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# First-Year Compliance with ESRS Environmental Standards: Evidence from Polish Construction Companies in the Inaugural CSRD Reporting Period

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**Abstract**

The Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRSs) fundamentally transform non-financial reporting in the European Union, yet empirical evidence on first-year compliance—particularly in Central and Eastern Europe (CEE) and in construction—remains scarce. This study provides a first, exploratory assessment of ESRS E1–E5 environmental disclosure compliance among Polish construction companies in the inaugural year of mandatory CSRD reporting. A structured content analysis of three purposively selected groups' FY 2024 sustainability reports (Budimex, ERBUD, WPIP) applied a three-point scale (0–2) to a 39-item disclosure checklist, yielding 117 assessments. The compliance rate across the three groups studied was 73%, ranging from 86% (ERBUD) to 54% (WPIP). ESRS E5 (Resource Use and Circular Economy) proved most challenging (57%); recurrent deficiencies included missing CAPEX/OPEX allocations and unjustified omissions of anticipated financial effects. Distinguishing substantive disclosure from procedural responses (documented non-materiality, transitional relief, and exemptions) lowers this to 41% and reverses the ranking of the two mandatory reporters. This pattern is consistent with organisational decoupling, in that headline compliance figures systematically overstate the environmental information actually reported. Prior reporting experience was positively associated with compliance, although the small purposive sample precludes causal inference. The findings establish a baseline for monitoring ESRS implementation in the CEE construction sector.

**Keywords:** CSRD compliance; ESRS environmental standards; sustainability reporting quality; organisational decoupling; double materiality; content analysis; construction sector; Poland; reporting experience

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## 1. Introduction

The accelerating urgency of climate change and broader sustainability challenges has fundamentally reshaped the regulatory landscape for corporate reporting in the European Union. The Corporate Sustainability Reporting Directive [1], adopted in December 2022, replaces the Non-Financial Reporting Directive (NFRD) and substantially expands its scope, extending mandatory sustainability reporting to an estimated 50,000 undertakings across EU Member States [1,2]. The CSRD is operationalised through the European Sustainability Reporting Standards (ESRSs), twelve topical standards adopted by the European Commission as delegated acts in 2023 [2]. The ESRSs depart from prior frameworks by imposing

standardised, granular, and externally assuring disclosure requirements, thereby transforming sustainability reporting from a largely discretionary practice into an auditable compliance obligation comparable in rigour to financial reporting [3]. In doing so, the CSRD operationalises core commitments of the European Green Deal and supports EU progress toward the Paris Agreement climate targets and the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action) [4].

The construction sector occupies a particularly prominent position within this regulatory transition. Construction and the built environment together account for approximately 37% of global energy-related $CO_2$ emissions, 50% of all raw material extraction, and substantial shares of water consumption and waste generation [5]. Despite this significance, the sector has historically trailed the energy, finance, and manufacturing industries in the quality and completeness of sustainability disclosures [6]. Poland holds the largest construction market in Central and Eastern Europe (CEE) by output and employment, making it a strategically relevant case for examining first-year ESRS compliance in the region. The transition from NFRD-compliant reporting to the considerably more demanding ESRS framework therefore represents a substantial operational and governance challenge for construction companies.

Fiscal year (FY) 2024 marks the first reporting period for which the largest undertakings in the EU are legally required to apply the ESRSs [1]. In Poland, the CSRD was transposed into national law on 6 December 2024 [7], bringing the country's largest public-interest entities into scope with immediate effect. This circumstance creates a distinctive empirical window: the FY 2024 annual reports, published in 2025, constitute the first observable output of mandatory ESRS compliance. Examining how Polish construction companies have responded to these obligations in their inaugural reporting year is therefore of considerable scholarly and practical relevance. However, because transposition occurred after the end of the fiscal year for most entities, the legal obligation to apply the ESRSs for FY 2024 was not yet formally binding during the reporting period. The first-year compliance measured here therefore reflects a mixture of mandatory and anticipatory voluntary adaptation—a qualification revisited in the limitations.

The academic literature on non-financial disclosure quality offers a robust methodological foundation but provides limited empirical coverage of the current regulatory transition. Prior research has predominantly examined NFRD implementation in Western European contexts, particularly Italy, Spain, and Germany [8–11]. More recent work has begun to map early CSRD preparedness among large listed firms in selected EU jurisdictions [12,13]. Nevertheless, three substantive gaps persist. First, Central and Eastern European markets, and the construction sector in particular, remain markedly underrepresented in the empirical evidence [11]. Second, the relationship between prior NFRD reporting experience and ESRS compliance has been theorised but not empirically tested at the firm level [14]. Third, existing studies tend to report aggregate ESG scores rather than disaggregated, standard-by-standard analyses capable of identifying which specific topical requirements pose the greatest implementation challenges [15]. The Polish construction sector in FY 2024 is well suited to addressing these gaps. It combines a high-impact industry, a CEE jurisdiction reporting under the ESRSs for the first time, and natural firm-level variation in NFRD experience. This study's disaggregated, standard-by-standard design responds directly to the third gap.

This study is guided by three research questions, focusing exclusively on the five topical environmental standards: ESRS E1 (Climate Change), ESRS E2 (Pollution), ESRS E3 (Water and Marine Resources), ESRS E4 (Biodiversity and Ecosystems), and ESRS E5 (Resource Use and Circular Economy). Compliance is operationalised as formal com-

pleteness of required disclosures against the ESRS checklist—capturing the presence and structural adequacy of information rather than its veracity or alignment with actual environmental performance.

**RQ1:** What is the level of compliance of environmental disclosures made by Polish construction companies with ESRS E1–E5 in the first year of mandatory CSRD reporting?

**RQ2:** Which ESRS environmental standards present the greatest implementation challenges for construction sector entities, and what are the most common types of disclosure deficiency?

**RQ3:** Is prior experience with non-financial reporting under the NFRD associated with higher levels of ESRS compliance in the first year of mandatory CSRD reporting?

A purposive sample of three Polish construction groups (Budimex, ERBUD, and WPIP) was selected to maximise variation across reporting history, company size, and stock exchange listing status, thereby enabling direct examination of RQ3. Sustainability reports for FY 2024 were analysed using a structured content analysis approach with a three-point scoring scale (0–2), drawing on a 39-item disclosure checklist derived from the ESRS E1–E5 requirements. The confounds inherent in the purposive sampling design—notably the presence of one voluntary reporter and the impossibility of isolating prior experience from regulatory pressure—are addressed in full in Section 3.

The remainder of this article is structured as follows: Section 2 reviews the literature on sustainability reporting quality, the NFRD-to-CSRD regulatory trajectory, and construction sector disclosure; Section 3 describes the methodology; Sections 4 and 5 present the results and a discussion; Section 6 concludes.

## 2. Literature Review

### *2.1. The Regulatory Trajectory from the NFRD to the CSRD*

The obligation to disclose non-financial information in the EU was formally established by the Non-Financial Reporting Directive [16], which required large public-interest entities to report on environmental, social, and governance (ESG) matters from FY 2017. Despite representing a milestone in European sustainability governance, the NFRD revealed persistent limitations in practice. Anguiano-Santos et al. [10] demonstrated, in a comparative study of agri-food companies from Italy, the Netherlands, Germany, and Spain, that country-level differences accounted for only 6.1% of the variance in sustainability information disclosed, indicating that the Non-Financial Reporting Directive failed to achieve the harmonisation it sought. Romić et al. [11], analysing public-interest entities across thirteen Central and Eastern European (CEE) countries, found that disclosure quality improved significantly between 2017 and 2022 (Wilcoxon test, $p = 0.001$); nevertheless, substantial heterogeneity in comprehensiveness and specificity persisted throughout the NFRD period. The CSRD addresses these deficiencies through standardised ESRS requirements, mandatory third-party assurance, and the double materiality principle.

Early evidence on corporate readiness for this transition is sobering. Macuda and Kobiela-Pionnier [17] found that 67% of Polish WIG30 companies had not disclosed any actions related to the double materiality assessment (DMA) as of 2023, with engagement driven primarily by regulatory deadlines rather than proactive implementation. This pattern is consistent with coercive isomorphism, in which organisations adopt formal practices in response to external pressure rather than through genuine internalisation of sustainability objectives. Notably, that study measured readiness in 2023, i.e., before the CSRD transposition and before the FY 2024 reporting cycle; whether the same entities subsequently translated formal DMA processes into substantive ESRS disclosures in their FY 2024 reports remains an open empirical question that the present study begins to address. Lippai-Makra and Tóth [9] documented an analogous dynamic in Hungary, where total

disclosure intensity increased significantly across 2017–2022 (from a mean of 6.00 to 7.43 on a composite index); however, improvement was concentrated in the financial sector while other industries lagged, suggesting that sector-specific regulatory exposure moderates the pace of institutional adaptation.

