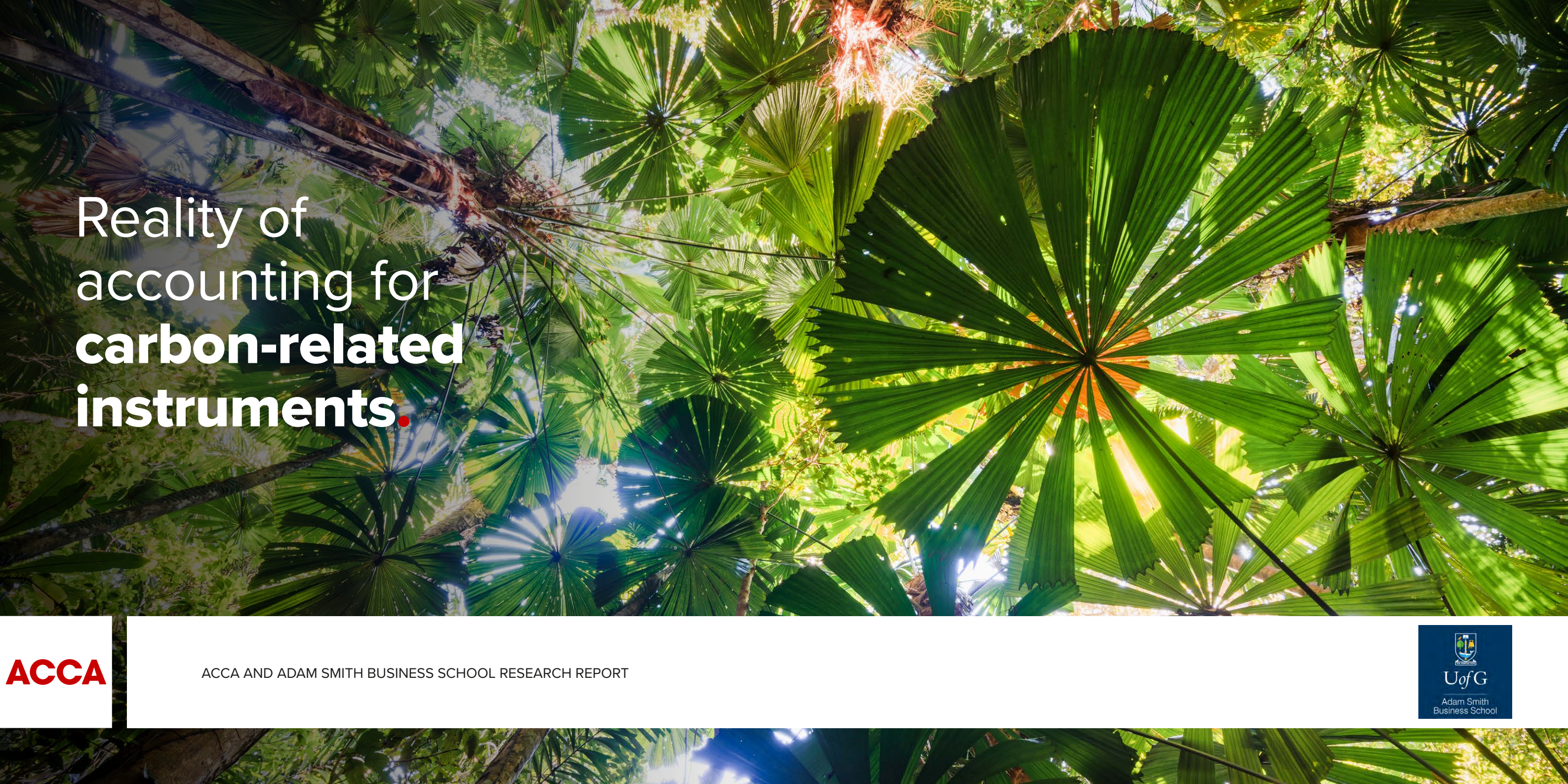




Reality of accounting for **carbon-related instruments.**

ACCA

ACCA AND ADAM SMITH BUSINESS SCHOOL RESEARCH REPORT



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executive summary.

Background and objectives

The importance and magnitude of mandatory and voluntary carbon markets, where various carbon-related instruments (such as carbon allowances, carbon credits and carbon quotas) are traded or given at no cost, has been growing at an unprecedented pace.

An increasing number of companies have participated (mandatorily or voluntarily) in carbon markets and use a variety of such instruments. Further, companies are found to use diverse terms to refer to these carbon-related instruments, without always providing a clear definition of these terms or descriptions of the instruments they use. The prices of some of these instruments have been increasing and could cost more in the future. Indicatively, in 2023 one metric ton of carbon emissions in the European Union Emissions Trading System (EU ETS) was priced at €83.66, which reflects an increase of more than 3.3 times the 2020 prices.

Although the importance of carbon-related instruments for companies has grown as more companies are expected to reduce their carbon emissions, the International Accounting Standards Board (IASB) does not provide any specific standard or guidance to account for these instruments. In addition, IFRS S2 'Climate-related Disclosures' requires companies to disclose information on the use of relevant instruments (ie carbon credits) and on how (if at all) they use carbon

prices in making decisions. Taking these together, it appears there is currently a void of guidance on the actual accounting treatment of carbon-related instruments and on how information required under IFRS S2 is ‘connected’ with companies’ financial statements.

Challenges for corporate reporting and accounting for carbon-related instruments arise from the size of the carbon markets; the plethora of terms used when companies refer to their carbon-related instruments within financial statements, coupled with vague or absent definitions of these terms; the absence of clear guidance on how companies should account for such instruments; and, more importantly, the increasing market price of carbon-related instruments.

Against this backdrop, this exploratory study offers first-hand evidence of the current corporate reporting and accounting practices applied for carbon-related instruments that companies use or engage with to reduce their impact on global climate change. This study aims to answer the following questions.

- Do companies disclose their participation in carbon markets (eg EU ETS)?
- Do companies disclose whether they purchase or create voluntary carbon credits?
- Do companies disclose whether they apply any internal carbon pricing mechanism? If so, do they provide disclosures on the actual pricing?
- How many companies refer to carbon-related instruments in their financial statements?
- What terms do companies use to describe the carbon-related instruments they use (eg carbon allowances, carbon credits, carbon rights)?
- How do companies account for their carbon-related instruments? How do they recognise and measure them? Are the amounts financially significant?
- Do companies disclose any carbon-tax regulation to which they are subject, and explain the carbon-tax issues they face?
- Do auditors raise any issues relating to carbon-related instruments (eg a key audit matter) in the auditors’ report?

Method

This research examined the narrative and financial statements parts of the annual reports of 300 companies operating globally in subsectors with high carbon emissions, such as airlines, materials, oil and gas, and utilities. We identified and captured all disclosed information relevant to carbon-related instruments in the sample companies’ annual reports, while reflecting on the research questions outlined above.

Main findings and implications

- Engagement with carbon-related instruments is not yet pervasive but may grow. Among the 300 companies, only 84 (ie 28% of our sample) disclose in the narrative parts of their annual reports their participation in a carbon market, even though these companies operate in subsectors with high carbon emissions; 20 companies express their interest in participating in a carbon market in the future. Half of these 20 companies are headquartered in Asia.
- Only 40% of the sample (121 companies) refer to carbon-related instruments in their financial statements. These companies, and thus their engagements with carbon-related instruments, are not concentrated in any subsectors.
- The regulatory environment within which a company operates appears to be an important driver for companies’ engagement with carbon-related instruments and subsequent disclosure of information about these instruments in their financial statements. Europe, with its long-standing EU ETS, has more companies than other regions reporting information about carbon-related instruments.
- Disconnections between information in the two parts of annual reports (ie narratives and financial statements) have been observed. For instance, among the 300 sample companies, 84 companies mention their participation in one or more carbon markets in the narrative parts, whereas only 77 do so in the financial statements part of their annual reports. Only 50 of these companies disclose their participation in both the narrative and financial statements parts of their annual reports. Disjointed information potentially impairs the connectivity of financial statements with the rest of the annual report.
- Of the 121 companies that refer to carbon-related instruments in their financial statements, only 51 companies disclose the associated amounts. The size of these amounts (as a percentage of the total assets or revenues) varies considerably among companies, without necessarily being significant for all companies. This indicates that the magnitude of the carbon-related instruments’ value within the financial statements is not the sole determinant of recognition of and disclosure about carbon-related instruments.
- A variety of terms are used to describe carbon-related instruments and many variations of each term were observed (both within and across companies). Although most of the terms identified can be directly attributed to carbon allowances or credits, some terms are less clear and hence may refer to different instruments.
- Companies adopt various accounting treatments for carbon-related instruments within their statement of financial position and statement of profit or loss. Carbon-related instruments are recognised as ‘intangible assets’, ‘inventories’ or ‘other assets’. Further, some companies recognise financial assets related to such instruments (primarily derivatives). On the liabilities side, provisions



‘This exploratory study offers first-hand evidence of the current corporate reporting and accounting practices applied for carbon-related instruments that companies use or engage with to reduce their impact on global climate change.’

relating to carbon-related instruments are most often observed, followed by deferred income. We also noted income or expenses in the statement of profit or loss relating to the use, sale or disposal of carbon-related instruments. Notably, of the 121 companies that refer to carbon-related instruments, 11 do not specify their accounting treatment.

- Both across and within companies, carbon-related instruments are measured at either cost or fair value, though not all companies disclose their measurement approaches. In each case, the chosen approach appears to be influenced by how these instruments were acquired and their intended use.
- Some companies include the cost for carbon-related instruments in the estimated recoverable amounts of assets when testing their assets (primarily goodwill) for impairment. This indicates that carbon-related instruments could become a significant cost for the future activities of these companies.
- In the narrative parts of the annual reports, very few companies disclose their engagements with voluntary carbon credits.
- Only 48 companies (ie 16% of our sample companies) mention the use of internal carbon pricing in the narrative parts of their annual reports. The extent of information about how internal carbon pricing is used and the relevant amounts varies considerably.
- Relatively few auditors' reports discuss issues about carbon-related instruments. Those that do tend to discuss issues about associated areas requiring the exercise of judgement or the use of assumptions, such as accounting for carbon-related instruments, measurement of these instruments, impairment tests for assets, and changes in accounting policy.

Policy recommendations

As many companies are expected to engage with carbon-related instruments in the future, it is important to ensure that they use a consistent approach to account for and provide information about these instruments, to enable users of their annual reports (including financial statements) to understand their nature, function and intended use, and be able to evaluate the financial effects of these instruments on the company.

Therefore, companies need globally applicable guidance for consistent accounting treatment of carbon-related instruments. Such guidance should help determine:

- the appropriate **scope** when accounting for each carbon-related instrument that faithfully represents its nature, function and intended use
- **when** and **how** to recognise the instrument
- the appropriate **measurement approaches**, and
- relevant **disclosures** to enable users to evaluate the financial effects of such an instrument on the company, including its nature, function and intended use.

Below, we recommend interventions for specific groups of stakeholders in the corporate reporting ecosystem.

‘Companies need globally applicable guidance for consistent accounting treatment of carbon-related instruments.’

Preparers of financial statements

Preparers should take proactive measures to:

- clearly state their accounting policies for the recognition and measurement of carbon-related instruments
- clearly describe the nature, function and intended use of their carbon-related instruments
- provide information about carbon-related instruments in a coherent manner in the financial statements and the narrative part of an annual report
- collaborate with peers to promote consistency of accounting treatments, in particular with peers who share a common purpose of engaging with carbon-related instruments, and
- share best practices to support their peers in the subsector.

Auditors

Auditors should:

- check the coherence of information in the financial statements and the narrative part of an annual report, and
- lend their technical expertise to support the development of globally applicable guidance for consistent accounting treatment of carbon-related instruments, and to help ensure the resulting accounting and disclosure requirements are auditable.

Users and those charged with governance

Users and those charged with governance should:

- familiarise themselves with carbon markets and carbon-related instruments to understand what companies do with these instruments and why
- steer companies towards providing coherent information
- engage with standard setters and relevant policymakers and regulators to provide inputs about the information they need for decision-making, why they need this information, and how they will use it.

Standard-setters, policymakers and regulators

Standard-setters, particularly the IASB, have a major future role in developing a dedicated accounting standard with appropriate definitions and requirements for the recognition, measurement and disclosure of carbon-related instruments, and in supporting consistent application of the resulting accounting and disclosure requirements. Standard-setters need to be supported by policymakers and regulators to improve the overall consistency of accounting treatments and disclosure of carbon-related instruments and thus the comparability of financial statements. Therefore, this group of stakeholders should:

- periodically scan the horizon to monitor the evolving state of play among companies around the world, and consider proposals or white papers produced by other standard setters or other reporting-related bodies
- facilitate collaboration and discussion among stakeholders in the corporate reporting ecosystem to gather insights for developing the truly global accounting standard and accompanying application guidance and illustrative examples
- work collaboratively at national, regional and international levels to:
 - develop a truly global accounting standard to promote consistency in accounting treatments for carbon-related instruments across all jurisdictions
 - introduce best practices to uphold the integrity and transparency of carbon markets and associated instruments
 - provide general guidance on disclosing connected financial and sustainability-related information.



1. Introduction

1.1 Background – rapid development of carbon markets at a global scale

In response to demands to tackle climate change, an increasing number of companies across the world participate in carbon markets to reduce their carbon emissions, either because of national or supra-national regulations or purely by choice. In broad terms, within these carbon markets, carbon emissions are priced, and companies are able to reduce their carbon footprint by trading *carbon-related instruments*¹ (such as carbon allowances and credits) which are connected to carbon emissions (IOSCO 2023: 7).

Broadly speaking, these instruments are created and traded in 1) a compliance market (ie cap-and-trade schemes, and baseline and credit schemes) or 2) a voluntary market (ie avoidance/reduction and removal/sequestration schemes) (IOSCO 2023: 7). The significant development of different types of schemes under each market and their combinations have resulted in a plethora of different instruments with which companies may engage. These instruments vary both in substance and intended use.² For example, in February 2024, there were 36 mandatory carbon

markets in force around the world and these covered 18% of carbon emissions worldwide at the time (ICAP 2024: 4).³ There were another 22 at various stages of consideration and development (ICAP 2024: 4). This rapid development is particularly noticeable in key emerging economies, such as Mexico and Brazil in Latin America and China, India and Indonesia in the Asia Pacific region.

While markets in such carbon-related instruments are not new (for example, the cap-and-trade EU ETS, where companies trade carbon allowances, has operated since 2005 on a mandatory basis), the amount of freely allocated allowances is being reduced and the price of carbon allowances is rising. For example, the annual average price of EU ETS allowances has risen from €24.61 in 2020 to €83.66 in 2023 (Statista 2024).⁴ In addition, the global voluntary carbon credit market size, according to Global Markets Insights, was valued at USD 1.7bn in 2024 and it is estimated to grow at a compound annual growth rate of 25% from 2025 to 2034, with a value projection of USD 15.7bn in 2034 (GMI 2024). Moreover, the EU Carbon Border Adjustment Mechanism (CBAM) currently covers

¹ During our empirical investigation, we found that companies may use different terms (such as allowances, credits, certificates) or variations of similar terms (such as carbon allowances, ETS allowances, emissions allowances) to refer to products traded in carbon markets. Consequently, throughout the report we coined the term ‘carbon-related instruments’ to refer broadly to these various instruments.

² Refer to CPA Canada, IFAC and ISF (2024) for further explanation on the respective carbon markets and why they exist.

³ It is indicative of the significance of these mandatory markets that the EU Commission reports that the EU ETS cap for 2024 amounted to 1,386,051,745 allowances (EU Commission n.d.).

⁴ Indicative of this is the following quote from one of our sample companies, Tata Steel (Iron and Steel) (India) (annual report p. 271): ‘Reforms of the EU and UK Emissions Trading System, reducing the supply of permits, are causing the price to rise’.

the import of certain cement, iron and steel, aluminium, fertilisers and hydrogen products, and electricity products. The EU is planning to assess and potentially expand coverage of the CBAM by 2030, aiming to include over half of emissions in the EU ETS sectors by the full phase-in of CBAM in 2034 (PwC 2024).⁵

1.2 Carbon related instruments: corporate reporting challenges

This diverse background contributes to challenges from a corporate reporting perspective. First, the IASB does not provide a specific standard or guidance for accounting for carbon-related instruments. Hence, the accounting treatment of the same or similar items may differ significantly across companies. Second, IFRS S2 Climate Related Disclosures requires an entity to disclose the company’s planned use of carbon credits for offsetting carbon emissions to achieve a net carbon emissions target, and ‘whether’ and, if so, how the company uses a carbon price in making decisions about managing carbon emissions (for example, investment decisions, transfer pricing and scenario analysis). This may raise reporting connectivity challenges for companies that report under both IFRS Accounting Standards and IFRS Sustainability Standards and may also create a compounding comparability problem across companies.

Owing to the importance of global climate change and related emissions at a company level, these challenges are becoming increasingly prominent as the underlying issues/items/transactions become more frequent and arguably more likely to influence the decisions of users, both internally and externally. It’s indicative of the increasing interest in the issue that many respondents to the IASB’s Third Agenda Consultation in 2021 identified a project on *pollutant pricing mechanisms* (PPMs) as a high priority.⁶ Nonetheless, the IASB concluded that there were other projects of higher priority and did not add a project on PPMs to the work plan. Several stakeholders have since suggested that the IASB should prioritise a project on PPMs, arguing that their prevalence is increasing and there is diversity in the accounting for them. In response to this, IASB staff have been conducting activities (horizon-scanning) to assess whether the situation has changed since the agenda consultation to help them consider whether a project on PPMs needs to be added to the work plan (IFRS Foundation 2024).⁷ In January 2025, the IASB decided to defer its decision to add a relevant project to its Fourth Agenda Consultation. Work on the IASB’s Fourth Agenda Consultation is expected to begin in 2025 and will cover the period 2027 to 2031. This will allow the IASB and its stakeholders to form a more holistic opinion about the necessity of a PPM project (IFRS Foundation 2025).

