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THE TRANSITION TO AN IMPACT-BASED APPROACH IN SUSTAINABILITY AND FINANCIAL REPORTING

Sürdürülebilirlik ve Finansal Raporlamada Etki Temelli Yaklaşıma Geçiş

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Abstract

This paper analyzes the paradigm shift in sustainability and financial accounting on a sample of the first 100 companies reporting under the European Union's Corporate Sustainability Reporting Directive (CSRD). Drawing on the shift from financial-focused reporting to impact-based disclosures, the study concentrates on the use of materiality and double materiality concepts developed by ESRS. Through a review of the world practices in these early adopters, the research also elicits patterns and challenges that firms face, as well as wider strategic implications involved with ESG considerations for corporate reporting. It emerged from the findings that there is considerable diversity in double materiality interpretation, indicating a lack of consistency and comparability despite regulatory guidance. The analysis also highlights the importance of harmonized standards to increase transparency, trust from stakeholders, and sustainable value creation. By harmonizing between classical financial and the impact-based sustainability reporting, this study delivers implications for researchers, regulators, as well as standard setters and professionals and practitioners interested in companies' reporting in the age of CSRD ESRS. Ultimately, the study contributes to a deeper understanding of how early adoption of CSRD reporting shapes corporate accountability, decision-making processes, and the measurement of long-term ESG impacts.

Keywords: Sustainability, Corporate Sustainability Reporting Directive, European Sustainability Reporting Standards, Environmental Social and Governance, Energy Sector.

JEL Codes: Q56, M41, M49.

Öz

Bu makale, Avrupa Birliği Kurumsal Sürdürülebilirlik Raporlama Direktifi (CSRD) kapsamında raporlama yapan ilk 100 şirketin örnekleminden yola çıkarak sürdürülebilirlik ve finansal muhasebedeki paradigma değişimini analiz etmektedir. Finansal odaklı raporlamadan etki temelli açıklamalara geçişten yola çıkan çalışma, ESRS tarafından geliştirilen önemlilik ve çift önemlilik kavramlarının kullanımına odaklanmaktadır. Bu erken benimseyenlerin dünya uygulamalarını inceleyerek, araştırma aynı zamanda şirketlerin karşılaştığı kalıpları ve zorlukları ve kurumsal raporlama için ESG hususlarıyla ilgili daha geniş stratejik etkileri ortaya koymaktadır. Bulgular, çift önemlilik yorumunda önemli bir çeşitlilik olduğunu ortaya koymuş ve bu da düzenleyici kılavuzlara rağmen tutarlılık ve karşılaştırılabilirlik eksikliğini göstermektedir. Analiz ayrıca şeffaflığı, paydaşların güvenini ve sürdürülebilir değer yaratmayı artırmak için uyumlaştırılmış standartların önemini vurgulamaktadır. Klasik finansal raporlama ile etki temelli sürdürülebilirlik raporlamasını uyumlu hale getiren bu çalışma, CSRD ESRS çağında şirketlerin raporlamasıyla ilgilenen araştırmacılar, düzenleyiciler, standart belirleyiciler, profesyoneller ve uygulayıcılar için çıkarımlar sunmaktadır. Sonuç olarak, bu çalışma, CSRD raporlamasının erken benimsenmesinin kurumsal hesap verebilirliği, karar alma süreçlerini ve uzun vadeli ESG etkilerinin ölçülmesini nasıl şekillendirdiğine dair daha derin bir anlayışa katkıda bulunmaktadır.

Anahtar Kelimeler: Sürdürülebilirlik, Kurumsal Sürdürülebilirlik Direktifi, Avrupa Sürdürülebilirlik Raporlama Standartları, Çevresel Sosyal ve Yönetimsel, Enerji Sektörü.

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1. Introduction

Corporate reporting systems have been evolving rapidly in response to global sustainability imperatives and changing stakeholder expectations over the last decade. The EU’s Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS) associated with it move from financial to impact disclosure. This shift challenges the way in which companies think about materiality, accountability, and value creation. It shifts corporate reporting from a compliance exercise into integrating sustainability information into decision-making processes and connecting environmental and social outcomes with business value.

The transformation of this regulatory shift is well-documented, but the academic knowledge on it is piecemeal. Previous studies of sustainability reporting have mainly focused on voluntary disclosure standards such as GRI or SASB and frequently concentrated on a high-level evaluation of quantity or quality environmental, social, and governance (ESG) indicators, instead of the theoretical constructs that underpin disclosure discretion.

Double Materiality introduced under CSRD, for reports covering both financial and impact materiality, not only constitutes a new reporting architecture but also sets up conceptual challenges calling for scholarly interpretation. The contested nature of materiality has been acknowledged in extant literature (Oll et al., 2025); yet, despite this inherent resistance of the concept, very few studies connect to that debate as well as to wider theories on organizational legitimacy and stakeholder accountability.

The theorization of the institutionalization of sustainability reporting can take several perspectives. Stakeholder theory (Freeman, 1984) helps to predict why firms would be responsive to society and investor calls for transparent sustainability. According to legitimacy theory (Suchman, 1995), disclosure is viewed as an approach to fostering and maintaining organizational legitimacy in the face of regulatory and social pressure. Signaling theory (Spence, 1973) offers an interpretation for how sustainability disclosures signal credibility and responsibility to external parties.

Both frameworks allow for a more sophisticated understanding of how firms reconcile the conflicting demands of regulatory compliance with reputational differentiation in the post-CSRD era. Yet despite this profusion of policy debate, empirical academic understanding about how real-world companies implement double materiality is scarce. The majority of the existing literature has been concentrated on normative and/or descriptive aspects of ESRS, rather than its real-world application or theoretical significance.

Against this background, the present study contributes to existing research by providing empirical insights into the first 100 so-called corporate sustainability reports issued under the CSRD regime in order to ascertain how early adopters interpret, structure, and disclose materiality assessments. Therefore, the study is underpinned by the following primary research question:

What sectors and concepts characterize early CSRD adopters when it comes to the (application of) double materiality in sustainability reporting?

In tackling this topic, the studies aim to narrow the distance between regulatory evolution and academic theorizing. It tries to clarify the interrelations between policy design and corporate behavior, adding empirical evidence to ongoing debates within the field of sustainable accounting. The results of the study may illuminate the impact of reporting as a tool for legitimacy, stakeholder participation, and sustainable value source.

