

Eco innovation disclosure in Italian Firms: A Content Analysis Approach

*Carmelo Arena**, *Stefania Veltri**, *Franco Rubino**

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Abstract

The increasing urgency to rethink economic development models in favor of sustainability, combined with growing stakeholder pressures on companies, has fostered the interest in eco-innovation, which encompasses the adoption of techniques, processes, systems, and products aimed at reducing or eliminating harmful environmental impacts. In this context, the aim of the study is to examine whether Italian companies disclose eco-innovation in their sustainability reports. To address this question, we employ a content analysis of sustainability reports from leading Italian companies in innovation and sustainability practices, based on R&D investments and ESG scores, extracted from Refinitiv. The findings suggest that green innovation remains an emerging topic yet to be fully embraced in corporate reporting practices. This study expands the academic literature on eco-innovation disclosure and offers valuable insights for managers, enabling them to critically evaluate their sustainability reports, improve the quality of their communications, and enhance transparency levels.

Keywords: Eco-innovation, Content analysis, Sustainability reporting

1. Introduction

Against increasing attention to sustainability and the significant impact of businesses, particularly on the environment, companies play a central role in the debate on how to develop a sustainable future for humanity (Liang et al., 2024). Firms are under growing social and political pressure to enhance their environmental performance, leading them to implement structured

* University of Calabria, Department of Business Administration and Law. Corresponding author: carmelo.arena@unical.it

strategies to minimize their ecological footprint (Borlatto et al., 2024). Consequently, they require effective mechanisms to track, measure, and communicate their environmental efforts (Góes et al., 2023; Cantele et al., 2024; Madonna et al., 2024; Broccardo et al., 2024; Buonasera et al., 2024; Vitale, 2024; Borlatto et al., 2024).

The primary mechanism through which stakeholders assess corporate sustainability performance is disclosure (Damiano & Di Maria, 2024). Beyond implementing measures to protect the environment and support the communities in which they operate, companies are increasingly required to provide detailed sustainability-related information (Friedman & Ormazabal, 2024; Pozzoli & Raffaele, 2022; Rupo et al., 2024). Meeting stakeholder expectations in this regard enables firms to mitigate environmental and social risks, enhance their image and reputation, and gain access to additional resources (Galeazzo et al., 2024).

Empirical research has extensively examined sustainability disclosure, emphasizing its benefits in terms of corporate performance and reputation for firms that engage in such reporting (Escamilla-Solano, 2024). Within this field, a growing area of interest concerns the disclosure of eco-innovation information (Vieira & Radonjič, 2020), which refers to how companies reduce their environmental impact through technological, process, product, or organizational innovations (Xavier et al., 2017). While prior studies have largely focused on developing frameworks to measure eco-innovation (García-Granero et al., 2020) and analyzing its positive effects on corporate performance (Przychodzen & Przychodzen, 2015), less attention has been paid to eco-innovation disclosure (Vieira & Radonjič, 2020).

This paper investigates whether companies sufficiently disclose information about eco-innovation practices, addressing the following research question (RQ): *Do Italian companies report on eco-innovation in their sustainability disclosures?*

To achieve this objective, we adopt the theoretical lens of legitimacy theory, which posits that disclosing sustainability information can serve as a strategy to gain legitimacy, meet stakeholder expectations, and respond to social pressures. Drawing on this theoretical framework, we conduct a content analysis of the sustainability reports of 20 listed Italian companies recognized as leaders in R&D and ESG performance.

Given the limited research on eco-innovation disclosure, this study provides an original contribution on eco-innovation, providing a structured assessment of disclosure practices, thereby shedding light on how firms seek to achieve legitimacy by integrating eco-innovation into their sustainability reporting. Our research makes a twofold contribution to the literature. First,

it addresses the need for further studies on eco-innovation by analyzing the extent and nature of information disclosed regarding green innovation implementation (Vieira & Radonjič, 2020). Second, it employs a scoring-based methodology, moving beyond binary analyses that merely indicate the presence or absence of information. This approach responds to the increasing complexity of sustainability reports (Hedley et al., 2024).