### *2.2. Sustainability Disclosure Quality: Measurement Approaches and Benchmarks*

Content analysis with scoring rubrics applied to standardised disclosure checklists has emerged as the dominant method for assessing non-financial disclosure completeness. The methodological precedent most directly relevant to the present study was established by Venturelli et al. [18], whose pre-NFRD compliance assessment of Italian listed companies employed a three-point scale (0 = absent, 1 = partial, and 2 = full) to evaluate firm readiness against Directive 2014/95/EU. That study reported a mean compliance score of approximately 1.2 out of 2.0 for Italian companies in the year preceding the NFRD's entry into force, providing a Western European baseline for first-year regulatory compliance. Subsequent studies applied analogous approaches in mandatory reporting contexts: Lippai-Makra and Tóth [9] employed a 0–2 scale with composite indices for Hungarian NFRD compliance, while Romić et al. [11] adopted a graduated 0–1–2 quality scheme for CEE entities.

In CSRD/ESRS-generation studies, Azevedo et al. [19] found that, in a content analysis of twelve companies on the Portuguese stock index assessed against the ESRS 2 general disclosure requirements for FY 2022, none achieved complete compliance, although some firms partially satisfied individual requirements, with substantial variation across firms. Interpretation of this figure requires caution: Azevedo et al.'s study measured pre-implementation readiness before the mandatory effective date, whereas studies examining actual first-year compliance after the regulation entered into force capture a conceptually different construct. Direct numerical comparison between pre-implementation readiness scores and realised first-year compliance rates is therefore methodologically problematic and should be treated as indicative rather than conclusive. Matuszak et al. [13] similarly documented substantial gaps in Polish energy sector reports prepared under Global Reporting Initiative (GRI) standards relative to forthcoming ESRS requirements, with environmental sub-index scores ranging from 0.07 to 0.68. Collectively, these figures establish a practically relevant benchmark: first-year ESRS compliance rates in the range of 50–75% appear to represent the norm rather than the exception, even among large and experienced reporters.

Beyond coverage scores, qualitative dimensions of disclosure also differ systematically across firms. Demartini [8] found that stronger ESG performance is associated with more credible and transparent tonal characteristics in non-financial reports, suggesting that disclosure quality reflects substantive organisational commitment rather than merely formal compliance. Guthrie et al. [20], analysing Italian integrated reports, found that 93.8% of risk disclosures were non-monetary and 71.3% were neutral in tone—a disclosure profile characterised by retrospective narrative reporting that is structurally incompatible with the prospective, metric-intensive orientation required by the ESRSs.

### *2.3. The Construction Sector and Environmental Disclosure*

The construction sector presents a distinctive context for sustainability reporting research. Despite its pronounced environmental footprint—among the highest of any sector in terms of energy-related $CO_2$ emissions, raw material extraction, and waste generation—the sector has historically trailed the energy, financial, and manufacturing industries in disclosure quality (see Section 1 for quantitative estimates). Nováková [6] found that all fifty of the largest Czech construction companies published ESG data and that 92% held ISO certification; however, significant deficiencies remained in Scope 3 emissions reporting and Task Force on Climate-related Financial Disclosures (TCFD) implementa-

tion, areas that correspond directly to ESRS E1 and E2 requirements. Drozd [21], in a case study of the Budimex Capital Group (one of the companies examined in the present study), concluded that the group's ESG report primarily fulfilled an informational function, lacking sufficient linkage to strategic objectives and financial allocations—a finding that directly anticipates the capital expenditure (CAPEX) and operational expenditure (OPEX) disclosure deficiency identified in the present study's results. However, Drozd's analysis was conducted before FY 2024 and examined NFRD-era reports; whether the same limitation persisted into the first CSRD reporting year is an empirical question that the present study tests directly (see Section 4). This study therefore hypothesises, on the basis of Drozd's finding, that CAPEX/OPEX allocation deficiencies will recur across multiple ESRS standards.

Chang et al. [22], in a global study of the ten largest international construction contractors, demonstrated a positive Spearman correlation ($\varrho = 0.59$) between the ambition level of environmental initiatives and actual environmental performance improvements, suggesting that disclosure quality in the sector reflects substantive organisational commitment rather than mere reporting formality. That study's sample comprised only the ten largest global contractors (e.g., China State Construction, Vinci, and Hochtief), whose scale and resources substantially exceed those of Polish mid-sized construction groups; the generalisability of its findings to the Polish context is therefore constrained, though the correlation remains informative as an upper-bound benchmark. Andini and Rachmawati [23] identified limited funding, lack of enforcement, and the absence of standardised reporting frameworks as dominant barriers to ESG implementation among construction firms—constraints that are directly relevant to the situation of Polish mid-sized entities now entering the CSRD scope.

### *2.4. The CEE Context and the Research Gap*

Central and Eastern European markets remain markedly underrepresented in the empirical literature on sustainability disclosure quality. The studies most directly relevant to the Polish context—Romić et al. [11] on CEE public-interest entities and Lippai-Makra and Tóth [9] on Hungary—both document the positive effect of the NFRD regulatory framework on disclosure quality trajectories, while also demonstrating that CEE companies begin from lower baselines and exhibit greater heterogeneity than their Western European counterparts. To the author's knowledge, no published study has assessed ESRS environmental compliance for Polish construction companies in the first year of mandatory reporting, nor has any empirical study examined whether accumulated NFRD reporting experience translates into higher ESRS compliance at the firm level.

The relationship between prior reporting experience and CSRD readiness is theoretically grounded in organisational learning theory and neo-institutional theory, and yet it remains empirically unresolved. Agostini et al. [24], in a difference-in-differences analysis of Italian listed firms subject to Directive 2014/95/EU, found that mandatory non-financial disclosure exerted a significant positive effect on subsequent financial performance, consistent with mandatory regulation generating institutional pressure toward improved practice—suggesting that the transitional compliance burden is likely to be asymmetric across firms with differing reporting histories. Similarly, Aluchna et al. [25], examining the effects of the NFRD on ESG performance, found that firms' substantive response to mandatory disclosure varied considerably, with formal compliance not uniformly translating into improved practice. Dziwok and Ferens [26], in a survey of 325 Polish firms, documented a significant negative association between identified climate risks and declared disclosure scope, indicating that reporting scope is driven by regulatory expectations rather than by internal risk assessment. A methodological qualification is required here: Dziwok and Ferens [26] measured declared disclosure scope (firms' stated intentions), not actual

disclosed content; the present study therefore extends their work by examining actual ESRS disclosures, but direct comparability is limited by this difference in constructs. This finding raises substantive doubts as to whether formally experienced reporters have necessarily developed the analytical capacities that ESRS demands.

A second theoretical lens is required to interpret not whether firms comply, but how. Neo-institutional theory anticipates that organisations facing strong coercive pressure but limited internal capacity engage in decoupling—adopting the formal structures of compliance while leaving substantive practice only loosely coupled to them. Under the ESRSs, the double materiality assessment and the first-year transitional provisions create precisely the conditions in which symbolic, procedurally complete disclosure can substitute for substantive performance reporting. Whether early ESRS compliance is substantive or symbolic is therefore an empirical question, which the disaggregated and procedural-versus-substantive analyses developed below are designed to address.

Taken together, these unresolved questions directly motivate the three research questions formulated in the Introduction. Figure 1 presents the conceptual framework guiding this study, in which prior NFRD reporting experience and mandatory CSRD status are treated as the two primary explanatory dimensions, and firm size is acknowledged as a potential confounder.

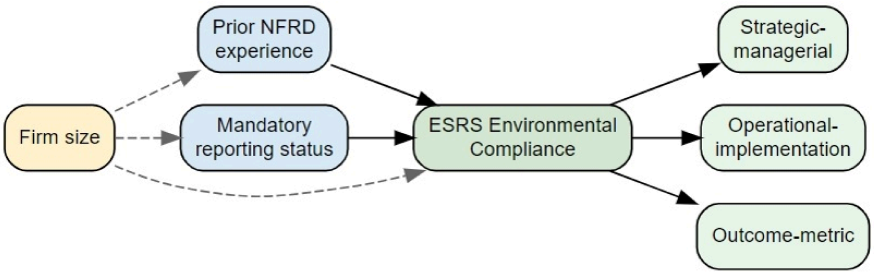



**Figure 1.** Conceptual framework: Determinants of ESRS environmental compliance in first-year mandatory reporting. The framework positions prior NFRD experience and mandatory reporting status as the two primary explanatory dimensions, with firm size as a potential confounder. ESRS compliance is operationalised across three disclosure categories: strategic-managerial, operational-implementation, and outcome-metric. Source: Own elaboration.

