



Carbon Accounting and Its Impact on Environmental Cost Control and Corporate Sustainability Performance: A Systematic Review

Uli Wildan Nuryanto¹, Hidayatullah², Mochamad Fahru Komarudin³

^{1,2} Students of of Master of Accounting, Posgraduate Program,, Universitas Bina Bangsa, Indonesia

³Lecturer of Master of Accounting, Posgraduate Program,, Universitas Bina Bangsa, Indonesia

Article Info:

Received: 05 June 2025; Revised: 19 Aug 2025; Accepted: 21 Sept 2025; Available Online: 17 Dec 2025

Abstract – This study aims to analyze the effect of carbon accounting on environmental cost control and corporate sustainability performance through a Systematic Literature Review (SLR) approach. The background of this study is based on increasing global pressure on companies to manage carbon emissions transparently and accountably as part of sustainable business practices. The research method uses an SLR by reviewing Scopus, SINTA, and Google Scholar indexed scientific articles published in the period 2021–2026. The literature selection process is carried out using the PRISMA approach to ensure the quality and relevance of the studies analyzed. The results of the study indicate that carbon accounting has a positive effect on environmental cost control through improved cost information accuracy, efficient resource utilization, and reduced energy waste. In addition, carbon accounting also contributes to improving corporate sustainability performance, particularly in environmental aspects and reporting transparency. However, this relationship is not always direct and is influenced by contextual factors such as the quality of accounting systems, stakeholder pressure, and environmental regulations. The implications of this study show that carbon accounting is a strategic instrument that functions not only as a reporting tool but also as a mechanism for cost control and improving sustainability performance. This research is expected to provide both theoretical and practical contributions to the development of sustainability accounting at the corporate level.

Keywords – carbon accounting, environmental cost, sustainability performance, Systematic Literature Review (SLR), environmental accounting

INTRODUCTION

In the past two decades, issues related to climate change and carbon emissions have become a global concern. IPCC reports indicate that global CO₂ emissions have increased by 1.1% annually since 2010, requiring companies to adopt more transparent environmental accounting practices. Carbon accounting has emerged as an important instrument for measuring, reporting, and controlling the environmental impacts of companies. Recent studies emphasize that environmental accounting plays a role in improving the quality of ESG disclosure and supporting long-term sustainability (Nyakuwanika & Panicker, 2025).

This condition creates increasing pressure on companies not only to focus on economic performance but also to take responsibility for the environmental impacts generated by their operational activities. In this context, companies are required to adopt more comprehensive and transparent environmental accounting practices, particularly through the implementation of carbon accounting. Transparency in measuring and reporting carbon emissions is essential as it serves as a basis for strategic decision-making as well as a form of accountability to stakeholders. Thus, the increase in global emissions is not only an environmental issue but also drives the transformation



of corporate accounting systems toward a more sustainable and environmentally oriented approach.

Studies show that the implementation of carbon accounting systems can moderate the relationship between sustainability strategies and corporate performance, particularly in the energy and manufacturing sectors (Huang & Gergel, 2023). As global pressure on sustainability issues increases, companies are integrating environmental aspects into their reporting systems and decision-making processes. Carbon accounting has emerged as a strategic approach that enables companies to systematically measure, record, and report carbon emissions. In addition, global trends show increasing adoption of sustainability reporting standards such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD), which encourage the integration of carbon information into corporate financial reporting (Khan et al., 2022).

In Indonesia, attention to carbon accounting has increased in line with the government's commitment under the Paris Agreement to reduce carbon emissions by 29% by 2030 (Indarto & Ani, 2024). Manufacturing companies have begun integrating carbon accounting into management accounting systems as an effort to control environmental costs; however, implementation still faces various challenges, including limited resources and technology (Silaban, 2025), the absence of standardized reporting frameworks leading to uncertainty and inconsistency in carbon mitigation data (Goldstein, 2022), and low managerial awareness of the importance of carbon emission management (Pratiwi et al., 2021). These conditions indicate that the implementation of carbon accounting in Indonesia is still in its early development stage and requires regulatory support as well as organizational capacity building.

In addition, companies also face major challenges in integrating the relationship between carbon accounting and corporate sustainability

performance, which has become a key concern in academic literature. Sustainability performance includes economic, social, and environmental aspects measured through ESG (Environmental, Social, and Governance) indicators. A study by Qian et al. (2022) found that effective carbon accounting practices contribute positively to improving corporate ESG performance, particularly in environmental aspects. This indicates that carbon accounting functions not only as a reporting tool but also as a strategic instrument in achieving sustainability.