The paper is structured as follows: Section 2 outlines the theoretical framework and the identified research gap. Section 3 details the methodological approach. Section 4 presents the results, and Section 5 concludes with implications and suggestions for future research.

2. Background and Literature review

2.1 Theoretical lens

Legitimacy theory remains the primary conceptual framework for analyzing sustainability disclosure, particularly regarding the motivations that drive firms to disclose such information (Veltri et al., 2023). Legitimacy is defined as the perception that an organization's actions align with the value system of an established social order (Dowling & Pfeffer, 1975; Suchman, 1995). From this perspective, sustainability disclosure reflects firms' efforts to implement and report sustainability initiatives to gain legitimacy from stakeholders (Veltri et al., 2023). As a result, legitimacy-based claims can encourage firms to adopt and disclose environmentally responsible innovations, thereby improving relations with external stakeholders and gaining recognition. (Berrone et al., 2013). However, stakeholder legitimacy pressures can also lead to opportunistic sustainability disclosures that build an external image of compliance rather than fostering substantive sustainable innovation. (Boiral, 2013). This symbolic approach, in contrast to a substantive one, often involves emphasizing selective information—such as future commitments or marginal achievements—without necessarily integrating meaningful sustainability efforts (Roszkowska-Menkes et al., 2024). Consequently, organizations may mitigate stakeholder legitimacy pressures without enacting substantial changes (Zhang et al., 2024).

Legitimacy theory also holds relevance in the context of eco-innovation, particularly considering the evolving concerns of stakeholders. Recently, stakeholder expectations have shifted toward the adoption and implementation of innovative products, processes, services, or managerial practices that enable organizations to reduce their environmental impact

(Adomako & Nguyen, 2023). Stakeholders are increasingly interested in how production and business organisation are innovated in line with the principles of environmental sustainability, rather than just general efforts to reduce environmental impact (Hojnik et al., 2018). Firms may thus adopt eco-innovative practices for two primary reasons. From a substantive perspective, they may pursue genuine efforts to enhance environmental performance through technological advancements. Conversely, from a symbolic standpoint, firms may seek to satisfy societal expectations without implementing significant environmental improvements (Jia et al., 2024).

2.2 Literature review

The empirical literature reflects two distinct research streams on these topics. One strand of research on sustainability disclosure has predominantly examined the motivations and determinants influencing firms' disclosure decisions, identifying key drivers such as legitimacy pressures, stakeholder expectations, and country-specific regulatory requirements (Yeaw & Seow, 2023; Liao et al., 2015; Leong & Hazelton, 2019). Another line of inquiry has explored the consequences of sustainability disclosure, highlighting its impact on firms' financial and environmental performance (Zhou et al., 2023; Hassan & Romily, 2018). Similarly, empirical studies on eco-innovation have largely investigated the drivers of sustainable innovation, emphasizing the role of stakeholders, corporate governance, and the benefits associated with internal efficiency and firm performance (Fosu et al., 2023; Bossle et al., 2016).

Overall, a strong relationship emerges between sustainability disclosure and eco-innovation, particularly in relation to stakeholder pressures and the ways in which firms use both strategies to meet stakeholder expectations. Studies indicate that sustainability reporting generates increased value, especially for firms subject to high levels of social scrutiny from stakeholders concerned with ethical and environmental issues (García-Meca & Martínez-Ferrero, 2021). Stakeholder pressures, therefore, serve as a critical link between sustainability disclosure and eco-innovation, driving firms to enhance the transparency of their sustainability reports by incorporating information on green innovations (Vieira & Radonjič, 2020).

Despite the growing academic interest in sustainability disclosure (Latella & Veltri, 2024) and eco-innovation (Takalo et al., 2021), most studies have treated these two phenomena as separate, leaving a gap in understanding how they interrelate and how sustainable innovation can be effectively integrated into sustainability disclosure. This research gap presents an opportunity for

further investigation into the integration of eco-innovation within sustainability reporting (Esposito et al., 2024; Leotta, 2024).

