



Working Paper

Double Materiality in Practice: Evidence from Two Years of CSRD Reporting

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Abstract

The Corporate Sustainability Reporting Directive (CSRD) requires large EU companies to conduct a double materiality assessment (DMA), evaluating financial materiality of sustainability risks and opportunities alongside impact materiality on people and the environment. Despite its central role in the CSRD framework, empirical evidence on DMA outcomes remains scarce. Prior research has largely relied on industry-level proxies that cannot capture firm-level-assessments. This paper addresses this gap by providing the first large-scale longitudinal documentation of DMA outcomes, covering 241 large listed EU companies across ten topical European Sustainability Reporting Standards for FY2024 and FY2025. Using manual content analysis of CSRD-compliant sustainability reports, I construct binary materiality indicators distinguishing between positive and negative impacts, financial risks, and opportunities, offering a firm-specific operationalization of materiality.

I find that overall materiality rates decline moderately between FY2024 and FY2025, driven primarily by environmental standards apart from ESRS E1 (Climate Change), and concentrated in financial materiality dimensions. This pattern implies an ongoing calibration process that unfolds even before the most decisive revisions to the CSRD are implemented. Sector profiles reveal substantial heterogeneity with the most pronounced differences to the overall sample present in the Financials sector. The findings have implications for preparers, investors, and standard-setters navigating the early implementation phase of a substantially reformed reporting regime.

Keywords: sustainability reporting, materiality, mandatory disclosure, CSRD

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01 INTRODUCTION

The Corporate Sustainability Reporting Directive (CSRD; Directive (EU) 2022/2464), which entered into force in January 2023, fundamentally reshapes the landscape of corporate sustainability reporting in the European Union. For affected companies across the EU, it harmonizes the previously fragmented landscape of materiality perspectives by requiring them to perform a Double Materiality Assessment (DMA) and report about process and results. Minimum requirements are set up for assessing impacts, risks and opportunities (IROs) related to business model and value chain. Potentially material topics are assessed from two perspectives: the impact materiality of the company's activities on sustainability matters and the financial materiality of sustainability-related risks and opportunities on the firm's performance.

Materiality, especially financial materiality, is an extensively researched concept. However, quantitative research is primarily based on industry-based variables leveraging the guidelines of the Sustainability Accounting Standards Board (SASB) (Grewal et al., 2021; Khan et al., 2016; Schiehl & Kolahgar, 2021). In the EU, materiality analyses were already required in sustainability reports prior to the introduction of the CSRD. However, materiality under the preceding Non-Financial Reporting Directive (NFRD; Directive 2014/95/EU) was poorly defined and member states' implementation into national law was heterogeneous, leading to a fragmented materiality landscape under the NFRD regime (Miettinen, 2024; Raith, 2023). Under the CSRD, the required granularity and complexity increased significantly, creating an environment in which materiality assessments can be used to derive conclusions on reporting practices and beyond across the EU.

While research on industry-implied materiality exists and first limited-scope comparative analyses of first- and second-year CSRD reports slowly emerge (Großkopf et al., 2026; Hombach et al., 2026), granular, intertemporal empirical evidence on firm-assessed materiality remains absent. This paper addresses this gap by presenting systematic evidence on dimension-level DMA patterns across two consecutive reporting years. The reporting years covered by this report (FY2024 and FY2025) capture an early and particularly dynamic implementation phase. Intertemporal changes in DMA outcomes are particularly interesting in this phase since they give insight into the realization of an expected consolidation of reporting practices after an initially heterogeneous implementation (Deloitte, 2025; Ernst & Young, 2025). While it is possible that ongoing revisions to the European Sustainability Reporting Standards (ESRS; Commission Delegated Regulation (EU) 2023/2772) (European Commission, 2025a) introduce further dynamics in upcoming years that would affect future data collection and comparability, understanding whether and how the initial consolidation affects the second year of CSRD-compliant sustainability reporting remains both timely and policy-relevant.

I therefore ask how firms adapt their materiality assessments, and thereby the content reported, in the second year of CSRD-implementation. To answer this question, this paper documents the DMA outcomes of 241 large listed EU companies for FY2024, and tracks year-on-year changes for a matched sub-sample of 210 companies for which FY2025 data are available until a cut-off date set at 30 April 2026. Using manual content analysis of CSRD sustainability reports, I construct a panel dataset of binary materiality indicators and provide a systematic longitudinal descriptive analysis of DMA outcomes across two reporting years. By analysing not only overall materiality for each of the ten topical ESRS, but also the underlying materiality dimensions – positive and negative impacts, financial risks and opportunities – I trace company-level changes at a granular level. I find that companies assess fewer topical ESRS standards as material in FY2025 than in FY2024. Materiality rate reductions span all impact, risk and opportunity (IRO) dimensions and are overall more pronounced for financial materiality dimensions (risks and opportunities) than for impact materiality dimensions (positive and negative impacts). There is substantial heterogeneity in materiality assessments and their year-on-year dynamics across GICS sectors.

This paper makes two contributions to the sustainability reporting literature. First, it advances how materiality can be operationalized empirically. Prior research has largely relied on industry-level proxies derived from SASB standards – a necessary simplification, but one that conflates within-sector heterogeneity and cannot capture how individual firms actually assess their exposure to and from sustainability aspects. By constructing a firm-assessed, IRO-dimension-level panel dataset from manual content analysis of CSRD reports, this paper provides a more granular and more directly valid operationalization of materiality at scale, and offers a foundation for future research. Second, the paper provides systematic evidence on how firms adapt their materiality assessments in the early implementation phase of a substantially updated mandatory reporting regime. The finding that companies assess fewer topical ESRS as material in their second year and that reductions are more pronounced along financial materiality dimensions speaks to an ongoing calibration process that unfolds even before the most decisive revisions to the CSRD are implemented. This has direct relevance for regulators and standard-setters assessing whether the current simplification debate is grounded in firms' actual reporting behaviour, and for practitioners seeking to benchmark their own DMA outcomes against a large-sample reference.

The report proceeds as follows: Section 2 describes data and methodology; Section 3 presents overall materiality patterns in FY2024; Section 4 analyses changes between FY2024 and FY2025; Section 5 presents sector profiles; Section 6 discusses the findings in the context of current regulatory debates and highlights relevance for stakeholders.

O2 LITERATURE REVIEW

Research on sustainability-related materiality intensified in the last 15 years (Fiandrino et al., 2022). The concept of double materiality evolved as a combination of the original concept of financial materiality, which is applied by the IFRS, and impact materiality which was introduced through the GRI standards (GRI, 2026; Nobes, 2026). Some first traces of the concept were already found in companies' 2019 reportings, predominantly in Europe (Cristofaro & Gulluscio, 2023).

Materiality, especially the more investor-focused financial materiality, has been operationalized by several studies and is found to be relevant for capital market information dissemination. For instance, information that corresponds to industry-implied SASB financial-materiality-guidelines increases the stock price relevancy of sustainability-information (Grewal et al., 2021; Schiehl & Kolahgar, 2021). Similarly, firms that perform well on SASB-identified financially material sustainability topics outperform their peers that receive worse ratings in these topics (Khan et al., 2016).

While the NFRD already introduced double materiality as an obligatory basis of reporting in the EU, the CSRD is the first regime to convincingly operationalize it, reacting to significant shortcomings of its predecessor (Miettinen, 2024). Double materiality could lead to improvements beyond reporting: recent research suggests that CSRD-required DMAs could institutionalize sustainability-related performance management for firms subject to the directive (Lindgren et al., 2026).

Evidence from NFRD materiality research concludes that the step from NFRD double materiality to CSRD double materiality represents a significant step toward a more comprehensive and standardized materiality assessment process (Miettinen, 2024; Raith, 2023). Different kinds of deficiencies are found in the materiality assessment process descriptions of Spanish/Portuguese (Morganho et al., 2025), Romanian (Dragomir et al., 2025) and Polish companies (Macuda & Kobiela-Pionnier, 2025) when compared against the requirements of the CSRD. Since sample sizes in these studies are generally limited (20-30 firms, respectively), more research is needed to confirm the findings on a more generalizable basis. Dyczkowska and Szalacha (2025) underscore the complexity associated with a DMA under CSRD requirements, including setting relevant criteria and objective thresholds, as well as consulting stakeholders and setting reporting boundaries.

More broadly, the intensity of the change from NFRD to CSRD reporting is exemplified by studies analyzing the degree to which NFRD reports fulfill CSRD criteria. Studies consistently find significant deficiencies in different contexts; Italian companies (Nicolo et al., 2025) and specifically banks (Fedele et al., 2025), Romanian (Rusu et al., 2026) and overall EU-companies' (Raimo et al., 2025) pre-CSRD reports were not able to satisfy upcoming CSRD requirements. While compliance was not required before full CSRD implementation, the cited studies analyze the year before mandatory compliance, indicating significant need for reform within a limited time frame.

