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Current and future research in environmental sustainability: Synthesise of the role, responsibilities, and opportunities for the business sector

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ABSTRACT

Environmental sustainability is a timely and important topic to investigate given the increasingly complex challenges requiring businesses to reevaluate their business models in relationships with the natural environment, including their roles and responsibilities, and how opportunities in addressing these challenges may be utilized. This special issue enhances contemporary and future research by soliciting a wide variety of themes from ten papers falling under the scope of an ecological and climate focus of environmental sustainability relevant to the roles, responsibilities, and opportunities for the business sector, while also considering the links between environmental and social aspects. The articles included in the special issue provide an overview of five topics. These are 1) sub-national greenhouse gas accounting approaches, 2) corporate governance, policies, and practices, 3) sustainable finance, 4) consumer viewpoints and expectations, and 5) bioeconomy. Moreover, the crosscutting themes discussed suggest an inter- and transdisciplinary nature of environmental sustainability. In this introductory article to the special issue, the ten articles bring forth national and institutional levels, the sub-national level, and the organizational level. To conclude, future research avenues are vast based on suggestions presented in the ten papers the special issue covers. However, this introductory article also brings up topics suggested in the initial call for papers but were not covered in the papers included in the special issue, thus still relevant for future studies.

1. Introduction

The growing complexity of sustainability challenges has driven companies to rethink their business models and environmental interactions, highlighting their responsibilities in tackling these issues and seizing related opportunities. Investors and other stakeholders are increasingly favoring businesses that address their environmental impact, while companies are discovering strategic advantages in developing and applying efficient economic solutions to sustainability problems. Consequently, more businesses are integrating corporate social responsibility (CSR) and corporate sustainability (CS) concepts and prioritizing environmental, social, and governance (ESG) factors in their strategies and core businesses.

For this special issue, academic researchers, policymakers, and practitioners were encouraged to share "new knowledge, insights, experiences, and trends concerning issues related to the behavior of the corporation around environmental sustainability" (Jóhannsdóttir et al., 2023, p. 1) by submitting research articles, review articles, policy briefs, or opinion articles. Several relevant themes were suggested for the special issue. One of the themes suggested was environmental sustainability and strategic corporate social responsibility (CSR), suggesting that implementing strategy successfully would rest on measurement and performance evaluation (David and David, 2015). This also accounts for key success factors and obstacles (Vigfússon et al., 2021) often associated with the following elements: organizations purpose, principles, processes, people, and performance (Pryor et al., 2007; Vigfússon et al., 2021). The special issues also called for CSR-related case studies in various industries (Jóhannsdóttir et al., 2023), by referring to previous studies of Carroll (1991), Carroll (2016), and Latapí Agudelo et al. (2019) given the importance of understanding regulatory, normative, and cognitive contexts (Carroll, 2015; Garavan et al., 2010) affecting how companies adopt CSR (Barabanov et al., 2021). Disclosure of sustainability information and its implication for business performance was also seen as an important topic to cover (Jóhannsdóttir et al., 2023) given regulatory change around the subject in Europe. Specifically, the EU's Sustainable Financial Disclosure Regulation (SFDR), the Corporate Sustainability Reporting Directive (CSRD), and the Taxonomy classification system promote sustainable investments and advance the implementation of the European Green Deal (European Union, 2020). Relevant topics also include voluntary reporting guidelines, including the UN Global Compact, the Carbon Disclosure Project, the Global Reporting Initiative, the Nasdaq ESG Reporting Guide, and more (Nasdaq, 2017; Siew, 2015). Relevant to this topic are key performance indicators (KPIs), environmental accounting, and auditing, but as stated in the call for paper, "purpose of accounting, auditing standards, and verification is to provide information in a systematic way on business operations using relevant indicators as evidence" (Jóhannsdóttir et al., 2023, p. 2).