1.3 Research aims and objectives

This exploratory study reflects on and is motivated by this background. We aim to contribute to the IASB’s Fourth Agenda Consultation by offering first-hand evidence of the current corporate reporting practices for carbon-related instruments that companies use or engage with to reduce their impact on global climate change. Specifically, this research examines the narrative and financial statements parts of the annual reports of 300 companies operating globally in subsectors with high carbon emissions, such as airlines, materials, oil and gas, and utilities, and aims to answer the following questions.

- Do companies disclose their participation in carbon markets (eg EU ETS)?
- Do companies disclose whether they purchase or create voluntary carbon credits?
- Do companies disclose whether they apply any internal carbon pricing mechanism? If so, do they provide disclosures on the actual pricing?
- How many companies refer to carbon-related instruments in their financial statements?
- What terms do companies use to describe the carbon-related instruments they use (eg carbon allowances, carbon credits, carbon rights)?
- How do companies account for their carbon-related instruments? How do they recognise and measure them? Are the amounts financially significant?
- Do companies disclose any carbon-tax regulation to which they are subject, and explain the carbon-tax issues faced?
- Do auditors raise any issues relating to carbon-related instruments (eg a key audit matter) in the auditors’ report?

1.4 Report outline

Read [Chapter 2](#) for a short overview of the IASB’s efforts to develop accounting guidance on the treatment of carbon-related instruments and a review of existing reports or white papers on carbon-related instruments. [Chapter 3](#) outlines the sample selection process and sample companies’ characteristics. [Chapter 4](#) discusses the findings of the research, accompanied by extracts from companies’ annual reports. [Chapter 5](#) concludes the report by outlining the practical implications and recommendations.

‘Specifically, this research examines the narrative and financial statements parts of the annual reports of 300 companies operating globally in subsectors with high carbon emissions, such as airlines, materials, oil and gas, and utilities.’

5 Enacted in October 2023 as part of the EU’s Fit for 55 packages, the CBAM complements the existing EU Emissions Trading System (EU ETS). The CBAM effectively places a price on certain greenhouse gases (GHGs) emitted in the production of selected imports, which aligns with EU GHG reduction goals, preventing ‘carbon leakage’ and levelling the playing field for EU and non-EU producers. Carbon leakage refers to the relocation of industry due to differences in carbon pricing policies between jurisdictions (PWC 2024).

6 The IASB refers to pollutant pricing mechanisms (PPM) as mechanisms designed to achieve a reduction of greenhouse gases through the use of tradable emission permits or allowances (IFRS Foundation 2025a).

7 Concurrently, while for several years the Financial Accounting Standards Board (FASB) has been exploring the issuance of specific related guidance on the subject matter, on 17 December 2024, it issued the ‘Proposed Accounting Standards Update, Environmental Credits and Environmental Credit Obligations (Topic 818)’, which deals with closely related issues. The due date for comment letters is 15 April 2025.

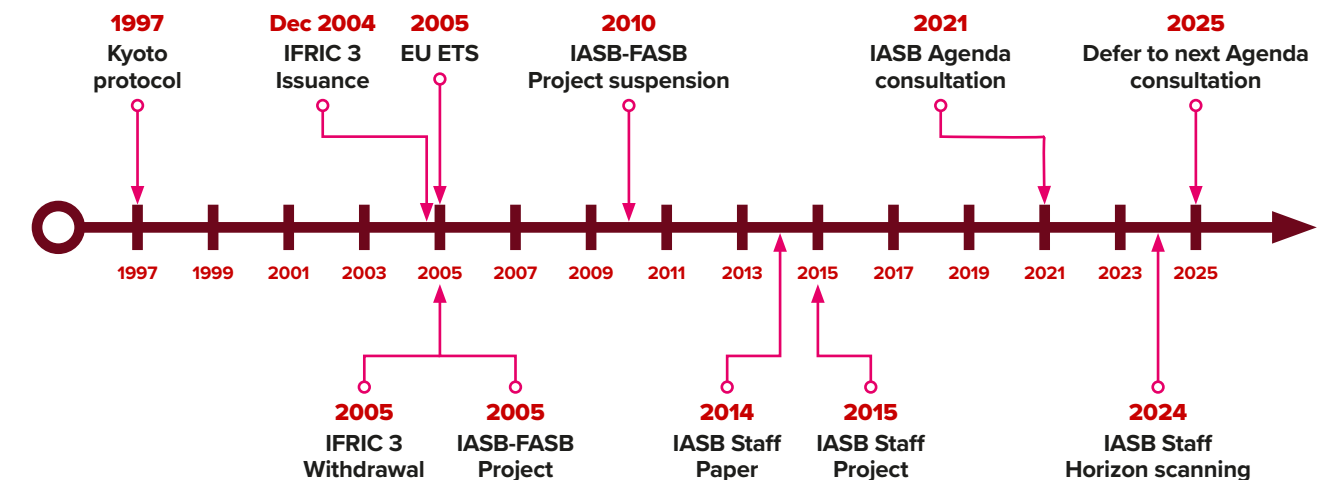
‘The expansion and abundance of carbon markets across the world has resulted in a variety of available instruments with which companies may engage.’

2. Review of existing reports or white papers on carbon-related instruments and their accounting treatment

2.1 IASB’s attempts to assist in accounting for issues resulting from participation in carbon markets

Figure 2.1 maps the key milestones for the potential development of IASB authoritative guidance on the accounting of carbon-related instruments.

Figure 2.1: Key milestones for the potential development of authoritative guidance on the accounting of carbon-related instruments from the IASB



The ‘journey’ starts with the adoption of the Kyoto Protocol in 1997, which propelled the use of ETS, with the cap-and-trade model being the most common (IASB 2014).⁸ In December 2004, the IFRS Interpretations Committee issued IFRIC 3 *Emission Rights*, primarily to address the accounting treatment of systems such as the EU ETS, which was due to be introduced in 2005, while acknowledging its potential relevance to other schemes. The EU ETS was the world’s first mandatory international emissions trading system. It was largely based on a draft interpretation that had been published in May 2003. But IFRIC 3 was withdrawn in 2005 owing to concerns about accounting mismatches in both recognition and measurement. Following the withdrawal of IFRIC 3, the IASB and the Financial Accounting Standards Board (FASB) undertook a joint project to find a more suitable and common solution. This initiative focused again on cap-and-trade schemes, with both Boards making tentative decisions on the nature of assets and liabilities within the scheme, as well as when and how to recognise and measure them. This project was suspended in 2010 owing to limitations of time and resources (IFRS Foundation 2014).

Against this background, in 2015, the IASB decided to take a fresh approach to looking at how to account for PPMs. With this initiative, the IASB and technical staff attempted

to challenge the thinking about which accounting approaches could be developed for consideration in a potential Discussion Paper about such a project (IFRS Foundation 2015). So far, this initiative has not resulted in any authoritative guidance.

Fast forward: since the IASB’s Third Agenda Consultation in 2021, several stakeholders have suggested that the IASB should prioritise a project on PPMs, arguing that their prevalence is increasing and there is diversity in accounting for them (IFRS Foundation 2024). In response to this, IASB staff conducted horizon-scanning activities in 2024 to assess whether a project on PPMs needed adding to the work plan. The results were presented to the IFRS Advisory Council for feedback in November 2024. There was evidence that the prevalence and significance of PPMs are increasing, but it was concluded that it was insufficient to suggest that PPMs are currently material to a significant number of financial statements prepared using the IFRS Accounting Standards (IFRS Foundation 2024). As discussed earlier, in January 2025, the IASB decided to defer any related activity at this stage. Work on the IASB’s Fourth Agenda Consultation is expected to begin in 2025, so presumably the IASB and its stakeholders will later form a more holistic opinion about the necessity of the PPM project.

2.2 Understanding various types of carbon-related instruments and their potential accounting treatment

The expansion and abundance of carbon markets across the world has resulted in a variety of available instruments with which companies may engage. While regulators, corporates, standard setters, or other stakeholders may use various labels to describe these instruments (arguably for the sake of simplicity or generalisation), it’s unclear whether they vary significantly in substance and intended use. Besides, these labels often do not accurately describe the underlying instrument.

The following are examples of the various labels commonly used.

- **‘Carbon credits’** typically refers to instruments linked to the voluntary market and are used to offset a company’s emissions.
- **‘Carbon allowances’** are often associated with a compliance market.
- **‘Carbon offsets’** has been applied to both voluntary and mandatory schemes, or even to refer to actual reduction in emissions.
- **‘Carbon taxes’** operate differently from credits or allowances, such as in the case of the CBAM.
- **‘Renewable energy certificates (RECs)’** are separate from carbon credits but may be used alongside them or purchased for similar purposes, such as helping companies meet emissions reduction targets.

There is also considerable variation in how these mechanisms function, whether compulsory or voluntary, across different regions/countries/locations, with varying rules and compliance timelines, as well as differences in the ways allowances or credits are distributed.⁹ Registries exist in the voluntary market, and companies engage in various projects that vary in type (eg nature-based, technology-based) in generating carbon credits. As previously mentioned, companies may play different roles when engaging with carbon-related instruments (eg emitter, intermediary or project developer).¹⁰

Companies have specific insights into their operations, roles and goals when engaging with carbon-related instruments, but may omit this information from their corporate reports. In fact, they may assign a label to these instruments and refer to them vaguely. Subsequently, they probably take into consideration the specific features of these instruments and make choices that result from applying existing accounting standards, particularly for project developers or investors in projects generating carbon credits. It is indicative that, in the absence of clear guidance from the IASB, various approaches have emerged to account for the financial effects of carbon-related instruments. For example, as early as in 2007, up to 15 different accounting variations were identified (IFRS Foundation 2014). These can be grouped into three main approaches (see Appendix C in the 2014 IASB staff paper (IFRS Foundation 2014)), each of which avoids the mismatches identified in IFRIC 3 while leading to a different accounting outcome.

⁸ The cap-and-trade model is a type of ETS in which the government sets an overall ‘cap’ on the volume of specified pollutants and uses tradeable ‘allowances’ (sometimes called certificates, rights or credits) of equal quantity to establish the price.

⁹ Beyond reflecting on the features of the EU ETS, interested readers are encouraged to engage with the following sources, which provide details of both compliance markets and voluntary markets: the CPA Canada, IFAC and ISF (2024) report on voluntary carbon market, IOSCO’s reports (2023 and 2024), and the Australian Carbon Credit Units system (Australian Government 2025).

¹⁰ Refer to CPA Canada, IFAC and ISF (2024) for further explanation of the respective carbon markets and roles of participants.

These three outcomes then hamper comparability across companies. Hence it is not surprising that users of financial statements find it hard to understand the financial implications of using these instruments (IFRS Foundation 2024).

Beyond the summaries of potential accounting practices for carbon-related instruments from previous IASB and FASB papers (see IFRIC 2004, IFRS Foundation 2014, IFRS Foundation 2015), the 2024 IASB staff paper (IFRS Foundation 2024) and an *Exposure Draft on Environmental Credits and Environmental Credit Obligations* (Topic 818) (FASB 2024), we have identified only three authoritative papers that offer guidance for accounting for carbon-related instruments.

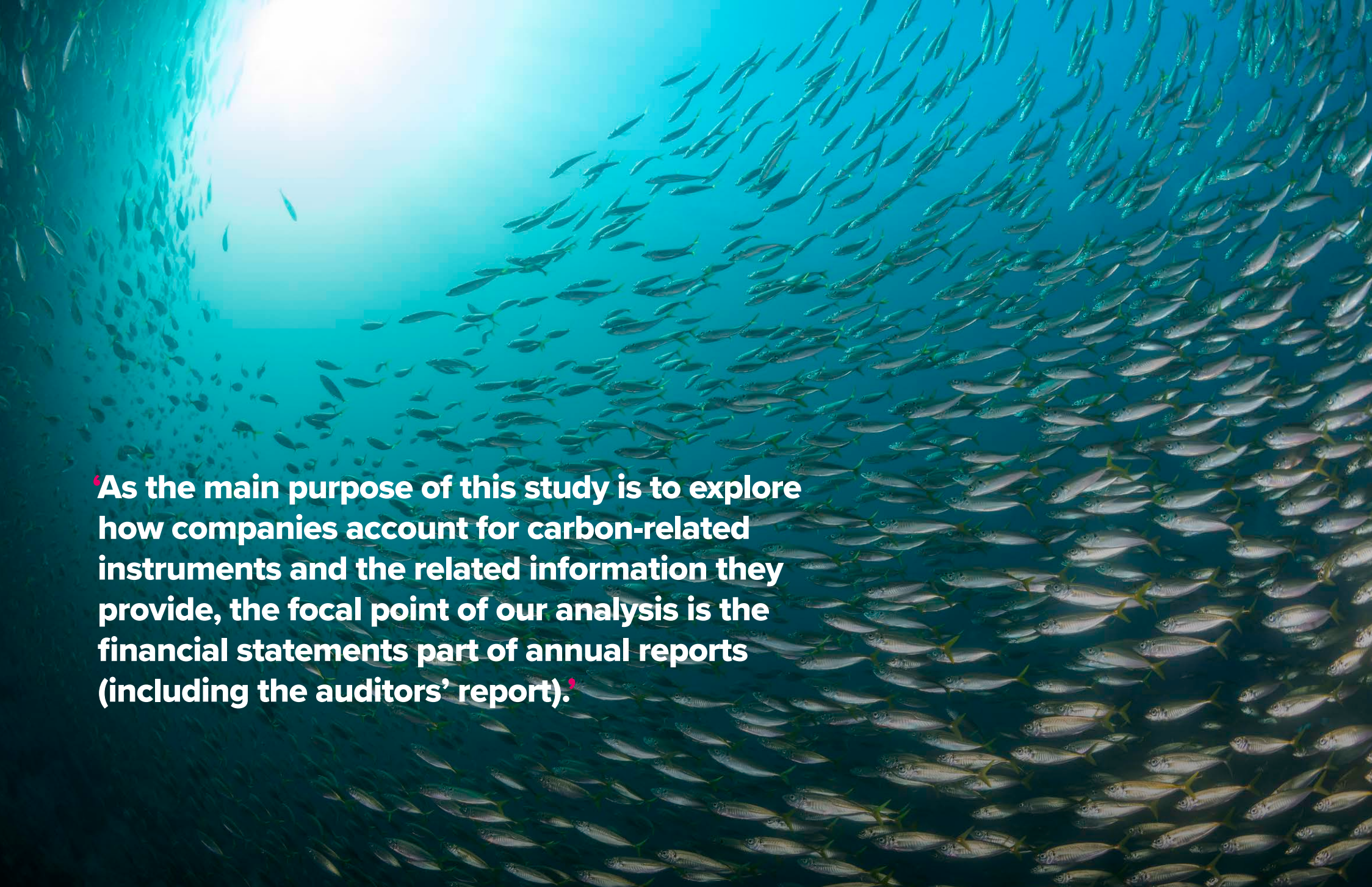
First, in 2019 the accounting authorities in China published (among other related regulations) the ‘Interim Provisions on Accounting Treatment for Carbon Emission Trading’ (see in Dentons 2020; EDF 2019). This is applicable to ‘Key Emission Enterprises’ ie companies conducting carbon emission trading activities in accordance with the ‘Interim Measures for the Administration of Carbon Emission Trading’ and other relevant regulations. This prescribes that: a) when Key Emission Enterprises acquire carbon emission quotas through purchase, the carbon emission quotas should be recognised as carbon emission rights assets on the purchase date and measured at cost, and b) when Key Emission Enterprises receive

carbon emission quotas free of charge (eg through government allocation), no accounting treatment is required. Specific guidance on presentation and disclosure of these instruments is also provided.

Second, in October 2023, the International Swaps and Derivatives Association (ISDA) published a white paper outlining the accounting issues for contracts that will or may result in the acquisition of voluntary and compliance carbon credits under both the IFRS Accounting Standards and US Generally Accepted Accounting Principles (GAAP) (ISDA 2023). In substance, this paper discusses the accounting treatment by companies that expect to use carbon credits to offset their own emissions, those that will trade these instruments in a secondary market and those that intend to do a combination of both.

Third, in October 2024, the European Securities and Markets Authority (ESMA) published *Clearing the Smog: Accounting for Carbon Allowances in Financial Statements* (ESMA 2024). This paper gives examples of different accounting approaches for carbon allowances used in the financial statements of listed companies in Europe. It encourages preparers to consider which IFRS Accounting Standards could be used to account for these instruments with recommendations for enhancing the decision usefulness of information relating to carbon allowances and ETS in the financial statements (ESMA 2024).





‘As the main purpose of this study is to explore how companies account for carbon-related instruments and the related information they provide, the focal point of our analysis is the financial statements part of annual reports (including the auditors’ report).’

3. Methodology

3.1 Scope

As the main purpose of this study is to explore how companies account for carbon-related instruments and the related information they provide, the focal point of our analysis is the financial statements part of annual reports (including the auditors’ report). To shed some light on the connectivity of information presented across the narrative and financial statements parts of an annual report, we also collected relevant information from the narrative parts of the annual reports.