Despite growing scholarly interest in CSRD implementation, empirical evidence on the outcomes of double materiality assessments remains scarce. Existing studies are either conceptual, limited to small national samples, or focused on compliance with procedural requirements rather than on the substantive content of materiality decisions. To my knowledge, no study has systematically documented which ESRS standards are assessed as material across a large, cross-sectoral sample of CSRD reporters, nor how these assessments vary across sectors or evolve over time. This study addresses this gap by providing the first large-scale empirical analysis of DMA outcomes based on a sample of 241 large listed EU companies across two consecutive reporting years. Beyond documenting materiality rates and their year-on-year dynamics, I provide granular evidence on the materiality dimensions underlying individual assessments – distinguishing between positive impacts, negative impacts, financial risks, and opportunities – and offer sector-level profiles that can serve as empirical benchmarks for preparers, users, and standard-setters alike.

03 DATA AND METHOD

03.1 REGULATORY BACKGROUND

The regulatory setting of this paper warrants brief elaboration since it is essential to interpreting the results. The CSRD, adopted in 2022 (European Commission, 2025b), fundamentally reshapes corporate sustainability reporting in the European Union. The first wave of reporting obligations applied to FY2024, covering large listed entities with more than 500 employees that were already subject to the preceding NFRD. Relative to its predecessor, the CSRD, among other important improvements, substantially increases the sophistication of required materiality assessments: companies must conduct specific analyses covering many of the topical ESRS including climate risk and biodiversity exposure analyses. Positive and negative impacts must be assessed separately from financial risks and opportunities, each within a universally applicable measurement structure.

However, significant political pressure and shifting majorities in the European Parliament triggered a revision process before the first CSRD-compliant reports had even been issued. Certain near-term easement measures have already been implemented, including the postponement of disclosure requirements that were subject to phase-in provisions in the first reporting year and a 'stop the clock' mechanism preventing the directive's scope from expanding for two years (European Commission, 2025a). More substantially, the ESRS, including certain aspects of the DMA, are currently under revision, and approximately 80% of companies previously within the directive's scope have been exempted, representing a clear reduction in the directive's regulatory ambition.

The FY2024 and FY2025 reporting years therefore represent a particularly instructive window for empirical analysis. This period is relatively stable in the sense that the most substantial revisions to the underlying ESRS had not yet been finalised, and the circle of affected companies remained largely

unchanged. At the same time, the anticipation of ongoing revisions may itself have influenced how companies approached their materiality assessments during this period, a consideration that is addressed further in the limitations section.

03.2 SAMPLE

The sample is based on an LSEG Workspace universe including listed companies with headquarters in the EU (excluding Sweden where the national parliament's decision to delay CSRD transposition by one year creates a regulatory context that is not comparable to other EU member states) and more than 500 employees in the financial year 2024. From there, to ensure adequate representation across sectors and size classes, I drew a proportionally stratified random sample of 350 companies and manually reviewed whether they issued a CSRD-compliant sustainability report in FY2024. Since a full assessment of CSRD compliance is not feasible without access to documentation beyond published reports, compliance was assumed when reports followed the basic structure of a CSRD-compliant sustainability report and the company explicitly referred to its report as fully compliant with CSRD/ESRS requirements. Strata were based on GICS sector and market capitalization quartiles. This resulted in a sample of 241 companies. Table 1 shows the distribution by sector. For an overview by country, please refer to Table 3 in the Appendix. By construction, the sample is restricted to large, listed EU companies subject to first-wave CSRD obligations; findings should not be generalized to smaller or non-listed entities that may be phased into the CSRD regime.

GICS sector	FY2024	FY2025
Communication services	22	16
Consumer discretionary	33	28
Consumer staples	18	14
Energy	4	4
Financials	25	24
Health care	17	15
Industrials	59	52
Information technology	23	16
Materials	23	17
Real estate	6	5
Utilities	11	11
Total	241	202

TABLE 1. Sample distribution of companies with a CSRD-compliant sustainability report by GICS sector for FY2024 and FY2025. Sectors with $n \leq 20$ in FY2025 are excluded from deeper sector-level analyses.

03.3 DATA COLLECTION

For each company, I code four binary materiality indicators for each of the ten topical ESRSs (E1–E5, S1–S4, G1; cp. Table 2) representing whether the company identified material positive impacts, negative impacts, financial risks, or financial opportunities related to the standard. A standard is coded as material when at least one related material IRO is identified, which triggers topic-related disclosure obligations for the firm. For a small number of firms where dimension-level coding was not feasible, only the overall materiality of each standard was recorded. These observations are included in overall materiality analyses but excluded from dimension-level analyses.

Abbreviation	ESRS topical standard
E1	Climate change
E2	Pollution
E3	Water and marine resources
E4	Biodiversity and ecosystems
E5	Resource use and circular economy
S1	Own workforce
S2	Workers in the value chain
S3	Affected communities
S4	Consumers and end-users
G1	Business conduct

TABLE 2. Summary of topical European Sustainability Reporting Standards (ESRS) (Commission Delegated Regulation (EU) 2023/2772)

The coding strategy is largely driven by substantial heterogeneity among reporting companies' DMAs. A more detailed analysis that counts material IROs would intuitively seem more informative, but the granularity of IROs assessed differs largely between companies and, in some instances, even between sustainability topics within one company's DMA. Additionally, an analysis that counts IROs cannot differentiate between individual IROs' importance, and thereby suggests a higher level of precision than it is ultimately able to provide.

I collect data until a cut-off date at 30 April 2026, balancing the timeliness of the results with potential data gaps for FY2025. Companies with reporting year ends deviating from the 31st of December as well as late reporters may be underrepresented in the matched sample.

03.4 ANALYTICAL APPROACH

I report materiality rates as the share of companies that assessed a given standard or a given dimension within a standard-analysis as material. Year-on-year change is reported as the absolute percentage-point difference between FY2024 and FY2025 rates. I distinguish upgrade rates (the

percentage rate of firms re-assessing a topic from non-material in FY2024 to material in FY2025) from downgrade rates (material to non-material).

Sector-level analyses are reported only for sectors with $n \geq 20$ in the matched sample, as smaller sub-samples yield 95% confidence intervals exceeding ± 22 percentage points at $p = 0.5$. Sectors with $10 < n < 20$ are included descriptively without dimension breakdowns. Confidence intervals for proportions are calculated using the Wilson score method (Wilson, 1927), which provides better coverage than the standard Wald interval for small samples and proportions close to 0 or 1.

O4 RESULTS

O4.1 HIGH-LEVEL REPORTING-RELATED CHANGES

Until the data collection cut-off date, information was available on 210 out of the 241 FY2024 sample companies. Out of these, two were restructured during FY2025, and thus excluded from analysis. Another six companies did not continue to report following ESRS-requirements and could thus not be analysed, leaving a matched sample of 202 companies for which data is available for both years.

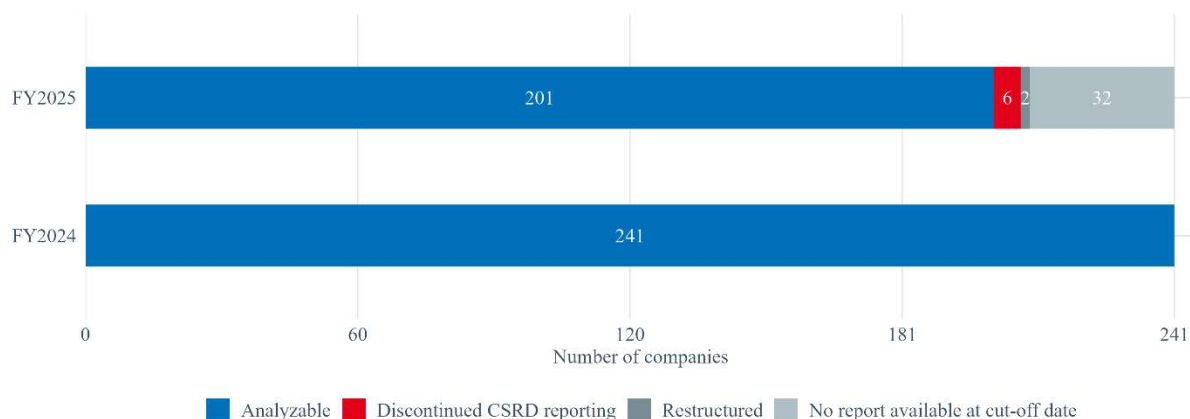


FIGURE 1 FY2025 data collection status compared to the FY2024 sample. Data collection cut-off at 30 April 2026.