Challenges and opportunities of labeling for environmental sustainability were suggested as a theme author could explore (Jóhannsdóttir

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et al., 2023), thus addressing consumers' concerns by conveying the different aspects of sustainability through sustainable labels (Torma and Thøgersen, 2021). Sustainable or green finance was also proposed as a potential theme of relevance (Jóhannsdóttir et al., 2023). Still, both concepts have been used in this context requiring taxonomy, or classification, to provide a common language (European Commission, 2018). However, the definitions and standards are still ambiguous in the case of financial services and products (Oehler et al., 2018) and investment portfolios of financial institutions are often not evaluated concerning climate risks (CDP, 2020; Jonsdottir et al., 2022). Furthermore, the topic of sustainable supply chains was proposed given that companies do not operate in isolation (Jóhannsdóttir et al., 2023). Focus should preferably lie on circular supply chains rather than linear ones (Nasir et al., 2017) and governance of sustainable supply chains (Vurro et al., 2009). Stakeholder engagement (Freeman, 1984; Freeman and Reed, 1983) and the focus on stakeholders, including those often marginalized, such as the natural environment and non-human stakeholders, i.e. other species, and under-represented human stakeholders, for example, infants, youth, elders, and future generations (Arruda and Johannsdottir, 2022) were suggested as a relevant topic for the special issue, including new types of stakeholder management/engagement models (Arruda and Johannsdottir, 2022; Fifka and Loza Adaui, 2015).

The call for papers (Jóhannsdóttir et al., 2023) included a suggestion to focus on the role of leadership in the context of CSR and environmental sustainability, as successful implementation of CSR requires "innovative and visionary leaders sharing their vision and companies' values" (Johannsdottir et al., 2014, p. 171). A relevant topic is also the role of employees in implementing environmental sustainability and CSR emphasis as they help shape corporate culture and companies' directions (Daft, 2010). In crucial roles, employees help carry out companies' goals and initiatives through daily actions and interaction with internal and external stakeholders (Bhattacharya et al., 2023; Bhattacharya et al., 2008), acting as a driving force for environmental sustainability (Johannsdottir et al., 2014) and co-creator in CSR implementation (Bolton et al., 2011). However, the role of employees regarding CSR and environmental sustainability needs to be explored, as their commitment can be limited by factors such as lack of motivation, lack of leadership and support, and negative view of the company's purpose (Garavan et al., 2010; Latapí et al., 2021). Operationalization of environmental sustainability activities, organizational changes, innovative business models, and financial and human resources (Piwowar-Sulej, 2020) are also matters of relevance, such as in the cases of challenges to overcome (Comin et al., 2020). Digital services and digitalization are also relevant topics, where the former is value-driven and the latter technological-driven (Xu et al., 2021), where negative impacts on the natural environment and humans are of importance (Compagnoni, 2022), particularly in the Global South where electronic waste is handled under unsafe conditions (Cotta, 2020), in the case of pollution (Bisschop, 2014; Wang et al., 2020) or diminishing natural resources, and issues addressed through urban mining and resource recovery processes (Zeng et al., 2018). Sustainable business models (Bocken et al., 2014; Osterwalder et al., 2005; Richardson, 2008) as well as unsustainable business models (Bocken and Short, 2021) and sustainable business model innovation (Geissdoerfer et al., 2017) were proposed as potential themes for exploration such as in the context of circular business models (Geissdoerfer et al., 2020), as well as various instruments supporting and guiding businesses on their environmental sustainability journey (Walker et al., 2022), voluntarily or mandatorily. These themes, although of various natures, are not exhaustive, thus authors were welcomed to submit other contributions relevant to the role, responsibilities, and potential opportunities of businesses to address environmental sustainability issues. As pointed out in the call for papers (Jóhannsdóttir et al., 2023), the topic is of an inter- and transdisciplinary nature, where different research methods and viewpoints are appropriate. Consequently, the special issue aimed at stimulating knowledge development relevant to the field of corporate environmental sustainability.

