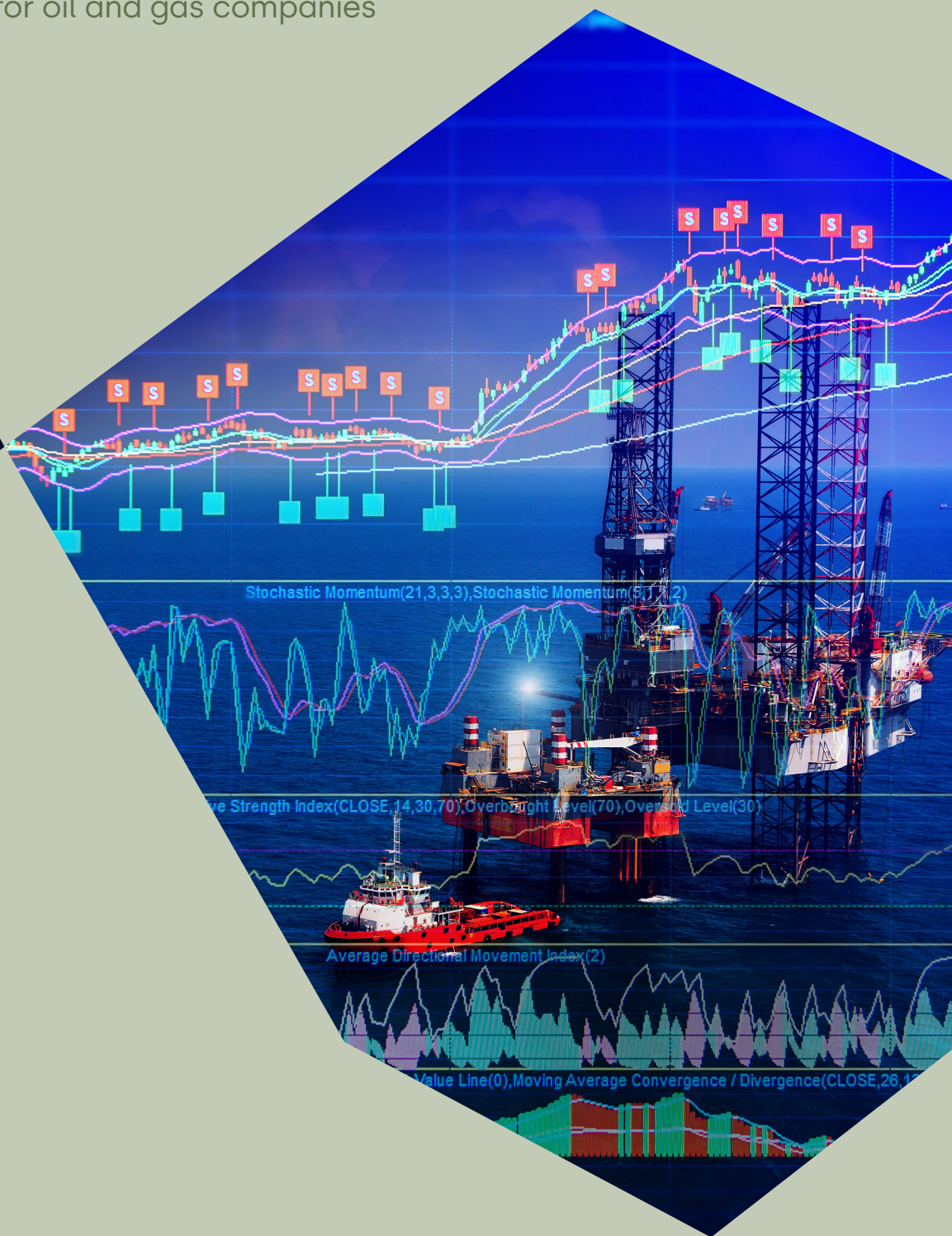


# Quantifying Climate-related Financial Impacts *in the Oil and Gas Sector*

→ A how-to guide for oil and gas companies



# Contents

<b>01.</b>	Executive <i>Summary</i>	04
<b>02.</b>	Chapter 1: <i>State of play - Existing guidance, emerging regulation and external perspectives</i>	08
<b>03.</b>	Chapter 2: <i>Challenges with quantifying and disclosing climate-related financial impacts</i>	19
<b>04.</b>	Chapter 3: <i>Quantification methods and best practices</i>	29
<b>05.</b>	Our call <i>to action</i>	43
<b>06.</b>	Appendices	46

# Contents

## List of figures

Figure 1: Oil & gas market capitalization by company count and geography	5
Figure 2: NZE by 2050 according to the International Energy Agency	6
Figure 3: TCFD thematic areas for disclosure (adapted from TCFD)	10
Figure 4: Percent of TCFD-aligned disclosures by industry sector	15
Figure 5: Levels of disclosure by region using TCFD	16
Figure 6: Common financial metrics assessed by Carbon Tracker	17
Figure 7: Strategy disclosure analysis by UK Financial Reporting Council of 25 premium-listed companies in the UK	18
Figure 8: Oil price assumptions for key NZE scenarios	27
Figure 9: Carbon price assumptions for key NZE scenarios	27
Figure 10: Example of milestone-driven definitions for future time horizons	33
Figure 11: Example of business plan-driven definitions for future time horizons	34
Figure 12: Key price assumptions	36
Figure 13: Total capital employed by business segment	36
Figure 14: Annual capital investment by business segment	37
Figure 15: Carrying amount, impairments and potential NZE impairments by business segment	37
Figure 16: Portfolio resilience to key sensitivities to the present value of EBITDA	39
Figure 17: Average annual revenue by business segment and scenario	41
Figure 18: Return on capital employed by business segment	42

## List of tables

Table 1: Major categories of financial impact and risks for the oil and gas sector	10
Table 2: Emerging regulatory frameworks and standards	12
Table 3: Physical climate risks, impacts and guidance	22
Table 4: Transitional climate risks, financial impacts and guidance	24
Table 5: General financial disclosure requirements	31
Table 6: Specified financial metrics for mandatory disclosure	32
Table 7: Recommended financial metrics for climate-related impacts	35

# Executive *summary*

01.

# Executive summary

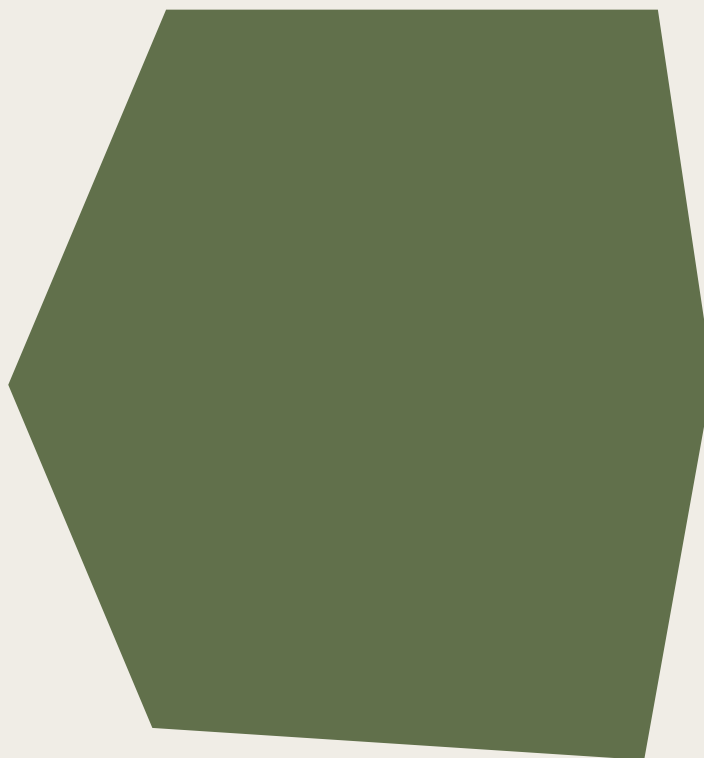
*Estimates put the global market capitalization of the oil and gas sector at USD \$6.5 trillion, which is equivalent to the combined gross domestic product of the United Kingdom and France in 2022. As the oil and gas industry transitions, this value will change and greater transparency on how this might occur is crucial to investors. Why? Increasingly with government support and incentives, such as the Inflation Reduction Act in the United States of America (USA) and the European Green Deal, investors marshal the needed energy investments into an orderly energy transition to a net-zero economy with an expectation for a reasonable rate of return. What drives us and our members in crafting this how-to guide? Our purpose is to help companies navigate the new regulatory disclosure requirements, enhance transparency and their dialogue with investors, improve corporate carbon performance and accountability, and accelerate the journey to a net-zero economy.*

Over the last few years, WBCSD has guided energy companies on how to implement the financial and sustainability reporting recommendations provided by the Task Force on Climate-related Financial Disclosures (TCFD). Yet, despite the remarkable progress companies made on climate-related reporting, there are growing demands from investors and regulators for more granular disclosures and greater transparency. And our member companies are listening and acting.

In anticipation of mandatory disclosure requirements, we continue our multi-year work by collating input and sharing best practices from leading oil and gas companies. Our work bridges the gap between TCFD reporting principles and the financial information needs of investors by providing detailed how-to guidance to oil and gas companies looking to take the next step in carbon performance and accountability. Our how-to guide will be of particular value to finance, accounting, investor relations and corporate reporting professionals in publicly listed oil and gas companies, as well as leading professionals in standard-setting and regulatory organizations.

We build on the recently issued International Sustainability Standards Board (ISSB) Climate-related Disclosure Standard and go beyond the TCFD recommendations by recommending current and forward-looking financial metrics that quantify climate-related risks. We also reflect on what regulators and industry watch groups are telling companies: While there are good examples of comprehensive climate-related reporting by some companies, many industry players are not disclosing enough on how they expect physical and transition climate risks to impact them financially. Our work on the quantification of metrics on financial position and performance paints a clearer picture for investors and allows them to evaluate an oil and gas company's financial progress through the energy transition.

Additionally, we review the emerging mandatory disclosure requirements in key jurisdictions such as the European Union (EU), United Kingdom (UK) and United States of America (USA) to prepare companies and help them navigate the growing list of climate-related financial reporting requirements. Growing disclosure demands on global companies require greater international alignment on reporting requirements. This would alleviate the reporting effort for companies by jurisdiction and provide a level playing field for the industry and investors, which will accelerate how the world collectively tackles the climate crisis and builds a sustainable economy.



## Why does this how-to guide matter?

Climate science, companies and investors are clear on the need for the global energy sector to decarbonize and create a net-zero carbon economy that will allow the world to limit the global warming increase to 1.5°C. As the global economy transitions, the financial value associated with oil and gas companies could change significantly – either because of changes in demand for oil and gas and related products or because oil and gas companies shift their portfolios towards low-carbon products, including renewables. Many global oil and gas companies<sup>1</sup> have already embarked on a transition journey and are transforming their energy products and services from fossil fuels to low- and zero-carbon energy; some companies may decide to keep oil and gas as their main products for a long time to come. Given these changes, investors, financial asset managers, shareholders and credit and insurance underwriters are increasingly seeking clear, reliable, comparable information to assess the climate-related financial impacts on the oil

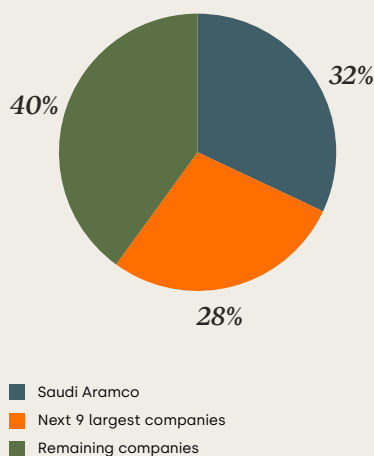
and gas sector. In part, this need for financial transparency led to the creation of the Task Force on Climate-Related Financial Disclosures (TCFD) in 2015 to “design a set of recommendations for voluntary company financial disclosures that promote alignment across existing regimes and clarify what may constitute material and relevant climate-related risks.”<sup>2</sup>

Current estimates put the market capitalization of oil and gas companies publicly listed on various stock exchanges worldwide at USD \$6.5 trillion<sup>3</sup>, which equals the combined 2022 gross domestic product of France and the United Kingdom. By comparison, the market capitalization of the 17 largest coal companies globally amounts to approximately USD \$0.2 trillion (or ~4% of the current oil and gas sector capitalization).

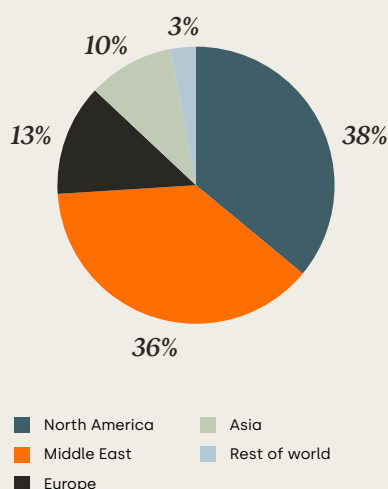
A key question is how the oil and gas market capitalization will change as the sector adapts business models and shifts revenue sources. As Figure 1 shows, only 10 multinational oil and gas companies hold about 60% of today’s oil and gas market capitalization, with Saudi Aramco, the largest global oil and gas company by far, accounting for a third of the total capitalization.

Figure 1: Oil & gas market capitalization by company count and geography

Oil & gas market capitalization by company



Oil & gas market capitalization by geography



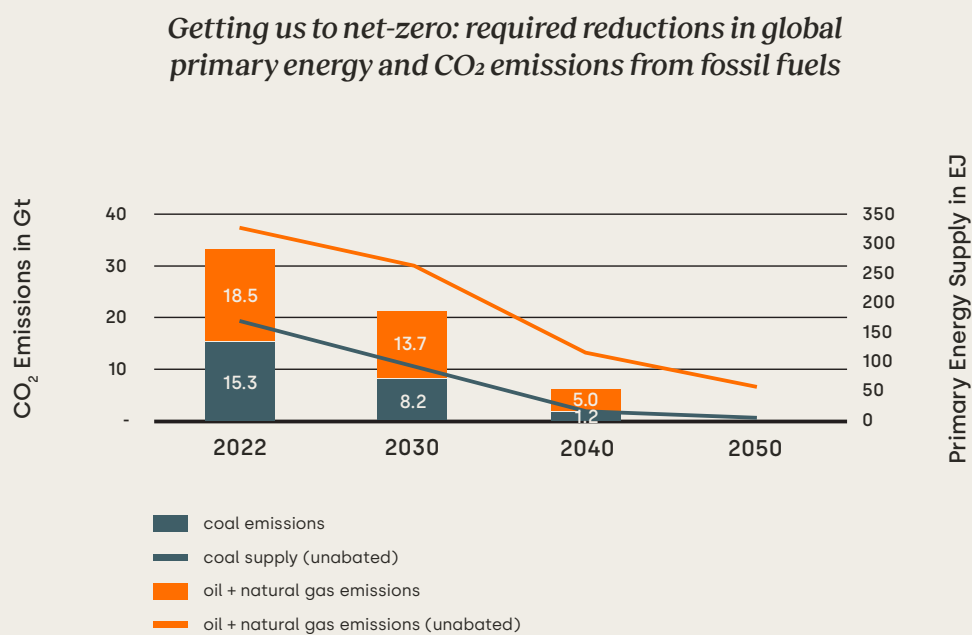
As many oil and gas companies have a net-zero emissions target, Paris-aligned scenario projections show that hydrocarbon production and emissions will reduce drastically over the coming two decades or sooner. The net-zero emissions (NZE) by 2050 scenario by the International Energy Agency (IEA) shows that oil and gas will remain in the global energy system longer than coal (see Figure 2) and thus most of the global CO<sub>2</sub> emissions will stem from burning oil and gas in the coming two decades.<sup>4</sup>

The oil and gas industry is highly exposed to the uncertainty around the pace and nature of the energy transition, in terms of future demand for fossil and low-carbon fuels. The declines in oil and gas demand will affect revenues, operational margins, cost of capital, return on investments, earnings per share and dividend payments. Oil markets are more global in nature than natural gas markets, so the changes and impacts will also have disproportionate regional implications with companies affected to varying degrees, depending on the mix of oil and gas assets in use, where they operate and to whom they sell their products.

To be transparent about the future financial impacts, many oil and gas companies, some of which are WBCSD members, have been reporting against the TCFD framework since TCFD published its final report on disclosure recommendations in

2017.<sup>6</sup> The TCFD status report from 2022,<sup>7</sup> however, highlights the following pertinent observations: About half of energy companies disclose climate-related metrics and, while "the levels of disclosure of climate-related metrics<sup>8</sup> and targets is relatively high, growth related to metrics has slowed" and the "majority of companies do not disclose information on specific scenarios." TCFD reiterates this in its final status report,<sup>9</sup> issued in October 2023. Interestingly, **companies headquartered in Europe disclose notably more than their US-based peers.** This is especially significant given that close to three-quarters of the oil and gas sector's market capitalization has headquarters in North America and the Middle East. As the regulatory disclosure requirements grow, a more level playing field will be created but companies will need time and spend more effort on compiling meaningful metrics and information for public disclosure. The pressure to be increasingly transparent by disclosing climate-related financial information comprehensively and comparatively will continue to grow. This report aims to provide companies with comparable metrics and help them manage carbon and financial performance more effectively. This will benefit investors and accelerate the much-needed change to a net-zero carbon economy.

Figure 2: NZE by 2050 according to the International Energy Agency<sup>5</sup>



Source: IEA WEO2023 NZE scenario

## About this report

**This report is a continuation of a series of WBCSD publications<sup>19</sup> advancing the implementation of the TCFD framework by industry.** It aims to bridge a recognized, crucial gap – providing oil and gas companies with **a voluntary how-to and best practice guide for quantifying climate-related financial impacts and disclosing them to the public via annual financial statements and annual reports.** As neither TCFD nor any international standard-setters, such as the International Financial Reporting Standards (IFRS), prescribe methodologies for the quantification of financial impacts, **we aim to provide guidance on comparable, transparent and clear methodologies** for estimating the financial impact of both climate risks and opportunities.

We also examine the emerging regulatory frameworks in various jurisdictions with the aim of preparing companies for their reporting requirements, which are clearly increasing as global awareness and scrutiny of environmental, social and governance issues rise among investors and society in general.

We have developed the recommended methods of quantification with WBCSD member company input. **Neither the observations in this report nor its recommendations are a product of TCFD or IFRS.** We hope that this report will help promote consistency in approaches and therefore better comparability between company disclosures. **Although this report offers detailed guidance, WBCSD is not a standard-setting organization and has no authority over what companies disclose.**

**The primary target audience of this report is finance, investor relations and corporate reporting professionals in publicly listed oil and gas companies.** The secondary target audience is general management, regulators and standard-setting organizations such as IFRS who can use the recommendations to provide further guidance such that financial impact assessments become clearer and comparable. This would **create a more level playing field for companies and enable more meaningful conversations with investors, shareholders and the public at large** relating to the financial impacts of the energy transition.

The reason for focusing our report on the oil and gas sector is two-fold: (1) WBCSD has already issued several other sector-specific guidance documents in the last few years and (2) the global energy transition will have a large impact on major oil and gas companies, especially considering the emerging regulatory disclosure requirements. Hence, we believe that this work is timely and addresses a key issue as oil and gas companies transform their portfolios over the coming years.

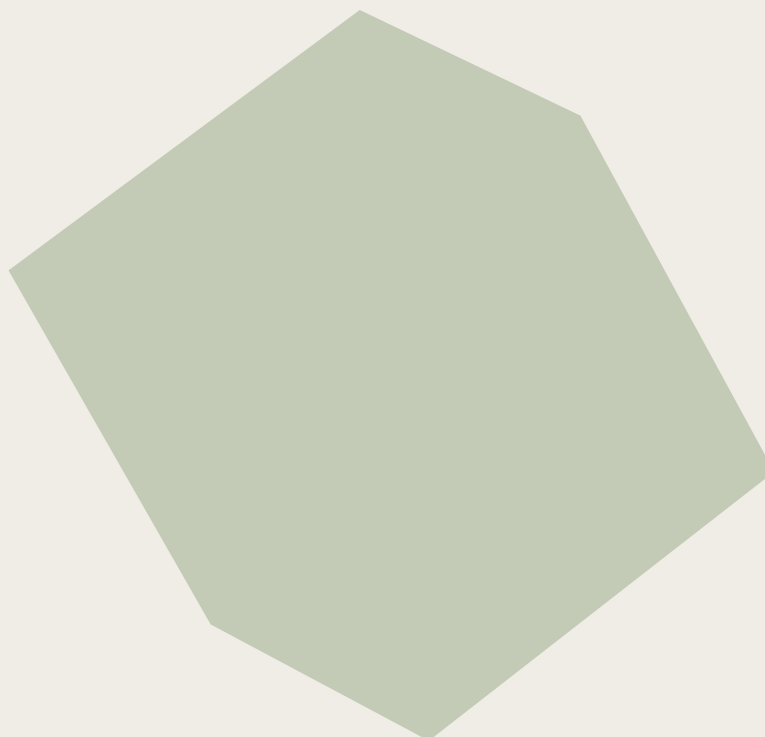
## Report outline

Chapter 1 describes the existing TCFD framework and issued guidance, summarizes the emerging regulation in key jurisdictions and presents how TCFD, industry watch groups and regulators see the progress and compliance by the oil and gas sector with the TCFD framework. We include a summary of the recently published International Sustainability Standards Board (ISSB) Sustainability Standards.