Report length shows mixed trends in the matched sample. While the average number of pages decreased slightly (118.0 to 113.9; -1.1%), the average word count² increased (62,574 to 65,650 words; $+5.4\%$). This divergence between pages and words warrants caution in interpreting either metric in isolation. Median statistics point in a different direction: both the median number of pages (102 to 100) and the median number of words (52,547 to 51,528) declined, suggesting that the mean

² Word counts were extracted using PyMuPDF and cleaned by removing repeating structural elements such as headers, footers, and tables of contents prior to comparison.

increase in word count is driven by a small number of reports with substantially higher text volume rather than a broad trend toward lengthier reporting. Nevertheless, these findings contradict first evidence provided by Hombach et al. (2026) and Großkopf et al. (2026) who find a more pronounced decline in report length, both in terms of words and pages. However, their samples of DAX companies and EURO STOXX 50 firms limits the comparability of the results to this study due to their limited size and focus on specific subgroups (the largest German reporting companies or largest European companies, respectively).

There are multiple circumstances potentially affecting this finding: while the EU introduced certain facilitating provisions for second-year reporting, which lift the strict requirement to implement additional disclosure requirements previously covered by phase-in provisions and adding additional flexibility on certain reporting standards, some companies may have nevertheless chosen to implement disclosure requirements previously not reported on due to phase-in provisions. Simultaneously, there may have been consolidation and feedback effects from the first year of reporting, affecting disclosure volume in an unclear direction. The collected data does not permit differentiating between these effects. Some stronger discrepancies in terms of page numbers are due to formatting changes like reformatting pdf-files to display double pages that contain twice as much content as before while still counting as a single page in our analysis. The number of words is therefore the more reliable metric.

The disclosures' complexity, measured by the Gunning (1968) Fog Index, remained stable across both reporting years (average: 20.93 to 21.01; median: 20.86 to 20.90 grade-level equivalents, i.e., years of formal education required to understand the text). This analysis is limited to a sub-sample of 161 reports for which English-language versions were available in both reporting years at the cut-off date.

The degree to which I was able to draw conclusions from firms' reports concerning dimension-level materiality increased in FY2025. While I was not able to assess materiality dimensions for 19 out of 241 companies (or 7.9%) due to insufficient reporting granularity in FY2024, this was only the case for seven out of 202 companies (or 3.5%) in FY2025 suggesting substantial improvements in clarity for reports that were lacking critical information in the first year of reporting.

04.2 OVERALL MATERIALITY PATTERNS

04.2.1 MATERIALITY RATES BY STANDARD

Figure 2 reports overall DMA results for FY2024. All but one firm identify ESRS E1 (99.6%) and S1 (99.6%) as material, followed closely by G1 (97.1%), reflecting the salience of these topics in current ESG discourse. A large share of the overall sample additionally identifies ESRS E5 (79.7%), S2 (71.0%) and S4 (70.5%) as material.

The least covered standard is ESRS S3 (37.9%), followed by E4 (42.5%) and E3 (42.3%). Lower materiality rates for environmental standards outside of ESRS E1 are consistent with comparatively lower reporting-related competencies for environmental topics outside of climate change, as suggested by Rusu et al. (2026). The results largely conform to relevant industry-reports (Deloitte, 2025; Ernst & Young, 2025).

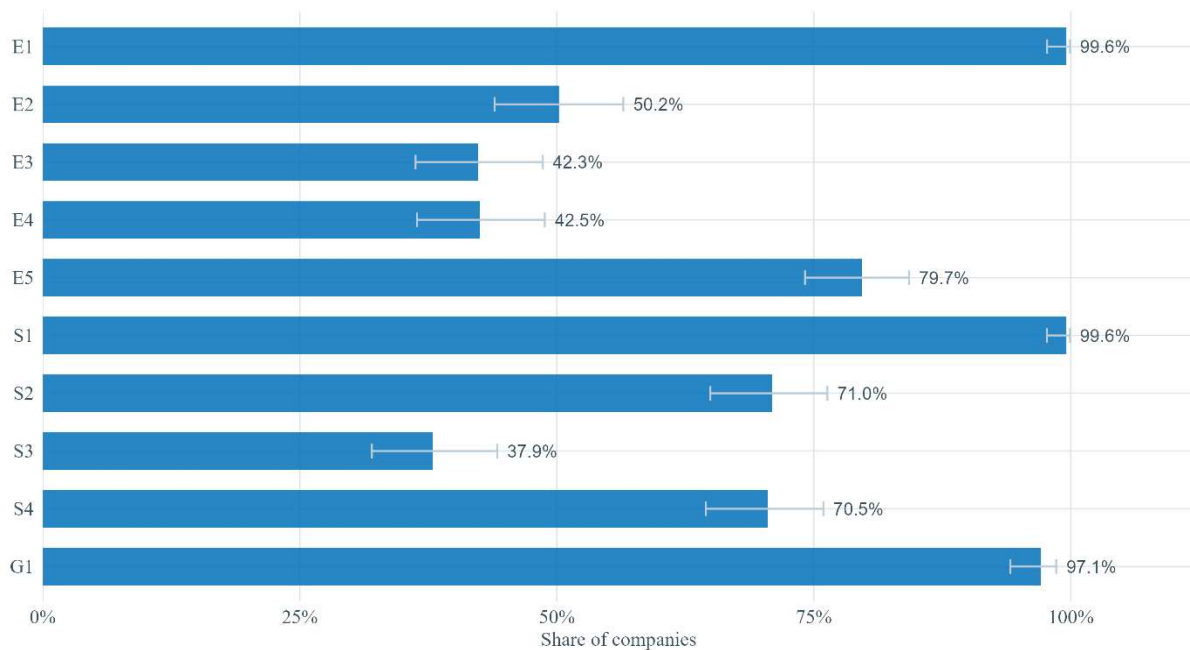


FIGURE 2 Share of companies assessing each ESRS standard as material (FY2024; N = 241).

04.2.2 MATERIALITY BY DIMENSION

Figure 3 shows the breakdown by dimension for standards assessed as material. Negative impacts are the most commonly cited materiality dimension across all standards, while financial opportunities are least often identified as material. 90.2% of the sample companies identify climate-related financial risks and 97.8% find material climate-related negative impacts of their business (compared to only 63.6% finding positive impacts). In the impact materiality dimension, standards covering environmental topics are largely identified as material due to negative impacts, whereas social and governance topics (with the exception of S2) show more positive than negative impact materiality. In terms of financial materiality, all standards are more often identified as material from a risk- than from an opportunity-perspective. However, those distributions are strongly heterogeneous across sectors, as shown in chapter six. Out of the 241 sample companies, I was not able to code materiality dimensions for all standards for 19, corresponding to 7.9%.

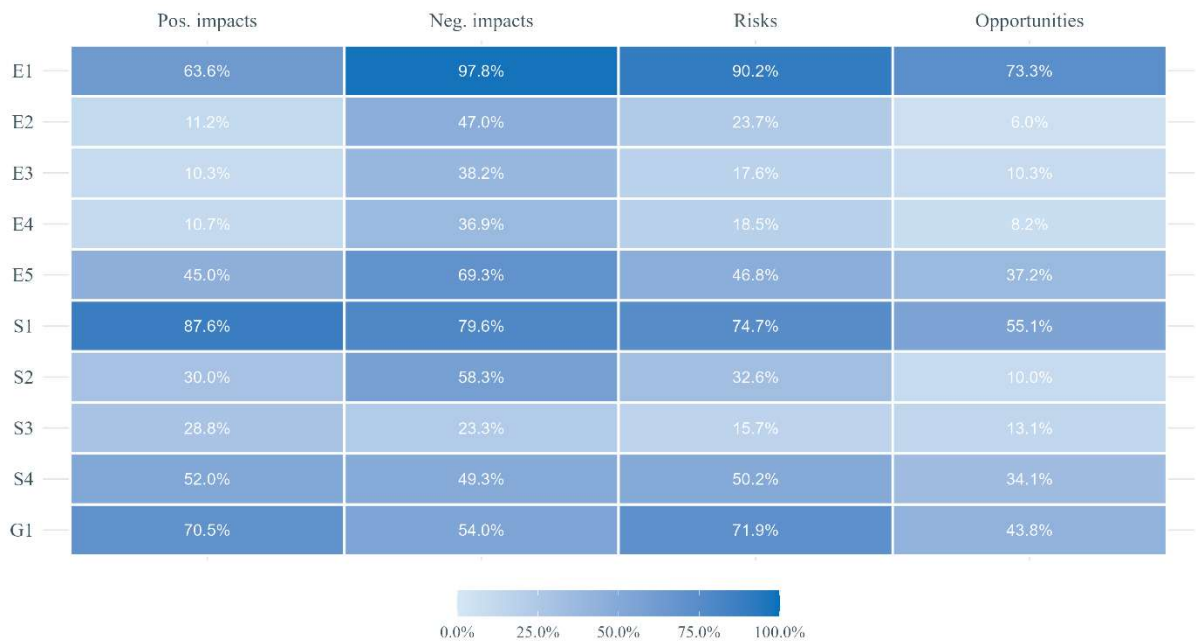


FIGURE 3 Share of companies citing each materiality dimension, conditional on overall materiality (Year 1, N = 224 to 236 depending on firm-level DMA result documentation availability).

