

Climate-related *financial impact guide*

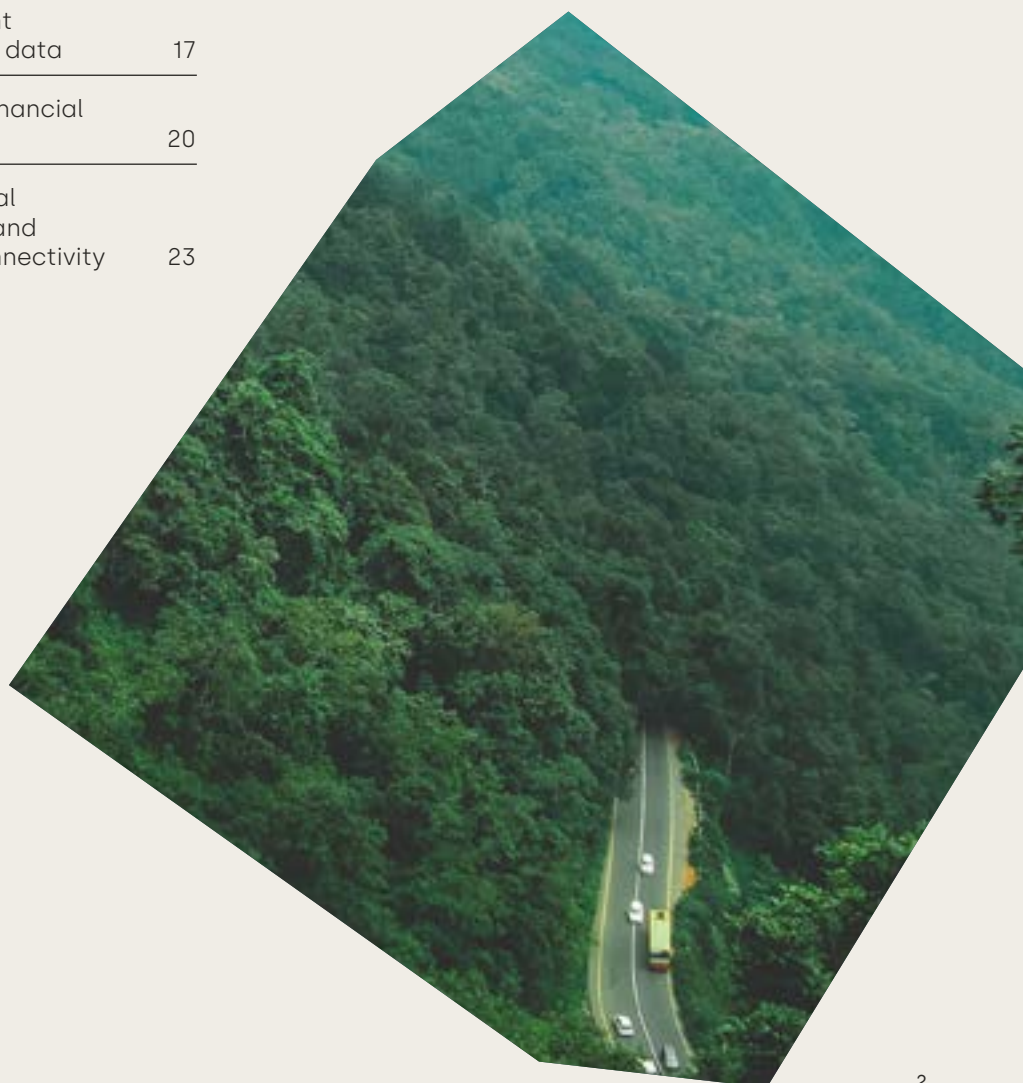
→ Supporting business assessment
and disclosure



World Business
Council
for Sustainable
Development

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Executive *Summary*



Executive summary

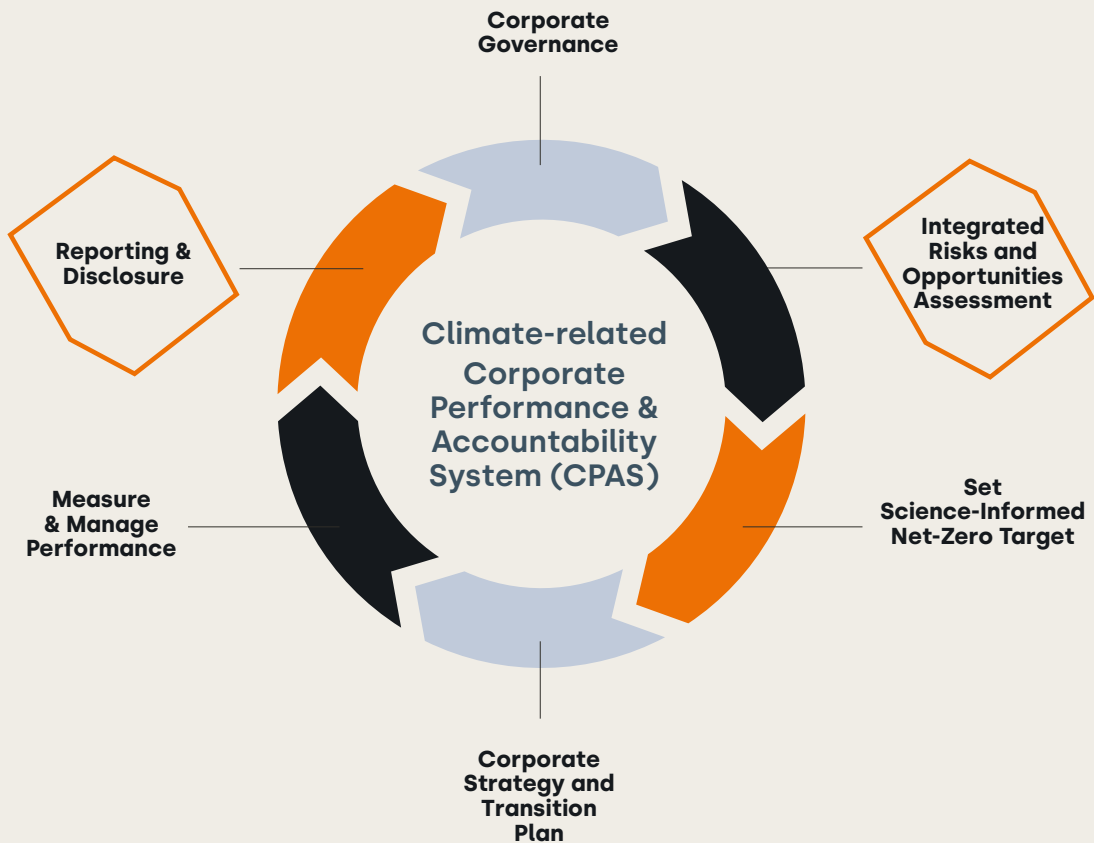
The climate crisis is rapidly changing the way that societies live and work, with people and organizations worldwide feeling the effects. As the effects of climate change and the implications of the net-zero transition become more pronounced, it is critical that businesses disclose associated impacts. **Companies and investors need high-quality, transparent and comprehensive information on the financial impacts of climate-related risks and opportunities.** To do this they need to assess the material **upsides such as increased revenue, positive returns on investments from climate solutions and downsides like increased costs, reduced production and lower asset value.**

The World Business Council for Sustainable Development's (WBCSD) "[CEO Guide to the Climate-related Corporate Performance and Accountability System \(CPAS\)](#)," emphasizes the importance of integrating climate considerations into every aspect of strategic and performance management processes. This ensures that businesses provide well-managed, consistent, and comparable data to financial markets and

stakeholders, aligning valuation and capital allocation models with scalable solutions, and meeting the rising demand for corporate performance and accountability on climate action.

The 2023 Taskforce on Climate-related Financial Disclosure (TCFD) Status Report highlights the user need and ask, with insights from a survey stating that over 70% of users found that a company's disclosure of the impact of climate-related matters on its financial position (73%) and financial performance (75%) is very useful, second only to GHG emissions.¹ In doing so, companies and investors will be better positioned to **understand the potential financial implications associated with climate-related risks and opportunities and the information available will become increasingly more decision-useful.** Such information supports more accurate pricing by investors. Additionally, it can provide an opportunity to attract better cost of capital by demonstrating climate-related opportunities and the resilience of the company.

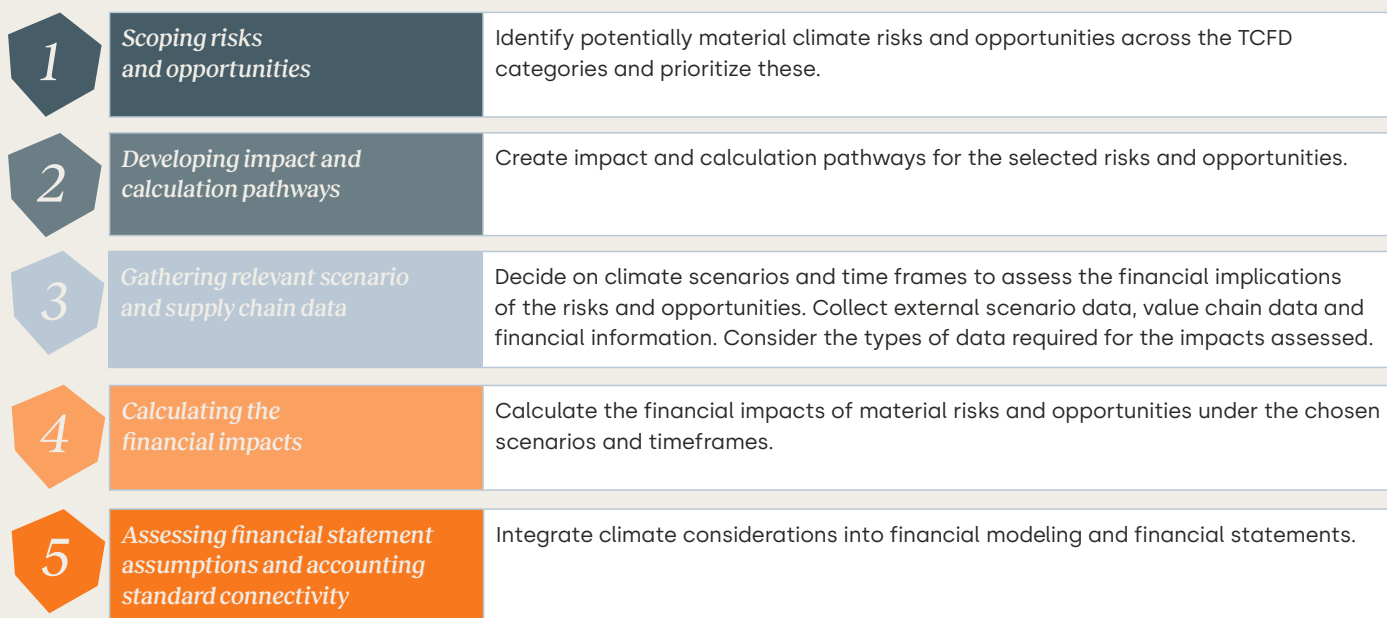
Figure 1: Climate-related Corporate Performance & Accountability System (CPAS)



WBCSD has developed this climate-related financial impact guide for companies looking to understand and assess the financial implications of climate change in the context of evolving reporting requirements. This supports CPAS actions on integrated risk and opportunities assessment and reporting and disclosure, specifically addressing financial impact assessment, scenario use, financial metrics, financial statement assumptions, reporting standards and valuation.

Considering financial impacts – and climate-related financial impacts specifically – is hard. We conducted research for this report to identify climate-related financial impact challenges and opportunities raised by companies. This report provides a step-by-step guide to how companies might better reflect climate-related financial analysis and new sustainability reporting requirements and considerations of how they can use that information to inform financial reporting.

Figure 2: Five steps for climate-related financial impact assessment and reporting



Introduction



01.

01. Introduction

Climate change impacts many businesses in almost all industries, presenting both challenges and opportunities depending on the course of climate change and the mitigation actions taken. In 2022, the United Kingdom's Environment Agency fined more than 30 companies for the breaching of climate change schemes that are in place to help the country meet 2050 net-zero emissions targets.² In contrast, in the next 20 years, the International Airlines Group (IAG) will invest USD \$400 million in sustainable aviation fuel development,³ while Mercedes has stated that by 2026, the company will have invested over USD \$60 billion in the "transformation to achieve a fully electric and software-driven mobility".⁴ **The reality is that climate change is having a financial impact today and companies need to act now.**

Given the potential magnitude of impact and uncertainty surrounding climate-related risks and opportunities, **companies are under pressure to share how they are assessing the scale of risk and opportunity for their business and how it could affect financial performance.** In improving disclosures, critical information will be available for boards, management, investors and stakeholders, informing strategy development and financial planning. **It also enables the effective pricing of climate-related risks and opportunities and can inform efficient allocation of capital.** Further, large investor coalitions such as the Principles for Responsible Investment (PRI), the Institutional Investors Group on Climate Change (IIGCC) and Climate Action 100+ are calling for companies to enhance their disclosures of climate-related risks.

A number of countries and regions, including the G7 and European Union, now have regulations that mandate climate-related disclosures. These regulations primarily align with Task Force on Climate-related Financial Disclosures (TCFD) recommendations. Established in 2015, the Financial Stability Board (FSB) requested the creation of the TCFD to improve transparency on climate-related risk and financial impacts. The TCFD Recommendations have now been incorporated in the International Sustainability Standards Board (ISSB) International Financial Reporting Standards (IFRS) S1 and IFRS S2 and the IFRS Foundation will take over TCFD responsibilities relating to monitoring climate-related disclosure progress. We provide a summary of climate-related financial disclosure requirements in the appendix.



