Accounting and Management Information Systems
Vol. 24, No. 3, pp. 509-529, 2025
DOI: http://dx.doi.org/10.24818/jamis.2025.03005

Sustainability Reporting and corporate governance in the European energy sector

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Abstract

Research Questions: How do selected companies present their materiality assessment policies in their annual reports? What are the selected company's due diligence processes? How do selected companies engage with their stakeholders? Do the selected companies have sustainability committees? Is there a designated person responsible for sustainability? How are the sustainability risks managed by the governance structure?

Motivation: With the increasing global emphasis on environmental responsibility and the impact of corporate actions on society, this study is motivated by the need to assess the commitment of the energy sector to transparency and governance, particularly in light of new EU directives.

Idea: This paper examines the adherence of European energy firms to sustainability reporting norms and governance practices. It evaluates the integration of sustainability into corporate strategies, risk management, and stakeholder engagement within the sector.

Data: The study utilizes a narrative review of sustainability reports and governance documents from the top six European energy companies with the highest ESG ratings according to Refinitiv database.

Tools: A qualitative assessment of the content of the sustainability reports and governance documents was conducted.

Findings: The results reveal a pervasive commitment to sustainability criteria among the examined energy firms. All selected companies demonstrated comprehensive adherence to sustainability practices, indicating full compliance with the criteria. The findings suggest a strategic alignment with sustainability imperatives and robust integration of sustainability reporting and corporate governance into operational frameworks.

Contribution: This study contributes to the existing literature on sustainability and integrated reporting by providing a comprehensive analysis of how European energy firms comply with sustainability reporting regulations and integrate these practices into their corporate

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Article History: Received 12 September 2024; Accepted 17 September 2025.
Accepted by: Camelia-Iuliana Lungu.

governance frameworks. The current research is not without limitations; however, it may offer perspectives for future studies. The paper exposes the need for further research in the field, focusing on the sustainability reporting and corporate governance within the European energy sector.

Keywords: Sustainability reporting, corporate governance, European energy sector, ESG scores, EU Directives

JEL codes: M41

1. Introduction

The energy sector serves as an essential pillar for the global economy, embracing diverse forms of resources and infrastructure. The sector includes renewable and non-renewable energy sources, with oil still maintaining its position as a key driver in the global market, contributing significantly to production and exports, particularly from nations such as Saudi Arabia (Mohamed, 2010). As organizations increasingly recognize the importance of sustainability reporting, they face the challenge of harmonizing economic, social, and environmental elements within their accounting practices (Lai & Stacchezzini, 2021). The discussion around creating a standardized method for sustainability reporting has captured the attention of academics, industry leaders, and legislators, who are collectively exploring the intricate and promising aspects of this trend (Brown & Dillard, 2014; Beck *et al.*, 2017)

Many studies overlook the critical role that stakeholder engagement plays in shaping sustainability reporting practices, particularly regarding how various stakeholders influence corporate governance decisions in the energy sector (Hahn *et al.*, 2015). This paper will investigate the dynamics between companies and their stakeholders, providing insights into how these interactions affect sustainability initiatives. Through addressing this gap, this research will contribute to a more nuanced understanding of sustainability practices in the energy sector and highlight the importance of stakeholder engagement in shaping effective corporate governance.

This study examines the sector's commitment to transparency and governance, essential for managing its significant social and environmental footprint. It reviews current research, highlights key findings, and assesses the sector's adherence to sustainability reporting norms, emphasizing the importance for stakeholders demanding responsible, sustainable practices. The study aims to evaluate European energy firms' compliance with reporting regulations and the broader implications for environmental stewardship.

The research concludes that the analysed European energy companies demonstrate a strong commitment to sustainability, setting a benchmark for responsible business practices in an era of heightened environmental awareness. Sustainability reporting has seen a marked increase in recent years, often undertaken voluntarily by companies. These entities now regularly produce sustainability reports, adhering to a variety of standards that ensure the reports' relevance and credibility. This approach to reporting is interchangeable with other concepts of non-financial disclosure such as corporate social responsibility and represents an advanced form of traditional reporting that consolidates the assessment of both financial and non-financial metrics into a single document.

The remainder of this paper is organized as follows: Section 2 provides a comprehensive review of the related literature, offering a detailed background and contextual framework. Section 3 describes the methodology employed in this study. Section 4 presents the research findings. Finally, Section 5 presents the conclusions and discussions of this paper.

2. Literature review

The fundamental aim of sustainability reporting is to cultivate and enhance corporate trust, creating a well-informed and sustainable operational landscape. This is essential as corporate actions have immediate effects on markets and all stakeholder groups, influencing societal trust levels. Sustainable measures are not solely derived from financial data; they involve 'evaluating risks and opportunities based on extensive current and future issue information' (Global Reporting Initiative, 2019).