04.3 YEAR-ON-YEAR UP- AND DOWNGRADES

This section examines how DMA results changed between Year 1 and Year 2 for the matched subsample for which a DMA was available in both years (n = 202). I distinguish upgrades (non-material to material), downgrades (material to non-material), and stable assessments.

04.3.1 OVERALL DIRECTION OF CHANGE

The dominant pattern is one of moderate contraction: materiality rates decline year-on-year for five out of ten standards, whereas overall materiality rates increase only for two standards (cp. Figure 4). The average company assesses 0.7% fewer topical standards as material compared to the previous year. This is consistent with a limited consolidation of initial DMA outcomes as companies refine their materiality processes. Possible interpretations include: (i) learning effects producing more selective determinations; (ii) alignment with sector-peer benchmarks; or (iii) deliberate narrowing of reporting scope in anticipation of CSRD simplification measures. The data do not permit distinguishing between these explanations.

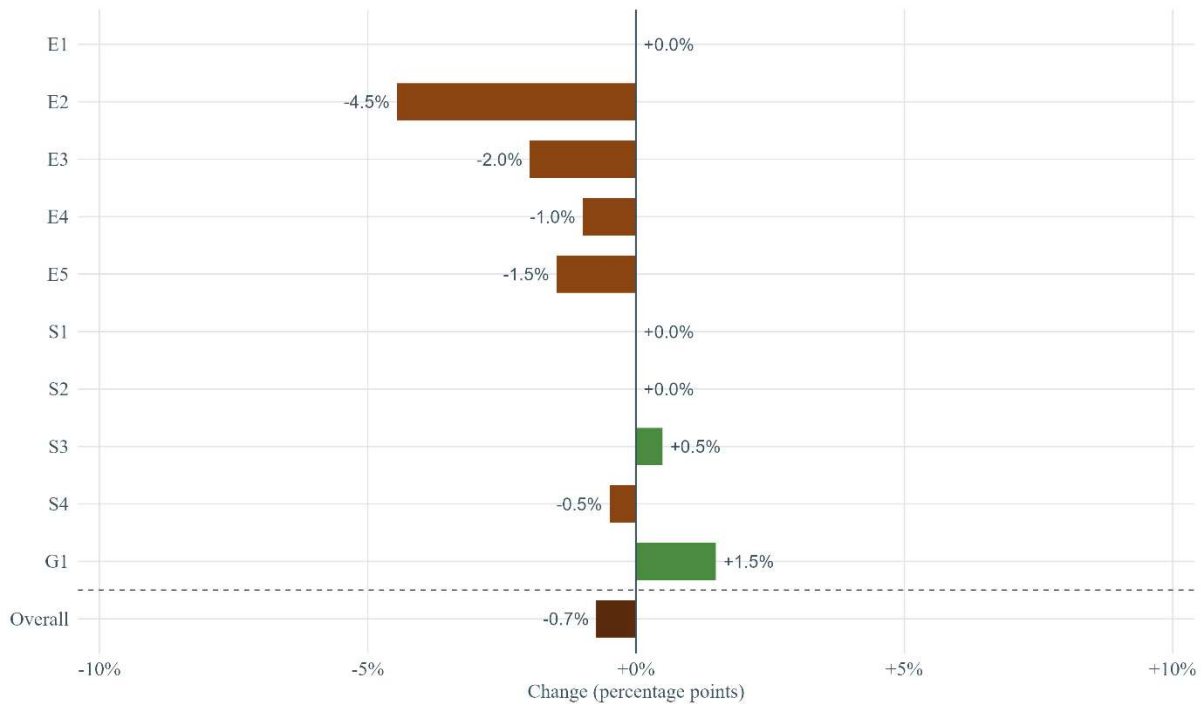


FIGURE 4 Year-on-year change in overall materiality rates by ESRS standard across the sample (percentage points). Matched sub-sample (n = 202). “Overall” depicts the average per-company change in the number of material topical standards.

04.3.2 UPGRADE AND DOWNGRADE RATES

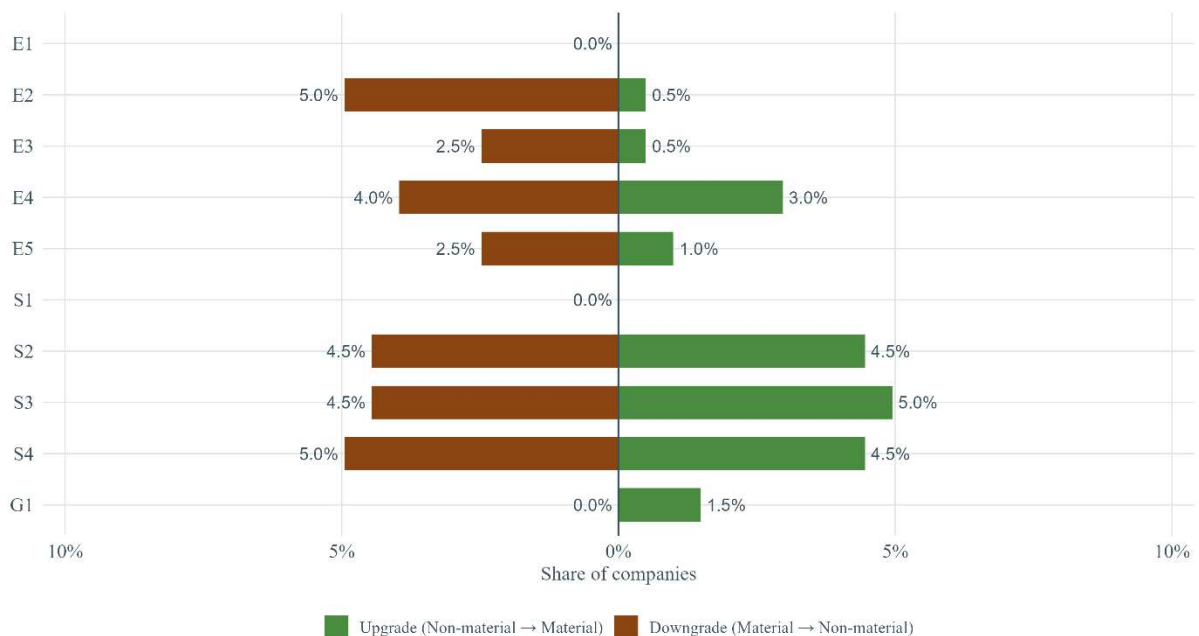


FIGURE 5 Upgrade and downgrade rates by ESRS standard. Matched sub-sample (n = 202).

Figure 5 shows upgrade and downgrade rates by standard. Downgrade rates substantially exceed upgrade rates when aggregating across standards, and for most individual standards. The highest

upgrade rates are observed for S3 (5.0%), S2 (4.5%) and S4 (also 4.5%), and the largest downgrade rates are observed for E2 (5.0%), S4 (5.0%), S2 (4.5%) and S3 (4.5%).

Overall, companies most often re-evaluate the materiality status of ESRS S2, S3, and S4, whereas the almost universally material standards E1 and S1 remain unchanged. ESRS G1, which similarly showed almost universal materiality already in FY2024, displays exclusively upgrades, which may be a sign of institutional pressure from peer-reporting bringing previously hesitant companies to reassess their evaluation of the standard.

04.3.3 CHANGE BY MATERIALITY DIMENSION

The differentiation between materiality dimensions summarized in Figure 5 reveals that companies consolidate their DMAs especially with regards to financial materiality: risks and opportunities show consistent net downgrades across almost all standards. Materiality rates have declined moderately year-on-year (cf. Figure 4), yet this decline is less pronounced than the retrenchment in the financial materiality dimensions would suggest. This pattern appears to be largely sustained by the stability of negative impact materiality which, aggregated across all standards, shows no significant movement. As long as a company identifies material negative impacts under a given standard, that standard remains material overall, irrespective of how financial dimensions are assessed.