To the best of our knowledge, the only study explicitly analyzing the relationship between eco-innovation and sustainability disclosure is that of Vieira and Radonjič (2020), which identifies a general lack of explicit references to eco-innovation in sustainability reports. However, their analysis focuses on selected European countries and assesses eco-innovation references using a binary approach (i.e., presence or absence of information). Given the increasing complexity of sustainability reports, methodologies capable of capturing varying degrees and nuances of eco-innovation disclosure are necessary (Hedley et al., 2024). This highlights the need for further research on the integration of eco-innovation information within sustainability disclosure.

Based on these insights, we propose the following research question:

RQ: Do Italian companies disclose information about eco-innovation in their sustainability reports?

3. Methodology

To address the research question, we conducted a manual content analysis, which is defined as a research technique for systematically deriving replicable and valid inferences from texts within their contexts of use (Krippendorff, 2004). In the literature, content analysis has been evaluated differently by researchers. Some scholars have criticized it for its subjectivity and lack of methodological consistency, as interpretations of texts may differ across researchers and contexts. Indeed, the absence of universally accepted coding frameworks raises concerns about reliability and replicability (Dumay & Cai, 2014). Conversely, other scholars argue that content analysis, unlike other methodological approaches, enables researchers to identify specific themes within documents. Moreover, among other advantages, this method is not excessively time-consuming, as it primarily consists of desk-based activities and allows for relatively easy access to materials (Guthrie, 2014).

Nevertheless, content analysis is widely employed in accounting research to examine public information and systematically codify textual data (Nicolò et al., 2024; Balluchi et al., 2024; Torelli et al., 2019). This methodology facilitates the organization of information into predefined categories, thereby enhancing the identification of patterns (Lodhia et al., 2020).

In our study, we adopted a qualitative thematic content analysis, as it enables a focused examination of the presence of specific attributes or topics within reports (Kothari et al., 2009). This approach aligns with the objective of our paper, which is to assess whether Italian companies disclose information related to eco-innovation in their sustainability reports.

To identify references to eco-innovation, we coded the entire set of source documents (Moreno & Quinn, 2020). Building on the framework proposed by García-Granero et al. (2020), we measured eco-innovation by considering four main categories—product, process, organizational, and marketing—and specific Key Performance Indicators (KPIs), as summarized in Table 1. Specifically, product eco-innovation primarily pertains to the materials used in production processes, with a particular focus on biodegradable and recycled packaging inputs. Process eco-innovation, by contrast, encompasses investments in green technology, the development and patenting of green innovations, and the recycling of materials. Organizational eco-innovation relates to the implementation of external environmental audits and consulting, as well as the allocation of personnel dedicated to environmental quality. Finally, marketing eco-innovation primarily addresses sustainable packaging and sustainability certifications.

The framework developed by García-Granero et al. (2020) thus identifies four types of eco-innovation directly linked to stakeholder expectations and, consequently, to the enhancement of corporate image. The eco-innovation measurement model adopted is, therefore, consistent with the theoretical framework of legitimacy theory.

Table 1 - Eco-innovation KPIs

Eco-innovation types	Eco-innovation performance indicators
Product	<ul style="list-style-type: none"> • Use new cleaner material or new input with lower environmental impact • Use of recycled materials • Reduce/optimize use of raw materials • Reduce number of product components • Eliminate dirty components • Product with a longer life cycle • Product ability to be recycled
Process	<ul style="list-style-type: none"> • Reduce chemical waste • Reduce use of water • Reduce use of energy • Keep waste to a minimum • Reuse of components • Recycle waste, water or materials • Environmental-friendly technologies • Renewable energy • R&D • Acquisition of machinery and software • Acquisition of patents and licenses
Organizational	<ul style="list-style-type: none"> • Green human resources • Pollution prevention plans • Environmental objectives • Environmental audit • Environmental advisory • Invest in research • Cooperation with stakeholders • New markets • New systems (remanufacturing systems and transport systems)
Marketing	<ul style="list-style-type: none"> • Returnable/reusable packaging • Green design packaging • Quality certifications

