriate ICP approach to facilitate decision-making and incentivise decarbonisation. Depending on the issuers' objective and decision-making process, some issuers may set more than one ICP for different business units or different decision-making processes.

⁷⁴ Adapted from Carbon Pricing Unlocked (2017) [How-To Guide to Corporate Internal Carbon Pricing](#) p.22.

Practical application 17: Common types of decision-making induced by ICP⁷⁵



Decision-making	Example approach
Capital expenditure decisions	<ul style="list-style-type: none"> • Use of ICP in return-on-investment calculations to evaluate investment projects on the risks of climate-related regulatory costs • Use of ICP in investment decisions on production sites to M&A decisions to determine the potential climate-related liabilities or assets of the target company
Procurement decisions	<ul style="list-style-type: none"> • Apply ICP to carbon footprint of purchased goods and services to push suppliers towards more low-carbon operations • Shift procurement towards low-carbon suppliers
R&D decisions	<ul style="list-style-type: none"> • Use of ICP to evaluate R&D proposals on the risks of climate-related regulatory costs, cost savings, and potential and commercial viability in a low-carbon future • A shadow price on the expected carbon footprint of new products and services to drive R&D decisions or allocate R&D budgets towards low-carbon innovation
Operational decisions	<ul style="list-style-type: none"> • Use of ICP to reveal hidden climate-related costs and opportunities by applying a shadow price to the carbon footprint of their assets
Business units	<ul style="list-style-type: none"> • Use of transfer pricing to charge internal departments or business units for their carbon footprint with an actual fee, directly affecting their profit and loss accounts

⁷⁵ Adapted from Carbon Pricing Unlocked (2017) [How-To Guide to Corporate Internal Carbon Pricing](#) p.29-31.

ICP mechanisms

Issuers should select the type of ICP mechanism to be implemented to stimulate changes in business decisions. Table 8 provides an overview of the types of ICP mechanisms that are available and how they may support issuers in meeting their objectives.

Table 8: Types of ICP mechanisms and their objectives and usage⁷⁶

Type of ICP mechanism	Description	Objectives and usage
Shadow price	Hypothetical cost of carbon emissions	<ul style="list-style-type: none"> The most common form of ICP Helps an issuer understand the impacts of climate-related risks such as technological shifts or future regulations Helps an issuer with risk management as well as internal strategic planning Allows issuers to model or test how a range of carbon prices affect their divisions, capital investments and other planned projects
Carbon fee	A per-unit fee based on the amount of GHG the company emits	<ul style="list-style-type: none"> Helps create an actual pool of funds, generating a revenue stream to help pave the way for greener projects and further R&D Prepares an issuer for a carbon-resilient world Encourages a business to transform into an environmental leader Allows for the creation of internal funds to invest into energy efficiency or renewable energy projects in order to cut energy costs Builds awareness of the importance of emission reductions within different business units
Implicit price	Helps quantify the capital investments required to meet climate-related targets	<ul style="list-style-type: none"> Helps issuers understand their initial carbon footprint Used as a benchmark to implement a more strategic internal price
Internal trading	Allows business units of an issuer to trade their allocated carbon credits based on respective emissions	<ul style="list-style-type: none"> Helps create awareness Allows issuers to prepare for more stringent measures such as shadow prices or carbon fees

⁷⁶ Carbon Pricing Leadership Coalition and CDP (2021) [What is Internal Carbon Pricing And How Can It Help Achieve Your Net-zero Goal?](#) p.6-7.

ICP form and price level

With the ICP mechanism decided, issuers should assess the form of ICP (e.g. uniform or differentiated price, static or evolving carbon price) and the price level of ICP that will be effective in incentivising decarbonisation.

Practical application 18: Common sources for setting the price level of ICP⁷⁷



Sources	Examples
Based on external sources	<ul style="list-style-type: none"> Prices from compliance or voluntary carbon trading markets Price projections from climate-related regulation (e.g. the expected future emissions trading system or carbon tax price and/ or implicit carbon price) or the social cost of carbon
Based on a benchmark against peers	<ul style="list-style-type: none"> Prices set by peers within the issuer's own sector/ industry associations
Based on internal consultation	<ul style="list-style-type: none"> Internally set price to drive a change to business strategy or decisions after consultation with key stakeholders
Based on technical analysis	<ul style="list-style-type: none"> Internal technical analysis to calculate the price by reference to a detailed assessment of the future costs associated with potential measures required in order to reduce the issuer's carbon footprint to meet its set targets

ICP roll out

Issuers should then test and roll out the ICP approach. To test its effectiveness, issuers can consider testing the ICP approach in pilot projects through different ways such as:

- simulation within the company;
- application to a specific department or business unit; and
- application to specific decisions.

A pilot roll out can support the issuer in planning for the company-wide roll out of ICP, and allow improvement of the mechanism based on obstacles encountered during the pilot project.

⁷⁷ Adapted from Carbon Pricing Unlocked (2017) [How-To Guide to Corporate Internal Carbon Pricing](#) p.27.

ICP monitoring and evaluation

After testing the ICP, issuers can consider enforcing ICP on a larger scale within the company. Issuers should put in place policies and procedures to familiarise the respective teams in leveraging ICP through:

- guidelines or directives on the use of ICP;
- training sessions;
- use of KPIs; and
- feedback mechanism.

Issuers should also regularly monitor the implementation of ICP, evaluate the ICP's performance as a tool to influence business decisions, and re-adjust the ICP as needed to ensure that it remains relevant to the decision-making process.

Further guidance on internal carbon price

CDP (2023) [Carbon Pricing: CDP Disclosure Best Practice](#)

CDP (2022) [Putting a Price on Carbon: The state of internal carbon pricing by corporates globally](#)

CDP (2021) [What is Internal Carbon Pricing and How Can It Help Achieve Your Net-zero Goal?](#)

Carbon Pricing Unlocked (2017) [How-To Guide to Corporate Internal Carbon Pricing](#)



Remuneration

Paragraph 35 S2 29(g)(i)

An issuer shall disclose whether and how climate-related considerations are factored into remuneration policy, or an appropriate negative statement. This may form part of the disclosure under paragraph 19(a)(iv).

The ESG Code does not mandate an issuer to factor in climate-related considerations into its remuneration policy. The board of directors has discretion to determine whether and how to factor climate considerations into the remuneration policy, or the scope of persons (i.e. executive management or a broader range of personnel) to be covered by such policy.

Nonetheless, to incentivise the board and management in achieving the issuer’s goals and objectives, issuers may consider linking executive and management compensation to climate-related issues.

Practical application 19: Examples of climate-related remuneration KPIs⁷⁸



Type of climate-related remuneration KPI	Description
Performance targets	Operational reduction targets (e.g. emissions intensity, energy intensity) are met by the issuer
Investment targets	A set amount of climate-related products invested
Product targets	A set amount of sustainable or green finance products issued
Rating targets	Sustainability ratings submitted and achieved a predetermined level
Target setting	Climate-related targets set are met by the issuer

⁷⁸ Adapted from TCFD (2021) [Guidance on Metrics, Targets, and Transition Plans](#) p.17.

Issuers should be transparent about how climate-related considerations are factored into their remuneration policy. Quantitative disclosures such as the percentage, weighting or amount of executive and/ or management remuneration linked to climate-related considerations are encouraged, e.g. some issuers may disclose the percentage of executive management remuneration in the current period that is linked to climate-related considerations as per IFRS S2 requirements, whereas others may discuss the weighting factors or total amount of compensation that could be impacted⁷⁹. Issuers can also opt for a descriptive narrative e.g. describe how climate change issues are included in balanced scorecards for executive remuneration. **S2 29(g)(ii)**

Where an issuer decides not to link compensation with climate-related issues, it should include an appropriate negative statement in the ESG report.