## 3. Methodology

### *3.1. Research Design and Analytical Approach*

This study employs a comparative multiple-case design in which a structured content analysis of sustainability reports published for fiscal year (FY) 2024 serves as the primary analytical instrument. The design prioritises analytical depth and theoretically informed cross-case comparison over statistical generalisation; accordingly, RQ3—concerning the relationship between prior reporting experience and compliance—is treated as exploratory and hypothesis-generating rather than confirmatory, a status reinforced by the sampling constraints discussed in Sections 3.2 and 3.4. Content analysis has become the dominant methodological approach in the non-financial disclosure literature, as it enables the systematic transformation of qualitative narrative text into quantifiable compliance indicators suitable for comparative examination [20]. The unit of analysis is the individual disclosure requirement as defined by the ESRSs. The scope of analysis is intentionally limited to the five topical environmental standards (ESRS E1 for Climate Change, ESRS E2 for Pollution, ESRS E3 for Water and Marine Resources, ESRS E4 for Biodiversity and Ecosystems, and ESRS E5 for Resource Use and Circular Economy), as these standards are most directly relevant to the construction sector's environmental footprint and constitute the primary empirical gap identified in the literature review.

The analysis evaluates the formal completeness of required disclosures. It does not verify the accuracy or methodological correctness of reported data, nor does it assess the double materiality process itself. Where a disclosure is omitted, the analysis examines only whether a substantiated justification was provided, not whether the underlying materiality determination was appropriate. Consequently, this study operationalises compliance as formal completeness against the ESRS checklist, recognising that this captures the presence and structural adequacy of information rather than its veracity or alignment with actual environmental performance.

### *3.2. Sample Selection*

A purposive sample of three Polish construction groups was selected: Grupa Budimex, Grupa ERBUD, and Grupa WPIP. Purposive sampling is appropriate when the research objective requires variation along theoretically relevant dimensions rather than statistical representativeness, and has been applied in analogous compliance studies examining small sets of strategically differentiated firms [18,27]. The three companies were selected to maximise heterogeneity across three criteria: (a) length of non-financial reporting history, (b) company size and capital market status, and (c) CSRD reporting obligation (mandatory versus voluntary).

Grupa Budimex is the largest Polish construction group by revenue, listed on the Warsaw Stock Exchange WIG20 index, and has published sustainability reports since 2011, with formal NFRD obligations applying from FY 2017. Grupa ERBUD is a mid-sized, publicly listed construction group that has reported on non-financial matters since 2016 and has undergone a significant strategic reorientation toward renewable energy since 2021. Grupa WPIP is a privately held company with no prior non-financial reporting history; its FY 2024 sustainability report constitutes its inaugural such publication, prepared on a voluntary basis. Key characteristics of the three entities are summarised in Table 1.

**Table 1.** Sample characteristics (FY 2024). Source: Own elaboration based on published FY 2024 sustainability reports.

| Characteristic | Grupa Budimex | Grupa ERBUD | Grupa WPIP |
|---|---|---|---|
| Stock exchange listing | WSE (WIG20) | WSE | Privately held |
| Sustainability reporting since | 2011 | 2016 | 2024 (inaugural) |
| NFRD obligation | Yes (from FY 2017) | Yes (from FY 2017) | No |
| Prior reporting experience (years, to FY 2024) | 13 (since 2011) | 8 (since 2016) | 0 |
| CSRD reporting status (FY 2024) | Mandatory | Mandatory | Voluntary |
| Employee threshold (FY 2024) | >750 | >750 | <750 |
| Notable characteristics | Largest Polish construction group by revenue; SBTi-validated climate targets | Strategic reorientation toward renewables since 2021; EMAS certification | First-time reporter; active in renewable energy (biogas) |

The selection of these three groups in particular follows from the analytical objectives rather than from convenience. Each case anchors a distinct, theoretically relevant position on the dimensions above: Budimex occupies the maximal-experience, mandatory, large-cap pole; WPIP, the zero-experience, voluntary, sub-threshold pole; and ERBUD, an intermediate position—mandatory and experienced, yet also distinguished by an unusually advanced environmental-management profile. This configuration is what makes the two comparisons on which RQ3 turns possible: the like-for-like contrast between the two experienced mandatory reporters (Budimex versus ERBUD), and the experience contrast

between ERBUD and WPIP. A sample drawn at random, or chosen simply to maximise size, would not reliably generate these specific contrasts.

A potential bias nonetheless requires direct acknowledgement. Because FY 2024 was the first mandatory ESRS cycle for only the largest public-interest entities, any study of first-year mandatory compliance is structurally confined to large, visible, well-resourced firms; the prominence of Budimex and ERBUD is thus a property of the regulated population, not an artefact of selection. WPIP is included precisely to offset this, introducing a small, privately held, low-visibility first-time reporter. Two residual biases cannot be eliminated within a three-case design and are carried into the limitations (Section 3.4): all three firms had published an accessible report, excluding any entity that produced none; and the two listed firms may be more capable than the median Polish construction company of comparable size. These caveats reinforce the exploratory, case-based reading of the results.

A critical qualification must be entered at this point. Because WPIP reports voluntarily rather than under a mandatory CSRD obligation, the ERBUD–WPIP comparison cannot isolate the effect of prior NFRD experience from that of regulatory pressure; this study therefore treats this comparison as indicative rather than causal (revisited in Section 3.4). The primary data sources are the sustainability reports published by the three groups for FY 2024, accessed in their published forms in 2025.

### *3.3. Scoring Instrument*

Compliance with each ESRS requirement was assessed using a three-point ordinal scoring scale (0–2), following the methodological precedent established by Venturelli et al. [18] in their pre-NFRD readiness assessment of Italian listed companies. The scale is operationalised as follows.

A score of 2 (full compliance) is assigned when the report provides the complete required information, including quantitative indicators, calculation methodology, and targets where applicable. A score of 2 is also awarded when a company formally omits a disclosure on the basis of a documented double materiality assessment, or when it explicitly invokes applicable transitional relief provisions, as both cases constitute legitimate, substantiated responses to ESRS requirements rather than unexplained omissions. This operationalisation introduces a distinction that warrants explicit scrutiny: a firm that has determined a topic to be non-material and therefore reports no operational data receives the same score (2) as a firm that reports complete, verified quantitative data. The two cases are treated as formally equivalent under the scoring protocol, yet they differ substantively—one reflecting procedural compliance, the other substantive data provision. This study retains this approach for consistency with the prior literature, but the limitation is addressed directly in Section 4.2, which reports a separate substantive-disclosure measure, and is revisited in Section 3.4, particularly for ESRS E2 and E4, where this feature materially affects the compliance rates reported here.

A score of 1 (partial compliance) is assigned when disclosures are present but lack quantitative indicators, or when the reported information does not cover the full scope required by the standard. A score of 0 (non-compliance) is assigned when required information is entirely absent without any supporting justification.

This scale reflects the distinction, widely recognised in the disclosure quality literature, between the mere presence of information and substantive, entity-specific disclosure [20,28]. Binary presence–absence scales, employed in some studies [10,29,30], fail to distinguish between boilerplate narrative statements and fully quantified, methodology-supported data. The 0–2 scale addresses this limitation by capturing degrees of completeness, thereby more accurately reflecting the granular requirements of the ESRSs.

A disclosure checklist of 39 items was derived directly from the mandatory and conditionally mandatory disclosure requirements of ESRS E1–E5. All 39 items are treated as equally

weighted in the calculation of compliance rates, meaning that a minor formal omission (e.g., absence of a cross-reference) receives the same weight as a substantive data gap (e.g., no Scope 3 emissions reporting). Equal weighting is adopted for three reasons. It follows the dominant convention in the comparable disclosure-scoring literature [9,11,18], preserving comparability with the benchmarks against which these results are interpreted. It avoids importing the researcher's subjective judgement about the relative importance of individual requirements into the headline metric. And the ESRSs themselves establish no formal hierarchy of importance among the mandatory and conditionally mandatory datapoints assessed here. To confirm that this convention does not drive the results, a sensitivity analysis re-computes every compliance rate under two differential schemes that progressively up-weight quantitative, metric-heavy disclosures relative to narrative ones; the principal findings prove robust to the weighting choice (Section 4.5). With three companies assessed against 39 items, a total of 117 individual assessments were completed. The maximum achievable score per company is 78 points, corresponding to a compliance rate of 100%. Standard-level compliance rates are calculated as the ratio of points obtained across all firms within a given standard to the maximum points achievable for that standard. The complete item-level scoring results for all 39 disclosure requirements across the three entities are presented in Appendix A, Table A1.