Directives 2014/95/EU and (EU) 2022/2464 establish regulatory frameworks for certain large entities, particularly public-interest entities such as those in the energy sector with a workforce exceeding 500 employees, to disclose information regarding their ESG performance. Through an integrated reporting approach, companies can present a more holistic view of their operations and their approach to addressing societal and environmental challenges, it also assists companies in recognizing potential opportunities and risks associated with their environmental impact (Arvidsson, 2019).

Directive (EU) 2022/2464, enacted by the European Parliament and Council, revises the non-financial reporting stipulations in Directive 2013/34/EU. As an integral part of the European Green Deal, this directive aims to steer the European Union towards becoming a modern, resource-efficient economy with zero net greenhouse gas emissions by 2050, thereby enhancing the well-being of its citizens and protecting the Union's natural capital. It emphasizes the importance of economic growth decoupled from resource use, promoting stability, job creation, and growth, including sustainable investments (European Parliament and the Council of the European Union, 2022).

Energy firms in Europe are increasingly prioritizing eco-friendly practices, a trend propelled by both legal regulations and market forces. The influence of the European Directive 2014/95/EU on sustainability disclosures by these companies has been profound, fostering greater openness and responsibility regarding their impact on the environment (Dumitru *et al*., 2019). This movement towards sustainability is observable as energy companies implement a range of green initiatives. However, the actual impact of these initiatives is subject to variation, especially within the oil and gas industry, where there are notable inconsistencies in the sustainability of supply chains (Augustine, 2021). Additionally, the incorporation of sustainable practices into energy service ventures reflects a more comprehensive conception of sustainability that includes economic, environmental, and social aspects (Jesus *et al*., 2018). A key component of sustainability reporting is materiality assessments, which identify the environmental, social, and governance factors that are most important to stakeholders and corporate operations. According to research, the materiality landscape for oil and gas companies is greatly influenced by systemic pressures like climate change and regulatory frameworks (Cherepovitsyn & Rutenko, 2022; Emeka-Okoli *et al*., 2024). To guarantee that reported sustainability initiatives are in line with business objectives and community needs, materiality assessments also need to consider the opinions of various stakeholders (Doni *et al*., 2021).

Addressing the complex problems that oil and gas companies face requires a close relationship between corporate governance and sustainability policies. Many European nations are moving toward legally binding laws that require thorough corporate sustainability due diligence (Buttke *et al*., 2024; Camoletto *et al*., 2022). Businesses must evaluate and control sustainability risks across their supply chains, according to the European Corporate Sustainability Due Diligence Directive, which expands on the German Supply Chain Due Diligence Act (Buttke *et al*., 2024). This legislative landscape compels firms to embed sustainability into their operational ethos, making governance features, such as board oversight and stakeholder engagement, integral to their corporate strategy (Amran *et al*., 2013).

The increasing pressures from civil society, including non-governmental organizations (NGOs), compel companies to adopt more responsive and transparent sustainability practices (Abdalla & Siti-Nabiha, 2015). Engaging stakeholders enhances corporate reputation and provides vital insights that inform sustainability strategies. Research indicates that actively involving stakeholders in the materiality assessment process can lead to more inclusive and impactful sustainability initiatives (Emeka-Okoli *et al*., 2024; Chowdhury *et al*., 2018). Moreover, the integration of sustainability committees within corporate governance frameworks facilitates an organized approach to addressing stakeholder concerns, enhancing overall corporate accountability (Dorić & Dimovski, 2018).

Research emphasizes the importance of having dedicated personnel responsible for sustainability oversight, often with representation from various departments within the organization (Ferns *et al*., 2017). Insights from empirical analyses indicate that companies with strong sustainability committees exhibit higher levels of engagement in CSR activities, thereby demonstrating a commitment to sustainable development (Amran *et al*., 2013; Ayoola & Olasanmi, 2013). Consequently, the presence of sustainability committees is linked to improved social performance and enhanced stakeholder trust.

The complex nature of oil and gas operations, coupled with socio-environmental challenges, necessitates robust risk management frameworks integrated with corporate governance strategies (Cherepovitsyn & Rutenko, 2022; Dorić & Dimovski, 2018). The implementation of corporate governance mechanisms that prioritize sustainability can facilitate the monitoring of environmental impacts and guide responsive strategies that mitigate risks associated with climate change and regulatory compliance (Amran *et al*., 2013). Research indicates that the proactive management of sustainability risks can enhance corporate performance, demonstrating the inseparable link between governance quality and sustainable business practices in the sector (Dorić & Dimovski, 2018; Ayoola & Olasanmi, 2013).