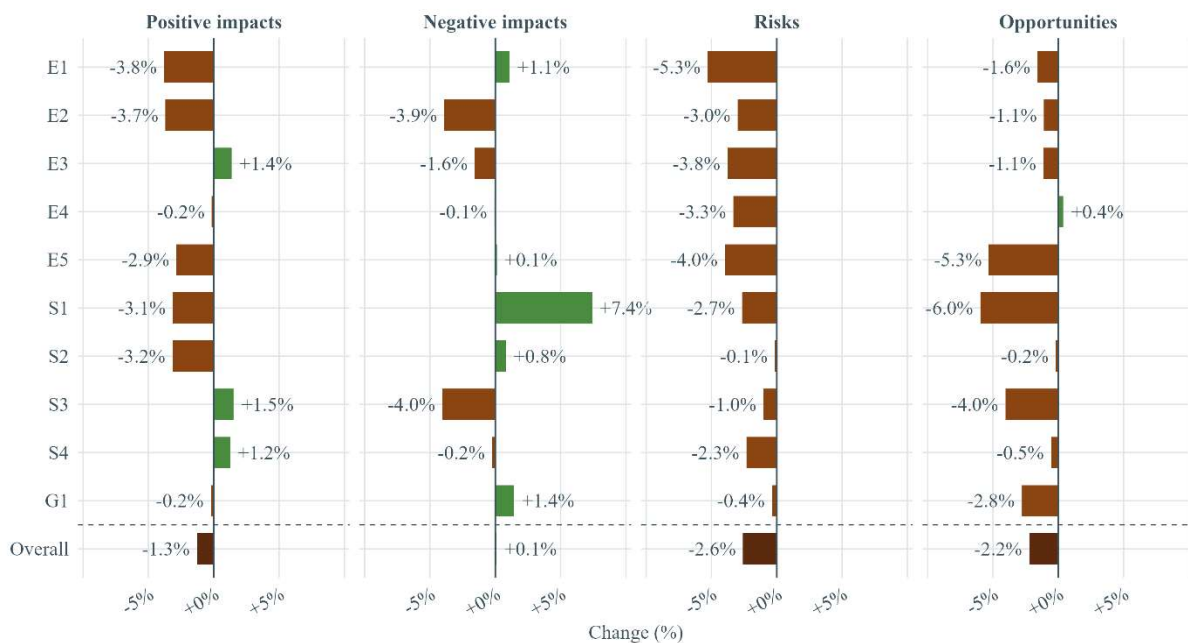


FIGURE 6 Year-on-year change in materiality rates by dimension. Matched sub-sample (n varies from 195 to 199 depending on firm-level DMA result documentation availability). “Overall” depicts the average percentage point change across all ten standards.

The relative stability and, in the case of ESRS S1, even substantial increase of negative impacts compared to risks and opportunities may reflect the asymmetric evidentiary burden associated with

different materiality types; negative impacts are arguably easier to identify and harder to contest, which may make them more resistant to consolidation over time. Notable exceptions are ESRS E2 and S3, where negative impact materiality shows a marked decline.

The results of the DMA can be reframed in terms of positive and negative perception of different sustainability topics. Averaging the change rates of positive impacts and opportunities into a 'positivity' dimension and negative impacts and financial risks into a 'negativity' dimension, one may observe interesting shifts in the perception of the standards (cp. Figure 7). Materiality positivity and negativity rates both decline year-on-year for ESRSs E1, E2, E5 and S3. More interestingly, the other standards show opposing patterns: for ESRSs E3, E4 and S4, companies assess marginally higher positive materiality but lower negative materiality in FY2025 compared to FY2024. For ESRSs S1, S2 and G1, the opposite is true; positive materiality decreases while negative materiality increases. The difference is most notable for ESRS S1, suggesting that companies increasingly perceive their workforce from a negative rather than a positive perspective for the purpose of sustainability reporting, driven mostly by more material negative impacts and less material opportunities related to the own workforce (cp. Figure 6).

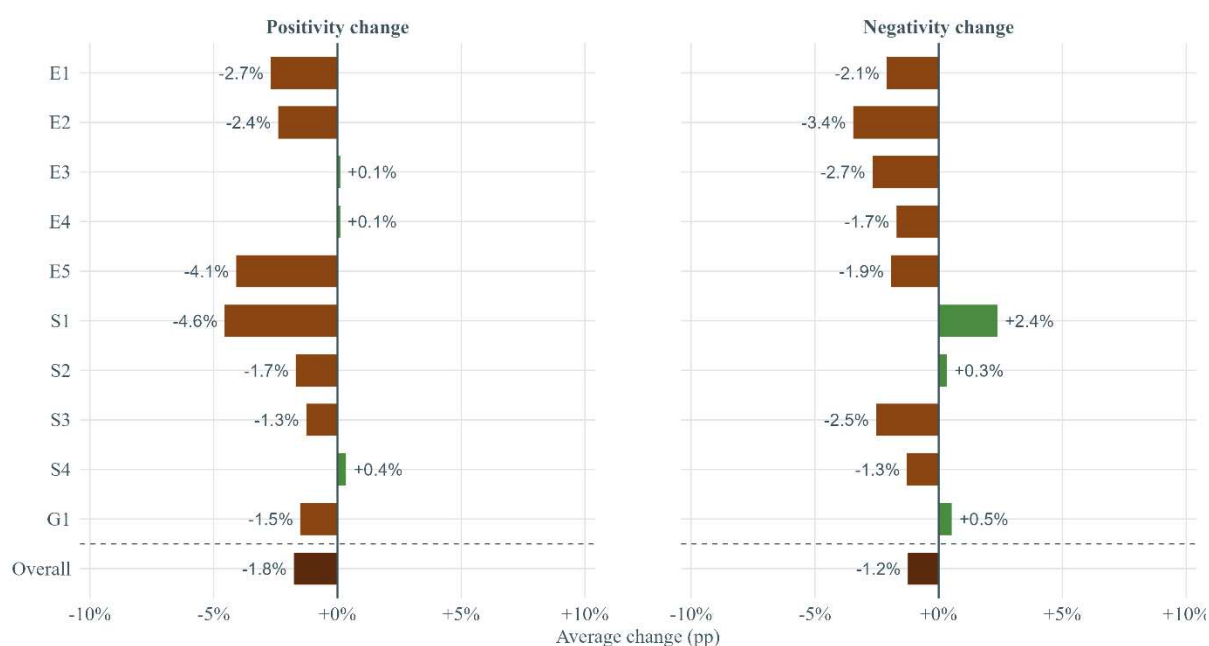


FIGURE 7 Year-on-year change in positivity and negativity implied by DMA results per ESRS. Matched sub-sample (n varies from 195 to 199 depending on firm-level DMA result documentation availability). “Overall” depicts the average percentage point change across all ten standards.

04.4 SECTOR PROFILES

For each sector with $n \geq 20$ in the matched sample – Industrials ($n = 52$), Consumer Discretionary ($n = 28$), and Financials ($n = 24$) – I provide four analyses. (Panel A) I measure the deviation in FY2024

overall materiality rates from the full FY2024 sample, calculated as the sector-specific materiality rate minus the full-sample rate for each ESRS standard. This highlights the sector-specific materiality profile relative to the cross-sectoral baseline. (Panel B) I calculate the analogous deviation at the dimension level (separately for positive impacts, negative impacts, financial risks, and opportunities) providing a more granular view of where sector-specific patterns originate and allowing the identification of dimension-level differences even where overall materiality rates are broadly in line with the full sample.

Further, I provide two analyses based on the matched sub-sample for which FY2025 data are available: (Panel C) the net year-on-year change in overall materiality per ESRS standard, calculated as the FY2025 materiality rate minus the FY2024 rate within the matched sub-sample; and (Panel D) the analogous year-on-year change at the dimension level. Note that Panels A and B are based on the full FY2024 sample for the respective sector, while Panels C and D are based on the matched sub-sample only. Sector-level results should therefore be interpreted with particular caution where matched sub-sample sizes are small, as individual company changes can translate into large percentage-point movements.

This caveat applies particularly to sectors where the matched sub-sample falls below $n = 20$: Materials ($n = 17$), Information Technology ($n = 16$), Communication Services ($n = 16$), Consumer Staples ($n = 18$), Health Care ($n = 15$), and Utilities ($n = 11$). Real Estate ($n = 5$) and Energy ($n = 4$). For these sectors, I therefore limit the analysis to overall materiality rates in FY2024 and year-on-year changes in overall materiality, corresponding to analyses (1) and (3) described above. Dimension-level analyses are not reported given the limited interpretability at these sample sizes.

04.4.1 INDUSTRIALS (N = 52)

Industrials displays a mixed picture at the level of overall materiality rates: while E1, E3, S1, and G1 are broadly in line with the full sample, the sector shows markedly above-average materiality for E2, E4, E5, S2, and S3, and substantially below-average materiality for S4. The dimension breakdown reveals that above-average materiality is predominantly driven by negative impacts and financial risks, consistent with the sector's direct exposure to production-related environmental and social impacts. S4 stands apart through below-average materiality across all four dimensions, most markedly for positivity dimensions (positive impacts; -16.9%, and opportunities; -16.5%), reflecting the sector's limited direct end-user exposure. A notable exception to the negative framing is E1 opportunities (+15.8%), suggesting that companies in the Industrials sector see above-average financial opportunities in the climate transition. Both G1 and S1 are more frequently framed negatively compared to the overall sample, consistent with compliance-driven governance and heightened occupational health and safety exposure, respectively.