To facilitate thematic interpretation of the results, all 39 disclosure requirements are additionally classified into three categories: (i) strategic-managerial disclosures, encompassing governance structures, policies, and risk and opportunity identification processes (including IRO-1 and SBM-3 cross-cutting requirements); (ii) operational-implementation disclosures, encompassing action plans, resource allocation, and quantitative targets; and (iii) outcome-metric disclosures, encompassing quantitative performance indicators such as greenhouse gas (GHG) emissions volumes, energy and water consumption, waste generation, and the anticipated financial effects of environmental risks.

### *3.4. Limitations*

Several limitations warrant acknowledgement. First, the sample of three companies precludes statistical generalisation to the Polish construction sector or to the broader CSRD-obligated population; this study is designed for analytical depth and cross-case comparison rather than representativeness. Relatedly, the purposive design carries a visibility bias: the two mandatory cases are necessarily among the largest, most prominent firms in scope, and all three groups had published an accessible report, so the findings should not be read as typical of smaller or non-reporting Polish construction firms (Section 3.2). Second, the presence of a voluntary reporter (WPIP) alongside two mandatory reporters introduces a confound: observed differences in compliance cannot be uniquely attributed to prior NFRD experience versus regulatory obligation, so RQ3 is addressed associatively rather than causally. Relatedly, the literature treats "NFRD experience" as a binary variable, ignoring variation in its depth and quality—the framework used (GRI, TCFD, or national), and whether reports underwent voluntary assurance; the purposive sample cannot resolve this heterogeneity, which is flagged for future large-sample research. Third, the scoring process is inherently interpretive. Nevertheless, the coding was performed by a single researcher, and no formal inter-rater reliability coefficient (e.g., Cohen's $\kappa$ or Krippendorff's $\alpha$) was computed, since reliability statistics of this kind presuppose two or more independent coders. This is a genuine limitation of the design and is the principal reason the cross-case comparisons and RQ3 are framed as exploratory and hypothesis-generating rather than confirmatory. Three features partially mitigate the associated subjectivity risk without eliminating it. Coding followed the explicit a priori decision rules set out in Section 3.3. Every individual score is accompanied by a documented justification traceable to a specific passage of the source report, providing a complete audit trail through which any external party can verify or contest each assessment (Appendix A,

Table A1). And the borderline cases that most depend on coder judgement—chiefly the distinction between documented procedural compliance and substantive disclosure—are isolated and reported separately through the substantive-disclosure measure (Section 4.2), so that their effect can be inspected directly rather than taken on trust. Independent double-coding by a second researcher, with a reliability coefficient computed on at least a pilot subset of items, remains a clear priority for confirmatory replication and is identified as such in the future-research agenda (Section 6). Fourth, the scoring protocol applies equal weighting to all 39 items and awards full points (2) both for substantive quantitative disclosures and for formally documented non-materiality determinations or transitional relief invocations; consequently, a firm may achieve a high compliance score without reporting operational data, as illustrated by ESRS E2 (ERBUD) and E4 (WPIP). The magnitude of this effect is quantified in Section 4.2 through a separate substantive-disclosure measure. Fifth, the analysis relies exclusively on self-reported data and therefore reflects reported rather than verified compliance [28]. Finally, as a cross-sectional study of the inaugural reporting year, the findings establish a baseline rather than a trajectory; the first-year transitional relief provisions under ESRS 1 Appendix A structurally compress compliance variability, so the FY 2024 rates reported here are not directly comparable with subsequent reporting cycles in which these provisions no longer apply.

## 4. Results

### *4.1. Overall Compliance Scores*

The content analysis yielded 117 individual assessments across three companies and 39 disclosure requirements. The mean compliance rate across the three firms, taken over all five ESRS environmental standards, was 73%. At the entity level, Grupa ERBUD achieved the highest total score of 67 out of 78 points (86%), followed by Grupa Budimex with 62 points (79%). Grupa WPIP recorded the lowest result, at 42 points (54%). The range between the highest and lowest entity scores was 32 percentage points, indicating substantial within-sample heterogeneity that the sample mean alone does not capture. Per-entity and per-standard compliance rates are presented in Figure 2. These headline figures, however, form only the contextual layer of the analysis. Because the scoring protocol awards full marks both for substantive data and for documented procedural responses (Section 3.3), the headline rate conflates two distinct things; the primary analytical lens in what follows is therefore the substantive-disclosure measure developed next (Section 4.2), against which the per-standard and per-category results (Sections 4.3 and 4.4) are read.

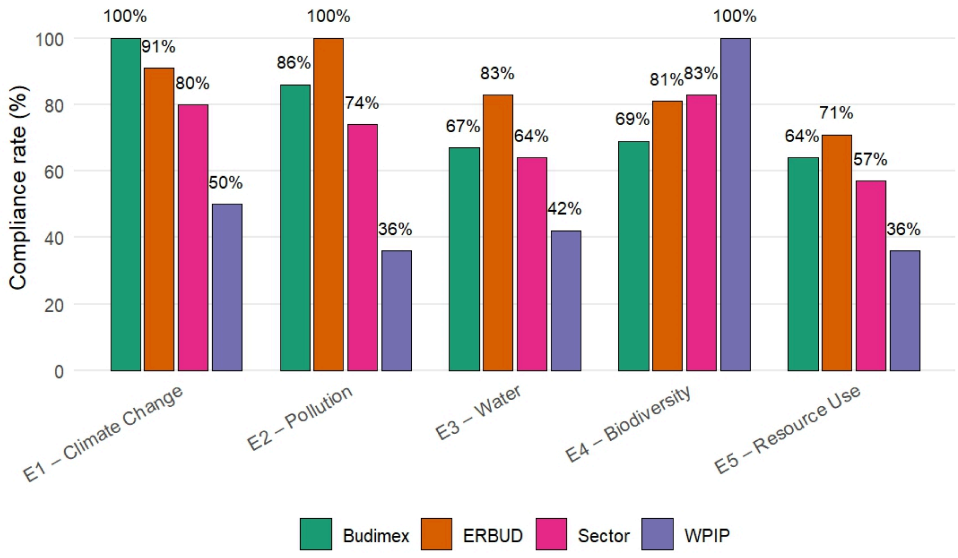



**Figure 2.** ESRS E1–E5 compliance rates by entity and standard (FY 2024). Source: Own elaboration.

### *4.2. Headline Versus Substantive Compliance*

Separating headline compliance from substantive disclosure is this study's primary analytical step, and the measure developed here frames the per-standard and per-category results that follow (Sections 4.3 and 4.4). A defining feature of the scoring protocol (Section 3.3) is that a full mark (2) is awarded both for substantive quantitative disclosure and for a documented procedural response—substantiated non-materiality, invocation of first-year transitional relief, or a sub-threshold reporting exemption. To separate these two forms of compliance, each full mark in Appendix A Table A1 was classified as substantive or procedural, and a substantive disclosure rate was computed by retaining only points reflecting actual reported data, including partial disclosures (score 1). It should be stressed that this measure quantifies the volume of environmental information actually reported, not regulatory adherence: a low substantive rate does not in itself indicate non-compliance, since formally substantiated non-disclosure is a legitimate response under the ESRSs. Table 2 contrasts the two measures.

**Table 2.** Headline compliance versus substantive disclosure, by entity (FY 2024). Source: Own elaboration; procedural full marks are those flagged [P] in Appendix A, Table A1.

| Entity | Headline Compliance | Points from Procedural Responses | Substantive Disclosure Rate |
|---|---|---|---|
| Grupa Budimex | 62/78 (79%) | 20 | 42/78 (54%) |
| Grupa ERBUD | 67/78 (86%) | 32 | 35/78 (45%) |
| Grupa WPIP | 42/78 (54%) | 22 | 20/78 (26%) |
| **Sector** | **171/234 (73%)** | **74** | **97/234 (41%)** |

The disaggregation materially changes the picture. Across the sample, 74 of the points awarded—32% of the maximum—are derived from procedural responses rather than substantive disclosure, lowering the rate across the sample from 73% to 41%. Most strikingly, the ranking of the two mandatory reporters is reversed: ERBUD, which leads on headline compliance (86%), records the lower substantive rate of the two (45%), because a large share of its score—the whole of ESRS E2 beyond the IRO-1 process, together with the forward-looking items across the other standards—reflects documented non-materiality and transitional relief rather than reported performance data. Budimex, by contrast, retains the higher substantive rate (54%), having earned most of its points through actual disclosures. WPIP's substantive rate (26%) is roughly half its headline figure, since its nominal E4 compliance (100%) rests entirely on sub-threshold exemptions and contributes no substantive content.