The study aims to answer the following questions: RQ1: How do selected companies present their materiality assessment policies in their annual reports?; RQ2:What are the selected company's due diligence processes?; RQ3:How do selected companies engage with their stakeholders?; RQ4:Do the selected companies have sustainability committees?; RQ5:Is there a designated person responsible for sustainability? and RQ6:How are the sustainability risks managed by the governance structure?

3. Methodology and methods

The objective of this research is to examine how European energy companies adhere to sustainability reporting regulations, along with the wider consequences for achieving environmental stewardship through a narrative analysis (Maione, 2023; Aluchna *et al*., 2019). The energy sector was selected for this study because prior research demonstrates its strong tendency to enhance sustainability reporting practices compared to other sectors (Cho, 2009; Demirkan *et al*., 2021). Narrative analysis, as a methodological framework, is employed within organizational studies to systematically interpret diverse datasets pertinent to the multifaceted phenomena of organizational existence (Robert & Shenhav, 2014) , as well as to elucidate the development and operation of strategic frameworks (Barry & Elmes, 1997).

The methodology used is grounded in a narrative review of sustainability reports and governance documents from leading European energy firms, with a focus on those with the highest ESG ratings according to Refinitiv database. To begin, a selection criterion was established to identify the top six European energy companies based on their ESG scores. These companies were chosen to provide a representative sample of the sector's commitment to sustainability practices.

The first step involved searching the Refinitiv database for European companies in the energy sector that had an ESG score. The initial search returned 101 companies, with ESG scores ranging from 4.43 to 94.70. The top six companies with the highest ESG scores were selected for analysis, as prior research (Huang *et al*., 2024) indicates that strong ESG performance correlates with more detailed and transparent sustainability reporting. By focusing on high-scoring firms, this study targets industry leaders to examine best practices in sustainability disclosure and governance integration.

In the Table 1 the companies and their ESG score are presented. The companies selected are: Snap, Shell, Repsol, BP, Eni, and Saipem:

Table 1. Companies with the highest ESG Score

Company Name	ESG Score
Snap SpA	94.40
Shell PLC	92.38
Repsol SA	88.94
BP PLC	88.64
Eni SpA	86.81
Saipem SpA	86.59

Once the companies were selected, a detailed examination of their publicly available sustainability reports and corporate governance documents was conducted, which were taken from the official websites of the companies. The analysis concentrated on six main aspects: materiality assessments, due diligence protocols, stakeholder engagement strategies, the existence of sustainability committees, the appointment of persons responsible for sustainability, and the management of sustainability risks within the governance structure. The reports were examined through a close reading of relevant sections, guided by keywords and phrases linked to the six aspects, such as “materiality assessment,” “due diligence,” “stakeholder engagement,” “sustainability committee,” “chief sustainability officer,” and “climate risks.” Where companies used different wording for similar concepts, such as “stakeholder mapping” instead of “stakeholder engagement,” these were treated as equivalent to ensure consistency across firms. This step was essential for maintaining comparability, given the variations in reporting style and terminology.

The research involved a qualitative assessment of the content of the sustainability reports and governance documents. This included an evaluation of the methodologies used for materiality assessments, the thoroughness of due diligence processes, the effectiveness of stakeholder engagement, the structure and impact of sustainability committees, and the integration of sustainability risks into the overall risk management framework.

The review went beyond identifying keywords by considering the context in which practices were described. For instance, when companies reported materiality assessments, attention was given to whether they detailed the process, the stakeholders consulted, and the outcomes of the assessment. Similarly, in the case of sustainability committees, both their existence and their role in governance were examined. This approach allowed the analysis to capture not only the presence of practices but also their integration into the governance framework. All findings were then organized under the six aspects to enable structured comparison between companies. This systematic approach highlights similarities and differences in how firms disclose their practices and ensures that results are directly traceable to the content of the reports. By following this strategy, the study offers a clear and transparent evaluation of sustainability and governance reporting among the analysed companies.

4. Results

To undertake this analysis, the article selected the top six corporations with the highest ESG ratings from Refinitiv database. The approach involved a thorough examination of their sustainability initiatives, analysing key aspects such as materiality assessments and due diligence protocols. The research also delved into their stakeholder engagement strategies and the efficacy of their governance frameworks, particularly in terms of sustainability integration. The research methodology is grounded in a narrative review, based on a comprehensive collection of sustainability reports and corporate governance documents from leading European energy firms.

The analysis of the six European energy firms Snam SpA, Shell PLC, Repsol SA, Saipem SpA, Eni SpA, and BP PLC reveals a wide commitment to sustainability reporting and governance. All companies demonstrated comprehensive adherence to the six key criteria examined: materiality assessments, due diligence, stakeholder engagement, sustainability committees, designated sustainability leadership, and risk management integration.