Chapter 2 pivots to the current approaches taken by oil and gas companies to financial disclosures and the underlying rationale. The chapter also examines some of the key challenges facing oil and gas companies and gauges the climate-related financial impacts and provides qualitative guidance to tackle these challenges.

Chapter 3 presents the detailed recommendations and best practices for calculating and disclosing the financial metrics and describes what aspects of climate change the proposed metrics address and how they will align with the emerging mandatory quantitative reporting requirements.

The report concludes with WBCSD's call to action to drive transparency, strive for better comparability and thereby advance the energy transition journey.





# Chapter 1:

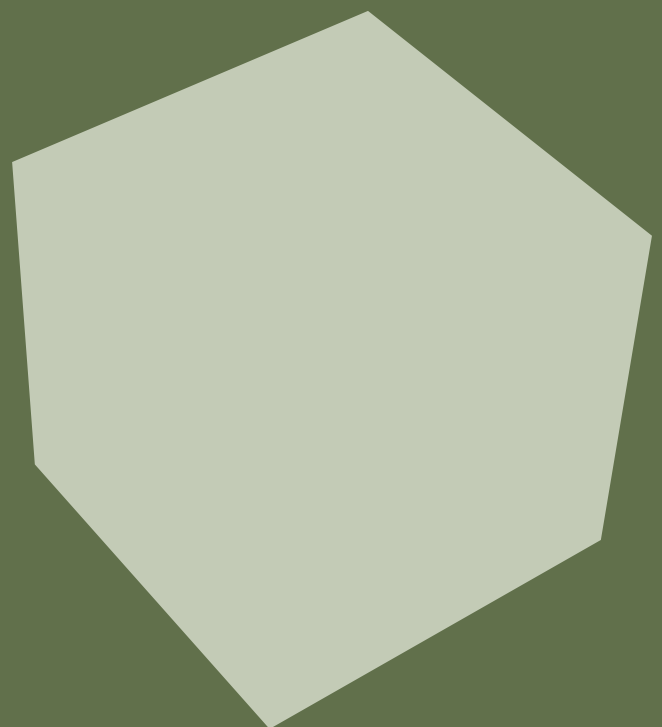
## *State of play*

- Existing guidance, emerging regulation and external perspectives*

02.

# Key messages

- **Our synopsis of the Task Force on Climate-related Financial Disclosures (TCFD) Status Report 2022** is that despite significant reporting progress, current reporting practices are still insufficient in terms of the financial metrics that help users understand future financial impacts and the disclosures are not readily comparable.
- **TCFD, as a voluntary disclosure framework, does not prescribe which financial metrics to use or how to calculate them.** TCFD has dissolved in Q4 2023 and the Financial Stability Board (FSB) has asked the International Financial Reporting Standards (IFRS) Foundation to take over the monitoring of the progress on companies' climate-related disclosures from TCFD as of 2024.
- **Repeated independent analysis of financial statements issued by oil and gas companies shows that there is no uniform approach to metrics;** sensitivities are useful but not readily comparable and financial inputs (especially commodity and carbon prices) do not necessarily align with externally published net-zero emissions (NZE) pathways.
- **The recently issued ISSB Sustainability Standards S1 and S2 and the European Sustainability Reporting Standards (ESRS)** answer the call over the last few years by many financial institutions, investor organizations and industry watch-groups for comprehensive disclosure standards and improved comparability of company exposure to climate risks and opportunities. The emerging regulatory requirements relating to climate-related financial impacts will mandate the increased disclosure of forward-looking assumptions and more comprehensive financial information.
- **The emerging draft regulations for climate-related financial disclosures in key jurisdictions differ from each other.** If they become law in their current form, then this will lead to greater compliance efforts due to the potentially varying mandatory requirements. We ask that regulators harmonize the requirements.



# Chapter 1: State of play

## - Existing guidance, emerging regulation and external perspectives

### Existing TCFD Guidance

The TCFD framework<sup>11</sup> guides companies on several voluntary, climate-related disclosure aspects and covers four thematic areas: (1) governance, (2) strategy, (3) risk management and (4) metrics and targets. TCFD provides disclosure recommendations for each theme. Companies using TCFD describe climate risks, impact and resilience under the theme of "strategy". The financial metrics that tie strategy to financial planning fall under the theme of "metrics and targets", which is the main subject of this report (see Figure 3).

TCFD<sup>12</sup> identifies the major financial categories that are impacted by climate risks and opportunities. Table 1 summarizes the categories in relation to risks specific to the oil and gas sector.

Figure 3: TCFD thematic areas for disclosure (adapted from TCFD)



Table 1: Major categories of financial impact and risks for the oil and gas sector

Financial category	Quantified & disclosed via	Generic risks & opportunities	Risks specific to the oil and gas sector (with focus on upstream)
Revenues	Income statement and Cashflow statement	Physical and transition risks	Demand for oil and gas products, long-term price uncertainty, ability to produce from existing or new infrastructure
Expenditures		Cost structure and ability to adapt to new supply chains	Competition for materials and supply chains is global and suppliers may choose the to exit the market, leading to rising costs or costs will fall as need for materials or equipment diminishes
Assets & liabilities	Balance sheet	Existing and committed future activities and decisions requiring new investment, restructuring, write downs, or impairment	Upstream oil and gas assets are valued and depreciated on the basis of the associated oil and gas reserves, which companies may not extract and could lead to large asset write-downs (devaluations) and potentially stranded assets
Capital & financing		Debt and equity structures and ability to attract capital and refinancing of existing debt	Cost of capital may rise due to the uncertainty of relating to the ability to extract oil and gas reserves in a timely manner and the rising costs of GHG emissions (e.g., via carbon pricing) factor fully into the production of oil and gas reserves

On top of identifying the key financial categories subject to climate-related risks and opportunities, TCFD has provided additional disclosure guidance to companies<sup>13</sup> such that they can inform investors about their current financial performance and financial position.

**Financial performance:** "Actual or potential changes to income and cash flow statements or other appropriate financial performance measures as a result of climate-related risks and opportunities [...]; impact on financial performance can include the following:

- increases in revenue from new products or services from climate opportunities
- increases in cost due to carbon prices, business interruption, contingency, or repairs
- changes to operating cash flow from changes in upstream costs
- impairment charges due to assets exposed to transition risks, and
- changes to total expected losses due to physical risks."

**Financial position:** "Changes to the balance sheet statement as a result of climate-related risks and opportunities can include the following:

- changes to the carrying amount of assets due to exposure to physical and transition risks
- changes to the expected portfolio value given climate-related risks and opportunities, and
- changes in liability and equity due to increases or decreases in assets (such as due to low-carbon capital investments or to sale or write-offs of stranded assets."

Most of the financial metrics listed above are relevant to oil and gas extraction activities; below is a more detailed explanation of why these metrics matter to oil and gas company financial performance and position.

- **Increases in cost due to carbon prices:** There are several functioning carbon markets and companies use the assumed future cost of carbon emissions in their financial modelling and decision-making. Therefore, carbon price assumptions have a direct bearing on capital allocation and current as well as future profitability.
- **Changes to expected business interruption due to physical risks:** Physical risks arising from acute and chronic climate events may lead to interruption of operations or prevent companies

from operating oil and gas infrastructure in the future, leading to a financial loss in the asset account of the balance sheet.

- **Impairment charges due to assets exposed to transition risks:** Impairment occurs when an asset, such as an oil platform or gas pipeline, has a recoverable value, either through continued use or sale, that is lower than the book (or carrying) value listed on the balance sheet.
- **Changes to the carrying amount of assets due to exposure to physical and transition risks:** The carrying amount (or carrying value) is the book value recorded on the balance sheet after deducting the accumulated depreciation (loss of economic value due to use of the asset over the course of its useful life). The company measures the impact on the carrying value due to future climate-related changes via the impairment test (as described above under "impairment charges").
- **Changes to the expected portfolio value, liability and equity due to increases or decreases in assets:** The company typically expresses the expected portfolio value by summing all discounted future cashflows of oil and gas projects and operations and is not part of annual financial statements. The portfolio value, liabilities and equity are a function of future revenues (driven by oil and gas production rates and prices of products), costs of operations (including carbon costs) and financing, exchange rates, and the oil vs gas produced (given that each product has different uses, prices and carbon emissions). A company may have to write off oil and gas assets, which may not recover the associated oil and gas reserves because the resulting carbon emissions are unacceptably high or cost prohibitive, weakening its financial condition.

**TCFD, as a voluntary disclosure framework, does not prescribe which financial metrics or assumptions to use to gauge the impact on the financial position or performance.** It leaves this to the companies. Financial standards such as US GAAP (Generally Accepted Accounting Principles, used in USA) and IFRS (International Financial Reporting Standards, used globally) partly govern this. For this reason, **TCFD is not planning to issue any further guidance as the global standard-setters and regulators in various jurisdictions look to embed the TCFD framework or use the ISSB standards in mandatory reporting going forward.**<sup>14</sup>

Many of the financial metrics covered by the existing financial accounting standards are current or backward-looking financial metrics.<sup>15</sup> Regulators require companies to disclose such financials to provide investors with reliable (and typically externally audited) information to make informed investment decisions; **it is up to companies to decide if they will disclose forward-looking financial metrics in their annual report. When doing so, they use legal disclaimers,<sup>16</sup> given that the view on future financial performance is inherently uncertain, potentially speculative and could mislead investors.<sup>17</sup>**

For companies to avoid the risk of litigation, given the inherent uncertainties relating to future financial performance and condition, most are careful and selective about issuing forward-looking statements to maintain degrees of freedom in decision-making, not exposing themselves to litigation or potentially misleading investors. This is not a new practice or driven by the uncertainties associated with climate change specifically. Chapter 2 covers the associated challenges and the financial disclosure practices chosen by oil and gas companies in more detail.

## Emerging regulation and standards

**Many countries and their regulators also recognize the need for comparable climate-related financial disclosures.** By design, our review is not meant to be exhaustive as the regulatory landscape is evolving rapidly. While we cannot know with certainty what regulators will write into law over the coming months, the trend towards more mandatory disclosures is clear. Regulators in several countries are in varying stages of drafting or implementing mandatory reporting requirements relating to climate impacts. Here, we focus on the emerging regulation, frameworks and standards in a few selected countries (EU, UK and USA), given their importance for the private oil and gas sector in terms of access to major capital markets and their associated mandatory disclosure requirements.<sup>18</sup> We also summarize the standards issued by the International Sustainability Standards Board (ISSB), which is an international standard-setting body created by the International Financial Reporting Standards (IFRS).

**Table 2: Emerging regulatory frameworks and standards**

Framework or standard	Issuing organization	Country or jurisdiction	Status	Effective date (target)
IFRS Sustainability Disclosure Standards	International Sustainability Standards Board (ISSB)	International	Final standard issued	2024
European Sustainability Reporting Standards (ESRS)	EU Commission	European Union members	Final standard	2024-2026 (with phase-in provisions)
Transition Plan Taskforce (TPT) Disclosure Framework	Transition Plan Taskforce (TPT)	United Kingdom	Final framework  Draft Oil & Gas Sector Guidance is open for public comment until 29 December 2023	To be decided, likely 2025
Proposed rule for the Enhancement and Standardization of Climate Related Disclosures for Investors	US Securities and Exchange Commission (SEC)	USA	Draft rule  Public consultation closed; final rule delayed	Unknown

Foundation to provide "rigorous, reliable and comparable sustainability information"<sup>19</sup> to make informed investment and economic decisions in the public interest. Many countries support ISSB, which is likely to set the global "gold" standard for financial disclosures. However, it is up to countries to decide on the mandatory regulatory reporting requirements and the effective dates for new disclosures.

Table 2 summarizes the requirements of the framework or standards as they stand currently. Note, however, that they are evolving or subject to change or ratification. Appendix B includes excerpts of the final or draft disclosure requirements by regulators.

**A high-level comparison of the proposed regulations shows all the proposed changes in financial disclosures are based on TCFD, meaning that companies must describe and quantify (to varying degrees) the financial impact of both physical and transition risks on their financial position and performance in the short, medium and long term. This entails more disclosures of forward-looking financial metrics and describing the expected future financial impact more clearly and transparently.** However, the differences among the requirements, if (or when) they become law, could lead to confusion among investors and will certainly lead to a greater reporting and compliance effort for companies, especially if countries require their own specific disclosures.

The European Sustainability Reporting Standards (ESRS) E1 standard is the most explicit and comprehensive in describing which financial metrics companies will have to report and expand on the requirements of the recently issued ISSB Sustainability Standards. However, ESRS reporting requirements are subject to materiality of the estimated impact and provide a phase-in provision, which means that companies can omit financial quantification in year 1 and make them qualitative years 2 and 3. The Transition Plan Taskforce (TPT) Disclosure Framework (UK) built on the ISSB standards. The proposed U.S. SEC rule covers many metrics, but which metrics will be part of a mandatory disclosures remains uncertain until the SEC issues the final rule.

**While the regulatory requirements are not final yet, the current issued ISSB standards are a leap forward** in terms of turning TCFD guidance and recommendations into a globally recognized standard. In this regard, the ISSB standards

address the calls many financial institutions, investor organizations and industry watch groups made over the last years for comprehensive disclosure standards and improved comparability of a company's exposure to climate risks and opportunities.

### *Additional voluntary disclosure frameworks, standards and initiatives*

In addition to TCFD and ISSB, there are several other, voluntary climate-related financial disclosure, frameworks, standards and assessments. Here, we highlight a few of these initiatives and industry standards, with the aim to share publicly available resources and ensure that we consider them in our guidance, especially in relevance to the financial metric recommendations (see Chapter 3).

→ **Global Reporting Initiative (GRI)**, founded in 1997: GRI is an independent, international organization working with businesses, investors, policymakers, civil society, labor organizations and other experts to develop the GRI Standards and promote their use by organizations around the world. The standards are advancing the practice of sustainability reporting and enabling organizations and their stakeholders to take action that creates economic, environmental and social benefits.

**Key resource:** Standard **GRI 11: Oil and Gas Sector 2021**, Topic 11.2 (Climate adaptation, resilience and transition) with additional sector recommendations such as reporting on:

- The emissions potential for proven and probable reserves;
- Internal carbon-pricing and oil and gas pricing assumptions that have informed the identification of risks and opportunities due to climate change;
- Climate change-related risks and opportunities affecting or that could affect the organization's operations or revenue;
- Development of currently proven and probable reserves;
- Potential write-offs and early closure of existing assets;

- Oil and gas production volumes for the current reporting period and projected volumes for the next five years;
  - Percentage of capital expenditure (capex) allocated to investments in prospection, exploration and development of new reserves, energy from renewable sources (by type of source), technologies to remove CO<sub>2</sub> from the atmosphere and nature-based solutions to mitigate climate change;
  - Other research and development initiatives that can address the organization's risks related to climate change;
  - Net mass of carbon in metric tons captured and removed from the atmosphere.
- **Carbon Disclosure Project (CDP)**, founded in 2000: CDP Global is an international non-profit organization that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. CDP uses the TCFD framework and disclosure recommendations extensively in its questionnaires to assess climate-related risks, opportunities and impacts.
- Key resource:** Collection and evaluation of financially relevant information and metrics, including:
- Type of risks and opportunities;
  - Type of financial impact (such as opex, capex, credit risk, revenues);
  - Financial impact figure (single value or range);
  - Cost of response to risk or to realize opportunity;
  - Use of scenarios;
  - Influence of risks and opportunities on financial planning;
  - Percentage share of spending/revenue aligned with organization's climate transition;
  - Green finance targets;
  - Oil and gas reserves (1P, 2P, 3P);
  - Breakeven price;
  - Carbon price assumptions.
- **United Nations Climate Disclosure Standards Board (CDSB)**, founded in 2007: The Climate Disclosure Standards Board is an international consortium of business and environmental NGOs, committed to advancing and aligning the global mainstream corporate reporting model to equate natural capital with financial capital. CDSB provides a framework for companies to report environmental information with the same rigor as financial information. In turn, this helps them provide investors with decision-useful environmental information via the mainstream corporate report, enhancing the efficient allocation of capital.
- Key resource:** A **checklist** to support preparers in identifying where climate-related matters that may be relevant in the preparation and presentation of financial statements in accordance with International Financial Reporting Standard (IFRS Standards), as issued by the International Accounting Standards Board (IASB).
- **Sustainability Accounting Standards Board (SASB)**, founded in 2011: SASB is a not-for-profit, independent standards-setting organization. SASB's mission was to establish and maintain industry-specific standards that assist companies in disclosing financially material, decision-useful sustainability information to investors. As of August 2022, the International Sustainability Standards Board (ISSB) of the IFRS Foundation assumed responsibility for the SASB Standards and has issued **guidance documents**.<sup>20</sup> The ISSB has committed to maintain, enhance and evolve the SASB standards and encourages preparers and investors to continue to use them.
- Key resources** (for the extractives & minerals processing sector): **Industry Standard** for Oil & Gas – Exploration & Production, which includes financially relevant metrics such as:
- Sensitivity of hydrocarbon reserve levels (proven and probable) to future price projection scenarios that account for a price on carbon emissions, using International Energy Agency (IEA) scenario sensitivity analysis;
  - Estimated carbon dioxide emissions embedded in proven hydrocarbon reserves;
  - Amount invested in renewable energy;
  - Revenue generated by renewable energy sales.

→ **Climate Action 100+**, founded in 2017: Five investor networks coordinate this investor-led initiative comprising about 700 investors: the Asia Investor Group on Climate Change (AIGCC), Ceres, Investor Group on Climate Change (IGCC), Institutional Investors Group on Climate Change (IIGCC) and Principles for Responsible Investment (PRI). A global Steering Committee supports this effort. The aim is to engage companies on improving climate change governance, cutting emissions and strengthening climate-related financial disclosures to create long-term shareholder value.

**Key resource:** Data collection and evaluation relating to capital investment in alignment with IEA scenarios, impairment price assessment and commitment to disclose per TCFD (including quantitative 1.5°C scenario analysis with disclosure of key assumptions, risks and opportunities).

→ **World Benchmarking Alliance (WBA)**, founded in 2018 at the 73<sup>rd</sup> session of the United Nations General Assembly: This joint initiative of Aviva, Index Initiative, the UN Foundation and the Business and Sustainable Development Commission aims to develop a series of benchmarks assessing 2,000 of the world's most influential companies on their contributions to the Sustainable Development Goals (SDGs).

**Key resource:** [Climate and Energy Benchmark in the Oil and Gas Sector Methodology](#), used to benchmark oil and gas companies

on a large set of metrics, including target-setting, investments in low-carbon projects, climate change oversight and stakeholder engagement.

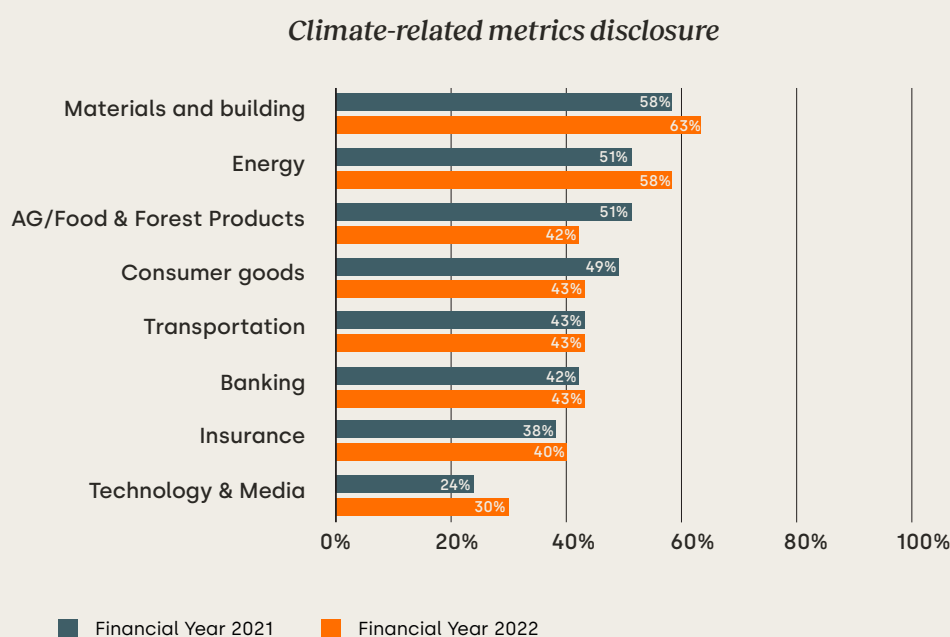
## The external perspective: What needs to improve?

Multiple organizations have been monitoring and commenting on the evolution of TCFD implementation by companies over the last few years. Their observations are crucial, as they provide an external view of the oil and gas (and other) industries and hold the mirror up to business, given its instrumental role in the energy transition and achieving the Paris goal. As with our review of emerging regulations, we cannot be exhaustive in this publication and hence present a snapshot of external viewpoints and recommendations; however, as we aim to cover a broad spectrum of viewpoints, we present findings from TCFD and the observations of regulators (UK Financial Reporting Council and UK Financial Conduct Authority) and an independent think tank (Carbon Tracker).

### TCFD (2022 and 2023 Status Report)

Given that that the TCFD framework has been in use for five years, it is prudent to take a closer look at what TCFD is observing after concluding its review of the reports issued by about 1,400 large companies.<sup>21</sup>

Figure 4: Percent of TCFD-aligned disclosures by industry sector



Source: TCFD 2022 & 2023 Status Report for FY2021



A few observations relating to climate-related metrics disclosures:

- The larger the market capitalization of a company, the more a company tends to disclose. This is intuitive, given what is at stake for large companies and the resources large companies can leverage in their disclosure efforts. Only mandatory regulation will level the playing field for large and small companies.
- While the energy sector (oil and gas, coal and electric utilities) is among the leading industries in terms of disclosures, the **gap to a complete disclosure per the TCFD framework remains high** (approximately 40-50% of companies reporting do not fully align with the TCFD framework and disclosure recommendations; see Figure 4).