This analysis operationalises, rather than merely flags, the procedural–substantive distinction that recurs throughout the results. It indicates that headline first-year ESRS compliance rates systematically overstate the volume of substantive environmental information disclosed, and that the overstatement is largest precisely for the entity whose materiality documentation is most sophisticated—a caution directly relevant to how regulators and analysts should interpret early compliance statistics.

A validity question follows directly from this design and warrants explicit reflection. Because a documented non-materiality determination earns the same headline mark as complete quantitative data, the headline metric can in principle be satisfied by scoping a difficult topic out rather than by reporting on it; in the limit, a firm facing a costly disclosure could be rewarded for "declaring away" an awkward issue under cover of a double materiality assessment. The headline measure therefore has limited construct validity as an indicator of disclosed environmental information: it captures regulatory adherence—whether each requirement was met in a form the standard accepts—not informational content. This is

less a flaw to be corrected than a property to be made visible, which is the purpose of the substantive-disclosure measure. By stripping procedural full marks, it isolates the points at which compliance was achieved through documented absence rather than data, and quantifies how far the two diverge. Whether a given exclusion reflects a genuine immateriality judgement or strategic avoidance cannot be adjudicated from the report alone—a distinction returned to in Section 5.2—but the two-measure design ensures that the choice between disclosure and documented non-disclosure is never concealed inside a single headline figure.

### *4.3. Results per Standard*

#### 4.3.1. ESRS E1—Climate Change

ESRS E1 produced the second-highest compliance rate across the three firms (80%), with a pronounced experience gradient: the two established reporters approached full compliance (Budimex 100%, ERBUD 91%), while the first-time reporter reached only 50%. All three entities converged on the governance, transition-plan, and energy-balance items (GOV-3, E1-1, IRO-1, and E1-5), each providing complete energy data and substantiated transition-plan timelines; only WPIP fell short of full compliance on the climate policy disclosure (E1-2). Divergence concentrated on two forward-looking requirements. On GHG reduction targets (E1-4), only Budimex disclosed Science Based Targets initiative (SBTi)-validated absolute targets aligned with the Paris Agreement; ERBUD reported revenue-relative targets without absolute values, and WPIP set none. On the anticipated financial effects of climate risk (E1-9), Budimex and ERBUD documented their invocation of first-year transitional relief, whereas WPIP omitted the item—together with E1-7 and E1-8—without justification. This contrast between documented deferral and silent omission, first observed here, recurs across every standard and constitutes the clearest single marker separating experienced from inexperienced reporters (item-level scores in Appendix A Table A1).

#### 4.3.2. ESRS E2—Pollution

ESRS E2 (74%) produced the most structurally distinctive pattern in the sample because its highest and lowest scores reflect opposite phenomena. ERBUD achieved 100% not by reporting pollution data but by documenting—through a double materiality assessment supported by European Pollutant Release and Transfer Register (E-PRTR) data and Eco-Management and Audit Scheme (EMAS)-verified audits—that pollution is non-material to its operations; under the scoring protocol this procedural compliance is scored identically to substantive disclosure (Section 3.3). The E2 rate across the sample therefore conflates documented exclusion with reported performance. Budimex (86%) anchored the substantive end, with fully quantified emission and hazardous-substance inventories (E2-4, E2-5) but the recurring absence of CAPEX/OPEX allocations on pollution actions (E2-2). WPIP (36%) exhibited the inverse of ERBUD's pattern: poorly documented inclusion rather than well-documented exclusion, classifying pollution as material in its IRO-1 assessment while declaring no formal policy and no targets—an internal inconsistency that undermines the coherence of its materiality framework. Notably, WPIP's only full mark on the standard (E2-4) was itself procedural, resting on a substantiated declaration rather than on reported emission inventories (Appendix A Table A1).

#### 4.3.3. ESRS E3—Water and Marine Resources

ESRS E3 recorded a below-average rate across the sample (64%), driven by two systematic weaknesses. First, no entity achieved full compliance on water targets (E3-3): disclosures uniformly lacked baseline values, scientific evidence, or explicit linkage to water-stressed operations. Second, the standard exposed data-quality failures in the metric disclosures (E3-4) that do not appear elsewhere. ERBUD calculated water intensity in

PLN rather than the EUR denominator the standard requires, compromising cross-entity comparability; WPIP's intensity ratio was distorted roughly a million-fold by using absolute euros rather than millions of euros in the denominator. These are failures of internal data review rather than strategic omission, and carry direct implications for the mandatory third-party assurance that will apply in subsequent reporting cycles. As on E1, the forward-looking item (E3-5) separated documented transitional relief (Budimex, ERBUD, Warsaw, Poland) from WPIP's unjustified omission.

#### 4.3.4. ESRS E4—Biodiversity and Ecosystems

ESRS E4 showed the highest nominal rate across the sample (83%), but this figure is an artefact of transitional relief rather than evidence of strong biodiversity reporting. WPIP, employing fewer than 750 persons, invoked the sub-threshold exemption for all eight E4 items and was scored 100% for documented omission while reporting no substantive biodiversity data. Excluding WPIP, the rate among entities providing actual disclosures falls to 75% (Budimex 69%, ERBUD 81%)—a more meaningful benchmark, reported here alongside the nominal figure for transparency. Among the substantive reporters, the recurring CAPEX/OPEX gap reappeared on biodiversity actions (E4-3), and ERBUD's IRO-1 contained an internal inconsistency—acknowledging habitat degradation while denying significant negative impacts—that mirrors, in a different topic, the materiality-coherence problem seen in WPIP's E2 disclosures.

#### 4.3.5. ESRS E5—Resource Use and Circular Economy

ESRS E5 generated the lowest rate across the sample (57%) and the widest inter-firm spread, confirming resource use and circular economy as the principal reporting challenge in the sample. The decisive deficiency was the cross-standard CAPEX/OPEX gap, which, on resource actions (E5-2), affected all three entities: each described circular-economy initiatives without linking them to financial allocations. This same gap recurred on E2-2, E3-2, and E4-3, making it the single most frequent deficiency in this study—present in four of the five standards—and the clearest evidence that operational environmental management has not yet been integrated into capital planning. A second systematic gap appeared on resource inflows (E5-4), where every entity reported recycled-material shares as percentages rather than the absolute masses the standard requires, reflecting an absence of material-flow tracking systems across all three firms. As elsewhere, the forward-looking item (E5-6) divided documented relief (Budimex and ERBUD) from WPIP's unjustified omission.

### *4.4. Compliance by Disclosure Type*

All 39 assessed requirements were classified into three categories, as described in Section 3.3: (i) strategic-managerial disclosures, (ii) operational-implementation disclosures, and (iii) outcome-metric disclosures. Compliance rates by entity and category are presented in Figure 3.

Strategic-managerial disclosures achieved the highest rate across the sample at 81%. ERBUD led this category at 93%, reflecting consistent documentation of governance structures, IRO processes, and policy frameworks across all five environmental standards. WPIP recorded its best performance across the three categories in this group (79%), demonstrating the entity's capacity to articulate strategic commitments and governance arrangements even in the absence of a prior reporting history. Budimex recorded its lowest category result at 71%, attributable primarily to gaps in the specificity of its pollution and water policies.

Operational-implementation disclosures (encompassing action plans, CAPEX/OPEX reporting, and quantitative targets) generated the lowest rate across the sample, at 63%. Budimex and ERBUD performed equally at 70%. The most recurrent deficiency in this category was the absence of dedicated financial resource allocations: across multiple stan-

dards (E2-2, E3-2, E4-3, and E5-2), both entities described substantive operational activities without identifying corresponding CAPEX or OPEX commitments. WPIP reached 50% in this category—a figure inflated by its sub-threshold exemptions on the E4 action and target items—reflecting otherwise weak target-setting and a limited operational infrastructure for environmental management.