3.2 Sample selection process

To identify the sample companies for analysis, we followed a two-step procedure. In the first step, we identified all publicly listed companies covered by the LSEG Data & Analytics database with available data for carbon emissions. For these companies, we calculated the median of total carbon emission levels (data code: ENERDP023) for every subsector in the Industry Classification Benchmark (ICB) for the period 2020 to 2022.

Considering the time available for the project and the time needed to collect the relevant information from companies’ annual reports, we subsequently focused on the companies in the following 10 ICB subsectors (from eight ICB sectors (shown in brackets)), which exhibit extremely high carbon emission levels:¹¹

- Airlines (Travel and Leisure)
- Aluminum (Industrial Metals and Mining)
- Cement (Construction and Materials)
- Chemicals: Diversified (Chemicals)
- Conventional Electricity (Electricity)
- Glass (General Industrials)
- Integrated Oil and Gas (Oil, Gas and Coal)
- Iron and Steel (Industrial Metals and Mining)
- Multi-Utilities (Gas, Water and Multi-utilities)
- Pipelines (Oil, Gas and Coal).

This process yielded an initial potential sample of 516 companies for analysis. In the second step, we used LSEG Data & Analytics to collect company-level data for the financial year 2023, which was the most recent year with an annual report available at the time of data collection. We then excluded 146 companies that do not report under IFRS.¹² We further excluded three companies with missing data in LSEG Data & Analytics.

For the remaining 367 companies, we searched for their annual report and excluded 67 companies because the annual report for 2023 was either not published or was not available in English at the time of data collection. This led to a final sample of 300 companies. Table 3.1 reports the sample selection process and [Appendix A](#) lists the names of the companies included in the analysis.

Table 3.1: Sample selection process

Universe of companies in LSEG Data & Analytics in the identified subsectors	516
Excluding those companies not reporting under IFRS	(146)
Excluding those companies with missing data in LSEG Data & Analytics database	(3)
<i>Sample of companies for which we searched for the annual reports</i>	<i>367</i>
Excluding those companies with missing annual report	(67)
<i>Final sample</i>	<i>300</i>

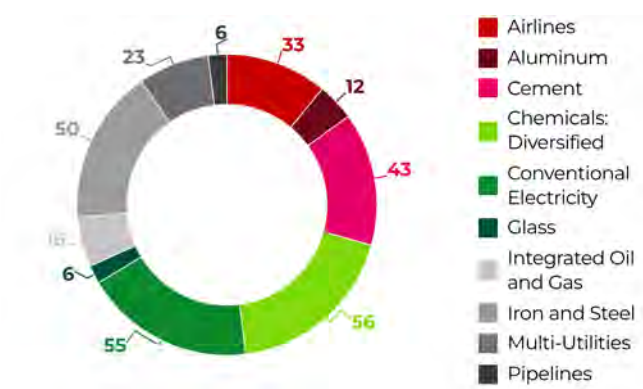
11 The mean CO2 emissions for these 10 subsectors is approximately 6.6m tonnes for the three years, while the corresponding figure for the remaining 162 subsectors is approximately only 205,000 tonnes.

12 To identify companies reporting under IFRS, as in Dionysiou et al. (2023) and Mazzi et al. (2019), we relied on Worldscope item ‘accounting standards followed’ (WC07536). We note that for many companies this item reports ‘Local standards’ when a company has its headquarters in countries/locations that have had their accounting standards converged to IFRS. We consider these companies to report under IFRS. To identify whether a country has had its accounting standards converged to IFRS, we consulted the IFRS by-jurisdiction guide published by the IFRS Foundation (IFRS 2025b).

3.3 Sample characteristics

Our sample consists of, primarily, companies in Chemicals: Diversified (56), Conventional Electricity (55), Iron and Steel (50) and Cement (43). The remaining subsectors are also well represented. The exceptions are Glass and Pipeline (six companies each).

Figure 3.1: Sample distribution across ICB subsectors



Our sample consists of companies from 48 countries/ locations. More specifically, these companies are headquartered primarily in India (55), mainland China (16), Hong Kong SAR (16), UK (16), Germany (13), Canada (12), Taiwan Region (12), Thailand (12) and Italy (11). The remaining countries/locations all have 10 or fewer companies and the representation from some countries/ locations is much smaller. [Appendix B](#) shows the distribution of the sample across all countries/locations.

As shown in [Appendix C](#), the mean (median) total assets value of the sample companies is €20.9bn (€6.2bn), the mean (median) market capitalisation is €15.4bn (€3.1bn) and the mean (median) of total sales/revenue is €13.3bn (€3.4bn).





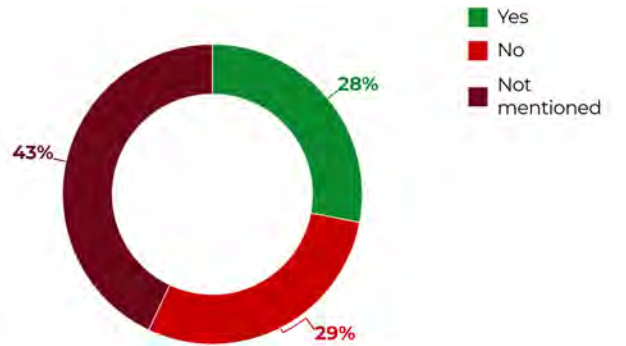
4. Findings and discussion

Sections 4.1–4.3 present the findings from the information collected from the narrative parts of the annual reports, while the remaining sections in Chapter 4 present the findings from information collected from the financial statements. Where relevant, we highlight discrepancies identified between these parts.

4.1 Participation in carbon markets

Arguably, the main trigger for a company to report information about carbon-related instruments in the financial statements would be its participation in one or more carbon markets. Among the 300 sample companies, 84 (28%) mention their participation in one or more carbon markets in the narrative parts of their annual reports, 86 (29%) explicitly state they do not participate in carbon markets and the remaining 130 (43%) are silent on this (see Figure 4.1). Participation in carbon markets is not yet prevalent, even among companies in subsectors with high carbon emissions.

Figure 4.1: Percentage of sample companies participating in one or more carbon markets



‘Among the 300 sample companies, 84 (28%) mention their participation in one or more carbon markets in the narrative parts of their annual reports, 86 (29%) explicitly state they do not participate in carbon markets and the remaining 130 (43%) are silent on this.’

Participation in one or more carbon markets appears to be more prevalent among companies in some subsectors than others. Specifically, 16 companies in the Airlines and Conventional Electricity subsectors, 11 in Iron and Steel, and 10 in Chemicals: Diversified and Multi-Utilities explicitly state their participation in one or more carbon markets (see Figure 4.2). Fewer than 10 companies across the remaining subsectors participate in one or more carbon markets.

Figure 4.2: Companies’ disclosure of participation in carbon markets in the narrative parts of annual reports (by subsectors)

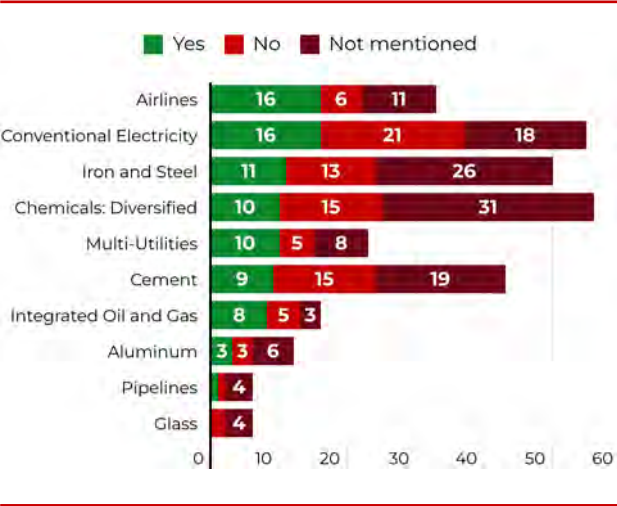


Figure 4.3 shows the five countries/locations with the largest number of companies that report participation in a carbon market in the narrative parts of their annual reports. There are 11 companies in the UK (69%), 10 in Germany (77%), five in Italy (45%) and Thailand (42%),

and four in Canada (33%).¹³ [Appendix D](#) shows the number of companies in all countries in our sample that report participation in a carbon market in the narrative parts of their annual reports.

Figure 4.3: Top five countries/locations with companies reporting participation in carbon markets in the narrative parts of their annual reports

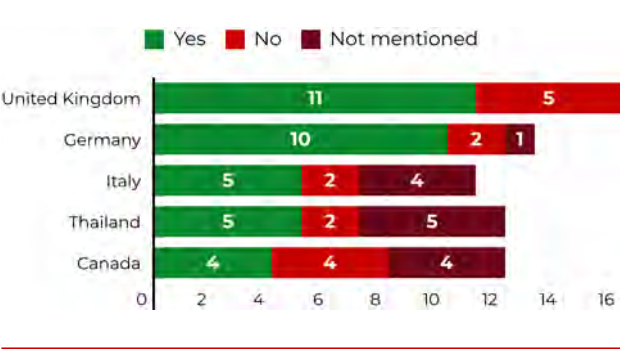


Table 4.1 shows the variety of jurisdictions with carbon markets and the frequency of participation by companies in our sample. Most of the 84 companies that disclose their participation in a carbon market in the narrative parts of their annual reports participate in carbon markets in the EU, ie 61 companies disclose their participation in the EU ETS only (38) or in combination with other carbon markets (eg UK, Germany) (23). Further, we note that 23 companies disclose their participation in the UK ETS. Most of these companies (19 in total) also participate in carbon markets in other jurisdictions (eg EU, Switzerland and mainland China). See Table 4.1.

¹³ The amounts in brackets represent the proportion of these companies compared with total companies sampled in their respective countries/locations.

Table 4.1: Jurisdictions of carbon markets and frequency of participation (based on disclosure in the narrative parts of annual reports)

CARBON MARKET JURISDICTION	NO. OF COMPANIES
EU	38
EU and UK	12
EU, UK and Switzerland	5
EU and Mainland China	1
EU and Australia	1
EU, Canada, Mainland China and UK	1
EU, Canada and Mexico	1
EU, Canada, UK and Switzerland	1
EU, Switzerland and US	1
UK	4
Canada	3
Thailand	3
Mainland China	2
Australia	1
Hong Kong SAR	1
Indonesia	1
Kazakhstan	1
Malaysia	1
New Zealand	1
Saudi Arabia	1
Taiwan Region	1
Not Specified	3
Total	84

Box 4.1 presents some examples of information that companies provide about their participation in carbon markets.

Box 4.1:

Information about a company’s participation in carbon markets

The following extracts from the narrative parts of five annual reports illustrate the nature and extent of information that companies provide about their participation in one or more carbon markets. Such information includes the respective jurisdiction of the carbon market, the company’s objectives for participating in a carbon market and/or engaging with carbon-related instruments, and the uncertainty about climate-related regulations, which may affect the carbon market and carbon-related instruments that the company uses. Finally, some companies provide information describing the characteristics of the carbon markets in which they participate.

IAG Group, Spain (Airlines)

IAG’s most material environmental metric – Scope 1 emissions – receives additional verification each year as part of the EU, Swiss and UK Emissions Trading Schemes (ETS) and the international Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), within six months of the issuance of this report (FYE 31 December 2023 annual report, p. 73).

Vicat, France (Cement)

At present, Vicat Group operates in countries with differing maturity in terms of climate change regulations. In Europe (France, Italy, Switzerland) and in California in the United States, Vicat Group is preparing for a reduction in CO2 emission allowances, without any assurance that it will be able to pass this on in its sale prices. In other regions (in Alabama in the United States, in Brazil, in Africa, Asia and the Mediterranean region), regulations are still unfolding. In the belief that regulations will converge, Vicat Group is keeping up with the pace of regulatory change to roll-out and market its low-carbon products and services (FYE 31 December 2023 annual report, p. 54).

China Eastern Airline, Mainland China (Airlines)

The Group abides by international and domestic carbon emission regulatory requirements by participating in EU carbon emission trading and Shanghai local pilot carbon trading mechanism, with an aim to fulfil carbon emission obligations through market-oriented mechanisms, and explore ways to improve carbon emission management capabilities (FYE 31 December 2023 annual report, p. 35).

ArcelorMittal, Netherlands (Iron and Steel)

ArcelorMittal’s activities in the 27 member states of the EU are subject to the EU-ETS, which was launched in 2005 pursuant to European Directive 2003/87/EC, relating to GHG [greenhouse gas] emissions. The EU-ETS is based on a cap-and-trade principle, setting a cap on GHG emissions from covered installations that is then reduced over time. Within this cap, companies receive emission allowances which they can sell to or buy from one another as needed. The limit on the total number of allowances available ensures that they have a value (FYE 31 December 2023 annual report, p. 79).

Separate consultations by the government of Quebec are underway with large GHG emitters regarding the cap-and-trade program regulation for the second and subsequent compliance periods from 2021 to 2030. Quebec completed the consultations for the 2021 to 2023 compliance period. For the period 2024 to 2030, negotiations are still in progress to minimize the financial impact of regulatory changes on ArcelorMittal’s operating subsidiaries in Canada (ibid, p. 81).

In Mexico, the federal government has initiated a comprehensive climate policy review, encompassing the framework for an ETS to fulfil its commitments under the Paris Agreement. On October 1, 2019, the government published rules and principles for an emissions trading system applicable to entities generating more than 100,000 tons of CO2 per year. Since 2020, a pilot of the ETS has been implemented for ArcelorMittal México Long and Flat Segments and Services areas (‘SERSIINSA’), along with other relevant companies (ibid, p. 82).

Total Energies, France (Integrated Oil and Gas)

At 2023 year end, our stock of credits stood at just under 11 million out of which the very large majority is certified by VERRA VCS standard (> 99%; the remaining < 1% being certified by the Australian Carbon Credit Units Scheme of the Australian Government). We have allocated \$100 million annually for these projects, and the cumulative budget pledged for all of these campaigns amounts to nearly \$725 million over their cumulated lifespan, with the accumulated credits expected to total 44 million in 2030 and 71 million in 2050.

The final tally of credits obtained will be determined once the projects have been completed. If such a stock of 44 million credits is built up in 2030 and on the basis of a consumption of 10% of the stock per year from 2030, then TotalEnergies would use around 5 million credits per year from 2030 onwards.

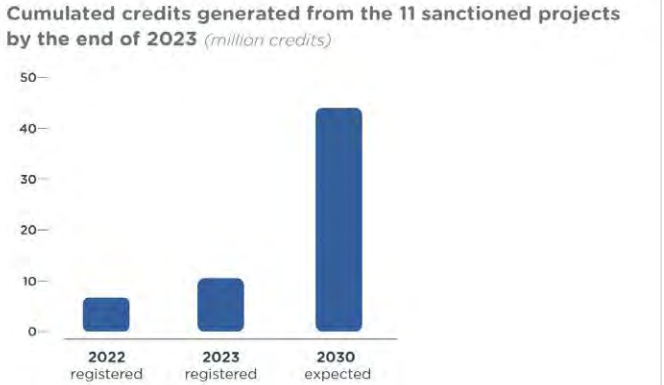
Highlight: Invest in a fund

In 2023, the Company has made the decision to invest \$100 million over 15 years in the projects of the Nature Based Carbon fund managed by Climate Asset Management, which focuses on preserving or restoring

(FYE 31 December 2023 annual report, p. 22).

In Europe, TotalEnergies’ industrial facilities participate in the CO2 emissions trading system (EU-ETS). The financial risk associated with the purchase of these allowances on the market could increase following the reform of the system approved in 2018. This emission allowance market entered its fourth phase in 2021. The share of

three types of ecosystems: degraded natural forests, grasslands impacted by human activity and wetlands.



emissions in the EU-ETS scope not covered by free allowances increases over time from phase to phase, as in the 2021–2030 period (phase 4). At the end of 2023, the price of these allowances was about €80/t CO2, and TotalEnergies estimates that this price could reach more than €100/t CO2 in phase 4 (ibid, p. 132).

In addition, we identified 20 companies that disclose their interest in participating in one or more carbon markets in the future. Among them:

- 18 companies currently do not participate in any carbon market
- four companies are headquartered in Malaysia, and three in each of Hong Kong SAR and India, respectively
- five companies operate in Airlines, and four in Cement, Chemicals and Conventional Electricity, respectively.

This suggests that there is a rising interest in carbon markets among companies in Asia and in companies operating in specific subsectors.

Box 4.2 presents extracts from the narrative parts of annual reports describing a company’s interest in participating in carbon markets in the future.

Box 4.2:

Disclosure of interest in participating in a carbon market in the future

Formosa Chemicals & Fibre Corporation, Taiwan Region (Chemicals: Diversified)
Furthermore, regarding carbon credits, in coordination with the official launch of the Taiwan Carbon Solution Exchange on August 7, 2023, and the commencement of carbon credit trading, the Company will evaluate the demand for trading in a timely manner (FYE 31 December 2023 annual report, p. 214).

JK Cement, India (Cement)
Carbon markets and emission trading schemes are expected to be introduced in the Indian market. Achieving targets will generate energy certificates, which will likely provide additional revenue (FYE 31 March 2024 annual report, p. 83).

CLP Holdings, Hong Kong (Conventional Electricity)
The Group is currently undertaking a review on its carbon market strategy covering a range of factors including market trading opportunities and carbon credit generation from CLP’s assets. The review is expected to be completed this year (FYE 31 December 2023 annual report, p. 56).