The regional differences in reporting are striking (see Figure 5). Europe-based companies have a huge lead on their peers for a variety of reasons, ranging from higher risk of litigation to public perception.

While the uptake of TCFD has grown year-on-year since 2017 and the disclosure quality is improving, users of TCFD (investors and others, per a recent TCFD survey) are asking companies to:

- Disclose actual and potential financial impacts of climate-related issues on their businesses, strategies or financial planning;
- **Ensure consistency** in reporting climate-related targets across companies.

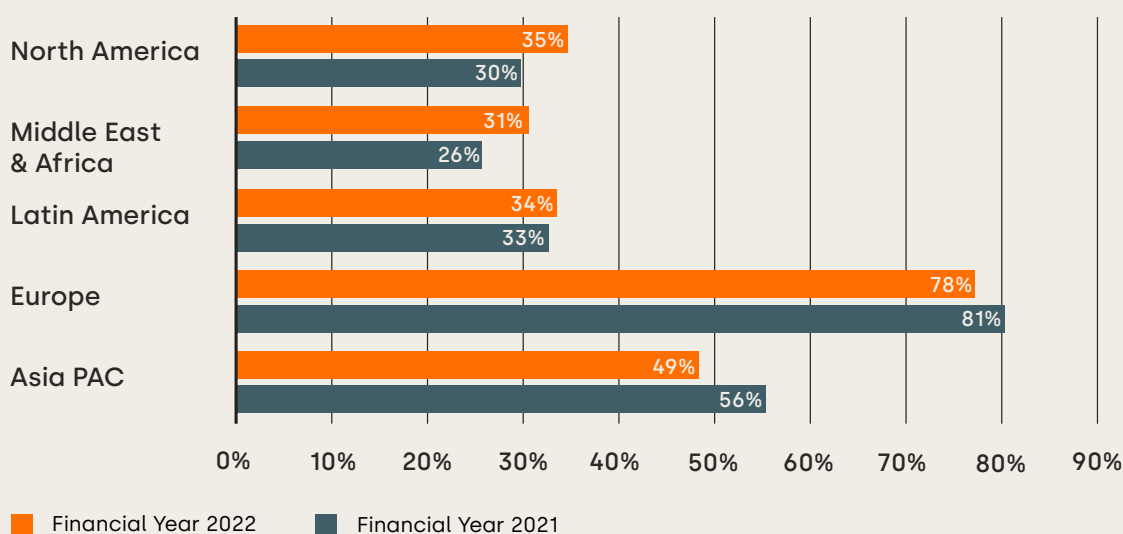
In other words, **current reporting practices are insufficient in terms of the financial metrics that help investors understand the future financial impacts and the disclosures are not readily comparable.**

### Carbon Tracker Initiative

The **Carbon Tracker Initiative**, an independent think tank, focuses on the impact of the energy transition on capital markets and carries out in-depth financial analysis of how the actions and investments by the fossil fuel industry affect global decarbonization efforts. With this aim in mind, the Carbon Tracker Initiative conducted a detailed analysis of the financial statements of 134 companies<sup>22</sup> from several industry sectors. The first publication – Flying Blind: The Absence of Climate Risk in Financial Reporting – in 2021<sup>23</sup> and its sequel – Still Flying Blind: The Absence of Climate Risk in Financial Reporting – in 2022 paint a critical view of the efforts by industry to disclose comprehensively and consistently.

Figure 5: Levels of disclosure by region using TCFD

### Regional Levels of Climate-related Metrics Disclosures



Source: TCFD Status Report 2022 & 2023

Using the **Climate Action 100+ Climate Accounting and Audit Assessment (CAAA) methodology**, Carbon Tracker noted a small improvement in financial disclosures from 2021 to 2022 but the **vast majority (94% for FY2021) of companies do not meet the criteria as laid out by the CAAA assessment and "disclosures remain insufficient"**<sup>26</sup>. Only eight<sup>25</sup> of 134 companies (or 6%) partially met the criteria. **It is noteworthy that all eight companies are based in Europe/the UK and five of the eight are oil and gas or electric utility companies.**

Drilling a bit deeper into the financial metrics assessed, the common quantitative climate-related inputs found by the analysis are commodity price assumptions, carbon price assumptions, estimated remaining asset lives and undiscounted amounts/estimated timing of asset retirements. Figure 6 shows how many of the 134 companies disclosed their key assumptions.

Carbon Tracker built on its 2022 analysis by **analyzing the impairment testing**<sup>26</sup> carried out by six large European oil and gas companies to show the range of information investors receive for one financial metric. The analysis yields that **there is no uniform approach to metrics, sensitivities are useful but not readily comparable and the financial inputs (especially commodity and carbon prices) do not necessarily align with externally published net-zero emissions pathways.**

To improve reporting of financial impacts, Carbon Tracker makes several recommendations to companies; we highlight only those relevant to this report. In the view of Carbon Tracker, companies need to:

- "Clearly indicate how they have incorporated the financial impacts of material climate-

related risks and their own commitments, as relevant, into the financial statements;

- Disclose, in the notes, the quantitative climate-related assumptions and estimates;
- Clearly and fully explain any significant differences across their climate-related reporting;
- Perform and disclose the results of sensitivities that reflect additional climate-related risks, including NZE, and the impacts of achieving their targets."<sup>27</sup>

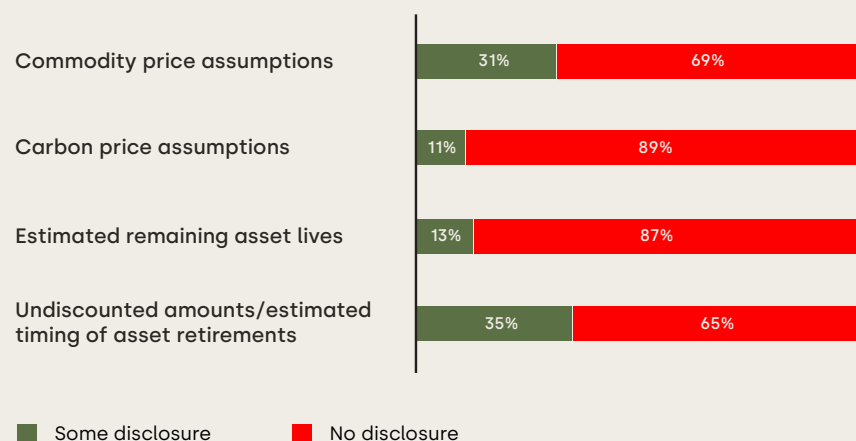
### UK Financial Reporting Council and Financial Conduct Authority

The **UK's Financial Reporting Council (FRC)**, which regulates auditors, accountants and actuaries in the public interest, issued a balanced, in-depth analysis of 25 premium listed UK companies that reported against TCFD in 2022.<sup>28</sup> The **analysis** was done in conjunction with the **Financial Conduct Authority (FCA)**, which regulates the conduct of businesses in the UK to ensure that the UK's financial markets are honest, competitive and fair.

The overall assessment is that UK companies are improving their TCFD disclosures but there are still gaps. Key themes are better, more quantified balance of risks and opportunities, improved integration of climate narratives and financial statements and clearer definitions and explanations of what issues are material for disclosure. The FRC recommendations align and resonate very well with the focus of our guidance:

The FRC expects companies to consider the **connectivity between TCFD disclosures and the financial statements**. Where necessary, it also expects companies to address if:

Figure 6: Common financial metrics assessed by Carbon Tracker



Source: Carbon Tracker, 2022

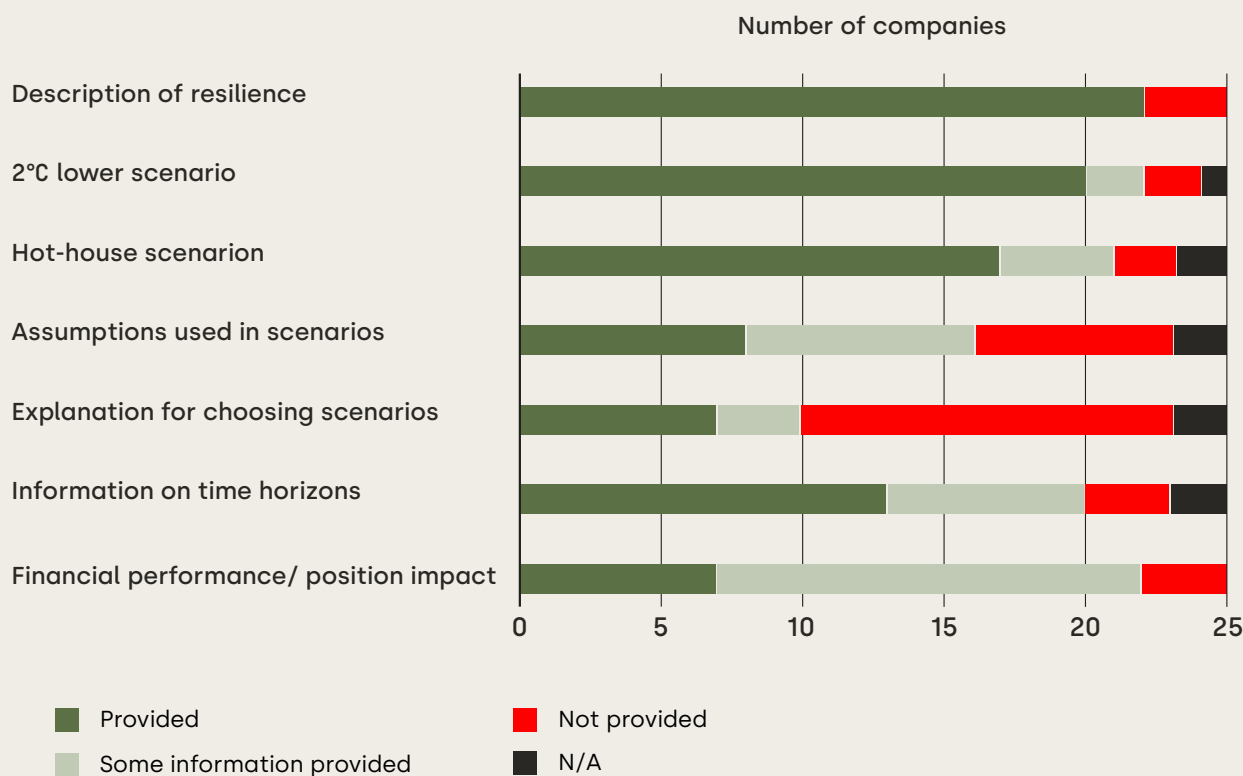
- The degree of emphasis placed on climate change risks and uncertainties in the narrative reporting, including TCFD disclosures, is consistent with the extent of disclosure about **how the company has reflected those uncertainties in judgements and estimates applied in the financial statements**;
- There is a need to elaborate on the **relationships between assumptions and sensitivities considered in TCFD scenarios**, including any Paris-aligned scenarios;
- The company has appropriately **reflected the emissions reduction commitments** and strategies described in the narrative in the **financial statements**;
- The segmental disclosures appropriately reflect the scale of growth of businesses and **extent of progress against climate-related opportunities referred to in the narrative reporting**;
- Discussion of matters that may have an adverse effect on asset values or useful lives in the narrative reporting is **consistent with positions taken in the financial statements**.

The FRC notes that most companies carried out scenario analysis but **only a quarter of companies disclosed quantified outcomes. Also, it is often unclear how scenario analysis informed the financial planning.** The FCA adds to this observation the recognition that quantified scenario analysis takes effort, data and capabilities that will take time to develop. Notably, only a small portion of the companies (7 out of 25) provided comprehensive, quantified disclosures relating to their financial performance/ position (see Figure 7).

The FRC makes detailed and clear recommendations on the use of scenarios. Especially pertinent to this report is the recommendation that companies should provide explanations of how scenarios, including **assumptions and sensitivities, correspond to financial statements.** We cover this aspect in more detail in Chapter 2.

The FRC also analyzed how climate targets affected the financial statements. The finding is that it "was often difficult to determine the extent to which the impact of targets on the financial statements had been considered, due to lack of company-specific disclosures."<sup>22</sup> **The FRC expects companies to assess the climate-related risks and explain how the risks will impact their financial statements.**

Figure 7: Strategy disclosure analysis by UK Financial Reporting Council of 25 premium-listed companies in the UK



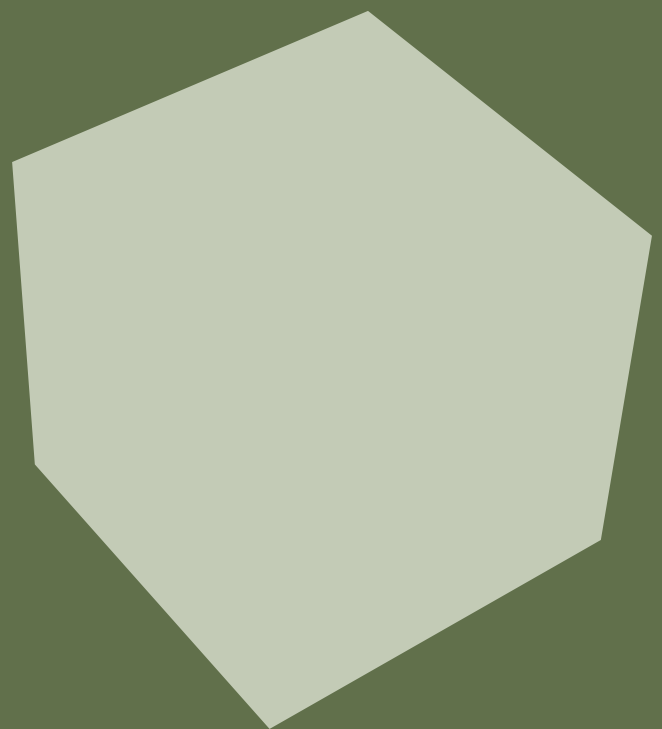
Source: FRC Thematic Review 2022

# Chapter 2: *Challenges with quantifying and disclosing climate-related financial impacts*

03.

# Key messages

- **Anticipating the change in consumer demand behavior and legislated measures** affecting oil and gas production is challenging and is the largest transitional risk for the oil and gas sector. Companies should capture demand uncertainty via commodity price sensitivities using scenarios, which is a TCFD-recommended practice.
- **We recommend that climate-related financial disclosures compare management's "best view"** with externally recognized net-zero reference scenario(s) that align with the Paris goal of limiting global warming to 1.5°C. Investors will understand how management sees the future and how this view compares with normative NZE scenarios.
- **The current financial quantification emphasis is mostly on estimating the impact on the financial position.** The approach should expand to quantifying the impacts of physical risks and include more forward-looking metrics relating to financial performance. This is likely to be part of the disclosure requirements in several jurisdictions.



## Chapter 2: *Challenges with quantifying and disclosing climate-related financial impacts*

The call for more action for companies to provide improved disclosures is clear. This chapter explores the underlying issues and summarizes the current approaches taken by oil and gas companies in their application of TCFD to date. Also, we examine the key transition risks facing the oil and gas sector and provide guidance on how to tackle them.

### *Current approaches to TCFD*

As indicated in the introduction of this report, a large portion of the oil and gas sector consists of a few major international (often simply referred to as the "Majors" or IOCs) and national oil companies (or NOCs). Members of the **Organization of Petroleum Exporting Countries (OPEC)** supplies about **40% of the current global oil production via their national oil companies**<sup>30</sup> and their share is likely to grow as other companies wind down their oil and gas production of more costly oil reserves in the drive to net-zero emissions. In our view, the oil and gas companies that are on the forefront of disclosing climate-related financial impacts per TCFD are European IOCs such as BP, ENI, Shell and Total Energies. US Majors such as Chevron and ExxonMobil have adopted TCFD but quantify less in terms of climate-related financial impact, likely due to the risk of litigation, which is high and consequential in the USA. Saudi Aramco, the largest oil company in the world, and many other national oil companies do not report against TCFD. The remainder of global oil and gas production and trade comes from small- to mid-sized independents, some of which have adopted TCFD.

The focus here is on the approaches taken by the leading IOCs to date. Many adopted TCFD in 2017, when the organization published its final recommendations, and have expanded the scope of their climate-related financial disclosures over the last five years. **To date, the emphasis is primarily on estimating the impact on the financial position;** specifically, the companies assess and disclose to what extent future climate-related risks could impair the asset book value (or carrying amount) listed in the balance sheet for the current reporting period. Companies conduct this assessment by applying the impairment test, which an IFRS standard<sup>31</sup> for financial statements prescribes. The way companies apply the impairment test varies as each company determines the assumptions for price, production, costs and discount rate (meaning standards do not prescribe what assumptions to make, which limits the extent of like-for-like comparisons).

IOCs and NOCs recognize that the largest uncertainty is the long-term demand for oil

and gas products. Given that oil and gas are commodities traded in liquid markets and prices are a function of demand and supply, price sensitivities are the most pragmatic way to deal with the range of demand uncertainty. Additionally, companies develop low-mid-high production forecasts for various purposes, but it is best to address demand uncertainty by taking a best estimate production forecast and varying the oil and gas price assumptions to evaluate the range of future revenue variation. The second largest uncertainty and variable in impairment testing is the future cost of CO<sub>2</sub> emissions. Like for oil and gas prices, companies typically use a range of CO<sub>2</sub> prices to assess climate-related financial impacts.

Next to asset impairment testing, portfolio (or resilience) testing is the other main financial impact assessment and is a measure of assessing financial performance. Companies assess the robustness of their oil and gas portfolios by considering the portfolio mix (oil vs gas vs other/green assets) and key sensitivities such as commodity prices and carbon costs. They also consider the impact of the discount rate (or cost of capital) in determining the impact of climate risk on the market value, expressed financially in the form of net present value (NPV) at the weighted average cost of capital (WACC). Companies recognize that climate risk may negatively impact their ability to access capital or that the cost of debt will rise. However, WACC is subject to several variables and, while climate-change risks may impact WACC, there is no unambiguous link between them. Some companies prefer the NPV metric, which is also one of the key financial metrics for internal capital decision-making and allocation, others prefer to measure the climate-related financial impact via changes to EBITDA (earnings before interest, taxes, depreciation and amortization), which is a measure of operational profitability and eliminates the financial overprints of taxes, capital and depreciation costs. While each metric serves a purpose, the use of different metrics makes comparability among companies more difficult. Organic break-even prices are yet another metric some companies choose to assess the resilience of their portfolio against assumed oil (and gas) prices.

The biggest challenge to comparability is, however, the fact that many oil and gas companies do not disclose the financial impacts of climate risks. Thus, the following sections provide a qualitative guide on how to approach the quantifying of climate-related impacts. Chapter 3 complements this by offering more detailed recommendations for financial quantification.

## Risks and opportunities for oil and gas companies during the energy transition

TCFD groups climate-related risks and opportunities<sup>32</sup> into two major categories: physical and transitional risks. Our aim here is not to guide companies on how to assess these risks and opportunities as the portfolios and transition strategies differ significantly among oil and gas company for many reasons. Also, the annual business planning process, which companies often use to generate impairment tests and quantify climate-related financial impacts, is different for each company. However, it is useful to consider key distinguishing features among oil and gas companies globally, as they will affect both the physical and transition risks and hence the financial performance in the long-term.

### Physical climate risks

The location of up-, mid- and downstream facilities affects the physical risk exposure, in particular as certain locations will be much more susceptible to more frequent severe weather phenomena. This risk also applies to supply chains and facilities, which provide power, materials and other resources to oil and gas facilities. Policy action in certain countries may also impose the risk of stranding assets, especially if companies are to curtail oil and gas production to meet climate policy targets. Table 3 presents an overview of physical risks relevant for the oil and gas industry.

Physical risks can have large financial impacts, but companies can mitigate them technically to quite an extent. By example, offshore facilities can

withstand severe storms and operate in very hostile conditions. While regular maintenance inspections and facility upgrades will increase the cost of operations, the risk for many offshore installations is relatively low unless acute weather events become more frequent. The oil and gas industry has been operating in very deep waters (such as the Gulf of Mexico, exposed annually to hurricanes) and severe climates (like the North Sea, with severe winter and maritime conditions) for decades and thus the increased risks associated with more severe weather conditions are mitigated to an extent by appropriate technical means but the extent of financial impacts will remain uncertain. Acute weather events are likely to increase production deferral and lead to more equipment damage, which will result in higher maintenance costs and lower (or deferred) revenues.

Similarly, onshore facilities, which operate in certain ambient temperature conditions, may require upgrades at relatively high costs if their design envelopes prevent the facilities from dealing with consistently higher or lower temperatures; a good example of this risk is the failure of the natural gas grid in Texas, USA, during an extreme and uncommonly long winter storm in 2021. Many facilities do not have sufficient insulation to deal with prolonged deep freezes.

Insuring against weather-related impacts is a financial mitigation option but insurance premiums are likely to increase as weather becomes more erratic and extreme; companies need to anticipate the change in insurance premiums in estimating future operating costs as used in business plans and impairment testing.