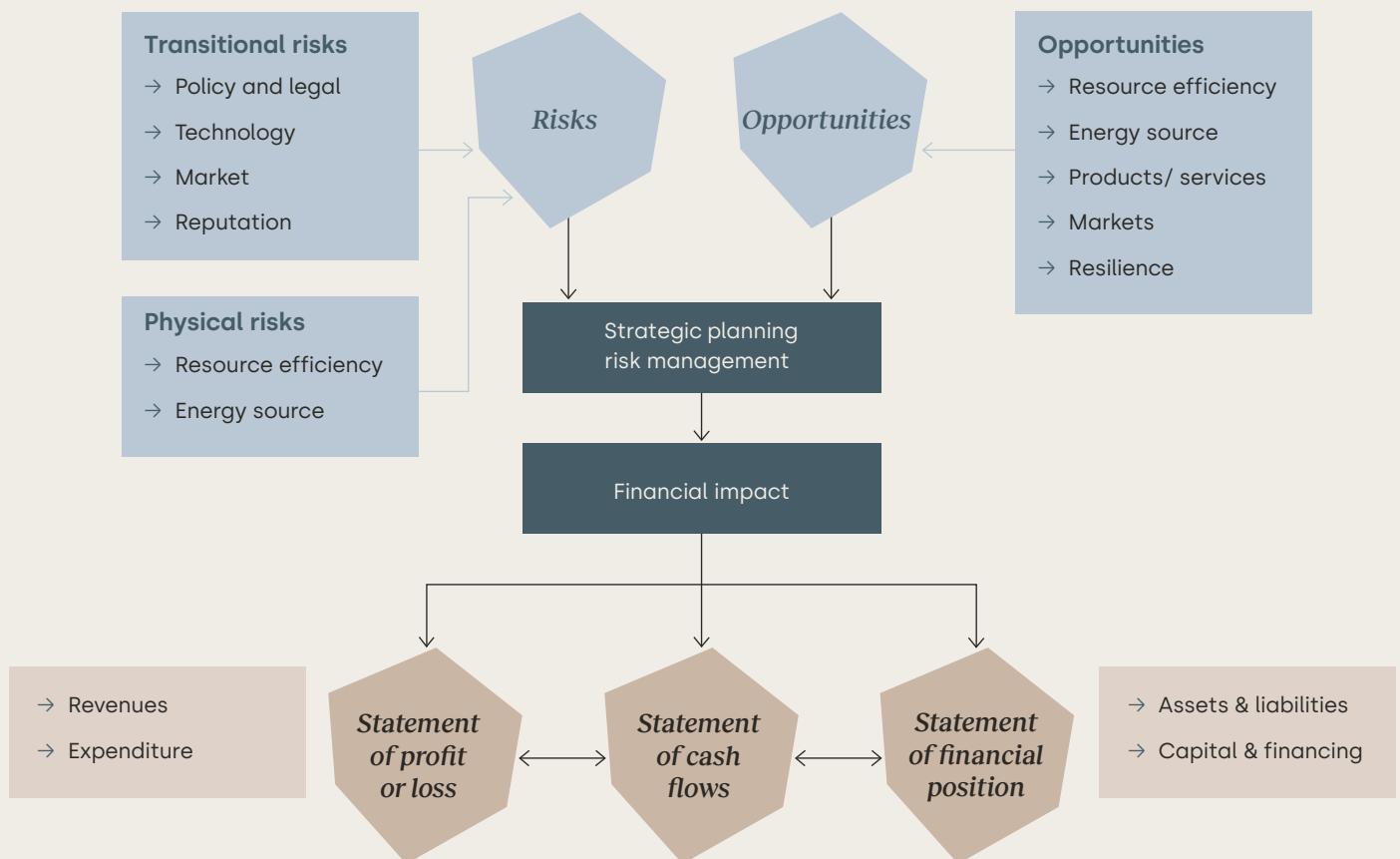
Climate risks and opportunities and financial impacts

The central objective of establishing the TCFD's recommendations was to encourage businesses to evaluate and disclose the material climate-related risks and opportunities that are most pertinent to their business activities.⁵ **To understand implications for company value and associated risks, investors require clear and transparent disclosure of climate-related matters so that they can redirect capital flows appropriately.** There is increasing pressure on directors to provide

more insight on climate-related risks and how they have considered them. From company to company, as with other inputs and assumptions on financial forecasts, the relevance and materiality of climate-related risks and opportunities will vary. This therefore requires management to make judgements about the nature of their disclosures.

The TCFD has identified four key categories of financial impact: revenues, expenditures, assets and liabilities, and capital and financing.

Figure 3: Climate-related risks, opportunities and financial impacts⁶



Regulation is driving an increase in the number of companies considering and disclosing the financial impacts of climate change.

Examples include companies subject to nationally mandated TCFD disclosures and the Corporate Sustainability Reporting Directive (CSRD). But a 2021 TCFD survey found that only 14% of companies disclose climate-related impacts on their financial position and 20% on their financial performance.⁷

This guidance is a business case for company action. As financial quantification and financial statement links can prove challenging, we have created this guidance with the aim of assisting practitioners in understanding what actions they can take to respond to this and other climate-related challenges. This report provides:

- A step-by-step guide to approach the quantification of climate risk;
- Guidance on how companies can reflect climate risk in financial statements using theoretical examples and case studies;
- References to other educational materials, such as those by the International Accounting Standards Board (IASB) and ISSB.

It is important to note that this report focuses on financial impacts and does not cover all ISSB requirements, the draft U.S. Securities Exchange Commission (SEC) rule and the EU's CSRD. It does, however, support companies in meeting climate-related financial integration requirements and developing climate-related financial information that can feed into risk management and strategic planning.

WBCSD has worked with leading companies on the application of the TCFD framework in specific sector contexts for many years (e.g. Electric Utilities,⁸ Food, Agriculture & Forest Products,⁹ Autos¹⁰). In 2023 leading international oil and gas companies came together to develop a how-to guide for quantifying and disclosing climate-related financial impacts for the oil and gas sector. This guide will be published in Q1 2024.



Step-by-step guide to climate-related financial analysis and disclosure



02.

02. Step-by-step guide to climate-related financial analysis and disclosure

This section provides a step-by-step guide for companies that are starting the process of assessing the financial impact of climate-related risks. The initial steps help companies **understand their risks and opportunities, develop impact pathways and assess impacts under different climate scenarios**. We have provided considerations and illustrative impact pathways and calculations to support companies as they go through these typical scenario analysis steps while preparing for integration into business financial modeling. The final step helps companies **consider the implications on financial statements**. Companies should consider what is financially relevant now, as well as the implications for line items impacted in the longer term.

Before doing so, each company should be aware of and align with standards, regulations and requirements relevant to its business and industry. Keeping track of the ever-evolving sustainability standards, regulations and requirements can be challenging. In Appendix 1, we summarize some recent updates from IASB, ISSB, SEC, EU CSRD and others.

More advanced companies can use the guidance from the step that fits their current position. We have built the guidance from key areas of TCFD guidance, technical expertise and the input of our member companies at varying stages of maturity in considering the potential climate-related financial impact.^{11, 12, 13}

The process includes five steps, as detailed in Figure 4.



Figure 4: Five steps for climate-related financial impact assessment and reporting

1	Scoping risks and opportunities	Identify potentially material climate risks and opportunities across the TCFD categories and prioritize these.
2	Developing impact and calculation pathways	Create impact and calculation pathways for the selected risks and opportunities.
3	Gathering relevant scenario and supply chain data	Decide on climate scenarios and time frames to assess the financial implications of the risks and opportunities. Collect external scenario data, value chain data and financial information. Consider the types of data required for the impacts assessed.
4	Calculating the financial impacts	Calculate the financial impacts of material risks and opportunities under the chosen scenarios and timeframes.
5	Assessing financial statement assumptions and accounting standard connectivity	Integrate climate considerations into financial modeling and financial statements.

Guidance for financial quantification of climate risks and opportunities, including scenario analysis

It is important to **identify and assess the materiality of the climate-related risks and opportunities** the company is facing to understand what requires integration into the financial statements. Steps 1 to 4 provide quick start guidance for this process. The TCFD provides detailed *Guidance on Scenario Analysis for Non-Financial Companies*.¹⁴ This report additionally highlights some key considerations to support this process.

Step 1: Scoping risks and opportunities

Step 1.1: Map the company's value chain

To understand how climate risks and opportunities can materialize, companies need to consider their full value chain, including: activities and locations of their supply chain, from raw materials to products; their own operations and activities and how climate change and a low-carbon transition could impact them; potential direct impacts on customers and changes to consumer behavior; and mapping what happens to products during use and at end of life.

A particular challenge is transparency in the supply chain. Greater transparency enhances a company's understanding of supply chain tiers and environmental data, including greenhouse gas (GHG) emissions, and provides details such as essential components of a business, physical locations, single points of failure and overall resilience. We recommend that companies record supply chain information in a supplier database as it enables them to determine the climate-related risk levels of each supplier. It will allow the company to identify emissions hotspots and consider the potential impact of replacing carbon-intensive technologies. Having access to this information supports the quantification of a range of climate-related risks and opportunities. A number of tools are emerging across the market designed to support this process, built on the basis of one or more of the capabilities outlined in Figure 5.

Figure 5: Examples of emerging tools designed to support the mapping of supplier networks

<i>Machine learning & artificial intelligence</i>	<i>Blockchain</i>	<i>Data infrastructure</i>	<i>Data collection platforms</i>
Machine learning and artificial intelligence solutions may use existing databases and web results to determine relationships between your suppliers and other businesses and map these for you.	Blockchain is a decentralized ledger that documents the movement of goods between parties. These solutions could document business-to-business transactions to get an asset to your business.	Data infrastructure solutions provide a platform to share data from suppliers directly to your business, allowing you to keep track of stakeholders in your supply chain.	Data collection platforms can request and capture data from suppliers. Your business can develop these solutions in-house or acquire them from an external provider.

Step 1.2: Identify potentially material climate risks and opportunities

Identify all relevant climate-related risks and opportunities across the TCFD categories. This includes considering the company itself, its value chain and all sectors and regions within which it operates. Include an assessment of the timeframe of financial impact in this process. Companies should contextualize these timeframes by the useful economic lives of the assets and infrastructure to which they relate, if relevant.

Step 1.3: Prioritize risks and opportunities

Companies should assess whether the risks and opportunities identified are material, including qualitative impacts and the scale of impact over the short, medium and long term. This will include considerations such as the severity, frequency and timescale of impact, as well as the importance to stakeholders. This process should include input from stakeholders with different roles across the business and will also assess the operational and financial impacts of the risks and opportunities (which companies can show through impact pathways as shown in Step 2). To prioritize risks and opportunities, consider materiality (in terms of both operational and financial impact severity and importance to stakeholders) and the feasibility of calculating a reasonable estimate due to complexity, data availability and assumptions and secondary data that can fill data gaps. The perception of risks and opportunities can vary among stakeholders; getting consensus often takes time. Quantifying the materiality threshold helps. However, these are usually impact- or outcome-driven, meaning it is necessary to run input sensitivity to understand the result for impacts or outcomes. The process itself is iterative, as companies may not know aspects such as data availability without further investigation, and will improve over time.

There are a number of other inputs and tools companies can use when identifying and prioritizing risks and opportunities, such as using hazard maps for key sites, horizon scanning across the TCFD risk and opportunity categories and extracting relevant data from widely used source scenarios such as the International Energy Agency (IEA)¹⁵ or Network for Greening the Financial System (NGFS)¹⁶. The TCFD's *Guidance on Risk Management Integration and Disclosure* provides further detail on the process and on useful tools.¹⁷ It is important to consider the materiality to the financial statements so that the company does not filter out climate-related matters that may be relevant for financial reporting at this stage.