Source: adapted by García-Granero, et al. (2020)

We assess the completeness of eco-innovation information disclosure. This variable evaluates the integrity and comprehensiveness of the disclosed information by determining whether each category is addressed in a vague, descriptive, or extensive manner (Korca et al., 2021). To measure completeness, we adopted a scoring system based on Al-Tuwaijri et al. (2004), which is widely applied in the literature for analyzing sustainability reports (Ferraro et al., 2024; Daub, 2007; Esposito et al., 2025). The scoring scale ranges from 0 to 3: a score of 0 indicates the absence of information, 1 represents vague disclosure, 2 signifies qualitative disclosure of eco-innovation, and 3 denotes quantitative disclosure (Table 2).

Table 2 -Scoring system

Score	Level of information
0	Information not provided
1	Vague information
2	Qualitative information provided
3	Quantitative information provided

Source: adapted by Al-Tuwaijri et al. (2004)

For our analysis, we selected a sample of 20 companies, following the approach of Vieira and Radonjić (2020) and Saeed et al. (2024), who employed the same sample size in their respective studies. The selection criteria were based on two key factors: R&D expenditure and ESG scores. This sampling strategy is supported by empirical evidence highlighting the critical role of both R&D and ESG in fostering sustainable innovation (Horbach, 2008; Wu et al., 2024).

Despite the small sample size adopted in this study, the generalizability of the results is not compromised. The selection of 20 companies, evenly divided between those with the highest R&D investments and those with the highest ESG scores, ensures that the sample is qualitatively representative of firms most engaged in eco-innovation, prioritizing a strategically selected dataset over numerical breadth (Horbach, 2008; Wu et al., 2024). Furthermore, the sample size is methodologically justified by the nature of the analysis conducted. Indeed, Al-Tuwaijri et al. (2004) emphasized that in exploratory and qualitative research, the depth of analysis is more critical than the dataset’s breadth.

Furthermore, drawing on the definition of eco-innovation provided by the Eco-Innovation Observatory (2013) and the OECD (2009)—which emphasize the measurement of green innovation through R&D investments and corporate sustainability—corporate sustainability performance and

R&D expenditure can be identified as the two primary indicators of eco-innovation. In our analysis, we conducted a separate content analysis of the sustainability reports of leading listed companies in R&D and ESG to determine whether R&D or ESG is the stronger driver of eco-innovation information disclosure. The selected companies were subsequently divided into two groups for analysis:

- Group A: The top 10 Italian firms with the highest Refinitiv ESG scores for the most recent year available (2023).
- Group B: The top 10 Italian firms with the highest R&D investments for the most recent year available (2023), based on Refinitiv data.

Data on R&D investments, ESG scores, and company size were obtained from Refinitiv, while sustainability reports for 2023 were directly retrieved from the companies' official websites. Table 3 provides a descriptive summary of the analyzed companies.

To ensure the reliability of the analysis, each author independently conducted the content analysis (Aggarwal & Singh, 2019). The authors assigned scores individually before convening a panel discussion to review the findings. No significant inconsistencies were observed. Since consensus was reached incrementally, the authors retained formal reliability assessments, such as Krippendorff's alpha, unnecessary.

Table 3 -Sample description

Group	Company	Sector	ESG Score	Investment R&D (€)
Group A	Enel	Energy	90.22	
	Eni	Energy	87.39	
	Generali	Financial services	91.37	
	Hera	Energy	85.54	
	Intesa	Financial services	91.97	
	Leonardo	Aerospace, Defense and Security	85.93	
	Moncler	Luxury	83.67	
	Saipem	Oilfield services	89.43	
	SNAM	Gas industry	92	
	Unicredit	Financial services	84.44	
Group B	Datalogic	Electronics		56.208.000,00
	Diasorin	Diagnostics		57.485.000,00
	Ferrari	Automotive		573.632.000,00
	Intercos	Cosmetics		22.800.000,00