2. Conceptual Framework

2.1. From Financial to Impact-Based Reporting

The evolution from traditional financial disclosure toward sustainability-oriented reporting marks a fundamental shift in corporate communication and accountability. Conventional financial reporting primarily serves shareholders, emphasizing short-term profitability and risk management. In contrast, impact-based reporting under the CSRD integrates ESG considerations into the firm's value-creation narrative. This shift reflects the recognition that long-term corporate resilience depends not only on financial capital but also on human, social, and natural capital.

The CSRD establishes a dual-layered disclosure architecture based on the principle of double materiality, requiring firms to report both:

Financial materiality: how sustainability issues affect the company's financial performance, and

Impact materiality: how the company's activities affect society and the environment.

This dual perspective transforms sustainability reporting from a peripheral voluntary activity into a core component of strategic management. It also redefines corporate transparency, linking firms' external accountability to their internal governance and decision-making processes (Hahn et al., 2015; Schaltegger et al., 2022).

2.2. Theoretical Background of Double Materiality

Although double materiality is often presented as a regulatory innovation, its intellectual roots are grounded in well-established organizational theories. Understanding how firms interpret and implement this concept requires a theoretical framework that connects regulatory expectations with corporate behavior.

Stakeholder Theory: The stakeholder theory states that organizations work in a network of varied stakeholders who exert pressure for transparency and accountability—investors, employees, communities, and government. Meanwhile, Wood's (1991) P-O-R model adopts the tenet that the efficiency of an enterprise depends greatly on how it is managed. Double materiality gives practice to this pluralistic perspective by making the integration of non-financial stakeholders' views in reporting a norm. From this perspective, sustainability disclosure is not simply a due diligence exercise but an act of communication that may serve to engage with stakeholders and negotiate value.

Legitimacy Theory: According to legitimacy theory (Suchman, 1995), organizations desire their actions to be congruent with social standards in order to maintain legitimacy. CSRD disclosures can therefore be looked upon as legitimacy-seeking processes in which companies seek to demonstrate compatibility with the EU's sustainability agenda as a strategy for gaining social and regulatory acceptance. Disclosure of environmental and social impacts increases the perceived legitimacy as well by sending a symbolic message that "we conform to community norms and values, in this case through activities which are beneficial for society" (Deegan, 2002).

Institutional Theory: Institutional theory (DiMaggio and Powell, 1983) gives a macro-level reasoning for the unification of corporate reporting practices. The application of coordinated schemes such as ESRS leads to institutional isomorphism—companies imitate the same transparency behaviors following coercive (regulatory), normative (professional), and mimetic (imitative) modes. “Double materiality,” then, is a heuristic-as-it-gets for an institutional framework form that enforces homogeneity across sectors but not rigidity against specific applications.

Signaling Perspective: According to signaling theory (Spence, 1973), sustainability reporting acts as a communication signal that indicates credibility, trustworthiness, and risk consciousness to investors and other stakeholders. Those firms that have high-quality, well-displayed CSRD disclosures are sending strong messages regarding strategic antennae and a long-term value focus, whereas lackluster or patchy disclosure can be subject to homage-based interpretations as risk signals or symbolic obedience.

2.3. Integrating Theories into the CSRD Context

Together, these theoretical perspectives elucidate the behavioral dynamics underlying double materiality reporting. Stakeholder and legitimacy theories explain why firms engage in sustainability disclosure. Institutional theory explains how regulatory frameworks produce convergence in disclosure practices. Signaling theory explains how firms differentiate themselves within that convergence through voluntary depth, tone, and assurance mechanisms.

Thus, the theoretical framework positions double materiality as a multi-dimensional construct—simultaneously reflecting compliance (institutional), legitimacy (social), communication (signaling), and accountability (stakeholder) dimensions. This integrated lens not only enriches the conceptual foundation of the study but also guides the empirical analysis that follows, particularly the content analysis of the first 100 CSRD reports.

2.4. Conceptual Model of the Study

Based on the above, this study conceptualizes double materiality as the intersection between, (i) The firm’s external impact on stakeholders (impact materiality), and (ii) The internal significance of sustainability issues for financial performance (financial materiality).

This intersection creates a bidirectional flow of accountability, where regulatory compliance, stakeholder legitimacy, and strategic signaling interact dynamically. We depict the conceptual linkage between the theoretical constructs (i.e., stakeholder, legitimacy, institutional, and signaling mechanisms) to CSRD reporting structure and empirical coding scheme in Figure 1.