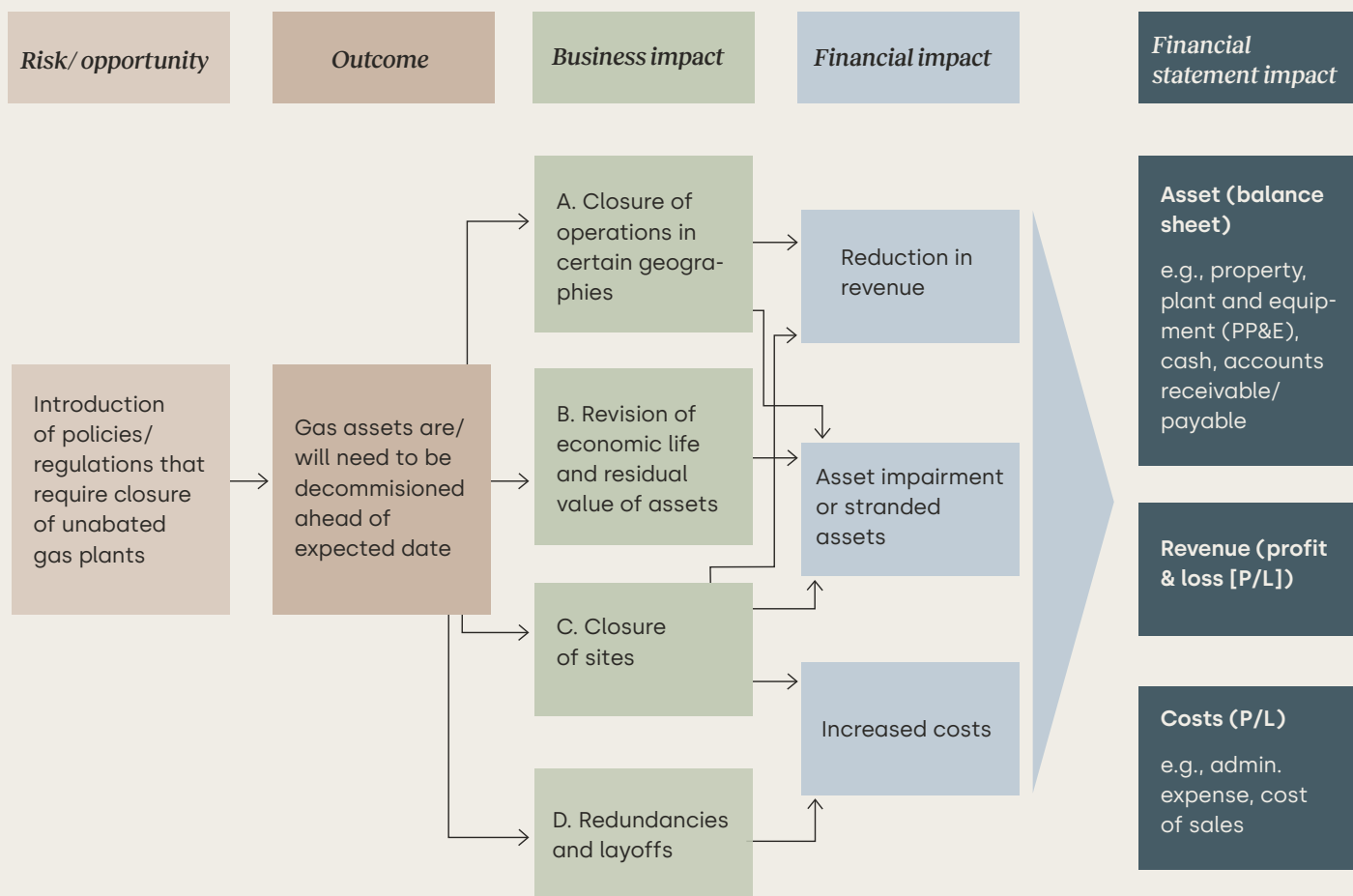
Step 2: Developing impact and calculation pathways

Step 2.1: Create impact pathways for the selected risks and opportunities

An impact pathway is a method of logically **working out the financial impact of identified risks and opportunities through consideration of the implications of the risk or opportunity on the business.** This includes consideration of the socio-economic or physical implications, such as climate change, legislative outcomes or taxation, and the resulting outcomes that might impact the business, such as market changes, new requirements or pricing changes. These outcomes result in business impacts such as new requirements, business disruption, new markets and, ultimately, financial impacts. Businesses should use the impact pathway process to assess the different ways the risk and opportunity could manifest and aid the process of understanding what the financial implications are and which could be material and it should assess. It is important to consider the financial impact in terms of impact on revenues and expenditure, assets and liabilities, capital and financing.



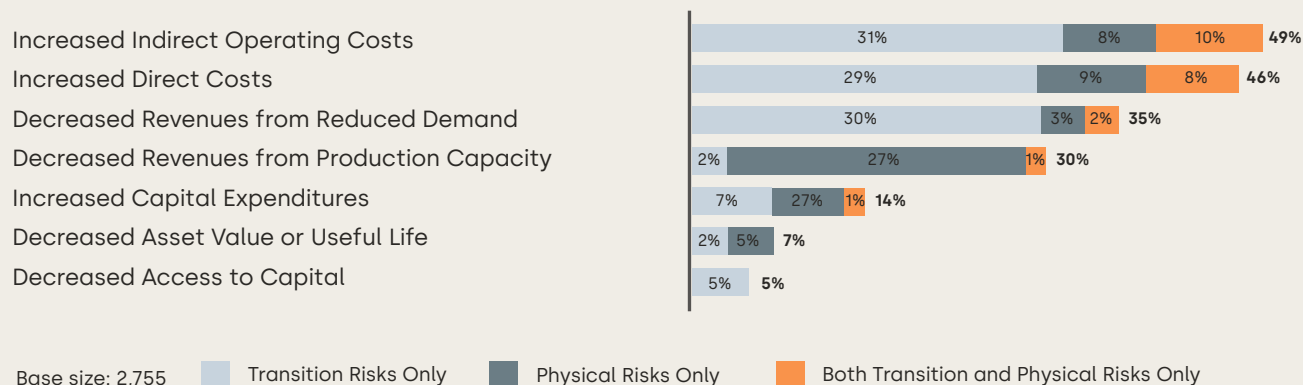
Figure 6: Example impact pathway



The TCFD provides examples of financial impact in Appendix A of its guidance released in October 2021.¹⁸ The current most common types of financial impact and associated drivers are available in the TCFD's final 2023 *Status Report* and in Figure 7.¹⁹

Figure 7: Types of potential financial impact estimated for substantive issues²⁰

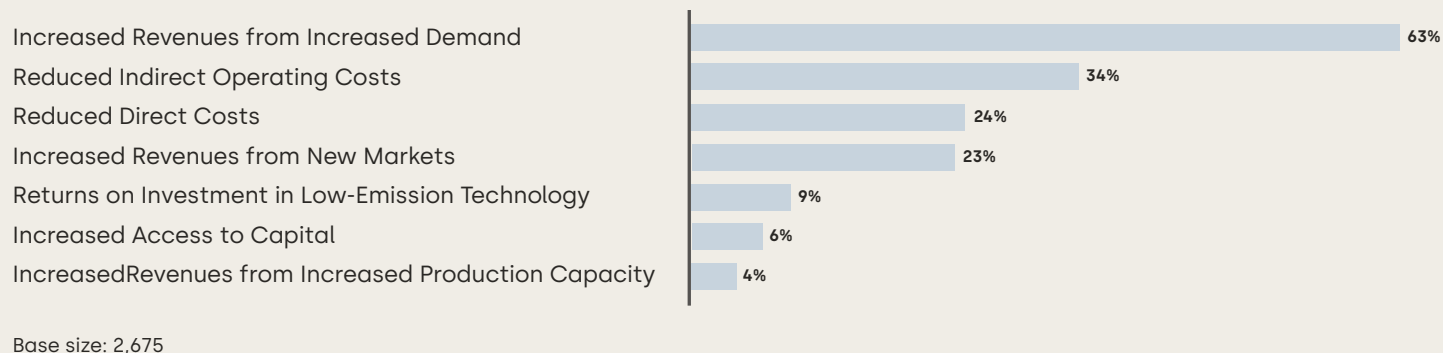
Types of Potential Financial for Substantive Climate-Related Risks*



* Percentages in bold represents the total percent of companies estimating a given type of financial impact.

Source: CDP, Responses to CDP Climate Change 2022 Questionnaire

Types of Potential Financial for Substantive Climate-Related Opportunities



Step 2.2: Create calculation pathways²¹

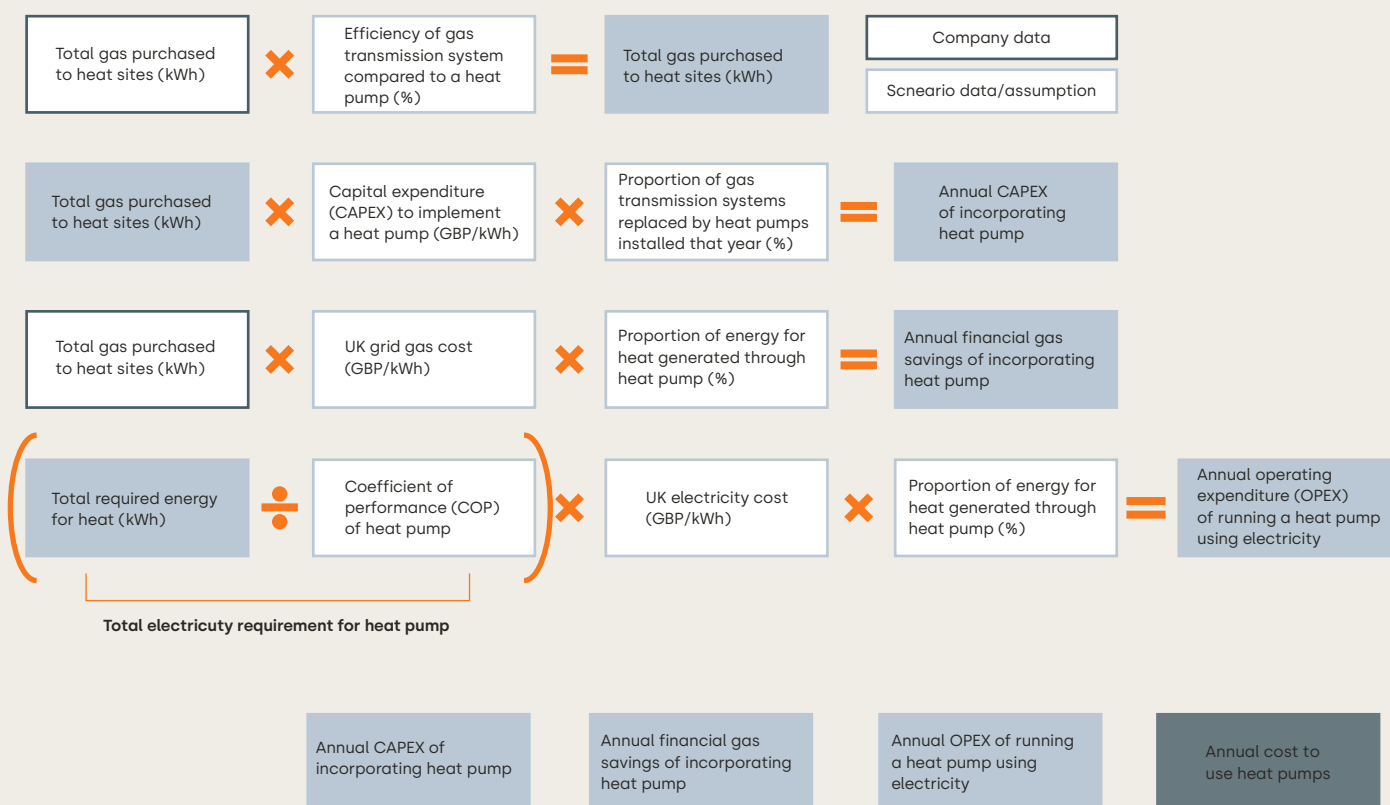
The inputs into the calculation pathway will often be both company-sourced backward-looking data and forward-looking scenarios, as well as assumptions. There are challenges associated with both data elements. The availability of this data may also influence the selection of risks to quantify in the first place. As the future is uncertain, where possible we recommend the consideration of several scenarios such that the company can either present the calculated figures as a range or disclose the sensitivity to changing inputs. This avoids relying on the assumption of one future scenario that may well not materialize.

Any assumptions, judgements and estimates made need to be transparent, reasonable and have buy-in from relevant stakeholders. Ideally, the company will disclose this information, although some scenarios may include commercially sensitive assumptions. Consider the calculation inputs required to assess the gross financial impact assuming the company is taking no action and, if material, the net impact where identified mitigating current and planned actions are in place. Remember that a successful response will likely have a cost implication but also a lessening of the financial impact.

Figure 8: Example calculation pathway

Calculation pathway example

To work out the cost of a heat pump in the UK



This calculation pathway calculates the increased costs associated with the elements of the impact pathway above highlighted with a dark blue border, namely the CAPEX and operating costs associated with the transition from natural gas heating to heat pumps in the UK.

Step 3: Gathering relevant scenario and value chain data

Step 3.1: Collect scenario data

Challenges in finding forward-looking data

Scenario analysis is beneficial in helping companies prepare for future uncertainty by providing a structured exploration of possible future climate states to challenge business models and financial planning and identify risks and opportunities. The nature of scenario analysis means there are no set risks, timeframes, scenarios and data sources for companies to use. Companies often find that identifying appropriate and reliable forward-looking data on a range of climate scenarios is a challenge, particularly given the variety in timeframes, scenarios and sources available. Inherent uncertainties in forward-looking data additionally make it challenging to identify what the “right” source or sources of data should be.

Some companies alleviated this challenge by using external providers to identify the sources of data and conduct scenario analysis. However, this does not solve the issues linked to different scenario forecast data, with limited availability of data for transitioning beyond energy supply and primary demand. It is important to consider that forward-looking data with considerable uncertainty already exists within financial statements. For example, life insurance companies will use projections of both life expectancy and market data for similar time horizons. Hence, Step 3.1 provides guidance to help companies source reliable forward-looking data.