	Iveco	Automotive		238.000.000,00
	Prada	Luxury		115.319.000,00
	Recordati	Pharmaceutical		166.138.000,00
	Saes Getters	Advanced materials		11.704.000,00
	Stevanato	Pharmaceutical		26.263.000,00
	Technoprobe	Electronics		31.181.000,00

Source: authors' elaboration

4. Results and discussion

The results indicate that while eco-innovation is emerging as a relevant component of corporate sustainability efforts, as indicated by the EU eco-innovation index (2024); its explicit integration into reporting frameworks remains limited. The analysis also reveals that firms strategically disclose eco-innovation practices in response to legitimacy pressures, often emphasizing symbolic rather than substantive environmental commitments. These findings align with those of Vieira & Radonjić (2020), who observed that large European firms rarely make direct references to "eco-innovation" in their sustainability reports, instead embedding such initiatives within broader environmental strategies without explicitly labeling them as eco-innovation. Table 4 shows the findings, also presenting the distribution of the results for each group (Pistoni et al., 2018).

Table 4 - Findings

Group A	Eco-innovation types	Score	Group B	Eco-innovation types	Score
	Product	1.7		Product	1.4
	Process	2.4		Process	1.5
	Organizational	1.8		Organizational	1.2
	Marketing	0.8		Marketing	0.8

Source: authors' elaboration

4.1 Insights from Group A

Group A, represented by companies with the highest ESG scores, shows an implicit approach to eco-innovation disclosure. Indeed, rather than explicitly addressing eco-innovation as a distinct category, companies incorporate elements of sustainable practices within broader corporate narratives to align with stakeholder expectations. For instance, energy firms highlight investments in renewable energy, while financial institutions

introduce ESG-aligned financial products such as green bonds. However, these disclosures often reflect a legitimacy-seeking strategy, where firms aim to project an image of environmental responsibility without necessarily embedding eco-innovation as a core operational principle (Cho & Patten, 2009; García-Meca & Martínez-Ferrero, 2021). This approach is consistent with Vieira & Radonjić's (2020) findings that many firms disclose aspects of eco-innovation indirectly, emphasizing their commitment to environmental sustainability without using explicit eco-innovation terminology.

Within the "Process" domain, companies exhibit strong commitments to sustainability through resource optimization and waste reduction initiatives. These efforts serve to reinforce their legitimacy by demonstrating adherence to environmental norms (Berrone et al., 2013). However, the extent to which these initiatives contribute to substantive eco-innovation remains unclear. Similarly, in the "Organizational" domain, firms engage stakeholders through surveys, community initiatives, and partnerships, reflecting an effort to maintain societal trust and legitimacy (Dowling & Pfeffer, 1975; Suchman, 1995). Vieira & Radonjić (2020) also found that organizational eco-innovations are widely referenced, particularly in relation to environmental management systems and supply chain sustainability. The "Marketing" domain, however, remains underdeveloped, with limited references to eco-innovation beyond sustainability certifications. This omission represents a missed opportunity to enhance legitimacy through transparent communication on eco-innovation-driven product differentiation.

Table 5 -Group A, Scoring distribution

Company Name	Product	Process	Organization	Marketing
Snam SpA	2	3	1	1
Intesa Sanpaolo SpA	0	3	3	1
Assicurazioni Generali SpA	3	2	0	0
Enel SpA	3	2	2	1
Saipem SpA	3	3	2	0
Eni SpA	0	2	3	1
Leonardo SpA	1	3	3	1
Hera SpA	2	2	2	1
UniCredit SpA	0	1	0	1
Moncler SpA	3	3	2	1

Source: authors' elaboration

4.2 Insights from Group B

Group B, composed of firms with high R&D investments, exhibits lower overall eco-innovation disclosure levels. While these firms engage in eco-innovation activities, they do not consistently articulate them in their sustainability reports, potentially due to the prioritization of proprietary technological advancements over public disclosure. This discrepancy suggests that firms in this group may prioritize symbolic eco-innovation, underutilizing sustainability reporting as a legitimacy tool (Hojnik et al., 2018). Vieira & Radonjič (2020) similarly observed that companies with high R&D investments often engage in eco-innovation but fail to disclose it explicitly, reinforcing the idea that eco-innovation activities and their communication strategies remain disconnected in corporate reporting.