Controladora Vuela Compañía de Aviación, Mexico (Airlines)
In 2016, Mexico signed the ‘North American Leaders’ Declaration on Climate, Clean Energy and Environment Partnership’ and committed to participate in the pilot phase of CORSIA. The countries in which we operate are ICAO [International Civil Aviation Organization] member states, and thus we may be affected by regulations adopted pursuant to the CORSIA framework (FYE 31 December 2023 annual report, p. 49).

4.2 Voluntary carbon credits

In the narrative parts of their annual reports, only a few companies disclose their engagement with voluntary carbon credits. Specifically, we have identified only three companies explicitly stating that they have generated carbon credits, and 10 companies explicitly stating they have purchased carbon credits. See Box 4.3 for an example of the former and Box 4.4 for examples of the latter. Overall, information about the type and quality of the carbon credits that would be useful for users of general-purpose financial reports is generally absent.¹⁴ A notable exception is the example provided in [Box 4.5](#).

Box 4.3:

Disclosure of activities that generate carbon credits

This extract from the annual report of Electricity Generating in Thailand explains the company’s activities that generate carbon credits.

Electricity Generating, Thailand (Conventional Electricity)
All power plants of EGCO Group, both in Thailand and overseas, participated in the carbon credit trading market. These power plants can identify greenhouse gas reduction methods that can be certified for carbon credit (FYE 31 December 2023 annual report, p. 90).

Box 4.4:

Disclosure of the source of purchased carbon credits

China Steel, Iron and Steel (Taiwan Region)
CSC acquires 500 metric tons of carbon credits in the inaugural transaction following the Taiwan Carbon Solution Exchange unveiling, marking a new milestone in CSC’s history of steel product carbon neutrality (FYE 31 December 2023 annual report, p. 17).

Saudi Arabian Oil (Saudi Aramco), Saudi Arabia (Integrated Oil and Gas)
We were also the leading bidder in the world’s largest-ever carbon-credit auction, which was held by the Regional Voluntary Carbon Market Company in Kenya in the second quarter of the year (FYE 31 December 2023, p. 11).

Over 2.2 million tons of high-quality carbon credits were sold at the auction. The purchase of carbon credits enables Aramco to offset some of its emissions, supports the establishment of a credible and functioning Saudi-based regional voluntary carbon market, and is one of the Company’s five levers to achieve GHG emissions reductions by 2035 (ibid, p. 67).

14 Companies that use carbon credits to offset carbon emissions and apply the IFRS Sustainability Disclosure Standards are required to provide information about the third-party schemes that verified or certified the carbon credits, the type of carbon credit (including whether the underlying offset will be nature-based or technology-based, and whether the offset is achieved through carbon reduction or removal), and other information that would help users understand the carbon credits’ credibility and integrity. See paragraphs 36(e)(ii), (iii) and (iv) of IFRS S2 *Climate-related Disclosures* (see IFRS Foundation 2023).

Box 4.5:

Disclosure of the source and quality of purchased carbon credits

In this example, the company explains its purpose for purchasing carbon credits from the voluntary carbon market. It also discloses the type, composition (in percentages) and quality of the carbon credits that it owns.

ELIA Group, Belgium (Conventional Electricity)

E1-7 – GHG removals and GHG mitigation projects financed through carbon credits

We do not have GHG removal and storage resulting from projects developed in own operations or contributed to in upstream and downstream value chain.

We purchase project-based carbon credits (verified to Gold Standard) to offset GHG emissions related to SF₆ leakages and business flights from the previous year.

As of 2021, we buy credits from the voluntary market to offset the previous year's GHG emissions associated with the above-mentioned categories. The carbon credits are used to financially support a climate change mitigation project, i.e. Solar Systems Supply of Senegalese households.

Elia Group	2022	2023
Total (tCO ₂ eq)	13,970.31	10,833.40
Share from removal projects (%)	0	0
Share from reduction projects (%)	100	100
Recognised quality standard Gold Standard (%)	100	100
Share from projects within the EU (%)	0	0
Share of carbon credits that qualify as corresponding adjustments (%)	0	0

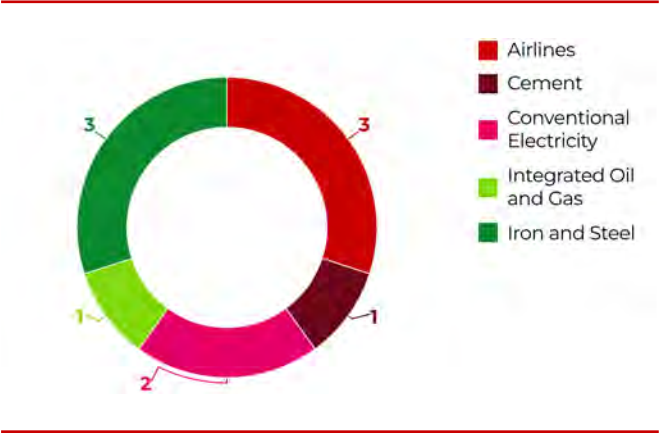
'Elia Group' = Elia Transmission Belgium SA/NV, Elia Engineering SA/NV, Elia Asset SA/NV, 50Hertz Transmission GmbH, 50Hertz Offshore GmbH (no employees), Eurogrid GmbH.

We are currently rethinking our GHG emissions offset approach and therefore cannot currently disclose any future carbon credits planned to be cancelled outside the undertaking's value chain.

(FYE 31 December 2023 annual report, p. 231).

Two companies that disclose having purchased carbon credits operate in the Conventional Electricity subsector, three in Airlines, three in Iron and Steel, and one in Cement and Integrated Oil, respectively (see Figure 4.4). Three of these companies are headquartered in Taiwan Region, two in each of Saudi Arabia and Thailand, and one in each of Austria, Ireland and the UK.

Figure 4.4: Number of companies that disclose purchases of carbon credits (by subsectors)



4.3 Internal carbon pricing

Disclosures in the narrative parts of annual reports may indicate how internal carbon prices are used in making decisions (eg impairment assessment, asset valuation, investment, climate transition planning, transfer pricing, scenario analysis). Such disclosures would also prompt users to find information about carbon prices. Against this backdrop, we captured the presence of such information in the narrative parts of annual reports.

We identified 48 companies (ie 16% of the sample) that mention the use of internal carbon pricing in the narrative parts of their annual reports.¹⁵ The use of internal carbon pricing appears to be more prevalent in some subsectors than others. Among these companies, we observed varying extents of information about how internal carbon pricing is used in making decisions, and the relevant amounts. Some companies do not disclose information beyond the fact that they are using internal carbon pricing. Box 4.6 provides some examples of these disclosures. Interestingly, seven companies (about 2% of total sample) explicitly state that they do not apply internal carbon pricing. See Box 4.7 for examples of such disclosures.

‘The use of internal carbon pricing appears to be more prevalent in some subsectors than others. Among these companies, we observed varying extents of information about how internal carbon pricing is used in making decisions, and the relevant amounts.’

¹⁵ Such disclosure could become prevalent in future. Companies that apply the IFRS Sustainability Disclosure Standards are required to disclose whether and, if so, how the company applies a carbon price in decision-making. See paragraph 29(f)(i) of IFRS S2 (see IFRS Foundation 2023).

Box 4.6:

Disclosure about the use of internal carbon pricing

The following extracts from the narrative parts of five annual reports illustrate the nature and extent of information that companies provide about their use of internal carbon pricing.

Japan Airlines, Japan (Airlines)

In addition, Internal Carbon Pricing (ICP) was introduced to accelerate efforts to reduce CO2 emissions from the perspective of how it contributes to the roadmap for reducing CO2 emissions, rather than focusing only on returns from initial investment (FYE 31 March 2024 annual report, p. 75).

Banpu Power, Thailand (Conventional Electricity)

In addition, the company has taken internal carbon pricing into account when making investment decisions in any project (FYE 31 December 2023 annual report, p. 101).

JK Cement, India (Cement)

INTERNAL CARBON PRICING

We have established an Internal Carbon Price (ICP) at \$ 19/tonne of carbon dioxide equivalent across all our operations, a strategic move to navigate the evolving regulatory landscapes effectively. Implementing a carbon pricing mechanism underscores our dedication to promoting a low-carbon economy and underscores

our sincere efforts to curb greenhouse gas emissions. Integrating internal carbon prices in our business planning process helps our Company to assess climate-related risks and opportunities, prepare for future climate regulations, steer investments towards low-carbon technologies and assess the

resilience of investments to such regulations. Setting a price on carbon enables our Company to evaluate the attractiveness of projects in different scenarios and helps make better decisions to future-proof the business. This approach can also stimulate innovative ideas on allocating capital to deliver higher returns in a low-carbon economy.

(FYE 31 March 2024 annual report, pg. 82)

AGC, Japan (Glass)

To mitigate the impact of these transition risks, we are promoting companywide business portfolio assessments, investments to reduce Scope 1 and 2 emissions, and the operation of an internal carbon pricing system that contributes to incentives for the development of technologies to reduce emissions (FYE 31 December 2023 annual report, p. 64).

Petronas Chemicals GP, Malaysia (Chemicals: Diversified)

Applied Internal Carbon Pricing (ICP) for all new projects (FYE 31 December 2023 annual report, p. 66).

Box 4.7:

Disclosure of non-application of internal carbon pricing

The following extracts demonstrate the disclosure by companies about not using internal carbon pricing currently. Nevertheless, two companies indicated that they may use internal carbon pricing in the future.

SigmaRoc, UK (Cement)

As SigmaRoc is exposed to the European Union's Emissions Trading Scheme, additional internal carbon prices are not applied. However, this will remain under review and the use of internal prices in the coming years will be considered as necessary (FYE 31 December 2023 annual report, p. 131).

Aksa Enerji Uretim, Turkey (Conventional Electricity)

Carbon pricing is not applied at Aksa Energy (FYE 31 December 2023, p. 79).

China Petrochemical Development Corporation, Taiwan Region (Chemicals: Diversified)

Internal carbon pricing is still under development (FYE 31 December 2023 annual report, p. 113).

Orient Cement, India (Cement)

Internal carbon pricing can be established and utilized as instrument to appraise the renewable and less GHG intensive projects (FYE 31 March 2024 annual report, p. 147, 'Opportunities for Improvement' section).

Of the 48 companies, nine are in Chemicals: Diversified and Cement, six in Conventional Electricity, and five in each of Airlines, Aluminum, Integrated Oil and Gas, and Iron and Steel. See Figure 4.5. Eight of these companies are headquartered in each of India and the UK and five in Taiwan Region. The remaining companies are located across 17 countries/locations.

Figure 4.5: Number of companies stating use of internal carbon pricing (by subsectors)



4.4 Carbon-related instruments in financial statements

To minimise potential loss of valuable and relevant information, when we delved into the financial statements parts of annual reports, we searched for a large number of terms (ie beyond just carbon allowances/credits) that companies may use to indicate that they participate in a carbon market or use carbon-related instruments (regardless of instruments in a compliance or voluntary market). Consequently, first, we collected all references to terms that appear relevant to the broad term ‘carbon-related instruments’.

We found that 121 out of the 300 companies in our sample use one or multiple terms when referring to carbon-related instruments. In other words, 60% of our sample companies do not mention carbon-related instruments in their (audited) financial statements at all.

Table 4.2 shows all the terms found in our analysis. At the outset, we observed many variations of each term (both within and across companies). For instance, the most commonly used term, ‘allowances’ (which was used 127 times), had 13 different variations (eg ‘carbon allowances’, ‘emission trading allowances’, ‘EUAs allowances’). The second most commonly used term, ‘rights’ (which was used 85 times), had nine different variations (eg ‘carbon rights’, ‘emissions rights’, ‘allocation rights’). The variety of terms indicates that a broad range of carbon-related instruments are being used. We came across various terms that remained unclear as their nature and purpose could not be evaluated since no definitions are provided by the companies that used them (eg carbon certificates). Considering the possibility that different variations of the same term may refer to the same carbon-related instrument, the variety of terms used may also add an extra layer of difficulty for users trying to understand the accounting treatments and thus the financial implications of the underlying instruments.



‘60% of our sample companies do not mention carbon-related instruments in their (audited) financial statements at all.’

Table 4.2: Frequency of terms used to refer to carbon-related instruments in financial statements

TERM	FREQ.
Allowances (Carbon, Carbon dioxide, CO2, Emissions, Carbon emissions, CO2 emissions, Greenhouse gas emission, GHG emissions, Emissions trading, ETS, EUAs, UKAs, Certificates)	127
Rights (Carbon, Carbon dioxide, CO2, Emissions, Carbon emissions, CO2 emissions, Emissions, Greenhouse gas, Allocation)	85
Certificates (Carbon, CO2, CO2 Emissions, Emissions, Certified Emission Reduction, Ex-Green, Grey, Energy, Energy efficiency, Verified emission reduction)	36
Price (Carbon, Carbon emissions, CO2, Emissions)	31
Credits (Carbon, Emissions, Emissions Trading Scheme, Australian carbon credit units, Offset)	30
Cost (Carbon, Carbon emission, CO2, CO2 emission, Emissions, Greenhouse gas emission)	19
Quotas (Carbon, Carbon dioxide, CO2, CO2 allocation, Emissions, Upstream emission reduction)	17
Tax (Carbon, CO2, Tax on emissions)	13
Liabilities (Carbon, Emissions, Emission obligations, Environmental, Liability towards CO2 emissions)	11
Permits (Carbon, CO2, Emissions, Emission Unit, Greenhouse gas emission)	8
Offsets (Carbon, CO2)	5
Other Carbon emission fees Carbon/Emissions trading Carbon bonds Carbon compensation Carbon compliance Emission units Emission charges Carbon licences Environmental securities Verified Carbon Units	12 2 2 1 1 1 1 1 1 1 1 1

Table 4.3 compares the relative size of companies that mention carbon-related instruments in their financial statements (121 companies) and those that did not (179 companies). We observed significant differences in the size of companies in these two groups, indicating that companies that disclose information about carbon-related instruments in their financial statements have much larger

assets, revenues and market capitalisation than those that did not. It's possible that a company's size influences its engagement with carbon-related instruments and its disclosure about such instruments in the financial statements. This may reflect the well-documented finding in the accounting literature that size is a determinant of companies' reporting practices (eg Comyns 2016).

Table 4.3: Relative sizes of sample companies that mention carbon-related instruments in their financial statements (Yes) and those that they do not (No)

	YES (121)		NO (179)	
	MEAN	MEDIAN	MEAN	MEDIAN
Total assets (in €'000)	33,300,000	10,900,000	12,500,000	3,991,585
Total sales/Revenue (in €'000)	22,100,000	6,607,978	7,429,687	1,999,394
Market capitalisation (in €'000)	27,900,000	5,075,489	7,037,415	2,234,075

Figure 4.6 shows, by subsectors, the number of companies that mention carbon-related instruments in their financial statements and those that did not. About half the companies that mention carbon-related instruments in their financial statements operate in the Conventional Electricity; Chemicals: Diversified; and Iron and Steel subsectors. Focusing on each subsector individually, Integrated Oil and gas and Multi-Utilities subsectors exhibit the highest proportion of companies mentioning carbon-related instruments in their financial statements (ie more than 60% of the sample), whereas Aluminum, Glass, and Pipelines exhibit the lowest proportions (ie around 16%). This indicates that companies' engagement with carbon-related instruments is not equally distributed among the reviewed subsectors and are not concentrated within any specific subsectors, though some subsectors exhibit more engagement than others. Therefore, this finding would not justify prioritising any specific subsectors' efforts to support the reporting of high-quality information about carbon-related instruments.

Figure 4.6: Number of companies that mention carbon-related instruments in their financial statements (Yes) and those that do not (No) (by subsectors)

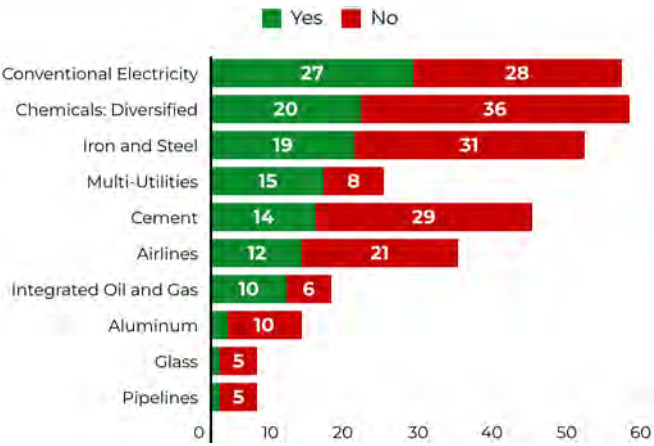


Figure 4.7 shows the number of companies that mention carbon-related instruments in their financial statements, by country/location. Again, there is great variation in the proportion of companies within each country/ location that do so. Unsurprisingly, more companies in European countries mention such instruments in their financial statements than companies elsewhere (such as India, Brazil, Malaysia and Thailand), though companies headquartered in Europe form less than 30% of the overall sample (see information in section 3.3). The EU ETS (long-standing relative to other carbon markets) and especially its new, fourth phase (2021–2030) has

important financial implications (see, for instance, Flori et al. 2024), which may drive companies in European countries towards disclosing the financial effects of their engagement with carbon-related instruments in the financial statements.

Indeed, most of the companies that mention carbon-related instruments in their financial statements refer to the EU ETS. Specifically, of the 121 companies that mention carbon-related instruments in their financial statements, 77 disclose their participation in one or more carbon markets.