**Table 3: Physical climate risks, impacts and guidance**

Physical risks	Impact on financial metrics	Guidance
<b>Chronic</b> location-specific climate changes that are predictable (seasonal storms, average change in temperature/heat stress, annual sea level rise, permafrost thawing, coastal erosion)	Reduction in operational uptime and loss of revenue  Increases in operational and capital expenditure for maintenance, repairs and adaptation measures, including longer term increases in cost of capital due to perceived elevated risk when operating in physically vulnerable locations (e.g., low-lying coastal areas, the Arctic)	Revenues: Assess how to adjust the forecasted operational uptime of assets leading to production/revenue deferral (e.g., using bottom-up or top-down approaches, with a focus on at-risk locations and material assets).  Opex: Identify material assets that may require larger maintenance budgets.  Capex: Identify existing assets with insufficient technical design envelopes relative to expected future operating conditions and estimate the capital investments required for upgrading. For new assets, consider wider technical design envelopes and costs accordingly.  Review and adjust cost of capital and insurance premiums annually.
Uncertain water or electricity supply		Assess and account for supply chain disruptions to water and electricity and if adaptation measures are required to create alternative or back-up solutions.
<b>Acute</b> and increasingly frequent natural phenomena that are mostly unpredictable (wildfires, erratic storms, unusually high precipitation, heat or cold waves, drought, flooding, hail, wind, extreme heat and cold waves)	Reduction in carrying value (asset value); in extreme cases, resulting in total write-off	Given that such risks are unpredictable, consider the source of funding to deal with major production outages, including the potential for environmental and human harm, at the corporate level.

Many large oil and gas facilities are in low-lying coastal areas where there are oil and gas reservoirs or where crude oil and raw gas arrive from more distant offshore reservoirs. Such areas, like the Niger delta and Mississippi delta, are likely to experience more extreme flooding events, which again will exert downward financial pressure due to higher costs in the form of maintenance and capital investment for mitigation measures. A prudent approach to take is to track and review annual maintenance costs and increase them to account for physical risks in the coming decades.

Both future revenue and cost assumptions will impact the carrying value of assets, but the impact is moderate, provided that companies take the necessary precautionary measures to prepare for physical risks. The oil and gas industry is adept at dealing with physical risks as evidenced by having pushed production to ever more hostile and challenging regions over the last few decades through technical innovation. However, extreme weather conditions will become more frequent, exposing facilities in many parts of the world to increasing disruptions and requiring them to undergo more maintenance or weatherproofing. Financially, this will lead to revenue loss and increased costs. In case of total loss of assets due to storms or flooding, the capital investment required for rebuilds can be exceptionally large, especially in the case of large refining and petrochemical complexes, liquefied natural gas (LNG) facilities and large offshore platforms.

Guidance for financial disclosures relating to physical risks:

- Distinguish between physical risks that are acute vs chronic and determine how to account for the risks in revenues, maintenance costs, litigation costs via the annual business planning process. Assess and plan for increases in insurance premiums.
- Consider which physical risks lead to short vs long-term exposure and how the timing of exposure relates to the estimated life of assets.
- For material assets, use a bottom-up approach to assess each risk individually and include mitigating costs (for maintenance or other adaptation measures). An alternative approach is to set aside costs at a corporate or portfolio level (for example, via a percent increase to costs). Also consider changes in production/revenue loss or deferral due to

physical risks. Material assets are those that contribute significantly to the carrying value and future revenues of the corporation; be clear in disclosures what is "material" to the financial position.

- Describe the chosen method for estimating the costs and investments relating to physical risk mitigation and disclose the associated capital and operating expenses in the annual report. Update the capital and operating expenses annually and report on changes for three reporting cycles (current year and the two preceding reporting periods).

### Transition risks

The transition risks are undoubtedly larger and even more difficult to quantify, given the inherent uncertainty in how and at what pace the energy transition will unfold in various parts of the world. Here, we describe the main transition risks and how they relate to the future financial performance. Table 4 provides a more comprehensive list of transition risks.

The change in customer and consumer demand behavior and legislated measures affecting oil and gas production are the largest transition risks and will depend on many factors and vary by country. Many oil and gas companies respond to this risk by setting decarbonization targets and changing the portfolio by increasing the share of assets with lower carbon intensity. Shareholder preferences and activism, the ability to access capital and general societal acceptance will also affect the chosen transformation strategies of companies. For those oil and gas companies that aspire to become large renewable and low-carbon energy providers, the return on investment will most likely reduce as the asset mixes become "greener".

One of the main reasons for this is the fact that renewable energies carry an intrinsically lower risk – oil and gas exploration was and remains a highly uncertain undertaking. The energy source uncertainty<sup>33</sup> for renewable projects is, relatively speaking, smaller. Despite recent supply chain constraints and rising costs for renewable projects, the longer-term outlook is that the costs for renewable technologies will probably continue to fall as supply chain issues resolve. The price of energy is the common denominator that drives consumer choices and policy action in the form of subsidies, carbon tax or other levies, all of which will affect the financial performance of oil and gas companies.



The relative mix of crude oil and raw gas production (upstream) and relative mix of oil and gas products (downstream, refineries and chemical manufacturing) vary by company and country. Several future energy scenarios foresee that gas will remain in the global energy system longer, mostly due to its lower carbon intensity. Thus, companies may shift their portfolios away from oil to gas assets in the medium term. However, gas sells at lower prices than oil in energy equivalent terms and this will affect future revenues. Gas markets and prices are regional in nature and the dynamics of gas markets require modeling at a regional level to understand the financial performance impact.

The relative carbon footprint (scope 1, 2 and 3 GHG emissions, in particular emissions associated with use of sold products) and carbon intensity of oil and gas products vary due to their different chemical compositions, which affects quality (heating value), the oil or gas price and the related carbon costs. Additionally, companies take different approaches to decarbonize their own energy use (scopes 1 and 2 GHG emissions) to produce and sell hydrocarbon products. As stated previously, the assumed cost of carbon emissions is a key variable affecting financial performance.

Further guidance for financial disclosures relating to transition risks:

- Capture demand uncertainty for oil and gas production (including refined products) via commodity price sensitivities, which currently is a customary practice. A simultaneous or double sensitivity of both production and price makes it difficult to discern the assumed cause and effect and, consequently, we discourage it. It is fair to assume that market mechanisms will balance supply and demand via price, which should be the dominant sensitivity in assessing impacts to carrying value and portfolio resilience. For low-carbon energy carriers such as hydrogen, companies should address demand uncertainty separately from assumed prices because the markets are still in nascent stages of development.
- Ensure the uncertainty relating to rising carbon price (or carbon taxes) is the second most relevant sensitivity, especially when assets are operating in established or voluntary carbon markets.
- Describe portfolio shifts from oil to gas products to low- and zero-carbon energy explicitly and the expected impact on revenues associated with such a portfolio change in the short term.

**Table 4: Transitional climate risks, financial impacts and guidance**

<i>Transition risks</i>	<i>Impact on financial metrics</i>	<i>Guidance</i>
Changes in product demand (consumer behavior, societal pressure and activism, generational change)	Lower revenue (due to lower demand and lower prices)	Estimate and disclose impacts via a range of scenario sensitivities (varying commodity prices and carbon cost assumptions).surance premiums annually.
Carbon emission costs and ability to emit	Higher carbon prices/costs, leading to lower revenue	Include carbon emission limits in the scenario analysis.
Public policy measures (limitations to production, increases in fines, phase out of internal combustion engines and boilers)	Higher capital costs and discount rates, affecting cost of debt and profit margins	Assess policy risks by jurisdiction. Disclose any judgements applied to the best estimate outlook.
Access to capital markets		Include cost of capital sensitivities in scenario analysis, impairment and portfolio robustness tests.
Increasing risk of litigation or onerous contracts	Higher costs due to litigation and compensation and inclusion of contract penalties in project cashflows	Review annually the cost of litigation and estimate the potential for future litigation costs at corporate level.
Stranded assets/impairment	Reduction in carrying value (asset value); in the extreme case resulting in total write-off	Apply scenario analysis to determine the conditions under which impairments can occur (with focus on price sensitivities).
Disruptive technologies and low-cost alternative energy carriers (which can also be a transition opportunity for some companies)	Compensating or higher revenues due to the transition to renewable energies	Compensating or higher revenues due to the transition to renewable energies

- Disclose the revenues and capital expenses related to oil/gas developments vs renewable projects and determine if the shift in capital allocation aligns with a stated net-zero target and transformation of the portfolio.
- Assess the risk of climate-related litigation and disclose relevant financial assumptions made.
- Describe the chosen price sensitivities and disclose the assumptions made and observed financial impacts. Update the sensitivities annually and report on changes for three reporting cycles (current year and the two preceding reporting periods).

But how can companies quantify what is inherently uncertain and unpredictable? The use of scenarios of future states is one of the best ways of evaluating the impact of transitional risks. The next section focuses on scenarios and how companies can use them in assessing climate-related financial impacts.

### *On the use and selection of climate reference scenarios*

The development and use of climate and business scenarios is one of the most useful means of assessing probable future states and preparing for inherent uncertainties. TCFD recommends the use of climate-related scenarios as part of its 2017 recommendation for companies to describe their strategy resilience. But this is not an easy task for companies: as noted by TCFD in the 2021 Status Report<sup>34</sup>, about 60-70% of preparers struggle with obtaining relevant data and selecting methodologies to quantify the impacts on financial position and performance. TCFD urges companies disclose the “*resilience of their strategies under different climate-related scenarios, including a climate-related scenario aligned with the latest international agreement on climate change*”.<sup>35</sup>

Since 2021, WBCSD has convened leading companies to compile climate-scenarios for use as reference scenarios. The most recent 2023 publication, [Climate Scenario Analysis Reference Approach: For companies in the energy system](#), with support from TCFD, describes the suite of reference scenarios. The underlying [scenario reference catalogue](#) v2.0 allows companies to compare several publicly available reference scenarios and extract variables for range of applications.

The scenario catalogue contains three scenario families:

1. **Paris Ambitious 1.5°C:** Scenarios with outcomes designed to keep temperature rise to less than 1.5°C above pre-industrial levels with limited/no overshoot
2. **Paris Aligned Well-Below 2°C:** Scenarios with outcomes designed to keep temperature rise well-below 2°C above pre-industrial levels with limited/no overshoot
3. **Current policies/business as usual (BAU) 2.5 – 3.5°C:** Scenarios that reflect the range of current climate policies and Nationally Determined Contributions (NDCs), implying a temperature rise between 2.5-3.5°C

Each scenario family contains several scenarios from globally recognized, publicly available sources. Here we focus only on the first family (Paris Ambitious 1.5°C) as most companies (should) use such scenarios to set their net-zero targets and, as such, 1.5°C-aligned reference scenarios are most relevant for climate-related financial disclosures. Our guidance is to **start any climate-related financial impact analysis by comparing management’s “best view” with externally recognized net-zero reference scenarios**, which align with the Paris goal of limiting global warming to 1.5°C. We **highly encourage the use of additional scenarios (or scenario families)**, given that covering the range of future conditions and outcomes requires several scenarios.

Annex C summarizes the **Paris Ambitious 1.5°C scenario family** and we provide a brief description of the underlying model for comparison purposes. **These scenarios are normative**; in other words, they make assumptions about energy demand, energy carriers, technologies, prices, costs and regulation that curb global greenhouse gas emissions over the coming decades such that the global temperature rise does not exceed 1.5°C. To achieve this, the models make use of the remaining available global carbon emissions budget, which the world must not exceed if global warming is to remain below the 1.5°C target. The various scenarios differ in their assumptions and it is beyond the scope of this guide to opine on whether the assumptions are likely or whether any one scenario uses “better” assumptions.

What is of relevance for this guide are the principles WBCSD uses to select the scenarios listed in Annex C – that the scenarios already exist, are business relevant, are readily accepted by investors and other stakeholders and, most importantly, are deemed neutral and authoritative, meaning they consider a range of possible future industry and market developments, options and solutions drawn from public scenarios without a particular vested commercial interest. Primary reference scenarios recognized by the financial community are those published by:

1. The [International Energy Agency \(IEA\)](#)
2. The [International Renewable Energy Agency \(IRENA\)](#)
3. The [Network for Greening the Financial System \(NGFS\)](#)
4. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) scenarios (available via [International Institute for Applied Systems Analysis \(IIASA\)](#))
5. United Nations-supported [Principles for Responsible Investment \(PRI\)](#).

The 1.5°C-aligned scenarios from the IEA and NGFS contain a similar number of variables that companies can download from WBCSD's scenario catalogue and are relevant for assessing transitional risks and financial modeling. NGFS has developed climate scenarios for central banks and supervisors as well as financial institutions (banks, investors and insurers) to use in stress testing and scenario analysis exercises. Energy (including oil and gas) companies tend to use the scenarios developed by the IEA because it provides more sector-specific information and is well-documented by the IEA annual [World Energy Outlook \(WEO\)](#) flagship publication. ISSB cites the IEA (WEO) scenario in its series of industry-based guidance documents for the oil and gas sector.<sup>36</sup>

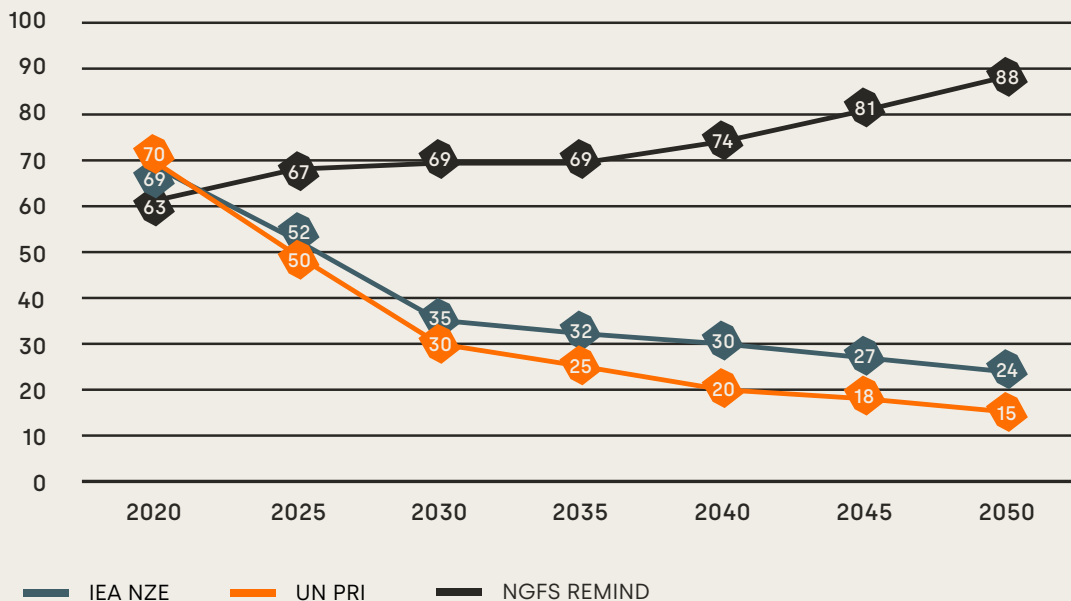
For physical risk assessments, scenarios that lead to temperature increases beyond 2.0°C are insightful as such climate scenarios will expose the threat of chronic weather events.

To illustrate how key assumptions such as oil and carbon price can vary among net-zero scenarios, we compare the assumptions made by the UN PRI, NGFS and the IEA NZE scenario in Figures 8 and 9; while all scenarios strive to achieve net-zero carbon emissions, the underlying key price assumptions diverge very quickly. The differences between the models underline the importance of using several scenarios but it is necessary to determine which ones to choose to ensure comparison of climate-related financial impacts across companies.

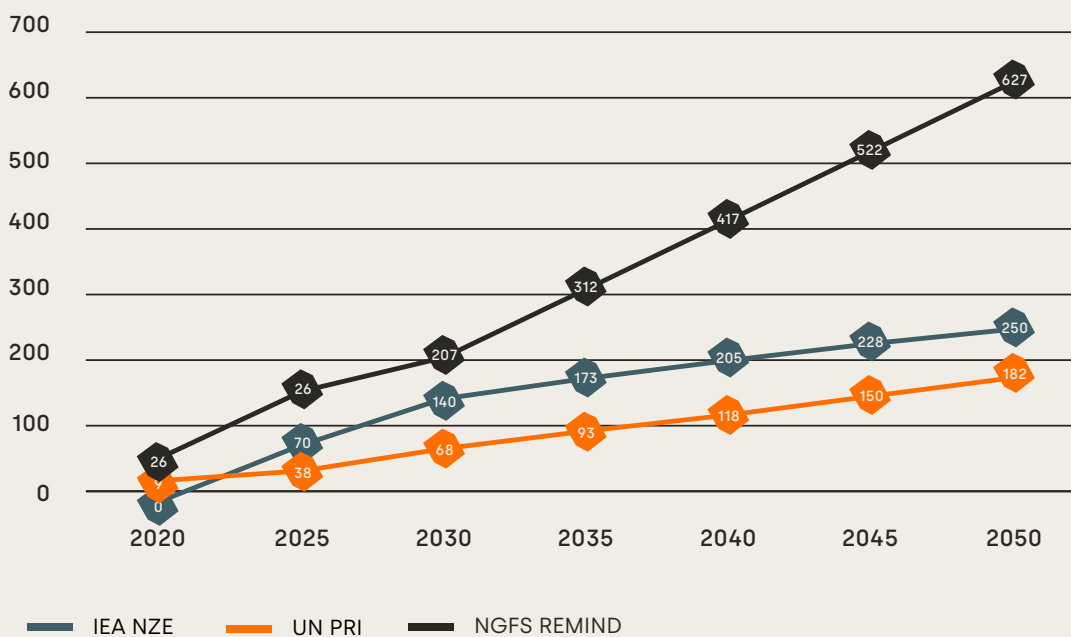
**Firstly, given the range of uncertainties, especially likely oil and gas price volatility, companies should use several scenarios to assess financial impacts. This aligns with the recommendation provided by TCFD.**

**Secondly, we recommend the IEA's Net Zero Emission (NZE or 1.5°C aligned) scenario as a possible climate stress test.** Given the wide acceptance of the IEA's scenario work among many stakeholders, including the IEA NZE scenario among a range of scenario sensitivities ensures there is one common, comparable sensitivity analysis across company disclosures. We recognize that several alternative pathways can lead to a net-zero economy but it useful to include one common sensitivity in corporate disclosures.

**Figure 8: Oil price assumptions for key NZE scenarios** (in USD \$ /barrel of crude, real terms 2021)



**Figure 9: Carbon price assumptions for key NZE scenarios** (in USD \$ /t CO<sub>2</sub>, real terms 2021)



### *The challenge of disclosing forward-looking financial metrics*

As discussed in the previous section, **aligning on forward-looking scenario assumptions is not trivial, making comparability of climate-related information is difficult.** The main financial statements, as prescribed by accounting standards, are for the current reporting period (fiscal year) and issuing statements for future periods can lead to confusion. However, **forward-looking financial metrics can provide key insights into how company management assesses climate risks, providing that the intent of disclosing such information is clear.** Forward-looking financial metrics, like the statement for the current reporting period, are a **snapshot in time, subject to change and should not constitute targets**, given that the business and regulatory environment is in constant flux. **Management needs to be able to react to unforeseen events; this is as much a fiduciary duty as is disclosure of relevant information.** We propose a set of current period and forward-looking financial metrics in Chapter 3, which constitute disclosure beyond what TCFD is recommending but what is a likely expectation of mandatory regulatory requirements.

For companies listed in the USA, where the risk of litigation and class-action lawsuits is particularly high, the use of safe-harbor provisions can mitigate the litigation risk.

### *Other key metrics affecting financial statements*

**Rate of depreciation and use of proven oil and gas reserves:** Companies commonly depreciate upstream oil and gas assets using the unit of production (UOP) method, which depreciates the carrying value over time using the ratio of production and proven reserves.<sup>37</sup> Proven oil and gas reserves are those quantities (volumes) of oil and gas estimated to be technically and economically recoverable with a high degree of confidence and therefore are, by definition, low or conservative estimates. The estimate of proven oil and gas reserves thus has an impact on the depreciation, net income and portfolio/market value.<sup>38</sup> Publicly listed companies must report proven reserves and we recommend disclosing by the company fully depreciated the assets, given the current proven reserves. This disclosure provides an insight into the longevity (or useful economic life) of upstream assets and whether climate risks could prevent the recovery of the associated proven reserves and lead to asset write-offs (loss in carrying value and stranding of assets).

Operational and cost forecasting, however, does not occur on the basis of proven reserves but instead use a best estimate (or most likely or probable) volumetric estimate of reserves, which is typically higher than the proven reserve volume. In other words, the best estimate for the estimated future production life is very likely longer than assumed on the basis of proven reserves, which creates a disconnect between the method of depreciation and internal business planning practices. The disclosure of both the proven (or low case) and best estimate (or most likely or probable) volume estimate provides investors with a more complete view of the upstream asset lifespan and company value but such a disclosure is not mandatory in most countries.

**Onerous contracts:** Companies may have contractual oil and gas delivery obligations that they may not fulfil if climate risks curtail the production of oil and gas. In such a case companies may be subject to paying penalties or compensations when they cannot meet the contractual obligations.

**Deferred taxes:** Companies may benefit from or suffer the negative impacts of tax deferral at the corporate level, subject to the taxation rules in various countries.

**Decommissioning provisions:** Climate risks may accelerate the expected future decommissioning expense, especially in the case of assets becoming stranded (such as due to transition risks) or severely impacted operations (for example, due to physical risks). A key uncertainty is the extent to which portfolios might change during the energy transition and as companies sell fossil fuel assets. This uncertainty will have a significant impact on future decommissioning liabilities as these liabilities typically transfer to the new owners.

**Dividend resilience:** Companies that pay dividends should assess their capacity to pay them by applying net-zero price and carbon cost scenario assumptions and assess whether the cashflow will be sufficient to sustain dividend payment or not.