Step 3.1.1: Understanding the purpose and design of scenarios

Before selecting scenarios, companies should understand their purpose and design.²²

A climate scenario defines assumptions, key factors and pathways for a plausible future. Climate scenario models are computer-modeled quantifications of these pathways that analyze multiple variables and interactions between them and project them into the future while remaining within the constraints set by the climate scenario. However, scenario modeling has various considerations and limitations. As such, companies should not simply take climate scenario model outputs “out of the box” and fit them into internal models or disclosures without users first comprehending what is driving the outputs of the quantified scenario. For further details on the intricacies of climate scenarios, please refer to WBCSD’s *Demystifying Climate Transition Scenarios* report.²³



Step 3.1.2: Selecting the appropriate scenarios

Scenario selection suitability will vary by sector, geography and risk or opportunity. **A range of scenarios should be used, wide use of just a few scenarios and pathways could create systemic risk in the market as resilience assessments and long term planning would be too narrowly focused.**

On the other hand, TCFD recommends including a Paris Agreement-aligned scenario – meaning with outcomes designed to keep temperature rise well below 2°C above pre-industrial levels with limited/no overshoot – for TCFD reporting, as without the understanding of how a company will fare in this scenario, investors will be unable to make aligned capital investment decisions to meet their own portfolio net-zero emissions targets.²⁴ WBCSD also explores this in its *Climate Scenario Analysis Reference Approach* publication.²⁵

Companies should follow the following best practices:

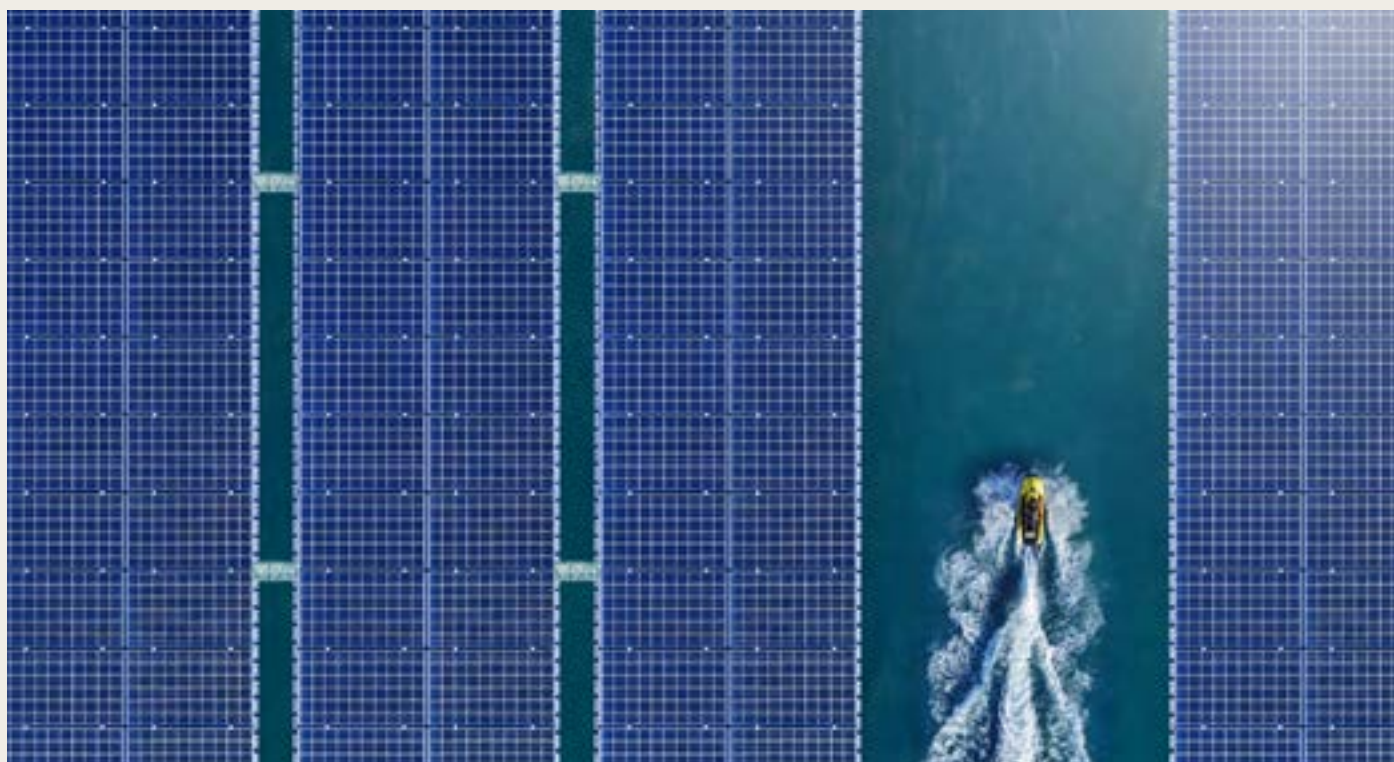
- Select scenarios from credible sources, such as widely used international providers, like the Intergovernmental Panel on Climate Change (IPCC), NGFS or IEA, and national/regional sources.
- Ensure scenarios are relevant to the company and business model.

Example: If a car manufacturing company assesses the cost of lithium in future scenarios, then the scenario selected should include this as a variable.

- Make sure scenarios include what management considers to be probable outcomes. This may require companies to use hybrid scenarios or management's best estimate where their view of a certain variable may differ from scenarios. If the company selects management's own views on certain assumptions as part of the quantification process, it should disclose this. In considering the best estimate case, companies should consider assumptions and data points already included in financial models. For example, there might be an existing assumption for future commodity prices that incorporates an assumption for carbon taxation or regulation.

Example: Shell has developed a "mid-price" scenario for oil price that it believes more accurately reflects the possible real-world oil price movements than external scenarios. It has additionally considered and disclosed the implications of IEA and NGFS transition scenarios.²⁶

- Choose other scenarios that differ from the view of the best estimate case to test the resilience of the business in different outcomes given the long-term nature of climate change. Companies can use these scenarios as sensitivity analysis within the financial modeling to align the scenario modeling and financial integration.



Step 3.2: Collect value chain data

Difficulty accessing historical value chain data

Companies that have an extensive value chain, given the sectors and geographies they work in, highlight the challenge of accessing historical value chain data and it being of high enough quality. Without access to accurate and granular data, it becomes difficult to understand what climate-related risks will affect a company and where they will occur geographically and in the value chain. It also makes calculations to quantify climate risk more difficult and reduces their robustness. For instance, a company with an extensive supply chain may not have visibility of its suppliers' emissions and therefore will not know the extent to which carbon pricing could impact the company.

As outlined by WBCSD reports, there is a pressing need for access to and visibility of quality primary data collected and stored centrally.²⁷ Some companies are beginning to build environmental data requirements into contractual arrangements to ensure that suppliers provide the necessary information. Additionally, there are processes and tools that can help companies alleviate the challenges of accessing supply chain data. We discuss these in this section.

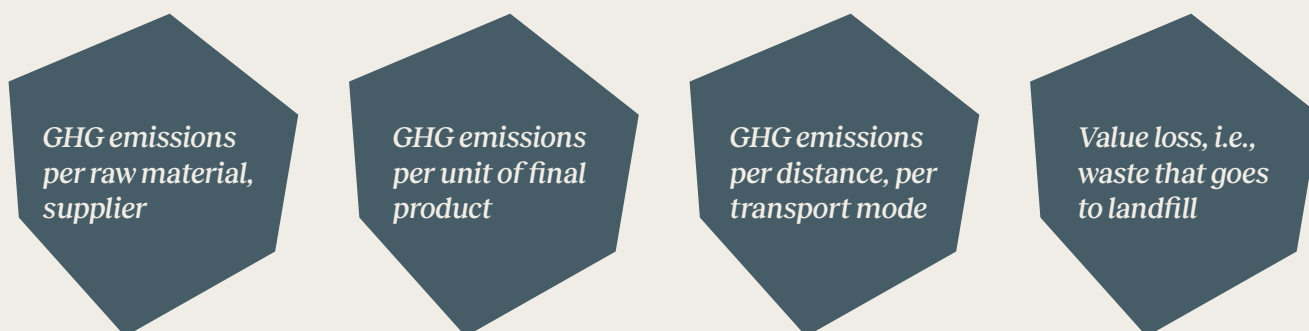
Step 3.2.1: Determining which types of data companies should be obtaining from their businesses and value chain

One of the key challenges often raised by companies is **understanding and collecting data from their wider value chain, in particular their supply chains**. Numerous types of data will help with quantifying climate-related risks and opportunities and considering the impact upon financial statements. Figure 9 provides some examples.

The calculation pathways created in Step 5 will determine the data requirements. Where possible, companies should use primary data.

Where data availability is limited, despite applying the above guidance, companies should consider using models for data estimation or proxies. For example, environmentally extended input-output (EEIO) models provide a simple method for assessing the linkages between economic consumption activities and environmental impacts, which they can use to estimate, for example, upstream/downstream GHG emissions. It is important to note that companies must disclose when they have modeled data and include information on the estimation process. Given the difficulty with collecting certain data types, for example those listed above, these models provide a suitable alternative and hence will assist with the process of quantifying climate-related risks and considering these in financial statements.²⁸

Figure 9: Examples of data to support climate risk quantification



Step 3.2.2: Supplier governance and incentives for supplying data

Once the company has mapped supplier networks, it should actively engage. This is important for building trust and a relationship with suppliers, which will improve the agency of suppliers to share consistent data and also increase supply chain visibility.²⁹ Companies need to consider how they incentivize suppliers to provide the required climate-related data, such as through contractual obligations and making it part of a request for proposal (RFP) process. We also recommend collaboration with other companies with a similar supplier base to scale impact and streamline data-sharing processes for environmental data.³⁰ Some technology solutions additionally enable companies to monitor suppliers providing environmental data and information against contract requirements and auto-prompting them for outstanding pieces.

When choosing an approach to supplier data collection, consider the company's data requirements, including wider environmental data needs, how the company will collect and verify supplier data, the user experience and the outputs required.

Step 4: Calculating the financial impacts

Step 4.1 Calculate current and future financial impacts of scenarios

This step **enables a company to understand the materiality of climate-related risks and opportunities and begin to consider whether there are potential implications for the company's financial position.** Companies do not incorporate the outcome of this step directly into financial models or statements but it is important in preparing for Step 5, which supports consideration of what adjustments, if any, they should make.

Once the company has created the calculation pathway and collected all data, it can calculate the financial impact. Companies should repeat this process for all risks and opportunities that need quantifying. If the outcome of this assessment of the financial risk or opportunity under different scenarios and timeframes is material, companies should usually report this with wider climate risk disclosures or in the strategic, management

commentary section of reports. If there is one, disclosing the link between the quantified risks and opportunities and the financial statements would support report users as they navigate the link between disclosures and financial accounts. If the company considers a quantified risk or opportunity to not have a material impact on the financial statements, it should make the rationale for this clear within the climate disclosure. This might include a consideration that the impact is not material now but may be in the future. One reason for this is to ensure consistency between the reporting narrative in an annual report and the financial statements.

Building the capabilities to conduct a quantified risk-assessment can take some time. For example, if data limitations mean that a robust quantification of a material risk using multiple scenarios is not currently possible, this does not mean the company should not attempt to quantify it. The company should, however, disclose the results alongside the methodology and clear assumptions so that the reader can appropriately interpret the results. The company should also make clear how it will deal with any barriers and limitations to improve reporting in the future.

Companies should disclose the exclusion of any omissions of risks and opportunities that may appear to be material from the quantification process with the reason for exclusion, for example data availability and, if relevant, how the company is remedying these challenges. For example, the company may state that it will improve the data collection process in time to quantify the risk and opportunity in the next reporting cycle. In the disclosure, it should make explicit how the reporting of quantified risks and opportunities will improve in the future.

Figure 10: Scenario financial quantification of regulatory and market risks – Unilever

1. Unilever

Unilever provides quantification of physical risks, transition risks and climate-related opportunities across material business risks. Using the IPCC's Sixth Assessment Report 1.5°C scenario as its reference scenario,³¹ the Unilever report details the potential financial impact on profit by disclosing a range (proactive v reactive pathways) in the year across three time frames – 2030, 2039 and 2050 – if it has taken no action. Disclosure also transparently shows the key assumptions used to reach that conclusion.³²

Financial quantification of assessed risks and opportunities		Potential financial impact on profit in the year (£bn) ^(a)			
Regulatory and Market Risks	Key assumptions	Sensitivity	2030	2039	2050
1. Carbon tax and voluntary carbon removal costs We quantified how high prices from carbon regulations and voluntary offset markets for our upstream Scope 3 emissions might impact our raw and packaging materials costs, our distribution costs and the neutralisation of our residual emissions post-2039.	→ Absolute zero Scope 1 and 2 emissions by 2030 → Scope 3 emissions exclude consumer use emissions → Carbon price would reach 245 USD/tonne by 2050, rising more aggressively in early years in a proactive scenario	ρ	-3.2	-5.2	-6.1
	→ The price of carbon offsetting would reach 65 USD/ tonne by 2050 → Offsetting 100% of emissions on and after 2039	τ	-2.4	-4.8	-6.1
2. Land use regulation impact on food crop outputs We quantified how changing land use regulation to promote the conversion of current and future food crops to forests could drive reduced crop output and lead to increased raw material prices, impacting sourcing costs.	→ By 2050, in a proactive scenario, land use regulation would increase prices by: → Palm: ~28% → Commodities and food ingredients: ~33%	ρ	-0.8	-2.1	-5.1
	→ By 2050, in a reactive scenario, land use regulation would increase prices by: → Palm: ~10%; → Commodities and food ingredients: ~11%	τ	-0.3	-0.7	-1.7
3. Impact of rising energy prices for suppliers and in manufacturing We quantified how electricity and gas price increases could impact both total energy annual spend as well as indirect cost increases passed through from raw material suppliers.	→ High uncertainty surrounds possible shifts to energy prices during a transition to 1.5°C world → Analysis assumes that by 2050 average electricity prices would: → Rise ~16% in The Americas → Rise ~18% in Europe → Decline ~1% in ASIA/AMET/RUB ^(b)	ρ	-0.6	-1.5	-3.4
	→ By 2050 average global gas prices would rise by ~141%	τ	-0.6	-1.5	-3.4

Figure 11: Risk management, scenario and potential financial impact examples – GSK

2. GSK

GSK details material physical risks, transition risks and opportunities and their associated potential profit impact spanning a 3 to 10 year timeframe. A business-as-usual scenario that assumes little to no mitigation leading to 3-5°C of warming by 2100, a low-carbon scenario that assumes that the global temperature increase is well below 2°C and a breach of planetary boundaries scenario not aligned to any of the pledges laid out within the Paris Agreement, inform the quantification of the risks and opportunities. The scenario architecture is based on IPCC Representative Concentration Pathways 4.5, 2.6 and 8.5.^{33, 34}