Among these 77 companies:

- 47 disclose their participation in the EU ETS only or in combination with another carbon market (eg UK, Germany)
- 15 participate in more than one carbon market, and
- 16 do not explicitly report the identity of the carbon market in which they participate (see Table 4.4).

The findings in Figure 4.7 and Table 4.4 combined indicate that the regulatory environment within which a company operates is an important driver for companies’ engagement with carbon-related instruments and subsequent disclosure of information about these instruments in the financial statements.

Figure 4.7: Number of companies that mention carbon-related instruments in their financial statements (Yes) and those that do not (No) (by country/location)

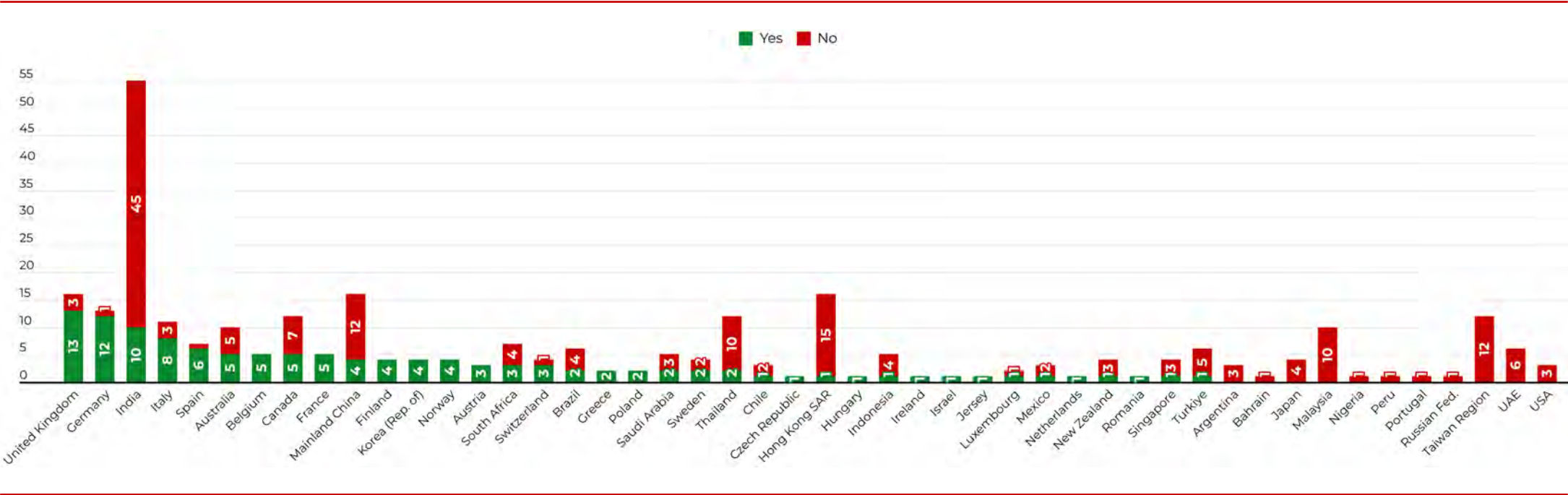
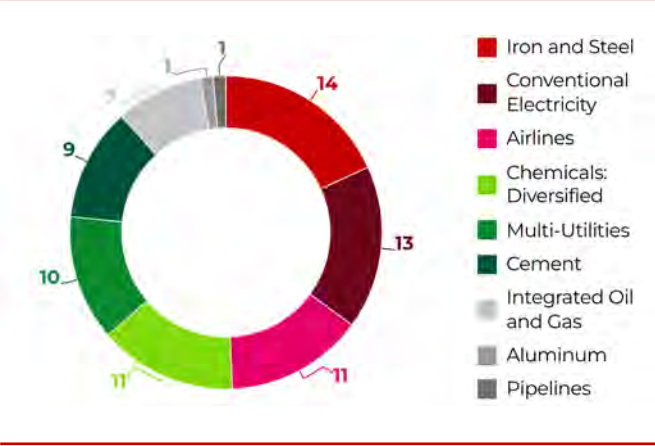


Table 4.4: Jurisdictions of carbon markets and frequency of participation (based on disclosure in financial statements)

CARBON MARKET JURISDICTION	NO. OF COMPANIES
EU	33
EU and UK	6
EU, Switzerland and UK	3
Germany	3
South Korea	3
UK	3
Austria and EU	1
Australia	1
Australia and New Zealand	1
Canada and EU	1
EU and Germany	1
EU, Germany and New Zealand	1
EU, Mexico and UK	1
New Zealand	1
Turkiye	1
US	1
Not specified	16
Total	77

Figure 4.8 disaggregates by subsector the 77 companies that report their participation in carbon markets in their financial statements. The Iron and Steel subsector (14) had the greatest number of companies, followed by Conventional Electricity (13), Airlines (11), Chemicals (11) and Multi-Utilities (10).

Figure 4.8: Number of companies that disclose their participation in carbon markets in their financial statements (by subsectors)



Finally, 50 of these 77 companies also disclose their participation in one or more carbon markets in the narrative parts of their annual reports, whereas 27 do not do so. Meanwhile, 34 companies that disclose their participation in one or more carbon markets in the narrative parts of their annual reports do not make the same disclosure in their financial statements. This indicates that the connectivity of information between the front-end and back-end of annual reports needs improvement. Companies should provide users with coherent, relevant and reliable information about their participation in carbon markets.

‘Companies should provide users with coherent, relevant and reliable information about their participation in carbon markets.’

4.4.1 Accounting treatment of carbon-related instruments

As discussed in [section 2.1](#), there is currently no IFRS accounting standard that specifically applies to carbon-related instruments, and thus no standardised accounting treatment for carbon-related instruments. Hence, companies are left to develop own accounting policies to account for them.¹⁶ Also, our findings in [section 4.4, Table 4.2](#) indicate that companies use various terms to describe carbon-related instruments in their financial statements, while not providing a clear definition for each term used. For the purpose of this report, we have adopted ‘carbon-related instruments’ as the generic term for all carbon-related instruments that we have analysed. In this section, we reviewed companies’ disclosures of their accounting policies, including recognition and measurement (often called valuation) methods for carbon-related instruments. See Tables 4.5 and [4.6](#), respectively. Although most of the accounting items identified refer to terms that can be directly attributed to carbon allowances/credits (such as ‘allowances’, ‘credits’, ‘quotas’, ‘rights’), our analysis comes with the caveat that some terms are less clear and hence may refer to different instruments.

Table 4.5: Recognition of carbon-related instruments

RECOGNITION	FREQ.
Assets	
Intangible assets	54
Inventories	35
Financial assets	28
Other assets	20
Impairment testing*	25
Liabilities	
Provisions	79
Deferred income / government grant	13
Income / Expenses	
Income / revenues	22
Expenses	34
Not specified	11

*Note: While impairment is not a type of asset, we observed carbon-related instruments were often incorporated into impairment tests and decided to highlight this observation separately.

16 A company that complies with the IFRS Accounting Standards is required to apply the IFRS that specifically applies to a transaction, other event or condition. In the absence of such an IFRS, the company is required to develop and apply an accounting policy that results in information that is relevant and reliable. In doing so, the company needs to refer to, and consider the applicability of, the requirements in IFRSs dealing with similar and related issues before considering the definitions, recognition criteria and measurement concepts for assets, liabilities, income and expenses in the Conceptual Framework for Financial Reporting, or other sources. See paragraphs 7, 10, 11 and 12 of IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors (IFRS Foundation 2024a).

Table 4.6: Measurement of carbon-related instruments

		MEASURED AT		
RECOGNISED AS	TOTAL	FAIR VALUE	HISTORICAL COST	UNSPECIFIED
Assets				
Intangible assets	54	4	44	6
Inventories	35	14	14	7
Financial assets	28	15	2	11
Other assets	20	3	9	8
Liabilities				
Provisions	79	43	12	24
Deferred income / government grant	13	1	1	11

We noted that companies adopt different accounting treatments for carbon-related instruments recognised within the statement of financial position and statement of profit or loss. The total does not add up to 121 because one company may have accounted for its carbon-related instruments in more than one way, reflective of their different intended use. On the assets side, carbon-related instruments are most often accounted for as intangible assets (54 companies), followed by inventories (35) and financial assets (28). Further, 20 companies presented their carbon-related instruments as other assets. On the liabilities side, carbon-related instruments are most often accounted for as provisions (79 companies) and to a lesser extent as deferred income (13).

Finally, companies’ profits may be affected positively or negatively by the acquisition, use, sale or disposal of carbon-related instruments. We noted these effects were accounted for as either income or expenses in the statement of profit or loss. Interestingly, the financial statements of 11 companies did not specify their accounting treatment for carbon-related instruments. Our findings about the accounting treatments suggest that carbon-related instruments are used by our sample companies primarily to manage climate-related risks through reducing carbon emissions. Relatively few companies generate income from carbon-related instruments. Our observations for each accounting treatment are provided below.

Intangible assets

As shown in Table 4.6, 54 companies recognised their carbon-related instruments as intangible assets. In most cases, these assets are measured at historical cost (44). In only four instances they are measured at fair value, whereas there are six companies that do not disclose their measurement approach. As expected, owing to the nature of these assets, companies do not provide information about their useful lives, with some of them explicitly stating that they tested them for impairment.

We observed that companies apply different measurement approaches for their carbon-related instruments depending on how these instruments were acquired. Specifically, carbon allowances that were allocated to the company free of charge were either:

- not recognised at all as an asset (and hence no measurement), or
- recognised, but often measured at nil value, or in few cases at fair value.

By contrast, purchased carbon-related instruments were often measured at historical cost. See the example in Box 4.8.

Box 4.8:

Extract of accounting treatment for carbon-related instruments as intangible assets

Emission rights purchased on the market are accounted for as intangible assets measured at cost. Emission rights received free of charge are measured at their nominal value (zero). Emission rights are not amortized ... The Group's consolidated balance sheet shows no items related to emission rights when the volume of actual emissions is lower than that of the free-of-charge emissions allowances and the Group has not bought allowances on the market (Kemira, FYE 31 December 2023 annual report, p. 183).



Inventories

As [Table 4.6](#) shows, 35 companies accounted for their carbon-related instruments as inventories, making inventories the second most frequently adopted accounting treatment.

The measurement approaches applied varied significantly as 14 of them used historical cost whereas another 14 used fair value. Seven companies did not specify their measurement approach. We also noted the measurement

of carbon-related instruments as inventories may vary depending on how an instrument was acquired and its intended use. See Box 4.9.

Further, some companies recognise their carbon-related instruments as either intangible assets or inventories and explicitly discuss that the choice is based on the intended use of those instruments. See related examples in Boxes 4.10 and 4.11.

Box 4.9:

Extract of accounting treatment for carbon-related instruments as inventories

In this example, Repsol recognised carbon allowances as inventories and measured them at historical cost except those that were received free of charge between 2013 and 2020. The latter were valued at market price. Carbon allowances that are held for trading (ie not for the company’s own use) are separated into a different category (ie trading inventories),

CO2 emission allowances (EUA CO2) are recognized as inventories and are initially recognized at acquisition cost. Those allowances received free of charge under the emissions trading system for the 2013–2020 period are initially recognized as inventory at the market price prevailing at the beginning of the year in which they are issued... When CO2 emission allowances are actively managed to take advantage of market trading opportunities, the trading allowances portfolio is classified as trading inventories (Repsol, FYE 31 December 2023 annual report, p. 56)

Box 4.10:

Extract of accounting treatment for carbon-related instruments based on their intended use (I)

Emission rights Government granted and purchased CO2 emission allowances [that are] expected to be used towards Hydro’s own emissions are recognized as intangible assets at nominal value (cost). The amounts are not amortized but are tested for impairment... CO2 emission allowances purchased for trading are measured and classified as inventory (Norsk Hydro, FYE 31 December 2023 annual report, p. 180).

Box 4.11:

Extract of accounting treatment for carbon-related instruments based on their intended use (II)

BP usually recognises its carbon allowances as intangible assets, but these instruments will be accounted for as inventories when ‘the emission allowances acquired or generated by the group are risk-managed by the trading and shipping function’ (BP, FYE 31 December 2023 annual report, p. 183).

19. Inventories

	\$ million	
	2023	2022
Crude oil	3,227	3,608
Natural gas	410	825
Emissions allowances	464	436
Refined petroleum and petrochemical products	7,413	7,920
	11,514	12,789
Trading inventories	9,850	14,004
	21,364	26,793
Supplies	1,455	1,288
	22,819	28,081
Cost of inventories expensed in the income statement	119,307	141,043

Source: BP FYE 31 December 2023 annual report p. 210.

Financial assets

In their financial statements, 28 companies recognise financial assets related to their carbon-related instruments. Upon further inspection, these are derivatives (eg forward, options, swaps) to mitigate the risks of fluctuation in prices of the underlying carbon-related instruments; 15 companies measured these derivatives at fair value. See Box 4.12 for related examples.

Box 4.12:

Extracts of accounting treatment of financial assets for carbon-related instruments

These extracts shed some light on the accounting treatment for derivatives for carbon-related instruments.

Endesa has entered into forward contracts for the purchase or sale of ... carbon dioxide (CO2) emission allowances ... these contracts are measured in the consolidated statement of financial position at their market value at the closing date, with differences in value recorded in the consolidated income statement as 'Revenue' or 'Procurements and services' (Endesa, FYE 31 December 2023 annual report, p. 258).

Ryanair uses forward swap contracts and options for the purchase of its ... carbon credit (Emission Trading Scheme) requirements to reduce its exposure to commodity price risk (Ryanair, FYE 31 March 2024 annual report, p. 178).

Other assets

Further, 20 companies recognise some of their carbon-related instruments as 'other assets' in the current assets part of the balance sheet, with almost half of them (nine) measuring them at historical cost, and three at fair value. Though presented as 'other assets', we observed the instruments are recognised using the accounting policies for various types of assets. See Box 4.13 for two examples. The remaining eight companies did not specify their measurement approaches.

Box 4.13:

Extracts of accounting treatment for carbon-related instruments as other assets

These extracts show the different accounting policies used to recognise the carbon-related instruments that are presented as 'other assets'.

Emission allowances acquired for production purposes are recognized at cost as inventories. In contrast, emission allowances acquired for trading purposes are recognized as other assets at fair value through profit or loss (ENBW, FYE 31 December 2023 annual report, p. 191).

Carbon credits purchased in the external market – are recognized at their purchase price as a prepayment and are presented within 'Other assets' on the Group's balance sheet (Ryanair, FYE 31 March 2024 annual report, p. 180).

Impairment testing

We observed 25 companies that consider the cost for carbon-related instruments when testing their assets (primarily goodwill) for impairment. This practice indicates that some companies identify carbon-related instruments as a significant cost for their future activities. See Box 4.14 for an example of such a practice.

Box 4.14:

Extract of a company's impairment test that incorporated carbon-related instruments

The Company's assumptions for future cash flows include an estimate for costs that the Company expects to incur to acquire emission allowances, which primarily impacts the flat steel operations in the EU under the ETS scheme and in Canada. The assumption for carbon emission cost is based on historical experience, implementation of decarbonization strategies to mitigate or otherwise offset such future costs and information available of future regulatory or operational changes. With respect to the EU ETS scheme, the assumption for carbon emission cost includes also the gradual phasing out of free emission allowances and the forecast market price of emission rights, for which the Company considered in its five-year cash flow projections internal estimates... (ArcelorMittal, FYE 31 December 2023 annual report, pp. 294–5)



Provisions

The provisions associated with carbon-related instruments in the financial statements of companies in our review typically represent companies’ obligations to satisfy regulatory requirements. These companies have legal obligations to either surrender carbon-related instruments sufficient to correspond with their actual levels of carbon emissions or use sufficient carbon-related instruments to offset their actual levels of carbon emissions in a period. A provision representing this obligation is recognised.

At the end of the reporting period, some companies may already have sufficient carbon-related instruments to satisfy their obligations while some companies need to acquire additional carbon-related instruments from external sources. These circumstances influence the measurement of the provisions. An obligation that can be settled using carbon-related instruments on hand is measured at the carrying amount of these instruments. Additional carbon-related instruments that need to be purchased from external sources are often measured at fair value. See Box 4.15 for examples of such provisions and their measurements. Interestingly, these examples also shed light on two different practices: ie recognising provisions at gross or net amounts. This highlights the importance of clarifying and standardising the appropriate accounting treatment.

Box 4.15:

Extracts of accounting treatment for provisions associated with carbon-related instruments

A liability is recognized when carbon emissions produced exceed the allowances received from governing bodies. These excess emissions produced by the Group are measured at fair value, reflecting the expenditure required to settle the present obligation at the reporting date. The liability is presented within ‘Accrued expenses and other liabilities’ on the Group’s balance sheet (Ryanair, FYE 31 March 2024 annual report p. 180).

An expense was recognized under ‘Other operating income/(expenses)’ in the income statement for the CO2 emissions released during the year, recognizing a provision calculated based on the tons of CO2 emitted, measured at: (i) their carrying amount in the case of those allowances that the Group has at year end; and (ii) the closing list price in the case of allowances that it does not yet have at year end (Repsol, FYE 31 December 2023 annual report, p. 56).

Deferred income (government grant)

Among the sample companies, 13 present deferred income associated with carbon-related instruments in their statements of financial position. Upon further inspection, the deferred income represents carbon-related instruments (primarily carbon allowances in a compliance carbon market) that the companies have received free of charge from a government¹⁷ and accounted for as non-monetary government grants. These companies recognise an asset (inventory or intangible asset) and a corresponding deferred income. Of these 13, 11 companies did not specify the measurement approach for these carbon-related instruments. There is more than one way to measure non-monetary government grants, hence it would be more useful if such information was provided.¹⁸ See Box 4.16 for an example of this practice.