Year-on-year, overall materiality rates in the Industrials sector are broadly stable. At the dimension level, the consolidation is most pronounced for financial materiality: E5 risks (-13.8%) and S1 opportunities (-12.9%) show the largest absolute declines. S1 negative impacts (+6.6%) is the clearest dimension of increasing materiality. S3 negative impacts decline markedly (-10.6%), suggesting that Industrials companies are reconsidering the extent to which they identify adverse community effects as material, even though this does not (yet) affect overall materiality of ESRS S3.



FIGURE 8 Materiality profile for Industrials. Panel A: materiality rates by standard vs. full-sample average (FY2024, n=59). Panel B: deviations from overall sample per materiality dimension and ESRS (FY2024, n=55-57 depending on firm-level DMA result documentation availability). Panel C: Year on year change in materiality rates by standard vs. full sample (FY2024 vs. FY2025, matched n=52). Panel D: Year on year

change in materiality by dimension (FY2024 vs. FY2025, matched n=51 due to lower availability of firm-level DMA result documentation).

04.4.2 CONSUMER DISCRETIONARY (N = 33)

Consumer Discretionary shows a distinctive materiality profile driven primarily by environmental standards and consumer- / end-user exposure. S4 (+17.3%), E3 (+15.3%) and E5 (+8.2%) are assessed as material substantially more frequently than in the full sample.

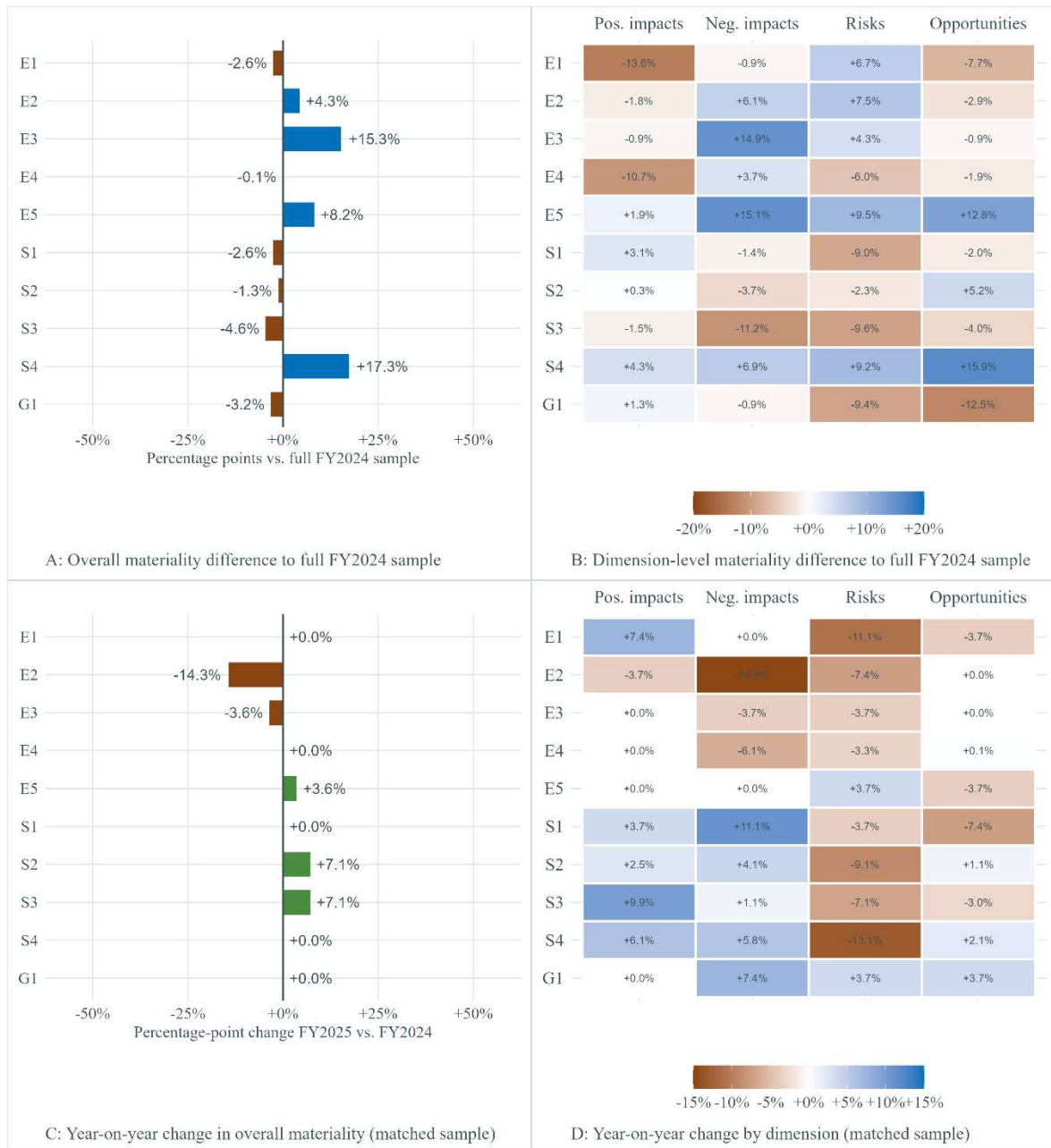


FIGURE 9 Materiality profile for Consumer Discretionary. Panel A: materiality rates by standard vs. full-sample average (FY2024, n=33). Panel B: deviations from overall sample per materiality dimension and ESRS (FY2024, n=32-33 depending on firm-level DMA result

documentation availability). Panel C: Year on year change in materiality rates by standard vs. full sample (FY2024 vs. FY2025, matched n=28). Panel D: Year on year change in materiality by dimension (FY2024 vs. FY2025, matched n=26-27 depending on firm-level DMA result documentation availability).

The dimension breakdown reveals that E3 and E5 above-average materiality is predominantly driven by negative impacts, consistent with the sector's exposure to resource-intensive supply chains and product lifecycles, while E5 also shows markedly above-average financial materiality (risks and opportunities). S4's above-average materiality is broadly distributed across all dimensions, with opportunities showing the strongest deviation (+15.9%), suggesting that Consumer Discretionary companies see material financial upside in managing their end-user relationships and product sustainability.

E1 seems to be material rather from a negative perspective: while overall materiality is in line with the full sample, positive impacts (-13.6%) and opportunities (-7.7%) are less often identified as material and risks (+6.7%) are identified as material more often than in the overall sample.

Year-on-year, the sector shows a strong decline in E2 materiality (-14.3%), driven mostly by lower negative impact (-14.8%) and risk materiality (-7.4%), shifting the sector sentiment toward positivity. Next to ESRS E2, the strongest dimension-level changes are observed in ESRSs S4 (-13.1% risks), E1 (-11.1% risks) and S1 (+11.1% negative impacts) but these deviations do not affect overall standard-level materiality.

04.4.3 FINANCIALS (N = 25)

The Financials sector displays the most distinctive materiality profile in the sample, characterised by markedly below-average materiality across almost all environmental standards and several social standards. E5 (-51.7%), E3 (-42.3%) and E2 (-42.2%) show the largest negative deviations observed across all sector profiles, consistent and extreme across all dimensions. This pattern reflects the sector's fundamental structural differences to other sectors: financial institutions do not produce goods, generate direct emissions at scale, or consume significant material resources in their own operations, which substantially reduces the materiality of environmental standards for their own operations and upstream value chain.

The picture in what is likely driven by the downstream value chain is more nuanced. E1 overall materiality is in line with the full sample, likely reflecting institutional pressure of the E1-specific disclose-or-explain approach as well as recognition of climate-related positive and negative impacts through financing- and insurance-related activities as well as systemic financial risks. The sharply below-average materiality of the remaining environmental standards may reflect two compounding factors: first, responsibility diffusion through diversified portfolio stakes makes attribution of specific

environmental impacts to individual institutions methodologically challenging; and second, the ESRS were primarily designed for real-economy companies and currently lack sector-specific guidance that would make downstream environmental materiality more tractable for financial institutions. The trend is less strong for ESRS E4, suggesting that the financial sector acknowledges relatively more connection of its activities with biodiversity-related issues, especially through nature-related opportunities which show the lowest deviation to the overall sample (-4.0%).

