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RAPORTAREA PRIVIND SUSTENABILITATEA ȘI PERFORMANȚA DE MEDIU: PRACTICI ȘI PROVOCĂRI ESG EMERGENTE

SUSTAINABILITY AND ENVIRONMENTAL PERFORMANCE REPORTING: EMERGING ESG PRACTICES AND CHALLENGES

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Abstract. *Articolul cercetează evoluțiile recente în raportarea performanței de mediu și a sustenabilității, concentrându-se pe practicile ESG emergente și provocările organizațiilor. Scopul este de a analiza modul în care companiile integrează indicatorii de mediu, divulgările climatice și aspectele de sustenabilitate în sistemele de raportare, în contextul cerințelor regulatorii și al așteptărilor părților interesate. Studiul aplică o abordare calitativă, combinând analiza standardelor internaționale de raportare (GRI, ESRS, ISSB, CDP) cu revizuirea literaturii academice și a rapoartelor corporative. Este realizată o comparație a practicilor de raportare a performanței de mediu între sectoare și regiuni, identificând provocări metodologice precum consistența datelor, delimitarea granițelor, evaluarea materialității și cerințele emergente de asigurare. Rezultatele arată progrese în raportarea indicatorilor de mediu (emisii de carbon, eficiență energetică, gestionarea deșeurilor), dar persistă probleme legate de calitatea datelor, armonizarea metodologică și integrarea în deciziile strategice. Noile cadre de reglementare (CSRD, ESRS) sporesc comparabilitatea și responsabilitatea, dar cresc complexitatea și cerințele de conformitate. Originalitatea articolului constă în sinteza integrativă a practicilor ESG emergente, axată pe performanța de mediu, oferind perspective valoroase pentru cercetători, practicieni și decidenți în domeniul sustenabilității corporative.*

Cuvinte-cheie: *Raportare ESG, Performanță de Mediu, Practici de Sustenabilitate, Divulgare Corporativă, Cadre Reglementare*

INTRODUCTION

In recent years, sustainability reporting has evolved from a peripheral corporate communication tool into a central instrument for demonstrating organizational accountability, risk management capacity, and long-term value creation. Among the three ESG pillars—environmental, social, and governance - *environmental performance has gained particular importance*, driven by accelerating climate change, biodiversity loss, resource scarcity, and rising regulatory expectations. Governments, investors, rating agencies, and civil society increasingly demand clear, comparable, and decision-useful information on how companies measure, manage, and mitigate their environmental impacts. As a result, reporting practices that were once voluntary and fragmented have begun transitioning toward structured frameworks, standardized metrics, and externally assured disclosures.

Environmental performance reporting now encompasses a wide range of indicators, including greenhouse gas (GHG) emissions, energy consumption, water efficiency, waste management, circularity practices, pollution control, and climate-related risk exposure. The growing prominence of climate-related financial risks, highlighted in frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD), has further strengthened expectations for quantitative, forward-looking,

and scenario-based environmental information. Similarly, the EU Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS) require companies to conduct double materiality assessments and disclose both environmental impacts and financial dependencies. This regulatory shift places environmental performance at the front line of corporate sustainability strategies and stakeholder evaluations.

Despite progress, significant challenges persist. Companies often struggle with measurement inconsistencies, limited availability of reliable environmental data, and difficulties in aligning internal management systems with new regulatory requirements. Small and medium-sized enterprises face additional capacity constraints as they adapt to emerging ESG expectations. Moreover, the integration of environmental performance indicators into strategic decision-making, risk assessment, and long-term planning remains uneven across sectors.

This article investigates these developments by analyzing current sustainability and environmental performance reporting practices and the emerging challenges associated with ESG disclosure. Through this examination, the study contributes to a deeper understanding of how organizations navigate evolving regulatory frameworks, rising stakeholder expectations, and the complex demands of environmental accountability. The findings aim to support both academic inquiry and practical decision-making, offering insights that enhance the transparency, reliability, and strategic relevance of environmental performance reporting.

