Aligning Slovenian Energy Companies' Sustainability Reporting with the ESRS: A Comparative Analysis

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Abstract

This paper examines how selected Slovenian energy companies are aligning sustainability reporting with the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS). It addresses three questions: how pre-ESRS reporting practices compared with an international benchmark, how compliance changed after the first mandatory ESRS reporting cycle, and which ESG areas remain least mature. A comparative longitudinal analysis was conducted for Enel, Petrol, HSE and GEN-I using a unified ESRS-based evaluation protocol. Reports from 2021-2023 were compared with the 2024 annual reports. Disclosures were scored on a 0-2 scale across specific ESRS aspects, ESRS 2 and the thematic standards E1-E5, S1-S4 and G1. The results show clear progress among Slovenian companies in 2024. HSE recorded the strongest improvement and reached 92.11% overall compliance, Petrol achieved 89.47%, and GEN-I 78.95%, while Enel remained the benchmark at 97.37%. Governance disclosures were the strongest area, whereas environmental and some social disclosures still differentiated the companies. The findings indicate that ESRS has already improved comparability, reporting structure and managerial attention to sustainability issues, but that organisational capabilities, double materiality assessment and report architecture remain decisive for higher-quality compliance. The paper contributes a replicable evaluation framework and offers practical implications for organisations preparing CSRD-compliant reports.

Keywords: sustainability reporting, ESRS, CSRD, energy sector, Slovenia, ESG disclosures

1 Introduction

Sustainability reporting has moved from a largely voluntary communication practice to a strategically important and increasingly regulated part of corporate accountability. Companies are no longer judged only on financial results, but also on how they manage environmental, social and governance (ESG) impacts, risks and opportunities. Foundational literature has long interpreted social and environmental disclosure through legitimacy and stakeholder perspectives, while later review studies connect the adoption, extent and quality of sustainability reporting with legitimacy, stakeholder, signalling and institutional theory (Gray et al., 1995; Hahn & Kühnen, 2013). Earlier Slovenian literature likewise noted that sustainability reporting in Slovenia was still developing while stakeholders were demanding broader, more comparable and more credible non-financial information (Babič & Biloslavo, 2012). International surveys show a strong long-term shift from selective disclosure towards more structured sustainability reporting frameworks (KPMG International, 2022).

This shift is especially relevant in the energy sector. Energy companies are central to decarbonisation, security of supply, infrastructure resilience and the broader transition to a low-carbon economy. Their disclosures therefore matter not only to investors but also to regulators, employees, local communities, and civil society. Research focused on energy- and utility-intensive industries confirms that reporting quality, assurance and ESG performance are especially salient in sectors with high environmental impact and reputational exposure (Karaman et al., 2021; Imperiale et al., 2023). At the European level, the most important regulatory change is the CSRD, which replaced the earlier Non-Financial Reporting Directive and introduced a much more demanding reporting architecture based on the ESRS (European Commission, 2023c, 2024).

For companies in scope, the first mandatory ESRS-aligned disclosures relate to the 2024 financial year. This makes the current period particularly suitable for examining whether the new regime has already changed reporting practice in a measurable way. Prior literature shows that the move from voluntary to mandatory sustainability reporting has important economic, organisational, and governance consequences, but also raises questions about implementation, enforcement, and decision usefulness (Christensen et al., 2021). Despite the practical importance of the issue, empirical evidence on how Slovenian energy companies are adapting to the ESRS remains limited. Existing discussions are often normative, whereas fewer studies assess actual reports before and after the introduction of the new standards.

Against this background, the paper addresses three research questions. The first research question asks how the pre-ESRS reporting practices of selected Slovenian energy companies compare with an international benchmark. The second research question examines the extent to which the first 2024 reporting cycle improved overall compliance with ESRS requirements. The third research question explores which ESG areas remain the most challenging and what organisational factors appear to support higher-quality reporting. By answering these questions, the paper contributes to the conference theme of sustainability management in organisations by linking regulatory compliance with organisational design, managerial capability, and stakeholder communication.

2 Regulatory background and analytical lens

The CSRD entered into force on 5 January 2023 and fundamentally changed the logic of sustainability reporting in the European Union. Instead of fragmented and often selective disclosure, the directive aims to create a coherent, auditable and comparable reporting regime that is closely connected to sustainable finance and corporate governance. In the academic literature, this shift is understood as part of a broader movement from non-financial reporting towards more integrated, decision-useful and mandatory sustainability reporting (Christensen et al., 2021; Baumüller & Sopp, 2022; European

Commission, 2024). The ESRS operationalise this goal by prescribing the structure and content of mandatory disclosures.