Further guidance on climate-related remuneration

TCFD (2021) [Guidance on Metrics, Targets, and Transition Plans](#)

Climate Governance Initiative and Willis Towers Watson (2021) [Executive Compensation Guidebook for Climate Transition](#)



⁷⁹ Adapted from TCFD (2021) [Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#) p.81.

Industry-based metrics

Paragraph 36 S2 32

An issuer is encouraged to disclose industry-based metrics that are associated with one or more particular business models, activities or other common features that characterize participation in an industry. In determining the industry-based metrics that the issuer discloses, an issuer is encouraged to refer to and consider the applicability of the industry-based metrics associated with disclosure topics described in the IFRS S2 Industry-based Guidance on implementing Climate-related Disclosures and other industry-based disclosure requirements prescribed under other international ESG reporting frameworks.

Issuers can consider other metrics on climate-related risks and opportunities associated with ESG areas such as water, energy and waste management where applicable.

While disclosure of industry-based metrics is optional under the ESG Code, issuers are encouraged to refer to IFRS S2 and consider the applicability of the industry-based metrics associated with disclosure topics described in the Industry-based Guidance⁸⁰.

Further guidance on industry-based metrics

IFRS (2023) [Industry-based Guidance](#)

IFRS [SASB Standards](#)



⁸⁰ For details related to the industry-based metrics, issuers can refer to the [Industry-based Guidance](#) issued by IFRS to locate its sector and industry, as well as the relevant metrics.

Climate-related targets

Setting climate-related targets

Paragraph 37 S2 33

An issuer shall disclose (a) the qualitative and quantitative climate-related targets the issuer has set to monitor progress towards achieving its strategic goals; and (b) any targets the issuer is required to meet by law or regulation, including any greenhouse gas emissions targets. For each target, the issuer shall disclose:

- (a) the metric used to set the target;
- (b) the objective of the target (for example, mitigation, adaptation or conformance with science-based initiatives);
- (c) the part of the issuer to which the target applies (for example, whether the target applies to the issuer in its entirety or only a part of the issuer, such as a specific business unit or geographic region);
- (d) the period over which the target applies;
- (e) the base period from which progress is measured;
- (f) milestones or interim targets (if any);
- (g) if the target is quantitative, whether the target is an absolute target or an intensity target; and
- (h) how the latest international agreement on climate change, including jurisdictional commitments that arise from that agreement, has informed the target.

To regularly monitor the progress of the transition towards a lower-carbon economy, issuers are encouraged to consider setting climate-related targets. As good market practice, issuers are further encouraged to set interim targets in respect of their longer term climate-related targets, thereby allowing their boards and stakeholders to keep track on their progress to achieve such targets.

Further guidance on target setting workflow and key considerations

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 5 Choose Metrics, Indicators and Targets

The guidance explains five key considerations (i.e. resource availability, staff readiness, financial impact, international and national drivers and community expectations) that issuers should consider when determining a fit-for-purpose climate-related target.



Practical application 20: Potential areas for consideration when setting climate-related targets⁸¹



Areas	Examples of climate-related targets
Greenhouse gas emissions: Scope 1, 2 & 3 GHG emissions	<ul style="list-style-type: none"> Reduce net Scope 1, Scope 2, and Scope 3 GHG emissions to zero by 2050, with an interim target to cut emissions by 70% relative to a 2015 baseline by 2035
Greenhouse gas emissions intensity	<ul style="list-style-type: none"> Reduce GHG emissions intensity of portfolio by 25% by 2035 relative to 2020 baseline year
Transition risks: assets or business activities vulnerable to climate-related transition risks	<ul style="list-style-type: none"> Reduce percentage of asset value exposed to transition risks by 30% by 2030, relative to a 2019 baseline
Physical risks: assets or business activities vulnerable to climate-related physical risks	<ul style="list-style-type: none"> Reduce percentage of asset value exposed to acute and chronic physical climate-related risks by 50% by 2050 Ensure at least 60% of flood-exposed assets have risk mitigation in place in line with the 2060 projected 100-year floodplain
Climate-related opportunities: proportion of revenue, assets or business activities aligned with climate-related opportunities	<ul style="list-style-type: none"> Increase net installed renewable capacity to meet 85% of total capacity by 2035
Capital deployment: capital expenditure, financing or investment deployed towards climate-related risks and opportunities	<ul style="list-style-type: none"> Lend at least 10% of portfolio to projects focused primarily on physical climate-related risk mitigation Invest at least 25% of annual capital expenditure into purchasing electric vehicles
Internal carbon prices: price on each tonne of GHG emissions used internally	<ul style="list-style-type: none"> Increase internal carbon price to HK\$300/tCO₂ by 2030 to reflect potential changes in policy
Remuneration: proportion of executive management remuneration linked to climate considerations	<ul style="list-style-type: none"> Increase amount of executive management remuneration impacted by climate considerations to 10% by 2025

81 Adapted from TCFD (2021) [Guidance on Metrics, Targets, and Transition Plans](#) p.33 (Table D1).

Under Part C of the ESG Code, issuers are required to disclose emission targets (KPI A1.5), waste reduction targets (KPI A1.6), energy use efficiency targets (KPI A2.3) and water efficiency targets (KPI A2.4) on a comply or explain basis. Climate-related targets set may or may not be those required under Part C of the ESG Code. Issuers may also set additional climate-related targets pursuant to paragraph 37 of the ESG Code.

Where an issuer has set climate-related targets (whether those required under Part C of the ESG Code or other additional climate-related targets), it should disclose information called for under paragraphs 37 to 40 of Part D of the ESG Code.

Paragraph 38 S2 34

An issuer shall disclose information about its approach to setting and reviewing each target, and how it monitors progress against each target, including:

- (a) whether the target and the methodology for setting the target has been validated by a third party;
- (b) the issuer's processes for reviewing the target;
- (c) the metrics used to monitor progress towards reaching the target; and
- (d) any revisions to the target and an explanation for those revisions.

This disclosure enables stakeholders to understand if the target set has been tested and confirmed by a third party, in relation to the climate science, as well as how the issuer monitors the progress in reaching the target.

Paragraph 39 S2 35

An issuer shall disclose information about its performance against each climate-related target and an analysis of trends or changes in the issuer's performance.

This disclosure enables stakeholders to understand whether the issuer is making progress to meet the targets set and the extent of the progress made. The disclosure may be qualitative (e.g. description of improvement or new initiatives during the reporting period) or quantitative (e.g. detailed comparison of progress made with respect to climate-related target in the current and past reporting periods).

Including an analysis of trends or changes in the issuer's performance would enable stakeholders to understand an issuer's progress to address climate-related risks and opportunities over the short, medium and long-term time horizon.

Please refer to Illustrative disclosures 7 and 8a below for examples of qualitative and quantitative disclosure on progress of implementing action plans and setting / achieving climate-related targets, respectively.

Important note

Issuers shall refer to both cross-industry metrics (paragraphs 28 to 35 of the ESG Code) and industry-based metrics (paragraph 36 of the ESG Code) and consider their applicability when preparing disclosures regarding climate-related targets⁸².



⁸² Paragraph 41 of the ESG Code.

Illustrative disclosure 7: Qualitative description of progress made on implementing plans and setting climate-related target

To minimise vulnerability from coastal flooding, we are in the process of installing flood walls in all of our assets, which is expected to reduce the chance of disruption by coastal flooding. During the reporting period, we have completed the installation of flood walls in 70% of its assets and plan to complete the installation in the remaining assets by 2025. We are also formulating future plans from 2030 onwards and aim to invest in lower risk locations to reduce the amount of potential stranded assets. **C2 23**

To monitor our vulnerability towards coastal flooding, we are planning to set a relevant climate-related target and are currently conducting desktop research and stakeholder engagement to design the right level of target. We aim to disclose the target set by the next reporting period. **C2 39**

Commentaries

C2 23

Described the progress made in the most recent reporting year in respect of the plans to install flood walls in all of its assets.