LITERATURE REVIEW

Environmental performance reporting has become a fundamental component of corporate sustainability disclosure, reflecting the increasing recognition of environmental risks as material strategic challenges for organizations. The academic literature emphasizes that environmental performance encompasses both quantitative and qualitative indicators related to emissions, resource efficiency, pollution control, waste management, and biodiversity impacts (Schaltegger & Burritt, 2018). Early studies focused on voluntary environmental reporting practices, highlighting the significant variation in scope, methodological rigor, and comparability across companies (Gray, Kouhy & Lavers, 1995). However, the regulatory landscape has since evolved, driven by global commitments to climate neutrality and the rising influence of ESG-oriented investors.

Environmental Accounting and Performance Metrics. Environmental performance is closely linked to environmental accounting, which provides the measurement and analytical basis for evaluating ecological impacts. According to Burritt, Schaltegger, and Carter (2002), environmental accounting systems are essential for generating reliable data that enable companies to monitor environmental efficiency and assess lifecycle impacts. More recent studies (Qian & Schaltegger, 2017) argue that environmental performance assessments should integrate both direct environmental impacts—such as GHG emissions, water use, and waste generation—and indirect impacts embedded in supply chains, requiring companies to improve traceability and data collection capabilities.

The emergence of standardized reporting frameworks has attempted to harmonize environmental metrics. The Global Reporting Initiative (GRI), particularly GRI 302 (Energy), GRI 303 (Water), and GRI 305 (Emissions), establishes widely adopted environmental indicators. Similarly, the Task Force on Climate-related Financial Disclosures (TCFD, 2017) emphasizes forward-looking assessments of

climate risks and resilience strategies. Scholars such as Eccles and Krzus (2018) emphasize that such frameworks stimulate comparability and reduce information asymmetry between companies and stakeholders.

Environmental Performance and Regulatory Developments. Regulation plays an increasingly influential role in shaping environmental reporting practices. The European Union has become a global leader in this field, with the recent Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standards (ESRS E1–E5) imposing mandatory requirements for detailed environmental disclosures. Academic analyses (La Torre et al., 2023) highlight that ESRS introduces a higher level of standardization and granularity, particularly regarding climate change mitigation, pollution prevention, water and marine resources, and circular economy practices. The shift toward mandatory environmental reporting addresses the well-documented limitations of voluntary disclosure, such as selective reporting and greenwashing (Cho & Patten, 2007).

Assurance and Reliability of Environmental Reporting. A significant stream of literature examines the assurance of environmental and sustainability information. Simnett, Vanstraelen, and Chua (2009) demonstrate that external assurance enhances the credibility and perceived reliability of environmental disclosures, particularly when assurance is provided by established audit firms. Recent studies (Boiral, Heras-Saizarbitoria & Brotherton, 2020) argue that assurance also contributes to organizational learning by encouraging more robust internal environmental management systems. The introduction of ESRS and growing investor pressure intensify the need for rigorous third-party verification to ensure the accuracy of environmental data and to combat symbolic disclosure.

Environmental Performance and Corporate Strategy. Research also emphasizes the strategic role of environmental performance within broader corporate sustainability agendas. According to Porter and van der Linde (1995), improved environmental performance can enhance competitive advantage by reducing resource costs and stimulating innovation. More recent perspectives (Dangelico & Vocalelli, 2017) suggest that environmental performance reporting drives eco-innovation, enabling firms to identify environmental hotspots and develop more sustainable business models. The literature further indicates a positive relationship between high-quality environmental reporting and improved financial performance, mediated by enhanced stakeholder trust (Clark, Feiner & Viehs, 2015).

Challenges in Environmental Performance Reporting. Despite regulatory progress, significant challenges remain. Companies face methodological difficulties in measuring complex environmental impacts, especially those associated with Scope 3 emissions (Kling et al., 2021). Data fragmentation, limited digital infrastructure, and inconsistent boundary definitions hinder comparability across sectors. Scholars (Hahn & Kühnen, 2013) also point to tensions between comprehensive reporting and information overload, raising questions about the balance between transparency and relevance. Furthermore, SMEs encounter disproportionate compliance burdens due to limited technical and financial resources (European Commission, 2023).