Notably, each company aligned its practices with global frameworks such as the GRI Standards and EU directives, reflecting a proactive approach to regulatory compliance. The uniformity in their high performance suggests that sustainability is now deeply embedded in corporate strategies, transcending mere compliance to become a core operational priority.

Interpreting these results, the study underscores the European energy sector's strategic alignment with sustainability imperatives, reflecting a robust integration of sustainability reporting and corporate governance into their operational frameworks. The adherence to sustainability criteria illustrates the sector's proactive approach to managing environmental and social impacts, as well as its commitment to transparency and accountability. The findings also suggest that companies with higher ESG scores are likely to have more comprehensive sustainability practices, as evidenced by their effective materiality assessments, due diligence processes, and stakeholder engagement strategies. This correlation underscores the importance of robust sustainability practices for achieving high ESG performance.

Below is the analysis of the Annual Report from 2023 of the Snam SpA, Shell PLC, Repsol SA, Saipem SpA, Eni SpA, and BP PLC**,** focused on the analysis of the materiality assessment, due diligence, stakeholder engagement, sustainability committees/structures, persons responsible for sustainability, sustainability risks managed by the governance structure (Snam SpA, Shell PLC, Repsol SA, Saipem SpA, Eni SpA, and BP PLC , 2023).

4.1 Materiality Assessment

The analysis of the Annual Reports 2023 for the six companies shows that these organizations exhibit robust materiality assessment methodologies, vital for identifying and prioritizing sustainability issues that hold considerable relevance for their operations and stakeholders. All entities synchronize their materiality assessments with global reporting frameworks and regulations, including the Global Reporting Initiative (GRI) Standards, the EU Non-Financial Reporting Directive, and the forthcoming Corporate Sustainability Reporting Directive (CSRD). Notably, with the exception of Shell plc, all companies have proactively aligned with the anticipated regulations outlined in CSRD 2023/2772, opting to conduct a dual materiality analysis.

Every organization acknowledges the necessity of engaging a diverse array of stakeholders ranging from local communities and NGO to investors and employees—to prioritize material concerns effectively. The identification of the sustainability issues that are most pertinent to their operations and stakeholder interests hinges on this engagement. Additionally, the materiality assessment process is characterized by its dynamic nature, occurring annually rather than being static; this adaptability enables these organizations to remain attuned to evolving trends and shifts in stakeholder expectations. The insights derived from these assessments play a critical role in strategic planning, the establishment of sustainability objectives, and the formulation of their sustainability reports.

The companies exhibit distinct variations in their materiality assessment strategies. For instance, Snam engages with over 10,000 stakeholders, contrasting with others that adopt a more selective approach, thereby influencing the breadth and depth of stakeholder engagement. The specific material issues identified are reflective of each firm's operational context and stakeholder challenges; for example, Saipem prioritizes biodiversity and waste recovery, while Repsol focuses on natural capital and ethical considerations. The methods employed to identify and rank material challenges vary; some organizations utilize surveys and workshops, whereas others depend on horizon-scanning and interviews.

Moreover, disparities exist among the firms concerning the governance frameworks overseeing sustainability initiatives. While certain companies have established dedicated sustainability committees, others incorporate environmental oversight into pre-existing committees, such as those focused on risk or governance. Furthermore, corporations vary in their levels of reporting transparency and the accessibility of materiality assessment process and outcome data; some provide extensive public documentation, while others offer less comprehensive information. There are also differences in the integration of materiality assessment findings into business strategy and risk management; some firms directly align material issues with strategic goals, while others adopt a more generalized approach. Although all six firms are committed to conducting materiality assessments as part of their sustainability initiatives, the specific methodologies, focal points, and governance structures are tailored to their unique circumstances and the expectations of their stakeholders.

While in this study, 5 out of the 6 European companies analysed adopted double materiality, Cristofaro and Gulluscio (2023) noted that the adoption of double materiality is inconsistent, with only a few companies, mainly in Europe, showing traces of its implementation in their reports. This discrepancy may reflect the evolving regulatory landscape, particularly the impending CSRD requirements. Nevertheless, both studies concur that persistent variations in disclosure practices underscore the continuing need for standardized operational guidelines.

4.2 Due diligence

Snam SpA, Shell PLC, Repsol SA, Saipem Spa, Eni Spa, and BP PLC exhibit both shared and distinct methodologies for managing risks associated with their operations, supply chains, and business affiliations through the implementation of due diligence protocols. Their commitment to comprehensive risk evaluation, which encompasses human rights, labour rights, environmental impacts, and financial viability, renders these entities somewhat comparable. Through pre-contractual assessments and ongoing performance evaluations within their Sustainability Reporting and Corporate Governance in the European Energy Sector, they routinely engage in supplier due diligence to ensure compliance with health, safety, environmental, and ethical standards.