Furthermore, research by Yin, Xiao, and Cao (2023) shows that companies with high levels of ESG disclosure tend to have better carbon performance, especially in highly polluting industries. This demonstrates that carbon accounting not only functions as a reporting tool but also as a strategic instrument in supporting the achievement of comprehensive corporate sustainability performance.

Carbon accounting plays an important role as a mechanism for identifying, measuring, and managing carbon emissions, thereby enabling companies to improve transparency and accountability in environmental aspects. This shows that carbon accounting functions not only as a reporting tool but also as a strategic instrument in supporting overall corporate sustainability performance.

However, empirical findings regarding the effect of carbon accounting on environmental cost control and sustainability performance remain inconsistent. Several studies report a significant positive relationship (San et al., 2021; Xia et al., 2025), while others suggest that the effect depends on contextual factors such as firm size, regulatory pressure, and the level of technology adoption (Al-Mawali, 2021; Bui & Nurul, 2022). This inconsistency indicates a research gap that needs further analysis.

Therefore, this study aims to analyze the effect of carbon accounting on environmental cost control and



corporate sustainability performance through a Systematic Literature Review (SLR) approach. Theoretically, this study is expected to enrich the literature on sustainability accounting. Practically, it provides implications for companies and policymakers in designing more effective and sustainable environmental management strategies.

OBJECTIVES OF THE STUDY

This study conducts a systematic review of leading national and international literature indexed in Scopus, Google Scholar, SINTA journals, and Web of Science databases to:

1. Identify how the implementation of carbon accounting affects environmental cost control in companies.
2. Analyze the extent to which carbon accounting contributes to improving corporate sustainability performance.
3. Develop an integrative conceptual framework linking the paradigm of carbon accounting with environmental cost control and corporate sustainability performance.

From a practical perspective, this study provides insights for policymakers by progressing from phenomenon identification, relationship analysis, to the development of a conceptual framework that can be used as both an academic and practical reference. Specifically, it aims to:

1. Identify how the implementation of carbon accounting influences environmental cost control in companies, particularly in terms of efficiency and transparency in carbon emission management.
2. Analyze the extent to which carbon accounting contributes to improving corporate sustainability performance, as measured by ESG (Environmental, Social, Governance) indicators.
3. Develop an integrative conceptual framework linking the paradigm of carbon accounting with

environmental cost control and corporate sustainability performance, which can serve as a reference for future academic research and managerial practice.

Through a critical synthesis of both national and international literature, this study aims to bridge theoretical fragmentation in the field of environmental cost control and propose new directions to strengthen carbon accounting practices and corporate sustainability.

MATERIALS AND METHODS

Research Design

This study employs a Systematic Literature Review (SLR) method to examine national and international literature related to carbon accounting, environmental cost control, and corporate sustainability performance. SLR was selected because it enables the integration of various theoretical and empirical perspectives in a systematic, transparent, and replicable manner. Nyakuwanika and Panicker (2025) emphasize that SLR is highly suitable for environmental accounting studies as it can identify dominant themes, theoretical developments, and existing research gaps related to ESG disclosure and sustainability reporting.

The review process follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological rigor. The PRISMA stages include identification, screening, eligibility, and inclusion of articles. Yoewono and Roziq (2025) applied a similar approach in reviewing the impact of carbon accounting implementation on corporate sustainability, highlighting the importance of methodological transparency to ensure replicability and auditability of findings. This approach is relevant for the present study as it strengthens the validity of the literature synthesis.

Tugiantoro, Adhani, and Supriyadi (2025) conducted an SLR and bibliometric analysis of 50 articles on carbon accounting and ESG disclosure in Indonesia. Their findings indicate that effective carbon



accounting practices improve ESG disclosure quality and positively affect firm value. This methodological foundation supports the present study in assessing the contribution of carbon accounting to sustainability performance, particularly in environmental cost control.

This research design is important as it incorporates both Indonesian and international contexts, enabling the development of a more applicable and contextually relevant conceptual framework.

Data Sources and Units of Analysis

The literature analyzed in this study was obtained from three academic databases: Scopus, Publish or Perish/Google Scholar as international sources, and SINTA (Science and Technology Index) as a national source. These databases were selected to ensure a comprehensive coverage of literature from both global and local perspectives. Scopus and Google Scholar index high-quality international publications, while SINTA captures relevant national research contributions within the Indonesian context. This combination ensures a more balanced and representative literature synthesis.