Box 4.16:

Extract of accounting treatment for deferred income associated with carbon-related instruments

...allowances received free of charge under the emissions trading system for the 2013–2020 period are initially recognized as inventory at the market price prevailing at the beginning of the year in which they are issued, against deferred income as a grant (Repsol, FYE 31 December 2023 annual report, p. 56).



17 In this context, we note the term ‘government’ could be a government, government agency and similar bodies whether local, national or international. See paragraph 3 of IAS 20 (IFRS Foundation 2025c).

18 We draw attention to paragraph 23 of IAS 20 for the acceptable approaches to measure non-monetary assets transferred for the use of the company in a government grant (IFRS Foundation 2025c).

Income / expense

Income associated with carbon-related instruments is presented separately in the financial statements of 22 companies, while expenses are presented separately in the financial statements of 34 companies. Such income or expenses are associated with the acquisition, use, sale or disposal of carbon-related instruments. See Box 4.17 for examples of such income and expenses. Considering the number of companies that recognise

assets or liabilities associated with carbon-related instruments in the statement of financial position, the number of companies that separately present income or expenses relating to these instruments is relatively small. The income or expense could be insignificant relative to other types of income or expenses in the statement of profit or loss. Alternatively, this could arise from the current lack of guidance for the accounting and disclosure of carbon-related instruments.

Box 4.17:

Extracts of income and expense associated with carbon-related instruments

The following extracts from notes to the financial statements of two companies shed some light on the accounting treatment for income or expense relating to carbon-related instruments recognised in the statement of profit or loss.

Note 35 : Revenue from Operations		
	(€ in Crore)	
	Year ended March 31, 2023	Year ended March 31, 2022
Revenue from contracts with customers [Refer footnotes below]		
Revenue from power supply	15,518.44	12,989.01
Revenue from trading of RLNG	3,068.65	547.94
	18,587.09	13,536.95
Less: Discount for prompt payment of bills	24.77	19.62
	18,562.32	13,517.33
Other operating income		
Provisions of earlier years written back	0.60	1.04
Amortisation of deferred revenue		
Contribution received from consumers [Refer note 43(b)(2)] #	97.32	87.41
Capital grant from government [Refer note 58(b)]	1.37	2.45
Income from Certified Emission Reduction (CERs)	12.34	3.30
Income from Generation Based Incentive	23.73	24.45
Insurance claim receipt	2.17	0.11
Incentive income under solar rooftop programme	55.14	9.81
Miscellaneous income	80.23	69.84
	273.90	198.41
	18,836.22	13,715.74

Source: Torrent Power, FYE 31 March 2024 annual report p. 266.

Further analysis of Other operating expenses is presented below:				
	Company		Group	
	2023	2022	2023	2022
Third party fees	5,763.65	6,467.21	5,643.39	7,265.87
Board of Directors remuneration	1,133.35	1,115.50	1,178.65	1,173.57
Cargo expenses	2,010.37	1,850.65	2,037.47	1,877.78
Personnel training	5,834.63	3,528.22	7,680.44	6,037.85
Mail and Telecommunications expenses	5,733.99	3,945.10	6,011.35	4,020.81
Rents	407.08	226.23	475.64	658.94
Insurance premiums	3,604.66	3,081.45	4,041.04	3,302.57
Maintenance for building and equipment	582.89	334.82	682.78	338.22
Travel expenses	6,931.12	6,228.85	8,258.60	7,408.92
Stationary	727.26	573.43	766.95	628.08
Subscriptions	2,657.27	2,996.34	3,706.47	3,651.89
Emissions rights	57,787.28	32,373.87	46,766.52	23,774.44
Other expenses	75,679.27	58,328.94	78,385.05	63,664.57
Total	168,852.83	121,050.63	165,634.35	123,803.49

Other expenses account includes reversal of provision for expected credit losses of € 2,764.52 for the Company and €2,711.29 for the Group, respectively (2022 € 707.76 for the Company and € 518.03 for the Group, respectively) (Note 3.10).

Emissions rights cost variation is related to the increased flight activity of the year compared to 2022 as well as to the significantly higher emissions market price.

Source: Aegean Airlines, FYE 31 December 2023 annual report, p. 201.

4.4.2 Significance of carbon-related instruments in financial statements

Reviewing the financial statements of the 121 companies that disclose the accounting treatment of carbon-related instruments, we can see that 51 companies disclose the values of 87 accounting items under which their carbon-related instruments are recognised. Some of these 51 companies disclose more than one value corresponding to these items.

Table 4.7 presents, by category, the distribution of the 87 accounting items for which values are disclosed and the relative significance as a proportion of these companies’ total assets (for assets and liabilities) and as a proportion of the companies’ total revenues (for income and expenses). The carrying amounts for provisions (22 times) are most often disclosed, followed by inventories (17 times), which correspond to a mean of 1.26% and 0.67% of the total assets respectively. The carrying amounts of provisions correspond to a mean of 1.97% of these companies’ total liabilities, whereas the carrying amounts of deferred income/government grants correspond to a mean of 2.18% of these companies’ total liabilities. Further, values for financial assets and deferred income/government grants are disclosed the least (six and two times respectively). Interestingly, the relative mean value as a proportion to the total assets of financial assets is very low (0.04%). Further, four companies explicitly disclose nil values for the year analysed. It is noted that these companies provide a reconciliation of their carbon-related instruments’ amounts.¹⁹

As for the statement of profit or loss, we observed nine cases where the values are disclosed for an item of income and eight cases for an item of expense. The value of income items represents, on average, a mere 0.30% (mean) of these companies’ total revenues. By contrast, expenses represent a relatively significant amount. The value of expense items represents a mean of 1.91% of these companies’ total revenues.

Finally, an interesting observation is that a small number of companies disclose the actual values of the respective accounting items although these values appear to be insignificant compared with the total assets and total revenues of these companies. This is manifested by the minimum values observed that fall, in some cases, even below 0.01% of the total assets and/or total revenues.

All in all, Table 4.7 indicates that the significance of carbon-related instruments (as a percentage of the total assets or revenues) varies considerably among the companies reviewed, without necessarily being significant for all companies. Hence, the magnitude of carbon-related instruments’ value is not the sole determinant for disclosure about these instruments in the financial statements.

‘The significance of carbon-related instruments varies considerably among the companies reviewed.’

19 These zero values have been excluded from the calculation of significance percentages in this section.

Table 4.7: Significance of carbon-related instruments in financial statements

RECOGNISED VALUES	FREQ.	MEAN	MEDIAN	MIN	MAX
% of total assets					
Inventories	17	0.67%	0.51%	0.02%	2.23%
Intangible assets	15	1.05%	0.27%	<0.01%	6.80%
Other assets	8	1.29%	1.22%	0.03%	3.74%
Financial assets	6	0.04%	0.09%	<0.01%	0.37%
Provisions	22	1.26%	0.69%	0.10%	4.10%
Deferred income / government grants	2	0.96%	0.96%	0.82%	1.09%
% of total liabilities					
Provisions	22	1.97%	0.86%	0.19%	5.60%
Deferred income / government grants	2	2.18%	2.18	2.12%	2.24%
% of revenues					
Income / revenues	9	0.30%	0.08%	<0.01%	0.83%
Expenses	8	1.91%	1.18%	0.02%	6.82%



4.4.3 Disclosure of carbon taxes

Companies face various regulatory interventions to reduce their carbon emissions. One such interventions is a tax on companies’ carbon emissions (commonly known as carbon tax). In their financial statements, 15 companies in our sample disclose that they are subject to a national carbon tax. See Box 4.18 for an example of such disclosure.

We observed that the disclosures in the financial statements of other companies were unlike the example in Box 4.18: the descriptions of carbon tax in their financial statements tend to be vague and provide little information about the carbon tax. For example, nine of them do not disclose the jurisdictions in which they are subjected to carbon tax (see Table 4.8). In some cases, it was not clear whether the companies use the term ‘carbon tax’ to describe a carbon-related instrument (eg carbon allowances in a compliance market). Interestingly, none of the 15 companies disclose the total carbon tax incurred during the reporting period. This may indicate that these companies do not regard these tax-related implications as significant and hence do not disclose them separately.

Box 4.18:

Extract of disclosure about carbon tax

In this extract, the company describes the carbon tax to which it is subject, including a basis for the tax and the applicable tax rate.

New carbon dioxide quota tax has been introduced for operators of an installation receiving a significant free allocation of CO2 emission rights for the tax year starting after 31 December 2022. The tax is based on the amount of carbon dioxide emissions in tons. The tax rate is 40 EUR/tCO2, equivalent in Hungarian forints (MOL, FYE 31 December 2023 annual report, p. 62).

Table 4.8: Disclosure of carbon taxes in financial statements

CARBON TAX – JURISDICTIONS	FREQ.
South Africa	2
Hungary	1
Poland	1
Portugal	1
Singapore	1
Not specified	9
Total	15

We also observed that companies refer to carbon tax as a factor being considered when testing their cash generating units (CGUs) for impairments. This indicates that carbon tax could be an important input in the calculation of recoverable amounts. Despite this, no specific amounts are provided to help users understand the effects of carbon tax on the recoverable amount from the CGU being tested. See Box 4.19 for an example.

In some cases, companies report the deferred tax effects of recognising carbon-related instruments as assets or liabilities in the statement of financial position. In fact, these deferred tax effects were found to be unrelated to carbon tax. See Box 4.20 for an example.

Our overall observation on the disclosure of carbon tax indicates that users could face difficulties in understanding the nature and the financial effects of carbon tax on a company.

‘Our overall observation on the disclosure of carbon tax indicates that users could face difficulties in understanding the nature and the financial effects of carbon tax on a company.’

Box 4.19:

Extracts of carbon tax considered in impairment tests

For each CGU, a sensitivity analysis has been undertaken on the impairment tests, with scenarios covering ... the effect of potential carbon taxes... (Synthomer, FYE 31 December 2023 annual report, p. 154).

Carbon taxes and costs of emissions allowances are included in estimates of future cash flows, where applicable, based on the regulatory environment in each jurisdiction in which the group operates (BP, FYE 31 December 2023 annual report, p. 176).

Box 4.20:

Extract of disclosure of deferred tax effects on the accounting for carbon-related instruments

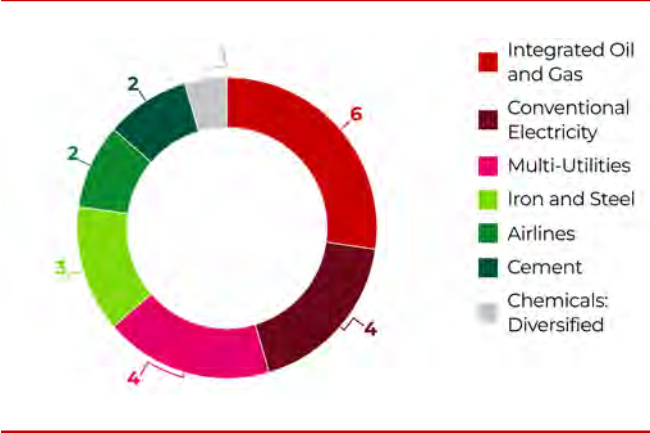
The evolution of the net deferred taxes between 2023 and 2022 mainly relates to...Deferred tax assets on other temporary differences: €(14) million at year-end 2023 – €52 million lower than in 2022 mainly due to the derecognition of the CO2 emission rights contracts in several legal entities (Solvay, FYE 31 December 2023 annual report, p. 282).

4.5 Carbon-related instruments and climate change in auditors’ reports

The final piece of information we collected from companies’ annual reports relates to the auditors’ reports. We explored whether auditors considered the accounting for carbon-related instruments as a key audit matter.

Of the 121 companies that mention carbon-related instruments in their financial statements, we noted that carbon-related instruments are mentioned in the auditors’ reports of 22 companies. Figure 4.9 presents the distribution of these 22 companies across subsectors. Of the 22 companies, six are in Integrated Oil and gas subsector, four in Conventional Electricity and four in Multi-Utilities. There are only three or fewer companies in each of the remaining subsectors.

Figure 4.9: Auditors’ reports that mention carbon-related instruments (by subsectors)



Although a relatively small number of auditor reports are found to discuss carbon-related instruments, we observed that the auditors have focused on several areas: the accounting for carbon-related instruments (see Box 4.21 for a related example), impairment tests for assets (where carbon-related instruments were used as one of the inputs) (see Box 4.22 for related examples), measurement of carbon-related instruments (see Box 4.23 for a related example) and change in accounting policy (see Box 4.24 for a related example). We observed two common themes that resulted in auditors’ putting more effort in these areas:

- the use of judgement, and
- the uncertainties around the assumptions used, in particular assumptions that use forward-looking information.

‘Of the 121 companies that mention carbon-related instruments in their financial statements, we noted that carbon-related instruments are mentioned in the auditors’ reports of 22 companies.’

Box 4.21:

Extract of auditor's reports – comments on the accounting for carbon-related instruments

EnBW, Germany (Conventional Electricity)

3. Recognition and measurement of energy trades

Reasons why the matter was determined to be a key audit matter

The energy trading business unit at EnBW is responsible for central access to the relevant markets along the value added chain for electricity, gas, fuels and emission allowances and sells the electricity generated by the renewable energy and conventional power plants. The product portfolio comprises physical and financial trading products on various stock exchanges and the over-the-counter market for electricity, gas, coal, freight, oil, LNG and CO₂ allowances, as well as structured contracts and gas storage. Additionally, long-term renewable power purchase agreements are used and regularly sold with guarantees of origin.

We classified the recognition and measurement of energy trades as a key audit matter because the complexity of the accounting for certain energy trades as derivatives according to IFRS 9 or as executory contracts according to IAS 37 entails uncertainties and the use of judgment. The latter also includes transactions that are to be settled physically, which do not come under the scope of IFRS 9 in accordance with the own use exemption. The large trading volume and the high volatility on the energy trading markets leads to an elevated risk of material misstatement.

The contracts concluded by the energy trading business unit are derivative financial instruments, leases or contracts for the purchase or sale of non-financial items (executory contracts). The transactions accounted for as derivative financial instruments are entered into as hedges in some cases to hedge price risks from future sales and procurement transactions. Leases are accounted for according to IFRS 16. Executory contracts must be regularly assessed according to IAS 37 to determine any need for provisions for onerous contracts. The valuation of standard products is based on prices on futures markets (exchanges, broker platforms), while the valuation of complex contracts is carried out using the Company's own valuation models.

Auditor's response

As part of our audit procedures, we analyzed the energy trading organization at the Company and evaluated the internal control system across all trading and valuation processes. In particular, we assessed the structure and execution of trades, the processes used to evaluate standard trading products and complex derivatives, the issuing and verification of incoming and outgoing invoices and the calculation of invoice amounts from individual transactions and, where relevant, their netting.

Furthermore, we assessed the structures and processes as well as the risk management and risk controlling processes including the trading systems used. In the process, we also assessed compliance with the segregation of functions and the settlement and valuation of energy trades. During the evaluation of the effectiveness of the internal control system in the energy trading business unit, we tested the established controls.

(FYE 31 December 2023 annual report, p. 292).

MVV Energie, Germany (Conventional Electricity)

① Within the MVV Energie AG Group, the consolidated subsidiary MVV Trading GmbH has primary responsibility for the procurement of energy and emission rights and for hedging energy price risks for the group companies MVV Energie AG, Stadtwerke Kiel AG and Energieversorgung Offenbach AG. To this end, MVV Trading GmbH trades on the spot and futures markets, mainly for electricity, gas and emission rights on energy exchanges and the over-the-counter market. The hedging measures take due account of factors such as the expected implications of macro-economic and geopolitical factors. The contracts thereby concluded constitute derivative instruments in accordance with IFRS 9; these are accounted for either at fair value through profit or loss (classified as financial assets or liabilities measured at fair value through profit or loss) or as pending transactions if the underlying for the derivative financial instrument will be received or delivered in future as part of the company's own expected purchase, sale or use requirements ("own use exemption"). The accounting treatment for physically settled derivative financial instruments is determined with the aid of the risk management system of MVV Trading GmbH, which allocates these derivative financial instruments to their corresponding purpose and therefore to the appropriate accounting treatment from a group perspective. Accordingly, physically settled derivative financial instruments are measured at fair value through profit or loss. These derivative financial instruments for electricity, gas and emission rights are in some cases included as hedging instruments in IFRS 9 hedge accounting, in this case as cash flow hedges. The underlying transactions are the purchase and sale of electricity, gas and emission rights at variable prices within a maximum of five years. The energy trading operations are supported by energy trading systems. These handle the process chain from the recording of trading transactions to the calculation and measurement of positions and the confirmation of trading transactions, as well as risk management.

(FYE 30 September 2023 annual report, p. 247).

Box 4.22:

Extracts of auditor’s reports – comments on the impairment tests of assets where carbon-related instruments are used as one of the inputs

RWE, Germany (Multi-Utilities)

The Company measures the fair values of the respective property, plant and equipment as the present value of the future cash flows using discounted cash flow models. The budget projections for the coming three years (medium-term plan) prepared by the executive directors and acknowledged by the supervisory board are used as the basis. These are extrapolated on the basis of long-term assumptions with regard to electricity, coal, natural gas and CO2 certificate prices as well as the planned service lives of the power plants. The assessment of the measurement of property, plant and equipment identified write-downs amounting in total to EUR 1.7 billion. The outcome of these valuations is dependent to a large extent on the estimates made by the executive directors of the future cash flows, and on the discount rates and other assumptions employed. The measurements are therefore subject to considerable uncertainties, meaning that this matter was of particular significance in the context of our audit (FYE 31 December 2023 annual report, p. 304).