Moreover, all six corporations prioritize human rights through dedicated due diligence processes or broader initiatives, while simultaneously emphasizing ethical and legal conformity through robust frameworks designed to comply with regulations concerning anti-bribery, corruption, and anti-money laundering. Despite these commonalities, the firms maintain varying due diligence strategies. Distinct areas of focus are evident; Shell prioritizes ethics and compliance, while Saipem emphasizes human and labour rights at their operational locations. The methodologies and techniques employed for due diligence also diverge, ranging from specialized risk registers to a combination of assessments, audits, and stakeholder engagement. Another point of divergence is the extent of supply chain scrutiny; certain firms concentrate on qualification and routine evaluations, while others perform thorough investigations and audits of suppliers.

Furthermore, the manner in which the organizations implement contractual provisions to uphold standards and the corrective measures applied in instances of non-compliance can vary significantly. The differences in due diligence strategies are further underscored by interactions with security personnel, the transparency of reporting, and the acknowledgment of benchmarks related to transparency.

Public disclosures regarding due diligence practices also differ in their level of comprehensiveness; some companies exhibit greater transparency than others, while certain firms provide extensive information about their procedures and outcomes. These rankings in their due diligence practices and disclosures may influence companies like Repsol and Eni, which are evaluated in benchmarks such as the Corporate Human Rights Benchmark. Although the overarching goals of risk management and adherence to ethical, legal, and human rights standards remain consistent, the specific policies and priorities of each organization reflect their unique operational challenges and stakeholder expectations within their respective sectors.

4.3 Stakeholder Engagement

The stakeholder engagement strategies of Snam SpA, Shell PLC, Repsol SA, Saipem SpA, Eni SpA, and BP PLC exhibit a shared commitment to fostering transparent communication with diverse stakeholder groups. All six corporations engage with a broad array of stakeholders, encompassing investors, employees, consumers, suppliers, local governments, NGOs, industry collaborators, and additional parties. This engagement is integral rather than peripheral; it is embedded within their corporate strategies, thereby influencing strategic direction and decision-making processes. To facilitate ongoing communication, established channels of interaction such as surveys, public consultations, meetings, and reports have been instituted.

Transparency holds significant importance for these firms, which consistently document their stakeholder engagement endeavours in annual and sustainability reports, employing governance frameworks to ensure these initiatives align with their strategic objectives and foundational principles. Despite these commonalities, the methods through which the firms engage their stakeholders reveal distinct differences. For instance, while Snam employs a structured four-phase methodology (planning, understanding, action, and continuous communication), Eni’s approach highlighted by Bossi *et al*. (2024), leverages a web-based tool to map, monitor, and evaluate stakeholder relationships across projects and geographies. This tool not only provides a dynamic picture of stakeholder themes and their evolution but also assesses associated risks, demonstrating how digital solutions can enhance the precision and scalability of engagement.

The emphasis on adapting Snam's 2023 strategic plan in response to the shifting geopolitical landscape, which prioritizes energy security, illustrates that the scope and depth of engagement initiatives differ significantly. The tools utilized for stakeholder mapping and management, including Eni's tailored applications, can vary among the companies. Saipem's emphasis on youth and education contrasts with Shell's focus on board-level engagement and site visits, resulting in customized areas of involvement reflective of each company’s operational context and stakeholder concerns.

Practices such as BP's appointment of community liaison officers to maintain direct communication with local stakeholders in regions of substantial operations further underscore the variances in approach. From in-person gatherings and site visits to digital platforms—which have become increasingly vital due to events such as the COVID-19 pandemic—the methods of engagement differ markedly. Some companies initiate specific campaigns to address particular challenges, exemplified by Snam's initiatives aimed at promoting reduced energy consumption and facilitating the energy transition. The integration of stakeholder feedback into corporate strategy and operations varies; certain organizations have established formal mechanisms to ensure that stakeholder perspectives are incorporated into decision-making processes. In summary, while overarching themes of communication and transparency are prevalent across the stakeholder engagement frameworks of these corporations, the specific approaches and focal points are meticulously tailored to reflect each firm’s unique context, stakeholder anticipations, and sustainability objectives.