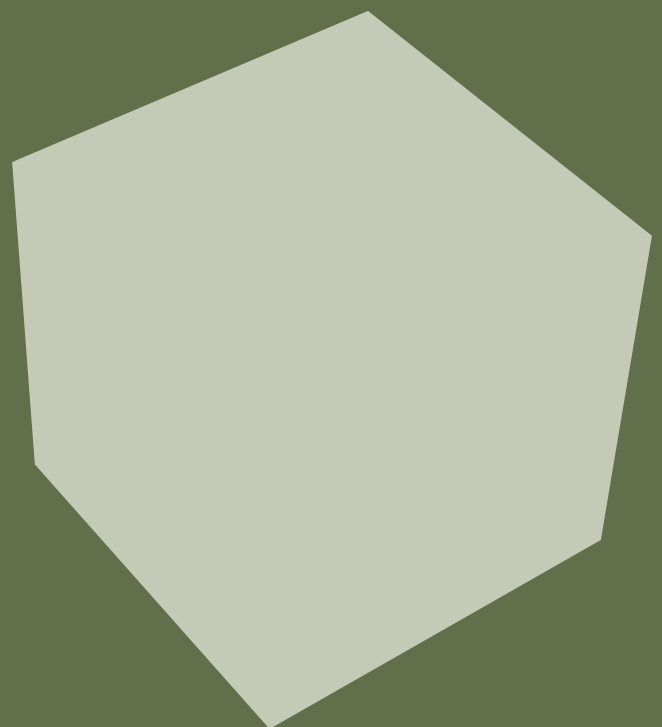
The perception of the various climate risks and their financial impact will change with time, implying that companies should review and quantify the risks and impacts annually. The quantification of key financial (and non-financial) metrics will be the subject of the next chapter.

# Chapter 3: *Quantification methods and best practices*

04.

# Key messages

- **The disclosure of the suggested financial metrics** must improve the dialogue between companies and investors for current and future impacts and, crucially, align with the emerging regulatory disclosure requirements. Ideally, companies should be able to apply a global standard and comply simultaneously with the regulatory requirements of various jurisdictions.
- **The current regulatory disclosure requirements are not prescriptive** in terms of methods (such as what assumptions to make, sensitivities to apply or scenarios to use) and rely on existing financial standards that are principle-based rather than rule-based. This will limit true apples-for-apples comparisons of impacts across companies.
- **Companies will embark on different transition trajectories and use** different time horizons for various purposes. Hence, to aid comparability, it is important to define future time horizons for climate-related financial disclosures and use them consistently with other reporting.
- **The disclosure of how climate risks affect the carrying value or amount** – meaning asset and liability values as stated on balance sheets – is the focus of companies to date. Disclosing more forward-looking metrics will make anticipated financial performance more transparent to investors.
- **We discuss and specify the disclosure of several current and forward-looking financial metrics**, addressing the aspects of inherent market uncertainties, sharing strategically sensitive information, legal implications and the extent to which metrics speak to climate risks directly or indirectly.



# Chapter 3: Quantification methods and best practices

In this chapter we present our detailed recommendations and best practices for quantifying climate-related financial impacts. **Our guiding principles are that the metrics should improve the dialogue between companies and investors on current and future impacts and align with emerging regulatory disclosure requirements. Ideally, companies should be able to apply a global standard and comply simultaneously with the regulatory reporting requirements of various jurisdictions.**





In Chapter 1 we present the emerging regulatory requirements in the USA, EU and UK and the recently issued IFRS Standards (S2). What follows is a comparison of the financial disclosure requirements, with a focus on which financial metrics to quantify. Tables 5 and 6 show, in abbreviated form, that the **ISSB S2 Standard and the emerging regulations specify only a few financial metrics and little on how to handle the financial quantification.** As stated by some regulators, **the (draft) disclosure requirements are not prescriptive in terms of methods** (such as what assumptions to make, sensitivities to apply or scenarios to use) **because the approach to disclosure requirements is principle-based rather than rule-based.** In other words, regulators

want companies to expand their disclosures but follow existing accounting standards rather than create detailed, alternative rule-based reporting requirements. Common to all (draft) regulations is that companies disclose relevant assumptions and explain their quantification methods. If assumptions deviate from those made for financial statements, then companies should explain such differences clearly.

Many regulators require the disclosure of how climate risks affect the carrying value or amount (meaning financial position). This aspect builds on the TCFD recommendations. Most companies have subsequently focused on impacts to carrying amounts in their financial disclosures. Our guidance also looks at several forward-looking financial performance measures. We stress again that **our how-to guide is voluntary** and does not constitute an obligation.





The biggest challenge to comparability is, however, the fact that many oil and gas companies do not disclose the financial impacts of climate risks. Thus, the following sections provide a qualitative guide on how to approach the quantifying of climate-related impacts. Chapter 3 complements this by offering more detailed recommendations for financial quantification.

**Table 5: General financial disclosure requirements**

 Issued STANDARD International Financial Reporting Standards (IFRS) S2 Climate-related Disclosures	 Final EU: European Sustainability Reporting Standards (ESRS) E1 Climate Change Disclosure Requirement	 Final UK: Transition Plan Taskforce (TPT) Disclosure Framework	 Draft US Securities and Exchange Commission (SEC): The Enhancement and Standardization of Climate-Related Disclosures for Investors
Disclose <b>carrying amounts</b> of Disclose the effects of climate-related risks and opportunities on the <b>entity's financial position, financial performance and cash flows</b> for the reporting period and over the <b>short, medium and long term.</b>	Disclose anticipated financial effects due to material physical risks and transition risks if they have a material influence on the undertaking's financial position, financial performance and cash flows, over the short, medium and long term. The results of scenario analysis used to conduct resilience analysis as required should inform the assessment of anticipated financial effects from material physical and transition risks.  Disclose the potential to pursue material climate-related opportunities to enable an understanding of how the undertaking may financially benefit from material climate-related opportunities.	Disclose qualitative and quantitative information about how the implementation of the transition plan to affect its financial position, performance and cashflows over the short-, medium-, and long-term	The proposed rule would include examples [see Table 6] of disclosures that may be required to reflect the impact of severe weather events and other natural conditions on each line item of the registrant's consolidated financial statements.



**Table 6: Specified financial metrics for mandatory disclosure**

 IFRS S2 Climate-related Disclosures <sup>39</sup>	 EU: ESRS E1 Climate Change Disclosure Requirements	 UK: TPT Oil & Gas Sector Guidance (Draft) <sup>40</sup>	 US SEC: The Enhancement and Standardization of Climate-Related Disclosures for Investors Draft
<p>Disclose <b>carrying amounts</b> of assets and liabilities in current reporting period.</p> <p>For example:  <b>Increased revenue</b> from products and services aligned with a lower-carbon economy;</p> <p><b>Costs arising from physical damage</b> to assets from climate events; and</p> <p><b>Expenses</b> associated with climate adaptation or mitigation</p>	<p>Disclose separately for physical and transition risks over the short, medium and long term:</p> <ul style="list-style-type: none"> <li>→ The <b>monetary amount and proportion (percentage)</b> of assets at risk (and) the <b>proportion of assets</b> at material physical risk <b>addressed by the climate change adaptation actions</b>;</li> <li>→ The monetary amount and proportion (percentage) of <b>net revenue</b> from its business activities at material physical and transition risk.</li> </ul> <p>Disclose the breakdown of the <b>carrying value</b> of the undertaking's real estate assets by energy-efficiency classes for transitional risks.</p> <p>Disclose <b>liabilities</b> that the company may need to recognize in <b>financial statements</b> and the <b>monetary amount and proportion (percentage)</b> of net revenue from oil- and gas-related activities</p>	<p>The specific requirements for the oil and gas sector have been published for public comment until 29 December 2023. Draft for Sub-Element 4.2</p> <p>Entity should consider:</p> <ul style="list-style-type: none"> <li>→ on an annual basis current and projected capital expenditure</li> <li>→ R&amp;D spend and activities</li> <li>→ financial implications of assumptions and external factors relating to transition</li> </ul> <p>Entity may additionally consider:</p> <ul style="list-style-type: none"> <li>→ a breakdown of current and projected capital between maintenance, expansion of existing fields, exploration and development of new fields financial implications of assumptions and external factors relating to transition</li> <li>→ financial risks associated with adjusting its business model(s) as a means to change its product portfolio mix to transition</li> </ul>	<p>Disclose changes to revenue or costs from disruptions to business operations or supply chains.</p> <p>Disclose impairment charges and changes to the carrying amount of assets.</p> <p>Disclose changes to loss contingencies or reserves (such as environmental reserves or loan loss allowances) due to impacts from severe weather events.</p> <p>Disclose changes to total expected insured losses due to flooding or wildfire patterns.</p> <p>Disclose changes to revenue or cost due to new emissions pricing or regulations resulting in the loss of a sales contract.</p> <p>Disclose changes to operating, investing or financing cash flow from changes in upstream costs and changes to interest expense</p>

In the subsequent sections we list the recommended financial metrics and relevant calculation and disclosure guidance

- Section A – Assumptions
- Section B – Metrics for financial position
- Section C – Metrics for financial performance.

Included are also fictitious disclosure examples for many of the metrics that serve to illustrate how companies could disclose the metrics. The aim of the metrics is to (1) improve alignment with TCFD, (2) enhance transparency, (3) enable comparability and (4) prepare companies for the expected regulatory reporting requirements.

### Definition of future time horizons

Companies use different time horizons for various purposes (financial, operational or strategic planning). Therefore, it is important for comparability that companies define future time horizons for climate-related financial disclosures clearly and use them consistently in corporate reporting.

Companies that have set interim transition milestones along their NZE journey (to 2050, Figure 10), should use these milestones to define the short-, medium- and long-term time horizons; such an approach drives climate goal-oriented strategic planning. This aligns with TCFD/ISSB and the EU regulation ESRS E1-9 which requires that medium- and long-term time horizons are defined by the company (or undertaking), and the definitions need to be "linked to the expected lifetime of the undertaking's assets, strategic planning horizons and capital allocation plans".<sup>41</sup>

Given the long-term uncertainties, most companies embark on detailed, project-level<sup>42</sup> business planning cycles annually with a forecast period of several years (typically 3-10 years). Beyond this period, companies use a variety of assumptions and methods to forecast cashflows and compute financials. The disclosures should state the duration of the annual business planning period, meaning the number of future

years with detailed project planning, cashflow analysis and capital allocations. Additionally, the company should make clear the extent to which the (annual) business and strategic planning period overlaps (or not) with the defined short-, medium- and long-term periods. Investors will benefit from understanding for how many years a company creates and aggregates project-level (or CGU) forecasts to corporate-level discounted cashflows for annual reporting and to what extent these plans align with climate-related transition targets. Companies should describe assumptions and methods used to quantify financial metrics beyond the business planning horizon in the disclosures to the extent that they provide a view of the level of accuracy expected for the long-term.

For strategic planning and scenario sensitivities by companies without interim or final NZE targets, we recommend the following time horizon definitions:

- **Short term:** next 5 years
- **Medium term:** years 6-10
- **Long term:** beyond the medium term (year 11+)

**Figure 10: Example of milestone-driven definitions for future time horizons**

Future time horizon	Short term			Medium term				Long term																				
Years	1 2 3			4 5 6 7				8+																				
Year	FY=2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
NZE milestones (example)			Interim					Interim																				NZE target
Business planning period with project-level cashflows	[Orange box]																											

The time horizons (see Figure 11) will move forward with each new financial and reporting year.

Table 7 provides an overview of the recommended financial metrics to quantify and disclose. Depending on the company's organizational design, it could quantify the metrics at the corporate level or at the business segment level. If a company manages multiple business segments, such as oil/gas upstream vs downstream vs renewable or other segments,

then it should disclose the financial impacts by business segment such that investors can clearly distinguish metrics at segment vs corporate level. For simplification and illustration purposes, here we distinguish only between the fossil and non-fossil fuel segments; many companies subdivide into further segments.

**Figure 11: Example of business plan-driven definitions for future time horizons**

Future time horizon		Short term					Medium term					Long term																
Years		1	2	3	4	5	6	7	8	9	10	11+																
Year	FY=2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Business planning period with project-level cashflows																												

**Table 7: Recommended financial metrics for climate-related impacts**

<i>Metric category</i> <sup>43</sup>	<i>Label</i>	<i>Financial metric</i>	<i>Unit</i>	<i>Historic period(s)</i> <sup>44</sup>	<i>Future period(s)</i>
Assumptions	A	Crude oil price (Brent or WTI)	USD \$/bbl RT (FY)	Actuals for 3 years prior to FY	Until 2050 (or stated NZE target year)
		Natural gas price (specify marker/hub)	USD \$/MMBTU RT (FY)		
		CO <sub>2</sub> price (or costs)	USD \$/t RT (FY)		
		Other prices (if financially material): biogas, refining margins, H <sub>2</sub> price	As required		
Financial position	B1	Total capital employed (fossil vs non-fossil fuels)	USD \$ RT	Actuals for FY-2, FY-1, FY	NA
	B2	Annual capital investment (fossil vs non-fossil fuels)	USD \$ RT	Actuals for FY-2, FY-1, FY	Short term
	B3	Impairment Testing (fossil & non-fossil fuels)	USD \$ RT	Actuals for FY-2, FY-1, FY	NA
	B4	Optional position metrics (if applicable)	See text	Actuals for FY-2, FY-1, FY	Planning period, if applicable
Financial performance	C1	Fossil fuel segment: portfolio resilience	% change	Actuals for FY-2, FY-1, FY	Planning period
	C2	Fossil fuel reserves depletion and carrying amount depreciated	%	NA	Short, medium and long term
	C3	Optional performance metrics (if applicable)	See text	NA	Short, medium and long term

Abbreviations used: FY = fiscal year, WTI = West Texas Intermediate, bbl = barrels, MMBTU = million British thermal units, RT = real terms, NA = not applicable

### A. Disclosure of key assumptions

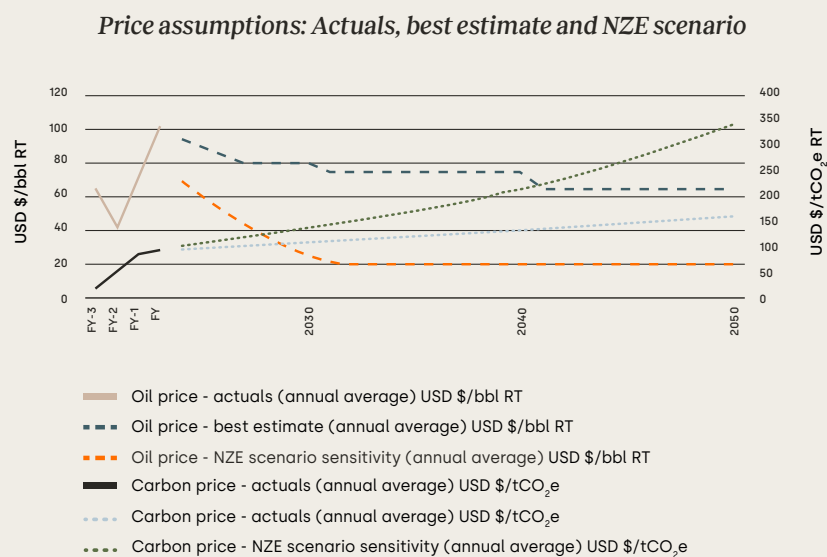
**Price assumptions – crude oil and natural gas commodity market prices, CO<sub>2</sub> prices, refining margins and renewable prices** (if applicable for opportunity assessment)

#### Disclosure guidance

- State the annualized oil and natural market prices in real terms per the current period (fiscal year [FY]). If price assumptions differ by purpose (such as strategic business planning vs impairment testing), then explain such differences.
- As there is no global CO<sub>2</sub> price, specify the applicable jurisdiction or trading hub marker for reference.
- Similarly, there is no global natural gas price; specify the regional gas price marker used and why.
- Compare the “best estimate case”<sup>45</sup> assumptions with the assumptions from a range of climate reference scenarios. For comparability purposes, we recommend including the IEA NZE scenario.

Illustrative example

**Figure 12: Key price assumptions**



### B. Disclosure of key metrics relating to financial position

#### B1. Total capital employed

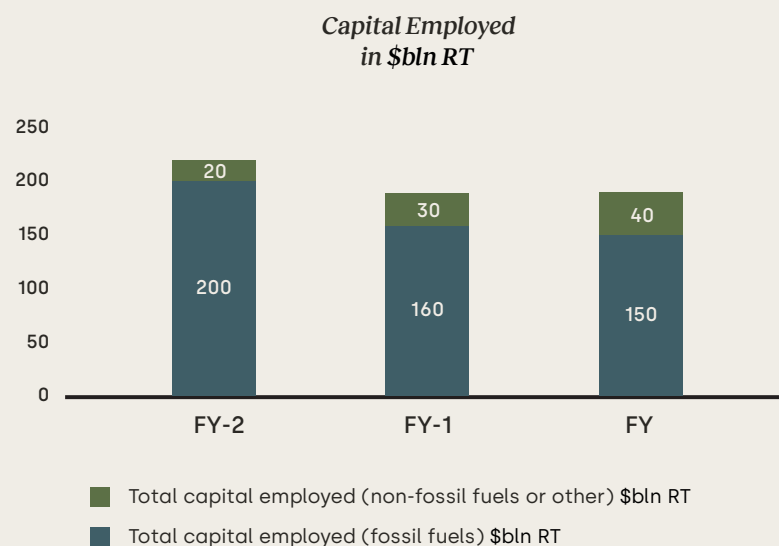
IFRS does **not** define “capital employed” but it is a widely used financial metric. We recommend that the disclosures include a definition of the metric and how the company uses it in the context of financial planning.

#### Calculation and disclosure guidance

- The metric provides an absolute and relative sense of capital proportions by business segment(s) and the amount of investment at risk (fossil fuels).
- Disclose the capital employed (or invested) over the last three years by business segment to make the financial magnitude of each segment clear to investors.

Illustrative example

**Figure 13: Total capital employed by business segment**



## B2. Annual capital investment

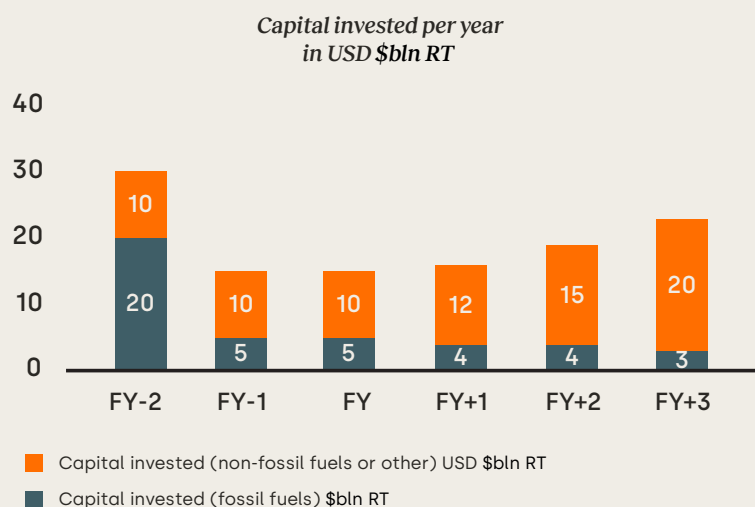
### Calculation and disclosure guidance

- Calculate and disclose the annual capital investment over the last three years and the short-term horizon (or per planning period) by business segment to make the absolute and relative investment magnitudes of each business segment clear to investors.
- State capital investments addressing physical climate-risks separately for the short, medium- and long-term.
- Additionally, consider splitting annual capital investments into two categories: existing assets (also commonly referred to as "brownfield assets") and new assets/major project ("greenfield assets").
- Like "capital employed", IFRS does **not** define "capital investment"; we recommend including a definition of the metric in the annual disclosures. Additionally, clarify whether the company uses the cash or accrual basis.

Illustrative example on Figure 14.

Illustrative example

Figure 14: Annual capital investment by business segment



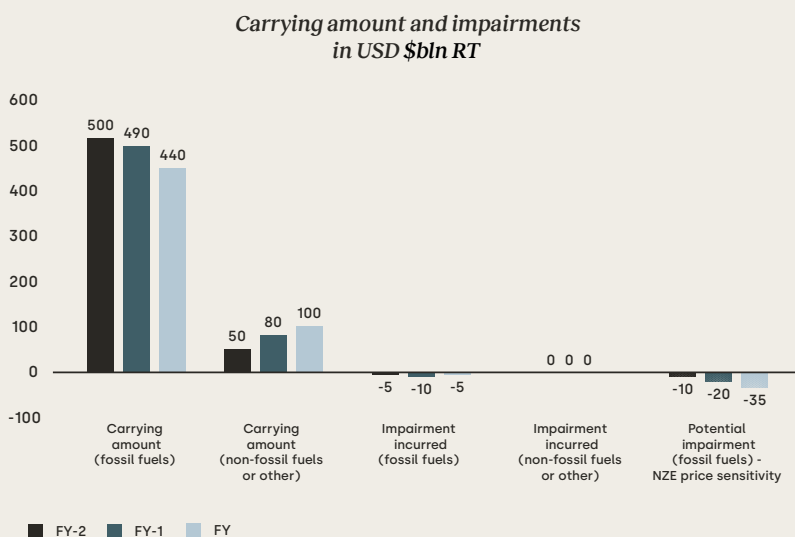
## B3. Impairment Testing

### Calculation and disclosure guidance

- Describe the assumptions (such as prices, depreciation basis, weighted cost of capital) made in the impairment testing to enhance comparability of impairment results.
- By business segment, explicitly disclose prior and current period impairment amount and the potential impairments calculated using a range of climate reference NZE scenarios.
- Calculate the potential impairment for:
  1. The best estimate case, using the company's outlook for commodity prices, CO<sub>2</sub> costs and discount rate (as used in annual business plan);
  2. The impairment sensitivity for a range of climate reference (NZE) scenarios, using the relevant NZE scenario assumptions for commodity prices and CO<sub>2</sub> costs. For comparability purposes, we recommend including the IEA NZE scenario.
- State the potential impairment in either absolute amounts or relative percentage change.
- The Application Requirements (AR) for ESRS E1-9 require companies to estimate the amount of potentially stranded assets from the reporting year until 2030 and from 2030 to 2050. Refer to Appendix B ESRS AR73 of this document for a detailed description.
- Relevant IFRS standard: IAS 36 Impairment of Assets

Illustrative example

Figure 15: Carrying amount, impairments and potential NZE impairments by business segment



#### **B4. Additional financial position metrics**

There are several other financial position metrics that can provide insights for investors, especially in gauging the sensitivity of a metric to a range of alternative NZE scenarios. These metrics may not be material or may provide only indirect insights to how physical or transition risks affect the financial position. However, as investors may consider these metrics in the quantification of climate-related financial impacts, we present them here but make them optional. The performance-related sensitivities presented in Section C are likely to provide more relevant information to investors.