The standards consist of two cross-cutting standards, ESRS 1 and ESRS 2, and thematic standards covering environmental (E1-E5), social (S1-S4) and governance (G1) issues. A defining feature of the ESRS is double materiality. Companies must report not only on sustainability matters that affect enterprise value, but also on the impacts the company has on people and the environment across its value chain. Recent scholarship emphasises that this is not merely a terminological change but a substantive shift away from narrower investor-oriented concepts of materiality, while also highlighting tensions between financial and impact materiality in practice (Baumüller & Sopp, 2022; Jørgensen et al., 2021). This requirement raises the methodological bar, because good reporting now depends on robust internal processes for identifying impacts, risks and opportunities, involving stakeholders and documenting decision logic (European Commission, 2023a; Fantini et al., 2023).

Compared with other major frameworks, the ESRS are both broader in scope and more prescriptive in legal effect. GRI remains highly influential and provides useful foundations for impact-oriented reporting, but it is voluntary and more flexible in format. ISSB standards focus primarily on financially material sustainability information for capital markets. The ESRS combine legal obligation with a double-materiality perspective, making them particularly demanding for organisations that previously relied on selective ESG narratives or loosely connected sustainability sections in annual reports. This also means that comparability cannot be reduced to formal uniformity alone: recent literature shows that comparability in sustainability reporting depends on how companies define material topics, operationalise disclosure requirements and enable meaningful benchmarking over time and across firms (Jørgensen et al., 2021; Korca et al., 2023).

This paper therefore approaches ESRS compliance not simply as a checklist exercise, but as an indicator of managerial maturity. High-quality alignment requires internal governance structures, cross-functional coordination, reliable data collection, a defensible double-materiality assessment, and a report architecture capable of linking strategy, targets, actions, metrics, and assurance. Research on disclosure quality warns that formal reporting practices do not automatically produce more balanced, precise or decision-useful information, which is why content-based assessment remains necessary even under a standardised framework (Michelon et al., 2015). The energy sector provides a demanding testing ground for these capabilities because environmental disclosures are material, stakeholder expectations are high and transition-related risks are especially salient (Imperiale et al., 2023; Karaman et al., 2021).

The scale of the regulatory change is substantial. KPMG estimates that the CSRD extends mandatory reporting to roughly 49,000 companies in Europe, far beyond the population previously covered by the NFRD (KPMG International, 2022). For many organisations, compliance therefore requires new routines for data governance, internal control, management oversight and assurance readiness. In this sense, ESRS implementation is not a narrow reporting reform but part of a broader transformation in how sustainability is governed inside firms.

3 Methodology

The empirical part of the study uses a comparative longitudinal design based on document analysis. The sample comprises Enel as an international benchmark and the three largest Slovenian energy companies ranked in the national top 100 energy companies list for 2022: Petrol d.d., HSE d.o.o. and GEN-I d.o.o. (Glas gospodarstva, 2023). Enel was included because it represents a mature European reporting practice and provides a useful external point of reference for evaluating the Slovenian companies.

The analysis covers both the period before mandatory ESRS application and the first mandatory reporting cycle. For the earlier period, the study examined Enel's Sustainability Report 2023, the 2023 annual reports of the Slovenian companies, and the earlier stand-alone sustainability reports of HSE (2021) and Petrol (2022) where these documents provided a clearer picture of pre-ESRS sustainability disclosure practice. For the current state, the study analysed the 2024 annual reports of all four groups (Enel Group, 2024, 2025; GEN-I d.o.o., 2024, 2025; HSE d.o.o., 2021, 2025; Petrol d.d., 2023, 2025).

To ensure repeatability and comparability, a unified evaluation protocol was developed directly from the ESRS architecture. Each disclosure item was scored on a three-point scale: 0 if the disclosure was absent, 1 if it was only partially covered, and 2 if it was fully covered in line with ESRS expectations. A score of 1 was assigned when a topic was acknowledged only in qualitative or general terms, lacked the underlying process (for example, no documented double materiality assessment), or omitted the expected metrics and targets, whereas a score of 2 required a fully developed disclosure combining a described process, identified impacts, risks and opportunities, and both qualitative explanation and quantitative metrics with targets. To support consistency and traceability, every individual score is accompanied by a short-written justification, documented in the detailed evaluation tables of the underlying master's thesis (Marčič, 2025). The protocol comprised 19 individually scored items, each worth a maximum of 2 points, grouped into three dimensions. The first dimension, specific ESRS-related aspects, contained five items - double materiality, value chain coverage and reporting boundary, EU taxonomy indicators, assurance, and digital reporting in ESEF/XBRL format - giving a maximum of 10 points. The second dimension, the cross-cutting standard ESRS 2, contained four items - governance, strategy, impacts, risks and opportunities (IROs), and metrics and targets - giving a maximum of 8 points. The third dimension, the thematic standards, contained ten items (E1-E5, S1-S4 and G1), giving a maximum of 20 points. The maximum overall score was therefore 38 points, and each report's compliance index was calculated as its achieved score divided by 38, expressed as a percentage.