4.4 Sustainability Committees/Structures

The governance of sustainability within corporations is enhanced by the sustainability committees established by Snam SpA, Shell PLC, Repsol SA, Saipem Spa, Eni Spa, and BP PLC. By forming committees or analogous frameworks dedicated to sustainability, these six entities demonstrate their commitment to this critical aspect of corporate governance. Typically functioning at the board level, these committees ensure that sustainability considerations are integrated into corporate decision-making processes. With expansive mandates encompassing ESG issues, climate change, health, safety, and other pertinent subjects, these committees serve in advisory capacities. Frequently tasked with assessing and providing counsel on sustainability reporting to align with relevant standards, they present recommendations to the board regarding sustainability policies and strategies. Despite these shared features, the structure and objectives of the committees exhibit notable differences.

The titles and specific focal areas of the committees such as Snam's ESGETS Committee and Shell's Sustainability Committee (SUSCO) illustrate the varying emphasis each corporation places on sustainability. The committees differ in composition and leadership; some are led by independent chairs while others are directed by board members possessing specialized sustainability expertise. Moreover, distinctions arise in the frequency of meetings, the extent of engagement with sustainability issues, and the manner in which other committees, such as those addressing risk or governance, interface with sustainability oversight. Responsibilities may span social issues and supply chain management to a concentration on climate change and energy transition.

Additionally, variations occur in the level of stakeholder engagement and the committees' involvement in strategic planning and risk management related to sustainability. Certain firms adopt a singular, centralized committee model, whereas others implement sub-committees or working groups to address specific sustainability issues or initiatives. Ultimately, notwithstanding a shared recognition of the necessity for sustainability governance, the sustainability committees within these organizations are customized to meet their unique operational needs, strategic objectives, and stakeholder expectations. These committees are integral in guiding and overseeing the sustainability trajectory of their respective organizations, thus ensuring that sustainability transcends mere theoretical discourse and is embedded within every dimension of their operational activities.

4.5 Persons Responsible for Sustainability

In the six examined companies, those at the helm of sustainability efforts hold influential positions crucial for the advancement of sustainability initiatives. These organizations share a common practice of involving their boards, with either executive management or board members taking on sustainability responsibilities to ensure strategic oversight. Each company underscores the significance of sustainability within its governance structure by designating specific roles or committees focused on this area. The individuals leading sustainability efforts are instrumental in shaping the sustainability agenda, crafting policies, and engaging with stakeholders, bringing a diverse array of expertise from environmental concerns to business strategy. However, the responsibilities and duties of these sustainability leaders vary across the companies.

Moreover, the composition of these committees, the specialized knowledge and skills of their members, and the extent of detailed public reporting also differ. Some companies adopt a more streamlined approach, while others have larger teams dedicated to sustainability. Public recognition of these sustainability figures varies, as does the integration of the sustainability role with other executive functions, such as risk management or business strategy. Despite these differences, those responsible for sustainability are key to incorporating sustainability considerations into corporate decision-making and addressing the unique sustainability challenges of their respective companies.

4.6 Sustainability Risks Managed by the Governance Structure

The examined companies recognize the essential role that sustainability plays in their risk management frameworks, demonstrating a strategic approach to managing environmental risks. Each company has established methods for identifying and assessing risks related to environmental, social, governance, and climate factors, among others. These risks are integrated into their broader enterprise risk management (ERM) systems, ensuring a comprehensive approach to risk alongside other business considerations. Governance structures, often through sustainability or risk committees, provide board-level oversight and are moving towards greater transparency as companies disclose sustainability risks in their annual reports.

A common practice is aligning the management of these risks with strategic objectives; many companies aim to mitigate risks through targeted sustainability initiatives and campaigns. However, the approaches to handling sustainability issues vary among the companies. The specific risks identified are tailored to each organization's operational environment, regional presence, and industry sector, leading to different areas of focus, such as energy security for Snam and energy transition for Shell. Risk management methods range from quantitative to qualitative assessments, influencing their significance in corporate reporting and strategy.

The extent of stakeholder involvement in the risk management process also varies; some companies engage more actively to identify and prioritize issues. Differences are also seen in the emphasis on environmental mitigation, social issues, or adaptation and resilience to climate change, as well as in the adoption of international standards and frameworks, the tools and systems used for risk management, and the time horizon for risk analysis - with some companies adopting a long-term view extending to 2025 and beyond. Although all recognize the importance of sustainability risk management, each company's specific strategies and priorities are shaped by their unique operational needs and the challenges they face in their sectors.

This tailored approach ensures that each company can effectively address the sustainability issues most relevant to its stakeholders and business. A thorough examination of materiality assessments, due diligence processes, stakeholder engagement strategies, sustainability committees, sustainability leaders, and sustainability risk management among Snam SpA, Shell PLC, Repsol SA, Saipem Spa, Eni Spa, and BP PLC reveals several overarching themes. Each company demonstrates a strong commitment to sustainability, evident in their operational practices, strategic planning, and governance structures. They maintain a stakeholder-focused approach that emphasizes transparency and responsiveness, aligning their sustainability efforts with international standards and frameworks such as the GRI Standards and the EU's reporting guidelines.