C2 39

In addition, the issuer describes qualitatively its upcoming initiative in investing in lower risk locations, as well as its plans to formulate and disclose its climate-related target with concrete timeline, i.e. in the next reporting period.



Illustrative disclosure 8a: GHG emission target

Target information

Target set	Reduce net Scope 1 and Scope 2 GHG emissions to zero by 2050, with an interim target to cut emissions by 70% relative to a 2020 baseline by 2035. C2 37(a)
Target type (Absolute/intensity)	Absolute C2 37(g)
Objective of target	<p>To align with Science Based Targets initiative (“SBTi”) and reduce GHG emissions of own operations to reach net zero. C2 37(b)</p> <p>The target aligns with the Paris Agreement’s goal in limiting warming to 1.5°C above pre-industrial levels, C2 37(h) and was validated by SBTi in 2021. C2 38(a)</p>
Monitoring progress	Our Climate Committee reviews the target and our performance on Scope 1 and 2 GHG emissions on an annual basis C2 38(c) and assesses whether any revision is required. C2 38(b)
Scope of target	Covers our real estate operations and headquarters operation, representing 90% of our total revenue. C2 37(c)

Target set

	Scope 1 & 2 GHG emissions (tCO ₂ e)	Reduction from base period(%)
Gross emissions - Base period (2020) C2 37(e)	7,500	-
Gross emission interim target (2035) C2 37(f)	2,250	▼ 70%
Gross emission target - Target period (2050) C2 37(d)	1,000	▼ 87%

Progress to date

C2 39	Scope 1 & 2 GHG emissions (tCO ₂ e)	Reduction from base period (%)
2021	7,300	▼ 2.6%
2022	6,800	▼ 9.3%
Current period (2023)	6,000	▼ 20%

During the reporting period, our chillers and some office equipment were replaced with more energy-efficient models, resulting in a gradual reduction in our GHG emissions.

Commentaries

C2 37(a)	Highlighted the specific target set by issuer for addressing climate-related risks and opportunities.
C2 37(b)	Indicated the objective of the target is to align with Science Based Targets initiative (“SBTi”).
C2 37(c)	Disclosed that the scope of the target covers the company’s real estate operations including its headquarters.
C2 37(d)	Indicated that the target will be applicable from the base period of 2020 to target period of 2050.
C2 37(e)	Indicated that base period from which progress is measured is in 2020.
C2 37(f)	Indicated that interim target of 2035 is set to monitor the progress of target.
C2 37(g)	Indicated that target set is an absolute target.
C2 37(h)	Indicated that target is aligned with the Paris Agreement as the latest international agreement on climate change to limit warming to 1.5°C above pre-industrial levels.
C2 38(a)	Indicated the target is validated by SBTi.
C2 38(b)	Indicated that the issuer’s Climate Committee is responsible in reviewing the target and monitors the Scope 1 and 2 GHG emissions on an annual basis to determine the need to revise the target.
C2 38(c)	
C2 38(d)	No revisions to the target at the moment and no disclosures made.
C2 39	Disclosed the progress made in the reporting period and the reduction compared to the base period, as well as historical information to enable assessment of progress in addressing climate-related issues.

Paragraph 40 S2 36

For each greenhouse gas emission targets disclosed in accordance with paragraphs 37 to 39, an issuer shall disclose:

- (a) which greenhouse gases are covered by the target;
- (b) whether Scope 1, Scope 2 or Scope 3 greenhouse gas emissions are covered by the target;
- (c) whether the target is a gross greenhouse gas emissions target or a net greenhouse gas emissions target. If the issuer discloses a net greenhouse gas emissions target, the issuer is also required to separately disclose its associated gross greenhouse gas emissions target;
- (d) whether the target was derived using a sectoral decarbonisation approach; and
- (e) the issuer's planned use of carbon credits to offset greenhouse gas emissions to achieve any net greenhouse gas emissions target. In explaining its planned use of carbon credits, the issuer shall disclose:
 - (i) the extent to which, and how, achieving any net greenhouse gas emissions target relies on the use of carbon credits;
 - (ii) which third-party scheme(s) will verify or certify the carbon credits;
 - (iii) the type of carbon credit, including whether the underlying offset will be nature-based or based on technology carbon removals, and whether the underlying offset is achieved through carbon reduction or removal; and
 - (iv) any other factors necessary to enable an understanding of the credibility and integrity of the carbon credits the issuer plans to use (for example, assumptions regarding the permanence of the carbon offset).

If an issuer has set any GHG emission target, in addition to information disclosed in accordance with paragraphs 37 to 39, it should also disclose details of each GHG emissions target (gross or net) and the use of carbon credits in accordance with paragraph 40.

Gross GHG emissions targets reflect the total changes in GHG emissions planned within the issuer's value chain. Net GHG emissions targets are the issuer's targeted gross GHG emissions minus any planned offsetting efforts (e.g. the issuer's planned use of carbon credits to offset its GHG emissions). S2 B68

Use of carbon credits

Some issuers may use carbon credits to achieve climate-related targets, especially for hard-to-abate emissions.

Carbon credits take the form of transferable or tradable instruments, certified by governments or independent certification bodies, representing the removal of emissions of one metric tonne of CO₂ or an equivalent amount of other GHGs. These credits can be nature- or technology-based. Issuers may generate credits, e.g. through cap-and-trade schemes where they can sell or buy carbon credits for their own use to offset some of their emissions.

Table 9: Types of carbon credits

Type	Definition	Examples
Nature-based solutions ⁸³	Involve activities that aim to protect, manage, enhance, and restore nature such as through afforestation, soil-based carbon sequestration, and the use of other biomass stores	<ul style="list-style-type: none">• Afforestation, reforestation and revegetation• Agricultural land management• Improved forest management• Reduced emissions from deforestation and degradation• Avoided conversion of grasslands and shrublands• Wetland restoration and conservation
Technology-based solutions ⁸⁴	Aim to provide permanent removal and artificial carbon sequestration	<ul style="list-style-type: none">• Bioenergy with carbon capture and storage• Direct air capture• Enhanced rock weathering

A number of governance bodies and standard setters, such as [Verra](#) and [Gold Standard](#), provide published methodologies, public registries, and detailed documentation of carbon projects and carbon credits generated. Carbon credits issued under each of these standards require compliance with their methodology, stakeholder engagement, and monitoring efforts.

To ensure the legitimacy and effectiveness of the use of carbon credits, carbon credits shall be subject to third-party credit verification or certification scheme approved by the governance bodies and standard setters. During the verification process, the approved auditors will determine:

- whether the project meets the rules and requirements set by the standard setters;
- whether the outcomes set out in the project documentation have been achieved and quantified according to the requirements of the relevant standard.

Where an issuer intends to use carbon credits to meet any net GHG emissions target, it is required to disclose, among other information, the extent to which and how carbon credits are intended to be used to achieve such net GHG emissions target, the type of carbon credit used and the third-party scheme used for verifying or certifying the carbon credit. See Illustrative disclosure 8b below.

83 For the definition of types of activities included in each example, issuers can refer to Verra (2022) [Verified Carbon Standard P.57-63 \(Appendix 1\)](#).
84 IEA (2020) [Going carbon negative: What are the technology options?](#).

Illustrative disclosure 8b: GHG emission target with intended use of carbon credit

Target set

Intended use of carbon credit

	Scope 1&2 GHG emissions (tCO ₂ e) ¹ C2 40(b)	Reduction from base period(%)	Type of carbon credit C2 40(e)(iii)	Nature-based - afforestation, reforestation and revegetation
Gross emissions target - Target period (2050) ² C2 40(c)	1,000	▼ 87%	Third-party credit verification C2 40(e)(ii)	Yes – by VERRA
Net emissions target – Target period (2050)	0	▼ 100%	Intended use of carbon credits C2 40(e)(i)	1,000 tCO ₂ e
<ol style="list-style-type: none"> Our GHG emissions include CO₂, CH₄ and N₂O and are converted to reflect the CO₂ equivalent. C2 40(a) Our emissions target takes into account SBTi's Sectoral Decarbonisation Approach for the Buildings sector of emissions aligned with 1.5°C. C2 40(d) 			Other consideration factors C2 40(e)(iv)	We prioritise on selecting forestry projects that sequester carbon with contracted durability of >100 years.