OMV, Austria (Integrated Oil and Gas)

We compared the assumptions for oil and gas as well as CO2 prices used in the sensitivity analysis with publicly available information (the IEA [International Energy Agency] net zero emissions scenario) (FYE 31 December 2023, p. 107).

ENGIE, France (Multi-Utilities)

For goodwill and CGUs presenting a specific impairment loss risk that we deemed material, our work on values in use mainly covered:

- the assumptions of the Group’s long-term reference scenario (trends in electricity and gas prices and demand, price of CO2, inflation) for which we have assessed the consistency with external studies carried out by international organizations or energy experts, particularly with regard to the climate and energy mix (FYE 31 December 2023 annual report, p. 364).

ENI, Italy (Integrated Oil and Gas)

We verified the sensitivity analyses performed by the Group which include assumptions of the projected hydrocarbon prices and CO2 costs in the decarbonization scenario ‘Net Zero Emissions 2050’ (NZE 2050) elaborated by the IEA which envisages keeping global warming within the 1.5° C threshold (FYE 31 December 2023 annual report, p. 430).

Totalenergies, France (Integrated Oil and Gas)

Analyzing the CO2 price assumptions included in the future cash flows, notably by comparing them with current market data and publicly available segment information (in particular, IEA); Comparing the hydrocarbon price scenarios used by the Company, prepared by the Strategy & Markets division, with publicly available industry information (from the IEA, brokers and consultants as applicable); in particular the price scenarios relating to the Announced Pledges Scenario (APS) and NZE [Net Zero Emissions], considered by the IEA to be compatible with the objective of the Paris Agreement to limit the temperature increase to ‘well below 2°C’ (FYE 31 December 2023 annual report, p. 417).

Box 4.23:

Extract of auditor’s reports – comments on the measurement of carbon-related instruments

Easyjet, UK (Airlines)

We have considered the estimated costs used by management in relation to carbon credits required to be purchased under Emission trading schemes and the minimum levels of SAF [sustainable aviation fuel] usage required under currently implemented mandates (FYE 30 September 2023 annual report, p. 138).

Box 4.24:

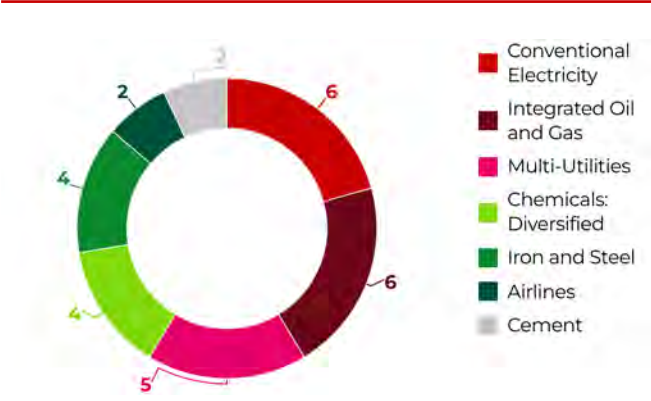
Extract of auditor’s reports – comments on change in accounting policy

Air France-KLM, France (Airlines)

We draw your attention to the matter set out in Note 3 to the consolidated financial statements entitled ‘Restatement of the 2022 financial statements’, which describes a change in accounting method regarding the accounting treatment of the greenhouse gas emissions trading scheme and its impact on the consolidated financial statements (FYE 31 December 2023 annual report, p. 430).

Companies typically engage with carbon-related instruments to manage their climate-related risks or opportunities. Other items in a company’s financial statements could be affected by climate-related risks or opportunities. The auditors’ reports for 29 of the 121 companies refer to climate-related risks. Figure 4.10 shows the distribution of these 29 companies across subsectors. The auditors’ reports for 13 companies refer to both climate-related risks and carbon-related instruments. This relatively small number indicates that climate-related risks have not caused significant issues in the audit of financial statements. Nonetheless, this situation may change when more companies are required to report sustainability-related information and become more familiar with the financial effects of sustainability-related risks and opportunities, including climate-related risks and opportunities.

Figure 4.10: Auditors’ reports that mention climate-related risks (by subsectors)





5. Implications, recommendations and conclusion

5.1 Implications

This exploratory study covered an examination of the narrative parts and financial statements in the annual reports of 300 companies operating globally; it has provided first-hand evidence of current corporate reporting and accounting practices for the carbon-related instruments with which companies engage. The implications of our findings, primarily for companies engaging with carbon-related instruments and users of annual reports (including financial statements), are set out below.

5.1.1 Engagement with carbon markets (and carbon-related instruments) is not yet pervasive but is growing

There is clear evidence of the growth of carbon-related markets. In February 2024, there were 36 mandatory carbon markets in force around the world and these covered 18% of carbon emissions worldwide at the time (ICAP 2024: 4). There were another 22 at various stages of consideration and development (ICAP 2024: 4). This rapid development is particularly noticeable in key emerging economies, such as Mexico and Brazil in Latin America and China, India and Indonesia in the Asia Pacific region. Further, the global voluntary carbon credit market size, according to Global Markets Insights, was valued at USD 1.7bn in 2024 with an estimated compound annual growth rate of 25% from 2025 to 2034, and a value projection of USD15.7bn in 2034.

However, fewer than 30% of our sample companies disclose their participation in a carbon market in the narrative parts of their annual reports, even though these companies operate in subsectors with high carbon emissions. Even fewer disclose information about their engagement with voluntary carbon credits and the use of ICP. About 40% of our sample companies mention carbon-related instruments in their financial statements. Engagement with carbon-related instruments is not concentrated in any subsectors. Nonetheless, a small group of sample companies that currently do not participate in any carbon market express interest in participating in a carbon market in the future.

The overall carbon marketplace is in a dynamic state of growth with an uneven level of maturity seen across the compliance and voluntary carbon markets. Nor is there a single uniform global scheme for each type of carbon market. The lack of scheme standardisation globally potentially raises regulatory concerns and affects the level of transparency and integrity of carbon-related instruments for users. This also has implications for the consistency of accounting for and reporting of carbon-related instruments, which could impair the comparability of financial statements among companies within and across jurisdictions. For instance, Europe has long-standing compliance carbon markets: the EU ETS began in 2005 and is currently

in its fourth iteration. Though a company may participate in more than one carbon market and engage with several carbon-related instruments, we observed that more companies in Europe participate in carbon markets than in other regions. This observation suggests that maturity and regulation of carbon markets may encourage more companies to participate in carbon markets and engage with carbon-related instruments.

5.1.2 Variety of terms cause complexity

Various terms are used to describe carbon-related instruments. Generally, however, no definitions are given for these terms and their descriptions are often vague. While some terms are frequently associated with one type of carbon market, such as ‘allowance’ with the compliance carbon market, and ‘credit’ with the voluntary carbon market, these associations are not always obvious. Further, where a particular term is used across companies it does not necessarily refer to the same underlying instrument. It is unrealistic to expect that users and other stakeholders in the corporate reporting ecosystem will be familiar with a variety of terms and their respective markets. The lack of clarity and the variety of terms potentially impair the understandability, comparability and transparency of annual reports, including financial statements, and thus reduce their decision-usefulness.

‘This observation suggests that maturity and regulation of carbon markets may encourage more companies to participate in carbon markets and engage with carbon-related instruments.’

5.1.3 Lack of accounting guidance leads to diversity in accounting practices

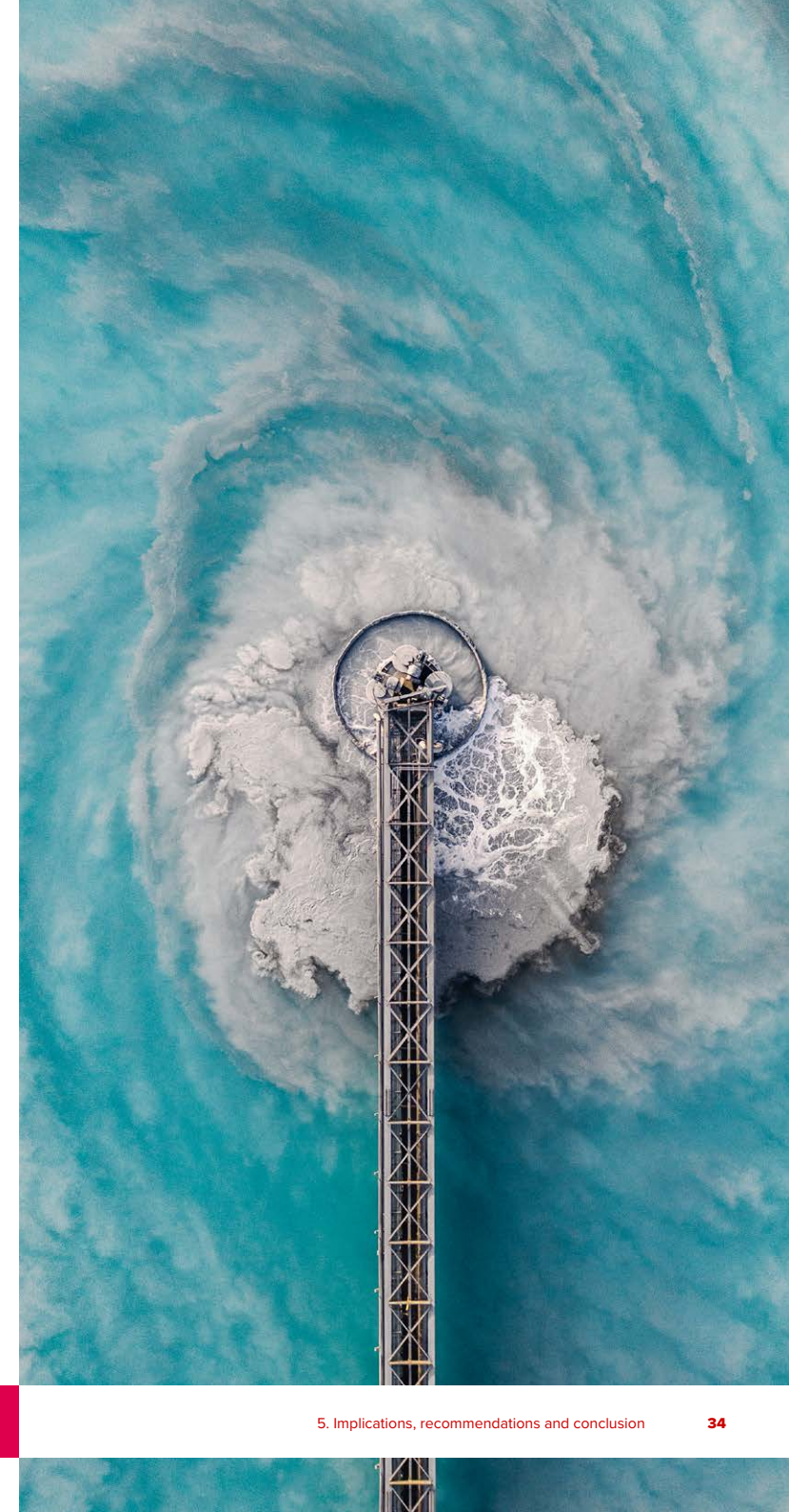
There is no IFRS accounting standard or guidance dedicated to accounting for carbon-related instruments. Consequently, companies have had to develop their own accounting policies to account for each carbon-related instrument as an asset, a liability, an income or an expense. As a result, several accounting treatments are observed across companies, which primarily account for these instruments as an asset. Further, these instruments are measured at cost or at fair value (or in combination), whereas some companies do not disclose their measurement approach at all. On the liabilities side, some companies recognise provisions on a gross basis, while others do so on a net basis.

Out of the 121 companies that refer to carbon-related instruments in the financial statements part of their annual report, only 51 disclose the actual values of these instruments. Arguably, one could attribute the inconsistency in accounting treatments and lack of disclosure to the fact that carbon-related instruments do not represent a significant amount in companies’ financial statements. The significance of these values (as a percentage of the total assets or revenues), however, varies considerably.

Considering the growing importance of carbon markets and associated accounting for carbon-related instruments, poor-quality information about such instruments affects a broad spectrum of stakeholders in the corporate reporting ecosystem, including preparers, those charged with governance, auditors, users, standard setters, policymakers and regulators. The lack of information about the nature, function, intended use, useful lives, amounts and measurement approaches of these instruments in the financial statements makes it more difficult for users to understand their relevance and financial effects on the company. Disjointed information about carbon-related instruments in different parts of an annual report potentially causes users to question the objectives for, and the financial effects of, engaging with these instruments. These weaknesses collectively impair the transparency, understandability and comparability of financial statements, reducing their decision-usefulness. Our observations collectively highlight the importance of clarifying and standardising the accounting treatments and disclosure of information about carbon-related instruments.

5.1.4 More effort during audits of financial statements

Finally, although this diversity in accounting practices has become an issue for some auditors, this is not pervasive. Indeed, relatively few auditors’ reports highlight issues about carbon-related instruments. These issues tend to be associated with areas that require the exercise of judgement or areas with a higher degree of estimation uncertainty where assumptions, in particular those involving forward-looking information, are used in accounting for such instruments. As a result of the current situation, auditors may need to spend more effort auditing financial statements of companies that engage with such instruments.



5.2 Recommendations

Introducing **an overarching term** would serve as a first stepping stone in developing guidance for the accounting and reporting of carbon-related instruments. Arguably, the term ‘carbon-related instruments’ adopted in this report could serve as this overarching term. This is especially important as it is expected that in the future more companies will engage with carbon-related instruments, given the expected growth of carbon markets and the importance of climate change and its management. Aligning the definitions for commonly used instruments from different carbon markets would also facilitate consistent accounting treatments for companies engaging with these instruments. When new instruments are developed, a common definition should be adopted. This will improve comparability between both carbon markets and companies.

Companies need guidance for consistent accounting treatment of carbon-related instruments, in particular for assets. Guidance (especially in the form of a dedicated future accounting standard) for carbon-related instruments would be ideal for supporting consistent application of accounting treatments and disclosure of relevant information. Such guidance should help determine:

- the appropriate **scope** when accounting for each carbon-related instrument that faithfully represents its nature, function and intended use
- **when** and **how** to recognise each instrument
- the appropriate **measurement approaches**, and
- relevant **disclosures** to enable users to evaluate the financial effects of each such instrument on the company, including its nature, function and intended use.

Guidance needs to be truly global. While the carbon markets in the EU and the UK are currently the most popular, when developing guidance standard setters need to allow for the characteristics of carbon markets and associated instruments across different jurisdictions, especially bearing in mind the growth of markets in more emerging economies.

Following on from this and our research findings, we now recommend interventions for specific group of stakeholders in the corporate reporting ecosystem.

5.2.1. Preparers of financial statements

Until definitive guidance is made available by standard setters, we encourage preparers (companies) to take proactive measures collectively to improve the consistency and comparability of accounting and reporting of carbon-related instruments in the financial statements and improve connectivity with information in the narrative parts of their annual reports. This would help improve users’ understanding of the connection between the company’s strategy for managing its climate-related risks or opportunities (such as using carbon-related instruments to offset carbon emissions) and the financial effects. For companies that apply both IFRS Accounting Standards and IFRS Sustainability Disclosure Standards, this would serve to facilitate connectivity in the reporting under both sets of reporting standards.

Therefore, preparers should:

- clearly state their accounting policies for the recognition and measurement of carbon-related instruments
- clearly describe the nature, function and intended use of their carbon-related instruments
- provide information about these instruments in a coherent manner, ie connecting information about

carbon-related instruments in the financial statements to information in the narrative part of an annual report relating to the company’s management of its climate-related risks and opportunities, carbon markets, and the company’s business strategy, where relevant.

We encourage preparers to collaborate with peers to promote consistency of accounting treatments for carbon-related instruments within the same subsectors, in particular peers that share a common purpose for engaging with these instruments. Peer companies with more experience in accounting for and reporting of carbon-related instruments (such as companies in Europe) could share best practices to support their peers in the subsector. This would promote comparability and consequently the decision-usefulness of financial statements.

5.2.2 Auditors

Auditors have an important task in reviewing the coherence of information in the financial statements and narrative part of the annual report.²⁰ Further, we encourage auditors to lend their technical expertise to supporting the development of guidance to facilitate consistent accounting treatment of carbon-related instruments, and to help ensure the resulting accounting and disclosure requirements are auditable. This includes the creation of a suitable overarching terminology, which is used consistently, for carbon-related instruments.

20 Auditors are required to read and consider whether there is a material inconsistency between the other information that accompanies the financial statements, or that is incompatible with the auditor’s knowledge of the company or its environment. Auditors need to discuss such material inconsistency with management and whether there is a material misstatement. See paragraphs 3, 11 and 16 of ISA 720 (IAASB 2025).

5.2.3 Standard-setters, policymakers and regulators

To improve the consistency of the accounting treatments and disclosure of carbon-related instruments and thus the comparability of financial statements, we encourage standard setters, in particular the IASB, to develop a dedicated accounting standard with appropriate definitions and requirements for recognition, measurement and disclosure of carbon-related instruments. As this is a relatively new area, application guidance and illustrative disclosure examples would also be very useful.