Their evolving sustainability practices adapt to the global sustainability framework, stakeholder expectations, and regulatory changes. Particularly, the adoption of a double materiality approach—which considers both the potential financial impacts on the company and the effects of its activities on the environment and society—is becoming increasingly prevalent. Sustainability risks are incorporated into the overall risk management systems, underscoring the importance of sustainability in ensuring long-term corporate resilience and success. Despite these commonalities, the companies differ in their focus and prioritization of sustainability challenges, each tailoring their approach to their specific operational context and stakeholder feedback.

Sustainability governance structures vary; some companies have specialized committees, while others incorporate these responsibilities into broader committees. Sustainability is strategically linked with business objectives, with goals and targets set to reflect commitments such as emissions reduction and energy security enhancement. The firms also exhibit proactive risk management, employing various methods and approaches to assess and mitigate sustainability risks. Public reporting and accountability are emphasized, with comprehensive disclosures on environmental practices and progress reported in annual and sustainability reports. The leadership in sustainability is defined by diverse knowledge and experience, enabling individuals to effectively steer their companies' sustainability agendas.

The findings of this study indicate a strong commitment to sustainability among the top six European energy firms. This aligns with previous research that emphasizes the importance of sustainability reporting for enhancing corporate transparency and accountability. Previous studies highlighted that effective governance structures are crucial for integrating sustainability into corporate strategies, which is reflected in the robust governance frameworks observed in the examined firms (Adams & Frost, 2008).

Moreover, the results corroborate the insights of Eccles *et al.* (2012), who found that companies engaging in sustainability reporting often experience improved corporate performance. The comprehensive adherence to sustainability practices among the studied companies suggests a strategic alignment with sustainability imperatives, echoing the findings of Lai and Stacchezzini (2021), which noted that organizations increasingly recognize the necessity of harmonizing economic, social, and environmental elements within their accounting practices.

The emphasis on materiality assessments and stakeholder engagement strategies within the analysed firms further supports the work of Hahn *et al.* (2015), who argued that stakeholder engagement is vital in shaping sustainability reporting practices. The diverse methodologies employed by the companies to identify and prioritize material issues reflect an understanding of the evolving expectations of stakeholders, a point also noted by Freeman and Reed (1983) in their exploration of stakeholder theory. The commitment of the examined companies to human rights and ethical compliance underscores the necessity for robust due diligence frameworks, as emphasized in previous studies that advocate for comprehensive risk management strategies in the energy sector (Pee *et al.*, 2019).

Furthermore, the establishment of sustainability committees within these firms aligns with the conclusions of Indrajit and Jaiswal (2015), who stressed the critical role of governance structures in driving sustainability initiatives. The varying structures and responsibilities of these committees highlight the tailored approaches that firms adopt in response to their unique operational contexts, a perspective supported by the findings of Bouten *et al.* (2011), which noted the challenges inherent in standardizing sustainability practices across different organizations.

5. Discussion and conclusion

The study provides a nuanced understanding of the European energy sector's commitment to sustainability reporting and corporate governance. The sector's proactive stance is essential for thriving in an environmentally conscious and regulated society. The research contributes to informing policy, guiding future behaviour, and supporting the energy transition, ultimately underscoring the sector's pivotal role in fostering sustainable development and innovation.

The results of this study provide a comprehensive overview of the current state of sustainability reporting and corporate governance within the European energy sector. The uniform adherence to sustainability criteria across the top European energy companies suggests a sector-wide commitment to sustainable practices and transparency. This commitment is in line with the increasing global emphasis on environmental stewardship and social responsibility, as well as the growing regulatory pressure for companies to disclose non-financial information.

Previous studies have highlighted the importance of sustainability reporting as a means for companies to communicate their ESG performance to stakeholders (Mohamed, 2010; Indrajit & Jaiswal, 2015; Arvidsson, 2019). The findings of this study are consistent with these perspectives, indicating that sustainability reporting is becoming an integral part of corporate governance in the energy sector. The strategic alignment with sustainability imperatives, as evidenced by the integration of sustainability into operational frameworks, reflects an understanding that long-term corporate success is increasingly dependent on sustainable practices. The results also suggest that companies with higher ESG scores are likely to have more comprehensive sustainability practices. This correlation may be indicative of a virtuous cycle where effective sustainability practices lead to better ESG performance, which in turn drives further improvement in sustainability practices. This finding is significant for investors and stakeholders who are increasingly using ESG scores as a metric for assessing company performance and risk.