##### **B4.1 Optional: Recoverable deferred tax assets**

###### **Calculation and disclosure guidance**

Companies may recognize deferred tax assets (credits) in the balance sheet, which will reduce the future tax liabilities. There is a risk that insufficient cashflow (such as due to a large, persistent drop in demand and prices) may prevent the company from applying the deferred tax credits. However, deferred taxation applies at the company level, not at the business segment level. Thus, there is no direct and unambiguous relationships between the components of taxable income and climate-related risks. If the company deems the impact material and appropriate, then calculate the future cashflow and probable tax liability reduction (tax asset recovery) for the best estimate case, using the company's outlook for commodity prices, CO<sub>2</sub> costs and discount rate (as used in annual business plan). Sensitivities to a range of climate reference (NZE) scenarios (using the relevant NZE scenario assumption for commodity and CO<sub>2</sub> costs) should be described qualitatively.

→ Relevant IFRS standard: IAS 12 Income Tax

##### **B4.2. Optional: Accelerated decommissioning liability provisions**

IFRS already requires the disclosure of decommissioning liabilities (IAS 37 Provisions, Contingent Liabilities and Contingent Assets). The additional information that could be useful to investors is if management foresees material changes in the decommissioning liabilities under NZE scenarios.

Quantifying long-term changes to decommissioning liabilities in alternative (NZE) scenarios is challenging due to the uncertainty stemming from likely portfolio changes (such as the sale of assets due to low product demand or low profitability) in an NZE future. Thus, a qualitative description of potential future changes might be more useful than quantifying future changes that might not occur (decommissioning liabilities will transfer to new owners in case of an asset sale). If the acceleration of the budgeted decommissioning liabilities has a material impact on portfolio resilience (see Section C), then the company should disclose this. Due to the nature of discounted cashflow methods, the effect of decommissioning costs on project (or portfolio) value is typically small but this could change if climate risks curtail the positive cashflow of projects.

##### **B4.3. Optional: Other climate-related liabilities (litigation and onerous contracts)**

Over the last several years the number of climate change-related lawsuits brought against oil and gas companies has increased notably. This trend is likely to persist. Quantifying whether more or fewer lawsuits might arise in NZE (or other) scenarios is difficult; some may argue that a company on an NZE trajectory might be less vulnerable to litigation because it is decarbonizing while others may see this as something that should have occurred sooner and may encourage litigation.

Other material liabilities could arise if the company cannot fulfill onerous contracts in the future due to production/revenue shortfalls.

We recommend quantifying the litigation costs incurred over the last financial reporting period and state this cost as a share of current liabilities. Additionally, the company should disclose any material liabilities that could arise if it cannot fulfill onerous contracts in the future due to production/revenue shortfalls.

### C. Disclosure of key metrics relating to financial performance

As a general guiding principle, management should disclose those forward-looking performance metrics that it uses to determine strategic direction, business resilience and financial targets. There is a variety of such metrics in use; IFRS defines some while others have no definition (but businesses and investors still use them widely), such as return on capital employed or internal rate of return. Most forward-looking performance metrics typically contain strategically sensitive assumptions that a company may not wish to disclose to maintain its commercial competitiveness. This is a key consideration. Also, as discussed previously, the disclosure of forward-looking metrics is legally challenging in some jurisdictions, unless companies deem safe-harbor provisions sufficient.

Financial performance metrics such as dividend resiliency have been considered but excluded from this guide because dividend payments are subject to company governance policies and companies have several shareholder remuneration options at their disposal at any given point in time. Given that many financial aspects beyond those relating to climate risks and opportunities are considered in decision to pay dividends, dividend resiliency is not a metric directly and only related to climate risks and opportunities.

#### C1. Fossil fuel portfolio resilience

Companies can quantify portfolio resilience in several ways. We recommend the change in EBITDA because it focuses on operational impacts and avoids the potential distortion stemming from non-operational aspects relating to financing, taxation and depreciation.

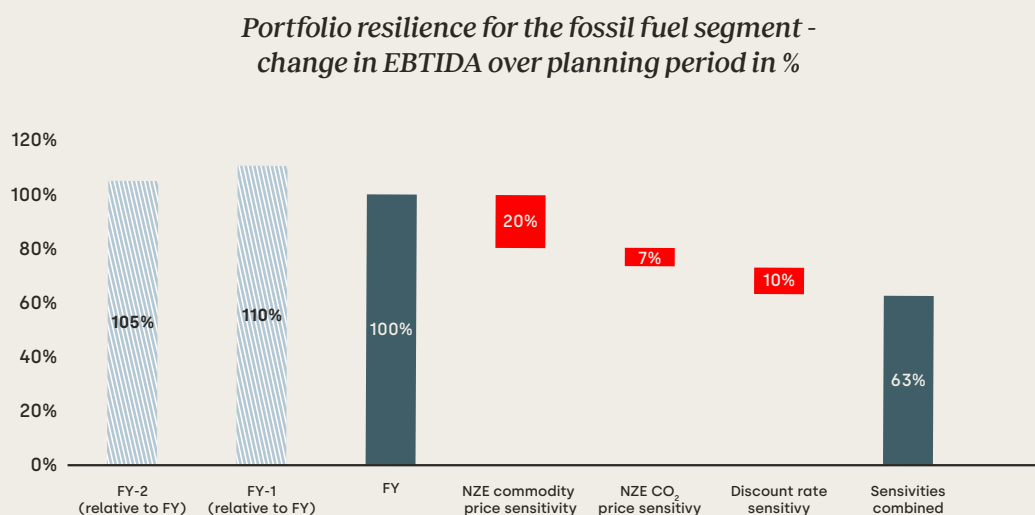
However, companies use different metrics internally, such as net present value (NPV, which includes tax, financing and depreciation expenses) or percent of "headroom", which the amount (in %) by which the best estimate case cashflow/fair value exceeds the result of the impairment tests. The aligned use of a common metric will certainly enhance comparability but we acknowledge that companies differ in the use of metrics for internal reasons.

#### Calculation and disclosure guidance

- Calculate the EBITDA (for the planning period or up to a chosen NZE milestone year) for the fossil fuel segments for the current year and compare to the EBITDA for the prior two periods. The commodity price, CO<sub>2</sub> price and discount rate are per the best estimate case. The EBITDA for the current year represents a relative reference basis of 100%. The following sensitivities demonstrate how the current year EBITDA will change on a relative (%) basis.
- Calculate the sensitivities of (1) NZE commodity prices, (2) NZE CO<sub>2</sub> prices and (3) a chosen discount rate to the best estimate EBITDA. The objective is to demonstrate the relative impact of these sensitivities on portfolio resilience. Additional sensitivities could be costs associated with physical climate risk or adaptation measures.
- The company could expand the EBITDA metric to show similar sensitivities for its non-fossil fuel segments.
- Note that IFRS does not support the EBITDA, but it is a suitable financial measure for operating profitability and used by many companies.

#### Illustrative example

**Figure 16: Portfolio resilience to key sensitivities to the present value of EBITDA**





## C2. Fossil fuel reserves depletion and carrying amount depreciated

### Calculation and disclosure guidance

- Regulatory requirements govern the estimation and disclosure of proven and probable (best estimate) reserves per jurisdiction. Many jurisdictions adopt the US SEC regulatory requirements, which mandate only the disclosure of proven reserves. Probable reserve disclosure is optional. We recognize this requirement and thus make the disclosure of probable reserves optional.
- Calculate and disclose the percent of proven and probable estimated upstream oil and gas reserves produced during the short, medium and long term to provide investors with an understanding of how much of the total reserves the company will produce in the stated time horizon and whether reserves will remain beyond the NZE target date (if applicable).
- Calculate and disclose by which year the company will have depreciated the most long-lived up- and downstream assets and explain the depreciation methods and assumptions used.
- Explain if and how a range of NZE scenarios could materially impact the production of reserves and depreciation of assets, focusing on the impact of price on the economic viability of the reserves. If applicable, quantify the amount or percentage of reserves exceeding the stated NZE target date.
- Relevant IFRS standards: ASC 932 (US GAAP), IFRS 6 Exploration for and Evaluation of Mineral Resources, IAS 16 Property, Plant and Equipment, IAS 38 Intangible Assets.

Illustrative example on the right.

<i>Time horizon</i>	<i>% of proven reserves produced</i>	<i>Optional: % of probable reserves (best estimate) produced</i>
<i>Short term (CY to 2030)</i>	50%	25%
<i>Medium term (2031-2040)</i>	30%	40%
<i>Long term (2041+)</i>	20%	35%
	<b>Total: 100%</b>	<b>Total: 100%</b>
	<i>Proven reserve basis</i>	<i>Optional: Probable (best estimate) reserve basis</i>
<i>NZE target year</i>	2050	
<i>Last year of economically viable upstream production</i>	2035	2045
<i>Final year of upstream depreciation of existing assets*</i>	2035	Not used for depreciation
<i>Final year of downstream depreciation of existing assets</i>	2040	

Notes: Companies typically depreciate upstream assets using proven reserves but some companies depreciate using probable reserves. State the basis of upstream reserve depreciation.

**C3. Additional financial performance metrics**

**C3.1. Optional: Annual revenue sensitivities**

Due to the volatility in oil and gas prices, annual revenues are equally variable.<sup>46</sup> While companies tend to keep their long-term price assumptions relatively stable year-on-year, actual revenues tend to vary quite significantly due to many unforeseen changes and events. Neither companies nor investors use revenue as a meaningful financial performance indicator for the future.

Regardless of the inherent structural uncertainties, we include the disclosure of optional forward-looking annual revenue by business segment in our list of financial performance metrics because it can provide an indication of the speed of transitioning from oil and gas to other forms of revenues. Also, the recently ratified ESRS regulation mandates the disclosure of revenues stemming from oil and gas operations at physical or transition risk over the short, medium and long-term.

If a company discloses forward-looking annual revenue sensitivities, then we suggest the following approach.

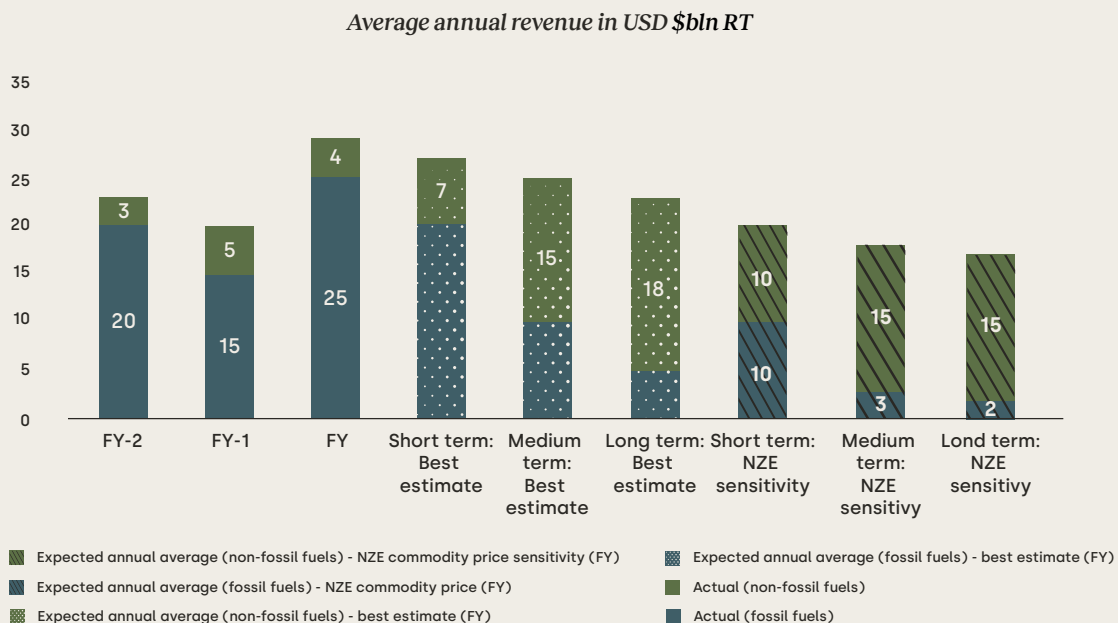
**Calculation and disclosure guidance**

- Disclose the annual actual revenue over the last three reporting periods by business segment (as also shown in the consolidated financial statements).
- Calculate and disclose the expected annual average revenue by business segment for the short-, medium- and long-term future for:

1. The best estimate case, using the company's outlook for commodity prices, CO<sub>2</sub> costs and discount rate (as used in annual business plan);
  2. The revenue sensitivities for a range of climate reference (NZE) scenarios, using the relevant NZE scenario assumptions for commodity prices and CO<sub>2</sub> costs; for comparability purposes, we recommend including the IEA NZE scenario.
- Include qualitative statements that describe management's view of any planned portfolio changes when applying NZE scenarios.
  - Estimate to what extent physical and transition climate risks could impact the expected future revenue (in absolute and relative terms) for the best estimate and NZE scenario sensitivity. The best estimate case may incorporate physical risks already and, if so, the company should explain the underlying assumptions. Given that the NZE scenario price or cost assumptions do not capture physical risks, the company should explain the extent to which physical impacts could affect the expected average annual revenue in the NZE sensitivity.
  - Note that ESRS E1-9 also requires the disclosure of the location of assets at material physical risk.
  - Relevant IFRS standard: IFRS 15 Revenue from Contracts with Customers

Illustrative example

**Figure 17: Average annual revenue by business segment and scenario**



### C3.2. Optional: Return on capital employed

Return on capital employed (ROCE) is as much a business outcome as it is a target for a company. As IFRS does not define ROCE, we recommend including a definition<sup>42</sup> of the metric in the annual disclosures or selecting other financial performance metrics if management uses them for planning purposes.

Regardless of future scenarios, management could take the view that forward-looking ROCE targets should not change (meaning the company will aim to shape its portfolio, capital investments and cost structure such that it will achieve the aspired ROCE ranges). In such cases, scenario sensitivities are redundant. Another consideration is that companies create one business plan – the best estimate case. Creating scenario-specific business plans to test the impact on ROCE requires a large effort and is not practical, given that companies review investments and cost budgets annually.

Additionally, in the USA, companies often do not deem safe-harbor provisions adequate for non-GAAP measures; this poses a litigation risk, which companies need to consider for disclosure.

An alternative to ROCE is to consider the break-even price for future projects and test to what extent this price exceeds the long-term scenario-based price assumptions.

ESRS E1-9 refers to the assessment of the anticipated financial effects related to the margin erosion over the short-, medium- and long-term but makes such disclosure optional.

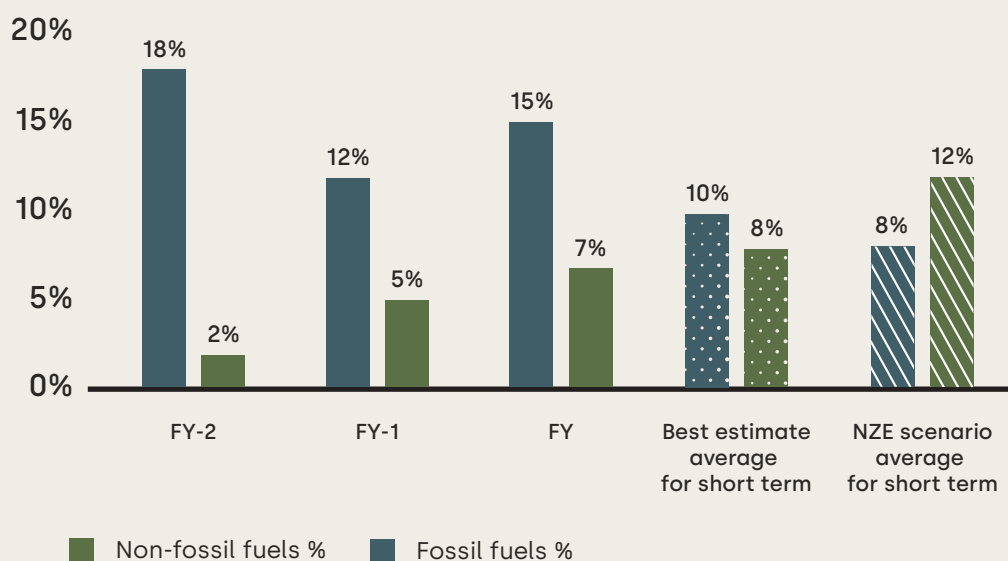
Given the legal risk associated with the communication of such sensitive information but acknowledging that investors will want to understand the future financial performance of the fossil fuel industries, we recommend a qualitative discussion of financial performance metrics such as return on capital employed for the medium- and long-term. For the short-term many companies disclose expected (or targeted) via annual strategy disclosures to financial markets.

#### Calculation and disclosure guidance

- Disclose the return achieved on capital employed over the last three reporting periods.
- State the expected (or targeted) average return on capital range invested for the short-term future (or for the financial planning period) by business segment for the best estimate case, using the company's outlook for commodity prices, CO<sub>2</sub> costs and discount rate.
- Describe qualitatively how the business would react to a range of NZE scenarios (meaning how it would change its portfolio, geographic focus, investment levels or cost structure).

#### Illustrative example

Figure 18: Return on capital employed by business segment



# Our call to action



# 05.

## Our call to action

*Our review of a variety of recent reports shows that the industry has more work to do to meet investor expectations for transparency and comparability. Mandatory disclosures will create a more level playing field for publicly listed companies and lead to the more productive engagement of oil and gas companies, investors and financial analysts.*

However, while the recently published International Sustainability Standards Board (ISSB) S1 and S2 Sustainability Standards and emerging regulations for climate-related financial disclosures strive for a more comprehensive assessment of impacts, improving comparability and avoiding regulatory discrepancies and potential confusion among investors require more clarity and uniformity. A common global approach will streamline reporting and reduce the burden for companies. TCFD, in its final status report, underscores this by asking regulators to ensure the “interoperability of the ISSB standards with jurisdictional frameworks to support consistent company reporting”.<sup>48</sup>

A true apples-to-apples comparability of climate-related financial impacts will remain elusive unless standard-setters and regulators define rules-based systems for quantifying climate-related financial impacts. However, we recognize that for every rule created, there will be an exception and thus the use of principle-based standards and regulations exists and is the preferred choice. But with our work we aim to bridge the gap between the principles and rules-based approaches and enhance transparency, both for better engagement with investors and for better alignment of business plans with NZE targets. This is crucial to driving the decarbonization of the oil and gas sector.

## Our call to action

- **For oil and gas companies:** Adopt our recommendations, enhance corporate transparency, manage climate-related risks and opportunities and financial performance sustainably and continue to improve the dialogue with investors.
- **For standard-setters:** Listen to the challenges associated with the implementation of standards and issue guidance that reduces reporting efforts and enhances the quality of externally disclosed information.
- **For regulators:** Examine the differences in the proposed requirements in detail and align on a common approach. Policies and regulations to decarbonize occur at the country level but the threat of climate change is global – a globally aligned approach will benefit all stakeholders, including the planet.

# Glossary

We have taken the definitions below from the International Financial Reporting Standards (IFRS).

**Carrying amount (or value):** The amount at which an asset is recognized after deducting any accumulated depreciation (amortization) and accumulated impairment losses thereon (IAS 16.6, IAS 36.6, IAS 38.8).

**Cash generating unit (CGU):** The smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IAS 36.6, IFRS 5A).

**Deferred tax assets:** The amounts of income taxes recoverable in future periods in respect of: (a) deductible temporary differences; (b) the carryforward of unused tax losses; and (c) the carryforward of unused tax credits (IAS 12.5).

**Deferred tax liabilities:** The amounts of income taxes payable in future periods in respect of taxable temporary differences (IAS 12.5).

**Depreciation:** The systematic allocation of the depreciable amount of an asset over its useful life. Depreciable amount is the cost of an asset, or other amount substituted for cost in the financial statements, less its residual value. Useful life is either the period of time over which an asset is expected to be used by the entity or the number of production or similar units expected to be obtained from the asset by the entity (IAS 16.6, IAS 36.6, IAS 38.8).

**Dividends:** Distributions of profits to holders of equity instruments in proportion to their holdings of a particular class of capital (IFRS 9.A).

**Material:** Information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity (IAS 1.7, IAS 8.5).

**Onerous contract:** A contract in which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it (IAS 37.10)

**Value in use:** The present value of the future cash flows expected to be derived from an asset or cash generating unit.

