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COMPANIES' READINESS TO ADOPT IFRS S2 *CLIMATE-RELATED DISCLOSURES*

ACCA AND ADAM SMITH BUSINESS SCHOOL RESEARCH REPORT

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Contents

1. Introduction

1.1 Background and objectives

In light of the increasingly obvious effects of human activities on the causes of climate change, there has been an ever-intensifying focus by governments and other organisations on the transformation of the global economy towards a state of net-zero carbon. In parallel, the investor community has increasingly put pressure on firms to identify the associated specific risks and opportunities for their long-term operations and sustainability. Against this backdrop, during the last two decades, there has been a significant increase in the number of different types of reporting frameworks globally that relate to sustainability matters, covering topics such as climate change, emissions, pollution, water management, and the wider context of their social responsibility, and governance. This plethora of different reporting frameworks are the products of different standard setters or other global bodies that have different focuses, capacities and objectives, as well as support from different governments and stakeholders worldwide. This has resulted in the existence of reporting frameworks that are not always mandatory and, importantly, vary significantly in their requirements. More importantly for our study, these frameworks do not necessarily attempt to link sustainability-related information with financial information and hence are not always viewed as being directly relevant to capital markets. Whilst it can be debated as to whether direct financial metrics are, or should be, an inherent part of such disclosures, nonetheless, various actors have argued that there is a need for consistent and comparable sustainability-related financial disclosures across industries and jurisdictions that provide decision-useful information to capital markets as well as wider stakeholders.

In response to this, in 2021, the IFRS Foundation undertook to set up a global standard-setter for sustainability-related financial disclosures aimed at investors: the International Sustainability Standards Board (ISSB). The ISSB aims to 'deliver a comprehensive global baseline of sustainability-related disclosure standards that provide investors and other capital market participants with information about companies' sustainability-related risks and opportunities to help them make informed decisions' (IFRS 2022). In fact, the IFRS Foundation has explicitly spelt out that the underlying objective of the ISSB will be to consolidate and then build on previous work on financial-related sustainability reporting performed by various organisations: the Climate Disclosure Standards Board (CDSB), the International Accounting Standards Board (IASB), the Task Force for Climate-related Disclosures (TCFD), the Value Reporting Foundation (VRF, which brought together the International Integrated Reporting Framework and Sustainability Accounting Standards Board (SASB) Standards) and the World Economic Forum (WEF).[1] Regulatory authorities across different jurisdictions could then adopt this consistent baseline (BDO 2022). Such an approach may eliminate the fragmentation among the multiple reporting frameworks currently in place.[2]

Along with the announcement of the formation of the ISSB, the IFRS Foundation published two prototype standards and a summary document that had been developed by the Technical Readiness Working Group (TRWG). On 31 March 2022, the ISSB launched a consultation on its first two proposed standards: The Exposure Draft IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information (General Requirements Exposure Draft)* and The Exposure Draft IFRS S2 *Climate-related Disclosures (Climate Exposure Draft)*. The former (hereafter ED IFRS S1) sets out general sustainability-related disclosure requirements and the latter (hereafter ED IFRS S2) specifies climate-related disclosure requirements. More specifically, ED IFRS S2 builds upon the recommendations of the TCFD (TCFD 2017) and incorporates industry-based disclosure requirements derived from the SASB Standards.

Considering that the majority of listed companies worldwide are already providing some information on sustainability and climate change-related matters, either on a voluntary basis or due to local regulations, the main objective of this project is to compare companies' current reporting practices with those proposed by the ISSB's ED IFRS S2. Through reviewing current reporting practice from companies in two industries (construction materials and chemicals) that face significant risks due to climate change but also contribute negatively to climate change owing to their high levels of greenhouse gas (hereafter GHG) emissions from their operations, this analysis gauges the extent of 'preparedness' of companies in these industries to provide the disclosures proposed in ED IFRS S2. To meet this objective, the evidence from the study provides insights into the following questions.

1 <https://www.ifrs.org/groups/international-sustainability-standards-board/issb-frequently-asked-questions/>

2 Effectively, this objective is similar to the objectives that underpinned the formation of the International Accounting Standards Committee (IASC), which aimed at developing International Accounting Standards (IAS) in the early 1970s by building on the elements of good accounting principles from the different sets of accounting standards in existence at the time.

- Which are the most and least common climate-related disclosures currently provided by companies that are directly relevant to those proposed by ED IFRS S2?
- To what extent are these disclosures provided in the annual report and/or other locations?
- Where disclosures are found in the annual report, to what extent are they located in the narratives of the management commentary or other locations within the annual report?
- Do companies provide cross-references to other sources/reports when providing climate-related disclosures?
- What reporting frameworks are referenced in relation to companies' climate-related disclosures?
- To what extent are the disclosures externally assured?

This research does not assess the extent or quality of compliance with sustainability-related standards that were referenced by the sample companies. While each company must exercise their own materiality judgement in applying the disclosure requirements set out in an IFRS Sustainability Disclosure Standard, we do not seek to evaluate whether the disclosure requirements proposed in ED IFRS S2 are material to each sample company. Additionally, while this research gathers information about whether disclosures have been assured, it did not probe into the level of assurance.

1.2 Method

The starting point of our analysis was the creation of a disclosure index as our main research instrument, which consists of 102 disclosure requirements in ED IFRS S2. We supplemented this with additional items: primarily reflecting the industry-based disclosure requirements in Appendix B of ED IFRS 2. (We refer to these disclosure requirements as 'disclosure items'). Subsequently, we have focused on the 50 largest emitting companies (based on their average Scope 1 and Scope 2 GHG emissions over the three-year period 2018-2020) in the chemicals and construction materials industries worldwide respectively, which released reports in English language. We collected their most recent annual reports and additional reports (ie sustainability reports, TCFD reports, surveys by CDP,[3] and proxy statements for US-listed companies). Then, we gauged the extent to which these 100 companies already provide the disclosures listed in our research instruments through these sources (either separately or in combination).

1.3 Key findings

The high-level findings emerging from this project are that companies in both industries exhibit a moderate overall disclosure score of the climate-related disclosures prescribed by ED IFRS S2, despite the fact that it was not available to firms when producing the reports considered in our analysis. This relatively moderate level of disclosure arises because **the majority of sample firms have adopted the TCFD Recommendations**. By contrast, many of the 'new' disclosure requirements proposed by ED IFRS S2, that do not feature in the TCFD Recommendations, receive very low levels of adherence. Moreover, while the majority of sample firms appear to adhere to various reporting frameworks (eg TCFD, Global Reporting Initiative (GRI), SASB) and produce a variety of different reports, **disclosures pertinent to ED IFRS S2 are scattered and in many cases duplicated across the various documents**. At the same time, there is clear evidence of a lack of cross-referencing between documents. The combination of these issues constitutes a typical example of information overload that hinders, instead of enabling, transparency and comparability across firms, with users having to spend considerable time and effort to identify the relevant information they may seek from a firm.

A more detailed outline of the key findings from our analysis can be summarised in the following points.

- **Companies in the chemicals industry exhibit a slightly higher degree of adherence to ED IFRS S2 than companies in the constructions materials industry:** Chemicals industry companies exhibit an overall mean score of disclosure of 43%, whereas companies in the construction materials industry have a slightly lower overall mean score of 39%. Further, the minimum score for the top quartile of chemicals companies is 58%, while the mean for those 'top scorers' is 64%; the maximum of the bottom quartile for those companies is 28%, while the mean score for those 'bottom-scorers' is 17%. For the construction materials companies the findings are rather similar. The minimum score for the top quartile of those companies is 51%, while the mean score for those 'top scorers' is 62% and the maximum of the bottom quartile is 28%, with a mean score for those 'bottom-scorers' of 16%.
- **TCFD-based disclosure requirements see significantly higher levels of disclosure than 'new' disclosure requirements across both industries:** Companies in the chemicals industry exhibit a mean score of 61% for adherence with the TCFD-based disclosure items and a mean score of 27% for adherence with the 'new' items of ED IFRS S2. Companies in the construction materials industry present a similar picture. The mean score for the TCFD-based items is 56% and that for the 'new' items is 23%.
- **The disclosures covered by the Governance dimension of ED IFRS S2 see the highest level of adherence:** The mean score on this is 59% for the chemicals and 60% for the construction materials.

3 CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. <https://www.cdp.net/en>.

- **Sample companies engage less with disclosures of the Strategy dimension:** The mean score for this dimension is 38% for the firms in the chemicals industry and 34% for those in construction materials industry.
- **Sample companies in both industries exhibit a very low score for the Financial Statements disclosures:** With a mean score of 12%, this suggests that there is a low level of climate-related disclosure pertinent to an entity's financial position, performance and cash flows. This finding is of particular interest as these disclosures refer to the integration of the 'front-end' of companies' annual reports with the 'back-end' (ie financial statements).
- **In relation to Risk Management dimension, companies do not engage a lot with these disclosures:** This is especially true of the "new" disclosure items that refer to information on the processes a company uses to identify climate-related risks for risk management purposes (mean score 37% and 33% for the Chemicals and Construction materials firms, respectively). In addition, when these disclosures are provided, they are usually located outside the annual and sustainability reports of companies (ie other reports such as TCFD report).
- **The sustainability section of the annual report appears to be the common location of climate-related disclosures.** Around half of the disclosure items provided by chemical companies and almost three-quarters of the disclosure items provided by the construction materials companies in their annual reports are located within the sustainability section of these reports. Climate-related disclosures are found to be moderately presented in the management commentary section of the annual reports of chemicals companies (on average, companies disclose 7.5 items out of total of 21.6 items found within their annual reports) and much less so in the management commentary section of the construction materials companies (4.2 items out of 24.5 items found within their annual reports).
- **Fewer than 50% of sample companies provide cross-references to other sources.** In fact, cross-references to other sources (such as other reports) are provided primarily by companies in the chemicals industry and they are mostly related to Governance (23 companies), Risks and Opportunities subcategory of the Strategy dimension (18 companies), Risk Management (17 companies) and Metrics and Targets (14 and 13 companies, respectively). On the contrary, 13 companies in the construction materials industry provide cross-references related to Governance whereas in all other disclosure areas fewer than 10 companies provide cross-references.
- **A sizeable proportion of our sample companies already engage with various existing reporting frameworks.** The vast majority of companies have made UN SDG commitments and most claim to follow the TCFD Recommendations and/or GRI Standards and fewer an Integrated Reporting (<IR>) approach. Further, about half of our sample companies explicitly refer to the Greenhouse Gas (GHG) Protocol as the method of measuring their carbon emissions (GHG Protocol n.d.).
- **55% of our sample companies do have some form of assurance for their disclosures.** Specifically, 15 companies have both their metrics and narratives assured whereas 40 companies have only their metrics assured.

1.4 Practical implications and policy recommendations

Key findings from our analysis can inform standard setters, companies, and national/regional regulators and users of the company reports. We outline the practical implications and policy recommendations accordingly.

Implications for the ISSB

- With the potential introduction of new reporting requirements and to mitigate against difficulties in their interpretation and application, it appears that companies (and users) will benefit from examples and education material that explain the disclosures required in ED IFRS S2 and particularly those that are not already required by other reporting frameworks. Our analysis reveals that the majority of sample firms do not provide disclosures against these new requirements at present.
- The ISSB appears to be facing the challenge of having to indicate more clearly where these disclosures (or disclosures across the different dimensions separately) would ideally be presented. The current reporting practice of providing some of the disclosures in multiple sources/reports with rare instances of clear cross-referencing does not promote transparency and comparability. The same applies in relation to the exact location within an annual report (eg Management commentary or sustainability section).
- To avoid voluminous and potentially irrelevant disclosures which currently require users to devote significant amount of time and effort to locate across multiple reporting channels, the ISSB needs to consider providing preparers and users with more guidance on the application of materiality and preparers to focus on decision-useful disclosures.

Implications for national and regional regulators

- Assuming that the proposed IFRS Sustainability Standards will be adopted by jurisdictions worldwide, the relatively moderate (and in cases low) level of preparedness identified by our study suggests that national/regional regulators will need to give sufficient lead time to firms to implement the ISSB standards.
- Regulators need to consider the implications arising from mandating any national/ regional disclosure requirements, beyond those set out in ED IFRS S2, as well as in developing implementation guidance.
- Considering that, across jurisdictions, companies have flexibility about the source/report or location in which to disclose sustainability-related information, national/ regional regulators need to work with the ISSB to enable more consistent and comparable sustainability reporting, including improved cross-referencing across sources/reports.

Implications for preparers/companies

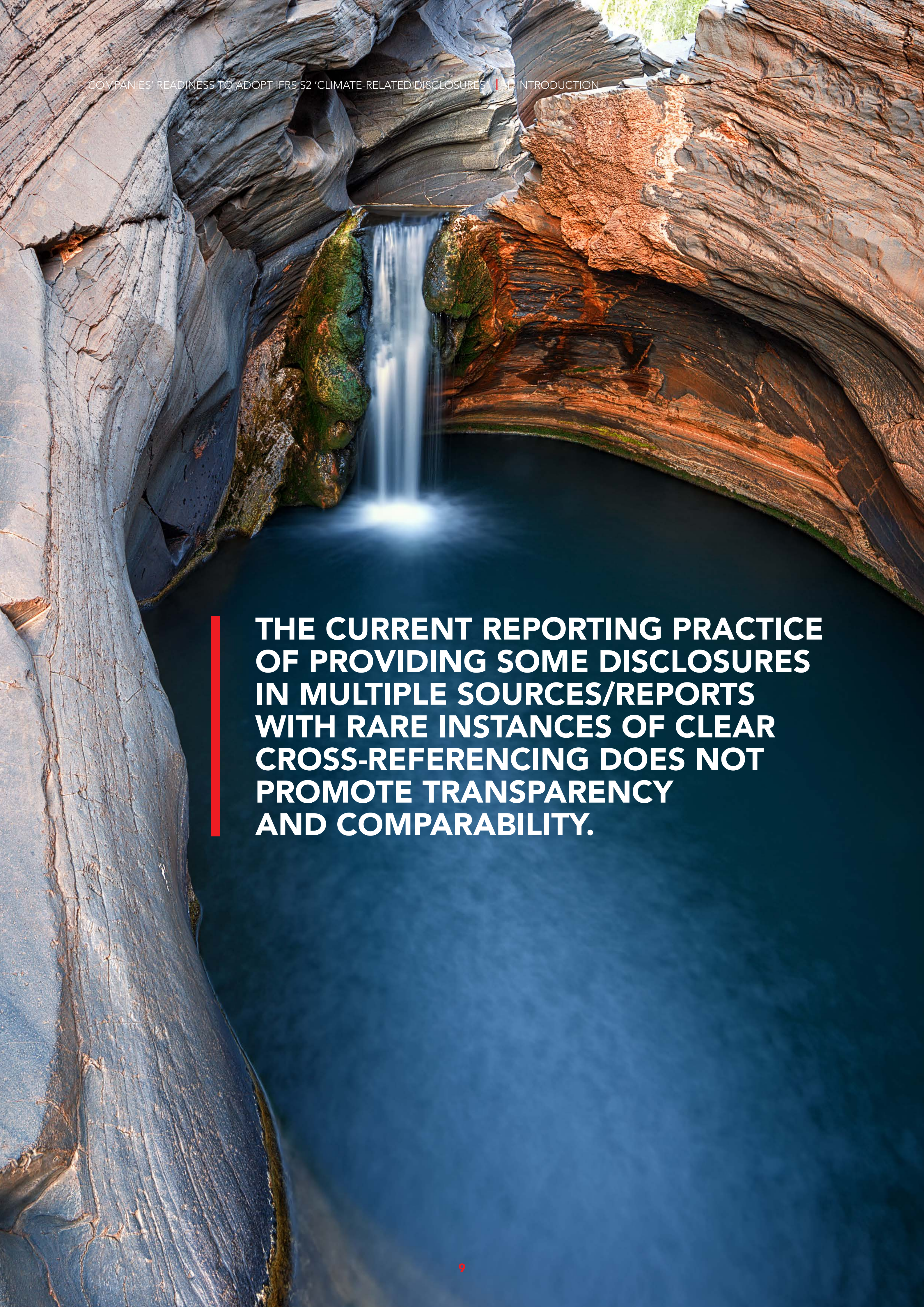
- For firms already reporting under the TCFD Recommendations, the main challenge is investing time and effort to collect and report information that is required by the additional 'new' disclosure requirements in ED IFRS S2.
- Companies need to reduce the number of sources/ reports in which climate-related disclosures are provided and significantly improve the level of cross-referencing between these sources/reports. Further, irrespective of the source/report disclosures are provided in, it is important for disclosures to be focused and not too voluminous.
- As the ISSB identifies capital providers as the primary users of the IFRS Sustainability disclosures, climate-related disclosures relevant to the financial statements are expected. Our analysis reveals that such information is frequently absent. As such there is significant scope for improvement from the preparers' point of view in this respect.
- Given the extensive list of prescribed disclosures and their technical features, we can foresee increasing pressure from investors and other stakeholders on firms to accompany the information provided with independent external assurance.