Physical risk/ description	GSK response	GSK response	Potential financial impact/ timeframe	Metrics	Targets
<p>The risk from increasing levels of water stress leading to interruptions to supply of water to GSK sites and third-party supply sites.</p> <p>GSK and its thirdparty suppliers use freshwater as the main source of water to manufacture medicines and vaccines. If water availability was restricted at a factory, then production operations would be interrupted.</p>	<p>We have identified three water basins in water-stressed areas in Algeria, India and Pakistan where we have manufacturing sites, and where we aim to be water neutral.</p> <p>At our manufacturing facility in Nashik, India we have built plants for rainwater harvesting.</p> <p>The climate scenario analysis has identified a number of sites and supplier sites located in water basins that could become water stressed by 2040 which have been added to a watch list. We will monitor changes to the risk levels and update our site water risk assessments appropriately.</p>	Current trajectory	Medium (£100m-£250)m/ Long term (> 10 years)	<p>Sites that have achieved water stewardship.</p> <p>Total supplied water.</p>	<p>Achieve good water stewardship at 100% of our sites by 2025.</p> <p>Reduce overall water use in our operations by 20% by 2030.</p>
		Breach of planetary boundaries	Low (< £100m)/ Long term (> 10 years)		
<p>Increasing frequency of extreme weather events causing disruption to GSK and third-party supplier sites.</p> <p>Extreme weather events from any one of precipitation (rainfall), flood from precipitation, tidal flood, extreme wind, wildfire, extreme heat or extreme cold can result in short-term interruptions to manufacturing at GSK or supplier sites.</p>	<p>The climate scenario modelling indicated that of the seven physical perils, flood from rainfall presents the highest likelihood of an acute interruption. However, the risk of flooding from rainfall and from the other extreme weather events is expected to remain very low.</p> <p>We have performed risk assessments for our manufacturing and other operations and have business continuity plans in place which are reviewed annually to respond to the impacts of extreme weather events including adopting appropriate mitigation plans.</p> <p>GSK has a well established loss prevention and risk engineering programme to identify a range of risks that could impact our sites and where flood risks exist, we have taken action to mitigate the risk.</p>	Low carbon scenario	Low (< £100m)/ Long term (> 10 years)	<p>Business continuity plans are reviewed annually.</p>	<p>Where climate-related risks to business continuity are identified, we have taken action to mitigate the risk.</p>
		Current trajectory scenario			
		Breach of planetary boundaries scenario			

Guidance on financial statement integration

Regulatory bodies, governments and relevant entities are increasingly emphasizing the consideration and, when significant, the inclusion of climate change impacts on financial reporting. In many countries, management must disclose the main risks in the strategic report in their annual report while they typically present the key assumptions used in financial statement preparation in the notes to the accounts. Consistency between different disclosures is important for a reader of the annual accounts as a whole and consequently are a focus area for a broad range of stakeholders.

Step-by-step guidance for integration into financial statements

This section of the report focuses on providing guidance for integrating climate considerations into financial modeling and financial statements. This builds on steps 1 to 4, which provide guidance on identifying the relevant risks and opportunities for consideration and assessing their financial materiality. Companies that have already undertaken risk and opportunity identification processes and conducted scenario analysis but not yet considered the implications of financial statement line items might wish to start here.

Step 5: Assessing financial statement assumptions and accounting standard connectivity

Step 5.1: Understand the accounting regulations in relation to climate issues

As part of the International Financial Reporting Standards (IFRS), there are **requirements for management to disclose information about the significant assumptions they make about the future and other sources of estimation uncertainty at the end of the reporting period.** This should include those that have a significant risk of resulting in a material adjustment to the carrying amounts of assets and liabilities in the next financial year.³⁵ This would include, where relevant and material, assumptions about climate risk. In light of the recent publication of ISSB IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* and S2 *Climate-related Disclosures*, the IFRS Foundation has updated and reissued educational materials to help companies understand the correlation between climate and financial reporting.³⁶

It's clear that some stakeholders are also interested in highly material impacts that, although they have no short-term impact, could be significant in the long term. In these cases, companies could consider making additional voluntary disclosures to deal with these impacts.



Step 5.2: Perform financial statement line item (FSLI)-level climate impact assessment

The notion of "materiality" underpins financial reporting. Materiality depends on the nature or magnitude of the information or both. **Companies need to judge it in the context of the financial statements as a whole and consider it from the perspective of users** (and importantly a broad spectrum of users, not just specific groups with narrow interests). Quantitative materiality focuses on the financial impact of an item on the financial statements, while qualitative materiality considers the nature and circumstances surrounding the items. Hence, it may be the case that quantitatively immaterial information might be qualitatively material and therefore the company needs to disclose it.

To determine necessary disclosures, management could undertake an in-depth assessment into each FSLI for which the company has identified an accounting estimate, which climate-related issues could affect it and if this would be material for disclosure. Alternatively, management could apply a top-down approach, identifying the most material climate-related impacts relevant to the entity.

We encourage management to consider performing both a bottom-up FSLI-level approach to ensure that they address the completeness of climate-related impacts in the financial statements and a top-down approach to make sure they consider material climate-related risks. Management would further need to ensure that any narrative disclosures made elsewhere in the annual report are consistent with the assessments, estimates and assumptions made in the financial statements.

Step 5.3: Dealing with climate risk uncertainties and assumptions

Making accounting estimates and significant judgements is an inevitable part of preparing financial statements. Various examples of accounting estimates are already part of financial statements and are dependent on future assumptions and subject to high levels of estimation uncertainty. These include, for example, the fair valuation of assets that are dependent on significant unobservable inputs, impairment assessments or future taxable profit forecasts supporting the carrying amount of deferred tax assets.

Step 5.3.1: Climate risk uncertainties

Risks and uncertainties underpin all accounting estimates; different estimates may be subject to different risks. For example, estimates may be subject to liquidity risk, performance risk, currency risk, credit risk, demand risk or market risk. Therefore, much like other risks that require varying degrees of assumption and uncertainty, companies should think of climate change as another risk affecting accounting estimates.

One challenge is uncertainty about the future climate scenario to consider in financial adjustments. One approach management can take in financial statements is to adjust the values by using a weighted average of the scenario analysis outputs with the weighting of different scenarios based on their judgment. The consideration of multiple scenarios means that users of the financial statements know that the company assumes no individual future state and is also measuring its resilience against high transition and high physical risk scenarios. Alternatively, management may choose to use a scenario it believes to be the most likely outcome and use other scenarios in sensitivity analysis to test the implication of scenario choice.

Step 5.3.2: Climate risk assumptions

The quantification of climate change assumptions is also subject to inherent uncertainty; the estimation of uncertainty with regards to the impact of climate change on accounting estimates is also likely to be high. In such cases, the key to addressing uncertainty is transparency and enhanced disclosures, particularly on critical estimates. The International Financial Reporting Standards (IFRS) International Accounting Standard 1 (IAS 1) provides a non-exhaustive list of disclosures that may help users of the financial statements understand the estimate made in the context of a significant risk resulting in a material adjustment to the carrying amounts of assets and liabilities in the next financial year:³⁷

- The nature of the assumption or other estimation uncertainty;
- The sensitivity of carrying amounts to the methods, assumptions and estimates underlying their calculation, including the reasons for the sensitivity;
- The expected resolution of an uncertainty and the range of reasonably possible outcomes in the next financial year with respect to the carrying amounts of the assets and liabilities affected; and
- An explanation of changes made to past assumptions concerning those assets and liabilities, if the uncertainty remains unresolved.³⁸

Step 5.4: Understanding and implementing evolving governance and assurance frameworks

The continued drive to integrate climate into financial reporting from investors and regulators also impacts assurance requirements and governance implementation. Regulatory updates such as CSRD will ensure that companies need to prepare for a future that requires reasonable assurance over climate-related metrics disclosed. As data and understanding of the impacts of climate change on companies improves, assurance providers are able to obtain more evidence to assess the related reporting requirements.

To help prepare for the increased scrutiny, companies should closely involve both finance and sustainability teams as part of the in-depth assessment to identify climate-related impacts and in drafting the financial statement disclosures. The process should be under the same internal scrutiny and discipline as that of any other financial reporting, which may include the Audit Committee. Companies could employ internal audit expertise to validate whether the process is in line with the internal control framework necessary for other established financial processes.

If the company determines that matters are relevant to financial statement impact, they will be subject to the scope of the financial audit. Therefore, the company should prepare and document those scenario analyses and assumptions that feed into the financial models to the same standard as other information that supports information subject to audit. External auditors will be seeking appropriate and relevant audit evidence as well as checking for management bias by testing the reasonableness of assumptions. For example, companies could consider whether they have factored in additional cost implications due to carbon pricing and perform line-by-line analysis of the completeness of material climate impacts in the financial statements.

Questions for audit teams to consider

1. Has the company considered connectivity between disclosures made as part of strategic report and the financial statements and explained it where necessary?
2. Has the company made any commitments, for example to purchasing a certain amount of carbon credits by a certain date, and has it factored the cost/future price uncertainty implications into future cash flows?
3. If the company conducted scenario analysis, how has it factored the assumptions into the preparation of the financial statements, such as impairment assumptions or estimates of expected future cash flows, risk adjustments to discount rates or useful lives?

From the perspective of the Board, the company should manage climate risk in line with other risks. As such, the governance applied over climate change should replicate that applied to all other risks and includes:

- Being fully aware of and spending enough time on the relevant climate issues for the business and industry; and
- Identifying and managing their principal climate-related risks and uncertainties, including the reporting requirements.

The role of the Board is to ensure that management is making the appropriate judgements and taking appropriate approaches to mitigate risks. As mentioned, in some cases this will mean having the Audit Committee look at the validity of financial data. In others it will be ensuring that the company is making progress on being able to make the relevant estimates, with the necessary internal or external resources. The company should clearly recognize and disclose known unknowns and dependencies on the actions of others.

Step 5.5 (discretionary): Consider the connection between the Paris-alignment pathway and accounting estimates

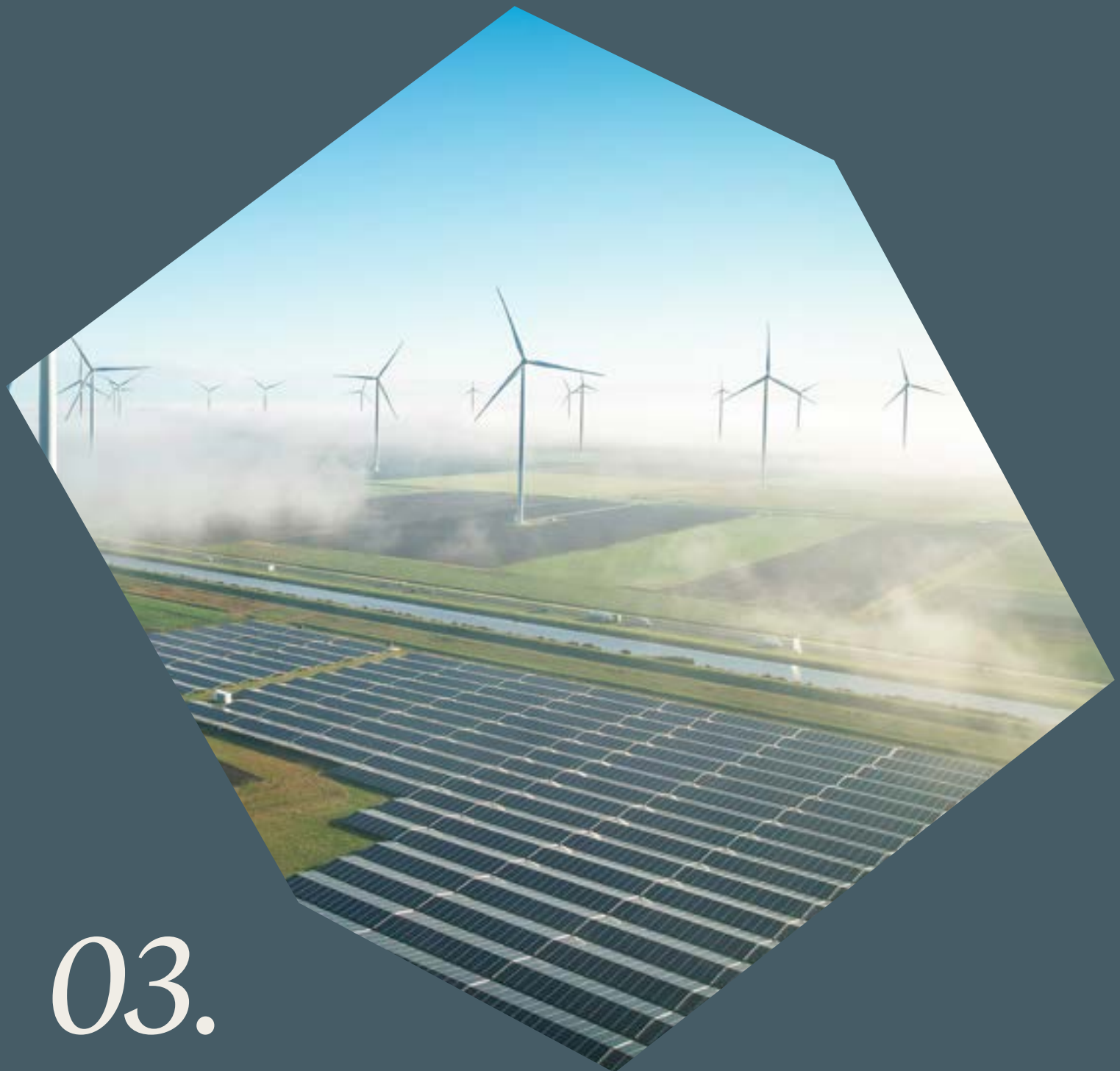
Investors and other users of accounts may press management to align assumptions and estimates with the Paris Agreement when preparing accounts. If management does not align them, then it may wish to include voluntary Paris-aligned sensitivity analysis or explain the rationale for the alternative scenario chosen to respond to investor expectations. It is important to note that to achieve a Paris-aligned global warming

scenario, individual governments can follow and direct societies, including companies, towards multiple possible pathways. Management has to assess what implications there are with regards to country-specific net-zero emissions targets where the company operates as well as the net-zero emissions commitments the company has made when preparing the financial statements.