# Appendices

## 06.

# Appendices

## Appendix A: WBCSD publications relating to the Task Force on Climate-related Financial Disclosures (TCFD) and the energy system

Following the impacts and dependencies identified and evaluated in the 'Evaluate' phase of LEAP, the TNFD suggests overarching questions and supplemental guidance for the 'Assess' phase of LEAP (see figure 8).



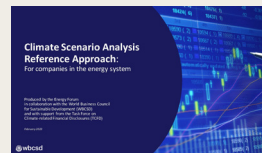
2018  
→ Climate-related Financial Disclosure by Oil and Gas Companies



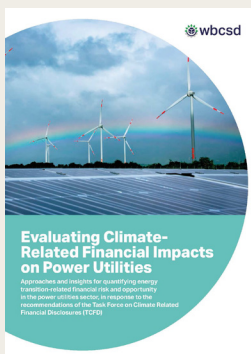
2022  
→ Demystifying Climate Transition Scenarios



2019  
→ Disclosure in a Time of Transition: Climate-related Financial Disclosure and the Opportunity for the Electric Utility Sector



2022  
→ Climate Scenario Analysis Reference Approach



2021  
→ Evaluating Climate-related Financial Impacts on Power Utilities



## Appendix B: Relevant excerpts from standards and (draft) regulations



Reference: [IFRS S2 Climate-related Disclosures](#)

### ***“Financial position, financial performance and cash flows”***

An entity shall disclose information that enables users of general purpose financial reports to understand:

- a. the effects of climate-related risks and opportunities on the entity's **financial position, financial performance and cash flows for the reporting period** (current financial effects); and
- b. the anticipated effects of climate-related risks and opportunities on the entity's **financial position, financial performance and cash flows over the short, medium and long term, taking into consideration how climate-related risks and opportunities are included in the entity's financial planning (anticipated financial effects)**.

Specifically, an entity shall disclose quantitative and qualitative information about:

- a. how climate-related risks and opportunities have affected its financial position, financial performance and cash flows for the **reporting period**;
- b. the climate-related risks and opportunities identified [...] for which there is a **significant risk of a material adjustment within the next annual reporting period to the carrying amounts of assets and liabilities** reported in the related financial statements;
- c. how the entity expects its financial position to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities, taking into consideration: (i) its investment and disposal plans (for example, plans for capital expenditure, major acquisitions and divestments, joint ventures, business transformation, innovation, new business areas, and asset retirements), including plans the entity is not contractually committed to; and (ii) its planned sources of funding to implement its strategy; and
- d. how the entity expects its financial performance and cash flows to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities (for example, increased revenue from products and services aligned with a lower-carbon economy; costs arising from physical damage to assets from climate events; and expenses associated with climate adaptation or mitigation).

In providing quantitative information, an entity may disclose a single amount or a range. In preparing disclosures about the anticipated financial effects of a climate related risk or opportunity, an entity shall:

- a. use all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort; and
- b. use an approach that is commensurate with the skills, capabilities and resources that are available to the entity for preparing those disclosures.

An entity need not provide quantitative information about the current or anticipated financial effects of a climate-related risk or opportunity if the entity determines that:

- a. those effects are not separately identifiable; or
- b. the level of measurement uncertainty involved in estimating those effects is so high that the resulting quantitative information would not be useful. In addition, an entity need not provide quantitative information about the anticipated financial effects of a climate-related risk or opportunity if the entity does not have the skills, capabilities or resources to provide that quantitative information. If an entity determines that it need not provide quantitative information about the current or anticipated financial effects of a climate-related risk or opportunity [...], the entity shall: (a) explain why it has not provided quantitative information; (b) provide qualitative information about those financial effects, including identifying line items, totals and subtotals within the related financial statements that are likely to be affected, or have been affected, by that climate-related risk or opportunity; and
- c. provide quantitative information about the combined financial effects of that climate-related risk or opportunity with other climate-related risks or opportunities and other factors unless the entity determines that quantitative information about the combined financial effects would not be useful.”



## European Union: European Sustainability Reporting Standards (ESRS)

Reference: **ESRS E1 Climate Change**

### **Disclosure Requirement EI-9 – Anticipated financial effects from material physical and transition risks and potential climate-related opportunities**

"The undertaking shall disclose its:

- a. anticipated financial effects from material physical risks;
- b. anticipated financial effects from material transition risks; and
- c. potential to benefit from material climate-related opportunities.

The objective of this Disclosure Requirement related to:

- a. anticipated financial effects due to material physical risks and transition risks is to provide an understanding of how these risks have (or could reasonably be expected to have) **a material influence on the undertaking's financial position, financial performance and cash flows, over the short-, medium- and long- term. The results of scenario analysis used to conduct resilience analysis** as required [...] should inform the assessment of anticipated financial effects from material physical and transition risks.
- b. potential to pursue material climate-related opportunities is to enable an understanding of how the undertaking **may financially benefit from material climate-related opportunities**. This disclosure is complementary to the key performance indicators to be disclosed in accordance with Commission Delegated Regulation (EU) 2021/2178.

The disclosure of anticipated financial effects from **material physical risks [...] shall** include:

- a. the **monetary amount and proportion (percentage) of assets at material physical risk over the short-, medium- and long-term** before considering climate change adaptation actions; with the monetary amounts of these assets disaggregated by acute and chronic physical risk;
- b. the **proportion of assets at material physical risk addressed by the climate change adaptation actions;**
- c. the **location of significant assets** at material physical risk; and
- d. the **monetary amount and proportion (percentage) of net revenue** from its business activities at material physical risk over the short-, medium- and long-term.

The disclosure of anticipated financial effects from **material transition risks [...] shall** include:

- a. the **monetary amount and proportion (percentage) of assets at material transition risk over the short-, medium- and long-term** before considering climate mitigation actions;
- b. the **proportion of assets at material transition risk addressed by the climate change mitigation actions;**
- c. a **breakdown of the carrying value** of the undertaking's real estate assets by energy-efficiency classes;
- d. **liabilities that may have to be recognised in financial statements over the short-, medium- and long-term;** and
- e. the **monetary amount and proportion (percentage) of net revenue from its business activities at material transition risk over the short-, medium- and long-term** including, where relevant, the **net revenue from** the undertaking's customers operating in coal, oil and gas-related activities.

The undertaking **shall** disclose reconciliations to the relevant line items or notes in the financial statements of the following:

- a. significant amounts of the assets and net revenue at material physical risk;
- b. significant amounts of the assets, liabilities, and net revenue at material transition risk.

For the disclosure of the potential to pursue climate-related opportunities [...] the undertaking **shall** consider:

- a. its expected cost savings from climate change mitigation and adaptation actions; and
- b. the potential market size or expected changes to net revenue from low-carbon products and services or adaptation solutions to which the undertaking has or may have access.

A quantification of the financial effects that arise from opportunities is not required if such a disclosure does not meet the qualitative characteristics of useful information included under ESRS 1 Appendix B Qualitative characteristics of information.

## Appendix A: Application Requirements (AR)

**Note that:** This Appendix is an integral part of the ESRS E1. It supports the application of the disclosure requirements set out in this standard and **has the same authority as the other parts of the Standard.**

### **Disclosure Requirement E1-9 - Anticipated financial effects from material physical and transition risks and potential climate-related opportunities**

#### **Anticipated financial effects from material physical and transition risks**

AR 67. Material climate-related physical risks and transition risks may affect the undertaking's financial position (e.g., owned assets, financially-controlled leased assets, and liabilities), performance (e.g., potential future increase/decrease in net revenue and costs due to business interruptions, increased supply prices resulting in potential margin erosions), and cash flows. The low probability, high severity and long-term time horizons of some climate-related physical risk exposures and the uncertainty arising from the transition to a sustainable economy mean that there will be associated material anticipated financial effects that are outside the scope of the requirements of applicable accounting standards.

AR 68. **Currently, there is no commonly accepted methodology to assess or measure how material physical risks and transition risks may affect the undertaking's future financial position, financial, performance and cash flows.** Therefore, the disclosure of the financial effects [...] will depend on the **undertaking's internal methodology and the exercise of significant judgement in determining the inputs, and assumptions needed to quantify their anticipated financial effects.**

#### **Calculation guidance - Anticipated financial effects from material physical risks**

AR 69. When disclosing the information required [...], the undertaking **shall** explain whether and how:

- a. it assessed the anticipated financial effects for assets and business activities at material physical risk, including the scope of application, time horizons, calculation methodology, critical assumptions and parameters and limitations of the assessment; and
- b. the assessment of assets and business activities considered to be at material physical risk relies on or is part of the process to determine material physical risk [...] to determine climate scenarios as required [...]. In particular, it shall explain how it has defined medium- and long-term time horizons and how these definitions are linked to the expected lifetime of the undertaking's assets, strategic planning horizons and capital allocation plans.

AR 70. When preparing the information on assets at material physical risk that is required [...], the undertaking **shall**:

- a. Calculate the assets at material physical risk in terms of monetary amount and as a proportion (percentage) of total assets at the reporting date (i.e., **the proportion is an estimate of the carrying value of assets at material physical risk divided by total carrying value as stated in the statement of financial position or balance sheet**). The estimate of assets at material physical risk shall be derived starting from the assets recognised in the financial statements. The estimate of monetary amounts and proportion of assets at physical risk may be presented as either a single amount or range.
- b. All types of assets including finance-lease / right-of-use assets shall be considered when determining the assets at material physical risk.
- c. To contextualise this information, the undertaking **shall**:
  - i. disclose the location of its significant assets at material physical risk. Significant assets located in the EU territory shall be aggregated by NUTS codes 3 level digits (Nomenclature of Territorial Units for Statistics). For significant assets located outside EU territory, the breakdown by NUTS code will only be provided where applicable.
  - ii. disaggregate the monetary amounts of assets at risk by acute and chronic physical risk.
- d. calculate the share of assets at material physical risk [...] that is addressed by the climate change adaptation actions based on the information disclosed under Disclosure Requirement E1-3. This aims at approximating net risks.

AR 71. When preparing the information required [...], the undertaking **may** assess and disclose the share of net revenue from business activities at physical risk. This disclosure

- a. shall be based on the net revenue in line with the requirements in accounting standards applied for financial statements, i.e., IFRS 15 or local GAAP.
- b. may include a breakdown of the undertaking's business activities with the corresponding details of the associated percentage of total net revenue, the risk factors (hazards, exposure and sensitivity) and, if possible, the magnitude of the anticipated financial effects **in terms of margin erosion** over the **short-, medium- and long-term time horizons. The nature of business activities may also be disaggregated by operating segments** if the undertaking has disclosed the contribution of margins by operational segments in its segment reporting in the financial statements.

### Calculation guidance - Anticipated financial effects from transition risk

AR 72. When disclosing the information required [...], the undertaking shall explain whether and how:

- a. it has assessed the potential effects on future financial performance and position for assets and business activities at material transition risk, including the scope of application, calculation methodology, critical assumptions and parameters, and limitations of the assessment; and
- b. the assessment of assets and business activities considered to be at material transition risk relies on or is part of the process to determine material transition risks [...] and to determine scenarios as required under paragraphs AR 12 to AR 13. In particular, it shall explain how it has defined medium- and long-term time horizons and how these definitions are linked to the expected lifetime of the undertaking's assets, strategic planning horizons and capital allocation plans.

AR 73. When disclosing the information on assets at material transition risk as required under paragraphs 67 (a) and (b):

- a. the undertaking shall at the **very least include an estimate of the amount of potentially stranded assets (in monetary amounts and as a proportion/percentage) from the reporting year until 2030 and from 2030 to 2050. Stranded assets are understood as the active or firmly planned key assets of the undertaking with significant locked-in GHG emissions over their operating lifetime. Firmly planned key assets are those that the undertaking will most likely deploy within the next 5 years. The amount may be expressed as a range of asset values based on different climate and policy scenarios, including a scenario aligned with limiting climate change to 1.5°C.**
- b. the undertaking **shall** disclose a **breakdown of the carrying value of its real estate assets, including rights-of-use assets, by energy efficiency classes.** The energy efficiency shall be represented in terms of either the ranges of energy consumption in kWh/m<sup>2</sup> or the EPC61 (Energy Performance Certificate) label class. If the undertaking cannot obtain this information on a best-effort basis, it shall disclose the total carrying amount of the real estate assets for which the energy consumption is based on internal estimates.
- c. the undertaking **shall** calculate the proportion (percentage) of total assets (including finance lease/right-of-use assets) at material transition risk addressed by the climate change mitigation actions based on the information disclosed under Disclosure Requirement E1-3. The **total assets amount is the carrying amount on the balance sheet at the reporting date.**

AR 74. When disclosing the information on **potential liabilities** from material transition risks[...]:

- a. undertakings that operate installations regulated under an emission trading scheme **may** include a **range of potential future liabilities originating from these schemes;**
- b. undertakings subject to the EU ETS, may disclose the potential future liabilities that relate to their allocation plans for the period before and until 2030. The potential liability may be estimated on the basis of:
  - i. the number of allowances held by the undertaking at the beginning of the reporting period;
  - ii. the number of allowances to be purchased in the market yearly, i.e., before and until 2030;
  - iii. the gap between estimated future emissions under various transition scenarios and free allocations of allowances that are known for the period until 2030, and
  - iv. the estimated yearly cost per tonne of CO<sub>2</sub> for which an allowance needs to be purchased;
- c. In assessing its potential future liabilities, the undertaking **may** consider and disclose the number of Scope 1 GHG emission allowances within regulated emission trading schemes and the cumulative number of emission allowances stored (from previous allowances) at the beginning of the reporting period;
- d. undertakings disclosing volumes of carbon credits planned to be cancelled in the near future (Disclosure Requirement E1-7) **may** disclose the potential future liabilities associated with those based on existing contractual agreements;
- e. the undertaking **may** also include its monetised gross Scope 1, 2 and total GHG emissions (in monetary units) calculated as follows:
  - i. monetised Scope 1 and 2 GHG emissions in the reporting year by the following formula:
    - (gross Scope 1 GHG emissions (t CO<sub>2</sub>eg) + gross Scope 2 GHG emission (t CO<sub>2</sub>eg) x GHG emission cost rate (€) t CO<sub>2</sub>eg)
  - ii. the number of allowances to be purchased in the market yearly, i.e., before and until 2030;
    - Total GHG emissions (t CO<sub>2</sub>eg) x GHG emission cost rate (€) t CO<sub>2</sub>eg
  - iii. by use of a lower, middle and upper cost rate for GHG emissions (e.g., market carbon price and different estimates for the societal costs of carbon) and reasons for selecting them

AR 75. Other approaches and methodologies **may** be applied to assess how transition risks may affect the future financial position of the undertaking. In any case, the disclosure of anticipated financial effects **shall include a description of the methodologies and definitions used by the undertaking.**

AR 76. When preparing the information required [...], the undertaking **may** assess and **disclose the share of net revenue from business activities at transition risks**. This disclosure:

- a. **shall** be based on the net revenue in line with the requirements in accounting standards applied for financial statements, i.e., IFRS 15 or local GAAP.
- b. **may** include a breakdown of the undertaking's business activities with the corresponding details of the **associated percentage of current net revenue, risk factors (events and exposure), and when possible, the anticipated financial effects related to margin erosion over the short-, medium- and long-term. The nature of business activities may also be disaggregated by operating segments if the undertaking has disclosed the contribution of margins by operational segments in its segment reporting in the financial statements.**

**Connectivity with financial reporting information**

AR 77. The reconciliation of the significant amount of assets, liabilities, and net revenue (vulnerable to either material physical risks or transition risks) to the relevant line item or disclosure (e.g., in segment reporting) in the financial statements[...] **may** be presented by the undertaking as follows:

- a. as a cross-reference to the related line item or disclosure in the financial statements if these amounts are identifiable in the financial statements; or
- b. If these cannot be directly cross-referenced, as a quantitative reconciliation of each to the relevant line item or disclosure in the financial statement using the below tabular format: reporting in the financial statements.

Carrying amount of assets or liabilities or net revenue vulnerable to either material physical or transition risks	
Adjusting items	
Assets or liabilities or net revenue in the financial statements	

AR 78. The undertaking **shall ensure the consistency of data and assumptions to assess and report the anticipated financial effects from material physical risks and transition risks in the sustainability statement with the corresponding data and assumptions used for the financial statements** (e.g., carbon prices used for assessing impairment of assets, the useful life of assets, estimates and provisions). The undertaking shall explain the reasons for any inconsistencies (e.g., if the full financial implications of climate-related risks are still under assessment or are not deemed material in the financial statements).

AR 79. For potential future effects on liabilities [...], if applicable, the undertaking shall cross-reference the description of the emission trading schemes in the financial statements.

**Climate-related opportunities**

AR 80. When disclosing the information [...], the undertaking **shall** explain the **nature of the cost savings (e.g., from reduced energy consumption), the time horizons and the methodology used, including the scope of the assessment, critical assumptions, and limitations, and whether and how scenario analysis was applied.**

AR 81. When disclosing the information required [...], the undertaking **shall explain how it has assessed the market size or any expected changes to net revenue from low-carbon products** and services or adaptation solutions including the scope of the assessment, the time horizon, critical assumptions, and limitations and to what extent this market is accessible to the undertaking. The information on the market size may be put in perspective to the current taxonomy-aligned revenue disclosed under the provisions of Regulation (EU) 2020/852. The entity may also explain how it will pursue its climate-related opportunities and, where possible, this should be linked to the disclosures on policies, targets and actions under Disclosure Requirements E1-2, E1-3 and E1-4.

**Annex II provides a definition of terms. Here we present an excerpt of key terms:**

**Fossil fuel:** Non-renewable carbon-based energy sources such as solid fuels, natural gas and oil.

**Renewable energy:** Energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas.

**Physical risks:** All global economic enterprise depends on the functioning of earth systems, such as a stable climate and on ecosystem services, such as the provision of biomass (raw materials). nature-related physical risks are a direct result of an organisation's dependence on nature. Physical risks arise when natural systems are compromised, due to the impact of climatic events (e.g., extremes of weather such as a drought), geologic events (e.g., seismic events such as an earthquake) events or changes in ecosystem equilibria, such as soil quality or marine ecology, which affect the ecosystem services

organisations depend on. These can be acute, chronic, or both. Nature-related physical risks arise as a result of changes in the biotic (living) and abiotic (non-living) conditions that support healthy, functioning ecosystems. Physical risks are usually location-specific. Nature-related physical risks are often associated with climate-related physical risks.

**Transition risks:** Risks that result from a misalignment between an organisation's or investor's strategy and management and the changing regulatory, policy or societal landscape in which it operates. Developments aimed at halting or reversing damage to the climate or to nature, such as government measures, technological breakthroughs, market changes, litigation and changing consumer preferences can all create or change transition risks.

**Impact materiality:** A sustainability matter is material from an impact perspective when it pertains to the undertaking's material actual or potential, positive or negative impacts on people or the environment over the short-, medium- and long-term. A material sustainability matter from an impact perspective includes impacts connected with the undertaking's own operations and upstream and downstream value chain, including through its products and services, as well as through its business relationships

**Financial materiality:** A sustainability matter is material from a financial perspective if it generates risks or opportunities that affect (or could reasonably be expected to affect) the undertaking's financial position, financial performance, cash flows, access to finance or cost of capital over the short, medium or long term.

**Appendix C** of the ESRS Standard stipulates the phase-in or effective date. The phase-in for E1-9 is:

*"The undertaking may omit the information prescribed by ESRS E1-9 for the first year of preparation of its sustainability statement. The undertaking may comply with ESRS E1-9 by reporting only qualitative disclosures for the first 3 years of preparation of its sustainability statement, if it is impracticable to prepare quantitative disclosures."*

The ESRSs will be effective as of 1 January 2024, i.e., the: "first" year is 2024.



## United Kingdom: Transition Plan Taskforce (TPT) Disclosure Framework

Reference: TPT Disclosure Framework (October 2023)

### **Financial planning (section 2.4):**

"An entity shall, to the extent the financial effects of its transition plan are separately identifiable, disclose information about the effects of its transition plan on its financial position, financial performance and cash flows over the short-, medium-, and long-term, including information about how it is resourcing or plans to resource its activities in order to achieve the Strategic Ambition of its transition plan.

As part of this, an entity:

- a. shall disclose information about how the entity is resourcing, and plans to resource, the current and planned activities set out in its transition plan
- b. shall disclose qualitative and quantitative information about how it expects implementation of its transition plan to affect its financial position over the short-, medium-, and long-term, taking into consideration matters such as:
  - i. its investment and disposal plans (e.g. plans for capital expenditure, major acquisitions and divestments, joint ventures, business transformations, innovation, new business areas, investments into research and development for climate solutions, and asset retirements), including plans to which the entity is not contractually committed
  - ii. planned sources of funding to implement its plan
- c. shall disclose qualitative and quantitative information about how it expects implementation of its transition plan to affect its financial performance and cash flows over the short-, medium-, and long-term (e.g. increased revenue from products and services aligned with a low-GHG emissions, climate-resilient economy, and expenses associated with climate adaptation or mitigation."

Reference: Oil and Gas Sector Reporting Guidance (DRAFT from November 2023, key excerpts only)

### **1.2 Business Model and Value Chain**

An entity shall disclose a description of the current and anticipated implications of the entity's Strategic Ambition on its business model and value chain.