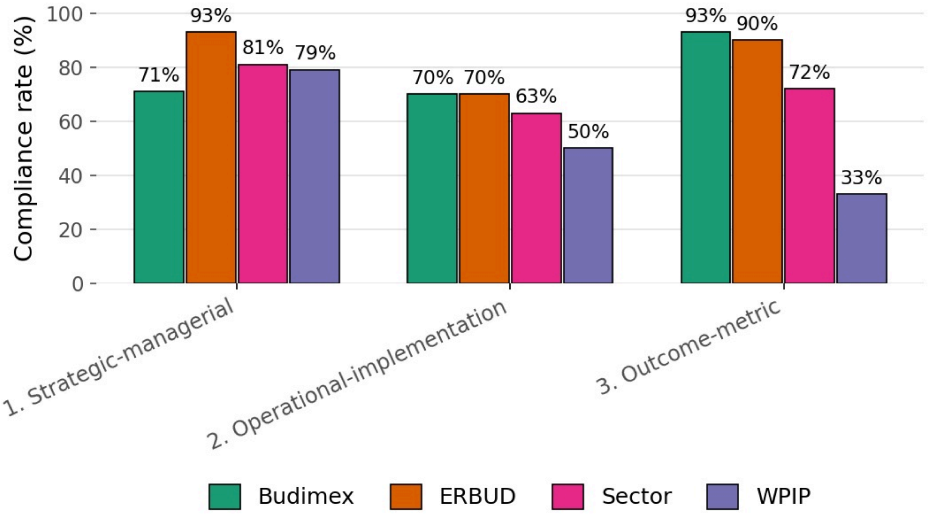



**Figure 3.** Compliance rates by disclosure category and entity (FY 2024). Source: Own elaboration.

Outcome-metric disclosures (quantitative performance indicators and forward-looking financial-effects estimates) produced a rate across the sample of 72%. Budimex and ERBUD performed strongly at 93% and 90%, respectively, demonstrating mature quantitative data collection systems. WPIP's outcome-metric score of 33% was its lowest category result. Key deficiencies included the absence of Scope 3 GHG emissions data (partially offset by transitional provisions); calculation errors in water and energy intensity indicators; and repeated unjustified omissions of anticipated-financial-effects disclosures across E1-9, E2-6, E3-5, and E5-6. The strong performance of experienced reporters (Budimex and ERBUD) on outcome-metric disclosures, contrasted with WPIP's weak performance, suggests that the capacity to generate reliable quantitative environmental data is the single strongest differentiator between firms with and without prior reporting experience—a finding directly relevant to RQ3.

### *4.5. Robustness to Weighting Choice*

Because the headline metric weights all 39 items equally (Section 3.3), the reported rates could in principle be artefacts of that convention rather than features of the data. To test this, all rates were re-computed under two differential weighting schemes that progressively prioritise quantitative, metric-heavy disclosures—the datapoints (e.g., Scope 3 emissions and absolute resource masses) whose omission is most consequential for an information user. Scheme S2 doubles the weight of outcome-metric items relative to strategic-managerial and operational-implementation items; Scheme S3 additionally halves the weight of the largely narrative strategic-managerial items. Table 3 reports the results against the equal-weighting baseline (S1).

The substantive conclusions are invariant to the weighting choice. The entity ranking on headline compliance (ERBUD > Budimex > WPIP) is preserved under all three schemes, as is the identification of ESRS E5 as the lowest-scoring standard—which, under quantitative weighting, falls further still (from 57% to 50%), reinforcing rather than weakening the RQ2 finding. Most importantly, the reversal between the two mandatory reporters under the substantive measure—Budimex ahead of ERBUD—not only persists but widens

as quantitative disclosures are up-weighted (from 54% versus 45% to 51% versus 38%), because ERBUD's procedural full marks are concentrated in exactly the outcome-metric items that these schemes emphasise. The materiality paradox documented in Section 4.2 is therefore not an artefact of equal weighting; prioritising the disclosures generally regarded as most consequential makes it more pronounced.

**Table 3.** Sensitivity of compliance rates to item weighting. S1 = equal weights (1/1/1 across strategic-managerial, operational-implementation, and outcome-metric categories); S2 = outcome-metric items weighted × 2 (1/1/2); S3 = outcome-metric × 2 and strategic-managerial × 0.5 (0.5/1/2). Source: Own elaboration.

| Measure/Scheme | Budimex | ERBUD | WPIP | Sector | Lowest Standard |
|---|---|---|---|---|---|
| Headline—S1 (equal) | 79% | 86% | 54% | 73% | E5 (57%) |
| Headline—S2 (outcome × 2) | 83% | 87% | 48% | 73% | E5 (53%) |
| Headline—S3 (quant-heavy) | 85% | 86% | 44% | 72% | E5 (50%) |
| Substantive—S1 (equal) | 54% | 45% | 26% | 41% | - |
| Substantive—S2 (outcome × 2) | 52% | 41% | 22% | 38% | - |
| Substantive—S3 (quant-heavy) | 51% | 38% | 20% | 37% | -- |

## 5. Discussion

Two figures frame this discussion: a headline compliance rate of 73% across the three Polish construction groups studied, and a substantive-disclosure rate of 41% once procedural responses are separated out (Section 4.2). The headline figure offers a point of contact with first-year benchmarks in the prior literature, but the substantive measure is the analytically meaningful one, and the gap between the two is itself among this study's central findings. Both must be read with qualifications relating to within-sample heterogeneity, standard-level variation, the structural effects of transitional relief, and the voluntary status of one of the three reporters.

### *5.1. Overall Compliance Level in Comparative Perspective (RQ1)*

On the headline measure, the 73% rate situates the three firms favourably against first-year benchmarks in the literature. The comparison demands care, however: as Section 4.2 showed, the headline figure itself overstates substantive disclosure. Early GRI-based construction studies reported far lower disclosure frequencies [6,31]. The only directly comparable ESRS assessment measured pre-implementation readiness rather than realised compliance [19]. The gap between that study's 48% ceiling and the present 73% therefore reflects a difference in construct—anticipated versus actual compliance—rather than demonstrable outperformance. The closest Western European precedent under the predecessor regime is instructive: Venturelli et al. [18] reported a mean readiness score of approximately 1.2 out of 2.0 (around 60%) for Italian listed companies on the eve of the NFRD. The 73% recorded here is thus broadly in line with—rather than dramatically above—the Western European first-cycle trajectory, particularly once the contribution of procedural responses (Section 4.2) is taken into account. A more structurally comparable reference comes from Romić et al.'s [11] assessment of CSRD readiness across CEE public-interest entities. It finds that sub-threshold and first-time reporters across the region face constraints similar to those reflected in WPIP's partial-compliance profile (54%), regardless of jurisdiction. Within this context, the strong E1 performance of the two established reporters compares favourably with the Polish multi-sector climate-readiness mean of 0.528 [26]. This may indicate that large listed construction firms are comparatively well positioned for climate reporting specifically. The composite index values and the compliance percentages reported here are not directly commensurable, however, and such cross-instrument comparisons should be read as indicative only.

A general caution governs every comparison drawn in this subsection. The reference points cited differ from the present study in reporting standard (NFRD, GRI, or pre-implementation ESRSs, versus realised ESRSs), in scoring instrument and scale, and in reporting period; their figures are not expressed on a common metric, and no statistical comparison across them is warranted. They are invoked here only to locate the present results within a broad qualitative range, not to demonstrate over- or under-performance, and every numerical contrast above should be read in that light.

### *5.2. Standard-Level Variation and Recurrent Disclosure Deficiencies (RQ2)*

The concentration of the lowest compliance on ESRS E5 (57%) is this study's most consequential finding, and a materiality consideration sharpens it. For an industry responsible for roughly half of global raw-material extraction, resource use and circular economy are the most material environmental domain of all—yet they proved the hardest to report. The firms studied are thus weakest precisely where the environmental stakes are highest, an inverse compliance–materiality relationship that the equal weighting of items would otherwise obscure. No firm reported absolute secondary- and recycled-material masses (E5-4). This points to an absence of material-flow tracking infrastructure—plausibly sector-wide—rather than to disclosure reluctance, echoing the resource-accounting gaps Santana Tovar et al. [32] identified for Italian construction.

Two further recurrent deficiencies share a common root. The absence of CAPEX/OPEX allocations recurred across four of the five standards. More strikingly, every anticipated-financial-effects disclosure (E1-9, E2-6, E3-5, E4-6, and E5-6) was either deferred under transitional relief or omitted: no entity reported substantive forward-looking financial figures on any standard. The two patterns converge on one conclusion. What most clearly distinguishes the ESRSs from the NFRD is the demand to integrate sustainability with financial quantification—capital allocation and anticipated financial effects—and this integration is the universal bottleneck. Its persistence in Budimex's reporting despite over a decade of experience (since 2011) corroborates Drozd [21]. In none of the firms has operational environmental management been embedded in capital-planning or financial-forecasting systems, regardless of reporting tenure.

The contrasting E2 and E4 results raise a question of interpretation that neo-institutional theory poses directly. Do they reflect organisational decoupling—formal compliance strategically adopted while substantive practice stays loosely coupled to it—or simply struggling, an immature reporting function unable to produce the required data? The two readings carry different implications and must be separated by the evidence rather than assumed. The observed pattern is the following. ERBUD's documented non-materiality on pollution and WPIP's sub-threshold exemptions on biodiversity each earned full marks for a formally complete absence of substantive data. WPIP's poorly documented inclusion on pollution, by contrast, scored low. Under the protocol, documentation outscores disclosure. The substantive measure (Section 4.2) quantifies the consequence: ERBUD's headline lead over Budimex (86% versus 79%) becomes a deficit under substantive scoring (45% versus 54%). The following is this study's materiality paradox: the entity with the most sophisticated double materiality documentation disclosed the least substantive environmental data. It arises because a rigorous double materiality assessment can be used just as legitimately to scope disclosure out as it can used to scope it in.