In the "Product" domain, firms reference the use of sustainable materials and product lifecycle improvements, but disclosures lack quantifiable data. Similarly, the "Process" domain reveals commitments to environmental efficiency; however, these initiatives are often presented without explicit framing within eco-innovation strategies. This pattern aligns with prior research indicating that firms may engage in green innovation primarily to meet regulatory requirements rather than as part of a broader legitimacy-building strategy (Jia et al., 2024). Vieira & Radonjič (2020) found that process-related eco-innovation was the most frequently disclosed category, though often indirectly through discussions of resource efficiency and emission reductions.

The "Organizational" and "Marketing" domains in Group B exhibit the weakest disclosure, with firms rarely detailing stakeholder engagement efforts or eco-innovation marketing strategies. This omission suggests a lower reliance on disclosure for legitimacy-building compared to Group A. Consequently, firms in Group B may benefit from strategically enhancing their transparency in eco-innovation reporting to better align with stakeholder expectations and reinforce their legitimacy in sustainability discourse.

Table 6 -Group B, Scoring distribution

Company Name	Product	Process	Organizational	Marketing
Ferrari NV	1	1	1	0
Iveco Group NV	2	2	2	2
Recordati Industria Chimica e Farmaceutica SpA	1	1	1	0
Prada SpA	1	2	2	1
DiaSorin SpA	0	0	0	0
Datalogic SpA	3	2	2	1
Technoprobe SpA	1	1	1	0
Stevanato Group SpA	1	2	2	0
Intercos SpA	2	2	1	2
Saes Getters SpA	2	2	0	2

Source: authors' elaboration

4.3 Overall Discussion

Comparing both groups, the findings highlight a divergence in eco-innovation disclosure strategies. Group A firms, subject to greater societal scrutiny due to high ESG visibility, employ sustainability reporting as a legitimacy tool, often adopting a symbolic approach to eco-innovation disclosure (Boiral, 2013; Roszkowska-Menkes et al., 2024). In contrast, Group B firms, while actively engaged in R&D-driven innovation, do not leverage disclosure as effectively to enhance legitimacy. This lack of information may reflect companies adopting a symbolic rather than substantive approach to sustainability reporting, highlighting broad commitments to environmental responsibility but not providing detailed information on eco-innovation efforts (Boiral, 2013; Roszkowska-Menkes et al., 2024). This selective transparency allows companies to meet stakeholder expectations without exposing themselves to additional scrutiny or verification risks (Vieira & Radonjič, 2020).

This gap underscores the need for firms to integrate eco-innovation more explicitly within their reporting frameworks to bridge the divide between substantive innovation efforts and legitimacy-driven disclosure strategies.

Overall, the study suggests that while firms recognize the importance of eco-innovation, its disclosure remains fragmented. To strengthen legitimacy, companies should adopt a more structured approach to eco-innovation reporting, emphasizing both qualitative and quantitative transparency.

Enhancing disclosure practices will enable firms to meet evolving stakeholder expectations, secure long-term legitimacy, and establish eco-innovation as a fundamental pillar of corporate sustainability strategies.

5. Conclusions

This study investigates the extent to which Italian companies disclose eco-innovation information in their sustainability reports. Through a content analysis of reports from the top 10 companies with the highest Refinitiv-ESG scores and the top 10 companies with the highest R&D investments, the research explores the intersection of eco-innovation, sustainability disclosure, and stakeholder expectations. Indeed, despite the increasing attention on eco-innovation by stakeholders, prior studies have paid limited attention to its integration sustainability disclosure (Vieira & Radonjič, 2020). In addressing this gap, our study formulates the research seeks to investigate if Italian companies disclose information about eco-innovation in their sustainability reports. Grounded in legitimacy theory, the study asserts that organizations strive to align their disclosures with societal norms to maintain legitimacy and address the growing demands of both internal and external stakeholders for environmental and social accountability.