Overall, the literature reveals a dynamic evolution in environmental performance reporting, driven by regulatory innovation, stakeholder expectations, and the growing recognition of environmental risks as central to business continuity. However, the operationalization of high-quality environmental reporting remains complex, underscoring the need for further research and capacity building.

MATERIALS AND METHODS

This study employs a qualitative, comparative, and document-based research design to explore sustainability and environmental performance reporting practices, with a specific focus on emerging ESG requirements in *Republica Moldova***,** *România*, and the *European Union*. The methodological approach was structured in four stages: (1) selection and analysis of regulatory frameworks; (2) collection of corporate sustainability and environmental reports; (3) coding and thematic content analysis; and (4) comparative cross-jurisdictional assessment. This combined methodological structure ensures both depth and contextual accuracy in evaluating how organizations approach environmental performance disclosures amid evolving ESG expectations.

Regulatory and Policy Documents. To examine the institutional context influencing reporting practices, the study draws upon a comprehensive set of regulatory documents, strategically selected to capture the full spectrum of environmental and sustainability reporting obligations:

- *European Union:* In the European Union, corporate sustainability reporting is shaped by several key regulatory frameworks and guidance documents, including the *Corporate Sustainability Reporting Directive (CSRD, 2022)***,** the *European Sustainability Reporting Standards (ESRS, E1–E5, 2023)***,** the *EU Taxonomy Regulation (2020)***,** and the earlier *Non-Financial Reporting Directive (NFRD, 2014)***.** These are complemented by the *EU Green Deal communications (2019–2024)* and *EFRAG's TCFD-aligned guidance (2021–2023)***,** which collectively establish the standards for ESG disclosure, assurance, and corporate transparency across member states.

- *Romania:* In Romania, the implementation of non-financial reporting requirements has been guided by the *transposition of Directive 2014/95/EU on Non-Financial Reporting***,** supported by *Order no. 1938/2016 issued by the Ministry of Finance***,** relevant *ANAF guidelines on non-financial reporting***,** and aligned with the country's strategic objectives outlined in the *National Strategy for Sustainable Development 2030.*

- *Republic of Moldova*: In the Republic of Moldova, the regulatory framework for non-financial and environmental reporting is primarily based on the *Law on Accounting and Financial Reporting (No. 139/2017)***,** supplemented by *regulations on non-financial reporting in the public sector***,** the *National Environmental Strategy 2030***,** and the *National Action Plan for Environment and Climate (NAP)***.** These are further supported by related guidelines and documents issued by the *Ministry of Environment* and the *National Commission of the Financial Market***,** collectively establishing the national standards and practices for ESG and environmental performance disclosure.

These documents were selected based on their direct relevance to environmental performance reporting, as well as their importance in establishing the ESG compliance framework.

Corporate and Institutional Reports. For the applied analysis, sustainability reports and integrated reports from the period 2020 - 2024 were analyzed, representing: companies listed on the Bucharest Stock Exchange (Romania); - multinational companies operating in Romania; - large utilities, energy, agro-industrial and telecommunications enterprises from the Republic of Moldova; - reports of European companies considered leaders in environmental performance reporting (e.g. Enel, Siemens, IKEA).

The selection criteria included: public availability, reporting according to GRI/ESRS/TCFD, relevance for sectors with high environmental impact and the presence of environmental performance indicators.

Limitations of the Methodology. The methodology presents several important limitations:

- lack of detailed ESG reports for Moldovan companies (reporting is still voluntary);
- very high variation in reporting maturity across sectors;
- lack of access to internal operational data for indicator verification;
- low comparability of environmental indicators between companies using GRI and those applying ESRS.

Despite these limitations, the dataset and methodological approach allow for robust assessment of trends, convergences and differences across jurisdictions. All documents analyzed are public, do not involve personal data or confidential information, and comply with academic principles regarding citation and limited reproduction of content.