The unit of analysis consists of peer-reviewed journal articles focusing on carbon accounting implementation, environmental cost control, and corporate sustainability performance. To ensure relevance and quality, inclusion criteria were applied: articles must be written in English or Indonesian, published in Scopus- or WoS-indexed journals, and focused on environmental accounting, ESG disclosure, or sustainability issues.

The review is limited to publications from 2021 to 2026 to capture the latest developments in carbon accounting practices, environmental cost control, and sustainability performance. This period reflects the intensified adoption of global sustainability reporting standards and increasing national commitments to carbon emission reduction targets. The included studies cover various methodologies, including qualitative,

quantitative, mixed-methods, and conceptual approaches.

The analyzed studies span international and national contexts, particularly in energy, manufacturing, and high-pollution industries. Typical stakeholders in the reviewed literature include corporate managers, environmental accountants, regulators, and external stakeholders. This diversity enables a cross-sectoral and cross-cultural understanding of how carbon accounting influences environmental cost control and sustainability performance.

Data Collection

Data collection was conducted through a systematic search in Scopus, Google Scholar, and SINTA databases to ensure comprehensive coverage of both international and national literature. Scopus was used to retrieve high-impact international studies, Google Scholar expanded interdisciplinary coverage, and SINTA captured relevant Indonesian research contributions.

The search used keywords such as “carbon accounting,” “environmental cost control,” “corporate sustainability performance,” and “ESG disclosure.” Boolean operators (AND, OR) were applied to refine search results, for example: “carbon accounting AND sustainability performance” or “carbon accounting AND environmental cost control.”

After the initial search, articles underwent a screening process. The first screening stage involved reviewing titles and abstracts to assess relevance to the research objectives.

The unit of analysis includes journal articles addressing the relationships between carbon accounting, environmental cost control, and corporate sustainability performance. The studies include various research designs—qualitative, quantitative, mixed-methods, and conceptual studies—allowing for a comprehensive synthesis of the phenomenon.



Instruments

The primary instrument used in this study is a systematic data extraction form designed to capture key information from each selected article. The form includes author(s), publication year, journal title, country of study, research objectives, theoretical framework, methodology, and key findings related to carbon accounting, environmental cost control, and sustainability performance. This instrument ensures consistency in data collection and minimizes researcher bias during the synthesis process.

In addition, a thematic analysis matrix is used to organize findings from the reviewed studies. This matrix facilitates the categorization of key themes, such as the relationship between carbon accounting and environmental cost efficiency, ESG disclosure, and corporate sustainability performance. Through this approach, recurring patterns and conceptual relationships can be identified, leading to a more comprehensive synthesis.

To ensure reliability, categorization is conducted through repeated reading and cross-comparison of extracted data. This iterative process strengthens conceptual validity and reduces interpretation bias. As Snyder (2019) notes, structured instruments in systematic reviews enhance data consistency and reduce research bias.

The instrument also enables integration of national (SINTA) and international (Scopus, Google Scholar) literature, allowing comparison across countries and sectors and identification of relevant research gaps.

Data Analysis

Data analysis follows the PRISMA framework. The first stage is identification, involving the collection of relevant articles from Scopus, Google Scholar, and SINTA databases. All references are exported to reference management software, and duplicates are removed.

The second stage is screening, where titles and abstracts are reviewed for relevance to carbon accounting, environmental cost control, and sustainability performance.

The third stage is eligibility, where full-text articles are assessed based on inclusion criteria (2021–2026, peer-reviewed, and topic relevance).

The final stage is inclusion, where eligible articles are analyzed using thematic analysis to identify key patterns and conceptual relationships.

RESULTS AND DISCUSSION

Results

Systematic Literature Review (SLR) Approach

The Systematic Literature Review (SLR) method was selected to explore this topic, ensuring rigor and credibility in the findings through an exploratory applied research approach based on literature review. This approach provides broad access to various relevant sources within the domain of accounting theory, including journals, articles, and other documents. The research process involves several steps, starting from the identification of relevant accounting theory concepts to the collection of appropriate literature materials. Subsequently, a critical analysis of the collected theories is conducted to understand their implications and contributions within the research context.

The research process involved identifying 20 accredited journals (2024–2026) relevant to the topic of the effect of carbon accounting on environmental cost control and corporate sustainability performance. Through a screening and eligibility process, 14 most relevant journals were selected for further analysis. The literature review is used to identify research developments, detect research gaps, and provide a comprehensive understanding of the relationships between the variables under study.