The remainder of this article is structured as follows. In Section 2, the main ideas of the papers published in these special issues are discussed, including theoretical concepts and lenses (see Table 1) and research methods and topics (Table 2). Five of these topics are shown in Table 2. These are 1) sub-national greenhouse gas accounting approaches, 2) corporate governance, policies, and practices, 3) sustainable finance, 4) consumer viewpoints, and 5) bioeconomy. In addition, 6) cross-cutting themes are discussed under Topic 6. Section 3 discusses the overall findings and elaborates on future research avenues in the field of corporate environmental sustainability.

2. Overview of papers in this special issue

This special issue includes ten papers by 57 authors from 15 countries (Australia, Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Iceland, Italy, Japan, Luxembourg, Madagascar, Spain, Switzerland, and the United Kingdom). The authors of the papers work in various universities, research institutions and reporting agencies, super-national and national governmental bodies, and regional development offices. Furthermore, they represent various research fields, including social sciences, business and engineering, life and environmental sciences, health, regional studies, and more. The papers employ different theoretical approaches, namely bioeconomy, consumer research, corporate sustainability, finance, greenhouse gas (GHG) accounting, and stakeholder theory, see Table 1. The level of analysis differs, ranging from a sub-national level to institutional and organizational levels.

Table 2 provides an overview of the research methods employed in the papers in the special issue. Two papers can be classified as review papers (Horn, 2024; Palermo et al., 2024), two papers as case studies (Atlason et al., 2023; Mitchell et al., 2024), one paper employed a consumer panel (Sonck-Rautio et al., 2024) and one paper used a scoring approach (Serrentino et al., 2024). Furthermore, five papers employed survey methods (Briers et al., 2024; Fletcher et al., 2024; Hirata et al., 2023; Sonck-Rautio et al., 2024; Zaehringer et al., 2024). Most of the papers are based on quantitative methods (six papers), while fewer (four papers) used qualitative methods. Table 2 also shows which papers fall under the topics of sub-national greenhouse (GHG) accounting approaches, corporate governance, policies and practices, sustainable finance, consumers viewpoints, and bioeconomy.

Topic 1. Sub-national greenhouse gas accounting approaches

Environmental sustainability is a matter of relevance at national/institutional, sub-national, and organizational levels, such as by studying divergence and potential gaps in accounting and aggregation of local greenhouse gas emissions. Palermo et al. (2024) studied the topic using two approaches, these being the Emissions Database for Global Atmospheric Research (EDGAR) and the Baseline Emission Inventory (BEI) approach. The focus is on cities, but the Covenant of Mayors initiative has supported cities in reaching the European Union's carbon emission reduction and energy-related targets. The sources for CO_2 emissions have been identified and categorized into two energy-related groups,

Table 1
Theoretical concepts and lenses used in this special issue (own synthesis).

	Theoretical concepts and lenses	Author(s)
1	Bioeconomy	Briers et al. (2024)
2	Consumer research	Fletcher et al. (2024)
3	Consumer research	Sonck-Rautio et al. (2024)
4	Corporate sustainability	Serrentino et al. (2024)
5	Finance	Mitchell et al. (2024)
6	Finance	Horn (2024)
7	Finance	Zaehringer et al. (2024)
8	Finance and GHG accounting	Atlason et al. (2023)
9	GHG accounting	Palermo et al. (2024)
10	Stakeholder theory	Hirata et al. (2023)

Table 2
Study focus, topics, and research methods (own synthesis).

Authors	Study focus	Review paper	Consumer panel	Case study	Survey	Scoring method	Quantitative	Qualitative
Topic 1: Sub-national greenhouse gas accounting approaches								
Palermo et al. (2024)	Comparison of GHG methods for accounting, aggregation and inventorying of GHG emissions at local levels	x						x
Topic 2: Corporate governance, policies and practices								
Serrentino et al. (2024)	Policies and practices related to environmental sustainability in the food sector					x	x	
Hirata et al. (2023)	Corporate governance and voluntary international standards				x		x	
Topic 3: Sustainable finance								
Horn (2024)	ESG and sustainable investment perspectives from economic, behavioural, and regulatory points of view	x						
Mitchell et al. (2024)	Sustainable business models, finance, and barriers			x				x
Atlason et al. (2023)	GHG accounting, investments, regulations, and reporting			x			x	
Zaehringer et al. (2024)	Extractive industries, SDGs, mining investments				x		x	
Topic 4: Consumers' viewpoints								
Fletcher et al. (2024)	Consumers' environmental self-identity and lifestyle actions relevant to the uptake of bio-based and biodegradable plastics				x		x	
Sonck-Rautio et al. (2024)	Consumers', food package waste, sustainability		x		x		x	x
Topic 5: Bioeconomy								
Briers et al. (2024)	Public and private sectors' familiarity and understanding of concepts relevant to bioeconomy, value chains, benefits, and risks				x		x	