Commentaries

C2 40(a)	Explained that three types of greenhouse gases are included in the issuer's GHG emissions.
C2 40(b)	Explained that Scope 1 and 2 GHG emissions are covered by the target.
C2 40(c)	Disclosed gross and net GHG emissions target separately.
C2 40(d)	Explained that Sectoral Decarbonisation approach of Building sector was taken into account when developing the GHG emissions target.
C2 40(e)(i)	Indicated that 1,000 tCO ₂ e of the emissions relies on the use of carbon credits.
C2 40(e)(ii)	Indicated the type of carbon credit purchased and identified VERRA as the third-party scheme that verified the carbon credits.
C2 40(e)(iii)	Indicated that carbon credit used is nature-based.
C2 40(e)(iv)	Explained the selection of forestry projects from VERRA with a specific criteria, to support the additionality and permanence of carbon credits used.



Further guidance on climate-related targets

Science-based Target Initiative (2024) [SBTi Corporate Net-Zero Standard](#)

UN-convened Net-Zero Asset Owner Alliance (2023) [Target Setting Protocol Third Edition](#)

HKEX (2021) [Guidance on Climate Disclosures](#) Chapter 5 Choose Metrics, Indicators and Targets

HKEX (2021) [Practical Net-Zero Guide for Business](#)

TCFD (2021) [Guidance on Metrics, Targets, and Transition Plans](#) Chapter D





Appendix

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Appendix 1: Location map – Key concepts under IFRS S1 to the ESG Code and Implementation Guidance

Key concept under IFRS S1	IFRS reference	Location in ESG Code / Implementation Guide
i. Quality of information	S1 Paragraph D4-D7, D9-D15, D17-D33	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (i) Quality of information
ii. Reporting entity	S1 Paragraph 20, B38	ESG Code: Paragraph 15 Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (ii) Reporting entity
iii. Timing of reporting	S1 Paragraph 64-69	ESG Code: Paragraph 4 Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (iii) Timing of reporting
iv. Location of disclosures	S1 Paragraph 60-63	ESG Code: Paragraph 12 Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (iv) Location of disclosures
v. Materiality	S1 Paragraph 17-19, B13-B28, D8	ESG Code: Paragraph 11(i) Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (v) Materiality
vi. Value chain concepts	S1 Paragraph 32, B2, B5 S2 Paragraph 13	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (vi) Value chain concepts
vii. Statement of compliance	S1 Paragraph 72-73	ESG Code: Paragraph 8 Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (vii) Statement of compliance
viii. Judgments and measurement uncertainty	S1 Paragraph 74-82	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (viii) Judgments and measurement uncertainty
ix. Interaction with law or regulation	S1 Paragraph B31-B33	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (ix) Interaction with law or regulation
x. Aggregation and disaggregation	S1 Paragraph B29-B30	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (x) Aggregation and disaggregation
xi. Comparative information	S1 Paragraph 52, 70-71, B49-B54	ESG Code: Paragraph 11(ii) and (iv) Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (xi) Comparative information
xii. Estimates and errors	S1 Paragraph 83-86, B55-B59	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (xii) Estimates and errors
xiii. Connected information	S1 Paragraph 21-24, 63, B39-B47	Implementation Guidance: Chapter 1 > IFRS S1 key concepts > (xiii) Connected information

Appendix 2: Illustrative cases

Three cases - **1** a real estate company, **2** a logistics company and **3** a manufacturing company - are included to illustrate the step-by-step workflow and thinking processes for preparing disclosures required by the Strategy (paragraphs 20-26 of the ESG Code) and Metrics and Targets (paragraphs 3-33 of the ESG Code) pillars. Each illustrative example focuses on one identified climate-related risk relevant to the company.

1 Real estate company

The issuer is a real estate company with properties owned and managed in Hong Kong and Mainland China. It has conducted stakeholder engagement to identify the relevant climate-related risks that may affect the business. The following table explains the issuer's assessment process for one of its identified climate-related risks, coastal flooding.

Key disclosure areas	Actions by the issuer
Climate-related risks and opportunities and business model and value chain	<p>The issuer identifies increased coastal flooding, a chronic climate-related physical risk derived from sea level rise, as one of its relevant climate-related risks. Coastal flooding can cause disruption to the issuer's business such as infrastructure deterioration and reduced drainage capacity. C2 20(a)-(b)</p> <p>During the year, an incident of coastal flooding occurred and caused damage to one of the issuer's properties in Hong Kong. The issuer expects some degree of future damage to properties located in the coastal area in the long term as these properties are more prone to coastal flooding. C2 21</p> <p>The issuer expects that coastal flooding will increase in severity and frequency over the long term (i.e. 2080), as compared to short term (i.e. 2030) and medium term (i.e. 2050). These time horizons are defined by factoring in the issuer's business plan, targets set as well as national and governmental policy. C2 20(c)-(d)</p>
Climate resilience	<p>To understand the potential impacts arising from coastal flooding, the issuer conducts scenario analysis during the reporting period to assess the vulnerability of (a) potential assets in pre-investment phase and (b) its owned land and properties. C2 26(b)(iii)</p> <p>The issuer has already put in place adaptation measures to minimise potential impacts arising from coastal flooding. For example, all assets are constructed above the base flood level and flood-resistant construction techniques were adopted during construction stage.</p> <p>In light of recent coastal flooding incidents, the issuer is also setting aside budget for the maintenance or enhancement of existing properties. However, the issuer highlights uncertainty around the potential change of the frequency and severity of coastal flooding in the future. C2 26(a)</p> <p>To assess the effect of coastal flooding on its business, the issuer endeavours to quantify the percentage of assets potentially affected by coastal flooding with the use of a climate-related scenario analysis.</p> <p><i>Inputs for analysis</i></p> <ul style="list-style-type: none"> The vulnerability of all of the issuer's 80 assets (including both potential assets as well as owned land and properties) to coastal flooding across Hong Kong and Mainland China is assessed. C2 26(b)(i)(7) The selected time horizons for analysis are 2030, 2050 and 2080. C2 26(b)(i)(6) The issuer identifies inputs to include for analysis such as expected damage from flooding and expected operating losses from business interruptions.