The protocol generated compliance indices that make it possible to compare companies and years in a transparent way. In addition to the scoring exercise, qualitative content analysis was used to interpret how companies structured their reports, which ESG themes were emphasised, and what organisational changes appeared to support stronger alignment. This combination of structured scoring and qualitative interpretation is appropriate for an early-stage ESRS setting, where report quality depends not only on the presence of disclosures, but also on the coherence of the reporting logic.

4 Results and discussion

The results reveal a clear distinction between the pre-ESRS baseline and the first mandatory ESRS reporting cycle. Before mandatory implementation, Enel was already close to full alignment, reaching 92.11% overall compliance. Among the Slovenian documents, Petrol's stand-alone sustainability report for 2022 performed best at 71.05%, followed closely by GEN-I's 2023 annual report at 68.42%. HSE lagged substantially behind, with 26.32% for its 2021 sustainability report and 34.21% for its 2023 annual report. These findings suggest that earlier Slovenian reporting practice was uneven, with major differences not only between firms but also between document types. In Petrol's case, the gap between the stand-alone sustainability report and the annual report indicates that sustainability information was still partly separated from mainstream corporate reporting rather than fully embedded in a single integrated disclosure architecture.

Table 1 summarises the overall compliance indices across the analysed documents and shows how strongly the Slovenian sample improved in 2024. Enel increased from 92.11% to 97.37%. The most striking change occurred at HSE, which moved from the weakest position in the baseline period to

92.11% in its 2024 annual report. Petrol also improved substantially, reaching 89.47%, while GEN-I advanced more moderately to 78.95%. The overall pattern indicates that the introduction of ESRS did not merely expand disclosure volume; it also pushed companies towards more standardised structures and more explicit treatment of material topics, governance and assurance.

Table 1: Overall ESRS compliance indices across the reports analysed

Report	Score (max. 38)	Compliance index (%)
Enel SR 2023	35	92.11
GEN-I AR 2023	26	68.42
HSE AR 2023	13	34.21
HSE SR 2021	10	26.32
Petrol AR 2023	16	42.11
Petrol SR 2022	27	71.05
Enel AR 2024	37	97.37
GEN-I AR 2024	30	78.95
HSE AR 2024	35	92.11
Petrol AR 2024	34	89.47

Source: authors' compilation based on the company's analysed reports.

The thematic pattern is equally revealing. In the baseline period, Slovenian companies generally performed better in governance than in environmental disclosures, while social disclosures were uneven. Petrol's 2022 sustainability report stood out for its very strong environmental and social coverage, but this quality was not fully replicated in its 2023 annual report. HSE's early reports displayed systematic gaps across all three ESG areas. In contrast, GEN-I showed a relatively balanced but not yet fully mature profile. These differences confirm that governance language alone is not enough for strong ESRS alignment; the most demanding aspect is translating sustainability governance into specific, evidence-based and cross-referenced disclosures.

The first ESRS cycle significantly narrowed these gaps. As shown in Table 2, all Slovenian companies reached 100% compliance in governance disclosures in 2024, and all three scored 75% in the social area. The remaining differentiation lies primarily in the environmental standards, where HSE achieved full compliance, Petrol 80%, and GEN-I 70%. This suggests that environmental disclosures remain the main frontier of reporting quality in the sector. The result is not surprising: energy companies face particularly complex requirements regarding climate change, pollution, water, biodiversity, resource use, and transition planning. Thematic completeness, therefore, depends on both technical data systems and organisational readiness.

From a managerial perspective, the most important finding is that the first ESRS cycle appears to reward internal integration. The strongest reports are not necessarily those that provide the largest volume of narrative text, but those that link governance, materiality, action plans, KPIs and report boundaries in a consistent way. Where that linkage is weak, the report may still look comprehensive, yet important ESRS expectations remain only partially addressed. The Slovenian cases therefore illustrate a difference between formal disclosure expansion and substantive reporting maturity.