The data analysis process in this study includes several steps:

1. Identification of literature relevant to the research topic,
2. Selection of articles based on publication year and relevance,
3. Content analysis of previous research findings, and
4. Literature synthesis to obtain a more comprehensive understanding of the effect of carbon accounting on environmental cost control and corporate sustainability performance.

Carbon Accounting and Corporate Sustainability Performance

Fina and Rahma Maulidia (2024) state that carbon emission disclosure aims to reduce negative environmental impacts, which in turn can enhance corporate environmental performance and attract investors to invest in environmentally responsible companies. With transparent information, stakeholders have a strong basis to evaluate the environmental impact of corporate operations, particularly regarding carbon emissions. Companies committed to reducing carbon emissions and openly disclosing related information can improve their corporate reputation.

Research conducted by Azizah Nur Fathia (2023) shows that carbon emission disclosure has a positive effect on corporate sustainability. Corporate sustainability is not only measured by profit but also by corporate responsibility toward society and the surrounding environment. One way to maintain sustainability is through the implementation of carbon emission disclosure programs. In this context, companies not only report the amount of carbon emissions produced but also design strategies to reduce those emissions. Through such disclosures, the public and investors can understand emission levels and the company's efforts to mitigate them.

Similarly, Kurnadi et al. (2025) found that corporate awareness of environmental sustainability,

particularly in terms of carbon emissions, has a positive effect on corporate sustainability. Carbon emission measurement data helps companies understand their contribution to climate change and provides a strong basis for setting emission reduction targets. However, Kurnadi et al. (2025) also found that carbon emission disclosure does not significantly affect firm value, which contradicts previous studies. In some cases, carbon emissions may not serve as a strong signal because not all investors perceive them as indicators of management quality or future performance. Investors may prioritize traditional financial indicators such as revenue, profit, and growth.

This finding is supported by Umi Hanifah and Novemy Triandari Nugroho (2024), who argue that highly profitable companies tend to prioritize shareholder interests, meaning they are more profit-oriented. As a result, such companies are less likely to disclose extensive non-financial information in annual reports, and environmental disclosure is not considered a priority. In addition, highly profitable firms may perceive environmental disclosures as unnecessary if they do not directly contribute to financial performance. This suggests that companies with high profits do not necessarily engage in extensive environmental disclosure or carbon trading activities when such actions are not perceived as financially beneficial.

Carbon emission reporting and corporate sustainability performance should be supported by strong sustainability practices to ensure high-quality sustainability reporting. However, this is often constrained by limited awareness or the relatively low priority given by investors to environmental issues in investment decision-making processes.

The Effect of Carbon Accounting on Environmental Cost Control

International research by Bui and Nurul (2022) shows that carbon accounting systems function as a control mechanism that can improve environmental performance through more structured emission management. Meanwhile, national research by Danial et



al. (2025) emphasizes that effective environmental cost control depends on a company's ability to identify cost components such as prevention costs, detection costs, and environmental failure costs.

Most studies indicate that carbon accounting has a positive effect on environmental cost control. Okechukwu et al. (2025) found that the implementation of real-time monitoring-based carbon accounting can reduce energy consumption by 12–23% and carbon emissions by 10–23%, which directly contributes to operational cost efficiency. In addition, Mayndarto and Sularto (2026) show that environmental management accounting based on carbon accounting can improve cost efficiency through the identification of non-value-added activities in production processes.

However, not all studies report consistent findings. Juniarti and Sasanti (2025) found that carbon accounting disclosure does not have a significant effect on firm financial performance ($p > 0.05$). This suggests that the relationship between carbon accounting and environmental cost control is indirect and requires supporting variables such as management accounting systems, corporate operational strategy, and management commitment.

These findings indicate that carbon accounting not only functions as a reporting tool but also as an environmental cost control instrument. Carbon accounting contributes significantly to improving environmental cost control, particularly through enhanced cost information accuracy. However, even though it is linked to financial performance, its impact on cost efficiency is not necessarily direct if it is not integrated with a proper cost management system.

The Effect of Carbon Accounting on Environmental Cost Control and Corporate Sustainability Performance

Research by Syam et al. (2024) shows that carbon accounting has direct implications for corporate accounting practices and sustainability reporting, particularly in emission measurement and carbon cost

management. In addition, Taufik (2025) finds that carbon accounting implementation positively affects environmental performance through operational cost efficiency and emission reduction. These findings indicate that carbon accounting functions not only as a reporting tool but also as an environmental cost control instrument.