Key disclosure areas	Actions by the issuer
	<ul style="list-style-type: none"> The analysis is conducted on a region-level and does not assess the issuer's asset locations individually as management expects region-level scenario analysis to be adequate to assess its portfolio risks. <p><i>Scenarios selection</i></p> <ul style="list-style-type: none"> The issuer selects IPCC SSP2-4.5 and SSP5-8.5 scenarios, an intermediate emission pathway and a very high emission pathway respectively, to assess physical risks. These pathways represent scenarios where carbon emissions remain around current levels until the middle of the century and where emissions roughly double from current levels by 2050. C2 26(b)(i)(1)-(5) <p><i>Approach to scenario analysis and findings</i></p> <ul style="list-style-type: none"> The issuer collects data points relevant to the identified inputs and its company data such as asset value to evaluate the potential impacts from coastal flooding. Based on the analysis, it is estimated that up to 0.7% of assets will be vulnerable to coastal flooding under the SSP2-4.5 scenario, versus ~5% of assets under the SSP5-8.5 scenario. As such, this risk is considered to be a lower risk compared to other climate-related risks. C2 31 The issuer will continue to monitor the risks in relation to the identified assets and consider the need for a more detailed asset-level analysis for more vulnerable assets to evaluate their adaptive capacity under different magnitudes of coastal flooding. <p><i>Assumptions</i> C2 26(b)(ii)</p> <ul style="list-style-type: none"> Insurance coverage or asset-specific mitigation measures are not taken into account. Time value is not taken into account.
Strategy and decision-making	<ul style="list-style-type: none"> As a result of the climate-related scenario analysis, the issuer understands that a portion of its assets are vulnerable to coastal flooding, especially under the SSP5-8.5 scenario. To minimise its vulnerability and to closely monitor its progress, the issuer has set a climate-related target, "to reduce percentage of total asset value exposed to coastal flooding by 25% by 2030, relative to a 2023 baseline". C2 22(a)(iv) The issuer is in the process of installing flood gates and sump pumps for its coastal assets to achieve its climate-related target. The issuer is also formulating future transition plans to reduce the amount of potential stranded assets. C2 22(a)(i)-(iii) To finance the transition, the issuer has set aside a budget for the installation of flood gates and sump pumps and expects to fund the investment with internal cash. C2 22(b)
Financial position, financial performance and cash flows	<ul style="list-style-type: none"> One of the issuer's properties has experienced coastal flooding in the previous financial year and incurred an impairment loss of HKD10 million. To minimise vulnerability to coastal flooding, the issuer is installing flood gates and sump pumps for all of its coastal assets, resulting in a capitalisation of ~HKD20 million. C2 24 The issuer plans to allocate a budget of HKD50 million over the next five years to engage consultants in planning and implementing its net-zero transition plan, and to upgrade existing infrastructure and to construct new facilities to support renewable energy initiatives. C2 25

2 Logistics company

The issuer is a logistics company operating primarily in Mainland China. It has a fleet of vehicles using internal combustion engine (“ICE”) and is considering to move to electric vehicles (“EVs”). Based on the issuer’s stakeholder engagement, it has identified carbon pricing as a relevant climate-related risk. The following table explains the assessment process that the issuer carried out on the risk of carbon pricing, as it expects carbon pricing to affect its profit margin.

Key disclosure areas	Actions by the issuer
Climate-related risks and opportunities and business model and value chain	<p>The issuer identifies increased carbon pricing, a climate-related transition risk, as a relevant climate-related risk. The issuer expects the increase in regulatory requirements on carbon pricing to affect its business in Mainland China and result in potential retirement of vehicles using internal combustion engine. C2 20(a)-(b), 21</p> <p>It expects that the transition risk may have a material impact over the short to medium term (i.e. 2025 and 2030), as compared to long term (i.e. 2050). The time horizons are defined taking into account the issuer’s 2030 and 2050 strategic planning horizons. C2 20(d)</p>
Climate resilience	<p>The issuer has been collecting GHG emissions for the past 5 years and understands its GHG emissions trajectory. However, as mandatory carbon pricing has not yet been introduced in the region, there is a high uncertainty on its mechanism and how it may impact the issuer. Hence the issuer has not yet accounted for the potential costs that may incur into its strategy. If carbon pricing is introduced in the region, the issuer expects its profit margin and financial performance to be affected. C2 26(a)</p> <p>To assess the effect of carbon pricing on its business, the issuer endeavours to quantify the amount of carbon cost during the reporting period with the use of scenario analysis. C2 26(b)(iii)</p> <p><i>Inputs for analysis</i></p> <ul style="list-style-type: none"> The issuer assesses the potential carbon costs based on GHG emissions from all of its 1,500 vehicles in Mainland China. C2 26(b)(i)(7) The selected time horizons for analysis are 2025, 2030 and 2050. C2 26(b)(i)(6) The issuer uses carbon price and GHG emissions as the inputs to quantify potential carbon costs it may face under the selected scenarios. <p><i>Scenarios selection</i></p> <ul style="list-style-type: none"> The issuer selects two scenarios, NGFS Current Policies and Net Zero 2050, as they provide comparison with a high contrast and focus on transition risks. The selected scenarios also provide time horizons that align with the issuer’s strategic planning horizons. C2 26(b)(i)(1)-(5) <p><i>Assumptions</i></p> <ul style="list-style-type: none"> The preliminary analysis assumes that all Scope 1 and Scope 2 GHG emissions in Mainland China will be subject to carbon pricing. The issuer assumes only Mainland China will be subject to carbon pricing. Other operating locations are not considered due to uncertainty around implications of carbon pricing. C2 26(b)(ii)