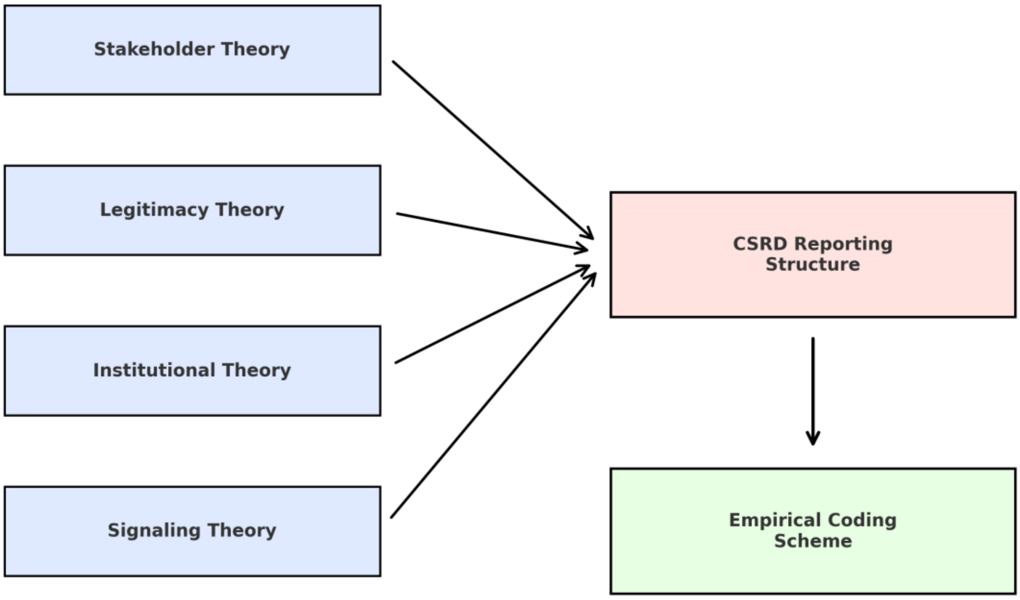

Figure 1. Conceptual Model

3. Related Literature (Table A1)

Research attention to sustainability reporting has surged in the past two decades, resulting in a vast literature on its development, motivations, and implications. Yet, the inclusion of KPIs clearly advances extant literature, which has addressed these issues only partially because of the current changes in regulation enacted through the CSRD and ESRS. To situate our present study within this emergent backdrop, the subsequent literature review distills previous work into three overarching thematic streams; (i) The concepts of and debates around materiality and double materiality, (ii) Empirical data concerning both sustainability reporting practices and standard adoption, and (iii) The evolving importance of assurance, investor confidence, and accountability.

Over the past years, ‘materiality’ and ‘double materiality’ have emerged to become one of the most debated issues in sustainability reporting. Recent studies during the period 2023–2025 reveal that these ideas are not only a techno-rational compliance necessity, but also encode a complex universe made up of corporate credibility, investor beliefs, and regulatory morality. In this context, the literature converges on three main axes of discussion. These are: (i) conceptual debates, (ii) examples of implementation and early adoption, and (iii) investor and stakeholder impacts.

At the conceptual level, Oll et al. (2025) argue that the concept of materiality is based on a fundamental debate and that plurality, rather than conceptual uncertainty, will determine the future of sustainability reporting. Similarly, Aprile et al. (2023) address materiality within the context of systems theory, demonstrating that different interpretations can enrich reporting standards. This literature shows that double materiality is shaped by multiple perspectives rather than a single interpretation.

Dragomir et al. (2025) note that dual materiality applications still contain uncertainties and that stricter regulation and transparency are needed within the CSRD framework. Correa-Mejia et al. (2024) highlight ‘discourse-action’ inconsistencies in the reports of early adopters, emphasizing that declared double materiality leads to limited change in practice. Szalacha (2024), using the example of Poland, shows that the application of double materiality brings consistency to reporting, but cross-sector comparability remains weak. These findings highlight the gap between regulatory pressure and corporate practices.

Shen et al. (2025), in their empirical study covering 34 countries, found that investors value accountable environmental performance more than mere disclosure. Similarly, Eriandani and Winarno (2024) show that reporting material issues mitigates the negative effects of ESG risks on firm value. Gromis Di Trana et al. (2024) emphasize that stakeholder engagement is cyclically linked to materiality assessments, with cultural and organisational factors shaping this process. This literature demonstrates that double materiality is not merely an internal accounting practice but also a strategic tool in terms of investor confidence and stakeholder engagement.

Tang and Cooper (2025) address materiality in the context of artificial intelligence, drawing attention to the risk of GenAI outputs becoming detached from 'material reality.' This study demonstrates that materiality discussions are being redefined not only along the axes of regulation and implementation but also through the epistemic boundaries of technological developments. This constitutes the innovative and forward-looking dimension of the literature.

The existing literature has addressed the concepts of materiality and double materiality from different angles; however, three key gaps remain apparent; (i) Regulation–implementation gap: There is a discrepancy between what companies declare and what they actually achieve in their reports, (ii) Stakeholder/investor imbalance: The balance between financial materiality and impact materiality remains controversial, (iii) New contexts: Digitalisation and artificial intelligence are opening up new areas of debate that redefine materiality. These gaps enable us to position our study beyond the existing literature.

3.1. Conceptual Debates on Materiality

Materiality in sustainability accounting is a contested issue. Hahn et al. (2015) discuss the challenges surrounding different interpretations of materiality, often regarded as a "cloudy matrix" of thought where several approaches have been criticized. The Chicago School's tradition has greatly influenced the understanding of materiality, emphasizing its importance and the criteria for declaring items immaterial.

During the early stages of sustainability research, highlighted concerns about reporting items crucial to shareholder decisions. They noted the disparities in wealth generation, where some individuals profit while others incur losses, stressing the need for intergenerational accountability (Dragomir et al., 2025).

Initially, materiality discussions centered around financial views, focusing on investor relevance and decision-usefulness. The efforts of GRI and frameworks like Europe's CSRD have broadened materiality to include stakeholder expectations (Schaltegger et al., 2022).

Recent studies, such as those by Oll et al. (2025) and Dragomir et al. (2025), redefine materiality's traditional boundaries, emphasizing its epistemological shifts in sustainability reporting. According to Oll et al. (2025), materiality is an "essentially contested concept," shaped by legitimacy and accountability interpretations. Dragomir et al. (2025) highlight the necessity for stringent methodological guidance to ensure consistent reporting.

Research remains divided between normative interpretations (what double materiality should mean) and operational interpretations (how it is measured and reported). This division underscores the need for integrative frameworks linking regulatory intent with theoretical foundations, a gap addressed by situating research on CSRD implementation within stakeholder, legitimacy, and institutional theory.

3.2. Empirical Evidence on Early Adoption and Reporting Practices

Research on sustainability information disclosure has accelerated with CSRD's introduction. Recent studies examine raw content to identify potential issues and compare practices across companies (Shen et al., 2025). While integration of sustainability frameworks is growing, reporting remains largely compliance-driven. Shen et al. (2025) find that environmental materiality receives more focus, while social and governance aspects are less emphasized. Shen et al. (2025) identify variations in disclosure across countries, indicating that national contexts influence sustainability reporting. Methodological studies employing ESG scores and discourse framing further reveal discrepancies in double materiality interpretations. These studies illustrate a gap between regulatory expectations and corporate practices, highlighting the need for theory-driven analyses like this study.

3.3. Assurance, Investor Trust, and Accountability

Research also explores the credibility of sustainability disclosures. Assurance mechanisms are crucial for transforming sustainability reporting into a reliable governance tool, beyond just public relations. External assurance references can increase investor confidence and mitigate "greenwashing" accusations (Michelon et al., 2019), though assurance practices vary across the EU.