Implications for users

- Given that IFRS S2 is still at the exposure draft stage and has not been adopted by regulators across the world, it is plausible that, for a while, it will be an additional standard that will co-exist with the plethora of other reporting frameworks in place. As such, users need to familiarise themselves with its additional 'new' disclosure requirements and understand how companies' disclosures might be affected.
- The disclosures prescribed in ED IFRS S2 are not explicitly required to be externally assured and we find that relatively few companies actually seek assurance for their metrics and even fewer for their narratives. Therefore, until IFRS S2 becomes a mandatory reporting standard and regulators across jurisdictions mandate the assurance of the relevant disclosures, users will continue to face the challenge of a potentially perceived lack of trust in the reliability of the information provided.

1.5 Report outline

The next chapter describes the sample selection process, method of analysis, and research instruments employed. Chapter 3 presents and discusses the results. Conclusions are set out in Chapter 4.



THE CURRENT REPORTING PRACTICE OF PROVIDING SOME DISCLOSURES IN MULTIPLE SOURCES/REPORTS WITH RARE INSTANCES OF CLEAR CROSS-REFERENCING DOES NOT PROMOTE TRANSPARENCY AND COMPARABILITY.

2. **Research** approach

2.1 Sample selection

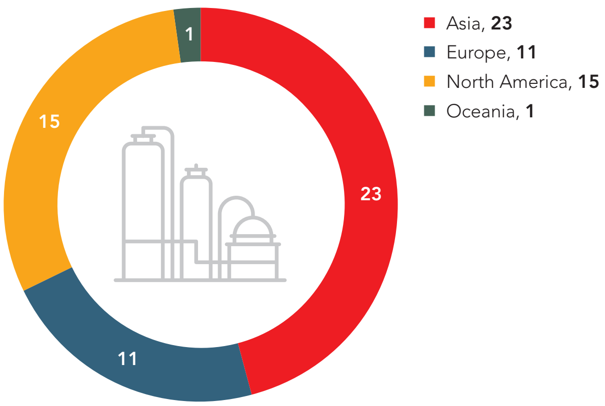
The sample selection process started by identifying all listed companies, across the world, that are covered by the Thomson Reuters Eikon database and belong to the chemicals and construction materials industries. These two sectors were identified as being responsible for high levels of GHG emissions from their operations. For the industry identification, we used the Sustainable Industry Classification System, as provided by the Sustainability Accounting Standards Board (SASB).[4] From this list of companies, we excluded those with no data available for their GHG Scope 1 and Scope 2 emissions during the period 2018–20. We then ranked companies on the basis of the mean of the sum of GHG Scope 1 and Scope 2 emissions over the period 2018–20. Then, we retained the 100 companies (50 from each industry for which we could identify annual reports in English) with the highest means of emissions.

The decision to focus on companies with the highest GHG emissions was made to ensure with some certainty that these companies would be more likely to (or be under pressure to) adhere to ED IFRS S2 disclosure requirements. According to ED IFRS S2, 'the objective of this Standard is to require entities to provide *material information* about their exposure to climate-related risks and opportunities that is useful to users of general-purpose financial reporting in assessing the entity's enterprise value and making decisions about whether to provide economic resources to the entity' (emphasis added, Para. B5). ED IFRS S2 continues by making explicit that 'the responsibility for making materiality judgements and determinations rests with the reporting entity for all requirements in IFRS Sustainability Disclosure Standards, including this Standard' (Para. B6). Accordingly, it can be assumed that companies with the highest levels of GHG emissions worldwide contribute materially to climate change, which in turn could have a detrimental effect on enterprise value. Therefore, one would expect that such companies would be concerned about climate change risks and opportunities and thus would be expected to engage with many (if not the majority) of the disclosure requirements prescribed in the ED.

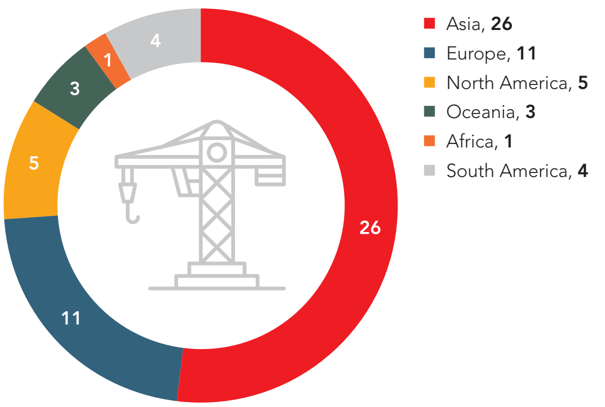
After these exclusions and considerations, our total sample consists of 49 firms from Asia, 22 from Europe, 20 from North America, four from Oceania and South America, respectively, and one from Africa. Of the 50 companies from the chemicals industry almost half (23) are based in Asia, 15 in North America, 11 in Europe and one in Oceania. In the construction materials sample, out of the 50 companies, 26 are based in Asia, 11 in Europe, five in North America, four in South America, three in Oceania and one in Africa (Figure 2.1). Appendix 1 provides the full list of companies in the sample with company names and their headquarter's domicile.

FIGURE 2.1: Sample distribution by geographic region of headquarter's domicile

Chemicals



Construction materials



As discussed above, we did not restrict our analysis to companies' annual reports only, since companies tend also (or only) to provide climate-related disclosures in other reports (eg sustainability reports, TCFD reports). Nevertheless, the starting point of our analysis was the identification of the latest English-language annual report

4 Given that Appendix B in ED IFRS S2 lists disclosure requirements that are expected from firms in specific industries and the identification of these industries has been influenced by SASB, we considered it appropriate that our sample firms should also be aligned with these classifications.

a company had released at the start of data collection (May 2022). For most of the companies in our sample, we were able to find annual reports that refer to the most recent fiscal year (ie year-end within 2021 or early 2022). For only one company did the most recent available annual report refer to the year ending in March 2022 but the majority of sample firms had their year-end on or after 30 September 2021 (Table 2.1).

TABLE 2.1: Number of annual reports analysed by year-end

DATE	NUMBER OF ANNUAL REPORTS	
	Chemicals	Construction materials
31/12/20	3	3
31/03/21	9	10
31/06/21	0	2
30/09/21	4	0
31/12/21	33	35
31/03/22	1	0
TOTAL	50	50

Table 2.2 provides basic descriptive statistics for our sample firms, as retrieved from Thomson Reuters' Eikon database. The mean total GHG Scope 1 and Scope 2 emissions for the period 2018–20 was almost 11.1m metric tonnes for the sample companies in the chemicals industry and 24.8 million metric tonnes for the construction materials companies. Although the firms in the chemicals industry appear to emit much less GHG emissions, they are much larger in terms of assets and market capitalisation than those in the construction materials industry. Specifically, the mean total of assets of companies in the chemicals industry sample is almost 24.1bn US dollars and market capitalisation of 24bn US dollars. For the construction materials sample, the mean of total assets is 12.9bn US dollars and 8.6bn US dollars of market capitalisation.[5]

2.2 Method of analysis

Given that the main purpose of our analysis is to examine the level of readiness of companies to adopt IFRS S2, we adopted as our main research instrument a disclosure index based on ED IFRS S2, published at the end of March 2022. After evaluating the disclosure requirements (ie paragraphs that describe information that 'an entity shall disclose') prescribed in ED IFRS S2 and discussions and consultations among the research team members, we constructed a disclosure index of 102[6] items elicited from ED IFRS S2.[7] Following ED IFRS S2, which explicitly identifies four disclosure dimensions of core content, we divided the disclosure items of our main research instrument into the following four dimensions:

- *Disclosures on governance (8 items):* These disclosures enable users of general purpose financial reporting to understand the governance processes, controls and procedures used to monitor and manage climate-related risks and opportunities (Para 5).
- *Disclosures on strategy (50 items):* These disclosures enable users of general purpose financial reporting to understand an entity's strategy for addressing significant climate-related risks and opportunities (Paras 9, 12, 13, 14 and 15).

TABLE 2.2: Descriptive statistics of the sample companies

	MEAN		MEDIAN	
	Chemicals	Construction materials	Chemicals	Construction materials
Total GHG emissions over the period 2018–2020 (CO2 equivalent in tonnes)	11,099,891.50	24,750,888.68	6,778,864.84	9,363,943.33
Total Assets (in mil $)	24,071.30	12,905.88	17,618.03	5,786.69
Total Market Capitalisation (in mil $)	24,042.62	8,612.91	10,153.76	4,072.85

5 Values of total assets and market capitalisation are those at the financial year-end of each firm we analysed.

6 Given that disclosure of information prescribed within a sub-paragraph may be dependent on the provision of information as a result of a prior disclosure item/sub-paragraph, not all 102 items were applicable for a small number of companies. Nevertheless, the applicable items for each company do not vary substantially. The minimum applicable items for any company is 99. Appendix 2a presents the research instrument and information on the number of companies for which each disclosure item was applicable.

7 Like the disclosure requirements in many IFRS Standards, those in ED IFRS S2 prescribe the expected disclosures in paragraphs disaggregated across sub-paragraphs into two to four levels. On account of this, it was decided that disclosures required up to the fourth level of disaggregation should constitute disclosure items (see examples and details for the different levels of disaggregation in Tsalavoutas et al. (2010). Hence, the number of disclosure items in our index appears larger than the number of paragraphs prescribing disclosure requirements in ED IFRS S2.

- *Disclosures on risk management (11 items):* These disclosures enable users of general purpose financial reporting to understand the process, or processes, by which climate-related risks and opportunities are identified, assessed and managed. Additionally, these disclosures shall enable users to assess whether those processes are integrated into the entity's overall risk management processes and to evaluate the entity's overall risk profile and risk management processes (Paras 16 and 17).
- *Disclosures on metrics and targets (33 items):* These disclosures enable users of general purpose financial reporting to understand how an entity measures, monitors and manages its significant climate-related risks and opportunities. Additionally, these disclosures shall enable users to understand how the entity assesses its performance, including progress towards the targets it has set (Paras 21 and 23).

Further, we divided the Strategy dimension into four subcategories: risk and opportunities (8 items), strategy and decision making (15 items), financial statements (10 items) and climate resilience (17 items). The Metrics and Targets dimension was also divided into two subcategories: metrics (22 items) and targets (11 items).

For each one of the four dimensions, we calculated a separate disclosure score computed as the ratio of the number of items disclosed to the number of applicable items. For the two dimensions for which subsequent subcategories were identified, we calculated separate scores per subcategory and an aggregate score for the dimension as a whole, by following the same approach (ratio of items disclosed to the number of applicable items).

Finally, we calculated an overall score based on all disclosure items (again being the ratio of all items disclosed compared to the total number of applicable items). Appendix 2a presents our research instrument along with scores per item, subcategory, dimension and in total.

Moreover, according to ED IFRS S1, information required by the IFRS Sustainability Disclosure Standards is part of its general purpose financial reporting but it does not require companies to disclose such information within the financial statements section of companies' annual report or anywhere else in the same report. For instance, Para.73 prescribes that companies may disclose their sustainability-related information in their management commentary section or similar sections, which may be identified in reports as 'management's discussion and analysis', 'operating and financial review', 'integrated report' or 'strategic report'.[8] In light of this, we have also explored the location of these disclosures.

Further, we explored whether companies provide cross-references within a report to other sources. According to Para.75 of ED IFRS S1, information required by IFRS Sustainability Disclosure Standards can be included by cross-reference to reports other than the annual report. In other words, ED IFRS S1 allows flexibility in the way companies disclose their relevant information. To assess the extent to which our sample companies provide cross-references to other sources, we looked for such disclosures for each one of the four dimensions and their respective subcategories.[9] In total, we looked for cross-references relating to disclosures for eight separate parts of our research instrument (ie Governance dimension, the four disclosure sub-categories of the Strategy dimension, Risk Management dimension, and the two disclosure sub-categories of the Metrics and Targets dimension).

In addition, we created a separate research instrument that includes a number of disclosure items that refer to Appendix B 'Industry-based disclosure requirements' of ED IFRS S2.[10] Appendix B provides extensive disclosure requirements about a company's climate-related risks and opportunities that are associated with specific features that characterise participation in an industry.[11] Specifically, for each separate feature identified within the industry-specific disclosure requirements, we included two items: first, whether a company discloses at least one metric suggested in Appendix B and second, whether a company discloses the methodology for calculating metrics suggested in Appendix B.

Finally, we also analysed other important aspects of companies' reporting: namely, whether a company has its climate-related metrics and narratives assured by a third party and whether a company follows any other reporting frameworks such as the GRI Standards, the SASB standards, the UN SDGs, the TCFD Recommendations and the International Integrated Reporting (<IR>) Framework.[12]

8 Management commentary is defined as the section of the front-end of the annual report which provides commentary on a company's prospects and other information and serves as a basis for understanding management's objectives and its strategies for achieving those objectives, <https://www.iasplus.com/en/standards/other/management-commentary>. We define as the Sustainability section the section also within the front end of the annual report that discussed sustainability-related issues but outside the Management Commentary. We define as the Corporate Governance section the section also within the front end of the annual report that discusses governance-related issues but outside the Management Commentary.