IFRS may give guidance on using best estimates when valuing assets and liabilities but it is possible for management not to consider any of the possible global warming paths targeted by the Paris Agreement as what they think is the best estimate of the actual outcome for the entity. In some cases, IFRS standards would not allow management to reflect certain future developments associated with a Paris Agreement-aligned climate transition in an entity's financial statements. This could be the case where anticipated liabilities do not yet meet the criteria for recognition of a provision or it is not possible to reflect an asset enhancement expenditure in impairment assessments. This would be a situation where management needs to clearly explain such differences in the notes to meet user expectations.



Examples of *the impact of climate change on financial statements*



03.

03. Examples of *the impact of climate change on financial statements*

There are numerous ways in which climate change can impact financial statements. We highlight some key areas to consider below.

Impairment review (asset impairments for assets falling under IAS 36)

Questions to consider

- 1. What climate impacts have implications for future cash flow, useful life and value in use calculations?**
- 2. Has the company taken cash flows beyond the forecast period into account during the impairment review process?**
- 3. Has the company provided assumptions for goodwill and intangibles assets?**

It is possible to overstate the carrying amount of assets falling under the guidance in IAS 36, such as property, plant and equipment, exploration and evaluation assets, intangible assets and goodwill, if the impairment assessments do not account for the effect of climate-related risks. Companies typically hold assets they have not revalued at the lower end of their carrying amount and the recoverable amount, where the recoverable amount is defined as the higher of its value in use and the fair value less cost to sell. Should the recoverable amount fall below its carrying value, this would result in an impairment.

For the majority of assets, the calculation of the recoverable amount uses cash flow forecasts in models that aggregate certain assets into cash generating units (CGU) as a testing basis because each individual asset often does not generate independent cash inflows. CGUs are the smallest group of assets generating cash inflows that are largely independent of the cash inflows from other assets. Such forecasts project relevant

inflows and outflows arising from revenues and certain costs into the future. The company then discounts future cash flows by an appropriate discount factor, often starting with the weighted average cost of capital. The discount rate needs to reflect a market view of the time value of money and the risks specific to the asset/CGU for which the company has not adjusted the future cash flow estimates.

Climate change could influence the projections, such as through:

- A decrease in customer demand for high carbon products;
- Additional costs for carbon taxes; or
- An increase in physical risk damage adding to insurance cost.

Reduced net future inflow projections could ultimately cause the recoverable amount of an asset or cash generating unit to fall below the carrying value.

In addition to goodwill and indefinite lived intangibles that companies test for impairment at least annually, IFRS states that:

“An entity shall assess at the end of each reporting period whether there is any indication that an asset may be impaired. If any such indication exists, the entity shall estimate the recoverable amount of the asset.”³⁹

Therefore, for certain assets and CGUs, management should undergo a trigger indicator review at the end of each reporting period as to whether it needs to undertake a detailed impairment test. Among other external and internal indicators in IFRS, the following are particularly relevant with regards to climate change risk:

- "Significant changes with an adverse effect on the entity have taken place during the period, or will take place in the near future, in the technological, market, economic or legal environment in which the entity operates or in the market to which an asset is dedicated."
- "Evidence is available of obsolescence or physical damage of an asset"
- "Significant changes with an adverse effect on the entity have taken place during the period, or are expected to take place in the near future, in the extent to which, or manner in which, an asset is used or is expected to be used. These changes include the asset becoming idle, plans to discontinue or restructure the operation to which an asset belongs, plans to dispose of an asset before the previously expected date and reassessing the useful life of an asset as finite rather than indefinite."
- "Evidence is available from internal reporting that indicates that the economic performance of an asset is, or will be, worse than expected."⁴⁰

Climate change could impact the economic performance of an asset or CGU or constitute a significant change with adverse effects on the entity that will take place in the period or near future (such as through the introduction of a new regulation) triggering an impairment review. While the company should not impair assets solely based on physical damage that has not yet occurred, it might consider incorporating increased costs to the extent that they are reasonably necessary and supportable, such as investing in flood defenses, raising insurance expenses or even imposing limitations on the useful economic lives of assets.

Theoretical example: Impairment review triggered due to climate change and how it would affect financial statements

Many years ago, company A acquired a business in country X and recognized significant goodwill as part of the business combination. The acquired business in country X depends on a factory located near the coast. Forecasts indicate rising water levels over the next 10 years. Management could either build costly defenses around the plant or sell the site as it will become unusable in this location for company A. This would also require expenditure in setting up a facility elsewhere.

The plant itself has a remaining useful life of 10 years. However, to maintain the current level of production and capacity, management needs to factor different cash outflow likelihoods into the terminal value calculations for the goodwill impairment test. This could be to either build water defenses to safeguard current levels and the capacity of production or to move the plant to a new location. Such expenses may mean that goodwill is impaired. The plant at the current site, as it only has a 10-year useful life, is not necessarily impaired.

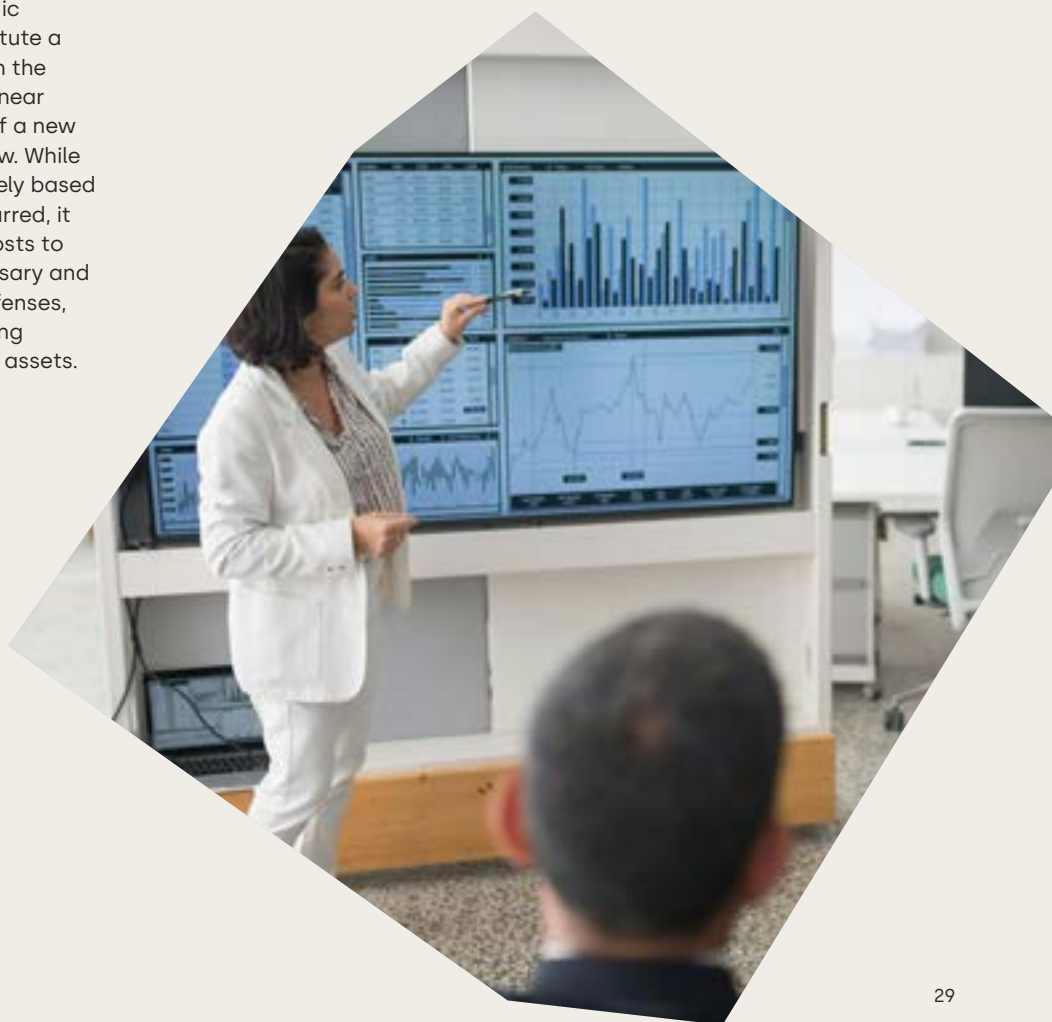


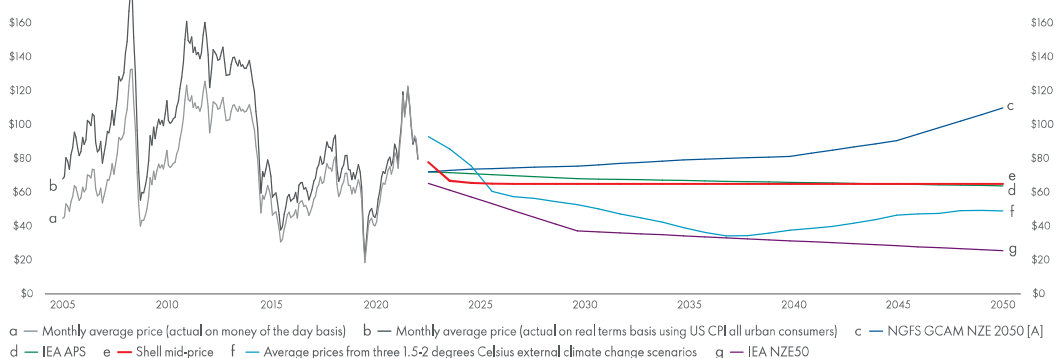
Figure 12: Oil price sensitivities – Shell

Practical example: Disclosure from the Shell Annual Report 2022⁴¹

Shell's report notes that the company has clearly disclosed the external scenarios that management has considered, as well as a comparison to its internal best estimate for future oil prices. The company has addressed uncertainties through sensitivity analysis.

Goodwill, other intangible assets, property plant and equipment and joint ventures and associates

Oil price assumptions



[A] The Network for Greening the Financial System (NGFS) is a group of 65 central banks and supervisors and 83 observers committed to sharing best practices, contributing to the development of climate- and environment-related risk management in the financial sector and mobilising mainstream finance to support the transition toward a sustainable economy. This scenario results from the NGFS GCAM model. This model embodies certain assumptions on the relationships between economic and energy output and climate interactions. This NGFS scenario shows a decline in world oil demand relative to the current policies baseline, in part a response to substitution away from fossil fuels. At the same time prices increase due to supply constraints.
[B] All figures are presented on RT22 basis unless noted differently.

The graph above shows the oil pricelines on a real-terms basis applied for the period until 2050 for Shell's mid-price outlook in comparison with the IEA announced pledges (IEA APS) scenario, the NGFS GCAM NZE 2050 scenario, the average prices from three 1.5-2 degrees Celsius external climate change scenarios (Priceline 1, above) and the IEA Net Zero Emissions by 2050 scenario (IEA NZE50, Priceline 3 above). The development of future oil prices is uncertain and oil prices have been subject to significant volatility in the past. Future oil prices may be impacted by future changes in macroeconomic factors, available supply, demand, geopolitical and other factors. The pricelines as per the scenarios NGFS GCAM NZE 2050, IEA APS, the average prices from three 1.5-2 degrees Celsius external climate change scenarios and IEA NZE50 differ from Shell's best estimate and view of the future oil price.

Sensitivity + 10% to the mid-price outlook

	Carrying amount		Sensitivity			
	Dec 31, 2022	Dec 31, 2021 [A]	2022	2021	2022	2021
Integrated Gas	75	65	2	3	3	5
Upstream	88	89	—	1	3	4
Total	163	154	2	4	6	9

Sensitivity - 10% to the mid-price outlook

	Carrying amount		Sensitivity			
	Dec 31, 2022	Dec 31, 2021 [A]	2022	2021	2022	2021
Integrated Gas	75	65	(2)	(4)	(8)	(10)
Upstream	88	89	—	(1)	(4)	(5)
Total	163	154	(2)	(5)	(12)	(15)

Sensitivity averaged from three below-two-degrees-Celsius external climate scenarios

	Carrying amount		Sensitivity			
	Dec 31, 2022	Dec 31, 2021 [A]	2022	2021	2022	2021
Integrated Gas	75	65	(4)	(6)	(13)	(16)
Upstream	88	89	(1)	(2)	(14)	(17)
Total	163	154	(5)	(8)	(27)	(33)

Sensitivity Hybrid Shell Plan + IEA NZE50

	Carrying amount		Sensitivity			
	Dec 31, 2022	Dec 31, 2021 [A]	2022	2021	2022	2021
Integrated Gas	75	65	(4)	(6)	(10)	(12)
Upstream	88	89	(1)	(2)	(5)	(6)
Total	163	154	(5)	(8)	(15)	(18)

Sensitivity IEA NZE50

	Carrying amount		Sensitivity	
	Dec 31, 2022	2022	2022	2021
Integrated Gas	75	(9)	(12)	
Upstream	88	(8)	(11)	
Total	163	(17)	(23)	

[A] In 2022 goodwill and other intangibles were included in the scope for sensitivity testing. In 2021 these assets were not within the scope of sensitivity testing. Based on the 2022 sensitivity testing performed, it is unlikely that if these assets would have been included in the scope for 2021 testing, this would have resulted in a material impact on the outcome of sensitivity testing.