The ESRS framework mandates alignment with the ISSA 5000 standard for assurance, yet academic discourse on its integration with materiality assessments is lacking. This study extends the inquiry by examining whether early CSR adopters reference assurance in their disclosures, how they describe materiality methods, and how these relate to stakeholder communication strategies.

3.4. Methodological Patterns and Research Gap

Explicit patterns in previous studies show reliance on content analyses (Neuendorf, 2017; Krippendorff, 2019), with varied coding methods leading to differing results. Methodological transparency and reliability are often lacking, resulting in descriptive rather than analytical publications.

Identified gaps include; (i) Lack of empirical investigation on corporations' handling of "double materiality" in the CSRD era, (ii) Insufficient understanding of institutional pressures and legitimacy impacts on transparency, (iii) Limited methodological detail in content analysis and assurance studies. This paper addresses these gaps from both a theoretical and practical perspective, aiming to connect regulatory innovation with organizational behavior and sustainability governance.

4. Methodology

4.1. Research Design

The study adopts a qualitative content analysis approach to examine how early CSRD adopters incorporate double materiality principles in their reports. Structural analysis holistically evaluates textual data, identifying patterns, themes, and conceptual relationships (Neuendorf, 2017; Krippendorff, 2019).

Following a theory-driven design combining inductive and deductive reasoning, categories are derived from regulatory frameworks (CSRD, ESRS 1–2), with empirical data emerging from iterative readings. This hybrid approach ensures rigorous analysis and context-specific insights (Schreier, 2022).

4.2. Sampling and Data Collection

The dataset comprises 100 sustainability reports from firms identified as "first adopters" of CSRD between January and July 2024. The reports were selected from the Global Reporting Initiative (GRI) Repository, the European Financial Reporting Advisory Group (EFRAG) Disclosure Register, and official corporate website databases.

Three selection criteria were used: Reports mentioning CSRD and ESRS compliance, availability of full-text English, and sectoral diversity spanning energy, aviation, manufacturing, telecommunications, and more. This sample provides insights into early adoption practices. A full list of companies is available in Table A2.

4.3. Coding Scheme and Analytical Framework

The analysis focused on three core aspects of double materiality:

Table 1. Coding Scheme

Dimension	Definition	Examples of Codes
Financial Materiality	Issues affecting financial performance or value	Revenue impact, cost exposure, investor trust, risk disclosure
Impact Materiality	Environmental or social footprint	Carbon emissions, biodiversity loss, community welfare, labor conditions
Governance Materiality	Linking sustainability plans to oversight and accountability	Board responsibility, ESG committee, assurance disclosure

Reports were manually coded with a codebook tailored to ESRS 1–2 disclosure requirements. Coding involved three phases:

1. Pilot coding (10 reports) to refine categories and definitions;
2. Full coding using NVivo 14;
3. Validation and recoding for consistency.

Emerging themes included legitimacy signaling, institutional isomorphism, and stakeholder responsiveness, aligning with the earlier theoretical framework.

4.4. Reliability and Validity

The established reliability criteria (Lombard et al., 2002; Krippendorff, 2019) were upheld in order to guarantee methodological transparency and replicability.

Inter-coder reliability was established by double-coding 20% of the data. The resulting Krippendorff's α was 0.82, reflecting substantial agreement.

Construct validity: Coding categories had been inductively derived from ESRS frameworks and theoretical building blocks (stakeholder, legitimacy, signaling).

Triangulation: Comparability was achieved by interpretation across regulatory documents, academic literature, and empirical data. Reflexivity was achieved by writing memos and auditing codes throughout the analysis to reduce researcher bias.

4.5. Data Analyzed and Interpreted (Table A3)

After coding procedures, frequency and co-occurrence analyses were used to identify predominant disclosure themes and patterns of cross-sector variation. The analysis took place in three steps:

1. Descriptive map of coverage of disclosure by ESRS subject domains.
2. Cross-industry and firm-size comparisons.
3. Interpretive insight pulling the patterns out of the empirical data to connect these levels of analysis with theories of legitimacy, signaling, and institutional isomorphism.

The focus was not only on what companies disclose, but also how they reason materiality—whether reporting represents a sincere commitment or symbolic cover. Such focus on interpretation is consistent with earlier appeals towards interpretive construction of sustainability reporting beyond pure enumerating descriptions (Hahn and Figge, 2011).

5. Findings and Discussion

5.1. Trend of Disclosure Under CSRD

The review of the initial 100 CSR-driven Sustainable Reports highlights a diverse pattern of adoption according to sectors and size classes. Although all companies formally referred to the CSRD and ESRS frameworks, there were wide differences in the extent and coverage of disclosure.

Around 78% of companies disclosed that they performed a double materiality assessment (DMA), but only 46% shared detailed information on the approach, stakeholder engagement, or priority matrix. This would imply that awareness of compliance is more widespread than the operationalization of double materiality, which is still in an early stage regarding institutional diffusion.

Sectoral differences were also evident. Although energy and manufacturing companies demonstrated more mature integration of impact materiality resulting from established environmental risk frameworks, other service sectors (e.g., finance, aviation, telecom) emphasized governance and relations with stakeholders more strongly. These forms of mimicry reflect institutional isomorphism, where the organization mimics other firms in its sectoral logic to gain legitimacy (DiMaggio and Powell, 1983).

5.2. ESG Materiality and Other Stories: An Isomorphism Perspective

Cross-sectoral contrasts show that environmental disclosures are the main driver for double materiality considerations, and it is followed by social aspects, as well as governance.

Environmental content, including GHG emissions, energy efficiency, and resource circularity, was present in 91% of reports.

The social inclusions (e.g., diversity, occupational health, impact on the community) are in 63%.

Governance-related disclosures (board oversight, Audit Mechanism) in 52%.

This distribution indicates an evolution from pre-ESG, where we had GRI ESG reporting in the past. For instance, environmental figures have been standardized for a long time. The institutional theory view assists in understanding this harmonization, toward overlapping environmental disclosures, by providing firms with coercive pressures of EU legislation and normative pressures determined in professional assurance standards (Correa-Meija, 2024).

But differences remain in the ways companies describe impact materiality. While MNCs engage in stakeholder mapping and quantitative measures, SMEs use narratives or symbols to talk about compliance. This supports the claim that double materiality is still institutionalized in structure, but not (yet) in practice, as evidenced in earlier stages of diffusion of sustainability standards (Boiral et al., 2021).