Key disclosure areas	Actions by the issuer																																																									
	<p><i>Approach to scenario analysis and findings</i></p> <ul style="list-style-type: none">The issuer uses the expected carbon price of Mainland China from the two selected scenarios under NGFS.The issuer also collects its Scope 1 and Scope 2 GHG emissions in the current reporting year and forecasts future emissions in 2025, 2030 and 2050 under a “Do nothing” strategy, assuming no decarbonisation efforts will be performed. C2 26(b)(ii) <p><u>Do nothing</u></p> <table><tr><th>Source</th><th>Variable</th><th>Unit</th><th>2025</th><th>2030</th><th>2050</th></tr><tr><td colspan="6">Current Policies scenario</td></tr><tr><td>NGFS</td><td>Carbon price</td><td>US\$/tCO₂</td><td>-</td><td>-</td><td>4.45</td></tr><tr><td>Company data</td><td>Scope 1 & 2 GHG emissions</td><td>Tonnes</td><td>100</td><td>120</td><td>140</td></tr><tr><td colspan="6">Net Zero 2050 scenario</td></tr><tr><td>NGFS</td><td>Carbon price</td><td>US\$/tCO₂</td><td>80.55</td><td>115.48</td><td>626.03</td></tr><tr><td>Company data</td><td>Scope 1 & 2 GHG emissions</td><td>Tonnes</td><td>100</td><td>120</td><td>140</td></tr></table> <ul style="list-style-type: none">The issuer then quantifies the potential impact of carbon pricing based on the below calculation: Potential carbon cost (US\$) = Carbon price (US\$/tCO₂) x Scope 1 & 2 emissions (tonnes) <table><tr><th>Variable</th><th>Unit</th><th>2025</th><th>2030</th><th>2050</th></tr><tr><td>Current Policies scenario</td><td>US\$</td><td>-</td><td>-</td><td>623</td></tr><tr><td>Net Zero 2050 scenario</td><td>US\$</td><td>8,055</td><td>13,858</td><td>87,644</td></tr></table> <ul style="list-style-type: none">Based on the analysis, all of the issuer’s vehicles will be vulnerable to the risk of carbon pricing. However, it is estimated that under a Net Zero 2050 scenario, carbon costs will be significantly higher than the Current Policies scenario due to more stringent climate policies coming into place. C2 30To minimise its impacts from carbon pricing, the issuer analyses the use of a “Gradual transition” strategy, where it assumes 100% of its fleet to be renewable, which results in lower levels of emissions as compared to a “Do nothing” strategy. C2 26(b)(ii)	Source	Variable	Unit	2025	2030	2050	Current Policies scenario						NGFS	Carbon price	US\$/tCO ₂	-	-	4.45	Company data	Scope 1 & 2 GHG emissions	Tonnes	100	120	140	Net Zero 2050 scenario						NGFS	Carbon price	US\$/tCO ₂	80.55	115.48	626.03	Company data	Scope 1 & 2 GHG emissions	Tonnes	100	120	140	Variable	Unit	2025	2030	2050	Current Policies scenario	US\$	-	-	623	Net Zero 2050 scenario	US\$	8,055	13,858	87,644
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	<p>Gradual transition</p> <table><tr><th>Source</th><th>Variable</th><th>Unit</th><th>2025</th><th>2030</th><th>2050</th></tr><tr><td colspan="6">Current Policies scenario</td></tr><tr><td>NGFS</td><td>Carbon price</td><td>US\$/tCO₂</td><td>-</td><td>-</td><td>4.45</td></tr><tr><td>Company data</td><td>Scope 1 & 2 GHG emissions</td><td>Tonnes</td><td>100</td><td>40</td><td>20</td></tr><tr><td colspan="6">Net Zero 2050 scenario</td></tr><tr><td>NGFS</td><td>Carbon price</td><td>US\$/tCO₂</td><td>80.55</td><td>115.48</td><td>626.03</td></tr><tr><td>Company data</td><td>Scope 1 & 2 GHG emissions</td><td>Tonnes</td><td>100</td><td>40</td><td>20</td></tr></table> <ul style="list-style-type: none">The issuer then quantifies the potential impact of carbon pricing based on the below calculation: Potential carbon cost (US\$) = Carbon price (US\$/tCO₂) x Scope 1 & 2 emissions (tonnes)<table><tr><th>Variable</th><th>Unit</th><th>2025</th><th>2030</th><th>2050</th></tr><tr><td>Current Policies scenario</td><td>US\$</td><td>-</td><td>-</td><td>89</td></tr><tr><td>Net Zero 2050 scenario</td><td>US\$</td><td>8,055</td><td>4,619</td><td>12,521</td></tr></table>Under a “Gradual transition” strategy, the issuer expects the potential carbon cost to be significantly lower than under the “Do nothing” strategy.	Source	Variable	Unit	2025	2030	2050	Current Policies scenario						NGFS	Carbon price	US\$/tCO ₂	-	-	4.45	Company data	Scope 1 & 2 GHG emissions	Tonnes	100	40	20	Net Zero 2050 scenario						NGFS	Carbon price	US\$/tCO ₂	80.55	115.48	626.03	Company data	Scope 1 & 2 GHG emissions	Tonnes	100	40	20	Variable	Unit	2025	2030	2050	Current Policies scenario	US\$	-	-	89	Net Zero 2050 scenario	US\$	8,055	4,619	12,521
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Net Zero 2050 scenario	US\$	8,055	4,619	12,521																																																						
Strategy and decision-making	<p>As a result of the scenario analysis, the issuer understands that all of its vehicles are vulnerable to carbon pricing, especially under the Net Zero 2050 scenario.</p> <p>To minimise exposure from a potential increase in operational expenses from carbon pricing, the issuer decides to replace its ICE fleet with EVs and plans to move to 100% EV by 2050. Through the replacement of ICE fleet, the issuer expects a reduction in carbon emissions. C2 22(a)(i)-(ii)</p> <p>The issuer does not currently have a climate-related transition plan in place. However, to monitor progress in replacing its ICE fleet, the issuer has set a climate-related target, “to reach 70% electric vehicles of its total fleet by 2030, and 100% electric vehicles of its fleet by 2050”. The issuer plans to set up a separate workforce to monitor its progress and report its progress on an annual basis to its stakeholders. C2 22(a)(iii)-(iv)</p>																																																									
	<p>During the year, the issuer has replaced 20% of its ICE fleet with EVs, resulting in an increase of capital expenditure by HKD3 million and decrease in its ICE fleet’s carrying amount. C2 24</p> <p>As the issuer has plans to move to 100% EV fleet, it expects to incur increased capital expenditure and EV’s carrying amount to replace the remaining 80% of its ICE fleet in the next 3 years. However, the issuer anticipates the replacement by EV to reduce operational expenses in the medium to long term by ~20% due to EV’s lower electricity cost compared to ICE fleet’s gas cost, as well as the lower maintenance cost associated. The issuer expects to finance its current plans through external borrowing and internal cash. C2 25, 33</p>																																																									

3 Manufacturing company

The issuer is a manufacturing company of packaging materials with plants in Guangdong province in Mainland China. With the increased spotlight on climate change such as China's '30-60' carbon neutrality targets⁸⁵, the issuer is observing a shift in consumer preferences whereby reusable or recyclable materials are increasingly preferred over single-use plastics. The issuer identifies the shift in consumer preference, a climate-related transition risk, as its relevant climate-related risk. The following table sets out the issuer's assessment process for this risk.

Key disclosure areas	Actions by the issuer
Climate-related risks and opportunities and business model and value chain	<p>The issuer expects a gradual consumer shift from single-use plastic to reusable or recyclable materials to impact its business, accelerating the need to upgrade its production lines to accommodate a change from single-use packaging materials to more sustainable packaging materials. C2 20(a)-(b)</p> <p>As the issuer anticipates the shift to realise in the next 5 years, its business in Mainland China will be impacted more significantly over the short term (i.e. 2025), as compared to medium and long term (i.e. 2030 and 2050). The time horizon was selected to align with the issuer's five-year strategic planning. C2 20(d), 21</p>
Climate resilience	<p>As part of its 2030 strategy, the issuer already has plans to set aside budget to upgrade 20% of its production lines that are manufacturing single-use plastics. However, the shift in consumer preference may come about faster than expected. The issuer highlights uncertainty around the exact time period when the impact will realise, as this may affect its production line upgrade plan. C2 26(a), 30</p> <p>To understand the potential financial effects from the shift in consumer preference, the issuer conducts a scenario analysis. C2 26(b)(iii)</p> <p><i>Inputs for analysis</i></p> <ul style="list-style-type: none"> All of the issuer's production lines in Mainland China are included for analysis. C2 26(b)(i)(7) The selected time horizons for analysis are 2025, 2030 and 2050. C2 26(b)(i)(6) The issuer identifies cost to upgrade its production lines and speed of shift in consumer preference as the key inputs to assess the potential impacts. The issuer expects only ~20% of its production lines to be impacted. C2 26(b)(ii) <p><i>Scenarios selection</i></p> <ul style="list-style-type: none"> As the issuer is unable to obtain strong evidence or sources to support its analysis, it has developed in-house scenarios including a 1.5°C scenario (in line with the Paris Agreement) and a 3°C scenario to conduct qualitative scenario analysis to assess the climate resilience. These are high contrasting scenarios, representing optimistic and pessimistic scenarios respectively. C2 26(b)(1)-(5)

85 National Development and Reform Commission (2021) [China maps path to carbon peak, neutrality under new development philosophy](#).

Key disclosure areas	Actions by the issuer
Climate resilience	<p><i>Approach to scenario analysis and findings</i></p> <ul style="list-style-type: none"> Under a 1.5°C scenario, the issuer expects the shift in consumer preference away from single-use plastics will be rapid and the impacts to realise from 2025. As a result, the issuer has to upgrade its production lines as soon as possible to cater for a change in product packaging. Under the 3°C scenario, the issuer does not foresee any shifts in consumer preference and expects to continue operating the production lines business as usual. The issuer then quantifies the potential costs associated with the shift in consumer preference. Under the 1.5°C scenario, the issuer expects some degree of capital expenditure associated with upgrading its production lines. On the other hand, under the 3°C scenario, no material financial effect is expected. <p><i>Assumptions</i></p> <ul style="list-style-type: none"> The issuer assumes the impact from shift in consumer preference to only realise from 2025 onwards. The issuer assumes no regulations related to the banning of single-use plastics will be introduced. C2 26(b)(ii)
Strategy and decision-making	<p>The issuer is investing in an upgrade of its production lines to increase climate resilience, prioritising those that use single-use plastics. It also plans to source new machinery in the medium to long term to cater for the changing consumer demand through external borrowing. C2 22(a)(i)-(ii)</p> <p>The issuer has yet to develop a transition plan or set a climate-related target to monitor its progress in upgrading its production lines. However, it plans to formulate a plan and disclose its relevant target by 2025. C2 22(a)(iii)-(iv), (b)</p>
Financial position, financial performance and cash flows	<p>Foreseeing the shift in consumer preference, the issuer has already upgraded some of its production lines and recorded an increase in HKD400,000 in its current capital expenditure. It also recorded an increase in the production lines' carrying amount after the upgrades. C2 24</p> <p>The issuer plans to source new machinery post-2030 after most of its machinery are retired to cater for the change in product packaging in its production lines. It anticipates an increase in capital expenditure by HKD2 million in the medium to long term, and plans to fund the investment through external borrowing. C2 25,33</p>