Therefore, the *Pollutant Pricing Mechanism (PPM)* project that is currently on the IASB’s reserve list should be included in the IASB’s next agenda consultation for its 2027 – 2031 work plan. In preparing for the PPM project, we encourage the IASB to continue horizon scanning to gauge the evolving state of play among companies around the world and consider the proposals or white papers from other standard-setters, such as the FASB, and other reporting-related bodies such as ISDA, ESMA and EFRAG to promote best-practice and consistency of accounting treatments.

We encourage all standard setters, policymakers and regulators to work collaboratively at all levels (ie national, regional and global levels) in developing a truly global accounting standard to promote consistency in accounting treatments for carbon-related instruments by companies across all jurisdictions. This would also prevent subsequent modification by individual jurisdictions that could harm comparability of financial statements across jurisdictions.

Relevant regulators should work collaboratively at all levels to introduce best practices to uphold the integrity and transparency of carbon markets and associated instruments, including promoting the consistent use of terms describing carbon-related instruments.

Standard-setters, policymakers and regulators collectively should also facilitate collaboration and discussion among preparers, auditors and users to gather insights to support developing a global accounting standard and harmonising accompanying application guidance as well as illustrative examples.

As more companies will eventually be required to create and communicate sustainability-related information, we urge standard setters, in particular the IASB and the International Sustainability Standards Board (ISSB), to work collaboratively to provide general guidance on disclosing connected financial and sustainability-related information, ie this guidance need not be specific to carbon-related instruments.

5.2.4 Users and those charged with governance

Climate change, its management and related accounting and reporting are expected to become increasingly important for companies. Investors, especially fund managers and other institutional investors, should be more proactive in engaging with companies on their commitments to climate change management and related accounting and reporting, where such information is expected to be material.

Users and those charged with governance should familiarise themselves with the types of carbon markets and carbon-related instruments so as to understand what companies do with these instruments and why. In addition, users who are investors and those charged with governance (in particular, independent directors and members of audit committees) should use their influence to steer companies towards providing coherent information in their annual reports about carbon-related instruments and the connection with the company's management of climate-related risks or opportunities.

Users, especially sophisticated capital market actors (fund-management firms and asset owners), and those charged with governance should engage with standard setters and relevant policymakers and regulators to provide inputs about:

- the information they need for decision-making
- why they need this information, and how they will use it (Chow 2024).

This may be done through responding to exposure drafts, or participating in policy forums or roundtable meetings with standard setters, or relevant policymakers or regulators.

5.3 Conclusion

The importance and magnitude of carbon markets are growing, with an increasing number of companies expected to participate in these markets. Hence, it becomes important to ensure companies use a consistent and comparable approach to account for and provide information about the carbon-related instruments with which they engage, in both the compliance and voluntary carbon markets. This will give users of their annual reports better understanding of the nature, function and intended use of these instruments and their financial effects on the company.

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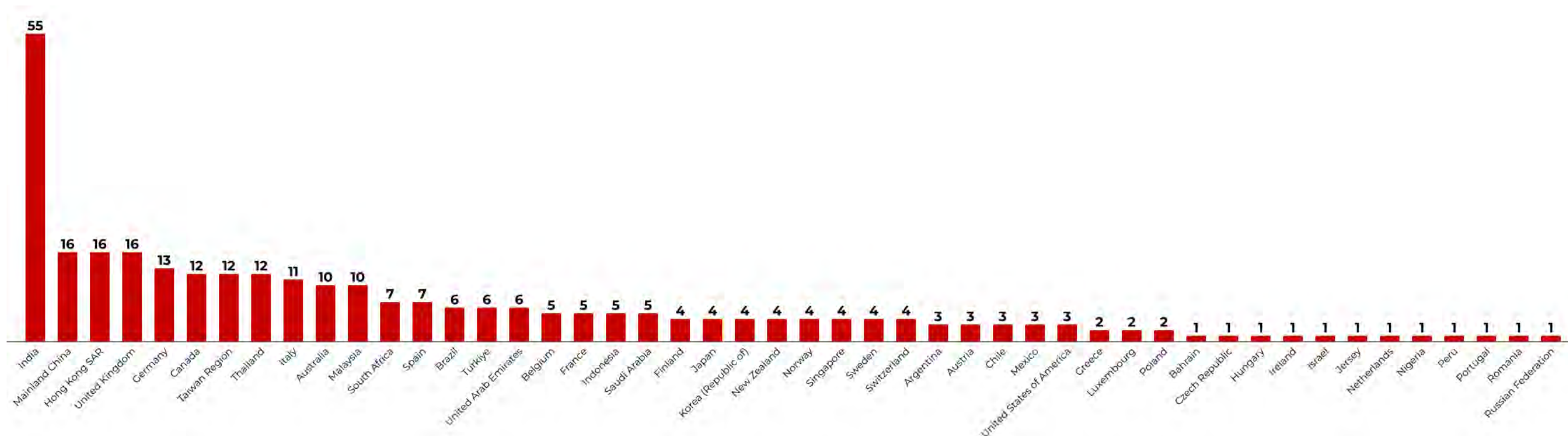
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Appendix A: Sample companies

A2A	BASF	CHONGQING IRON & STL.'H'	ETERNAL MATERIALS	IREN	NAVA	NACIONAIS	TATA POWER
ABU DHABI AVIATION	BASF INDIA	CHORUS AVTN.VTG.&. VAR.	EVA AIRWAYS	J K LAKSHMI CEMENT	NIPPON SHOKUBAI	REPSOL YPF	TATA STEEL
ABU DHABI NAT.ENERGY CO.	BBMG 'H'	VOTING	EVN	JAPAN AIRLINES	NOCIL	RWE	TATA STEEL (THAILAND)
ACEA	BE GROUP	CIKARANG LISTRINDO	EXCHANGE INCOME	JAYASWALS NECO INDS.	NORSK HYDRO	RYANAIR HOLDINGS	TAURON POLSKA ENERGIA
ACERINOX 'R'	BEKAERT (D)	CIMSA CIMENTO SANVETC.	FERREXPO	JET2	NORWEGIAN AIR SHUTTLE	SAGAR CEMENTS	TERNA RETE ELETTRICA NAZ
ACWA POWER	BIRLA CORPORATION	CKI HOLDINGS	FINNAIR	JINDAL SAW	NOSTRUM OIL & GAS	SALZGITTER	TERNIUM SPN.ADR 1:10
ADANI ENERGY SOLUTIONS	BKW	CLARIANT	FORMOSA CHEMS.& FIBRE	JINDAL STAINLESS	NUVOCO VISTAS	SANDUR MANGANESE (NSE)	TESSENDERLO GROUP
ADANI POWER	BLUESCOPE STEEL	CLP HOLDINGS	FORTESCUE	JINDAL STEEL & POWER	OMNIA	AND IRON ORES	THE RAMCO CEMENTS
ADBRI	BLUESTAR ADISSEO 'A'	CONSTELLIUM SE A	FORTUM	JK CEMENT	OMV	SAS	THIRUMALAI CHEMICALS
AECI	BOROSIL RENEWABLES	CONTROLADORA VUELA	FUJAIRAH CMT.INDS.	JOHNSON MATTHEY	OMV PETROM	SASOL	TITAN CEMENT
AEGEAN AIRLINES CR	BP	COMPANIA DE AVIACION	FUYAO GLSS.IND.GROUP 'A'	JSW ENERGY	ORIENT CEMENT	SAUDI ARABIAN OIL	TKI.SISE VE CAM FKI.
AGC	BRENNTAG	COPA HOLDINGS S A	GENESIS ENERGY	JSW STEEL	ORIENTAL UNION CHM.	SAUDI BASIC INDUSTRIES	TMT STEEL
AGL ENERGY	BROOKFIELD INFR.PTNS. UNITS	CRODA INTERNATIONAL	GIBSON ENERGY	KEMIRA	ORIGIN ENERGY (EX BORAL)	SAUDI ELECTRICITY	TORRENT POWER
AIR CANADA VOTING AND	CANADIAN UTILITIES 'A'	CSN MINERACAO ON	GLOBAL POWER SYNERGY	KEPPEL	OUTOKUMPU 'A'	SDIC POWER HOLDINGS 'A'	TOTALENERGIES
VARIABLE VOTING	CAPITAL A	CYDSA	GOL LINHAS AEREAS	KEPPEL INFRA UNIT	PAUSHAK	SEMBCORP INDUSTRIES	TRANSALTA
AIR CHINA LIMITED 'A'	CAPITAL POWER	DALMIA BHARAT	INTELIGENTES PN	KEYERA	PEMBINA PIPELINE	SHREE CEMENT	TUBACEX
AIR FRANCE-KLM	CATHAY PACIFIC AIRWAYS	DANGOTE CEMENT	GRASIM INDUSTRIES	KINGBOARD HOLDINGS	PETROCHINA 'A'	SHYAM METALICS AND ENERGY	TUNG HO STL.ENTER.
AKENERJI ELEKTRIK URETIM	CEMENTIR HOLDING	DEEPAK NITRITE	GULF CEMENT	KOC HOLDING	PETROLEO BRASILEIRO ON	SIAM CITY CEMENT	UACJ
AKSA ENERJI URETIM	CEMENTOS PACASMAYO SAA	DEUTSCHE LUFTHANSA	GULF ENERGY DEVELOPMENT	KOREAN AIR LINES	PETRONAS CHEMICALS GP.	SIGMAROC	ULTRATECH CEMENT
ALUMINIUM BAHRAIN	CEMEX CPO	DGI.PWG.'H'	HEIDELBERG MATERIALS	KUALA LUMPUR KEPONG	PIDILITE INDUSTRIES	SINGAPORE AIRLINES	UNIPER K
ALUMINUM CORP.OF CHINA 'A'	CENOVUS ENERGY	DONGYUE GROUP	HERA	KUMBA IRON ORE	POSCO FUTURE M	SINOPEC KANTONS HOLDINGS	UNITED COMPANY (HKG) RUSAL
ANHUI CONCH CMT. 'A'	CENTRICA	DRAX GROUP	HIAP TECK VENTURE	LANXESS	POSCO HOLDINGS	SNAM	USHA MARTIN
APA GROUP	CESC	E ON N	HIMADRI CHEMS. & INDS.	LATAM AIRLINES GROUP	POWER ASSETS HOLDINGS	SOCIEDAD QUIMICA Y MINERA	USINAS SIDERURGICAS DE
APERAM	CEZ	EASYJET	HINDALCO INDUSTRIES	LEON FUAT	POWER GRID CORPORATION	DE CH	MINAS GERAIS A PN
APEX INVESTMENT	CHAMPION IRON	EDENOR EMSA.DISB.Y COMLZ.	HK ELECTRIC INVESTMENTS	LOMA NEGRA COMPANIA	OF INDIA	SOLAR INDUSTRIES IDA.	VALE ON
APL APOLLO TUBES	CHANDRA ASRI PACIFIC	NORTE	HOLCIM	INDUSTRIAL ARGENTINA	PPC	SOLVAY	VECTOR
AQUAFIL	CHIN.PWR.INTDVT.	EDISON RSP	HUABAO INTL.HDG.	LOTTE FINE CHEMICAL	PRESS METAL ALUMINIUM	SRF	VICAT
ARCELORMITTAL	CHINA AIRLINES	ELECTRICITY GENERATING	HUADIAN POWER	M M FORGINGS	HOLDINGS	SSAB A	VOESTALPINE
ARCELORMITTAL SA.	CHINA EASTERN AIRL. 'A'	ELECTROSTEEL CASTINGS	INTERNATIONAL 'H'	MAANSHAN IRON & STL. 'A'	PRISM JOHNSON	SSE	VULCAN STEEL
ARKAN BUILDING MATERIALS	CHINA HONGQIAO GROUP	ELEMENTIS	HUAXIN CEMENT 'A'	MALAKOFF	PROFILGRUPPEN B	STALPRODUKT	WACKER CHEMIE
COMPANY	CHINA NATIONAL BUILDING	ELIA GROUP	HULAMIN	MALAYSIA STEEL WKS.(KL)	PTT GLOBAL CHEMICAL	STEEL & TUBE HOLDINGS	WEST CHINA CEMENT
ARKEMA	MATERIAL 'H'	ELKEM	IBERDROLA	MOL MAGYAR OLAJ-ES	QANTAS AIRWAYS	STEEL AUTHORITY OF INDIA	WIJAYA KARYA BETON
ASIA AVIATION	CHINA OIL AND GAS GP.	ELMERA GROUP	IBSTOCK	GAZIPARI	RAIN INDUSTRIES	SUNCOR ENERGY	WIZZ AIR HOLDINGS
ASIA CEMENT	CHINA PETROCHEMICAL DEV.	ENBW ENGE.BADEN-WURTG.	ICL GROUP	MOUNT GIBSON IRON	RAJRATAN GLOBAL WIRE	SUPREME PETROCHEM	XINYI GLASS HOLDINGS
ATCO CLASS 1	CHINA RES BUILD MATERIAL	ENDESA	ICT.TUNGGAL PRAKARSA	MVV ENERGIE	RATCH GROUP PCL	SWISS STEEL HOLDING AG	YPF
ATUL	TECH HOLD	ENEL	INCITEC PIVOT	MYTILINEOS	RATCH PATHANA ENERGY	SYMRISE	YTL CORPORATION
AZUL PN	CHINA RESOURCES POWER	ENEL CHILE	INDIA CEMENTS	NAN YA PLASTICS	REDEIA CORPORACION	SYNTHOMER	YTL POWER INTERNATIONAL
B GRIMM POWER	CHINA SHANSHUI CMT.GROUP	ENERJISA ENERJI	INDIA GLYCOLS	NATIONAL ALUMINIUM	RELIANCE INFRASTRUCTURE	TAIWAN CEMENT	
BANPU POWER	CHINA SOUTHERN AIRLINES 'A'	ENGIE	INTERGLOBE AVIATION	NATIONAL GRID	RELIANCE POWER	TAIWAN GLASS IND.	
BARITO PACIFIC	CHINA STEEL	ENI	INTL.CONS.AIRL.GP.	NATIONAL INDZT.	REN REDES ENERGETICAS	TATA CHEMICALS	

Appendix B: Distribution of sample companies across countries/locations

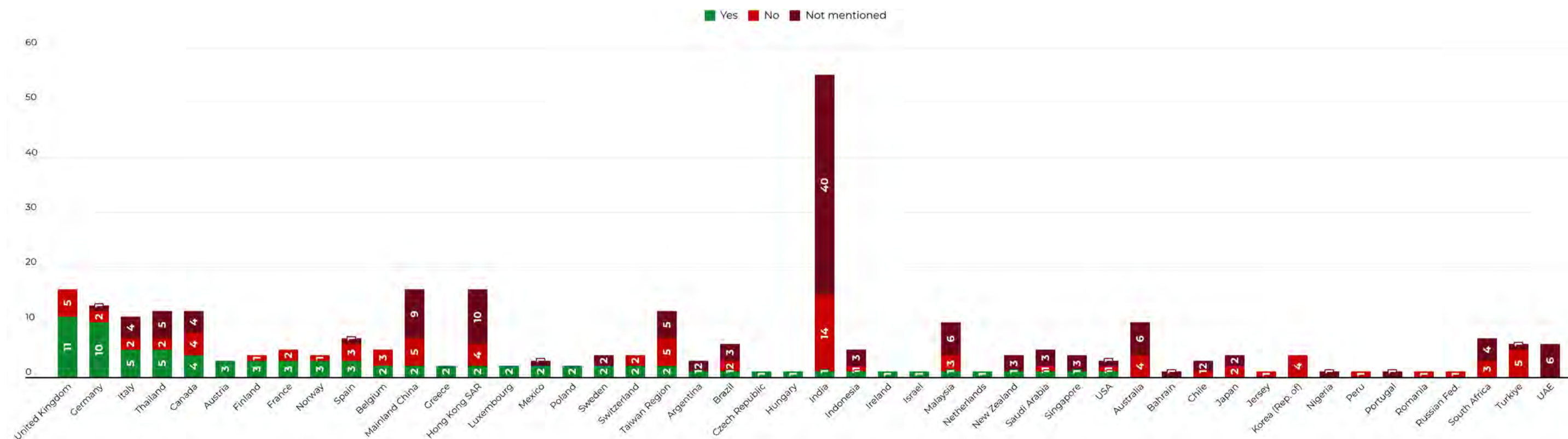


Appendix C: Financial characteristics of all sample companies

	MEAN	MEDIAN	MIN	P25	P75	MAX
Total assets (in €'000)	20,900,000	6,193,310	46,450	1,846,949	18,500,000	593,000,000
Total sales/Revenue (in €'000)	13,300,000	3,421,877	23,782	1,152,752	10,800,000	448,000,000
Total liabilities (in €'000)	12,900,000	3,858,041	6,978	898,411	10,800,000	181,000,000
Net income (in €'000)	1,111,150	185,475	-2,069,000	24,969	623,915	109,000,000
Total interest-bearing debt/obligations (in €'000)	6,165,893	1,893,992	0	424,462	6,284,304	81,500,000
Total shareholders' equity (in €'000)	7,954,600	2,418,136	-4,068,110	686,238	6,481,500	387,000,000
Market capitalisation (in €'000)	15,400,000	3,131,899	18,098	950,390	8,793,534	1,930,000,000
Return on assets (ROA) (<i>Net income/ total assets</i>)	0.044	0.034	-0.198	0.013	0.064	1.636
Leverage (<i>Total debt/total shareholders' equity</i>)	5.562	0.669	-15.649	0.319	1.351	1,345.057



Appendix D: Companies' disclosure of participation in carbon markets in the narrative parts of annual reports (full sample)





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