5.3. Financial Materiality and Signaling Mechanisms

Unlike impact materiality, the financial materiality in the studied reports was relatively brief. Only one-third of the companies specifically associate environmental or societal risks with financial reporting or key performance indicators. Instead, most companies had general things to say about “sustainability risks may have an impact on future profitability” rather than quantifying it.

The conservative language used here can be considered a type of signal to an external audience and read in a signaling theory framework (Spence, 1973). Companies seek to evidence awareness without showing weakness. However, those with quantified reporting – specifically for the energy and transport sector – experienced a stronger benefit of enhanced credibility and analyst attention presence, supporting the hypothesis that signaling transparency is conducive to stakeholders’ trust building (Michelon et al., 2019).

This observation also contributes to a dichotomy noted by previous literature between substantive and symbolic disclosure (Hahn and Figge, 2011) in the sense that all firms symbolically adopt CSRD language while less materialize this adoption into economically integrated reportage.

5.4. Assurance and Governance: Legitimacy Reinforcement

In only 37% of reviewed reports, explicit reference was made to external assurance audit sources regarding sustainability disclosures. Most of these were planning to perform a lesser level of assurance, while only 6 indicated they would perform reasonable assurance in line with ISSA 5000.

The level of assurance references has a positive relationship with the disclosure of board-level oversight. Companies that set up ESG committees or sustainability governance boards were significantly more likely to publish detailed double materiality assessments and assurance engagements.

Suchman's (1995) legitimacy theory: assurance practices signify conformity with societal and regulatory demands upon which the structure of a social contract is grounded. Additionally, these results connect with stakeholder theory (Freeman, 1984), suggesting that formal assurance acts to boost the trustworthiness of the relationship between firms and stakeholders, including institutional investors and regulators.

5.5. Cross-Theoretical Interpretation

Synthesizing these empirical observations, three theoretical dynamics emerge:

Table 2. Theoretical Dynamics

Theoretical Lens	Empirical Manifestation	Interpretation
Institutional Theory	Convergence in disclosure structures across industries.	Coercive and normative pressures from EU regulation drive harmonization of reporting practices.
Legitimacy Theory	Increased assurance and governance reporting.	Firms seek social and regulatory acceptance by demonstrating compliance credibility.
Signaling Theory	Selective transparency in financial materiality.	Firms use sustainability communication as a strategic signal of responsibility while managing reputational risk.

5.6. Discussion: Towards an Impact-Reporting Framework

The empirical findings show that the CSRD is underway in creating an impact accounting regime. Most organizations display procedural conformity in infusing CSRD language and ESRS sources while trailing behind on putting materiality into action: on strategy, risk technique, and financial reporting. This partial institutionalization might be regarded as an adolescent phase in the life cycle of regulatory diffusion (Hahn et al., 2015). As all of these aspects mature and become more standard, accounting will also evolve to a place where it hopefully converges towards more impact-focused disclosure practices.

From a macro level perspective, three realizations are underscored by the findings; (i) Institutionalization comes before standardization; companies first imitate the compliance as a behavior, only to develop much more mature analytic models. (ii) Disclosures evolve with legitimacy; market and governmental pressures push adoption more than strategic choices to be sustainable. (iii) Assurance is a credibility bridge: it’s what ties symbolic compliance with the substance of accountability.

Overall, the first wave of CSRD adopters reveals that double materiality is both a technical frame and a social process—a tool through which organizations negotiate legitimacy, make meaning, and signal accountability in an emergent sustainability landscape.

6. Conclusion and Implications

6.1. Theoretical Contributions

This paper adds to the recent scholarly debate on reporting as a double materiality, wherein it is articulated both as a conceptual development and an institutional stage. Although previous work has mostly approached the CSRD from a regulative or descriptive perspective, we draw on stakeholder, legitimacy, institutional, and signaling theories to explain how firms frame, enact, and talk about double materiality in practice.

The results contribute to knowledge in three respects. First, the study shows that reporting convergence happens mainly as a result of institutional isomorphism, which means that coercive and normative pressures, rather than strategic voluntary action-pattern early adopters’ behavior. Secondly, the findings offer empirical evidence to legitimacy theory and show that assurance and governance disclosures act as channels through which firms seek social and regulatory approval. Third, the study enlarges signaling theory, showing how selective transparency in financial materiality constitutes a reputational strategy through which responsibility can be sold and risks earned.

Across the paper, it is therefore argued that double materiality operates as a multi-theoretical hybrid that provides for the capture of regulatory adherence, stakeholder responsibility, and strategic communication. This holistic theoretical focalization effectively contributes to sustainability accounting literature by linking institutional mechanisms and organizational behavior.

6.2. Practical and Policy Implications

From a practical standpoint, the findings highlight that early CSRD adopters have initiated an important shift toward impact-based reporting, but the transition remains incomplete. Firms tend to exhibit procedural compliance-integrating CSRD terminology and structures without fully embedding materiality insights into strategic decision-making. To accelerate substantive adoption, several implications emerge:

For more rapid and meaningful adoption, several implications are revealed. Firstly, for corporate managers: Organizations need to incorporate double materiality in enterprise risk management and strategic planning, where sustainability data not only supports operations but drives financial decisions. Second, for policymakers and regulators: EC and EFRAG should better specify, on a business-by-business basis, the methodologies for materiality and assurance expectation to achieve a certain level of comparability between the reports. Thirdly, for auditors and assurance providers: Preparing strong methodologies under ISSA 5000 will be fundamental to turning sustainability assurance into a meaningful form of validation, rather than a mere symbol of it, which investors feel they can trust. Fourthly, educators and professional bodies: The inclusion of CSRD-aligned sustainability accounting modules in accounting and auditing curricula will equip accountants for the uniform application of ESRS standards.

From the macro perspective, the findings indicate that firm regulators and assurance actors need to collaborate for integrated CSRD so as to establish a balanced ecosystem conducive to enhancing transparency, comparability, and accountability.

6.3. Directions for Future Research

As one of the initial empirical analyses of early CSRD adopters, this study is not without limitations and guideposts for further research.