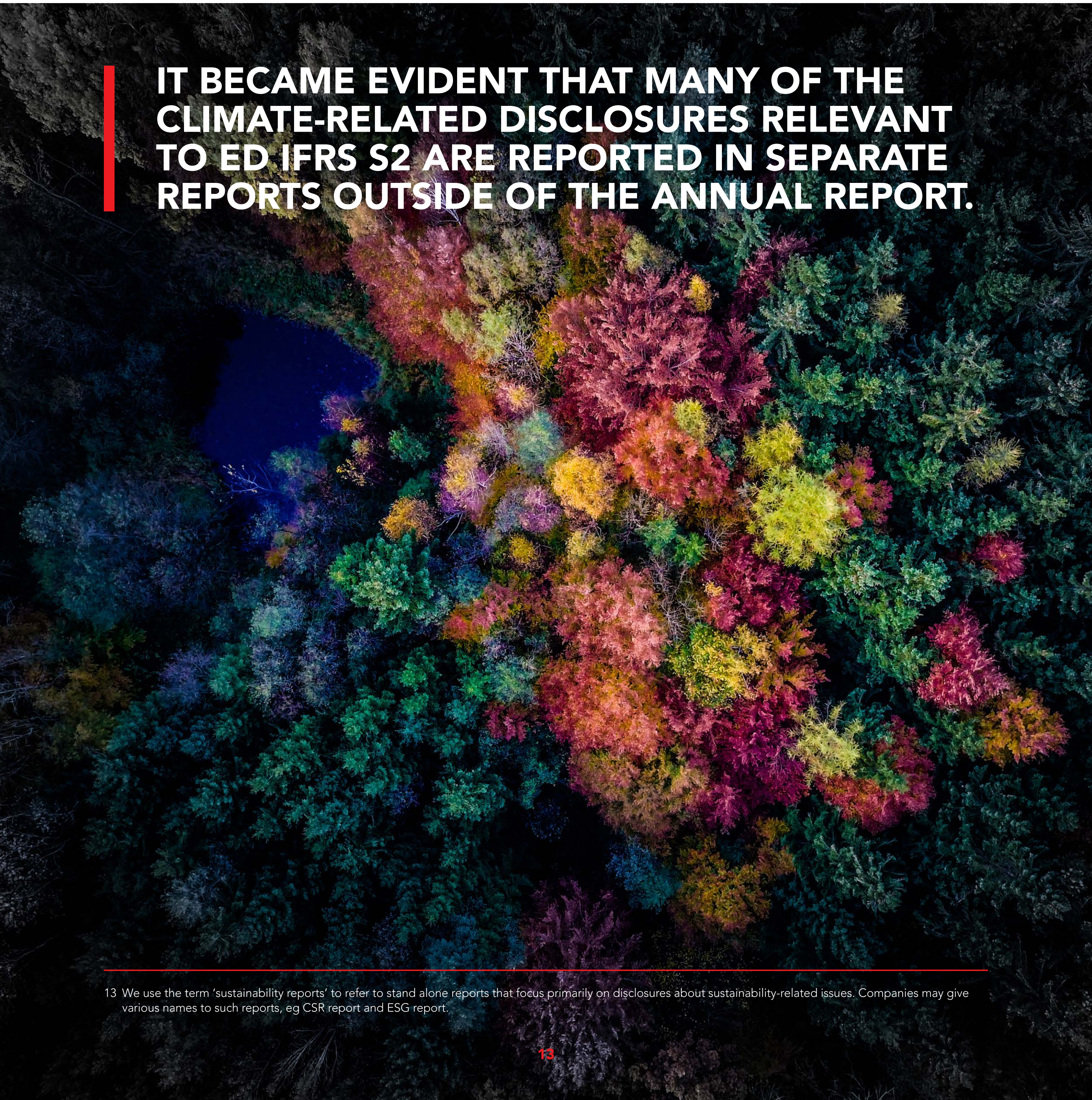
9 Appendix 2b presents the relevant items.

10 Appendix 2c presents the relevant items.

11 Appendix B is largely based on the industry-specific requirements of the SASB standards. A detailed examination of companies' adherence to all the disclosure items in Appendix B would render our study a direct examination of companies' adherence to the SASB industry-specific disclosure requirements. This would deviate from the objectives our research.

12 Appendix 2d presents the relevant items.

Having created the disclosure indices presented before, we conducted a pilot study by attempting to score 10 companies against them. It became evident that many of the climate-related disclosures relevant to ED IFRS S2 are reported in separate reports outside of the annual report. Accordingly, we analysed a large variety of reports produced by companies, such as sustainability reports,[13] separate TCFD reports, CDP surveys and proxy statements for US-listed companies. To observe which reporting channel companies use to report relevant to ED IFRS S2 information, seven categories have been created to observe where the information is reported, namely: 1) annual report only; 2) sustainability report only; 3) other reports (TCFD report, CDP surveys and proxy statements); 4) both annual and sustainability reports; 5) both annual and other reports; 6) both sustainability and other reports; and 7) annual, sustainability and other reports.



IT BECAME EVIDENT THAT MANY OF THE CLIMATE-RELATED DISCLOSURES RELEVANT TO ED IFRS S2 ARE REPORTED IN SEPARATE REPORTS OUTSIDE OF THE ANNUAL REPORT.

13 We use the term 'sustainability reports' to refer to stand alone reports that focus primarily on disclosures about sustainability-related issues. Companies may give various names to such reports, eg CSR report and ESG report.

3. Findings and discussion

3.1 Level of companies' preparedness for ED IFRS S2 requirements

Overall, our analysis reveals that companies in both industries exhibit a moderate overall level of the climate-related disclosures that are prescribed by ED IFRS S2. Companies in the chemicals industry exhibit an overall mean score of disclosure of 43%, whereas companies in the construction materials industry have a slightly lower overall mean score of 39% (Table 3.1 column 1). Further, untabulated descriptive statistics indicate that the minimum score for the top quartile of chemicals companies is 58%, while the mean for our 'top scorers' is 64%; the maximum of the bottom quartile for these companies is 28%, while the mean score for these 'bottom-scorers' is 17%. For the construction materials companies the findings are rather similar. The minimum score for the top quartile of these companies is 51%, while the mean score for the 'top scorers' is 62% and the maximum of the bottom quartile is 28%, with a mean score for these 'bottom-scorers' of 16%.

In the main research instrument (Appendix 2a), we have indicated which disclosure items are based on the 2017 TCFD Recommendations and which are newly introduced by ED IFRS S2 and thus we are able to capture and report such information separately.[14] The results, based on the level of adherence to the items across the two categories – Mean (TCFD-based items) and Mean (new items) – are presented in columns (2) and (3) of Table 3.1. These results reveal that companies primarily engage with items already recommended by the TCFD. Particularly, companies in the chemicals industry exhibit a mean score of 61% of adherence to the TCFD-based disclosure items and a mean of a mere 27% for adherence to the 'new' items. Companies in the construction materials industry present a similar picture. The mean score in relation to the TCFD-based items is 56% and that in relation to the 'new' items is 23%. This is not surprising if we consider that our analysis reveals that 77% of our sample companies explicitly claim to follow the TCFD Recommendations and further that ED IFRS 2 was not in place for the reporting period analysed. Please see section 3.5 for more details.

Against this backdrop, we can make the first observation that our sample companies do co-incidentally engage already with a number of climate-related disclosure requirements proposed by ED IFRS S2. Nonetheless, for the majority of firms, the level of 'readiness' to adopt ED IFRS S2 in its entirely is relatively low. Primarily, the current levels of disclosure reflect their engagement with the TCFD Recommendations, while they lack engagement with the 'new' disclosure requirements that ED IFRS S2 introduces for first time and that are beyond the TCFD Recommendations.

Table 3.1 also shows the disclosure levels across the four dimensions (Governance, Strategy, Risk Management, Metrics and Targets) and the respective sub-categories of the Strategy and Metrics and Targets dimensions. On account of this, we observe that the disclosures covered by the Governance dimension exhibit the highest mean score (59% for the chemicals and 60% for the construction materials). Additionally, this is the only dimension for which the disclosure scores of TCFD-based items and 'new' items are rather similar (62% and 55% respectively for chemicals and 63% and 55% respectively for construction materials).

By contrast, our sample companies are found to engage less with disclosures for the Strategy dimension. The mean score for this dimension is 38% for the firms in the chemicals industry and 34% for those in the construction materials. Further, a substantial variation among the four disclosure subcategories that comprise this dimension is found. Companies are found to engage more with the Risk and Opportunities (58% for the chemicals and 51% for the construction materials) and Strategy and Decision-making (50% for the chemicals and 44% for the construction materials) disclosure subcategories and less with the Climate Resilience disclosure subcategory (34% for the chemicals and 29% for the construction materials).

COMPANIES LACK ENGAGEMENT WITH THE 'NEW' DISCLOSURE REQUIREMENTS THAT ED IFRS S2 INTRODUCES FOR FIRST TIME AND THAT ARE BEYOND THE TCFD RECOMMENDATIONS.

14 Items based on the 2017 TCFD Recommendations are indicated by the asterisk next to them.

TABLE 3.1: Mean and median disclosure scores (total and by dimension) and break down by TCFD-based and 'new' items

CONTENT	(1) OVERALL MEAN	(2) MEAN (TCFD-based items)	(3) MEAN (new items)	(4) OVERALL MEDIAN	(5) MEDIAN (TCFD-based items)	(6) MEDIAN (new items)
PANEL A: CHEMICALS						
Total Disclosure Score	43%	61%	27%	46%	67%	27%
Governance	59%	62%	55%	69%	70%	67%
Strategy	38%	55%	26%	39%	52%	26%
Risks and opportunities	*58%*	*58%*	*N/A*	*69%*	*69%*	*N/A*
Strategy & decision-making	*50%*	*68%*	*40%*	*53%*	*80%*	*50%*
Financial statements	*12%*	*N/A*	*12%*	*20%*	*N/A*	*20%*
Climate resilience	*34%*	*44%*	*25%*	*18%*	*25%*	*11%*
Risk management	37%	45%	3%	36%	44%	0%
Metrics and Targets	49%	80%	26%	48%	86%	21%
Metrics	*38%*	*66%*	*28%*	*36%*	*67%*	*25%*
Targets	*70%*	*90%*	*16%*	*73%*	*100%*	*0%*
PANEL B CONSTRUCTION MATERIALS						
Total Disclosure Score	39%	56%	23%	38%	55%	24%
Governance	60%	63%	55%	63%	60%	67%
Strategy	34%	48%	23%	33%	45%	21%
Risks and opportunities	*51%*	*51%*	*N/A*	*44%*	*44%*	*N/A*
Strategy & decision-making	*44%*	*62%*	*35%*	*47%*	*80%*	*35%*
Financial statements	*12%*	*N/A*	*12%*	*0%*	*N/A*	*0%*
Climate resilience	*29%*	*36%*	*21%*	*12%*	*13%*	*11%*
Risk management	33%	40%	1%	27%	33%	0%
Metrics and Targets	44%	74%	22%	44%	86%	16%
Metrics	*33%*	*68%*	*20%*	*30%*	*67%*	*16%*
Targets	*65%*	*79%*	*27%*	*73%*	*88%*	*0%*

Note: 'New' items refer to disclosure items required by ED IFRS S2 but not included in the 2017 TCFD Recommendations.

Of particular interest are some disclosure items that appear to be disclosed very infrequently by our sample firms.[15] Specifically, with reference to the Strategy and Decision-making subcategory, companies engage very little with disclosures about the indirect adaptation and mitigation efforts they undertake to address climate change (Para.13a) and the processes for reviewing emission targets and their reliance on carbon offsets (Para. 13b). In addition, with reference to the Climate Resilience subcategory, companies are found not to engage with disclosures about their capacity, over the short, medium and long term, to adjust or adapt their strategy and business model to climate developments that may affect the availability and flexibility of their existing financial resources, their ability to redeploy, repurpose, upgrade or decommission existing assets and the effect of their investments in climate-related mitigation, adaptation or opportunities for climate resilience (Para. 15a). It is worth mentioning that all these disclosure items, with the exception of the one from Para. 13a, are 'new' disclosure items prescribed by ED IFRS S2 and not based on the 2017 TCFD Recommendations.

A special note needs to be made about the Financial Statements disclosures subcategory. Companies in both industries exhibit a very low score for these disclosures (a mean score of 12%). This finding is of particular interest as these disclosures refer to the integration of the 'front-end' of companies' annual reports with the 'back-end' (ie financial statements). As the ISSB identifies providers of capital as the primary users of the IFRS Sustainability disclosures, a strong connection between climate-related disclosures and the financial statements would be expected to enable the decision-usefulness of such disclosures. Our analysis reveals that companies appear not to inherently connect climate-related disclosures with information in their financial statements.

The mean disclosure scores for the Risk Management dimension reveal that our sample companies show a weak level of engagement with these disclosure items (37% for the firms in the chemicals industry and 33% for those in the construction materials). It is noted that companies score very low in the 'new' disclosure items (3% for the chemicals and 1% for the construction materials) such as some of those in Para.17b (ie 17b-iii and 17b-iv) of ED IFRS S2. These go beyond the TCFD Recommendations to specify disclosures about the input parameters and processes a company uses to identify and prioritise climate-related risks for risk-management purposes.

In relation to the final dimension, Metrics and Targets, although the mean score is above the overall mean score of our sample (49% for the chemicals and 44% for the construction materials), our sample companies are found to engage considerably more with the Targets disclosures subcategory (70% for the chemicals and 65% for the construction materials) than with the Metrics disclosures subcategory (38% for the chemicals and 33% for the construction materials). This finding may indicate that companies experience difficulties in measuring and hence disclosing their actual performance against relevant metrics set, although they still disclose future commitments.

In relation to the Metrics disclosures subcategory, our sample companies are found to engage to a very limited extent with disclosures about the Scope 1 and Scope 2 emissions of their associates, joint ventures, unconsolidated subsidiaries and other affiliates (Para.21a) or with disclosures about the amount and percentage of assets or business activities vulnerable to climate-related transition and physical risks or aligned with climate-related opportunities (Para. 21b). Similarly to categories discussed above, these items are 'new' ones and not based on the 2017 TCFD Recommendations.

Table 3.2 lists examples of items that exhibit very low frequencies across our sample firms and discussed above.

A SPECIAL NOTE NEEDS TO BE MADE ABOUT THE FINANCIAL STATEMENTS DISCLOSURES SUBCATEGORY. COMPANIES IN BOTH INDUSTRIES EXHIBIT A VERY LOW SCORE FOR THESE DISCLOSURES (A MEAN SCORE OF 12%).

15 For the interest of readers, Appendix 2a provides frequency scores for all disclosure items in our main research instrument and indicators of which disclosure items are based on the 2017 TCFD Recommendations or not.

TABLE 3.2: Examples of climate-related disclosure items with low frequencies

ED IFRS S2 PARAGRAPH – SUBPARAGRAPH		CONSTRUCTION MATERIALS	CHEMICALS
PARA 13			
13-a-i	(i) information about current and anticipated changes to its business model, including information about indirect adaptation and mitigation efforts it is undertaking (for example, by working with customers and supply chains or use of procurement).	8.00%	16.00%
13-b	(b) information regarding climate-related targets for these plans including:		
13-b-i	(i) the processes in place for review of the targets	0.00%	0.00%
13-b-iii	(iii) the intended use of carbon offsets in achieving emissions targets. In explaining the intended use of carbon offsets the entity shall disclose information including:		
13-b-iii	(1) the extent to which the targets rely on the use of carbon offsets	20.00%	16.00%
13-b-iii	(2) whether the offsets will be subject to a third-party offset verification or certification scheme (certified carbon offset), and if so, which scheme, or schemes	0.00%	0.00%
PARA 14			
14-a	Investment the current year	24.00%	24.00%
14-a	Impact on Accounting Policy	16.00%	10.00%
14-a	Impact on Financial Position/performance/cash flows	6.00%	4.00%
14-b	(b) information about the climate-related risks and opportunities identified in paragraph 14(a) for which there is a significant risk that there will be a material adjustment to the carrying amounts of assets and liabilities reported in the financial statements within the next financial year	0.00%	0.00%
14-c-i	(i) its current and committed investment plans and their anticipated effects on its financial position (for example, capital expenditure, major acquisitions and divestments, joint ventures, business transformation, innovation, new business areas and asset retirements):		
14-c-i	(1) Commit to climate related investment	22.00%	26.00%
14-c-i	(2) Link to financial position	0.00%	0.00%
14-c-ii	(ii) its planned sources of funding to implement its strategy;	0.00%	2.00%
14-d	(d) how it expects its financial performance to change over time, given its strategy to address significant climate-related risks and opportunities (for example, increased revenue from or costs of products and services aligned with a lower-carbon economy, consistent with the latest international agreement on climate change; physical damage to assets from climate events; and the costs of climate adaptation or mitigation); and	6.00%	6.00%
14-e	(e) if the entity is unable to disclose quantitative information for paragraph 14(a)–(d), an explanation of why that is the case.	0.00%	0.00%
PARA 15			
15-a-iii	(iii) the entity's capacity to adjust or adapt its strategy and business model over the short, medium and long term to climate developments in terms of:		

ED IFRS S2 PARAGRAPH – SUBPARAGRAPH		CONSTRUCTION MATERIALS	CHEMICALS
15-a-iii-1	(1) the availability of, and flexibility in, existing financial resources, including capital, to address climate-related risks, and/or to be redirected to take advantage of climate-related opportunities	0.00%	0.00%
15-a-iii-2	(2) the ability to redeploy, repurpose, upgrade or decommission existing assets	0.00%	0.00%
15-a-iii-3	(3) the effect of current or planned investments in climate related mitigation, adaptation or opportunities for climate resilience.	4.00%	4.00%
PARA 17			
17-b	(b) the process, or processes, it uses to identify climate-related risks for risk management purposes, including when applicable:		
17-b-ii	(ii) how it prioritises climate-related risks relative to other types of risks, including its use of risk-assessment tools (for example, science-based risk-assessment tools	12.00%	14.00%
17-b-iii	(iii) the input parameters it uses (for example, data sources, the scope of operations covered and the detail used in assumptions	2.00%	6.00%
17-b-iv	(iv) whether it has changed the processes used compared to the prior reporting period	0.00%	0.00%
PARA 21			
21-a-iii	(iii) for Scope 1 and Scope 2 emissions disclosed, the entity shall disclose emissions separately for:		
21-a-iii-2	(2) associates, joint ventures, unconsolidated subsidiaries or affiliates not included in paragraph 21(a)(iii)(1)	0.00%	2.00%
21-a-iv	(iv) the approach it used to include emissions for the entities included in paragraph 21(a)(iii)(2) (for example, the equity share or operational control method in the Greenhouse Gas Protocol Corporate Standard)	16.00%	32.00%
21-a-v	(v) the reason, or reasons, for the entity's choice of approach in paragraph 21(a)(iv) and how that relates to the disclosure objective in paragraph 19	0.00%	0.00%
21-a-vi	(vi) for Scope 3 emissions disclosed in accordance with paragraph 21(a)(i)(3):		
21-a-vi-3	(3) when the entity's measure of Scope 3 emissions includes information provided by entities in its value chain, it shall explain the basis for that measurement	6.00%	22.00%
21*	An entity shall disclose information relevant to the cross-industry metric categories of:		
21-b	(b) transition risks – the amount and percentage of assets or business activities vulnerable to transition risks	0.00%	0.00%
21-c	(c) physical risks – the amount and percentage of assets or business activities vulnerable to physical risks	0.00%	0.00%
21-d	(d) climate-related opportunities – the amount and percentage of assets or business activities aligned with climate-related opportunities	0.00%	0.00%

3.1.1 Extracts from companies' reports

To enable readers of this report to understand the complexity around these disclosures but also explore examples of helpful reporting practices, Figures 3.1 to 3.6, are extracts of interesting disclosures that we identified for the various dimensions and sub-categories covered by our research instrument.