RESULTS AND DISCUSSION

The analysis of sustainability reports from the Republic of Moldova, Romania and the European Union reveals a significant differentiation in the level of maturity in environmental performance reporting. The results indicate three distinct trajectories:

1. *EU* - advanced maturity, detailed reporting, aligned with ESRS/GRI/TCFD;
2. *Romania* - intermediate maturity, with accelerated growth due to the adoption of CSRD;
3. *Republic of Moldova* - emerging maturity, with a predominant focus on voluntary reporting and fragmented indicators.

Table 1. Level of detail of environmental indicators

Country	GHG indicators	Energy	Water	Waste	Roundness	Biodiversity
EU	Advanced	Advanced	Advanced	Advanced	Average - Advanced	Average
Romania	Average	Average	Average	Average	Low-Average	Low
Republic of Moldova	Low	Low	Low	Low	Low	Non-existent

The EU presents almost complete coverage of the indicators required by the ESRS E1–E5, while Romania is in a process of alignment and Moldova continues to show structural gaps.

The analysis of environmental performance at the European Union level provides an essential context for understanding the gaps and progress recorded by the Republic of Moldova and Romania. Structured on indicators such as GHG emissions, waste management, renewable energy, energy efficiency and air quality, the comparison highlights both structural and institutional differences.

In 2023, total EU emissions fell by around 30% compared to 1990, supported by the energy transition and ambitious climate policies. Romania, similarly, recorded a reduction of over 50% compared to 1990, as a result of post-industrial restructuring and investments in renewable energy

(Eurostat, 2024). In contrast, the Republic of Moldova shows a slower reduction, of around 15–18% compared to the 1990s, partly due to its dependence on energy imports and outdated industrial infrastructure (Ministry of Environment of the Republic of Moldova, 2024). The EU has reached a share of 23% renewable energy in gross final consumption in 2023, in line with the Fit for 55 targets. Romania exceeds the European average, standing at around 25%, due to investments in hydropower and wind power (ANRE, 2024). Moldova, however, has a share of only 4–5%, which highlights a major energy vulnerability and a critical need for diversification (EEA, 2024).

The EU is moving towards circular models, with a recycling rate of 48%. Romania continues to face systemic problems, reporting a recycling rate below 14%, being monitored in infringement procedures (European Commission, 2024). The Republic of Moldova has even lower performances, around 7–8%, reflecting the lack of infrastructure for separate collection and recycling (Environmental Agency of the Republic of Moldova, 2024). These data confirm that environmental performance in the two countries is predominantly influenced by institutional capacity, public investment, the degree of digitalization, and the pressures exerted by European policies, to which Moldova only aspires and is not yet fully aligned.

In Europe, the main ESG constraints are:

- the complexity of the Corporate Sustainability Reporting Directive (CSRD) standards;
- the need to allocate resources for internal ESG auditing;
- insufficient digitalization of non-financial reporting in SMEs.

For Romania, the major challenge lies in the coherent implementation of the legislation and the capacity of companies to produce verifiable reports, especially in energy-intensive sectors.

The *Republic of Moldova* faces additional challenges:

- the lack of mandatory ESG reporting for most companies;
- limited infrastructure for measuring emissions;
- lack of certified experts in the field of sustainability reporting.

A recurring obstacle in all three areas analyzed is data quality. In the EU, large companies already have robust data collection systems, but SMEs are lagging behind. In Romania, environmental data is often fragmented, relying on slow and sometimes incomplete administrative reporting. In Republic of Moldova, the shortcomings are even more pronounced — many companies lack equipment to measure emissions, resulting in incomplete reports or reports not aligned with international methodologies. Although companies in the EU are required to link ESG indicators to strategic plans, companies in Romania and Moldova often view environmental performance as a bureaucratic exercise. This limits the real impact of reporting. *The lack of strategic integration causes a significant gap between formal reporting and actual environmental performance*.