these being 1) key sectors (municipal buildings, residential buildings, tertiary buildings, transport), and 2) optional sectors (industry, agriculture forestry), in addition to non-energy related sectors, namely 3) optional sectors (waste) and 4) not included as activity sector (energy generation) (Palermo et al., 2024). Based on this analysis, a SWOT (strengths, weaknesses, opportunities, threats) analysis of the two approaches was conducted, demonstrating that they "cannot be directly combined or merged to assess local level emissions and provide figures at higher spatial coverage, or fill gaps of missing reporting cities". However, they can be beneficial and complementary (Palermo et al., 2024, p. 9).

Topic 2. Corporate governance, policies and practices

Policies and practices relevant to environmental sustainability were explored by conducting a pilot test of a monitoring framework developed by the global INFORMAS network (Serrentino et al., 2024). The framework is designed around policies and practices in ten specific domains: 1) environmental sustainability strategy, 2) greenhouse gas emissions, 3) biodiversity, 4) energy, 5) water, 6) environmental compliance, 7) animal-sourced products, 8) food loss and waste, 9) packaging, and 10) and relationships with other organizations (Serrentino et al., 2024). The sector assessed according to the framework was the food sector, namely prominent Australian food companies. According to the framework, a maximum of 100 points could be allocated to each company; the outcome was scores between 2 and 58, with a median score of 31 out of 100. The reporting practices of the companies differed greatly, and the companies fell short in "implementing a comprehensive approach to addressing environmental sustainability" (Serrentino et al., 2024, p. 1). However, some aspects showed somewhat strong commitments, such as greenhouse gas emissions reductions (median: 58/100), while others were significantly lower, such as the water aspect (median: 23/100) and the sourcing of animal products (median: 10/100). The study also showed a difference in the outcome between sub-sectors, namely retailers, food and beverage manufacturers, and quick service companies (see Fig. 2) (Serrentino et al., 2024).

Regarding the topic of corporate governance, policies, and practices, the authors have explored corporate governance characteristics when adopting voluntary standards, namely the ISO14001 standard, in Japanese subsidiaries operating in Thailand to address environmental problems, thus helping to achieve the Sustainable Development Goals (Hirata et al., 2023; United Nations, 2024). In this case, the focus is on board diversity and the share of voting rights in the subsidiaries. In total, panel data from 117 subsidiaries were used to obtain information about three industrial sectors, including machinery, precise machinery, and rubber products (Hirata et al., 2023). The results suggest that the length of the business history of parent companies, and direct voting rights, correlate positively with the adoption of ISO14001 by the subsidiaries. A slightly positive relationship was found in relation to the proportion of independent directors on the board of parent companies, but no in the case of the proportion of female directors associated with the wide gender inequality gap existing in Japan, where it is noted that only the proportion of female directors is only 4.63 % therefore not reaching critical mass to influence decision making (Hirata et al., 2023).