Climate-related Governance dimension disclosures

Figure 3.1 presents an extract from the 2022 Environment, Social and Governance (ESG) Report of the chemicals company Nutrien SA, based in Canada. Examining these disclosures against the proposed requirements of Para.5 of the S2 ED, we see that the company provides information about the body responsible for oversight of climate-related risks and opportunities (S&S Committee), its responsibilities, how it considers climate-related risks and opportunities when overseeing company's related actions and discussing the management's role in assessing and managing climate-related risks and opportunities. In addition, in the extract there is a cross-reference to another section of the annual report (Governance of ESG Risks) where more information about company's ESG governance structure is given.

FIGURE 3.1: Extract from Nutrien SA: Climate-related Governance disclosures

Governance of Climate-Related Risks and Opportunities

Board Oversight

Risk management is an integral part of our business and is governed by our Board and Board committees, who oversee our ELT and support the understanding and management of the principal risks to our business and strategy. Nutrien's S&S Committee has primary responsibility for oversight of our general strategy and policies for the management of our climate-related risks and opportunities. It directly reports to and advises the Board on these matters.

The **S&S Committee** meets generally on a quarterly basis and covers significant issues within its mandate, including oversight of climate-related risks and opportunities.

In 2021, the S&S Committee was specifically involved with

- overseeing policies relating to sustainability and progress towards sustainability goals;
- overseeing Nutrien's Feeding the Future Plan and Nutrien's 2021 ESG Report and supporting ESG targets and goals; and
- overseeing Nutrien's climate risk and GHG emission strategy.

Management's Role

Nutrien's ELT supports our Board in understanding the principal risks to our business and strategy. They have the responsibility of ensuring the Company's significant risks, including climate-related risks, are being appropriately identified, addressed and reported. Key ELT members and employee-level committees that play an important role in the monitoring of climate-related risks include

- The **CEO** has overall responsibility for the monitoring and management of climate-related risks and opportunities as part of providing leadership and strategic direction for our business. As the leader of the organization, the CEO provides a clear tone from the top in regards to all climate-related initiatives. Our CEO provides clear support and direction to the rest of the organization's efforts to reduce our GHG emission footprint, as well as meeting our commitments with key external stakeholders.
- The **Executive Vice President, Chief Strategy and Sustainability Officer** reports directly to the CEO and has a direct link to the S&S Committee. They are a member of the ELT who provides executive oversight of the Sustainability function, including climate, and strategic vision and leadership on sustainability-related issues at the executive level. This role is critical to ensure our climate-related initiatives are developed and resourced properly. This position also helps develop and monitor the climate performance objectives for the Company and provides direction to the ESG & Strategic Issues Cross-Functional Working Group, and the Executive ESG & Strategic Issues Committee.
- The **Executive ESG & Strategic Issues Committee** is an executive-level committee responsible for oversight of the external disclosures tied to the risk mitigation and opportunities of our material climate-related risks and other ESG issues.
- The **ESG & Strategic Issues Cross-Functional Working Group** is responsible for elevating significant climate-related issues and providing support to key issue teams such as our Scope 1, 2 and 3 Emission Teams. This group is also responsible for coordinating action on key issues with Nutrien executives on our Executive ESG & Strategic Issues Committee.
- **Scope 1, 2 and 3 Emission Teams** are composed of subject matter experts across the Company and are responsible for executing on the existing climate strategy for Scope 1 to 3 emissions reductions over the next 10 years and into the future, including reviewing emissions' performance against our targets with our operations' teams.

For more information on Nutrien's ESG Governance Structure in relation to climate risks and opportunities, please see the Governance of ESG Risks section.

In 2021, Nutrien's ELT approved our climate strategy, along with near-term and 2030 commitments and Scope 1 and 2 targets to reduce GHG emissions intensity by 30 percent from our 2018 baseline. This strategy was presented publicly in June 2021 and we are now developing our Scope 3 emissions reduction strategy tied to our Carbon Program and executing on our Scope 1 and 2 emissions reductions in our Nitrogen and Potash business units.

Source: Nutrien SA 2022 Environmental, Social and Governance Report: 94-95

Climate-related risk and opportunities disclosures (Strategy dimension)

Figure 3.2 presents an extract from the 2021 ESG Report of the chemicals company Dow Inc, based in the US. Examining these disclosures against the proposed requirements of Paras.9 and 12 of ED IFRS S2, we see that the company provides an account of its risks and opportunities, with a description of each of them, their time horizons, identification of the value chain stages being affected and the magnitude of their potential impacts. With regard to risks, the company identifies those that it characterises as 'physical' and 'transition' ones. Finally, at the bottom of Figure 3.2, the company provides information relevant to Para. 13a of ED IFRS S2 about the specific actions it is planning to take for addressing these risks and opportunities.

FIGURE 3.2: Extract from Dow Inc: Climate-related Risks and Opportunities disclosures

		Risk/Opportunity Type	Description	Value Chain Stage(s) Covered	Time Horizon (term)			Magnitude of Impact		
					SHORT	MEDIUM	LONG	LOW	MEDIUM	HIGH
Risks	Physical	Acute & Chronic	More frequent incidents of severe weather, or long-term changes in precipitation patterns	• Direct operations • Upstream	■	■			■	
Risks	Transition	Regulatory	Carbon pricing mechanisms	• Direct operations	■	■	■		■	
Opportunities		Technology	Transition to lower-emissions technology	• Direct operations • Upstream • Downstream	■	■	■			■
Opportunities		Resource Efficiency	Use of more efficient production and distribution processes	• Direct operations • Upstream	■				■	
Opportunities		Products & Services	Dow products can enable the transition to a low-carbon economy	• Upstream • Downstream	■	■	■			■

		Examples of Climate Risks and Opportunities and Related Potential Impacts			Elements of Dow's Climate Action Plans Addressing Risk/Opportunity					
		Risk/Opportunity Type	Description	Impacts/Opportunity	Optimizing Our Facilities and Processes	Increasing Renewable Energy	Investments in Carbon Capture	Innovating Low-Carbon Technologies	Engaging Suppliers to Reduce Value-Chain Emissions	Deploying Materials to Help Our Customers Reduce Their Emissions
Risks	Physical	Acute & Chronic	More frequent incidents of severe weather, or long-term changes in precipitation patterns	• Reduced revenue/decreased production (supply chain disruptions, etc.) • Increased operating or capital costs	●					
Risks	Transition	Regulatory	Carbon pricing mechanisms	• Increased costs to comply with changes in regulations	●	●	●			
Opportunities		Technology	Transition to lower-emissions technology	• Increased expense/capital investment in technology and innovation • Reduced exposure to carbon cost		●	●	●		●
Opportunities		Resource Efficiency	Use of more efficient production and distribution processes	• Reduced operating costs through efficiency gains and cost reductions	●			●	●	
Opportunities		Products & Services	Dow products can enable the transition to a low-carbon economy	• Increased revenue from carbon-advantaged products and technologies				●	●	●

Source: Dow Inc 2021 Environmental, Social and Governance Report: 113-114

Climate-related strategy and decision-making disclosures (Strategy dimension)

Figure 3.3 shows an extract from the 2021 annual report disclosures of Japanese company Mitsui Chemicals Inc. These disclosures refer to Para. 13b of ED IFRS S2 about the level of the company's emission reduction targets to be achieved through emission reductions within its value chain and the timeline for these reductions.

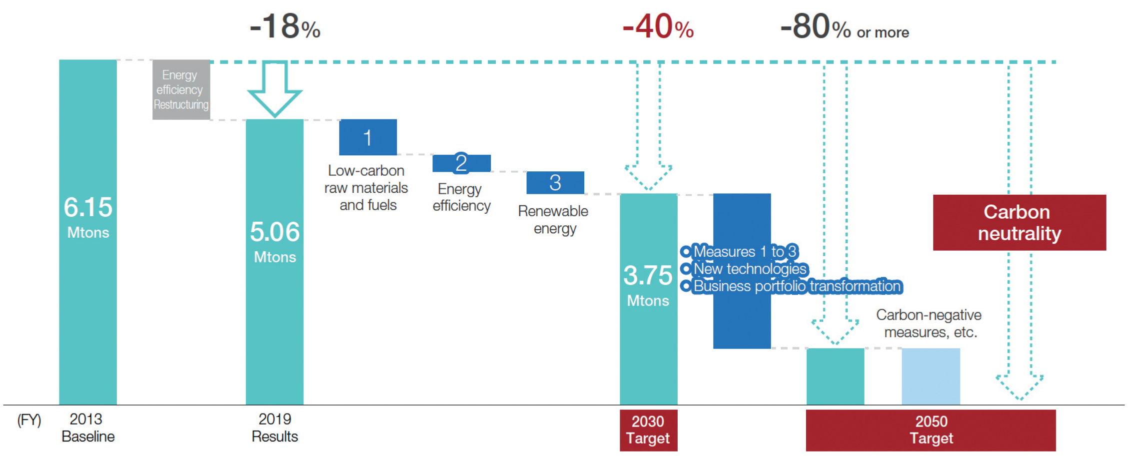
FIGURE 3.3: Extract from Mitsui Chemicals Inc: Climate-related Strategy and Decision-making disclosures

Carbon neutral strategy CN

The Mitsui Chemicals Group believes that as a chemicals company we have an important role to play in helping to build a sustainable society that can limit the average global temperature rise to 1.5 degrees Celsius. Therefore, in November 2020, we declared our commitment to become carbon neutral by 2050. Our carbon neutral strategy is centered around the two pillars of (1) reducing our own greenhouse gas (GHG) emissions (Scopes 1 and 2), and (2) maximizing the avoided emissions of our products over their entire life cycle. We are starting off with the purpose of contributing greatly to the transformation of society.

Reducing GHG emissions of the Mitsui Chemicals Group (Scopes 1 and 2)

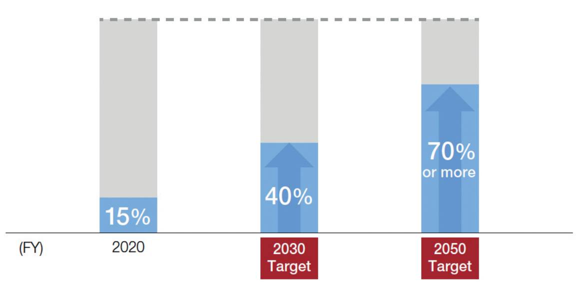
We plan to focus our efforts to reduce GHG emissions (Scopes 1 and 2) on production sites with greater emissions volumes. Specifically, we aim to reduce our GHG emissions by 40% by fiscal 2030 compared to fiscal 2013 through transitioning to low-carbon raw materials and fuels, conserving energy by installing highly energy-efficient equipment and the like, and adopting renewable energy. We have set this as one of our non-financial targets in VISION 2030. In order to reach carbon neutrality by 2050, in addition to the aforementioned measures, we intend to achieve 80% or more of these reductions mainly through development of new technologies and the transition of our business portfolio—though this presupposes external factors concerning markets and customers falling into place. We also plan to pursue policies which include the development and implementation of carbon-negative technologies, such as carbon capture, utilization, and storage (CCUS), to handle the remaining 20%.



Maximizing avoided GHG emissions through provision of our products

Many of the chemical products we provide go through various life stages in the hands of our customers, including processing, use, and disposal. Through our supply of Blue Value™ products with environmental contribution value, we aim to maximize avoided GHG emissions over the entire product life cycle. In this way, we intend to help all of society achieve carbon neutrality. In order to reach carbon neutrality by 2050, we have set a 40% or greater Blue Value™ products sales revenue ratio as one of our non-financial targets in VISION 2030. As part of our carbon neutral strategy, hereafter, we plan to incorporate measures to expand the lineup of and increase sales revenue ratio of Blue Value™ products into the individual strategies of each business domain.

Blue Value™ products sales revenue ratio



Source: Mitsui Chemicals Inc 2021 Annual Report: 43

Climate resilience disclosures (Strategy dimension)

Figure 3.4 presents an extract from the 2021 integrated report of the construction materials company Cemex SAB de CV (based in Mexico). In line with the proposals in Para. 15 of ED IFRS S2, the company provides three alternative scenario analyses and detailed explanations of the assumptions used in each one of these scenarios.

FIGURE 3.4: Extract from Cemex SAB de CV: Climate Resilience disclosures

c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

CEMEX assesses the resilience of its medium and long-term climate strategy with different climate scenarios. Up to 2020, we used as reference the RCP-IPCC (RCP 6.0, RCP 4.5); the 2DS (IEA-CSI Cement Low-Carbon Technology Roadmap 2018); and B2DS of the IEA-Energy Technology Perspectives 2017 (ETP2017) climate-related scenarios.

In early 2021, we updated the reference scenarios to the latest ones developed by IEA, the World Energy Outlook 2020, and revisited them in October 2021, when the World Energy Outlook 2021 was published and the underlying assumptions on macro-drivers, policies and techno-economic inputs were adjusted.

The new scenarios included in the evaluation of our strategy resiliency are the Stated Policies Scenario (STEPS), the Sustainable Development Scenario, and the Net Zero emissions by 2050 Scenario (NZE).

The worst case temperature scenario is now the STEPS, which does not take it for granted that governments will reach all announced goals. Instead, it takes a granular sector-by-sector look, considering not only existing policies but also of those that are under development, like the "Fit for 55" package. The SDS and NZE are also considered to evaluate the resiliency of our strategy, as more restrictive transitional scenarios.