The implications of these findings are far-reaching. As the European energy sector continues to navigate the challenges of the energy transition and climate change, the integration of sustainability into corporate governance can serve as a catalyst for innovation and transformation. Companies that are proactive in addressing sustainability issues are likely to be better positioned to adapt to changing regulatory landscapes, stakeholder expectations, and market dynamics. Research indicates that the energy sector is on the edge of significant transformation, driven by three key trends that are reshaping energy production and consumption (Marr, 2022). The first trend, decarbonization, is steering the world towards a carbon-free future. This shift is primarily fuelled by the growing adoption of renewable energy sources and the imposition of higher costs on fossil fuel usage, critical element of this trend is the transition to electric solutions, such as electric vehicles. However, as a large portion of electricity generation still relies on fossil fuels, a marked push towards renewables like wind, solar, and biofuels is essential to achieve emission-free power (Marr, 2022). Addressing the intermittent nature of these sources, energy storage solutions are becoming increasingly important to ensure a steady supply.

Nuclear power emerges as a viable alternative to renewables, providing a steady energy supply when other sources are not available. Despite safety considerations, nuclear energy remains one of the cleanest sources of power, looking to the future, new forms of renewable energy are being explored, including the European Commission's green hydrogen initiative and geothermal systems powered by Earth's heat, with Iceland already harnessing magma-enhanced geothermal systems for power generation (Marr, 2022).

The second trend, decentralization, is moving away from highly centralized energy infrastructures towards systems that allow consumers to generate their own electricity locally, thereby enhancing energy security and resilience, this trend includes a range of setups, from individual households with rooftop solar panels to entire communities with localized microgrids. Such decentralized energy systems empower local authorities, businesses, and consumers to manage their energy profiles more autonomously (Marr, 2022).

Lastly, digitization is revolutionizing the sector by applying digital technologies to maximize the efficiency of energy infrastructure and consumption, this trend is closely linked with decarbonization and decentralization, facilitating the management of complex energy systems (Marr, 2022). Technologies like artificial intelligence and predictive analytics are improving grid management, while smart home devices are helping users regulate their energy consumption more effectively, blockchain technology is also playing a role in enabling consumers to trace the origins of their energy and ensure its renewability (Marr, 2022).

Despite the promise of these trends, challenges persist, particularly in overhauling existing energy infrastructures and addressing the health and safety concerns associated with energy production, traditional energy companies may resist change due to significant investments in current systems, nonetheless, embracing these trends is essential for remaining competitive in an increasingly dynamic and demanding market (Marr, 2022).

In conclusion, the research provides an understanding of sustainability reporting and corporate governance within the European energy sector. The study delves into how energy companies are aligning with EU Directives 2014/95/EU and (EU) 2022/2464, showcasing their commitment to sustainability through in-depth report analysis of firms from the energy sector. The study emphasizes how actively these six organizations are in including sustainability into their main operations. Although their particular methods may differ, the trend is definitely toward thorough integration of sustainability into corporate strategies, risk management, and stakeholder involvement. Navigating the sustainability problems within the energy industry and supporting the general goals of sustainable development depend on this dedication to openness, responsibility, and ongoing progress.

The results indicate that businesses are not merely conforming to sustainability reporting norms but are also proactively abiding by sustainability mandates. Notably, 5 of the 6 companies examined are ahead of the curve, already aligning with the new

CSRD 2023/2772 by incorporating double materiality assessments in their 2023 annual reports, despite the requirement to report double materiality starting with the 2024 annual report. Future research directions may include longitudinal studies to assess the impact of sustainability reporting on company performance over time. Additionally, comparative studies between sectors could provide insights into the effectiveness of different sustainability strategies. Research could also explore the role of digital technologies in enhancing the quality and accessibility of sustainability reporting.

Overall, the study provides insights for companies seeking to improve their sustainability practices. It underscores the critical role of governance structures in fostering a culture of sustainability within the energy sector and advocates for greater transparency, stakeholder engagement, and innovation in sustainability reporting and governance. The current research is not without limitations; however, it may offer perspectives for future studies. The study highlights the necessity for in-depth analysis of the interplay between sustainability reporting and corporate governance structures, potentially extending to explore moderating factors that influence this dynamic.

Acknowledgment

This paper was co-financed by The Bucharest University of Economic Studies during the PhD program. The article was presented at the International Conference on Economics - Challenges and Opportunities (ICECO 2025). Special thanks are addressed to the editors and all the reviewers for the helpful comments and the constructive remarks.

In the writing process, the author used Microsoft Word Editor and Writefull to support academic writing in English by checking grammar and spelling. The AI tool was utilized under the author oversight, who carefully reviewed and edited the outcome, assuming full responsibility for the article's final content and conclusions.

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