Figure 13: Impairment charges net of reversals – Rio Tinto

Practical example: Disclosure from Rio Tinto Annual Report and Accounts 2022⁴²

In this example, Rio Tinto has identified and disclosed an impairment charge for an aluminum smelter sited in Queensland, Australia. In this disclosure, it highlights a number of assumptions it has made in preparing its impairment assessment, including how these relate to its commitments with respect to the reduction of its carbon emissions.

It has also included a qualitative sensitivity disclosure to highlight that it could reverse the impairment charge in the future if it had prepared the valuation using the set of commodity and energy price assumptions under its "Aspirational Leadership" scenario. It describes the basis for this scenario elsewhere in its annual report.

Aluminium - Pacific Aluminium, Australia and New Zealand

The operating and economic performance of the Boyne Smelter in Queensland, Australia was below our expectations in 2022. The plant operated with reduced capacity and the economic performance suffered due to the high cost of energy from the coal-fired Gladstone Power Station. These conditions have been identified as an impairment trigger. We have calculated a recoverable amount for the cash-generating unit based on post-tax cash flows, expressed in real terms and discounted using a post-tax rate of 6.6% over the period to 2029. This date was chosen as it coincides with both the remaining term of the Boyne Smelter joint venture agreements and the Group's Paris-aligned commitment to reduce carbon emissions by 50% by 2030 relative to the 2018 baseline. Despite the recent implementation of temporary energy price caps by the Australian Government, this resulted in an impairment charge of USD \$202 million, representing a full impairment of the carrying value of the Boyne Smelter investment in equity accounted unit.

Impact of climate change on our business - Boyne Smelter

We are committed to the repowering of our aluminium smelter in Queensland with firmed renewable energy by 2030. For this reason, along with the coal price cap noted above, we have separated the Gladstone Power Station from the Boyne Smelter cash-generating unit. As a sensitivity we have considered the impact of a potential repowering of the smelter using commodity and energy price assumptions from our Aspirational Leadership scenario, with all other assumptions being unchanged. This would result in improved cash flows, including an extension of operations at the Boyne Smelter beyond current joint venture agreements through to 2040. The potential value uplift under this sensitivity is not part of our base valuation as it is dependent upon commercial agreements that are not currently in place, but could support the reversal of past impairments. Both the recorded outcome and the sensitivity, as described in "Impact of climate change on the Group" section on pages 152 to 155, are considered to be Paris-aligned.

Useful economic lives of tangible and intangible fixed assets

Questions to consider

1. Will the transition to a low-carbon economy affect any company assets?
2. Has the company considered how the speed of decarbonization will impact the timing of asset replacement?
3. Has the assessment of the assets' useful lives considered possible climate and stranded asset risk impacts?

In this scenario a company will make a public commitment to be carbon neutral by 2030. The company may need to revise the residual values of some assets downward to reflect the fact that equipment using less energy-efficient fuels will have lower resale values at the time of disposal. In this scenario, **companies should clearly state how they have taken account of any published plans to replace material assets that need it and explain clearly how they have reflected known plans to reduce emissions in their assessment of the assets' useful lives.**

Theoretical example: Revision of upper earnings limits (UELs) and residual values of certain assets triggered due to climate change

Company A has made a commitment, as cited in the environmental section of its annual report and in various press releases, to become carbon neutral by 2030. Company A estimates that this means it will need to replace approximately 50% of the asset base with more energy-efficient or non-fossil fuel using equipment by 2030.

It performed an analysis and identified that it needed to shorten the UELs of some of the assets in the fixed asset register to appropriately represent the fact that it would replace 50% of the asset base over the next 10 years.

The company made this adjustment prospectively, as a change in estimate, as required by IAS 16 / FRS 102 section 17 and IAS 8 / FRS 102 section 10. Therefore, there is no "one-off" adjustment to the financial statements. IAS 8 and FRS 102 section 10 require the disclosure of the effects of changes in estimates. Even though the amount may not be material, management has voluntarily included a narrative explanation of this change in estimate in the note disclosure for property, plant and equipment. This is to demonstrate how it has aligned the financial statement assumptions with the company's environmental strategy.

Company A further revised the residual values of the assets in question downwards to reflect the fact that equipment using fossil fuels will have lower resale values at the time of disposal. Similar voluntary and mandatory disclosure as for the change in UELs applies.

Figure 14: Gas asset lives – National Grid

Practical example: Disclosures from National Grid Plc 2022/2023 annual report⁴³

In this example, National Grid has clearly stated that it holds fixed assets with UELs that extend beyond 2080. However, the company maintains that the lives of these assets remain the best estimates despite climate risks. National Grid acknowledges that there is uncertainty surrounding future decarbonization pathways and, as such, provides sensitivity analysis, highlighting the increase in the annual depreciation expense should it shorten the UELs of these assets for three timeframes.

Gas asset lives

The role that our US gas networks play in the pathway to achieving the greenhouse gas emissions reductions targets set in the jurisdictions in which we operate is currently uncertain. In the year, policymakers in New York and Massachusetts have indicated an increase in electrification and a strategic downsizing of gas networks in their formal plans to meet their respective decarbonisation targets. As a result, there is a risk that the UELs of certain elements of our gas networks may be shortened in line with future legislation.

We believe the gas assets which we own and operate today will continue to have a crucial role in maintaining security, reliability and affordability of energy beyond 2050, although the scale and purpose for which the networks will be used is dependent on technological, legal and regulatory developments.

In the US, our gas distribution asset lives are assessed as part of detailed depreciation studies completed as part of each separate rate proceeding. Depreciation studies consider the physical condition of assets and the expected operational life of an asset. We believe these assessments are our best estimate of the UEL of our gas network assets in the US.

The weighted average remaining UEL for our US gas distribution fixed asset base is circa 52 years; however, a sizeable proportion of our assets are assumed to have UELs which extend beyond 2080. We continue to believe the lives identified by rate proceedings are the best estimate of the assets' UELs, although we continue to keep this assumption under review as we gain more certainty about policy-driven legislation. We continue to actively engage and support our regulators to enable the clean energy transition in a safe, reliable and affordable way.

Asset depreciation lives feed directly into our US regulatory recovery mechanisms, such that any shortening of asset lives and regulatory recovery periods as agreed with regulators should be recoverable through future rates, subject to agreement, over future periods, as part of wider considerations around ensuring the continuing affordability of gas in our service territories.

Given the uncertainty described relating to the UELs of our gas assets, below we provide a sensitivity on the depreciation charge for our New York and New England segments were a shorter UEL presumed. It should be noted that all net zero pathways suggest some role of gas in heating buildings beyond 2050, so our sensitivity analysis for 2050 illustrates an unlikely worst-case scenario:

	Increase in depreciation expense for the year ended 31 March 2023		Increase in depreciation expense for the year ended 31 March 2022	
	New York £m	New England £m	New York £m	New England £m
UELs limited to 2050	185	54	140	40
UELs limited to 2060	90	21	67	15
UELs limited to 2070	42	3	31	1

Note that this sensitivity calculation excludes any assumptions regarding the residual value for our asset base and the effect that shortening asset depreciation lives would be expected to have on our regulatory recovery mechanisms. In the event that any of the US gas distribution assets are stranded, the Group would expect to recover the associated costs. While recovery is not guaranteed and is determined by regulators in the US, there are precedents for stranded asset cost recovery for US utility companies.

Figure 15: Consideration of sustainability- related aspects – Mercedes-Benz

Practical example: Disclosure from Mercedes-Benz group 2022 annual report⁴⁴

Mercedes-Benz has clearly considered the impact of climate risks on the estimated remaining useful lives of fixed assets in the transformation to electric vehicles and identified that it expects no material impacts up to the reporting date.

Consideration of sustainability related aspects in connection with the recognition and measurement of assets and liabilities

With "Ambition 2039" the Mercedes-Benz Group has set itself the target of a CO₂-neutrality for the new vehicle fleet by 2039 in its business strategy. With the strategic step to "Electric only", the Mercedes-Benz Group is accelerating its transformation into an all-electric and software-driven future. Recognition and measurement of the Group's assets and liabilities take into account climate-related risks and developments associated with the transformation, which also include the climate targets set in the Paris Climate Agreement.

Accounting estimates and management judgments in connection with sustainability-related aspects are taken into consideration in particular in the accounting of assets and liabilities described below:

The determination and review of the useful lives of the capitalized development costs are based on the expected product life cycle. Changes in the originally envisaged product life cycles can result from the transformation to all-electric vehicles. Due to the resolutions regarding the accelerated transformation new developments in the area of conventional powertrains are reduced and already capitalized development expenditure will partly be used for longer. For this reason the useful lives of specific development expenditures have been extended with effect from 1 January 2022, which resulted in a positive effect on EBIT in the amount of €0.2 billion for 2022. An effect in the same amount is expected for 2023.

In the same way, the useful lives of property, plant and equipment assets are regularly reviewed in the light of the transformation to all-electric vehicles. This did not require any material adjustments of the useful lives up to the reporting date as the production facilities of the Group are basically flexible in use.

Measurement of decommissioning provisions

Questions to consider

1. Has the company considered climate-related risk in recognition of new or adjusting existing provisions?
2. Has the company considered the potential impact of climate-related fines and penalties on the provision?
3. Has the company considered the risks and uncertainties related to climate matters when determining the cash flows and discount rate for measuring the provision?

Physical climate change risks and transition risks, such as government policies and regulatory changes, can affect the recognition, measurement and disclosure of provisions, contingencies and onerous contracts. To address these evolving dynamics, companies should consider the conditions for recognizing a provision:⁴⁵

- An entity has a present obligation (legal or constructive) as a result of a past event;
- It is probable that settling the obligation will require an outflow of resources embodying economic benefits; and
- The company can make a reliable estimate of the amount of the obligation.

Consequently, there may be a need to update recognized provisions due to emerging responsibilities arising from climate-related risks, such as the need for premature retirement of emission-producing assets that require decommissioning earlier than originally planned. Companies may also need to recognize provisions because they now see pre-existing obligations, once considered unlikely, as probable occurrences, such as the likelihood of losing a legal case related to pollution activities, which they previously viewed as only possible, but now consider probable.

When considering decommissioning provisions, new laws or regulations are likely to be the most significant factor to consider, especially in the energy sector where governments consistently introduce new legislation to reduce emissions in high-emissions industries.

For instance, in 2021, the EU proposed regulations for reducing methane emissions in the energy sector, which it will likely adopt into law in 2024.⁴⁶ This regulation will have a significant impact, playing a role in the phasing out of coal mines over the next decade and driving the decarbonization of electricity supply in the EU. Given this situation, the energy sector will need to reform its energy supply chain and transition to cleaner energy sources.

Theoretical example: Decommissioning provisions due to climate change

Company A operates a plant that is heavily dependent on fossil fuels and for which it has recognized a decommissioning provision. Management's sustainability strategy promises carbon neutrality by 20X5. It can only realistically achieve this by substituting the plant with a newer hybrid model plant in the mid-term. It may be possible to substitute and decommission the plant somewhat later than 20X5 but it would require the purchase of carbon offsetting credits in the meantime.

Management should explain in the accounts how it has taken the climate transition into account in estimating the amount of the provision and provide sensitivities for the impact on the provision of bringing forward the timing of the expected outflow due to an earlier decommissioning of the plant than originally envisaged when it first set up the provision.

Figure 16: Asset decommissioning liabilities and retirement obligations - CLP Group

Practical example: Disclosures from CLP Group 2022 annual report⁴⁷

In this example, CLP clearly states its consideration of legislation from the Hong Kong government. As part of the retirement of its coal-fired generation units, the company considered the need for adequate asset retirement obligations for the reporting period.

Accounting Policy

When the Group has a legal and / or constructive obligation for remediation and the likelihood of economic outflow is probable, provisions for asset retirement obligations are recorded for estimated remediation costs of reclamation, plant closure, dismantling and waste disposal. A provision for asset retirement costs is determined by estimating the expected costs associated to remediate the site based on the current legal requirements and technologies and is discounted to its present value with an unwind adjustment recognised in finance costs. An asset is recognised on initial recognition of the provision and is depreciated over the useful life of the facility. The asset retirement costs are reviewed annually and adjustments are made to the carrying amount of the assets to reflect changes made to these estimated discount rates or future costs.

Critical Accounting Estimates and Judgements

Estimating the amount and timing of the obligation to be recorded requires significant judgement. Management has assessed the Group's obligations for each asset based on the local regulatory environment and expected closure dates.

CLP Power has been investing in the transmission and distribution network to supply electricity to the customers in its supply area in Hong Kong. As CLP Power expects that the land sites being used for the transmission and distribution network will continue to be used for the distribution of electricity supply to its customers, it is currently considered remote that the network would be removed from the existing land sites. Therefore in accordance with applicable accounting standards, asset retirement obligations for these assets have not been recognised by CLP Power.

Critical Accounting Estimates and Judgements (continued)

As part of the current development plan agreed with the Hong Kong Government, CAPCO is retiring the coal-fired generation units at Castle Peak "A" Station (CPA) between 2022 to 2025. Following this retirement, the removal of CPA's coal-fired generation units has become probable. In support of the Government's net-zero carbon emissions targets in the "Hong Kong's Climate Action Plan 2050", CAPCO is in discussion with the Government to phase out the use of coal for daily electricity generation in Castle Peak "B" Station and work on ways to convert its gas-fired generation facilities to operate on green fuels. While it is envisaged that these remaining generation units will have their roles in supporting the Government's Climate Action Plan 2050, with the continuous development in decarbonisation technologies, the removal of these units and replacement by alternative facilities is possible. Under the SoC, CAPCO makes a periodic charge to accrue in the statement of financial position a liability balance to be utilised in discharging asset decommissioning costs if and when incurred. CAPCO considers that the dismantling obligation for the CPA units is covered under the asset decommissioning liability accrued under the SoC as at 31 December 2022. While no provision for asset retirement obligations for the other generation units of CAPCO has been recognised, it is expected that if such an obligation be incurred, it will be met by the liability accrued and the cost recovery mechanism under the SoC.