When interpreting the Disclosure Framework for the Oil & Gas sector, an entity should consider disclosing:

- if it plans to transition its business model, how it plans to do so, by business segment and how it anticipates the product mix/portfolio will change over the short- and medium-term including, as applicable:
  - oil and/or gas operations;
  - physical trading of oil, gas, and other commodities;
  - managed phase-out of unabated oil or gas assets or related activities;
  - GHG neutralising measures and associated offsets (e.g. CCUS, DAC, nature based solutions, CDR); and o low-carbon fuels and/or electricity generation;
  - how it plans to mitigate potential climate-related risks, originating from its business model, such as stranded asset risks, litigation risks, transferred emissions and other risks from former or sold assets and access to financial and capital markets;
  - the role of new oil and gas exploration and production assets in its business model, stating any impact these have on its Strategic Ambition. This should consider disclosure of their location, and projected absolute emissions and intensity calculated over their operating life; and
  - their approach towards assessing the compatibility of partnerships and joint ventures with the realisation of their Strategic Ambition, and their transition plan and how it applies its plan to transition its business model to any interests it holds in partnerships, non-operated joint ventures and other minority interests, including the emissions boundary used.

### **1.3 Assumptions and External Factors**

An entity shall disclose assumptions that it uses and external factors on which it depends in order to achieve the Strategic Ambition of its transition plan.

When interpreting the Disclosure Framework for the Oil & Gas sector, an entity should consider disclosing

- assumptions which inform or affect its transition plan, including those relating to the following over the short, medium-, and, long-term on a regional or global level (where relevant):

- oil and gas demand and pricing; o GHG emissions prices (including methane pricing); o low-carbon fuels demand and pricing; the role of new oil and gas exploration and production assets in its business model, stating any impact these have on its Strategic Ambition. This should consider disclosure of their location, and projected absolute emissions and intensity calculated over their operating life; and
- low-carbon electricity pricing; o expected role of GHG neutralising measures, including assumptions relating to permanence/leakage;
- tax (including carbon border taxes), allowances and reliefs;
- reliance on technological development and related infrastructure readiness, with specific reference to Carbon Capture, Utilisation and Storage; and
- physical risks and impacts of climate change

When disclosing, an entity may additionally consider:

For assumptions relating to:

- Scenarios, refer to internationally recognised scenarios to identify key forward looking assumptions. For example, the IEA publishes data annually in the World Energy Outlook and other analysis, providing comprehensive projections of materials demand, technology cost, energy production and consumption, energy prices, energy mix, CO<sub>2</sub> prices and more.
- The reliance on advancement and deployment of technologies (such as those relating to CCUS or new low-carbon products and/or services), entities may consider referring to technology readiness levels (TRL) used by the IEA. [...]
- The availability of natural resources which may include, assumed future availability of water abstracted from natural ecosystems, or assumed future availability of land for applying natural climate solutions / nature-based solutions. Justification of these assumptions could reference material nature-related dependencies, and risks and opportunities identified following the TNFD LEAP process.

#### 4.2 Financial Planning

An entity shall disclose information about the financial metrics and targets that it uses in order to drive and monitor progress towards the Strategic Ambition of its transition plan, and report against these metrics and targets on at least an annual basis.

When interpreting the Disclosure Framework for the Oil & Gas sector, an entity should consider disclosing:

on an annual basis current and projected capital expenditure for (as applicable):

- oil and/or gas operations, including long-lived fields;
  - low-carbon fuels and/or electricity generation;
  - GHG neutralising measures and associated offsets (e.g. CCUS, DAC, nature based solutions, CDR);
  - physical trading of oil, gas, and other commodities; and
  - managed phase-out of unabated assets or related activities.
- R&D spend and activities in all of the areas listed above, including low/zero carbon and mitigation technologies, carbon removal technologies, and any other emerging technologies;
  - financial implications of assumptions and external factors (section 1.3 Key assumptions and external factors) relating to transition. For example, an entity may disclose sensitivity of hydrocarbon reserve levels and/or refining capacity to future price projection scenarios that account for increasing economic costs of GHG emissions and other drivers of demand shift (such as electric vehicles or heat pumps).

When disclosing, an entity may additionally consider:

- a breakdown of current and projected capital expenditure for oil and/or gas operations between maintenance, expansion of existing fields, exploration and development of new fields;
- financial risks associated with adjusting its business model(s) as a means to change its product portfolio mix, as different products across the value chain may have varying associated transition risks (e.g. cost and emissions intensity); and
- the ACT Oil and Gas methodology which includes guidance on measuring an entity's growth in sales of low-carbon products and/or services compared with a benchmark.





## US: U.S. Securities and Exchange Commission (U.S. SEC) – The Enhancement and Standardization of Climate-Related Disclosures for Investors

**Financial impact metrics:** “the proposed rule would include the following examples of disclosures that may be required to reflect the impact of the severe weather events and other natural conditions on each line item of the registrant’s consolidated financial statements (e.g., line items of the consolidated income statement, balance sheet, or cash flow statement):

When interpreting the Disclosure Framework for the Oil & Gas sector, an entity should consider disclosing:

- **Changes to revenue or costs** from disruptions to business operations or supply chains;
- **Impairment charges and changes to the carrying amount of assets** (such as inventory, intangibles, and property, plant and equipment) due to the assets being exposed to severe weather, flooding, drought, wildfires, extreme temperatures, and sea level rise;
- **Changes to loss contingencies or reserves** (such as environmental reserves or loan loss allowances) due to impact from severe weather events; and
- **Changes to total expected insured losses** due to flooding or wildfire patterns.

With respect to the financial impacts of transition activities, the proposed rule would include the following examples of potential impacts:

- **Changes to revenue or cost due to new emissions pricing** or regulations resulting in the loss of a sales contract;
- **Changes to operating, investing, or financing cash flow** from changes in upstream costs, such as transportation of raw materials
- **Changes to the carrying amount of assets** (such as intangibles and property, plant, and equipment), for example, due to a reduction of the asset’s useful life or a change in the asset’s salvage value by being exposed to transition activities; and
- **Changes to interest expense** driven by financing instruments such as climate-linked bonds issued where the interest rate increases if certain climate-related targets are not met.”

**Expenditure metrics:** “As proposed, the expenditure metrics would require a registrant to separately aggregate amounts of (i) **expenditure expensed** and (ii) **capitalized costs incurred during the fiscal years presented**. For each of those categories, a registrant would be required to disclose separately the amount incurred during the fiscal years presented (i) toward positive and negative impacts associated with the climate-related events (i.e., severe weather events and other natural conditions and identified physical risks) and (ii) toward transition activities, specifically, to reduce GHG emissions or otherwise mitigate exposure to transition risks (including identified transition risks). The registrant may also choose to disclose the impact of efforts to pursue climate-related opportunities associated with transition activities.

**Financial Estimates and Assumptions:** “The proposed rules would require a registrant to disclose whether the **estimates and assumptions used to produce the consolidated financial statements were impacted by exposures to risks and uncertainties associated with, or known impacts from, climate-related events** (including identified physical risks and severe weather events and other natural conditions), such as flooding, drought, wildfires, extreme temperatures, sea level rise. [...] Similar to the other proposed financial statement metrics, the proposed rules would include a provision that would require separate disclosure focused on transition activities (including identified transition risks). [...]

Other financial statement estimates and assumptions that may require disclosure pursuant to the proposed rules may include those related to the **estimated salvage value of certain assets, estimated useful life of certain assets, projected financial information used in impairment calculations, estimated loss contingencies, estimated reserves** (such as environmental reserve or loan loss allowances), **estimated credit risks, fair value measurement of certain assets, and commodity price assumptions.**”

**Inclusion of Climate-Related Metrics in the Financial Statements:** “The proposed financial statement metrics would be required in the financial statements, and therefore would be (i) included in the scope of any required audit of the financial statements in the relevant disclosure filing, (ii) subject to audit by an independent registered public accounting firm, and (iii) within the scope of the registrant’s ICFR.”

**Appendix C: Description of the Paris Ambitious 1.5°C climate reference scenarios as published in WBCSD's Climate Scenario Analysis Reference Approach: For companies in the energy system**

<i>Model</i>	<i>Model description</i>	<i>Scenario</i>	<i>Scenario description</i>	<i>Source(s)</i>
International Energy Agency (IEA) Global Energy and Climate Model	The IEA Global Energy and Climate Model (GEC) is a bottom-up partial optimization model for energy demand, supply, transformation and prices.	Net Zero Energy 2050	The Net Zero Energy 2050 scenario sets out a pathway for the global energy sector to achieve net-zero CO2 emissions by 2050. It does not rely on emissions reductions from outside the energy sector to achieve its goals. Universal access to electricity and clean cooking are achieved by 2030.	<a href="#">IEA World Energy Outlook 2022</a>
International Renewable Energy Agency (IRENA)	IRENA provides transition modelling of the energy system with a focus on renewables.	1.5°C Scenario	The 1.5°C Scenario is an orderly transition to limit global warming to 1.5°C by the end of the century with a focus on renewables. It reaches net-zero energy emissions in 2050. The model is a calculator based on energy statistics with a link to a macro-econometric model for socio-economic analysis. It does not cover the land-use sector.	<a href="#">World Energy Transitions Outlook: 1.5°C Pathway: Global Renewables Outlook: Energy transformation 2050</a>
Network for Greening the Financial System (NGFS) Global Change Assessment Model (GCAM)	The NGFS provides transition modelling with the aim to develop climate risk management in the financial sector. GCAM is a partial equilibrium model of the energy and land sector, which assumes myopic consumers and producers.	Divergent Net Zero	The Divergent Net Zero scenario assumes the implementation of optimal carbon prices in line with the long-term targets immediately after 2020 to bring the median temperature below 1.5°C in 2100, after a limited temporary overshoot. The distribution of policy pressure and mitigation efforts is uneven across sectors, with stronger mitigation action taking place in the transport and buildings sectors and with policy-makers preferring to reflect consumer-oriented measures.	<a href="#">NGFS Scenario Explorer</a>
		Net Zero 2050	The Net Zero 2050 scenario foresees global CO2 emissions to be net zero in 2050. Furthermore, assumptions are that countries with a clear commitment to a specific net-zero policy target at the end of 2020 meet this target. This scenario assumes the implementation of optimal carbon prices in line with the long-term targets immediately after 2020.	

<i>Model</i>	<i>Model description</i>	<i>Scenario</i>	<i>Scenario description</i>	<i>Source(s)</i>
NGFS REMIND-MagPIE (REgional Model of INvestment and Development-Model of Agricultural Production and its Impact on the Environment)	The NGFS provides transition modelling with the aim to develop climate risk management in the financial sector. REMIND-MagPIE combines a general equilibrium model on the energy sector and the macroeconomy under perfect foresight with a partial equilibrium model on the land sector under myopic behavior.	<b>Divergent Net Zero</b>	The Divergent Net Zero scenario assumes the implementation of optimal carbon prices in line with the long-term targets immediately after 2020 to bring the median temperature below 1.5°C in 2100, after a limited temporary overshoot. There is uneven distribution of policy pressure and mitigation efforts across sectors, with stronger mitigation action taking place in the transport and buildings sectors and with policy-makers preferring to reflect consumer-oriented measures.	<a href="#"><u>NGFS Scenario Explorer</u></a>
		<b>Net Zero 2050</b>	The Net Zero 2050 scenario foresees global CO2 emissions to be net zero in 2050. Furthermore, assumptions are that countries with a clear commitment to a specific net-zero policy target at the end of 2020 meet this target. This scenario assumes the implementation of optimal carbon prices in line with the long-term targets immediately after 2020.	
Riahi et al. (2017) from the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) Database	Riahi et al. (2017) use a multi-model approach to estimate the emissions and land-use implications of the Shared Socioeconomic Pathways (SSP). The two scenarios presented here have the lowest and highest GDP growth trajectories of all the AR6 Scenario Database and Explorer scenarios.	<b>SSP3 (low growth) pathway</b>	Regional rivalry characterizes the SSP3 pathway. The scenario builds on the narrative that nationalism, concerns about competitiveness and security, leads to low international priority for addressing environmental concerns causing environmental degradation and low economic growth.	<a href="#"><u>Riahi, et al., 2017</u></a>
		<b>SSP5 (high growth) pathway</b>	Fossil fuel-led economic growth characterizes the SSP5 pathway. It assumes that a push for economic and social development is coupled with the exploitation of abundant fossil fuel resources, leading to rapid growth of the global economy.	
United Nations (UN) Principles for Responsible Investment (PRI)	The UN-supported Principles for Responsible Investment (PRI) has commissioned the Inevitable Policy Response (IPR) consortium, including Vivid Economics, to prepare institutional investors for the portfolio risks and opportunities associated with a forecast acceleration of policy responses to climate change. IPR contends this forecast acceleration of policy responses is "inevitable" as governments will be forced to act more decisively than they have thus far, leaving financial portfolios exposed to significant transition risk.	<b>Required Policy Scenario (RPS)</b>	The RPS is a stringent scenario explicitly designed to assess the policy gap to limit global warming to 1.5°C. Additional performance standards and subsidies help achieve additional policy ambitions.	<a href="#"><u>Inevitable Policy Response 2021</u></a>

# Endnotes

- 1 Here we refer to companies that derive most of their annual revenues from exploring, producing, refining and selling oil and gas products as oil and gas companies. We recognize that many (but not all) oil and gas companies are on their transition journeys and are also often referred to more generally as energy companies.
- 2 Task Force on Climate-related Financial Disclosures (TCFD) (2016). Phase I Report of the Task Force on Climate-Related Financial Disclosures. Basel: TCFD.
- 3 Companiesmarketcap.com (2023). Largest oil and gas companies by market cap. Retrieved from: <https://companiesmarketcap.com/oil-gas/largest-oil-and-gas-companies-by-market-cap/>.
- 4 International Energy Agency (IEA) (2023). World Energy Outlook 2023. Paris: IEA.
- 5 International Energy Agency (IEA) (2023). World Energy Outlook 2023. Paris: IEA.
- 6 Task Force on Climate-related Financial Disclosures (TCFD) (2017). Recommendations of the Task-Force on Climate-related Financial Disclosures. Basel: TCFD. Retrieved from: <https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf>.
- 7 Task Force on Climate-related Financial Disclosures (TCFD) (2022). 2022 Status Report. Basel: TCFD.
- 8 Climate-related metrics include several types of metrics, including financial metrics.
- 9 Task Force on Climate-related Financial Disclosures (TCFD) (2023). 2023 Status Report. Basel: TCFD.
- 10 WBCSD (2019). Climate-related financial disclosure and the opportunity for the electric utilities sector. Retrieved from: <https://www.wbcsd.org/Programs/Redefining-Value/TCFD/Resources/Disclosure-in-a-time-of-transition-Climate-related-financial-disclosure-and-the-opportunity-for-the-electric-utilities-sector>.  
WBCSD (2021). Evaluating climate-related financial impacts on power utilities. Retrieved from: <https://www.wbcsd.org/Programs/Climate-and-Energy/Resources/Evaluating-climate-related-financial-impacts-on-power-utilities>.  
WBCSD (2022). Demystifying Climate Transition Scenarios. Retrieved from: <https://www.wbcsd.org/Programs/Redefining-Value/TCFD/Resources/Demystifying-Climate-Transition-Scenarios>.
- WBCSD (2023). Climate Scenario Analysis Reference. Retrieved from: <https://www.wbcsd.org/Programs/Redefining-Value/TCFD/Resources/Climate-Scenario-Analysis-Reference-Approach>.
- 11 The ISSB S1 and S2 Climate-related Disclosure Standards superseded the TCFD framework, guidance and recommendations in 2023 and TCFD will dissolve in Q4 2023. Our report still references the TCFD framework and guidance because it forms the basis of the ISSB S1 and S2 Sustainability Standards.
- 12 See also tables A1.1 and A1.2 in the Appendix of TCFD's [Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#).
- 13 Task Force on Climate-related Financial Disclosures (TCFD) (2021). Guidance on Metrics, Targets and Transition Plans. Basel: TCFD.
- 14 The [IFRS Foundation announced in July 2023](#) that as of 2024 the IFRS Foundation will "take over the monitoring of the progress on companies' climate-related disclosures from the Task Force on Climate-related Financial Disclosures (TCFD)" because the IFRS S1 and S2 have fully incorporated the recommendations of TCFD.
- 15 Climate risks will affect, among other things, the forecasted demand for oil and gas, the associated price assumptions and anticipated future costs which are all used impairment testing to assess the current amounts of assets in the balance sheet.
- 16 Such disclaimers are also referred to as "safe harbor" provisions; e.g., for the USA, refer also to Safe Harbor Under the [Private Securities Litigation Reform Act of 1995](#).
- 17 TCFD acknowledges that "forward-looking analyses are especially important but challenging." Task Force on Climate-related Financial Disclosures (TCFD) (2021). Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures. Basel: TCFD.
- 18 The status of the emerging regulation may have changed since the time of writing this report.
- 19 International Financial Reporting Standards (IFRS) (2023). ISSB Frequently Asked Questions. Retrieved from: <https://www.ifrs.org/groups/international-sustainability-standards-board/issb-frequently-asked-questions/>.

- 20** International Financial Reporting Standards (IFRS) (2023). Industry-based Guidance on implementing Climate-related Disclosures. Retrieved from <https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards-issb/english/2023/issued/part-b/ifrs-s2-ibg.pdf>.
- 21** TCFD has been issuing status reports annually since 2020. The findings referenced here are from the 2022 status report and apply to financial year (FY) 2021. Source: Task Force on Climate-related Financial Disclosures (TCFD) (2022). 2022 Status Report. Basel: TCFD.
- The 2023 status report will be the final status report by TCFD. ISSB will monitor financial disclosures as of 2024.
- 22** The 134 companies are part of Climate Action 100+, an investor-led initiative with the aim for large corporate greenhouse gas emitters to act on climate change.
- 23** Davidson, B. (2021). Flying Blind: The Absence of Climate Risk in Financial Reporting. Carbon Tracker Initiative.
- 24** Davidson, B. (2022). Still Flying Blind: The Glaring Absence of Climate Risk in Financial Reporting. Carbon Tracker Initiative.
- 25** Among the eight companies are BP, ENI, Equinor and Shell, which are all WBCSD members.
- 26** Guy-Knapp, C. (2022). Drilling down: The importance of understanding projected oil and gas prices used in financial reporting. Carbon Tracker Initiative.
- 27** BP, Equinor, Repsol, Shell, Total Energies and OMV
- 28** The 2022 FRC report on TCFD disclosures is part of the its thematic review of corporate reporting over the last few years.
- Financial Reporting Council (FRC) (2022). FRC Thematic Review of TCFD disclosures and climate in the financial statements. London: Financial Reporting Council.
- 29** Financial Reporting Council (FRC) (2023). CRR Thematic Review of Climate-Related Metrics and Targets. London: Financial Reporting Council.
- 30** U.S. Energy Information Administration (EIA). (2023). What drives Crude Oil Prices? Retrieved from: <https://www.eia.gov/finance/markets/crudeoil/supply-opec.php>.
- 31** IAS 36 Impairment of Asset: RB2023-A – Issued IFRS Standards
- 32** As stated previously, given that companies have different transition strategies and NZE aspirations, our how-to guidance focuses on risks rather than opportunities; the current view is also that risks outweigh opportunities for many companies.
- 33** For example, the amount of average solar irradiation by location or wind potential as a function of location and time are well understood.
- 34** Task Force on Climate-related Financial Disclosures (TCFD) (2021). 2021 Status Report. Basel: TCFD.
- 35** Task Force on Climate-related Financial Disclosures (TCFD) (2023). 2023 Status Report. Basel: TCFD.
- 36** International Financial Reporting Standards (IFRS) (2023). Industry-based Guidance on implementing Climate-related Disclosures. Retrieved from: <https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards-issb/english/2023/issued/part-b/ifrs-s2-ibg.pdf>.
- 37** Some companies use different (other than proven) reserves estimate for depreciation.
- 38** Companies best estimate (or probable) reserves and (typically risked) resources are also used to determine market value.
- 39** IFRS has issued [educational material](#) linking the S2 Standard with the IFRS Accounting Standards.
- 40** TPT Oil & Gas Sector Guidance (Draft for Consultation November 2023)
- 41** ESRS 1 Section 6.4 provides a year-based definition for short term (reporting period of financial statements), medium term (end of short term to 5 years)and long term (more than 5 years) but also states that "if different definitions of medium- or long-term time horizons are required for specific items of disclosure in other ESRS, the definitions in those ESRS shall prevail,"..
- 42** Many companies also use cash-generating units (CGUs) as the lowest level for cashflow forecasting. In upstream, CGU are often oil or gas fields; in downstream, a refining complex.
- 43** If the information is also included in the annual financial statements, then the metrics should be consistent with the current year financial statements. If the metric deviates from the financial statements, then the company should explain this difference.
- 44** Companies should not inflate actuals for prior years to the current year (FY) to avoid confusion with reporting of financial statements for prior periods.
- 45** Also referred to as the "mid" case, "base" case or "best judgement" case as proposed by management.
- 46** The Ukraine war is a recent example of how unforeseen geopolitical events can have dramatic effects on oil and gas prices and revenues.
- 47** Our definition: return on capital employed = (earnings before interest and tax)/capital employed, with capital employed = total assets – current liabilities.
- 48** Task Force on Climate-related Financial Disclosures (TCFD) (2023). 2023 Status Report. Basel: TCFD.

# Acknowledgements

## *Disclaimer*

This publication is released in the name of the World Business Council for Sustainable Development (WBCSD). It is the result of a collaborative effort between WBCSD and representatives from companies participating in the WBCSD TCFD Oil and Gas Sector Working Group. A wide range of members have reviewed the material, thereby ensuring that the document broadly represents a majority view. It does not mean, however, that every company within the workstream agrees with every word. This publication has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice.

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## *About WBCSD*

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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