Table 2: Compliance with thematic ESRS areas in the 2024 annual reports

Report	Environment (%)	Social (%)	Governance (%)
Enel AR 2024	100	87.5	100
GEN-I AR 2024	70	75	100
HSE AR 2024	100	75	100
Petrol AR 2024	80	75	100

Source: authors' compilation based on the analysed company reports.

The qualitative analysis helps explain why HSE improved so markedly. Its 2024 report reflects a more disciplined ESRS structure, a formalised double-materiality assessment, and a clearer internal allocation of responsibility. Petrol's improvement is also associated with the stronger integration of double materiality into the annual report. GEN-I remains relatively stable and credible, but its progress is more limited, partly because the 2024 report does not reflect as substantial a redesign of the reporting architecture as in the HSE case. Across the sample, the evidence supports the view that compliance improves most when ESRS implementation is treated as an organisational project rather than a purely editorial exercise.

5 Conclusion

The transition to ESRS is already reshaping sustainability reporting in the Slovenian energy sector. The evidence from this study shows that the first mandatory reporting cycle improved overall comparability and significantly raised compliance levels among the analysed Slovenian companies. HSE achieved the largest improvement, Petrol also made strong progress, and GEN-I maintained a solid but somewhat less advanced profile, while Enel remained the benchmark throughout. Governance disclosures are now comparatively strong across the sample, but environmental reporting continues to explain most of the remaining differences.

The main conclusion is that high-quality ESRS alignment depends less on rhetorical commitment to sustainability than on organisational readiness: governance structures, robust double materiality assessment, coherent report design and the ability to integrate sustainability into mainstream management processes. For organisations preparing future CSRD-compliant reports, sustainability reporting should therefore be understood not only as a compliance task, but as a strategic management capability.

5.1 Implications for organisations and society

For organisations and managers, the findings point to three practical lessons. First, governance structures matter. Companies that establish a dedicated sustainability function, a responsible committee, or clear cross-functional coordination mechanisms are better positioned to connect strategy, targets, metrics and disclosure. This is visible across the analysed companies, where improved alignment is associated with more explicit internal sustainability roles and stronger governance arrangements (Enel Group, 2024, 2025; GEN-I d.o.o., 2024, 2025; HSE d.o.o., 2025; Petrol d.d., 2025).

Second, a credible double materiality assessment is not only a regulatory requirement but also a managerial tool. It helps organisations prioritise ESG topics, clarify accountability, and align reporting with actual strategic decision-making. Third, reports on usability deserve more attention. As sustainability sections grow longer and more technical, stakeholders may struggle to identify the key messages. Short executive summaries, better navigation, and stakeholder-oriented presentation formats could increase the practical value of otherwise compliant reports.

The societal implications are equally important. More transparent and comparable sustainability reporting improves the information base available to investors, regulators, employees, communities and nongovernmental organisations. This can reduce information asymmetry and the risk of symbolic disclosure or greenwashing, while also enabling better scrutiny of companies that play a key role in the green transition (European Commission, 2024). In the energy sector, where transition choices affect infrastructure, affordability, security of supply and environmental impacts, better reporting is therefore not only an organisational issue but also a matter of broader social responsibility.

5.2 Originality, limitations and further research

The paper makes three main contributions. First, it applies a unified ESRS-based evaluation protocol that allows structured comparison across companies and across reporting periods. Second, it provides one of the first focused empirical analyses of ESRS alignment in the Slovenian energy sector across the transition from pre-ESRS to mandatory 2024 reporting. Third, it links compliance outcomes to organisational capability, thereby connecting technical reporting requirements with the broader management agenda of the IRDO conference.

At the same time, the study has limitations. The sample is small and purposive rather than statistically representative. The analysis is restricted to publicly available reports and therefore evaluates disclosure quality rather than underlying sustainability performance. The inclusion of one international benchmark strengthens interpretation, but broader cross-country comparison would require a larger sample. Future research could extend the protocol to other sectors, examine multiple post-2024 reporting cycles, compare assurance practices in more detail, and include stakeholder perspectives on the actual usability of ESRS-based disclosures.

For policymakers and professional associations, the findings also suggest that capacity building remains necessary. Even within a relatively focused sector, companies differ considerably in how they interpret ESRS requirements and translate them into report architecture. Guidance, examples of good practice and exchange between preparers, auditors and academics could reduce these differences and accelerate learning in subsequent reporting cycles.

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