Big Sample and Longitudinal: In the future, from the dataset extension to the 100th firm onwards, to count on late adopter firms and do longitudinal comparison of discloser quality variation in time.

Quantitative Pathways: It would be possible to add content analysis findings into financial performance measures or ESG ratings to see whether double materiality disclosures correspond with actual business results.

The Cross-Country and Cultural Dimension: Comparative analysis among EU member states could investigate how institutional context, legal tradition, and societal expectations condition the reception of double materiality.

The Use of Assurance and Credibility Perception: Future studies may explore how the different depth of assurance (restricted vs. reasonable) is related to stakeholders' perceived trustworthiness.

Artificial Intelligence and Automated Reporting: As corporate users of AI-based ESG analytics grow, automation's implications for CSRD transparency in terms of its quality, accuracy, and accountability may warrant further investigation.

By following these paths, researchers will be able to further expand our knowledge of sustainability reporting as a developing social-technical system—where regulation, corporate practice, and stakeholder expectation are dynamically entangled.

6.4. Final Evaluation

The adoption of the CSRD is a game-changer for corporate responsibility as it denotes a shift towards impact materiality over financial materiality and from voluntary to mandatory disclosure regarding sustainability-related information.

But, as this research shows, regulation alone does not ensure that changes take root. The essence of the challenge is to convert compliance from a ritual into meaningful corporate change - where obsessed disclosure takes on multiple roles: learning, governance, and sustainable value creation.

In short, the principle of dual materiality, deeply embedded in corporate strategy, has the potential to transform how companies view responsibility, risk, and resilience. The shift to impact-based reporting heralds not only a new regulatory era but also a different approach to accountability, where transparency is no longer divorced from trust and sustainability is paramount to corporate success.

Declaration of Research and Publication Ethics
This study which does not require ethics committee approval and/or legal/specific permission complies with the research and publication ethics.

Researcher's Contribution Rate Statement
The authors declare that they have contributed equally to the article.

Declaration of Researcher's Conflict of Interest
There are no potential conflicts of interest in this study.

Ethical Considerations
All data used in this study are publicly available. No confidential or proprietary information was accessed. Citations, coding decisions, and interpretations adhere to ethical research standards as outlined in the European Code of Conduct for Research Integrity (ALLEA, 2023).

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APPENDIX

Table A1. Related Literature

Authors	Article Title	Methodology	Revised Findings	Category Synthesis
Pozzoli et al. (2024)	Does financial materiality judgement matter in reporting intellectual capital? A systematic literature review and future research trends	Systematic literature review	The concept of financial materiality has been addressed in intellectual capital reporting using different approaches, and four research trends have been identified in which both quantitative and qualitative thresholds are discussed.	Studies falling into this category consist of publications that do not directly link materiality to theoretical or applied discussions, but offer indirect contributions to the topic.
Aprile et al. (2023)	Enhancing the materiality principle in integrated reporting by adopting the General Systems Theory	Content analysis	The principle of materiality has been reinterpreted within the framework of General Systems Theory, proposing a more functional understanding for managers and regulators.	Studies falling into this category discuss the theoretical foundations of the concepts of materiality and dual materiality. In particular, it emphasizes that materiality is based on conceptual pluralism and is enriched by different theoretical frameworks (e.g., systems theory). The literature suggests that pluralism, rather than a single, uniform understanding of materiality, will shape the future of sustainability reporting.
Oll et al. (2025)	The concept of materiality in sustainability reporting: from essential contestation to research opportunities	Systematic review	It demonstrates that the concept of materiality stems not from uncertainty but from substantive debate, and therefore conceptual pluralism will shape the future of sustainable reporting.	Studies falling into this category discuss the theoretical foundations of the concepts of materiality and dual materiality. In particular, it emphasizes that materiality is based on conceptual pluralism and is enriched by different theoretical frameworks (e.g., systems theory). The literature suggests that pluralism, rather than a uniform understanding of materiality, will shape the future of sustainability reporting.
Belidan and Baghad (2024)	Navigating materiality in sustainability reporting: A scoping review of single and double materiality approaches	Content analysis	Studies on single and double materiality approaches in the literature are still limited; this points to new areas of research.	This group focuses on how dual materiality is implemented in practice. Reports in early adopter companies often appear to contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Beyne and Moratis (2025)	A material world: how can materiality assessments be used to define organizational sustainability priorities, while taking into account the United Nations' SDGs?	Survey research	Most companies struggle to integrate SDGs into materiality analysis, with information and methodology gaps limiting this process.	This group focuses on how dual materiality is implemented in practice. Reports in early adopter companies often appear to contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Correa-Mejia et al. (2024)	Analysis of double materiality in early adopters. Are companies walking the talk?	Content analysis	Although double materiality statements have been made by early adopters, it has been found that material topics in reports have changed only to a limited extent.	This group focuses on how dual materiality is implemented in practice. Reports in early adopter companies often appear to contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
De Cristofaro and Gulluscio (2024)	In Search of Double Materiality in Non-Financial Reports: First Empirical Evidence	Content analysis	Initial empirical evidence points to limited traces of double materiality in non-European companies and more pronounced traces in Europe.	This group focuses on how dual materiality is implemented in practice. In early-adopter companies, reports often contain gaps between rhetoric and action. However, in some cases, the implementation of double materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Dragomir et al. (2025)	Double Materiality Disclosure as an Emerging Practice: The Assessment Process, Impacts, Risks, and Opportunities	Content analysis	Clearer, more detailed guidance and stricter regulations under the CSRD are needed for the effective implementation of the double materiality concept.	This group focuses on how double materiality is implemented in practice. In early-adopter companies, reports often contain gaps between rhetoric and action. However, in some cases, the implementation of double materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Lee (2024)	Double Materiality Assessment and ESG Management: A Comparative Study of Global Steel Corporations	Content analysis	A comparative analysis of steel companies shows progress in ESG integration, but differences persist.	This group focuses on how double materiality is implemented in practice. In early-adopter companies, reports often contain gaps between rhetoric and action. However, in some cases, the implementation of double materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Nielsen (2024)	ESG Reporting and Metrics: From Double Materiality to Key Performance Indicators	Content analysis	Direct links have been established between double materiality and performance indicators in ESG reporting.	This group focuses on how double materiality is implemented in practice. In early-adopter companies, reports often contain gaps between rhetoric and action. However, in some cases, the implementation of double materiality has increased reporting consistency. The findings point to a regulation-implementation gap.