Table 2. Cross-country Comparative Analysis: Institutional Maturity Level

Country	ESG maturity level	Reporting obligations	Institutional capacity	Observations
EU	Advanced	CSRD/ESRS mandatory	Advanced	Global leader
Romania	Average	CARD transposition	Average	Under consolidation
Republic of Moldova	Low	Voluntary	Low	Gradual alignment

We note that according to the EPI 2024 indicator (Environmental Performance Index), which results from a global analysis that provides a picture of the environmental performance of countries in terms of sustainability, environmental protection and ecological health, the EU occupies 7 - 80 places among the top 50 worldwide, Romania - 77th place, and the Republic of Moldova - 97th place.

These differences reflect the capacity to implement green infrastructure, investments in clean energy and the degree of adoption of decarbonization policies.

The results of the analysis undertaken by us confirm the following essential conclusions:

1. Environmental performance is closely correlated with the level of European integration. Romania benefits from EU pressures and opportunities, while Moldova remains dependent on international cooperation for progress.

2. ESG reporting does not automatically equate to improving environmental performance. Without concrete measures and investments, reporting becomes a formality.

3. Data quality is the biggest obstacle for Moldova and Romania. Equipment, digitalization and standardization are insufficient.

EU companies are already at an advanced stage of ESG maturity, which is a model for the two countries analyzed.

CONCLUSIONS

This study provides a comprehensive analysis of sustainability and environmental performance reporting, with a particular emphasis on environmental indicators within the ESG framework, across the European Union, Romania, and the Republic of Moldova. The findings highlight significant differences in reporting maturity, regulatory alignment, and actual environmental performance, reflecting both institutional capacities and the degree of integration into the European regulatory ecosystem. First, the analysis demonstrates that *EU-based companies* exhibit the highest level of environmental reporting sophistication. This is largely driven by the mandatory frameworks of CSRD and ESRS, which ensure that disclosures are not only standardized but also externally assured. EU companies report extensively on greenhouse gas emissions (Scopes 1–3), energy efficiency, water usage, waste management, circularity, and, increasingly, biodiversity. These reports are often integrated into corporate governance structures, linking environmental performance to strategic decision-making and executive incentives. Consequently, the credibility, comparability, and reliability of the environmental data are significantly enhanced, reinforcing stakeholder trust and fostering the transition toward climate neutrality. Second, *Romania* shows considerable progress in aligning with European ESG standards. Large enterprises and multinational subsidiaries demonstrate proactive reporting practices, particularly in energy-intensive sectors. Romania’s recent transposition of CSRD and national sustainability strategies (SNDD 2030) contributes to better data collection and reporting consistency. However, limitations remain in reporting Scope 3 emissions, circular economy metrics, and biodiversity indicators, particularly among small and medium-sized enterprises. These gaps highlight the need for enhanced technical support, capacity building, and regulatory guidance to achieve full compliance and meaningful environmental impact.

Third, the *Republic of Moldova* represents an emerging context, where sustainability reporting is largely voluntary and concentrated among larger companies.

Environmental performance metrics are fragmented, focusing primarily on energy consumption and, to a limited extent, greenhouse gas emissions. Data on waste management, water use, and biodiversity are minimal or absent, reflecting infrastructural constraints, lack of standardized methodologies, and limited regulatory pressure. These challenges underscore the importance of international cooperation, capacity building, and gradual alignment with European frameworks to improve environmental performance and reporting credibility.

Overall, the comparative analysis reveals the following main key conclusions:

- Regulatory frameworks are essential drivers of environmental reporting maturity and quality, as evidenced by the EU experience.

- Data quality, transparency, and integration into strategic governance remain critical factors for achieving environmental performance improvements across all jurisdictions.

- Emerging economies like Moldova require targeted support to develop institutional capacities, adopt standardized methodologies, and enhance ESG reporting, which can facilitate sustainable development and integration with EU practices.

In conclusion, enhancing environmental performance reporting is not merely a compliance exercise; it is a strategic tool for improving corporate sustainability, fostering stakeholder confidence, and supporting the broader transition to a low-carbon, circular economy. The study provides evidence-based insights that can inform policymakers, regulators, and corporate managers in shaping effective ESG strategies and environmental disclosure practices in diverse European contexts.

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