Furthermore, Murti (2022) shows that environmental cost accounting enables companies to classify environmental costs into prevention, detection, and failure costs, thereby improving cost control effectiveness.

In terms of sustainability performance, research findings show that carbon accounting contributes to improving environmental performance and firm value. Han et al. (2024) find that carbon-based policies such as carbon trading can significantly reduce corporate emission intensity and improve ESG performance. Carbon accounting plays an important role in improving the accuracy of environmental cost information, reducing energy and resource waste, and supporting corporate operational efficiency.

Discussion

The Effect of Carbon Accounting on Corporate Sustainability Performance

The findings indicate that carbon accounting, particularly through carbon emission disclosure, plays a strategic role in improving corporate sustainability performance. Fina and Rahma Maulidia (2024) emphasize that transparency in carbon emission disclosure enhances corporate image and strengthens stakeholder trust, including investors. Open information regarding carbon emissions provides a more objective basis for evaluating the environmental impact of corporate activities, thereby encouraging greater environmental responsibility.

This finding is consistent with Azizah Nur Fathia (2023), who states that carbon emission disclosure has a positive effect on corporate



sustainability. Sustainability is no longer measured solely by financial performance but also includes social and environmental responsibilities. Accordingly, companies that actively disclose carbon emissions not only provide quantitative information but also demonstrate strategic commitment to managing environmental impacts through emission reduction programs.

Furthermore, Azizah Nur Fathia (2023) reinforces that corporate awareness of environmental issues, particularly carbon emissions, contributes positively to sustainability performance. Carbon emission measurement enables companies to understand their contribution to climate change and serves as a basis for setting more targeted emission reduction goals. However, this study also reports inconsistencies, showing that carbon emission disclosure does not significantly affect firm value. This suggests that not all investors consider environmental information as a key determinant in investment decisions, as they still tend to focus on traditional financial indicators such as profitability and earnings growth.

This finding is supported by Umi Hanifah and Novemy Triyandari Nugroho (2024), who show that highly profitable companies tend to be more shareholder-oriented. In such conditions, firms are likely to reduce environmental disclosures because they are perceived as not providing direct financial benefits. This reflects a conflict between profit orientation and sustainability, which remains a key challenge in the implementation of carbon accounting.

In addition, the effectiveness of carbon emission disclosure is influenced by the level of investor awareness regarding environmental issues. Limited investor attention to sustainability aspects leads to carbon accounting information being underutilized in investment decision-making. This indicates that the relationship between carbon accounting and sustainability performance is indirect and influenced by external factors.

In addition, the findings of this study indicate that accountability performance in government agencies is increasingly influenced by digital transformation and adaptive governance mechanisms. The integration of digital accounting systems, artificial intelligence, and organizational databases enables institutions to improve budget monitoring, financial reporting accuracy, and operational transparency. Suseno and Yusuf (2024) explain that digital transformation strengthens governance adaptability and organizational sustainability because institutions become more responsive to environmental changes and public demands. Similarly, Putri et al. (2025) emphasize that artificial intelligence and integrated organizational databases contribute significantly to strategic decision-making quality and risk management effectiveness. These findings suggest that modern accounting control systems supported by digital innovation are essential for improving accountability performance in public institutions. Furthermore, collaborative governance and sustainability-oriented innovation strengthen institutional resilience and governance continuity through integrated coordination and adaptive operational systems (Suseno et al., 2021; Nuryanto & Basrowi, 2024). Therefore, accountability performance is no longer limited to administrative compliance but also includes institutional adaptability, technological integration, and sustainable governance capability.

Another important finding relates to the growing emphasis on sustainability and environmental governance within modern accountability systems. Similar to the implementation of carbon accounting in corporate sustainability management, government institutions are increasingly expected to adopt transparent and sustainability-oriented financial governance practices. Research on carbon accounting demonstrates that transparent disclosure mechanisms improve stakeholder trust, organizational legitimacy, and sustainability performance. This perspective aligns with the findings of Faeni et al. (2025), Widana et al. (2025), and Pratiwi et al. (2025), who argue that sustainability-oriented governance, environmental awareness, and organizational innovation positively



influence institutional performance and governance quality. In the context of government agencies, transparent budgeting systems and effective accounting controls function similarly to carbon accounting disclosure because both mechanisms support transparency, accountability, and public trust. Moreover, adaptive governance supported by digital transformation enables public institutions to maintain operational sustainability while improving governance effectiveness and financial accountability. Therefore, accountability performance should be viewed not only from financial compliance perspectives but also from sustainability, transparency, and governance resilience dimensions.