SCENARIO NAME	STATED POLICIES	SUSTAINABLE DEVELOPMENT	NET ZERO EMISSIONS BY 2050
Short name - external reference scenario	STEPS	SDS	NZE
Temperature range (2030-2050-2100): (Confidence level: 50%)	(1.5°C - 2°C - 2.6°C)	(1.5°C - 1.7°C - 1.6°C)	(1.5°C - 1.5°C - 1.4°C)
Reference temperature scenario	> 2°C Scenario	Well Below 2°C	Net-Zero emissions by 2050 - 1.5°C
Source	IEA - Energy Outlook 2021	IEA - Energy Outlook 2021	IEA - Energy Outlook 2021
RELEVANT UNDERLYING ASSUMPTIONS			
Industry policies and incentives to technology development	Different measures depending on the geography. EU: New Industrial Strategy and country-level spending on green industry pilots, circular economy and hydrogen. U.S.: Investments from a Department of Energy program to decarbonize manufacturing. LATAM: No incentives, except in Brazil.	In all geographies, policies to support increasing deployment of CCUS and hydrogen, to support circular economy, enhanced minimum energy performance standards by 2025 for electric motors and mandatory energy audits.	Relies on a much more rapid pace of technology innovation than has typically been achieved in the past and at a competitive cost. Most new clean technologies in heavy industry demonstrated at scale in 2030 and more than 90% of heavy industrial production is low emissions in 2050. In 2035, we expect to capture 25% of the carbon in our facilities, and in 2050, 90% of the carbon.
Building sector policies	Different measures depending on the geography. EU: Country-level incentives for renovation and appliance upgrades, new building codes, and clean heating incentives and investment. Egypt: minimum performance standards for incandescent lamps. U.S.: Updated minimum energy performance standards. LATAM: no building policies in place but for Argentina.	Mandatory energy conservation building codes, including net-zero emissions requirement for all new buildings by 2030 at the latest.	Universal energy access and all new buildings are zero carbon-ready and 85% of all buildings are zero carbon-ready in 2050.
Carbon price (IEA reference) USD/ton	EU: 2030: 65 / 2040: 75 / 2050:90 Colombia, Mexico: 2030: 15 / 2040: 20 / 2050: 30 US: Price only in California.	Advanced economies: 2030: 120 / 2040: 170 / 2050: 200 Colombia and Mexico with NZ pledge: 2030: 40 / 2040: 110 / 2050: 160	Advanced economies: 2030: 130 / 2040: 205 / 2050: 250 Developing economies: 2030:15 / 2040: 35 / 2050: 55
Cement demand and demand of low carbon products	CAAGR: +0.7 in 2030 and -0.2 in 2050 Low carbon products demand increase +0.1	CAAGR: +0.7 in 2030 and -0.4 in 2050 Low-carbon products demand increase +0.2	CAAGR: -0.20 in 2030 and -0.3 in 2050 Low-carbon products demand increase +0.5

Source: Cemex SAB de CV 2021 Integrated Report: 267

Climate-related Risk Management dimension disclosures

Figure 3.5 provides an extract from the 2020 TCFD report of the chemical company PhosAgro PAO (based in Russia). Comparing these disclosures with what is prescribed in Para. 17b of ED IFRS S2, we find that the company is one of the very few that provides detailed discussion of the processes adopted to assess its climate-related risks, the type, time horizon and degree of certainty of each risk identified.

FIGURE 3.5: Extract from PhosAgro PAO: Climate-related Risk Management disclosures

Most of climate risks were identified in production processes (ore mining and processing, fertilizer production, storage and transportation of finished products), which is in line with the Company's business as it owns and operates a variety of diverse material assets (production and infrastructure facilities, etc.) that are subject to the physical effects of weather activities in different climatic zones.

The management assessed climate risks using the established risk materiality and probability criteria in line with TCFD recommendations. The resulting score was a sum of criteria assessed taking into account their weight. Each criterion was assessed using the applicable approach.

Climate risk assessment criteria and approach

Criterion	Assessment approach
Confidence level	Assessment was based on the most credible international sources (International Energy Agency, Intergovernmental Panel on Climate Change), taking into account uncertainties associated with subjective judgments regarding the Company.
Scenario sensitivity	Assessment of risk sensitivity to climate change scenarios (2°C or 4°C).
Probability	Assessment of risk probability
Time horizon	Assessment covered 2025–2030–2050.
Financial	Assessment depending on the impact on the Company's financial performance.
Reputation	Assessment depending on reputational implications: local, nationwide, and global.

Following the assessment, the Company identified 5 material risks (see the Strategy section) rated as manageable and relevant. These risks were described in its 2019 CDP report. By now, the Company has updated its risk identification and assessment framework as follows.

Climate risk priority map

Climate risk assessment and priority

No		1	2	3	4	5
Climate risk		Disruptions in production processes and logistics operations due to increasing acute climatic effects and other climatic factors	Flaws in supply chains, construction design, health and safety; negative environmental footprint and reduced flows of ecosystem services; lower resilience of infrastructure and communications due to increasing climatic effects	Company's failure to comply with regulations reducing its negative environmental footprint (following the adoption of the carbon border adjustment mechanism)	Deterioration of the Company's sustainability reputation	Increased costs and losses (as a result of customers' failure to meet their obligations, rising prices for feedstock, materials and services, higher borrowing rates) and shrinking revenues (as a result of a decline in sales, customers, countries and regions of operation)
Risk type		Production	Operational	Regulatory	Reputational	Financial
Term		Long-term	Long-term	Medium-term	Long-term	Medium-term
Certainty	**Confidence level**	Medium	Medium	Medium	Medium	Medium
	Scenario sensitivity	High	Medium	High	Medium	Medium
	Probability	Medium	Medium	Low	Low	High
	Grade Qualitative	High	Medium	Medium	Medium	High
Materiality	**Time horizon**	High	High	Medium	High	Medium
	Financial	Medium	Medium	High	High	High
	Reputation	Medium	Medium	High	High	Medium
	Grade Qualitative	High	High	High	High	High
Risk map quadrant		9	8	8	8	9

Source: PhosAgro PAO 2020 TCFD Report: 34–35

Climate-related Metrics and Targets dimension disclosures

Figure 3.6 provides an extract from the 2021 annual report of the France-based construction materials company, Vicat SA. A number of matters relevant disclosure items to Paras. 21 and 23 of ED IFRS S2 are identified. The company summarises in one page the main targets it has set and the most important achievements-metrics it has accomplished over the last year. Specifically, the company provides numerical targets for its GHG emissions, alternative fuels, levels of clinker content in cement and self-produced renewable energy. At the same time, it provides information about its 2021 metrics for the same targets outlined above.

FIGURE 3.6: Extract from Vicat SA: Climate-related Metrics and Targets disclosures

Vicat is a French industrial company, present in 12 countries and operating mainly in the cement, concrete and aggregates businesses. Anxious to respect its environment and to take into account the major challenges, particularly demographic and climatic, Vicat's industrial strategy extends over the long term. It relies on sustainable governance, a stable family shareholding structure, and the strong, passionate commitment of its employees.

GOALS AND TARGETS

The Group's Climate Strategy is reflected in:

A goal for 2050

To contribute to the carbon neutrality of the entire value chain.

Targets for 2030

1. Reduce emissions to 540kg net CO_2 per metric ton of cement eq. at the Group level - Reduce emissions to 430kg net CO_2 per metric ton of cement eq. for Europe.
2. Reach 40% of alternative fuels at the Group level, including 100% of alternative fuels in its artificial cement manufacturing plants in Europe.
3. Achieve a level of clinker content in cement of 75%.
4. Deliver a ratio of self-produced renewable power of 20% of the Group's total power consumption.

Under the framework of its CSR approach, the Group has also set the following working targets for coming years:

1. To produce locally by favoring virtuous circular economy solutions at the service of sustainable cities.
2. To preserve the wealth of ecosystems encountered on the sites by implementing biodiversity management plans; making the landscaping of its quarries an opportunity to create habitats; developing products that help welcome biodiversity; optimizing forest management to increase carbon storage.
3. To strengthen the Group's environmental performance dashboard by following new pilot indictors in the fields of water, air quality, product management and innovation, and customer relations.
4. To achieve zero accidents.
5. To increase the proportion of women in the overall workforce and in managerial positions.
6. To promote responsible purchasing and sustainable and balanced relations with suppliers.

ACHIEVEMENTS

Climate issues

In 2021, the Group invested €74.5 million and ran 68 decarbonation projects. Obtaining a B score with the CDP, for a first voluntary response, is recognition of the strategy put in place.

- CO_2 emissions:
  - At the Group level: 624kg net CO_2 per metric ton of cement eq
  - Europe: 544kg net CO_2 per metric ton of cement eq
- A rate of alternative fuels of 26.2% reaching 62.9% in Europe.
- A clinker content rate of 78.9% in cement.
- A ratio of self-produced renewable power of 4.8% of the Group's total power consumption.

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOALS

- In view of its other significant **CSR challenges**, the Vicat Group has implemented policies and diligence, which have been measured as part of its annual reporting.
- Circular economy: creation of CIRCUL*ère*, the French subsidiary specialized in the circular economy.
- Responsible purchasing: adoption of a 2021-2024 roadmap and launch of a training program for buyers.
- HR challenges:
  - Severity rate of accidents: 0.24.
  - Frequency rate of accidents: 5.8.
  - Female employees as a percentage of the workforce: 11.5%.

Source: Vicat SA 2021 Annual Report: 53

In relation to the Financial Statements disclosures subcategory, while a number of companies provide some relevant disclosures that may satisfy a few of the disclosure items prescribed by ED IFRS S2, we were not able to identify any example of good reporting practice that satisfies the majority of the relevant disclosure items.

3.2 Location of the disclosures

Motivated by the relative flexibility allowed by ED IFRS S1 on the location of sustainability-related information, we examined the locations where companies currently make climate-related disclosures similar to those prescribed by ED IFRS S2 set out in Table 3.3. For each disclosure item, we identified the source that the disclosure was made. Given that some of the disclosure items are found in multiple sources, our analysis presents separately the number of items disclosed in a single source such as the annual report, the stand-alone sustainability report or other reports (TCFD reports, CDP surveys and proxy statements for US-listed companies) alone and in any combination of these sources.

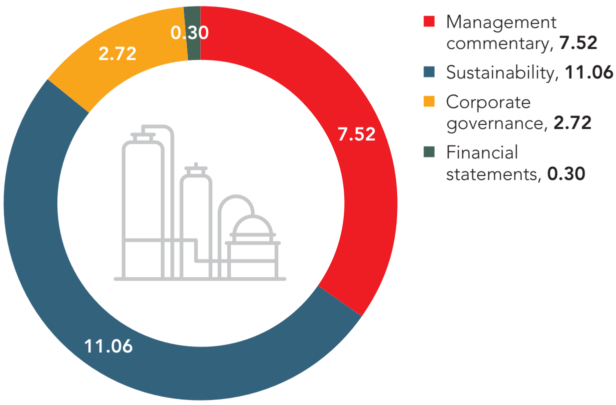
Table 3.3 Panel A shows that companies in the chemicals industry provide, on average, only half of their disclosures (21.6 out of the total 43.6 items companies are found to disclose on average) through their annual reports. In fact, on average, 12.7 items out of these 21.6 are presented multiple times across different reports in addition to the annual reports (sustainability reports, TCFD reports, CDP surveys and proxy statements). A similar trend is found for the sample firms in the construction materials industry (Panel B) where companies provide 24.5 out of their average 39.5 disclosure items through their annual reports. And similarly, on average, 11.3 items out of these 24.5 are presented multiple times across different reports in addition to the annual reports (sustainability reports, TCFD reports, CDP surveys and proxy statements).

Figure 3.7 shows the number of disclosure items found in different sections within annual reports for the sample chemicals and construction materials companies. In both industries, most of the disclosure items within the companies' annual reports are disclosed in the sustainability-related section.[16] Specifically, around half of the disclosure items provided by chemical companies and almost three-quarters of the disclosure items provided by the construction materials companies in their annual reports are located within the sustainability section. Further, we note that only about a third (7.5 out of 21.6) of climate-related disclosures are found within the management commentary section of the annual reports of chemicals companies and much less (4.2 out of 24.5) in the management commentary section of the construction materials companies. Even fewer disclosure items are found in the corporate governance section of the annual reports.

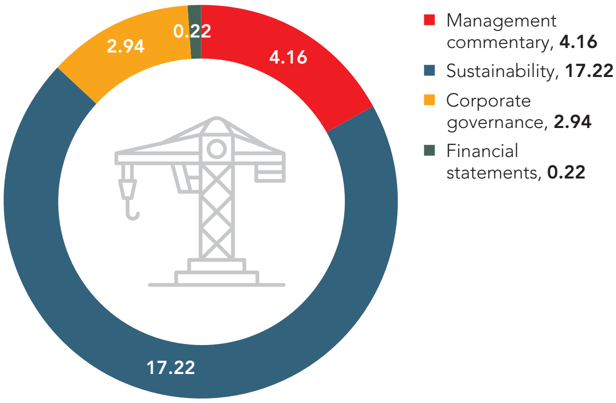
Finally, almost no disclosures are found in the financial statements section. This finding is in line with our findings from the Financial Statements disclosures subcategory of the Strategy dimension. Companies in both industries do not connect their climate-related disclosures with their financial statements, which is a rather concerning finding of current practice, and perhaps serves to motivate the main purpose of IFRS climate-related disclosures to drive their decision-usefulness and better inform providers of capital.

FIGURE 3.7: Average number of disclosure items found in different sections of the annual reports

Chemicals



Construction materials



The second most important source of climate-related disclosures is found to be companies' standalone sustainability reports. Specifically, companies in the chemicals industry are found to provide on average 8.5 out of their actual 43.6 disclosure items solely through their sustainability reports. It is noted that, on average, an additional 12.4 disclosure items appear in both companies' sustainability reports and other types of reporting (annual reports, TCFD reports, CDP surveys and proxy statements for US-listed companies). This suggests that the total average number of disclosure items a user can find in chemicals companies' sustainability reports adds up to

16 Companies may give various names in such a section of the annual report (eg sustainability, CSR or ESG).

20.9. In the construction materials industry, the average number of disclosure items found to be disclosed solely in companies' sustainability reports is nine. Further, these companies provide, on average, an additional 9.3 disclosure items in both their sustainability reports and other types of reporting (annual reports, TCFD reports, CDP surveys and proxy statements). This brings the total average number of disclosure items a user can find in construction materials companies' sustainability reports up to 18.3.

Other reports (ie TCFD reports, CDP surveys and proxy statements) are found to provide a considerable number of disclosures, especially in the chemicals industry. Specifically, companies in the chemicals industry are found to publish 8.9 disclosure items only in other (ie not annual or sustainability) reports, whereas companies in the construction materials disclose on average 4.6 items only in other reports.

Further, companies in both industries are found to provide a number of disclosure items in more than two reports. Specifically, companies in the chemicals industry are found to provide, on average, 3.9 out of their 43.6 disclosure items in their annual, sustainability and one other report (TCFD report, CDP survey or proxy statement). For the construction materials companies sample, the average number of disclosure items found in their annual, sustainability and one other report (TCFD report, CDP survey or proxy statement) is 7.2 out of 39.5. Finally, our findings show that the most common disclosure items found in different reports are related to the Strategy or Metrics and Targets dimensions. This is a rather expected finding, since these two dimensions have many more disclosure items than the other two (Governance and Risk Management dimensions). Even so, we also note that companies in both industries provide a large part of their Risk Management disclosures through other reports and not within their annual or sustainability reports. This can be connected to the adoption of TCFD Recommendations by more than three-quarters of our sample companies, as mentioned above and discussed in section 3.5 in more detail.

The above findings indicate that users need to use multiple reporting channels if they want to collect all relevant climate-related disclosures provided by a company, since only half of the disclosure items are found within companies' annual reports. At the same time, our results reveal that companies disclose a large amount of similar information in multiple sources, which effectively increases companies' preparation costs, perhaps unnecessarily.

COMPANIES IN BOTH INDUSTRIES PROVIDE A LARGE PART OF THEIR RISK MANAGEMENT DISCLOSURES THROUGH OTHER REPORTS AND NOT WITHIN THEIR ANNUAL OR SUSTAINABILITY REPORTS.