Appendix 3: Overview of tools and application to climate-related risks⁸⁶

Tool	Description	Application	Process		
			Risk Identifi-cation	Risk Assess-ment	Risk Manage-ment
Scenario Analysis	A process for identifying and assessing potential implications of a range of plausible future states under conditions of uncertainty	Explore and develop an understanding of how climate-related risks and opportunities might plausibly impact a company over time	√	√	√
Probabilistic Modelling – Catastrophe Models	Probabilistic models based on deep understanding of the physical parameters that define a natural hazard (e.g. wind speeds) and characteristics of the exposures (e.g. location)	Estimate potential losses from natural catastrophes	√	√	√
Stakeholder Engagement	A means of obtaining input for decision making from those parties who may be affected by the decision or have knowledge that may inform the decision	Seek insight from a range of internal and external stakeholders (e.g. management executives, suppliers) who can provide feedback on changing conditions and potential impacts associated with climate-related risks	√	√	
Hazard Maps	Location-level information on the extent or severity of perils using assumptions on the frequency, severity, and location parameters of primary events and dependencies with secondary perils	Present peril event scenarios based on current and potential future states considering the impact from climate change, which will result in different frequency and severity of events affecting certain locations	√	√	
Delphi Method	Structured communication method for eliciting information and opinions from experts	Conduct interviews or collect expert input from business leaders, actuaries, insurers, meteorologists, oceanographers, climate, and atmospheric scientists	√	√	

⁸⁶ Adapted from TCFD (2020) [Guidance on Risk Management Integration and Disclosure](#) p.43-44 (Table A3-1).

Tool	Description	Application	Process		
			Risk Identifi- cation	Risk Assess- ment	Risk Manage- ment
Economic Scenario Generator	Models that simulate possible future states of economies and financial markets based on risk factors to identify unexpected but plausible outcomes	Test valuation models under a broad range of possible economic and financial conditions (e.g. considering climate change and socioeconomic factors)	√	√	
Horizon Scanning	Systematic and proactive approach to risk identification based on available information	Identify various climate-related risk types across different spatial and temporal scales	√		
Forecasting	An approach for predicting the impact of a future event based on past and present data	Use historical data and lookback studies to understand previous climate-related impacts to inform estimates of potential future impacts, changing key parameters (e.g. frequency, duration, intensity) within plausible ranges		√	
Probabilistic Modelling - General	Systems modelling that involves probabilistic inputs, processes, and outputs	Numerical weather and climate predictions that allow a representation of uncertainties, a reduction of systematic biases, and improved representation of long term climate variability		√	
Sensitivity Analysis	Statistical analysis that examines the change in a desired output relative to a change in input parameters	Analyse a company's sensitivity to changing climate-related conditions (e.g. carbon or commodity prices or demand)		√	
Simulation	Use of models to imitate a situation many times in order to estimate the likelihood of various possible outcomes (e.g. Monte Carlo method)	Assess the likelihood or propensity of different climate-related scenario pathways accommodating multiple variables and parameters		√	

Appendix 4: Illustrative list of emission factors and sources

List of emission factors and sources ⁸⁷	Issuer	Region coverage	Example of data available ⁸⁸
<u>AR6 WGI Report Chapter 7 [7.SM.6 Tables of Greenhouse Gas Lifetimes, Radiative Efficiencies and Metrics]</u>	The Intergovernmental Panel on Climate Change (“IPCC”)	Global	<ul style="list-style-type: none"> GWP of various GHGs (e.g. CH₄, HFCs, PFCs) based on a 100-year time horizon
<u>GHG Protocol Emission Factors from Cross-Sector Tools</u>	GHG Protocol	Global	<ul style="list-style-type: none"> Emission factors of fuel used in stationary and mobile combustion (e.g. natural gas, gasoline, LPG)
<u>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</u> ⁸⁹ <u>2006 IPCC Guidelines for National Greenhouse Gas Inventories</u>	The Intergovernmental Panel on Climate Change (“IPCC”)	Global	<ul style="list-style-type: none"> Emission factors of fuel used in stationary and mobile combustion (e.g. natural gas, gasoline, LPG) Emission factors of domestic and industrial wastewater treatment (e.g. amount of CH₄ emitted from 1kg of BOD and 1kg of COD)
<u>Notice on Enhancing 2023-2025 Greenhouse Gas Emissions Reporting and Management of Power Generation Enterprises</u>	Ministry of Ecology and Environment (“MEE”)	Mainland China	<ul style="list-style-type: none"> Average emission factor of purchased electricity in China
<u>Regional Power Grid Baseline Emissions Factors of China for Emissions Reduction Projects in 2019</u>	Ministry of Ecology and Environment (“MEE”)	Mainland China	<ul style="list-style-type: none"> Emission factors of purchased electricity in China by region (e.g. Southern China, Northern China, Eastern China)
<u>Guidelines for Accounting Methods and Reporting of GHG Emissions for Land Transportation</u>	National Development and Reform Commission (“NDRC”)	Mainland China	<ul style="list-style-type: none"> Emission factors of fuel used in mobile combustion (e.g. natural gas, gasoline, diesel oil)
<u>EPA Emission Factors Hub – Emission Factors for Greenhouse Gas Inventories</u>	U.S. Environmental Protection Agency, Washington, DC, USA	United States	<ul style="list-style-type: none"> Emission factors of fuel used in stationary and mobile combustion (e.g. natural gas, gasoline, LPG) Emission factors of purchased electricity, steam and heat Emission factors for calculating Scope 3 category emissions (e.g. emission factors for transportation and distribution, waste generated, business travel)

⁸⁷ As these tools and sources are updated on a regular basis, issuers should access the relevant websites to refer to the latest versions when calculating their GHG emissions.

⁸⁸ Examples identified are for reference purposes only, and are not intended to be exhaustive.

⁸⁹ Guidelines published by the IPCC in 2006. Issuers should also refer to IPCC’s 2019 refinement to understand the updates, supplements and/or elaborations of the 2006 IPCC Guidelines where gaps or out-of-date science have been identified.

List of emission factors and sources ⁸⁴	Issuer	Region coverage	Example of data available ⁸⁵
<u>Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions</u>	UK Department for Business, Energy & Industrial Strategy and UK Department for Environment, Food & Rural Affairs	United Kingdom	<ul style="list-style-type: none"> Emission factors of fuel used in stationary and mobile combustion (e.g. natural gas, gasoline, LPG) Emission factors for calculating Scope 3 category emissions using activity-based method (e.g. emission factors for transportation and distribution, waste generated, business travel)
<u>UK Full Dataset 1990-2020, including conversion factors by SIC code</u>	UK Department for Environment, Food & Rural Affairs	United Kingdom	<ul style="list-style-type: none"> Emission factors for calculating Scope 3 category emissions using spend-based method (e.g. emission factors for transportation and distribution, waste generated, business travel)
<u>Measuring emissions: A guide for organisations: 2022 Summary of Emission Factors</u>	New Zealand Ministry for the Environment ("MfE")	New Zealand	<ul style="list-style-type: none"> Emission factors of fuel used in stationary and mobile combustion (e.g. natural gas, gasoline, LPG) Emission factors of purchased electricity, steam and heat

Appendix 5: Useful standards and guidance from the GHG Protocol

Name	Description
Standards	
<u>The GHG Protocol Corporate Accounting and Reporting Standard (2004)</u>	<ul style="list-style-type: none"> Provides requirements and guidance for companies and other organisations preparing a corporate-level GHG emissions inventory
<u>Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)</u>	<ul style="list-style-type: none"> Provides a methodology that can be used to account for and report emissions from companies of all sectors, globally
Guidance	
<u>GHG Protocol Scope 2 Guidance (2015)</u>	<ul style="list-style-type: none"> Standardises how corporations measure emissions from purchased or acquired electricity, steam, heat and cooling (i.e. Scope 2 GHG emissions)
<u>Technical Guidance for Calculating Scope 3 Emissions (2013)</u>	<ul style="list-style-type: none"> Provides information not contained in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard, such as: <ul style="list-style-type: none"> Methods for calculating GHG emissions for each of the 15 categories of Scope 3 emissions (such as purchased goods and services, transportation and distribution, and use of sold products); Guidance on selecting the appropriate calculation methods; and Examples to demonstrate each calculation method.