The Effect of Carbon Accounting on Environmental Cost Control

In the context of environmental cost control, carbon accounting has proven to function as an effective management tool. Bui and Nurul (2022) show that carbon accounting systems can improve environmental performance through more structured emission management. This system enables companies to identify emission sources and associated costs, thereby facilitating better cost control.

Danial et al. (2025) emphasize that the effectiveness of environmental cost control depends on a company's ability to classify environmental costs such as prevention costs, detection costs, and failure costs. With carbon accounting, companies can allocate costs more accurately, thereby improving environmental management efficiency.

Furthermore, Okechukwu et al. (2025) find that real-time monitoring-based carbon accounting can reduce energy consumption by 12–23% and carbon emissions by 10–23%. This reduction directly contributes to operational cost efficiency, indicating that carbon accounting functions not only as a reporting tool but also as an effective cost control mechanism.

These findings are strengthened by Mayndarto and Sularto (2026), who show that integrating carbon

accounting with environmental management accounting (EMA) helps identify non-value-added activities in production processes. As a result, companies can reduce resource waste and improve cost efficiency.

However, Juniarti and Sasanti (2025) find that carbon accounting does not have a significant effect on financial performance. This suggests that environmental cost control through carbon accounting does not always directly translate into financial performance improvements, particularly when it is not supported by an integrated cost management system.

Integrated Effect of Carbon Accounting on Environmental Cost Control and Corporate Sustainability Performance

Overall, the findings indicate that carbon accounting plays a dual role, namely as an environmental cost control tool and as a driver of corporate sustainability performance. Syam et al. (2024) show that carbon accounting directly contributes to sustainability reporting practices through carbon emission measurement and carbon cost management.

Furthermore, Taufik (2025) finds that carbon accounting implementation improves environmental performance through operational cost efficiency and emission reduction. This indicates an indirect causal relationship, where carbon accounting enhances cost efficiency, which in turn contributes to sustainability performance.

In addition, Murti (2022) shows that systematic classification of environmental costs can improve cost control effectiveness. In this context, carbon accounting serves as an important information base for managerial decision-making, thereby strengthening its role in supporting corporate operational efficiency.

Research by Han et al. (2024) highlights that carbon-based policies, such as carbon trading, are effective in reducing corporate emission intensity while significantly improving ESG performance. These findings demonstrate that carbon accounting plays a



strategic role in improving the accuracy of environmental cost information. Through systematic carbon recording, companies are able to identify sources of energy waste and inefficient resource utilization. This encourages more targeted cost control measures, which not only reduce financial burdens caused by environmental externalities but also support overall operational efficiency.

Furthermore, carbon accounting functions as a mechanism that integrates environmental policy and business strategy. With transparent emission and environmental cost data, companies can enhance stakeholder credibility, strengthen social legitimacy, and gain competitive advantages through energy efficiency and technological innovation. Thus, the implementation of carbon accounting not only impacts environmental cost control but also acts as a catalyst for achieving long-term corporate sustainability performance.

CONCLUSION AND RECOMMENDATION

Based on the Systematic Literature Review (SLR), it can be concluded that carbon accounting plays a strategic role in improving environmental cost control and corporate sustainability performance. Carbon accounting enables companies to identify, measure, and manage carbon emissions in a more systematic manner, thereby enhancing operational efficiency and improving the transparency of environmental information.

The review findings indicate that carbon accounting has a positive effect on environmental cost control, particularly through improved cost information accuracy, reduced energy waste, and optimized resource utilization. In addition, carbon accounting also contributes to improving corporate sustainability performance across environmental, social, and governance (ESG) dimensions through enhanced transparency and accountability to stakeholders.

However, the relationship between carbon accounting, environmental cost control, and sustainability performance is not always direct. The

effectiveness of carbon accounting is influenced by several contextual factors, such as the quality of management accounting systems, the level of environmental awareness within the organization, stakeholder pressure, and regulatory support. Therefore, although the overall findings support a positive relationship, variations in results indicate that the implementation of carbon accounting is not yet fully optimal across all companies, particularly in developing countries.

Thus, carbon accounting can be understood as a strategic instrument that functions not only as a reporting tool but also as a mechanism for environmental cost control and continuous improvement of corporate sustainability performance..

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