

Carbon Accounting in the Oil and Gas Industry: Regulatory Obligations or Corporate Legitimacy Strategy?

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Abstract : Climate change and rising carbon emissions are prompting the oil and gas industry to adopt carbon accounting practices. In Indonesia, however, such initiatives lack robust and mandatory regulatory support, raising questions about whether they are driven more by regulatory obligations or by corporate legitimacy strategies. This study examines how regulations and stakeholder pressure influence carbon accounting practices through a qualitative literature review of Scopus-, SINTA-, and Google-Scholar-indexed articles published between 2021 and 2025. The findings indicate that the desire for legitimacy plays a stronger role than regulatory compliance in motivating carbon accounting adoption. At the same time, carbon accounting has a dual effect: it imposes short-term costs and performance challenges, while also generating long-term benefits, including enhanced reputation, greater investor confidence, and improved sustainability. Thus, in the Indonesian oil and gas industry, carbon accounting functions both as a legitimacy-building strategy and as an investment in sustainable performance. This study contributes explicitly by clarifying and distinguishing the relative importance of legitimacy versus regulatory drivers in shaping carbon accounting practices within this sector..

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Introduction

Climate change and increasing carbon emissions are driving the development of carbon accounting practices as part of a company's sustainability strategy.(Dragomir et al., 2023)The energy sector, particularly oil and gas, is a major driver of carbon emissions and is now under immense pressure to improve transparency and environmental accountability.(Azzahra & Hamzah, 2025)In this case,

carbon accounting serves as a structured way to measure, manage, and report a company's carbon emissions, to support more efficient carbon management. (Ong et al., 2021) In Indonesia, the practice of carbon emission reporting is still relatively low and is not fully supported by comprehensive regulatory guidelines. (Wahyuningrum et al., 2025) This situation makes the oil and gas industry an important sector in the discussion of carbon accounting due to its high levels of emissions and environmental impacts. (Ma et al., 2023).

Empirical literature shows that carbon emission disclosure and carbon accounting practices have various influences on company performance and value. (Vaicondam et al., 2025) Several studies in the energy sector have shown that transparency regarding carbon emissions can improve a company's image and support its value. (Gamar & Widoretno, 2024) In contrast, research in the oil and gas sectors in Malaysia and Indonesia suggests that carbon emissions disclosure has a positive relationship with financial performance, although implementing other sustainability aspects can incur short-term costs. (AW Putri & Purnama, 2026). In addition, the implementation of carbon accounting is also related to efforts to improve business sustainability among energy sector companies. (AA Putri & Paramita, 2025). Several differences in the results of this study indicate that the reasons and impacts of carbon accounting practices vary, influenced by the industrial context and the characteristics of each company.

From a legitimacy theory perspective, companies with high emissions tend to increase carbon disclosure in response to social, political, and regulatory pressures. (Liu et al., 2023). The need for clearer guidelines regarding carbon emissions disclosure also emphasizes the role of regulators in influencing corporate reporting behavior. (Wahyuningrum et al., 2025) However, most studies focus on the relationship between carbon disclosure and corporate performance, without clearly distinguishing whether the practice is driven by regulatory obligations or corporate legitimacy strategies. (Bazhair et al., 2022) Therefore, this study aims to examine in more depth the practice of carbon accounting in the oil and gas industry, whether it is carried out for regulatory compliance or as a corporate legitimacy strategy in the face of pressure from stakeholders.

Literature review

Legitimacy Theory

The legitimacy theory developed by Mark C. Suchman (1995) explains that companies operate based on a social contract with society, and therefore must ensure their activities align with prevailing values and norms. If a company's activities have a significant impact on the environment, legitimacy can be threatened, leading the company to increase its disclosure of environmental information. In carbon emissions, companies with a significant impact on the environment typically increase their carbon emissions reporting in response to pressure from society and the public. (Liu et al., 2023). This report serves as a strategic communication tool to protect their image and gain social support from stakeholders.