TABLE 3.3: Average number of disclosure items found in different reports by company (total and by dimension)

TYPE OF REPORT	(1) Average number of items	(2) Governance	(3) Strategy	(4) Risk management	(5) Metrics and Targets
PANEL A: CHEMICALS					
Annual report only	8.88	1.04	3.62	0.84	3.38
Sustainability report only	8.54	0.62	3.00	1.06	3.86
Other report (TCFD, CDP etc) only	8.94	0.74	5.02	1.40	1.78
Annual and sustainability reports	4.02	0.4	2.14	0.10	1.38
Annual and other reports	4.82	0.82	2.36	0.16	1.48
Sustainability and other reports	4.48	0.84	1.40	0.46	1.78
Annual, sustainability and other reports	3.88	0.28	1.20	0.06	2.34
TOTAL	43.56	4.74	18.74	4.08	16.00

TYPE OF REPORT	(1) Average number of items	(2) Governance	(3) Strategy	(4) Risk management	(5) Metrics and Targets
PANEL B CONSTRUCTION MATERIALS					
Annual report only	13.22	1.70	5.46	1.20	4.86
Sustainability report only	9.02	1.12	3.94	0.64	3.32
Other report (TCFD, CDP etc) only	4.56	0.44	2.42	0.82	0.88
Annual and sustainability reports	7.22	0.74	2.70	0.58	3.20
Annual and other reports	3.42	0.48	1.38	0.22	1.34
Sustainability and other reports	1.36	0.20	0.46	0.04	0.66
Annual, sustainability and other reports	0.68	0.12	0.26	0.10	0.20
TOTAL	39.48	4.8	16.62	3.60	14.46

3.3 Cross-referencing

In this section, we explore whether companies provide cross-references to other sources in relation to disclosures for the eight separate parts of our research instrument (ie Governance dimension, the four disclosure sub-categories of the Strategy dimension, Risk Management dimension, and the two disclosure sub-categories of the Metrics and Targets dimension). As Table 3.4 shows, less than half of companies provide cross-references to other sources. In fact, cross-references to other sources are provided primarily by companies in the chemicals industry in relation to Governance (23 companies), Risks and Opportunities (18 companies), Risk Management (17 companies) and Metrics and Targets (14 and 13 companies, respectively).

Fewer companies from the construction materials industry provide cross-references to other sources. Specifically, 13 companies provide cross-references related to Governance whereas in all other disclosure areas fewer than 10 companies provide cross-references.

Although the ISSB attempts to offer companies flexibility as to where the prescribed disclosures should be provided, while enabling transparency by requiring cross-referencing, at present, these findings suggest that cross-referencing seems not to be practised by the majority of sample firms. Hence, although a considerable proportion of the required disclosures are provided (see findings in section 3.1), potentially users need to spend a significant amount of time to locate these disclosures.

TABLE 3.4: Number (proportion) of sample companies providing cross-references to other sources, by industry and disclosure dimension.

	CHEMICALS	CONSTRUCTION MATERIALS
Governance	23 (46%)	13 (26%)
Strategy		
Risks and Opportunities	18 (36%)	7 (14%)
Strategy and Decision Making	12 (24%)	8 (16%)
Financial Position, financial Performance and Cash Flows	1 (2%)	0 (0%)
Climate Resilience	9 (18%)	1 (2%)
Risk Management	17 (34%)	5 (10%)
Metrics and Targets		
Metrics	14 (28%)	7 (14%)
Targets	13 (26%)	3 (6%)

3.4 ED IFRS S2 Appendix B-related disclosures

In addition to the disclosure items proposed by ED IFRS S2, Appendix B of the ED provides additional, industry-based disclosure requirements. On account of this, we extended our examination by exploring whether our sample companies in the two industries provide at least one metric for each separate industry-specific feature and whether they disclose the methodology for calculating these metrics as prescribed in Appendix B of ED IFRS S2.

Most sample companies in the chemicals industry are found to disclose at least one metric related to energy consumed (88%), water withdrawal (92%) and water-management risks and risk-mitigating practices (62%). In contrast, only 36% of the companies in this industry provide disclosures related to the number of incidents of non-compliance associated with water quality permits, standards, and regulations and 24% disclose their revenues from products designed for use-phase resource efficiency.

While at least one metric is generally disclosed, we found lower levels of disclosures when it came to the methodologies used for the estimation of these metrics. From the five separate industry-specific features for the chemicals industry, the lowest number of disclosures is that on information about the approach adopted in measuring the revenues from products designed for use-phase resource efficiency, disclosed by only 14% of the sample, while the highest number of disclosures are those on the measurement approach to water management risks and risk mitigating practices, disclosed by 42% of this sample.

As for the construction materials industry, a large proportion of companies are found to disclose at least one metric related to air emissions (80%), energy consumed (92%), freshwater withdrawal (86%) and waste generated (84%). Firms in this industry tend not to disclose information related to products that qualify for credits in sustainability design and construction certifications (18%) and market share for products that reduce energy, water, and/or material impacts (14%). For all six industry-specific features, most of the sample construction material companies do not provide disclosures about the methodology applied in measuring these metrics (scores vary from 22% for freshwater withdrawal to 8% for market share of products that reduce energy, water, and/or material impacts). Appendix 2c presents scores for all disclosure items.[17]

3.5 Other reporting frameworks and assurance

3.5.1 Other reporting frameworks

Our sample companies are found to engage with various reporting frameworks currently available.[18] As indicated in Table 3.5, 76 companies declare that they follow GRI Standards, 44 companies declare that they follow SASB Standards, 77 companies declare that they follow TCFD Recommendations, 84 companies declare that they follow the UN SDGs and 31 companies declare that they follow an <IR> approach. These are not mutually exclusive. Perhaps surprisingly, seven companies are found to follow none of these reporting approaches. Further, these seven companies exhibit low disclosure scores (average 17% for the chemicals and 8% for the construction materials companies). As can be seen in Table 3.5, the number of companies following the reporting frameworks are comparable across the two industries.

Further, we note that ED IFRS S2 proposes the application of the GHG Protocol (WRI 2004) for companies measuring their carbon emissions. In our sample, 60% of the chemicals companies and 42% of the construction materials companies explicitly refer to the GHG Protocol as the method of measuring their carbon emissions (untabulated).

TABLE 3.5: Reporting frameworks sample companies declare to follow

REPORTING FRAMEWORKS	CHEMICALS	CONSTRUCTION MATERIALS
GRI	38 (76%)	38 (76%)
SASB	26 (52%)	18 (36%)
TCFD	40 (80%)	37 (74%)
UN SDG	45 (90%)	39 (78%)
IR	13 (26%)	18 (36%)
None of the above	3 (6%)	4 (8%)

17 We note that some caution needs to be exercised when judging the proportion of firms adhering to these disclosure requirements. This is because many of these disclosure items may not be applicable to all sample companies, but the companies may not make this explicit.

18 We note that a company may self-declare to follow a particular framework, while, in practice, this may not mean full compliance with it.

The findings of this analysis here help to shed more light on, and provide an explanation for, the relatively moderate levels of climate-change-related disclosures of our sample firms. While ED IFRS S2 was not a framework publicly available for firms to follow when preparing the various types of reports we analyse, its provisions have been heavily influenced by and based on various existing reporting frameworks including TCFD Recommendations and SASB Standards. As these other reporting frameworks have been in place for some time now and firms have been applying them, a relatively large proportion of the prescribed disclosures in ED IFRS S2 seem to be provided. This evidence is in line with the findings in section 3.1 on particular disclosure items, which are found to be the least disclosed by the companies as the majority of them are 'new' items not included in the TCFD Recommendations.

3.5.2 Assurance of climate-related disclosures

The final aspect of our analysis includes the exploration of the number of companies that have their climate-related disclosures assured. We explored the extent to which companies do have their disclosures assured, as this is expected to add credibility to their reporting. Whilst the level of assurance was not measured in our analysis, we find that 55% of our sample companies do have some form of external assurance for their disclosures.[19] Specifically, 15 companies have both their metrics and narratives assured while 40 companies have only their metrics assured. A notable difference is observed between the two industries in the number of companies that have both their metrics and narratives assured, with construction materials companies having 12 against only 3 from the chemicals companies (Figure 3.8).

Figure 3.9 presents an extract of the independent limited assurance report on climate-related and other metrics of the chemicals company Petronas Chemicals Group Bhd (based in Malaysia), incorporated in its 2021 Sustainability report. In relation to climate-related metrics, the company sought assurance for its Scope 1 and 2 GHG emissions, total non-renewable energy consumption, total weight of nitrogen oxides (NOx) and sulphur oxides (SOx) emissions and total water supplies.

FIGURE 3.9: Extract from Petronas Chemicals Group Bhd: Limited assurance report on metrics

Independent Limited Assurance Report to PETRONAS Chemicals Group Berhad and its subsidiaries ("the Group") on the Selected Non-Financial Material Matters for the year ended 31 December 2021 as published in the Integrated Annual Report 2021

We, KPMG PLT ("KPMG"), were engaged by the Board of Directors of the Group to provide limited assurance on the Selected Non-Financial Material Matters, the ("Subject Matter"), listed below, for the year ended 31 December 2021 as published in the Integrated Annual Report 2021 ("the Report"), in the form of an independent limited assurance conclusion as to whether the Subject Matter is in all material respects in accordance with International <IR> Framework by the International Integrated Reporting Council ("IIRC") (hereafter known as the International <IR> Framework), as well as the Group's definition and calculation methodologies which are disclosed in the Report including any significant inherent limitations, the ("Applicable Criteria").

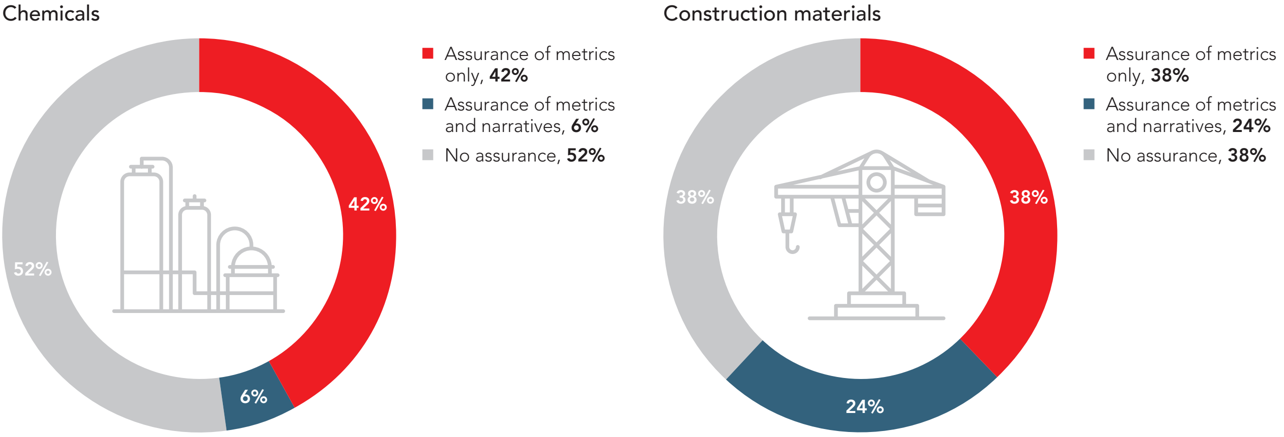
Subject Matter

The Selected Non-Financial Material Matters covered by our limited assurance engagement are:

(i) Effluent Pollution Loading – Chemical Oxygen Demand ("COD");
(ii) Greenhouse Gas Emissions Scope 1 & Scope 2;
(iii) Lost Time Injury Frequency ("LTIF");
(iv) Total Recordable Occupational Illness Frequency ("TROIF");
(v) Total non-renewable energy consumption;
(vi) Total weight of NOx and SOx emissions from the selected operating sites;
(vii) Total municipal water supplies (or from other water utilities); and
(viii) Tier 1 Process Safety Event ("T-1 PSE").

Source: Petronas Chemicals Group Bhd 2021 Sustainability Report: 77

FIGURE 3.8: Number of companies having their climate-related disclosures assured



19 This is broadly consistent with IFAC's *State of Play in Reporting and Assurance of Sustainability Information: Update 2019-2020 Data & Analysis*, <https://www.ifac.org/system/files/publications/files/IFAC-State-of-Play-in-Sustainability-Reporting-and-Assurance-2019-2020-date.pdf>

THE SCATTERED LOCATION OF THE DISCLOSURES, DUPLICATION AND LACK OF CROSS-REFERENCING MAKE IT CHALLENGING FOR USERS TO ACCESS RELEVANT INFORMATION. THIS NEEDS TO BE ADDRESSED BY REGULATORS AND THE ISSB.

4. Conclusions

In light of the ISSB's launch of a consultation on its first two proposed standards on 31 March 2022, the main objective of this project is to capture companies' current reporting practices against ED IFRS S2 'Climate-related Disclosures' Standard. We concentrate on the 100 companies with the highest average GHG emissions over the three-year period 2018-2020 in the construction materials and chemicals industries (50 from each industry) worldwide, which provide an annual report in English language. Specifically, we gauge the extent to which these companies already provide the disclosures items listed in our research instrument – which effectively mirror the prescribed requirements in ED IFRS S2 – through the most recent reports (ie annual reports, sustainability reports, TCFD reports, CDP surveys and proxy statements for US-listed companies), either separately and/or in combination. It must be noted however, due to the inherent timing of the research that the publication of ED IFRS S2 is subsequent to the reporting periods examined. However, given the objective of the research, through reviewing current reporting practice from companies in two industries that face significant risks due to climate change but also contribute negatively to climate change through the high levels of GHG emissions from their operations, the analysis gauges the extent of 'preparedness' of companies in these industries to provide the disclosures proposed in ED IFRS S2.

The high-level findings emerging from this project are that companies in both industries exhibit a moderate overall level of the climate-related disclosures prescribed by ED IFRS S2. Nonetheless, this relatively moderate level of disclosure is seen because the majority of sample firms have adopted the TCFD Recommendations. Many of the items required by ED IFRS S2 that are not covered by the TCFD Recommendations receive very low levels of adherence. Moreover, disclosures pertinent to ED IFRS S2 are scattered and in many cases duplicated across the various documents. At the same time, there is clear evidence of lack of cross-referencing between documents.

4.1 Considerations for standard-setting and implementation

Bearing in mind our sample companies' low levels of preparedness in relation to the 'new' disclosure requirements that ED IFRS S2 introduces, we would recommend that the ISSB pays special attention to these in finalising the standard to ensure that the disclosure requirements are clear and easily understandable to preparers to whom they are likely to represent unchartered territory.

The ISSB may need to conduct field-testing to further assess the costs, including those associated with changes in systems and processes, of such disclosures. Extensive application guidance and illustrative examples to help preparers understand 'what good looks like' will be needed.

For national and regional standard-setters and regulators, our findings indicate the strong influence that the TCFD Recommendations have on reporting practice today, and the important part that they play in preparing companies to meet the requirements of IFRS S2. Promoting compliance with – and where appropriate, aligning jurisdictional disclosure requirements with – the TCFD Recommendations is therefore a crucial step in achieving globally-aligned climate-related disclosures.

The scattered location of the disclosures, duplication and lack of cross-referencing make it challenging for users to access relevant information. This needs to be addressed by national and regional regulators. The ISSB also has an important role to play in resolving this problem, by providing greater clarity around location and cross-referencing in the standards, and by collaborating with the regulators to achieve a consistent approach.

4.2 Limitations

As in every research project, we acknowledge that our research is bounded by two limitations. First, it is possible that some of the disclosures prescribed by the ED IFRS 2 may not be applicable to some of the sample firms. Despite having made every effort to read carefully the companies' reports to ascertain applicability of the items, a firm may have been scored as not adhering to a disclosure item while there should be no expectation for the firm to do so: for example, the disclosure may have been deemed to be immaterial. The fact that most firms publish various types of reports and cross-referencing is seldomly found may have exacerbated the limitation to some extent. Second, our sample is skewed towards very large companies which operate in multiple countries. Thus, not only are their disclosures likely to be under scrutiny, but they are also likely to have sufficient resources to invest in reporting. Therefore, one would expect even lower levels of adherence with ED IFRS S2 for smaller and less international companies.