Table A1. Continued

Szalacha (2024)	Double materiality implementation and its impact on sustainability reporting: Findings from Polish early adopter reports	Content analysis	Early adopters in Poland have increased reporting consistency through materiality practices, but cross-sector comparability remains limited.	This group focuses on how dual materiality is implemented in practice. Reports in early-adopting companies often contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Tan and Dipendra (2024)	Tensions between Materiality Assessments and Stakeholder Engagements in Thai Corporate Sustainability Leaders	Content analysis	Materiality assessments are generally conducted more systematically than stakeholder engagement, suggesting that stakeholder-focused standards may be superficially implemented in practice.	This group focuses on how dual materiality is implemented in practice. Reports in early-adopting companies often contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Di Trana et al. (2024)	The interplay between stakeholder engagement and sustainability materiality assessment: a circular perspective	Qualitative research	There is a cyclical relationship between stakeholder engagement and materiality assessments; multidisciplinary and cultural factors shape this process.	This group focuses on how dual materiality is implemented in practice. Reports in early-adopting companies often contain gaps between rhetoric and action. However, in some cases, the implementation of dual materiality has increased reporting consistency. The findings point to a regulation-implementation gap.
Eriandani and Winarno (2024)	ESG Risk and Firm Value: The Role of Materiality in Sustainability Reporting	Content analysis	Materiality reporting can play a role in mitigating the negative impact of ESG risks on firm value.	This category addresses the perspectives of investors and stakeholders on the concept of materiality. Empirical findings suggest that investors should not only report but also perform accountably.
Festa et al. (2024)	The Unintended Consequences of Audit Materiality Disclosures on Whistleblowing Intentions	Content analysis	Disclosure of materiality thresholds can reduce investors' whistleblowing intentions.	This category addresses investors' and stakeholders' perspectives on the concept of materiality. Empirical findings indicate that investors value accountable performance, not just disclosure. Furthermore, the interaction between stakeholder engagement and materiality assessments is shaped by factors such as corporate culture and multidisciplinarity.
Festa et al. (2024)	Auditor Materiality Disclosures and Investor Trust: How to Address Conditional Risks of Disclosure Mandates	Content analysis	Quantitative materiality disclosures can be misleading when investor concerns about earnings management increase.	This category addresses investors' and stakeholders' perspectives on the concept of materiality. Empirical findings indicate that investors value accountable performance, not just disclosure. Furthermore, the interaction between stakeholder engagement and materiality assessments is shaped by factors such as corporate culture and multidisciplinarity.
Schiehll and Kolahgar (2025)	Common ownership and investor-focused disclosure: Evidence from ESG financial materiality	Quantitative analysis	This demonstrates that shared ownership influences companies' financial materiality-focused disclosures and shapes investor expectations.	This category addresses investors' and stakeholders' perspectives on the concept of materiality. Empirical findings indicate that investors value accountable performance, not just disclosure. Furthermore, the interaction between stakeholder engagement and materiality assessments is shaped by factors such as corporate culture and multidisciplinarity.
Shen et al. (2025)	Does environmental materiality matter to corporate financial performance: Evidence from 34 countries	Multilevel regression model	Investors reward accountable environmental performance over disclosures based solely on statements, demonstrating that environmental materiality is directly related to financial performance.	This category addresses investors' and stakeholders' perspectives on the concept of materiality. Empirical findings indicate that investors value accountable performance, not just disclosure. Furthermore, the interaction between stakeholder engagement and materiality assessments is shaped by factors such as corporate culture and multidisciplinary approach.
Xie et al. (2023)	Do investors incorporate financial materiality? Remapping the environmental information in corporate sustainability reporting	Content analysis	The integration of financial materiality within the SASB framework can enable more effective reporting of environmental risks.	This category addresses investors' and stakeholders' perspectives on the concept of materiality. Empirical findings indicate that investors value accountable performance, not just disclosure. Furthermore, the interaction between stakeholder engagement and materiality assessments is shaped by factors such as corporate culture and multidisciplinary approach.
Albuquerque et al. (2024)	What material topics by ESG dimensions can be found within the materiality matrix from the European entities' sustainability reports?	Content analysis	Materiality issues have been identified in European companies' reports based on ESG dimensions, and these issues have provided guidance for regulators, investors, and practitioners. Materiality has been re-discussed in a philosophically aesthetic context.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative future-oriented discussion area in the literature.

Table A1. Continued

Ciavatta (2024)	Hegel's Aesthetics of Materiality	Conceptual	Materiality has been revisited in a philosophically aesthetic context.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative future-oriented discussion area in the literature.
Huang et al. (2024)	The Economic Consequences of Heightened Materiality Uncertainty: An Auditing Perspective	Content analysis	Materiality disputes in companies examined by inexperienced auditors have led to more auditor turnover.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative, future-oriented discussion area in the literature.
Kuu-Park et al. (2024)	Materiality in community energy innovation: A systematic literature review of hands-on material engagement in energy transition	Systematic literature review	In community energy innovation, materiality has been examined in multidisciplinary contexts, and different types of networks have emerged.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative, future-oriented discussion area in the literature.
Miettinen (2024)	Are materiality determination practices evolving in the wake of increasing legislation on sustainability reporting? Findings from EU pharmaceutical companies' reports	Content analysis	In the European pharmaceutical sector, materiality has evolved from NFRD to CSRD, but inconsistencies in definition and reporting persist.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative, future-oriented discussion area in the literature.
Setia et al. (2024)	Shifting perspectives: unveiling the double nature of sustainability materiality in integrated reports	Content analysis	The practical application of double materiality can lead to reporting results that are inconsistent with theoretical expectations.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative, future-oriented discussion area in the literature.
Tang and Cooper (2025)	The Role of Materiality in an Era of Generative Artificial Intelligence	Conceptual (GenAI)	In the context of artificial intelligence, materiality demonstrates the need to connect information to material reality, as opposed to decontextualized outputs.	This group consists of studies that address materiality in new contexts. Artificial intelligence, digitalization, and aesthetic approaches demonstrate that materiality transcends classical reporting frameworks. This opens up an innovative, future-oriented discussion area in the literature.