Topic 3. Sustainable Finance

In this issue, there is a clear focus on the importance of sustainable finance, such as investments (Horn, 2024), green bonds (Mitchell et al., 2024), financed greenhouse gas emissions (Atlason et al., 2023), and sector-specific (mining) investments (Zaehringer et al., 2024). However, the context of each article differs. The first article, for instance, brings forth the purpose of the Green Deal, the EU Taxonomy relevant to sustainable investments, and the importance of finance solutions and capital flow towards sustainable development and the grant challenges embedded in climate change, biodiversity loss, and social inequalities (Horn, 2024). The purpose of the article is to propose suggestions for policymakers and to emphasize the role of financial services, including banks, mutual funds, and financial advisors, in providing information to retail investors. This will "enable retail investors' self-determined decision-making" so they can understand risks embedded in how environmental, social, and governance (ESG) investments (Horn, 2024).

The second article, falling under the topic of sustainable finance, focuses on green bonds and internal barriers relevant to issuing such bonds. The context is the business models of Nordic energy companies explored through a case study of five companies (Mitchell et al., 2024).

The findings suggest the importance of improving mission and strategy from an environmental point of view, sound governance mechanisms, investing and divestment of assets that improve or deteriorate environmental improvements, respectively, and research and development (R&D) in CO_2 emission reduction. Issuing of green bonds furthermore influences changes to sustainable business models, such as by introducing green finance frameworks and supplementary governance methods, thereby "reinforcing choices and consequences emerge to create virtuous cycles", but before issuing of the bonds, barriers must be removed (Mitchell et al., 2024, p. 1). Eligible assets and green projects must be available, green definitions clear, reputational risks and how they should be mitigated recognized, and resource aspects addressed, just to name a few (Daft, 2010; Mitchell et al., 2024).

Through a case study, the third article focuses on accounting for time in cases where financed greenhouse gas emissions are estimated for lending and investment portfolios (Atlason et al., 2023). The study premises are the EU Taxonomy sustainable finance package and green bond financial instruments. This regulatory development and public pressure are driving forces influencing the estimation and publishing of information by financial institutions on financed greenhouse gas emissions embedded in investments and capital lent to companies. However, the study suggests that current methods do neither "reflect the duration of such loans or investment holdings, nor the variability of carbon emissions from the underlying investments" (Atlason et al., 2023, p. 1). Instead, the standard practice is to use the year-end value of an outstanding loan or investment, compared to the enterprise value, including cash, to determine the share of emissions from the investment that should be attributed to the investor or financial institution. Employing these methods can lead to inaccurate conclusions since investment portfolios are dynamic and can change throughout the year, with some investments being removed and others being added later. Moreover, company emissions can fluctuate significantly over the year due to seasonality or other influencing factors. As the study reveals, this issue can lead to financial institutions reporting somewhat distorted financed emissions at best, completely inaccurate at worst, and may even result in greenwashing (Atlason et al., 2023).

Sustainable development and foreign mining investments in large-scale extractive projects are the subject of the fourth article, given that sustainable development requires resource extraction. This has local consequences for "social-ecological systems in Madagascar", claimed to be "a global biodiversity hotspot" (Zaehringer et al., 2024, p. 1). The foreign investors include "Ambatovy Moramanga, Ambatovy Tamatave, QIT Madagascar Minerals/Rio Tinto, Ranobe, and Tantalum Rare Earth Malagasy" (Zaehringer et al., 2024, p. 1). Employing a counterfactual approach, survey responses were collected from 459 households engaged in agro-pastoral activities, artisanal fisheries, and small-scale farming. Information regarding general household characteristics was collected as well. The study suggests that the impacts are mainly negative, such as on livelihoods, wellbeing, land and sea use, and security. Pollution from mining operations decreased access to water and fisheries resources, and natural forest areas diminished. Pollution of air, water, and soil decreased productivity, negatively impacting various land uses, and also affecting people's health, although some projects resulted in improved infrastructure and healthcare. The negative impacts occurred both during the exploration and operation of the projects. This study provides an in-depth perspective on the local impact of large-scale extractive industry investments, also bringing forth policy implications that need to be addressed for these investments to contribute to progress towards the sustainable development goals (Zaehringer et al., 2024).