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Appendix 1:
Sample companies

PANEL A: CHEMICALS			
COMPANY NAME	HEADQUARTER'S DOMICILE	COMPANY	HEADQUARTER'S DOMICILE
3M Co	USA	Mitsubishi Chemical Holdings Corp	Japan
Air Liquide SA	France	Mitsui Chemicals Inc	Japan
Air Products and Chemicals Inc	USA	Mosaic Co	USA
AKR Corporindo Tbk PT	Indonesia	Nan Ya Plastics Corp	Taiwan
Alfa SAB de CV	Mexico	National Industrialization Company SJSC	Saudi Arabia
Asahi Kasei Corp	Japan	Nippon Sanso Holdings Corp	Japan
Basf Se	Germany	Nutrien Ltd	Canada
Cabot Corp	USA	OCI NV	Netherlands
CF Industries Holdings Inc	USA	Olin Corp	USA
Chemours Co	USA	Petronas Chemicals Group Bhd	Malaysia
China BlueChemical Ltd	China	PhosAgro PAO	Russia
Covestro AG	Germany	PTT Global Chemical PCL	Thailand
Dow Inc	USA	Saudi Basic Industries Corporation SJSC	Saudi Arabia
Dupont De Nemours Inc	USA	Shin-Etsu Chemical Co Ltd	Japan
Eastman Chemical Co	USA	Solvay SA	Belgium
ENN Natural Gas Co Ltd	China	Sumitomo Chemical Co Ltd	Japan
Evonik Industries AG	Germany	Tata Chemicals Ltd	India
Grupa Azoty SA	Poland	Tokuyama Corp	Japan
Incitec Pivot Ltd	Australia	Toray Industries Inc	Japan
Indorama Ventures PCL	Thailand	Tosoh Corp	Japan
LG Chem Ltd	South Korea	Tronox Holdings PLC	USA
Linde PLC	UK	UBE Corp	Japan
Lotte Chemical Corp	South Korea	Wanhua Chemical Group Co Ltd	China
LyondellBasell Industries NV	UK	Westlake Corp	USA
Methanex Corp	Canada	Yara International ASA	Norway

PANEL B: CONSTRUCTION MATERIALS			
COMPANY NAME	COUNTRY	COMPANY	COUNTRY
ACC Ltd	India	Heidelberg Cement AG	Germany
Adbri Ltd	Australia	Holcim AG	Switzerland
AGC Inc	Japan	Indocement Tunggal Prakarsa Tbk PT	Indonesia
Akcansa Cimento Sanayi ve Ticaret AS	Turkey	J K Cement Ltd	India
Ambuja Cements Ltd	India	Martin Marietta Materials Inc	USA
Anhui Conch Cement Co Ltd	China	Nippon Sheet Glass Co Ltd	Japan
Asia Cement Corp	Taiwan	Owens Corning	USA
Boral Ltd	Australia	PPC Ltd	South Africa
Breedon Group PLC	Jersey, UK	Ramco Cements Limited	India
Buzzi Unicem SpA	Italy	RHI Magnesita NV	Austria
Cementir Holding NV	Italy	Semen Indonesia (Persero) Tbk PT	Indonesia
Cementos Argos SA	Colombia	Shree Cement Ltd	India
Cementos Pacasmayo SAA	Peru	Siam Cement PCL	Thailand
Cemex SAB de CV	Mexico	Sumitomo Osaka Cement Co Ltd	Japan
China National Building Material Co Ltd	China	Taiheiyo Cement Corp	Japan
China Resources Cement Holdings Ltd	Hong Kong	Taiwan Cement Corp	Taiwan
China Shanshui Cement Group Ltd	China	Taiwan Glass Ind Corp	Taiwan
Cimsa Cimento Sanayi ve Ticaret AS	Turkey	Titan Cement International SA	Belgium
Compagnie de Saint Gobain SA	France	Turkiye Sise ve Cam Fabrikalari AS	Turkey
CRH PLC	Ireland	UltraTech Cement Ltd	India
Dalmia Bharat Ltd	India	Union Andina de Cementos SAA	Peru
Fletcher Building Ltd	New Zealand	Vicat SA	France
Grasim Industries Ltd	India	Vulcan Materials Co	USA
Grupo Argos SA	Colombia	Wienerberger AG	Austria
Grupo Cementos de Chihuahua SAB de CV	Mexico	Xinyi Glass Holdings Ltd	Hong Kong

Appendix 2a: Main research instrument based on ED IFRS S2 requirements with mean scores per item and per industry

Items based on the 2017 TCFD Recommendations are indicated with asterisks (*)

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	GOVERNANCE						
5*	To achieve this objective, an entity shall disclose information about the governance body or bodies (which can include a board, committee or equivalent body charged with governance) with oversight of climate-related risks and opportunities, and information about management's role in those processes. Specifically, an entity shall disclose:	45	50	90.00%	41	50	82.00%
5-a	(a) the identity of the body or individual within a body responsible for oversight of climate-related risks and opportunities;	45	50	90.00%	41	50	82.00%
5-b	(b) how the body's responsibilities for climate-related risks and opportunities are reflected in the entity's terms of reference, board mandates and other related policies;	37	50	74.00%	41	50	82.00%
5-c	(c) how the body ensures that the appropriate skills and competencies are available to oversee strategies designed to respond to climate-related risks and opportunities;	1	50	2.00%	1	50	2.00%
5-d*	(d) how and how often the body and its committees (audit, risk or other committees) are informed about climate-related risks and opportunities;	25	50	50.00%	28	50	56.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	GOVERNANCE (cont.)						
5-e*	(e) how the body and its committees consider climate-related risks and opportunities when overseeing the entity's strategy, its decisions on major transactions, and its risk management policies, including any assessment of trade-offs and analysis of sensitivity to uncertainty that may be required;	30	50	60.00%	23	50	46.00%
5-f*	(f) how the body and its committees oversee the setting of targets related to significant climate-related risks and opportunities, and monitor progress towards them (see paragraphs 23–24), including whether and how related performance metrics are included in remuneration policies (see paragraph 21(g)); and	29	50	58.00%	29	50	58.00%
5-g*	(g) a description of management's role in assessing and managing climate- related risks and opportunities, including whether that role is delegated to a specific management-level position or committee and how oversight is exercised over that position or committee. The description shall include information about whether dedicated controls and procedures are applied to management of climate-related risks and opportunities and, if so, how they are integrated with other internal functions.	28	50	56.00%	33	50	66.00%
	GOVERNANCE – Dimension mean score			**60.00%**			**59.25%**

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE-RELATED RISKS AND OPPORTUNITIES						
9*	An entity shall disclose information that enables users of general purpose financial reporting to understand the significant climate-related risks and opportunities that could reasonably be expected to affect the entity's business model, strategy and cash flows, its access to finance and its cost of capital, over the short, medium or long term. Specifically, the entity shall disclose:	43	50	86.00%	40	50	80.00%
9-a*	(a) a description of significant climate-related risks and opportunities and relevant discussion of the time horizon over which each could reasonably be expected to affect its business model, strategy and cash flows, its access to finance and its cost of capital, over the short, medium or long term.	14	50	28.00%	18	50	36.00%
9-a-additional*	(a) a description of significant climate-related risks and opportunities without a discussion of the time horizon	45	50	90.00%	39	50	78.00%
9-b*	(b) how it defines short, medium and long term and how these definitions are linked to the entity's strategic planning horizons and capital allocation plans.	18	50	36.00%	24	50	48.00%
9-c*	(c) whether the risks identified are physical risks or transition risks. For example, acute physical risks could include the increased severity of extreme weather events such as cyclones and floods, and examples of chronic physical risks include rising sea levels or rising mean temperatures. Transition risks could include regulatory, technological, market, legal or reputational risks.	35	50	70.00%	32	50	64.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE-RELATED RISKS AND OPPORTUNITIES (cont.)						
12*	An entity shall disclose information that enables users of general purpose financial reporting to understand its assessment of the current and anticipated effects of significant climate-related risks and opportunities on its business model. Specifically, an entity shall disclose:	19	50	38.00%	27	50	54.00%
12-a*	(a) a description of the current and anticipated effects of significant climate-related risks and opportunities on its value chain; and	19	50	38.00%	27	50	54.00%
12-b*	(b) a description of where in its value chain significant climate-related risks and opportunities are concentrated (for example, geographical areas, facilities or types of assets, inputs, outputs or distribution channels).	10	50	20.00%	24	50	48.00%
	CLIMATE-RELATED RISKS AND OPPORTUNITIES – Subcategory mean score			**50.75%**			**57.75%**
	STRATEGY AND DECISION-MAKING						
13*	An entity shall disclose information that enables users of general purpose financial reporting to understand the effects of significant climate-related risks and opportunities on its strategy and decision-making, including its transition plans. Specifically, an entity shall disclose:	45	50	90.00%	47	50	94.00%
13-a*	(a) how it is responding to significant climate-related risks and opportunities including how it plans to achieve any climate-related targets it has set. This shall include:	41	50	82.00%	40	50	80.00%
13-a-i*	(i) information about current and anticipated changes to its business model, including:						

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	STRATEGY AND DECISION-MAKING (cont.)						
13-a-i-1*	(1) about changes the entity is making in strategy and resource allocation to address the risks and opportunities identified in paragraph 12. Examples of these changes include resource allocations resulting from demand or supply changes, or from new business lines; resource allocations arising from business development through capital expenditures or additional expenditure on operations or research and development; and acquisitions and divestments. This information includes plans and critical assumptions for legacy assets, including strategies to manage carbon- energy- and water-intensive operations, and to decommission carbon-energy- and water-intensive assets.	26	50	52.00%	36	50	72.00%
13-a-i-2*	(2) information about direct adaptation and mitigation efforts it is undertaking (for example, through changes in production processes, workforce adjustments, changes in materials used, product specifications or through introduction of efficiency measures).	40	50	80.00%	40	50	80.00%
13-a-i-3*	(3) information about indirect adaptation and mitigation efforts it is undertaking (for example, by working with customers and supply chains or use of procurement).	4	50	8.00%	8	50	16.00%
13-a-ii	(ii) how these plans will be resourced.	1	50	2.00%	1	50	2.00%
13-b	(b) information regarding climate-related targets for these plans including:	41	50	82.00%	46	50	92.00%
13-b-i	(i) the processes in place for review of the targets;	0	50	0.00%	0	50	0.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	STRATEGY AND DECISION-MAKING (cont.)						
13-b-ii	(ii) the amount of the entity's emission target to be achieved through emission reductions within the entity's value chain;	41	50	82.00%	46	50	92.00%
13-b-iii	(iii) the intended use of carbon offsets in achieving emissions targets. In explaining the intended use of carbon offsets the entity shall disclose information including:	25	50	50.00%	32	50	64.00%
13-b-iii-1	(1) the extent to which the targets rely on the use of carbon offsets;	10	50	20.00%	8	50	16.00%
13-b-iii-2	(2) whether the offsets will be subject to a third-party offset verification or certification scheme (certified carbon offset), and if so, which scheme, or schemes;	0	50	0.00%	0	50	0.00%
13-b-iii-3	(3) the type of carbon offset, including whether the offset will be nature-based or based on technological carbon removals and whether the amount intended to be achieved is through carbon removal or emission avoidance; and	25	50	50.00%	31	50	62.00%
13-b-iii-4	(4) any other significant factors necessary for users to understand the credibility and integrity of offsets intended to be used by the entity (for example, assumptions regarding the permanence of the carbon offset).	0	50	0.00%	0	50	0.00%
13-c	(c) quantitative and qualitative information about the progress of plans disclosed in prior reporting periods in accordance with paragraph 13(a)–(b). Related requirements are provided in paragraph 20.	33	50	66.00%	38	50	76.00%
	STRATEGY AND DECISION MAKING – Subcategory mean score			**44.27%**			**49.73%**

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	FINANCIAL POSITION, FINANCIAL PERFORMANCE AND CASH FLOWS						
14	An entity shall disclose information that enables users of general purpose financial reporting to understand the effects of significant climate-related risks and opportunities on its financial position, financial performance and cash flows for the reporting period, and the anticipated effects over the short, medium and long term – including how climate-related risks and opportunities are included in the entity's financial planning. An entity shall disclose quantitative information unless it is unable to do so. If an entity is unable to provide quantitative information, it shall provide qualitative information. When providing quantitative information, an entity can disclose single amounts or a range. Specifically, an entity shall disclose:	23	50	46.00%	26	50	52.00%
14-a	(a) how significant climate-related risks and opportunities have affected its most recently reported financial position, financial performance and cash flows;						
14-a additional	Investment the current year?	12	50	24.00%	12	50	24.00%
14-a additional	Impact on Accounting Policy?	8	50	16.00%	5	50	10.00%
14-a additional	Impact on Financial Position/ performance/cash flows?	3	50	6.00%	2	50	4.00%
14-b	(b) information about the climate-related risks and opportunities identified in paragraph 14(a) for which there is a significant risk that there will be a material adjustment to the carrying amounts of assets and liabilities reported in the financial statements within the next financial year;	0	50	0.00%	0	50	0.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	FINANCIAL POSITION, FINANCIAL PERFORMANCE AND CASH FLOWS (cont.)						
14-c	(c) how it expects its financial position to change over time, given its strategy to address significant climate-related risks and opportunities, reflecting:						
14-c-i	(i) its current and committed investment plans and their anticipated effects on its financial position (for example, capital expenditure, major acquisitions and divestments, joint ventures, business transformation, innovation, new business areas and asset retirements);						
14-c-i additional	Commit to climate related investment?	11	50	22.00%	13	50	26.00%
14-c-i additional	Link to financial position?	0	50	0.00%	0	50	0.00%
14-c-ii	(ii) its planned sources of funding to implement its strategy;	0	50	0.00%	1	50	2.00%
14-d	(d) how it expects its financial performance to change over time, given its strategy to address significant climate-related risks and opportunities (for example, increased revenue from or costs of products and services aligned with a lower-carbon economy, consistent with the latest international agreement on climate change; physical damage to assets from climate events; and the costs of climate adaptation or mitigation); and	3	50	6.00%	3	50	6.00%
14-e	(e) if the entity is unable to disclose quantitative information for paragraph 14(a)–(d), an explanation of why that is the case.	0	50	0.00%	0	50	0.00%
	FINANCIAL POSITION, FINANCIAL PERFORMANCE AND CASH FLOWS – Subcategory mean score			**12.00%**			**12.40%**

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE RESILIENCE						
15*	An entity shall disclose information that enables users of general purpose financial reporting to understand the resilience of the entity's strategy (including its business model) to climate-related changes, developments or uncertainties – taking into consideration an entity's identified significant climate-related risks and opportunities and related uncertainties. The entity shall use climate-related scenario analysis to assess its climate resilience unless it is unable to do so. If an entity is unable to use climate-related scenario analysis, it shall use an alternative method or technique to assess its climate resilience. When providing quantitative information, an entity can disclose single amounts or a range. Specifically, the entity shall disclose:	27	50	54.00%	28	50	56.00%
15-a*	(a) the results of the analysis of climate resilience, which shall enable users to understand:	17	50	34.00%	22	50	44.00%
15-a-i*	(i) the implications, if any, of the entity's findings for its strategy, including how it would need to respond to the effects identified in paragraph 15(b)(i)(8) or 15(b)(ii)(6);	15	50	30.00%	20	50	40.00%
15-a-ii	(ii) the significant areas of uncertainty considered in the analysis of climate resilience;	14	50	28.00%	16	50	32.00%
15-a-iii	(iii) the entity's capacity to adjust or adapt its strategy and business model over the short, medium and long term to climate developments in terms of:						