Table A2. Companies Comprising the Sample

	Company	Country	Report Period
1	Archer Limited	NO (registered BMU/operations NO)	2022-2024
2	Cenergy Holdings SA	BE (registered) / GR operations)	2022-2024
3	Energie Beheer Nederland B.V.	NL	2022-2024
4	Eni SpA	IT	2022-2024
5	Equinor ASA	NO (EEA)	2022-2024
6	Galp Energia, SGPS, S.A.	PT	2022-2024
7	HELLENiQ ENERGY Holdings S.A.	GR	2022-2024
8	Jordanes ASA	NO (EEA)	2022-2024
9	KID ASA	NO (EEA)	2022-2024
10	LPP S.A.	PL	2022-2024
11	Neste Oyj	FI	2022-2024
12	Österreichische Mineralölverwaltung AG (OMV)	AT	2022-2024
13	PetroNor E&P ASA	NO (EEA)	2022-2024
14	Repsol S.A.	ES	2022-2024
15	Shell PLC	UK (listed EU)	2022-2024
16	TotalEnergies SE	FR	2022-2024

Table A3. Findings

Company	Double Materiality Disclosure	IRO Clarity	ESRS/Taxonomy Link	Impact Materiality Themes	Assurance	Overall Evaluation
Archer Limited	Yes. The ESRS 2 IRO 1 process is used as a reference in the audit.	Yes. IRO reported under IRO 1	IRO 1 presented in conjunction with the EU Taxonomy	Yes. Climate, security, and ethics in energy services	Yes. PwC Limited Assurance (ISAE 3000)	Strong compliance with ESRS IRO 1
Cenergy Holdings SA	Yes. A four-step method is being followed.	Yes. Thresholds/stakeholder inputs are defined	Presented with ESRS-referenced content and index	Yes. Climate and governance in cable/energy infrastructure	Yes. Limited Assurance (ISAE 3000)	Structured process with stakeholder input
Energie Beheer Nederland B.V.	Yes. The governance risk basis for transitioning from ESRS 2 to IRO 1 is in place.	Partially. Method/framework exists; maturation is planned	ESRS 2 linked to IRO 1 and the EU Taxonomy	Yes. Energy transition focus	No explicit assurance findings identified	Framework exists, but assurance gap
Eni SpA	Yes. Sustainability Statement designed in accordance with ESRS	Yes. Compatible with IRO + EU Taxonomy	Separate Sustainability Statement presented	Yes. Energy transition and financial impacts	Yes. Limited Assurance (ISAE 3000)	High alignment with ESRS + assurance
Equinor ASA	Yes. The IRO 1 process has been verified through the audit process.	Yes. IRO is under ESRS 2 IRO 1	Sustainability Statement and Taxonomy presented	Yes. Core energy sector issues	Yes. EY Limited Assurance (ISAE 3000)	Verified IRO process, strong assurance
Galp Energia, SGPS, S.A.	Yes. The methodology has been explained in detail.	Yes. The two dimensions are considered together.	Structure according to ESRS + KPIs Sustainability Statement + Taxonomy	Yes. Energy transition and occupational safety	Yes. Independent Limited Assurance	Detailed methodology, independent assurance
HELLENiQ ENERGY Holdings S.A.	Yes. The process is explained according to IRO 1.	Yes. IROs are included in IRO 1.	Sustainability Statement + Taksonomi	Yes. Refinery/marketing focus	Yes. EY Hellas Limited Assurance	Clear process and EY assurance
Jordanes ASA	Yes. Scored based on seriousness/probability/stakeholder.	Yes. Impact + risk/opportunity are framed together.	Matrix/mapping with ESRS codes	Yes. Food and agriculture supply chain focus	No explicit assurance findings	Good coverage, lacks assurance
KID ASA	Yes. There is an explanation of Impact, Risk & Opportunity.	Yes. Material/Note material distinction is clear.	ESRS data point/index + Taxonomy	Yes. Retail – human rights/ethics/supply chain	Yes. PwC Limited Assurance	Clear materiality distinction + PwC assurance
LPP S.A.	Yes. There is a process according to IRO 1 and indexing according to ESRS.	Yes.	Table linked to ESRS + policy established	Yes. Circularity/human rights	Yes. Grant Thornton Limited Assurance	Circularity focus + assurance
TotalEnergies SE	Yes. Process under ESRS 2 IRO 1/2	Yes. IRO presentation is available under IRO 1/2.	ESRS sections + incorporation by reference	Yes. Climate, pollution, circularity, Taxonomy	Auditor Certification Reports (Limited)	Strong CSRD alignment + auditor certification
Shell PLC	Yes. The double materiality process is included in the report and the auditor's report.	Yes. Material IRO coverage confirmation is available.	Sustainability Statements (ESRS 2, E1–E5, S, G)	Yes. Oil and gas core issues	Limited Assurance (Independent Auditor)	High transparency, independent assurance
Repsol S.A.	Yes. The materiality assessment / double materiality section is available.	Yes. IRO presentation is available under ESRS.	Appendix V and ESRS indexes	Yes. Climate, pollution, water, circularity	Yes. PwC Limited Assurance	Comprehensive coverage, PwC assurance
Österreichische Mineralölverwaltung AG (OMV)	Yes. Sustainability Statement ESRS; auditor Reference to double materiality present	Yes. The auditor evaluates the information determined by the EO.	General/Environmental/Social/Governance + Assurance	Yes. E1–E5 + Taxonomy focus	Yes. KPMG Limited Assurance	Strong assurance with KPMG
Neste Oyj	Yes. Sustainability statement; ESRS 2 General Disclosures available	Yes. E/S/G and Taxonomy are explained.	Within the YKB report; complies with Article 8	Yes. Sector priorities such as E1, E2, E4, E5, etc.	Yes. KPMG Limited Assurance	Detailed disclosures with KPMG
PetroNor E&P ASA	Partially. 2023: ESRS referenced; comprehensive dual materiality plan available in 2024	Partially. Materiality is explained; structured expansion plan.	ESRS index/core policies within the ESG report	Yes. Climate/environmental policies; targets by 2024	No external assurance (2023)	Partial implementation, no assurance in 2023