Glossary

Glossary

Glossary	Definition
Business model	An entity's system of transforming inputs through its activities into outputs and outcomes that aims to fulfil the entity's strategic purposes and create value for the entity and hence generate cash flows over the short, medium and long term.
Carbon credit	An emissions unit that is issued by a carbon crediting programme and represents an emission reduction or removal of greenhouse gases. Carbon credits are uniquely serialised, issued, tracked and cancelled by means of an electronic registry.
Climate-related physical risks	<p>Risks resulting from climate change that can be event-driven (acute physical risk) or from longer-term shifts in climatic patterns (chronic physical risk). Acute physical risks arise from weather-related events such as storms, floods, drought or heatwaves, which are increasing in severity and frequency. Chronic physical risks arise from longer-term shifts in climatic patterns including changes in precipitation and temperature which could lead to sea level rise, reduced water availability, biodiversity loss and changes in soil productivity.</p> <p>These risks could carry financial implications for an entity, such as costs resulting from direct damage to assets or indirect effects of supply-chain disruption. The entity's financial performance could also be affected by changes in water availability, sourcing and quality; and extreme temperature changes affecting the entity's premises, operations, supply chains, transportation needs and employee health and safety.</p>
Climate-related risks and opportunities	<p>Climate-related risks refers to the potential negative effects of climate change on an entity. These risks are categorised as climate-related physical risks and climate-related transition risks.</p> <p>Climate-related opportunities refers to the potential positive effects arising from climate change for an entity. Efforts to mitigate and adapt to climate change can produce climate-related opportunities for an entity.</p>
Climate resilience	The capacity of an entity to adjust to climate-related changes, developments or uncertainties. Climate resilience involves the capacity to manage climate-related risks and benefit from climate-related opportunities, including the ability to respond and adapt to climate-related transition risks and climate-related physical risks. An entity's climate resilience includes both its strategic resilience and its operational resilience to climate-related changes, developments and uncertainties.
Climate-related transition plan	An aspect of an entity's overall strategy that lays out the entity's targets, actions or resources for its transition towards a lower-carbon economy, including actions such as reducing its greenhouse gas emissions.
Climate-related transition risks	Risks that arise from efforts to transition to a lower-carbon economy. Transition risks include policy, legal, technological, market and reputational risks. These risks could carry financial implications for an entity, such as increased operating costs or asset impairment due to new or amended climate-related regulations. The entity's financial performance could also be affected by shifting consumer demands and the development and deployment of new technology.

Glossary	Definition
CO ₂ equivalent	The universal unit of measurement to indicate the global warming potential of each greenhouse gas, expressed in terms of the global warming potential of one unit of carbon dioxide. This unit is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.
Disclosure topic	A specific sustainability-related risk or opportunity based on the activities conducted by entities within a particular industry as set out in an IFRS Sustainability Disclosure Standard or a SASB Standard.
Financed emissions	The portion of gross greenhouse gas emissions of an investee or counterparty attributed to the loans and investments made by an entity to the investee or counterparty. These emissions are part of Scope 3 Category 15 (investments) as defined in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).
General purpose financial reporting	<p>Reports that provide financial information about a reporting entity that is useful to primary users in making decisions relating to providing resources to the entity. Those decisions involve decisions about:</p> <ul style="list-style-type: none"> (a) buying, selling or holding equity and debt instruments; (b) providing or selling loans and other forms of credit; or (c) exercising rights to vote on, or otherwise influence, the entity's management's actions that affect the use of the entity's economic resources. <p>General purpose financial reports include—but are not restricted to—an entity's general purpose financial statements and sustainability-related financial disclosures.</p>
Global warming potential	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given greenhouse gas relative to one unit of CO ₂ .
Greenhouse gases	The seven greenhouse gases listed in the Kyoto Protocol—carbon dioxide (CO ₂); methane (CH ₄); nitrous oxide (N ₂ O); hydrofluorocarbons (HFCs); nitrogen trifluoride (NF ₃); perfluorocarbons (PFCs); and sulphur hexafluoride (SF ₆).
Indirect greenhouse gas emissions	Emissions that are a consequence of the activities of an entity, but occur at sources owned or controlled by another entity.

Glossary	Definition
Internal carbon price	<p>Price used by an entity to assess the financial implications of changes to investment, production and consumption patterns, and of potential technological progress and future emissions abatement costs. An entity can use internal carbon prices for a range of business applications. Two types of internal carbon prices that an entity commonly uses are:</p> <ul style="list-style-type: none"> (a) a shadow price, which is a theoretical cost or national amount that the entity does not charge but that can be used to understand the economic implications or trade-offs for such things as risk impacts, new investments, the net present value of projects, and the cost and benefit of various initiatives; and (b) an internal tax or fee, which is a carbon price charged to a business activity, product line, or other business unit based on its greenhouse gas emissions (these internal taxes or fees are similar to intracompany transfer pricing).
Impracticable	Applying a requirement is impracticable when an entity cannot apply it after making every reasonable effort to do so.
Latest international agreement on climate change	An agreement by states, as members of the United Nations Framework Convention on Climate Change, to combat climate change. The agreements set norms and targets for a reduction in greenhouse gases.
Primary users of general purpose financial reports (primary users)	Existing and potential investors, lenders and other creditors.
Scope 1 greenhouse gas emissions	Direct greenhouse gas emissions that occur from sources that are owned or controlled by an entity.
Scope 2 greenhouse gas emissions	<p>Indirect greenhouse gas emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by an entity.</p> <p>Purchased and acquired electricity is electricity that is purchased or otherwise brought into an entity's boundary. Scope 2 greenhouse gas emissions physically occur at the facility where electricity is generated.</p>
Scope 3 greenhouse gas emissions	Indirect greenhouse gas emissions (not included in Scope 2 greenhouse gas emissions) that occur in the value chain of an entity, including both upstream and downstream emissions. Scope 3 greenhouse gas emissions include the Scope 3 categories in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).

Glossary	Definition
Scope 3 categories	<p>Scope 3 greenhouse gas emissions are categorised into these 15 categories—as described in the Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011):</p> <ol style="list-style-type: none"> 1. purchased goods and services; 2. capital goods; 3. fuel- and energy-related activities not included in Scope 1 greenhouse gas emissions or Scope 2 greenhouse gas emissions; 4. upstream transportation and distribution; 5. waste generated in operations; 6. business travel; 7. employee commuting; 8. upstream leased assets; 9. downstream transportation and distribution; 10. processing of sold products; 11. use of sold products; 12. end-of-life treatment of sold products; 13. downstream leased assets; 14. franchises; and 15. investments.
Value chain	<p>The full range of interactions, resources and relationships related to a reporting entity's business model and the external environment in which it operates.</p> <p>A value chain encompasses the interactions, resources and relationships an entity uses and depends on to create its products or services from conception to delivery, consumption and end-of-life, including interactions, resources and relationships in the entity's operations, such as human resources; those along its supply, marketing and distribution channels, such as materials and service sourcing and product and service sale and delivery; and the financing, geographical, geopolitical and regulatory environments in which the entity operates.</p>

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