The findings reveal substantial gaps in eco-innovation disclosure, despite Italy is ranks among the top-rated countries in the EU Eco-innovation index (2024). While companies monitor eco-innovation indicators (Table 1), explicit references to eco-innovation remain infrequent. Reports primarily contain qualitative information, often lacking quantitative data, financial metrics, or specifics about achieved results and future targets. This lack of depth undermines the effectiveness of companies' communication strategies regarding sustainable innovation, limiting their ability to meet stakeholders' transparency expectations. The study confirms Vieira and Radonjič's (2020) observation, which found that large firms often embed eco-innovation efforts within broader sustainability narratives rather than explicitly disclosing them. However, notable variability exists across different eco-innovation domains. Companies tend to prioritize disclosures in the "Process" domain, such as sustainable value chain management, and the "Product" domain, where the development of innovative and environmentally friendly products aligns with evolving consumer needs. In contrast, the "Marketing" domain is less represented, particularly regarding indicators like "Packaging" and "Quality Certifications." This oversight highlights a missed opportunity for

companies to enhance their environmental impact and strengthen their reputational advantage throughout all phases of their operations.

5.1 Theoretical implications

This research contributes to the growing academic discourse on eco-innovation by highlighting deficiencies in corporate disclosure practices and their implications for organizational legitimacy. By incorporating eco-innovation into corporate strategies and reporting frameworks, both researchers and practitioners can gain deeper insights into how organizations navigate stakeholder expectations and societal pressures. The study also provides valuable contributions to the literature on the relationship between disclosure and legitimacy. It emphasizes the importance of examining eco-innovation across diverse business contexts, offering a foundation for future research on how these disclosures shape stakeholder perceptions and corporate legitimacy.

5.2 Managerial Implications

From a managerial standpoint, this study highlights the importance for companies to enhance their eco-innovation disclosures to strengthen legitimacy by stakeholders. Improving transparency in areas such as "Marketing" and providing quantifiable metrics across all eco-innovation domains would allow firms to align more effectively with stakeholder expectations. For companies with strong ESG performance, refining communication strategies can solidify their market reputation, especially as stakeholders increasingly prioritize sustainability in their decision-making processes. Furthermore, companies with substantial R&D investments can use these findings to reassess their eco-innovation disclosure practices. By addressing transparency gaps, particularly in underemphasized areas such as "Marketing" and "Packaging," these companies can enhance stakeholder engagement and capitalize on the reputational benefits associated with eco-innovation.

5.3 Limitations and future research directions

Despite the contributions of this study, several limitations should be acknowledged. Firstly, due to the emerging nature of the topic, the study takes an exploratory approach. As a result, the sample is limited to 20 Italian companies, which constrains the ability to generalize the findings to a broader population. Furthermore, the analysis is based exclusively on reports from 2023, which may not reflect potential variations or evolving trends.

Future research could build on this work by conducting longitudinal studies to explore the evolution of eco-innovation disclosure practices over time. Cross-contextual analyses comparing firms across different countries or industries would help identify external factors that influence the quality of disclosure, as different sectors have different impacts on the environment and climate and therefore stakeholders may have different expectations depending on the sectors in which companies operate (Jain et al., 2017). Additionally, comparative studies of family-owned versus non-family-owned businesses could shed light on how ownership structure impacts eco-innovation disclosure strategies, as some prior studies have noted the strong sustainability orientation of family businesses (Miroshnychenko & De Massis, 2022; Christensen-Salem et al., 2021). By addressing these limitations, future research could offer deeper insights into how organizations balance the pursuit of legitimacy with the advancement of eco-innovation. This would enable both academia and practice to develop more standardized frameworks for eco-innovation disclosure, equipping companies to better meet the demands of an increasingly sustainability-focused society.

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