Which interpretation the evidence supports differs by deficiency, and the two should not be conflated. Most of the gaps documented here are better read as struggling than as decoupling. The cross-standard CAPEX/OPEX gap, the universal deferral of anticipated-financial-effects disclosures, WPIP's unjustified omissions, and the intensity-ratio errors all indicate absent systems and limited capacity rather than strategic concealment. Sev-

eral appear even in Budimex, where a concealment motive is least plausible. The single pattern that genuinely resembles decoupling is the ERBUD materiality paradox: an evidently capable firm using a defensible materiality rationale to scope substantive pollution disclosure out. Even here the claim must be qualified. The data establish the structural conditions under which decoupling can occur—capability combined with minimal substantive disclosure under a documented materiality determination—but not the intent behind it. This study found no evidence of active concealment, nor of any effort to disguise a gap between disclosure and practice. And a confident immateriality finding by a capable firm is also precisely what a correct materiality assessment would yield. The pattern is therefore consistent with decoupling without demonstrating it. This study's contribution is framed accordingly: not to assert that concealment occurred, but to identify the conditions, and the substantive-disclosure measure, that make first-year decoupling visible and testable. Read this way, the ESRS materiality architecture—intended to focus reporting on what matters—can in the first year also furnish capable firms with a documented and legitimate route to minimal substantive disclosure.

This pattern appears systemic rather than firm-specific in the Polish environment. Macuda and Kobiela-Pionnier [17] found that two-thirds of WIG30 firms had disclosed no actions following their double materiality assessment, consistent with a coercive-isomorphism dynamic in which formal compliance precedes—and, for some firms, may substitute for—substantive internalisation.

### *5.3. The Governance–Implementation Gap and Disclosure Type Hierarchy*

The disclosure-type hierarchy—strategic-managerial being the highest (81%), and operational-implementation being the lowest (63%)—carries the clearest theoretical implication of the study. The firms have developed governance-level reporting capabilities—documenting policies, IRO processes, and governance frameworks—that substantially outpace their operational and data-system capacities. This asymmetry fits the institutional logic of early coercive-isomorphism cycles: firms first satisfy the visible, narrative-based procedural requirements, deferring the monitoring infrastructure needed to generate verifiable quantitative data.

This governance–implementation gap is not new to the ESRSs. NFRD-period research documented the same pattern—improving CEE disclosure quality alongside persistent weakness in comprehensiveness and specificity [11], and Hungarian disclosure gains concentrated in formal categories [9]. Its consistency across jurisdictions, frameworks, and time periods supports interpreting it as a systemic feature of early-cycle regulatory adaptation rather than a Poland- or construction-specific artefact. The two experienced reporters disclose substantive quantitative data where internal systems exist and formally justify deferral where they do not. This stands in clear contrast to WPIP's repeated unjustified omissions—the clearest differentiator between experienced and inexperienced reporters in the sample.

### *5.4. Prior NFRD Experience and CSRD Compliance Readiness (RQ3)*

The most defensible evidence on RQ3 comes not from the largest raw gap but from the comparison least vulnerable to confounding. Budimex and ERBUD are both experienced, both mandatory reporters with comparable NFRD histories, yet they diverge—and, crucially, the divergence inverts under substantive scoring. On headline compliance, ERBUD leads (86% versus 79%), but on substantive disclosure, Budimex leads (54% versus 45%; Section 4.2). Prior reporting experience, held roughly constant across these two firms, is therefore not what differentiates their substantive disclosure quality; whatever does lies elsewhere.

The most plausible candidate is the maturity of environmental management itself, as distinct from reporting experience. ERBUD's strategic reorientation toward renewables since 2021, its EMAS-verified environmental management, and its consistent use of the mitigation hierarchy point to genuine operational capability. Yet that same capability is also consistent with the confident non-materiality determination that accompanies its lower substantive E2 disclosure, whereas Budimex reports more substantive data across more standards. Reporting tenure and environmental-management maturity are confounded in this sample and cannot be separated here. On this evidence, distinguishing them matters more than reporting tenure alone, and is a priority for larger-sample research. This qualifies Korca's [14] institutional-pressure account: the depth and strategic orientation of environmental management, not the mere duration of reporting, appears to be the discriminating factor.

The larger ERBUD–WPIP gap (86% versus 54%) is consistent with the organisational learning hypothesis—that prior reporting builds data-governance infrastructure and familiarity with external scrutiny [9,14]. The effect is most visible in outcome-metric disclosures, where ERBUD's quantitative data systems clearly outperform WPIP's. But this comparison conflates reporting experience with mandatory status: WPIP reports voluntarily and ERBUD under obligation, so the gap may reflect regulatory pressure as much as accumulated learning. It is reported here as corroborating but not decisive.

More broadly, the pattern speaks to Dziwok and Ferens [26]. Firms that adapted to the NFRD through external regulatory pressure, rather than through genuine internalisation of analytical sustainability processes, may carry the same structural gaps into the more demanding ESRS regime. And, as the pattern documented in Section 5.2 suggests, they may use the ESRS's own materiality machinery to manage their disclosure burden.

## 6. Conclusions

This study has provided the first empirical assessment of compliance with the five ESRS environmental standards (E1–E5) among Polish construction companies in the inaugural year of mandatory CSRD reporting. It draws on a structured content analysis of FY 2024 sustainability reports from three purposively selected firms—Grupa Budimex, Grupa ERBUD, and Grupa WPIP—scored against a 39-item disclosure checklist. The result is a disaggregated, standard-by-standard picture of where first-year compliance is strongest, where it falters, and how it relates to prior reporting experience.

In response to RQ1, the compliance rate across the three firms was 73%, ranging from 86% (ERBUD) to 54% (WPIP). This constitutes a moderate first-year baseline—neither negligible nor comprehensive—broadly consistent with benchmarks documented for analogous first-year regulatory transitions. The result confirms that complete ESRS compliance is not attainable within a single inaugural cycle, even among established reporters with mature governance functions. Because the sample comprises only two mandatory reporters, and because first-year transitional relief permits penalty-free deferral of certain disclosures, this figure is best understood as a preliminary baseline requiring confirmation through larger-sample and longitudinal research.

In response to RQ2, ESRS E5 (Resource Use and Circular Economy) was the most challenging standard (57%). The finding is telling: circular-economy reporting is the most material environmental domain for a raw-material-intensive sector, so firms proved weakest precisely where the stakes are highest. The recurrent deficiencies converged on a single theme. The absence of CAPEX/OPEX allocations across four standards, together with the universal deferral or omission of every anticipated-financial-effects disclosure, identifies financial integration as the principal bottleneck distinguishing ESRSs from NFRD reporting. By financial integration, we mean linking environmental management to capital allocation and forward-looking

financial estimates. A separate, qualitatively distinct weakness was the recurrence of internal inconsistencies between IRO-1 materiality determinations and the disclosures that followed them. These weaknesses are structural rather than idiosyncratic and identify where regulatory guidance and sector-specific capacity-building would yield the greatest return.

In response to RQ3, prior reporting experience is positively but not straightforwardly associated with compliance. The experienced reporters outperformed the first-time reporter on headline compliance (Budimex, 79%; ERBUD, 86%, versus WPIP 54%), most visibly in outcome-metric disclosures. Yet this study's most instructive comparison is between the two experienced firms. Under substantive scoring, their ranking inverts (Budimex, 54%, versus ERBUD, 45%). This shows that reporting tenure does not by itself account for substantive disclosure quality, and that environmental-management maturity—confounded with tenure in this sample—is the more promising explanatory variable. The mandatory–voluntary confound between ERBUD and WPIP further precludes causal inference; prior experience is therefore associated with, but not sufficient for, higher compliance. Beyond the research questions, this study's principal conceptual contribution is to surface a materiality paradox in first-year ESRS reporting. The entity with the most sophisticated double materiality documentation disclosed the least substantive environmental data, because a rigorous materiality assessment can legitimately scope disclosure out as readily as in. This pattern is consistent with organisational decoupling, although the data establish the conditions under which it can arise rather than proving intent (Section 5.2).