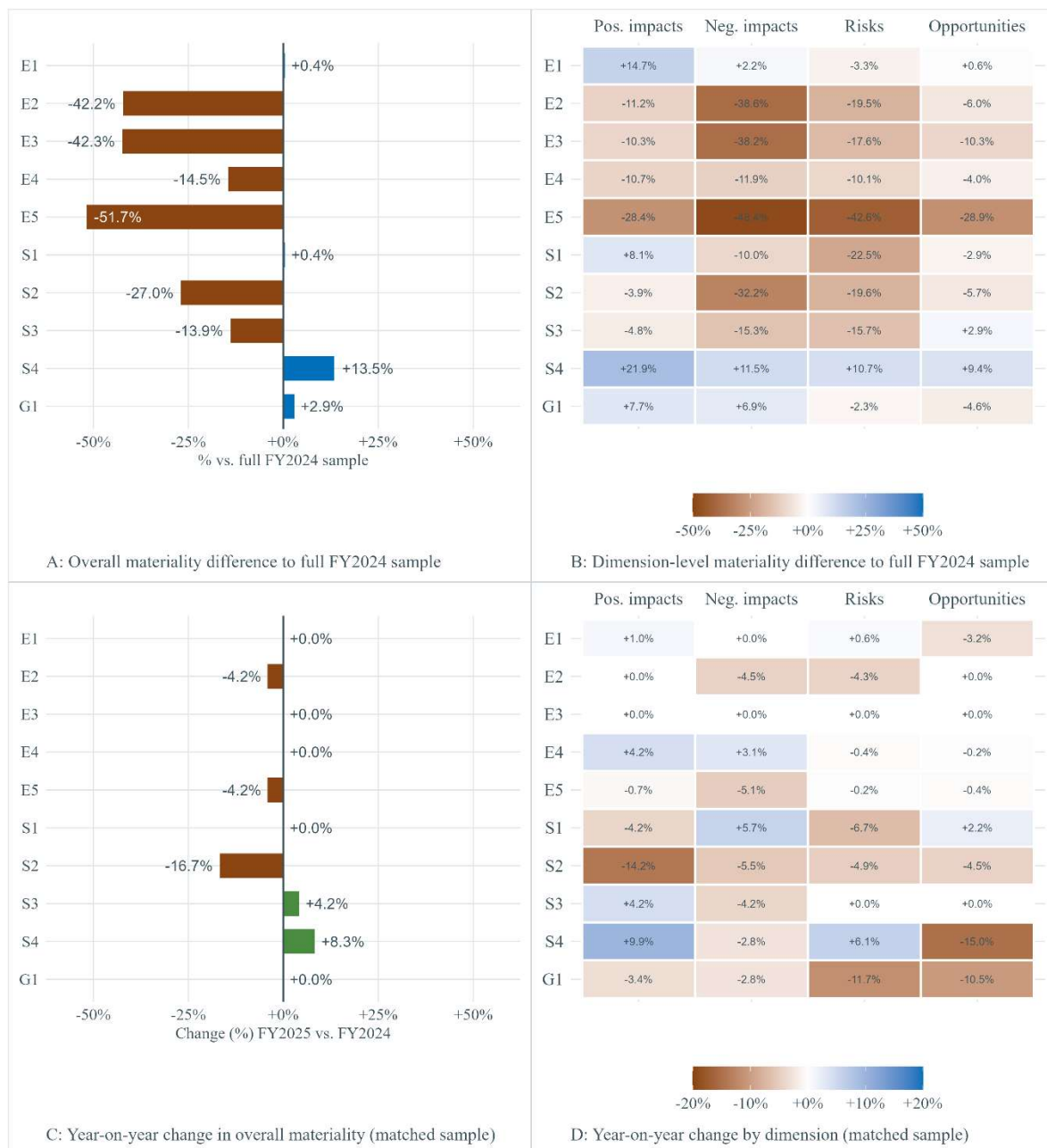


FIGURE 10 Materiality profile for Financials. Panel A: materiality rates by standard vs. full-sample average (FY2024, n=25). Panel B: deviations from overall sample per materiality dimension and ESRS (FY2024, n=23-25 depending on firm-level DMA result documentation availability). Panel C: Year on year change in materiality rates by standard vs. full sample (FY2024 vs. FY2025, matched n=24). Panel D: Year on year

change in materiality by dimension (FY2024 vs. FY2025, matched n=23-24 depending on firm-level DMA result documentation availability).

S2 (-27.0%) and S3 (-13.9%) show patterns similar, albeit less pronounced, for reasons analogous to E2, E3 and E5, while S4 (+13.5%) and G1 (+2.9%) are the only standards with above-average materiality, consistent with the centrality of customer relationships and governance for the trust-based business models in the financial services sectors.

Year-on-year, S2 declines further (-16.7%), driven by less material positive impacts identified, while S3 and S4 each increase modestly. The most notable dimension-level development is a decline in G1 financial materiality across both risks (-11.7%) and opportunities (-10.5%), suggesting that Financials companies are consolidating their governance materiality away from a financial materiality framing – a notable finding given the sector's traditionally strong focus on governance as a financial risk factor.

04.4.4 SECTORS WITH FEWER OBSERVATIONS: MATERIALS, INFORMATION TECHNOLOGY, COMMUNICATION SERVICES, CONSUMER STAPLES, HEALTH CARE, UTILITIES

Due to sub-sample sizes below the reporting threshold in the matched sample, the following overviews are limited to overall materiality rates and should be treated as indicative only. Figure 11 reports the overall materiality rates for smaller sectors across all ESRS, whereas Figure 12 shows the change rates from FY2024 to FY2025 on standard-level.

Communication Services (n = 22) shows a strongly polarised environmental profile: while E1 and E5 are near-universal at 100% and 86.4% respectively, E2 (4.5%), E3 (9.1%), and E4 (18.2%) are among the lowest rates observed across all sectors, consistent with the limited direct physical environmental footprint of communication companies. S4 (95.5%) is above the full-sample average, reflecting the sector's significant end-user exposure. Year-on-year, the sector is almost entirely stable, with S2 showing the only change (+6.2%), corresponding to a single company in the matched sample of n = 16.

Consumer Staples (n = 18) stands out for its universally high E5 materiality rate of 100%, the highest observed for this standard across all sectors, likely driven by packaging. E3 (72.2%) and E4 (50.0%) are also above the full-sample averages. G1 falls slightly below universality at 88.9%, while E2 (38.9%) and S3 (22.2%) are notably below the full-sample averages. Year-on-year, E4 and G1 show the largest increases (+14.3% each), while E3 and S2 decline (-7.1% each). Given the matched sample of n = 14, each change of 7.1 percentage points corresponds to a single company.

Health Care (n = 17) shows above-average materiality for several environmental standards, most notably E5 (94.1%), E2 (82.4%) and E3 (64.7%), which substantially exceed the full-sample averages. S3 (23.5%) is the main below-average standard. Year-on-year, the sector shows a broadly

downward pattern, with S3 recording the largest decline (-20.0%), followed by E4 and S2 (-13.3% each). Notably, S3 was already among the lowest rates in FY2024, making its further decline particularly interesting. Given the matched sample of n = 15, individual changes of 6.7 percentage points correspond to a single company.



FIGURE 11 Overall FY2024 materiality rates for sectors with few observations. Note that confidence intervals are wide and figures are indicative only.

Information Technology (n = 23) displays markedly below-average materiality across almost all environmental standards except E1, with E4 at 4.3% being the lowest rate observed for any standard across all sectors in this study. This is consistent with the sector's limited direct physical

environmental footprint. Social standards are also generally below average, with S3 (21.7%) and S4 (65.2%) below the full-sample rates. Year-on-year, the sector is largely stable; E5, S3, and S4 each decline by 6.2 percentage points while G1 increases by the same amount, each corresponding to a single company in the matched sample of n = 16.



FIGURE 12 Change of materiality rates FY2025 vs. FY2024 for sectors with few observations. Note that confidence intervals are wide and figures are indicative only.

Materials (n = 23) shows a strongly environment-focused profile, with E2 (82.6%) and E3 (73.9%) substantially above the full-sample averages, consistent with the sector's direct exposure to pollution-intensive extraction and processing activities. S4 (30.4%) is markedly below the full-sample average

of 70.8%, reflecting limited direct end-customer exposure in a predominantly B2B sector. Year-on-year, S3 shows the largest increase (+11.8%), while S4 records the sharpest decline (-11.8%). Given the matched sample of $n = 17$, individual changes of 5.9 percentage points correspond to a single company.

Utilities ($n = 11$) shows an environment-heavy profile consistent with the sector's physical infrastructure and energy generation activities. E4 (72.7%) and S3 (81.8%) are substantially above the full-sample averages of 42.7% and 38.1% respectively, the latter likely reflecting significant local community impacts through infrastructure projects and land use. S4 (54.5%) is below the full-sample rate of 70.8%. Year-on-year, the sector is almost entirely stable, with only E5 showing a decline (-9.1%), corresponding to a single company in the matched sample of $n = 11$.