Topic 4: Consumers' viewpoints

Consumer orientations and viewpoints were the focus of two articles, one focusing on the uptake of bio-based and biodegradable plastics and the other focusing on sustainable food packaging. The former article emphasizes the excessive use of conventional plastics which has caused numerous environmental and socio-economic problems, including carbon emissions, plastic pollution, and resource depletion. Recognizing these issues, national, supranational, and international organizations have advocated for alternatives like bioplastics (Fletcher et al., 2024). The market for these materials remains small, as businesses are still determining the costs and benefits of using such innovative materials. Effective and sustainable adoption of such materials relies on public acknowledgment and shifts in consumers' actions. Consequently, the study aimed to explore "how consumers' orientation towards environmental sustainability is related to consumer utilization of alternatives such as bio-based and biodegradable plastics". Additionally, the study analyzed "consumer knowledge and performance expectations of these materials" (Fletcher et al., 2024, p. 1). Responses were collected through a self-administered online survey where snowball sampling was used. The results indicate ongoing consumer confusion, unrealistic expectations, and a gap between values and actions. These factors could impact market adoption and have broader effects across the value chain. It is, therefore, crucial for policymakers and businesses to tackle these barriers by improving the communication of relevant information and enhancing consumer awareness and knowledge (Fletcher et al., 2024).

The latter article focused on the increasing waste from food packaging, which has sparked both practical and academic interest in developing, designing, and marketing sustainable alternatives (Sonck-Rautio et al., 2024). This article examines packaging sustainability from the consumer's point of view, suggesting that it involves not just the packaging content but also its functions. It argues that consumers' criteria for sustainable packaging differ from those of the packaging industry. Based on data from an online consumer panel in Finland, the study finds that while the containment function is most important to consumers, the informative function is particularly significant for sustainability. Additionally, two new functions, "usability and disposability," are highly valued by consumers but largely overlooked by the industry. These insights are crucial for advancing sustainable food packaging and developing new packaging solutions (Sonck-Rautio et al., 2024, p. 1).

Topic 6: Bioeconomy

Public and private sector perceptions shaping the bioeconomy across Europe were the subject of one of the articles in the special issue (Briers et al., 2024). The bioeconomy is a promising solution to complex global challenges, requiring collaboration among diverse stakeholders to build resilient and sustainable economies. This transformation is driven by the public and the private sectors "through strategies, policies, regulations, business choices and investments and market implementation, respectively (Briers et al., 2024, p. 1). This study examines how public and private sector actors in nine European regions perceive bioeconomy, focusing on familiarity and understanding of the concept, potential benefits, risks, and value chains (Briers et al., 2024). The research is unique in assessing regional-level understanding of the bioeconomy. Rather than imposing a top-down agenda, it gathers practitioner insights from 534 survey responses in regional languages. The data was analyzed using descriptive and summary statistics, as well as non-parametric tests. The main findings demonstrate 1) a positive view towards bioeconomy, and 2) implementation is considered to be complicated, with environmental benefits seen as the most important aspect, although socio-economic aspects are also recognized. Tensions between personal risks and societal benefits are also observed, indicating that a sustainable bioeconomy must balance environmental and socio-economic goals and their varying impacts. 3) Although there is a growing consensus on the elements of the bioeconomy, sector-specific priorities, and regional conditions prevent a uniform approach across regions, which should be considered in policy development (Briers et al., 2024).

Topic 6. Crosscutting themes

The papers presented in this special issue demonstrate that some of the themes and discussions are crosscutting, emphasizing the inter and transdisciplinary nature of environmental sustainability. For instance, Palermo et al. (2024) discussed divergences and potential gaps in local GHG emissions accounting and aggregation from a sub-national point of

view, while Atlason et al. (2023) addressed financed GHG emissions from investment and lending portfolio viewpoints. Furthermore, GHG emissions were also discussed by Serrentino et al. (2024) from the standpoint of corporate governance, policies, and practices.