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE RESILIENCE (cont.)						
15-a-iii-1	(1) the availability of, and flexibility in, existing financial resources, including capital, to address climate-related risks, and/or to be redirected to take advantage of climate-related opportunities;	0	50	0.00%	0	50	0.00%
15-a-iii-2	(2) the ability to redeploy, repurpose, upgrade or decommission existing assets; and	0	50	0.00%	0	50	0.00%
15-a-iii-3	(3) the effect of current or planned investments in climaterelated mitigation, adaptation or opportunities for climate resilience.	2	50	4.00%	2	50	4.00%
15-b*	(b) how the analysis has been conducted, including:	24	50	48.00%	25	50	50.00%
15-b-i*	(i) when climate-related scenario analysis is used:						
15-b-i-1*	(1) which scenarios were used for the assessment and the sources of the scenarios used;	24	50	48.00%	24	49	48.98%
15-b-i-2	(2) whether the analysis has been conducted by comparing a diverse range of climate-related scenarios;	20	50	40.00%	22	49	44.90%
15-b-i-3	(3) whether the scenarios used are associated with transition risks or increased physical risks;	18	50	36.00%	21	49	42.86%
15-b-i-4	(4) whether the entity has used, among its scenarios, a scenario aligned with the latest international agreement on climate change;	20	50	40.00%	23	49	46.94%
15-b-i-5	(5) an explanation of why the entity has decided that its chosen scenarios are relevant to assessing its resilience to climate-related risks and opportunities;	9	50	18.00%	12	49	24.49%
15-b-i-6*	(6) the time horizons used in the analysis;	18	50	36.00%	20	49	40.82%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE RESILIENCE (cont.)						
15-b-i-7*	(7) the inputs used in the analysis, including – but not limited to – the scope of risks (for example, the scope of physical risks included in the scenario analysis), the scope of operations covered (for example, the operating locations used), and details of the assumptions (for example, geospatial coordinates specific to entity locations or national- or regional-level broad assumptions); and	14	50	28.00%	19	49	38.78%
15-b-i-8*	(8) assumptions about the way the transition to a lower carbon economy will affect the entity, including policy assumptions for the jurisdictions in which the entity operates; assumptions about macroeconomic trends; energy usage and mix; and technology.	11	50	22.00%	13	49	26.53%
15-b-ii	(ii) when climate-related scenario analysis is not used:						
15-b-ii-1	(1) an explanation of the methods or techniques used to assess the entity's climate resilience (for example, single-point forecasts, sensitivity analysis or qualitative analysis);	0	0		1	1	100.00%
15-b-ii-2	(2) the climate-related assumptions used in the analysis including whether it includes a range of hypothetical outcomes;	0	0		0	1	0.00%
15-b-ii-3	(3) an explanation of why the entity has decided that the chosen climate-related assumptions are relevant to assessing its resilience to climate-related risks and opportunities;	0	0		0	1	0.00%
15-b-ii-4	(4) the time horizons used in the analysis;	0	0		0	1	0.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	CLIMATE RESILIENCE (cont.)						
15-b-ii-5	(5) the inputs used in the analysis, including – but not limited to – the scope of risks (for example, the scope of physical risks included in the analysis), the scope of operations covered (for example, the operating locations used), and details of the assumptions (for example, geospatial coordinates specific to entity locations or national- or regional-level broad assumptions);	0	0		0	1	0.00%
15-b-ii-6	(6) assumptions about the way the transition to a lowercarbon economy will affect the entity, including policy assumptions for the jurisdictions in which the entity operates; assumptions about macroeconomic trends; energy usage and mix; and technology; and	0	0		0	1	0.00%
15-b-ii-7	(7) an explanation of why the entity was unable to use climate-related scenario analysis to assess the climate resilience of its strategy.	3	26	11.54%	3	25	12.00%
	CLIMATE RESILIENCE – Subcategory mean score			**29.46%**			**33.90%**
	STRATEGY – Dimension mean score			**33.72%**			**38.08%**

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	RISK MANAGEMENT						
16*	The objective of climate-related financial disclosures on risk management is to enable users of general purpose financial reporting to understand the process, or processes, by which climate-related risks and opportunities are identified, assessed and managed.	38	50	76.00%	39	50	78.00%
17*	To achieve this objective, the entity shall disclose:						
17-a, i and ii*	(a) the process, or processes, it uses to identify climate-related: (i) risks and (ii) opportunities	26	50	52.00%	31	50	62.00%
17-b*	(b) the process, or processes, it uses to identify climate-related risks for risk management purposes, including when applicable:	25	50	50.00%	31	50	62.00%
17-b-i*	(i) how it assesses the likelihood and effects associated with such risks (such as the qualitative factors, quantitative thresholds and other criteria used);	18	50	36.00%	15	50	30.00%
17-b-ii*	(ii) how it prioritises climate-related risks relative to other types of risks, including its use of risk-assessment tools (for example, science-based risk-assessment tools);	6	50	12.00%	7	50	14.00%
17-b-iii	(iii) the input parameters it uses (for example, data sources, the scope of operations covered and the detail used in assumptions); and	1	50	2.00%	3	50	6.00%
17-b-iv	(iv) whether it has changed the processes used compared to the prior reporting period;	0	50	0.00%	0	50	0.00%
17-c*	(c) the process, or processes, it uses to identify, assess and prioritise climate-related opportunities;	8	50	16.00%	9	50	18.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	RISK MANAGEMENT (cont.)						
17-d, i and ii*	(d) the process, or processes, it uses to monitor and manage the climaterelated: (i) risks, including related policies; and (ii) opportunities, including related policies;	10	50	20.00%	19	50	38.00%
17-e*	(e) the extent to which and how the climate-related risk identification, assessment and management process, or processes, are integrated into the entity's overall risk management process; and	37	50	74.00%	39	50	78.00%
17-f*	(f) the extent to which and how the climate-related opportunity identification, assessment and management process, or processes, are integrated into the entity's overall management process.	11	50	22.00%	11	50	22.00%
	RISK MANAGEMENT – Dimension mean score			**32.73%**			**37.09%**
	METRICS						
21*	An entity shall disclose information relevant to the cross-industry metric categories of:	49	50	98.00%	47	50	94.00%
21-a*	(a) greenhouse gas emissions – the entity shall disclose:						
21-a-i*	(i) its absolute gross greenhouse gas emissions generated during the reporting period, measured in accordance with the Greenhouse Gas Protocol Corporate Standard, expressed as metric tonnes of GHG equivalent, classified as:						
21-a-i-1*	(1) Scope 1 emissions;	49	50	98.00%	46	50	92.00%
21-a-i-2*	(2) Scope 2 emissions;	49	50	98.00%	46	50	92.00%
21-a-i-3	(3) Scope 3 emissions;	25	50	50.00%	33	50	66.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	METRICS (cont.)						
21-a-ii	(ii) its greenhouse gas emissions intensity for each scope in paragraph 21(a)(i)(1)–(3), expressed as metric tonnes of GHG equivalent per unit of physical or economic output;	33	50	66.00%	32	50	64.00%
21-a-iii*	(iii) for Scope 1 and Scope 2 emissions disclosed in accordance with paragraph 21(a)(i)(1)–(2), the entity shall disclose emissions separately for:						
21-a-iii-1*	(1) the consolidated accounting group (the parent and its subsidiaries);	49	50	98.00%	44	50	88.00%
21-a-iii-2	(2) associates, joint ventures, unconsolidated subsidiaries or affiliates not included in paragraph 21(a)(iii)(1);	0	50	0.00%	1	50	2.00%
21-a-iv*	(iv) the approach it used to include emissions for the entities included in paragraph 21(a)(iii)(2) (for example, the equity share or operational control method in the Greenhouse Gas Protocol Corporate Standard);	8	50	16.00%	16	50	32.00%
21-a-v*	(v) the reason, or reasons, for the entity's choice of approach in paragraph 21(a)(iv) and how that relates to the disclosure objective in paragraph 19;	0	50	0.00%	0	50	0.00%
21-a-vi	(vi) for Scope 3 emissions disclosed in accordance with paragraph 21(a)(i)(3):						
21-a-vi-1	(1) an entity shall include upstream and downstream emissions in its measure of Scope 3 emissions;	16	50	32.00%	24	50	48.00%
21-a-vi-2	(2) an entity shall disclose the categories included within its measure of Scope 3 emissions, to enable users of general purpose financial reporting to understand which Scope 3 emissions have been included in, or excluded from, those reported;	15	50	30.00%	27	50	54.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	METRICS (cont.)						
21-a-vi-3	(3) when the entity's measure of Scope 3 emissions includes information provided by entities in its value chain, it shall explain the basis for that measurement;	3	50	6.00%	11	50	22.00%
21-a-vi-4	(4) if the entity excludes those greenhouse gas emissions in paragraph 21(a)(vi)(3), it shall state the reason for omitting them, for example, because it is unable to obtain a faithful measure;	3	47	6.38%	6	39	15.38%
21-b	(b) transition risks – the amount and percentage of assets or business activities vulnerable to transition risks;	0	50	0.00%	0	50	0.00%
21-c	(c) physical risks – the amount and percentage of assets or business activities vulnerable to physical risks;	0	50	0.00%	0	50	0.00%
21-d	(d) climate-related opportunities – the amount and percentage of assets or business activities aligned with climate-related opportunities;	0	50	0.00%	0	50	0.00%
21-e	(e) capital deployment – the amount of capital expenditure, financing or investment deployed towards climate-related risks and opportunities;	12	50	24.00%	19	50	38.00%
21-f	(f) internal carbon prices:						
21-f-i	(i) the price for each metric tonne of greenhouse gas emissions that the entity uses to assess the costs of its emissions;	12	50	24.00%	12	50	24.00%
21-f-ii	(ii) an explanation of how the entity is applying the carbon price in decision-making (for example, investment decisions, transfer pricing and scenario analysis);	14	50	28.00%	15	50	30.00%
21-g	(g) remuneration:						

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	METRICS (cont.)						
21-g-i	(i) the percentage of executive management remuneration recognised in the current period that is linked to climate related considerations; and	10	50	20.00%	13	50	26.00%
21-g-ii	(ii) a description of how climate-related considerations are factored into executive remuneration (also see paragraph 5(f)).	19	50	38.00%	24	50	48.00%
22-b	(b) in accordance with paragraphs 37–38 of [draft] IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, consider the relationship of these amounts with the amounts recognised and disclosed in the accompanying financial statements (for example, the carrying amount of assets used should be consistent with amounts included in the financial statements and when possible the connections between information in these disclosures and amounts in the financial statements should be explained).	0	50	0.00%	0	50	0.00%
	METRICS – Subcategory mean score			**33.44%**			**38.37%**
	TARGETS						
23*	An entity shall disclose its climate-related targets. For each climate-related target, an entity shall disclose:	42	50	84.00%	46	50	92.00%
23-a*	(a) metrics used to assess progress towards reaching the target and achieving its strategic goals;	42	50	84.00%	46	50	92.00%
23-b*	(b) the specific target the entity has set for addressing climate-related risks and opportunities;	42	50	84.00%	46	50	92.00%

		CONSTRUCTION MATERIALS			CHEMICALS		
ED IFRS S2 paragraph – subparagraph		Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score	Number of firms disclosing the item	Number of firms of which the item is applicable	Mean score
	TARGETS (cont.)						
23-c*	(c) whether this target is an absolute target or an intensity target;	42	50	84.00%	45	50	90.00%
23-d*	(d) the objective of the target (for example, mitigation, adaptation or conformance with sector or science-based initiatives);	40	50	80.00%	46	50	92.00%
23-e	(e) how the target compares with those created in the latest international agreement on climate change and whether it has been validated by a third party;						
23-e additional	how the target compares with those created in the latest international agreement on climate change	22	50	44.00%	21	50	42.00%
23-e additional	whether it has been validated by a third party	18	50	36.00%	2	50	4.00%
23-f	(f) whether the target was derived using a sectoral decarbonisation approach;	1	50	2.00%	1	50	2.00%
23-g*	(g) the period over which the target applies;	42	50	84.00%	46	50	92.00%
23-h*	(h) the base period from which progress is measured; and	42	50	84.00%	44	50	88.00%
23-i*	(i) any milestones or interim targets.	24	50	48.00%	41	50	82.00%
	TARGETS – Subcategory mean score			**64.91%**			**69.82%**
	METRICS AND TARGETS – Dimension mean score			**43.94%**			**48.90%**
	OVERALL – All Dimensions mean score			**39.00%**			**43.13%**

Notes: ED IFRS S2 (sub)-paragraphs in asterisk indicate disclosure items based on the 2017 TCFD Recommendations. Yellow-framed figures show mean scores for the six disclosure subcategories within the Strategy and Metrics and Targets dimensions, blue-framed figures show mean scores for the four disclosure dimensions; green-framed figures show overall mean score.

Appendix 2b:
Additional items in relation to cross-referencing

Governance
Strategy
Climate Related Risks and Opportunities
Strategy and Decision Making
Financial Position, financial Performance and cash flows
Climate Resilience
Risk Management
Metrics and targets
Metrics
Targets

Appendix 2c: **Additional items based on the Appendix B of ED IFRS S2 requirements with mean scores per item and per industry**

		Number of firms disclosing the item	Number of firms item is applicable	Mean score
	CONSTRUCTION MATERIALS			
EM-CM-120a.1.	**EM-CM-120a.1. Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) particulate matter (PM10), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs), and (7) heavy metals**			
EM-CM-120a.1.	Companies that disclose at least one metric suggested by the Appendix B	40	50	80%
EM-CM-120a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	7	50	14%
EM-CM-130a.1.	**EM-CM-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage alternative, (4) percentage renewable**			
EM-CM-130a.1.	Companies that disclose at least one metric suggested by the Appendix B	46	50	92%
EM-CM-130a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	10	50	20%
EM-CM-140a.1.	**EM-CM-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress**			
EM-CM-140a.1.	Companies that disclose at least one metric suggested by the Appendix B	43	50	86%
EM-CM-140a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	11	50	22%
EM-CM-150a.1.	**EM-CM-150a.1. Amount of waste generated, percentage hazardous, percentage recycled**			
EM-CM-150a.1.	Companies that disclose at least one metric suggested by the Appendix B	42	50	84%
EM-CM-150a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	7	50	14%
EM-CM-410a.1.	**EM-CM-410a.1. Percentage of products that qualify for credits in sustainable building design and construction certifications**			
EM-CM-410a.1.	Companies that disclose at least one metric suggested by the Appendix B	9	50	18%
EM-CM-410a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	5	50	10%

		Number of firms disclosing the item	Number of firms item is applicable	Mean score
EM-CM-410a.2.	**EM-CM-410a.2. Total addressable market and share of market for products that reduce energy, water, and/or material impacts during usage and/or production**			
EM-CM-410a.2.	Companies that disclose at least one metric suggested by the Appendix B	7	50	14%
EM-CM-410a.2.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	4	50	8%
	CHEMICALS			
RT-CH-130a.1.	**RT-CH-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy**			
RT-CH-130a.1.	Companies that disclose at least one metric suggested by the Appendix B	44	50	88%
RT-CH-130a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	20	50	40%
RT-CH-140a.1.	**RT-CH-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**			
RT-CH-140a.1.	Companies that disclose at least one metric suggested by the Appendix B	46	50	92%
RT-CH-140a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	18	50	36%
RT-CH-140a.2.	**RT-CH-140a.2. Number of incidents of non-compliance associated with water quality permits, standards, and regulations**			
RT-CH-140a.2.	Companies that disclose at least one metric suggested by the Appendix B	18	50	36%
RT-CH-140a.2.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	12	50	24%
RT-CH-140a.3.	**RT-CH-140a.3. Description of water management risks and discussion of strategies and practices to mitigate those risks**			
RT-CH-140a.3.	Companies that disclose at least one metric suggested by the Appendix B	31	50	62%
RT-CH-140a.3.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	21	50	42%
RT-CH-410a.1.	**RT-CH-410a.1. Revenue from products designed for use-phase resource efficiency**			
RT-CH-410a.1.	Companies that disclose at least one metric suggested by the Appendix B	12	50	24%
RT-CH-410a.1.	Companies that disclose the methodology for calculating metrics suggested by the Appendix B	7	50	14%

Appendix 2d: Additional items in relation to assurance and other reporting frameworks

PANEL A: ASSURANCE
Companies with assurance on climate related disclosures
Metrics only
Both metrics and narrative
PANEL B: REPORTING FRAMEWORKS
GRI
SASB
TCFD
UN SDG
IR
None of the above

PI-ISSB-CLIMATE-DISCLOSURE

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