05 DISCUSSION AND CONCLUSION

05.1 OPERATIONALIZATION OF FIRM-ASSESSED DOUBLE MATERIALITY

This paper advances the empirical operationalization of double materiality by constructing a systematic, large-scale dataset of DMA outcomes at the IRO-dimension level. Existing empirical work on sustainability reporting materiality has predominantly relied on industry-implied financial materiality (Grewal et al., 2021; Khan et al., 2016; Schiehl & Kolahgar, 2021). By distinguishing between positive impacts, negative impacts, financial risks, and opportunities for each of the ten topical ESRS, the coding approach applied here captures a dimension of the DMA that is conceptually central to the CSRD framework but has not previously been documented at scale. The resulting dataset enables a more granular analysis of how companies interpret and apply the double materiality concept in practice, and how these interpretations evolve over time. It allows for a firm-specific measurement of impact-, financial- and double-materiality for companies that comply with the DMA-related provisions of the ESRS as well as a novel assessment of materiality negativity and positivity toward certain sustainability-related topics.

05.2 MATERIALITY DYNAMICS IN EARLY CSRD IMPLEMENTATION

The most consistent finding across standards and sectors is a moderate decline in overall materiality rates between FY2024 and FY2025, driven primarily by environmental standards. E2 (Pollution) shows the largest decline (-4.5%), followed by E3 (-2.0%), E5 (-1.5%), and E4 (-1.0%). Most social standards remain broadly stable, with S1 and S2 recording no net change. G1 and S3 are the only standards with positive net changes (+1.5% and +0.5% respectively). Three non-mutually-exclusive interpretations may account for the overall pattern. First, the decline may reflect a genuine learning effect: companies conducting their DMA for the second time may apply more rigorous processes, yielding more targeted and defensible materiality determinations. Second, feedback from the first

CSRD reporting season and simultaneous debates around simplification and reporting proportionality may have shifted companies' materiality thresholds. Third, isomorphic pressures created as companies observe sector peer reporting may be producing convergence towards lower, sector-norm materiality levels.

The dimension-level analysis reveals that this consolidation is not uniform across materiality types. Risks and opportunities decline consistently across almost all standards, while negative impacts show a more mixed picture: the overall negative impact dimension is supported by a marked increase for S1 (+7.5%), which partially offsets reductions elsewhere. Positive impacts decline across most standards, with the notable exception of a marginal positive tendency for E3 (+1.4%) and modest increases for S3 and S4 (+1.2% and +0.8% respectively). This pattern is broadly consistent with the view that negative impacts, once identified as traceable to a company's activities, are harder to contest than financial risks and opportunities, which are more susceptible to judgement and reinterpretation.

The reframing of materiality in terms of positive and negative perception reveals further heterogeneity. While almost all standards show declines in both positivity (average -1.8%) and negativity (average -1.2%), the patterns diverge for two standards. S1 shows a pronounced shift towards negative framing: positivity declines sharply (-4.6%) while negativity increases substantially (+2.4%), suggesting that companies increasingly frame workforce topics as a source of risk and adverse impact rather than positive impact or opportunity. S2 shows a similar though more modest pattern (-1.7% positivity, +0.3% negativity).

Figure 5 shows that most standards experience movement in both directions; some companies newly identify standards as material that were previously non-material, and vice versa. E1 and S1 are exceptions, showing neither upgrades nor downgrades, consistent with the near-ceiling materiality rates for these standards leaving little room for movement. G1 shows only upgrades (1.5%), despite already being at near-universality in FY2024 (97.5%). This likely reflects isomorphic pressure: companies that initially assessed G1 as non-material appear to have revised this judgement in response to near-universal G1 materiality among their peers. S2, S3, and S4 show the largest gross movements, each with downgrade and upgrade rates between 4.5% and 5.0%.

Sector-level analyses reveal substantial heterogeneity that aggregate trends obscure. The Financials sector shows structurally lower materiality rates across almost all standards, consistent with its limited direct physical footprint and the methodological challenges of attributing financed impacts to individual institutions. Industrials and Materials show the opposite pattern, with markedly above-average environmental materiality driven predominantly by negative impacts and financial risks. Consumer Discretionary and Communication Services show elevated S4 materiality, reflecting their substantial end-user exposure.

05.3 IMPLICATIONS FOR PRACTICE AND POLICY

The findings carry several implications for preparers, users, and standard-setters.

For preparers, the sector profiles documented here provide an empirical overview of market practice that can serve as a benchmark for companies assessing whether their own materiality profile is plausible relative to peers; both as a sanity check and as a defence against stakeholder challenges. The near-universal convergence on G1 materiality suggests that companies still assessing G1 as non-material face increasing justification pressure. More broadly, the evidence of increasing readability and consistency of DMA disclosures in the second reporting year suggests that companies already subject to the CSRD are establishing de facto best practices that later reporting waves and voluntary reporters will likely need to align with.

For users of sustainability reports, including investors, analysts, and civil society, the declining materiality rates carry an important cautionary note: the information base available under CSRD may be narrowing rather than expanding as companies consolidate their assessments, independently of any formal simplification through the Omnibus procedure. Users relying on CSRD data for comparability or monitoring should be aware that year-on-year reductions in materiality rates directly translate into reduced disclosure obligations and therefore reduced data availability. The sector heterogeneity documented here further suggests that cross-sector comparisons of materiality assessments (especially when they include sectors like Financials that are particularly different from remaining sectors) may be of limited value; sector-adjusted benchmarks are more appropriate for meaningful analysis.

For standard-setters, the findings raise several considerations. First, the bidirectional movement in materiality assessments, even within the existing framework and prior to the most substantial Omnibus simplifications, demonstrates that companies are actively revisiting their DMAs and that the system remains fluid. Second, the strong heterogeneity among GICS sectors, particularly pronounced in the Financials sector, may be interpreted as supportive for sector-specific ESRS guidance: without it, the ESRS in general, but in particular the DMA may not fully reflect sectoral specificities.

05.4 LIMITATIONS AND OUTLOOK

Several limitations should be noted. First, the sample covers only the first wave of companies subject to the CSRD (particularly large, listed EU entities) and findings should not be generalized to smaller or non-listed companies that will be phased into the reporting regime in subsequent years. Second, the binary coding approach abstracts from the depth and quality of individual materiality assessments: two companies may both record a standard as material while differing substantially in the rigour and granularity of their underlying DMA, a distinction the present dataset cannot capture. Third, the ESRS require companies to assess IROs on a gross basis, prior to the application of mitigation measures. In practice, not all companies may have fully adhered to this requirement, particularly in FY2024 which

marks the first year of CSRD-implementation. For instance, a company with strong responses to its substantial environmental impacts should, under ESRS, nevertheless report material gross negative impacts and explain mitigation measures in the resulting disclosures. It is possible, however, that some companies did not follow this logic and instead recorded mitigation measures as positive impacts, rather than as responses to material negative impacts. More broadly, firm-level materiality decisions may not perfectly reflect the conceptual construct the ESRS framework intends to measure, introducing measurement error at the company level that cannot be identified or corrected through the coding approach applied here. Fourth, FY2025 data were not fully collected at the time of writing; year-on-year analyses are therefore preliminary. Fifth, the ESRS are subject to ongoing revision (European Commission, 2025a), which introduces two additional constraints. On the one hand, future changes to the standards may limit the comparability of the materiality rates documented here with those reported in subsequent years. On the other hand, the anticipation of further regulatory changes may itself affect firm behaviour during the period under study: companies may adjust their DMAs more cautiously than they would in a stable regulatory environment, which would limit the representativeness of the dynamics observed here for other mandatory reporting implementation phases.

Future research may further explore the differences between industry-implied and firm-assessed materiality as well as other potential applications for firm-specific materiality indicators including materiality positivity and negativity. Further iterations of ESRS reporting or general improvements of reporting practices may additionally allow for more refined operationalizations that consider the relative importance of individual IROs for a more nuanced picture of materiality, rather than referring to dimension-level overall materiality only. Finally, the ongoing simplification initiatives under the EU Omnibus procedure represent an important avenue for future monitoring: whether and how proposed changes to CSRD scope and granularity affect companies' materiality assessments and the depth of DMA-related disclosures remains an open empirical question with direct relevance for the comparability of evidence over time.

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APPENDIX

Country	FY2024	FY2025
Austria	15	11
Belgium	8	8
Croatia	1	1
Czech Republic	1	1
Denmark	20	18
Estonia	5	5
Finland	26	24
France	34	27
Germany	35	31
Greece	2	2
Hungary	1	0
Ireland	3	2
Italy	32	24
Lithuania	1	0
Luxembourg	1	0
Netherlands	10	10
Poland	17	12
Portugal	3	3
Romania	2	2
Slovenia	1	1
Spain	23	20
Total	241	202

TABLE 3. Sample distribution of companies with a CSRD-compliant sustainability report by country for FY2024 and FY2025.