Consideration for other FSLIs

Inventories

IAS 2 defines inventory as “assets held for sales in the ordinary course of business; in the process of production for such sales, or in the form of material or supplies to be consumed in the production process or in the rendering of services.”⁴⁸ Inventories typically serve as short-term assets for the majority of companies, making them less exposed to the influence of climate-related occurrences compared to long-term assets like properties and investments.

Specific climate-related transition risks have the potential to significantly affect the net realizable value of inventory, for instance, in the case of manufacturing firms when they hold certain spare parts or raw materials for the long term to support various production lines. The emergence of technological advancements and regulatory changes leading to product design updates could render some of the raw materials in inventory obsolete, necessitating a write down in value. Companies need to closely monitor such developments and adjust the inventory value accordingly.

Disaggregated revenue

Climate considerations will likely have growing material influence on business models in various sectors. This influence could arise from shifts in market demand and customer preferences, impacting aspects such as product design preferences and product viability, sales prices and value chain costs. Additionally, governments may introduce legislation or taxes that affect reported revenue from customer contracts or outlaw certain products. As businesses come under increasing pressure to adapt to climate-related risks and opportunities, management may consider altering product designs or standard contract clauses, exploring new alternative revenue streams or implementing other modifications to their future business models.

IFRS 15 requires an entity to disaggregate revenue from contracts with customers into categories that depict how economic factors affect the nature, amount, timing and uncertainty of revenue and cash flows.⁴⁹ The company must determine the accounting treatment for these changes as they arise. These forthcoming commercial challenges require companies to respond and address them as needed.

Theoretical example: Disaggregation disclosures under IFRS 15

Company A is in the process of preparing its annual financial statements. In the narrative reporting section of its annual report, the company discusses distinct business operations and their revenue streams affected by climate change in substantially different ways.

Management is debating the disaggregation disclosures for revenue under IFRS 15 para 114. The standard requires that company A disaggregate revenue from contracts with customers into categories that depict how economic factors affect the nature, amount, timing and uncertainty of revenue and cash flows.

Management acknowledges that climate change presents substantially different risks and opportunities for the company's distinct business operations despite the revenues being otherwise all recognized at a point in time and in the same territory to similar customers. In particular, management has identified that one revenue stream faces a particularly high risk of suffering an adverse climate change impact in the medium term. This compares to the other revenue streams, which all face different but less substantial risks over that same time period. Management concludes that the different risk profile of this one revenue stream is of such significance that the revenue requires disaggregation from other revenue streams for disclosure purposes to meet the requirements of IFRS 15 para 114.

Companies should also consider whether an explanation that transition plans to other products or revenue streams due to potential regulatory changes will have an impact on the useful life of an asset and whether it is likely to be qualitatively or quantitatively material to the users of the financial statements.

It is worth noting that the examples above are not an exhaustive list of climate impacts, nor will they be directly applicable to every company. We have not discussed various other climate impacts, such as segmental reporting. As a general reminder, management should consider what is likely to be material to the users of the financial statements in the course of deciding whether to disclose certain climate impacts. This could include qualitatively or quantitatively material information.

Conclusion



04.

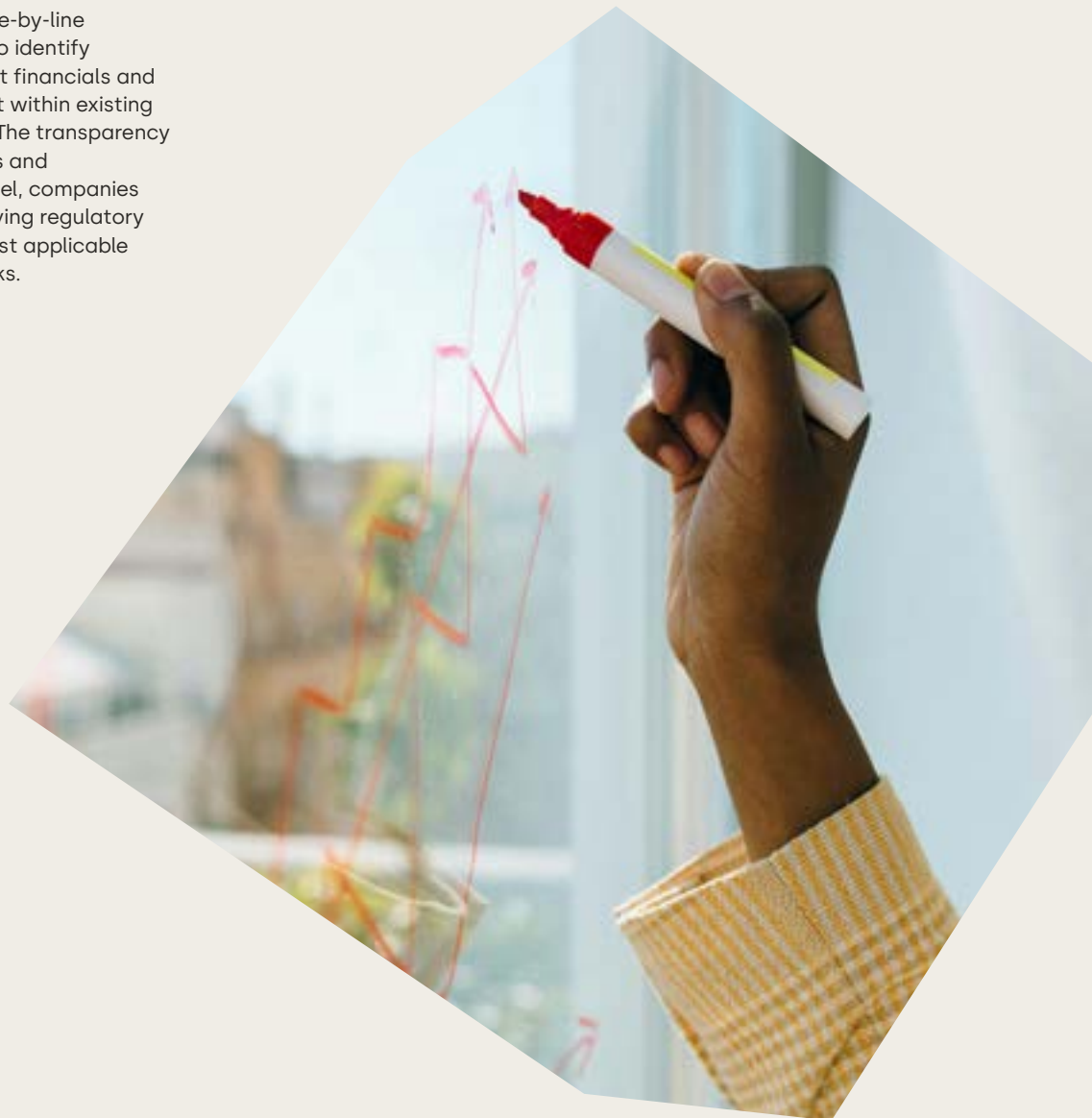
04. Conclusion

The consideration and quantification of climate-related financial impacts is a challenge for companies, yet it remains an important and urgent issue. Companies must therefore take steps to understand and disclose this information, ensuring the integration of any material impacts in financial statements. The purpose of this guidance is to empower companies to progress on and feel confident to lead the way in climate-related financial reporting. We provide five practical steps to support companies with this process alongside case studies, theoretical examples and questions to consider.

Steps 1-4 help businesses scope their climate-related risks and opportunities, develop impact and calculation pathways and gather relevant data to calculate the financial impacts. This will allow companies to progress to the final step where they should consider the impact of material climate risks on the financial statements. Companies could also perform line-by-line financial statement assessment to identify where climate change may impact financials and ensure that reporting is consistent within existing accounting frameworks (step 5). The transparency and disclosure of key assumptions and uncertainties is essential. In parallel, companies should also monitor the ever-evolving regulatory landscape to account for the latest applicable sustainability reporting frameworks.

We encourage the use of this guidance to overcome the challenges companies face and embrace the opportunity to financially quantify their climate-related impacts.

Transparent assessment and integration of climate-related financial impacts is a crucial enabler to strengthen the [Climate-related Corporate Performance and Accountability System](#) and align business and financial market action on climate.



Appendix: *Standards, regulations, requirements, guidance*



05.

05. Appendix:

Standards, regulations, requirements, guidance

International Accounting Standards Board (IASB)

The IFRS Foundation released educational material on the effects of climate-related matters on financial statements, summarizing examples of some connections with specific IFRS Accounting Standards (e.g. IAS 1, 2, 12, 16, 36, 37, 7, 9).⁵⁰ In September 2023, the IASB revealed that it exploring targeted actions to improve application of the requirements in IFRS Accounting Standards related to reporting on the effects of climate-related and other uncertainties in the financial statements. Actions may include, providing further illustrative examples, clarifying or enhancing requirements relating to estimates and providing interpretations.⁵¹

International Sustainability Standards Board (ISSB)

In June 2023, the ISSB released two standards *IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information* and *IFRS S2 Climate-related Disclosures*. IFRS S2 sets out specific disclosures on climate-related risks and opportunities with particular emphasis on financial effects. This includes current and anticipated effects of climate-related risks and opportunities on financial position, financial performance and cash flows. For more detailed information, please refer to IFRS S2.⁵²

U.S. Securities Exchange Commission (SEC)

In March 2022, the SEC proposed new requirements for climate change disclosure. The SEC has proposed climate-related disclosure rules that would require most SEC registrants, including foreign private issuers, to include certain climate-related disclosures (see the SEC's *Enhancement and Standardization of Climate-Related Disclosure* fact sheet for the content of the proposed disclosure).⁵³ Detailed in this is the inclusion of the financial impact of severe weather and other natural events as well as transition activities on individual financial statement line items and if using scenario analysis to assess resilience to climate-related risk, qualitative and quantitative information about the scenarios considered and the potential financial impact. For further detail, please refer to SEC's *Proposed Rule*.⁵⁴

EU Corporate Sustainability Reporting Directive (CSRD)

As of October 2023, the European Parliament formally approved the delegated act which outlines the first set of EU Sustainability Reporting Standards (ESRS). These standards form a core component of the Corporate Reporting Directive (CSRD). ESRS E1 specifies disclosures to enable users of sustainability reports to understand several aspects of climate change in relation to the reporting entity, including:

- The financial effects on the company arising from the company's impacts and dependencies on climate change;
- How a company affects climate change, in terms of positive and negative material and potential impacts;
- Its past, current and future mitigation efforts in line with the Paris Agreement;
- The plans and capacity of a company to adapt its strategy and business model in line with the transition to a sustainable economy;
- The nature, type and extent of the company's material risks and the opportunities arising from their impacts and dependencies on climate change and how they manage them.

For assessing the potential financial effects of physical and transition risk there are application requirements and calculation guidance specified. For potential future effects on total assets, liabilities and net revenue the company shall include a cross-reference to the related FSLI or, if this is not possible, then a quantitative reconciliation table reconciling the carrying amount of the assets, liabilities and net revenue to the total assets or liabilities or net revenue presented as at the balance sheet date.

Building on the considerations of E1-9, which focus on the size of potential financial risks to climate change, companies should also explore E1-1 and E1-3, which center on financial disclosures relating to climate mitigation and adaptation actions. For example, E1-1 (16) states how, when disclosing its transition plan for climate change mitigation, companies should provide an explanation and quantification of their investments and funding that support the transition plan and include a reference to KPIs of taxonomy-aligned CAPEX that they have disclosed in accordance with Commission Delegated Regulations (EU). For further information, please refer to the *ESRS 1 General Requirements*.^{55, 56}

Transition Plan Taskforce

In October 2023, the UK's Transition Plan Taskforce (TPT) published a Disclosure Framework and supporting materials.⁵⁷ The purpose of this guidance is to help companies developing, disclosing and delivering climate transition plans. According to the TPT, to ensure alignment between climate-related disclosures and financial statements, a company should explain how the implementation of a transition plan will impact financial planning. A company should further consider how its strategic plan will impact its financial performance and position and cash flows over the short, medium and long term. In addition, to take climate change into account, a company may consider performing a sensitivity analysis on its transition plan. For further information, please also refer to *The Transition Plan Taskforce Implementation Guidance*.⁵⁸

Glasgow Financial Alliance for Net Zero

The Glasgow Financial Alliance for Net Zero (GFANZ) published a report *Expectations for Real-economy Transition Plans*, which outlines themes that financial institutions will be looking for in company transition plans. It includes specific components relating to financial planning (e.g. investment, budget), financial impact, financial statements, sensitivity analysis, financial metrics and targets.⁵⁹



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Further reading:

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The World Business Council for Sustainable Development (WBCSD) is a global community of over 225 of the world's leading businesses driving systems transformation for a better world in which 9+ billion people can live well, within planetary boundaries, by mid-century. Together, we transform the systems we work in to limit the impact of the climate crisis, restore nature and tackle inequality.

We accelerate value chain transformation across key sectors and reshape the financial system to reward sustainable leadership and action through a lower cost of capital. Through the exchange of best practices, improving performance, accessing education, forming partnerships, and shaping the policy agenda, we drive progress in businesses and sharpen the accountability of their performance.

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