The Sustainable Development Goals were brought up as a business aspect in the papers by Hirata et al. (2023) and Zaehringer et al. (2024) while the regulatory changes in Europe relevant to reporting, disclosure, and finance were addressed by Atlason et al. (2023) and Horn (2024). Yet, another example is the uptake of bio-based and biodegradable plastics discussed by Fletcher et al. (2024), which has relevance for food packaging covered by Sonck-Rautio et al. (2024), both topics addressed from consumer viewpoints. Driving forces (pressures) were mentioned by Atlason et al. (2023) and Hirata et al. (2023), but Atlason et al. (2023) and Horn (2024) brought up the issue of greenwashing. This coverage is not exhaustive but gives an idea of the inter- and transdisciplinary nature of topics covered in the special issue.

3. Discussions and future research avenues in the field of corporate environmental sustainability

The papers in the special issue identify various research gaps worth exploring. These include expanding and evaluating relevant, existing, different, and new approaches and technologies, increasing data availability and quality, transparency, and reliability, such as in the case of sub-national evaluation of GHG accounting approaches (Palermo et al., 2024). Furthermore, a deeper understanding can be gained by adding in-depth interviews and a more comprehensive dataset to explore the parent companies-subsidiaries relationship in implementing voluntary standards, as well as by exploring similarities and differences by industry types (Hirata et al., 2023). Research gaps exist where voluntary actions of companies and monitoring of outcomes are seen an insufficient (Serrentino et al., 2024). Since the policy relevance and role of financial services were explored in the context of European regulatory frameworks (Horn, 2024), it would be relevant to expand the horizon to other regions as well. Future studies can also focus on change in sustainable business models relevant to sustainable finance and the issuing of green bonds. Other financial instruments could also be explored in the context of their effects on business models, such as how finance can guide companies with conventional business models transitioning towards sustainability (Mitchell et al., 2024).

It is also suggested that future research is conducted to assess the impact of considering only year-end holdings of financial instruments. Current methods are susceptible to unintentional greenwashing, as financial institutions might report financed emissions that do not accurately reflect their investments or loans throughout the year. This contradicts the purpose of the Sustainable Finance Disclosure Regulation (SFDR), which aims to reduce greenwashing (Atlason et al., 2023). In the case where the local impact of large-scale extractive industry investments has been studied (Zaehringer et al., 2024), there is also a gap in the literature regarding other countries and regions. Study limitations of studies also reveal research gaps, such as in the cases where small sample sizes have been used, but by using larger datasets, the generalizability of results can be enhanced. Furthermore, other aspects may be considered, such as national legislative frameworks or cultural context to understand the context-specific circumstances or accurate data from validated reports, instead of self-reporting data (Sonck-Rautio et al., 2024). Finally, to enhance strategic promotion and maximize practical implications on the bioeconomy, further academic research and education are needed (Briers et al., 2024).

Future studies could also address topics suggested in the call for papers (Jóhannsdóttir et al., 2023), but not covered in the special issue. These include the strategic aspect, measurement and performance (David and David, 2015), key success factors and obstacles for strategy implementation (Vigfússon et al., 2021), and sustainable labelling and sustainable labels (Torma and Thøgersen, 2021). Furthermore, the topic of sustainable supply chains was suggested (Jóhannsdóttir et al., 2023), as well as circular and sustainable supply chains (Vurro et al., 2009). Stakeholder engagement (Freeman, 1984; Freeman and Reed, 1983) was proposed as a topic, in particular, the ones currently marginalized, such as the natural environment and non-human stakeholders, i.e., other species, and under-represented human stakeholders, for example, infants, youth, elders, and future generations (Arruda and Johannsdottir, 2022; Johannsdottir and Davidsdottir, 2024). The leadership topic could also have received more attention as well as employees' role in implementing environmental sustainability (Daft, 2010), although the role of boards was addressed (Hirata et al., 2023),. Operationalization of environmental sustainability activities, organizational changes, innovative business models, and financial and human resources (Piwowar-Sulej, 2020) are also matters of relevance, such as in the cases of challenges to overcome (Comin et al., 2020), but also technological aspects, including digital services and digitalization (Xu et al., 2021). This discussion suggests that there is still a vast room for studies in corporate environmental sustainability.

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