These findings carry concrete implications for four audiences. For reporting entities, the highest-yield short-term priorities are CAPEX/OPEX tracking, value-chain data collection, and rigorous pre-publication validation of quantitative indicators. Denominator specifications deserve particular attention, given the intensity-ratio errors observed. For standard-setters, ESRS E5 and the anticipated-financial-effects requirements across all environmental standards are where interpretive guidance is most urgently needed; the materiality architecture itself also warrants monitoring, since a rigorous double materiality assessment can legitimately justify minimal substantive disclosure. For the assurance providers who will deliver the mandatory assurance on these reports, the results map the highest-risk areas with some precision. The calculation and denominator errors in the intensity metrics (E3-4) are exactly the kind of defect assurance is designed to catch. The procedural–substantive gap, in turn, marks where a report can be fully compliant yet substantively thin—a distinction assurance engagements will need to articulate rather than collapse into a binary opinion. For the Polish Financial Supervision Authority (KNF) and other enforcement bodies, the recurring pattern of unjustified omissions warrants close attention in the next reporting cycle. The small sample, however, counsels a broader systematic review before any enforcement prioritisation.

A final, forward-looking consideration concerns the expiry of the first-year transitional provisions, and it bears on both the findings and the method. The FY 2024 baseline reported here is, by construction, a product of those provisions. The universal deferral of anticipated-financial-effects disclosures (E1-9, E2-6, E3-5, E4-6, and E5-6), the partial relief on Scope 3 emissions, and the sub-threshold exemptions that lifted WPIP's nominal E4 score are all permitted only in the inaugural cycle, and will not recur in the same form. As they lapse, the procedural route to full marks narrows: items that could be deferred with documentation must henceforth be reported substantively. The gap between headline and substantive compliance should therefore compress. The two measures will converge where firms build the necessary systems, and headline rates themselves will fall where capacity remains absent. This carries a direct methodological corollary. The 39-item instrument used here reflects what was due in FY 2024; applied unchanged to later cycles it would understate the requirements then in force. Subsequent applications will need to revise the instrument in three ways: extend or

re-weight the checklist as conditionally mandatory items become unconditionally mandatory; incorporate the value-chain and anticipated-financial-effects datapoints that transitional relief currently shields; and reconsider whether the procedural full-mark convention (Section 3.3) remains appropriate once documented deferral is no longer available. For this reason, the FY 2024 rates are best treated as a baseline against which subsequent change is measured, rather than a fixed benchmark to be compared like-for-like with later years.

Future research should proceed along three lines. A longitudinal follow-up—applying the same core instrument, extended for newly mandatory requirements, to FY 2025 and FY 2026 reports—would track compliance improvement and the decay of transitional relief, distinguishing entities that relied on deferral from those that disclosed substantively. A larger-sample study covering all CSRD-obligated Polish construction firms would enable multivariate testing of compliance determinants—firm size, listing status, and reporting tenure—while controlling for mandatory status. Finally, cross-national CEE comparisons—coupled with refinement and external validation of the procedural–substantive sub-scale (Section 4.2)—would establish whether these patterns are specific to the sector, specific to the jurisdiction, or general features of first-year ESRS adoption. Together, these directions would convert the baseline established in this study into a longitudinal account of how environmental reporting quality evolves under the CSRD.

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## Appendix A

**Table A1.** Item-level compliance scores across all 39 ESRS E1–E5 disclosure requirements (FY 2024). Source: Own elaboration based on content analysis of FY 2024 sustainability reports.

| Standard | Disclosure Requirement | Category | Budimex | ERBUD | WPIP |
|---|---|---|---|---|---|
| E1 | ESRS 2 GOV-3—Incentive linkage to sustainability outcomes | S-M | 2 | 2 | 2 |
| E1 | E1-1—Transition plan for climate-change mitigation | S-M | 2 P | 2 P | 2 P |
| E1 | ESRS 2 IRO-1—Climate-related IRO identification process | S-M | 2 | 2 | 2 P |
| E1 | E1-2—Climate-change mitigation and adaptation policies | S-M | 2 | 2 | 1 |
| E1 | E1-3—Actions and resources for climate policy | O-I | 2 | 1 | 1 |
| E1 | E1-4—GHG reduction targets | O-I | 2 | 1 | 0 |
| E1 | E1-5—Energy consumption and energy mix | OUT | 2 | 2 | 2 |
| E1 | E1-6—GHG emissions (Scopes 1, 2, 3) | OUT | 2 | 2 | 1 |
| E1 | E1-7—GHG removal and carbon credits | OUT | 2 P | 2 P | 0 |
| E1 | E1-8—Internal carbon pricing | OUT | 2 P | 2 P | 0 |
| E1 | E1-9—Anticipated financial effects (climate) | OUT | 2 P | 2 P | 0 |
| | **E1 subtotal** | | **22** | **20** | **11** |

**Table A1.** *Cont.*

| Standard | Disclosure Requirement | Category | Budimex | ERBUD | WPIP |
|---|---|---|---|---|---|
| E2 | ESRS 2 IRO-1—Pollution-related IRO identification process | S-M | 2 | 2 | 1 |
| E2 | E2-1—Pollution policies | S-M | 1 | 2 [P] | 1 |
| E2 | E2-2—Pollution actions and resources | O-I | 1 | 2 [P] | 1 |
| E2 | E2-3—Pollution targets | O-I | 2 [P] | 2 [P] | 0 |
| E2 | E2-4—Pollution to air, water, and soil | OUT | 2 | 2 [P] | 2 [P] |
| E2 | E2-5—Potentially hazardous substances | OUT | 2 | 2 [P] | 0 |
| E2 | E2-6—Anticipated financial effects (pollution) | OUT | 2 [P] | 2 [P] | 0 |
| | **E2 subtotal** | | **12** | **14** | **5** |
| E3 | ESRS 2 IRO-1—Water-related IRO identification process | S-M | 1 | 2 | 1 |
| E3 | E3-1—Water and marine-resource policies | S-M | 1 | 2 [P] | 1 |
| E3 | E3-2—Water actions and resources | O-I | 1 | 2 | 1 |
| E3 | E3-3—Water and marine resources targets | O-I | 1 | 1 | 1 |
| E3 | E3-4—Water consumption metrics | OUT | 2 | 1 | 1 |
| E3 | E3-5—Anticipated financial effects (water) | OUT | 2 [P] | 2 [P] | 0 |
| | **E3 subtotal** | | **8** | **10** | **5** |
| E4 | E4-1—Biodiversity transition plan | S-M | 1 | 2 [P] | 2 [P] |
| E4 | ESRS 2 IRO-1—Biodiversity-related IRO identification process | S-M | 1 | 1 | 2 [P] |
| E4 | ESRS 2 SBM-3—Material impacts, risks, and opportunities | S-M | 1 | 1 | 2 [P] |
| E4 | E4-2—Biodiversity and ecosystem policies | S-M | 1 | 2 | 2 [P] |
| E4 | E4-3—Biodiversity actions and resources | O-I | 1 | 1 | 2 [P] |
| E4 | E4-4—Biodiversity targets | O-I | 2 | 2 | 2 [P] |
| E4 | E4-5—Impact metrics (biodiversity) | OUT | 2 | 2 | 2 [P] |
| E4 | E4-6—Anticipated financial effects (biodiversity) | OUT | 2 [P] | 2 [P] | 2 [P] |
| | **E4 subtotal** | | **11** | **13** | **16** |
| E5 | ESRS 2 IRO-1—Resource-related IRO identification process | S-M | 1 | 2 | 1 |
| E5 | E5-1—Resource-use and circular-economy policies | S-M | 2 [P] | 2 [P] | 2 |
| E5 | E5-2—Resource actions and resources | O-I | 1 | 1 | 1 |
| E5 | E5-3—Resource-use and circular-economy targets | O-I | 1 | 1 | 1 |
| E5 | E5-4—Resource inflows | OUT | 1 | 1 | 0 |
| E5 | E5-5—Resource outflows and waste | OUT | 1 | 1 | 0 |
| E5 | E5-6—Anticipated financial effects (resource use) | OUT | 2 [P] | 2 [P] | 0 |
| | **E5 subtotal** | | **9** | **10** | **5** |
| | **TOTAL (max 78)** | | **62** | **67** | **42** |
| | **Overall compliance rate** | | **79%** | **86%** | **54%** |

Scale: 0 = non-compliant (unjustified omission); 1 = partial compliance (present but incomplete); 2 = full compliance. The superscript [P] marks full marks (2) awarded for a documented procedural response—substantiated non-materiality, invocation of first-year transitional relief, or a sub-threshold reporting exemption—rather than for substantive quantitative disclosure (see Section 4.4). Category: S-M = strategic-managerial; O-I = operational-implementation; and OUT = outcome-metric. Maximum score per entity = 78 points. Note: WPIP achieved 16/16 on E4 by invoking the sub-threshold transitional exemption for all eight E4 items (all marked [P]); this reflects documented procedural compliance rather than substantive biodiversity disclosure (see Sections 4.4 and 5.2). Item scores for all entities reproduce the per-standard and per-category compliance rates reported in Figures 2 and 3 and the headline and substantive measures reported in Table 2.

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