Institutional Theory

Institutional theory, developed by Paul J. DiMaggio and Walter W. Powell (1983), explains that organizations are influenced by external factors, such as government regulations, professional standards, and industry practices. These factors encourage companies to change their policies and reporting systems to align with the expectations of the institutional environment. In the context of environmental reporting, regulatory pressure and institutional ownership have been shown to influence the extent to which companies disclose carbon emissions. (Hikal et al., 2025) This shows that carbon emission reporting practices are not entirely voluntary, but are also influenced by management structures and institutional pressures.

Carbon Accounting

Carbon accounting is the process of measuring and recording financial reports regarding carbon emissions produced by the company (Rahmawati et al., 2021) This practice allows companies to identify the source of emissions, design reduction plans, and improve efficiency in operations. (Liu et al., 2023) In the energy sector, measuring emissions is the first step in managing sustainability and complying with environmental regulations. (Kurniawan & Restie Utami, 2025). An organized measurement system also strengthens accountability and supports long-term sustainability plans.



Oil and Gas Industry

The oil and gas industry is a sector that produces large amounts of carbon emissions and has a large environmental impact, making it a major concern in sustainability.(AW Putri & Purnama, 2026)Research on the energy and oil and gas sectors shows that the way companies disclose carbon information is related to the company's value and financial results.(Houten & Wedari, 2023). The high emission characteristics and large public spotlight make the oil and gas sector important to analyze in the context of carbon accounting.(Azzahra & Hamzah, 2025). The regulatory pressures and need for legitimacy in this area are typically greater than in other sectors, making it an ideal setting to evaluate whether carbon accounting reflects more regulatory imperatives or corporate legitimacy strategies.(Liu et al., 2023).

Environmental Regulations

Environmental regulations are policies established by the government to regulate the impacts of economic activities, including carbon emissions.(Wahyuningrum et al., 2025). In developing countries, carbon reporting levels still vary and are influenced by the strength of existing regulations.(Hikal et al., 2025)Previous research has shown that in sectors with strong regulatory pressure, companies tend to improve carbon transparency to meet regulator and investor expectations.(Houten & Wedari, 2023)However, in law carbon disclosure is not yet completely voluntary, resulting in differences in practice between companies.(Wahyuningrum et al., 2025).

Previous Research

Table 1. Previous Research

Writer	Findings
(AW Putri & Purnama, 2026)(Azzahra & Hamzah, 2025)(Ong et al., 2021)(Vaicondam et al., 2025)(Gamar & Widoretno, 2024)(Houten & Wedari, 2023)(Liu et al., 2023)(Sharaf-Addin, 2024)(Sari et al., 2025)(Dewi et al., 2025)(Dragomir et al., 2023)(Rahmawati et al., 2021)	(+)
(Downar et al., 2021)(Harnida et al., 2025)(Wahyuningrum et al., 2025)(Hikal et al., 2025)(Bazhair et al., 2022)(Izzo et al., 2026)	(-)

Information :(+) Positive Effects, (-) Negative Effects

Method

This research employs a literature review method with a qualitative approach. The literature review involved analyzing various previous research articles related to carbon accounting, environmental regulation, and legitimacy theory in the context of the oil and gas sector. The data search was based on data indexed by Scopus, SINTA, and Google Scholar published between 2021 and 2025. The literature selection took into account its relevance to the research focus, which encompasses carbon accounting practices and influential regulatory and legitimacy aspects.

Results and Discussion

Carbon Accounting as a Legitimation Strategy and Response to Stakeholder Pressure

Practicecarbon accountingin the oil and gas industry is not only driven by the need to technically measure emissions, but also by encouragement from various stakeholders.(Di Vaio et al., 2026)Deter. The energy sector is a major contributor to carbon emissions, attracting public and regulatory attention. This situation has encouraged companies to increase transparency by disclosing their carbon emissions.(Satria, 2026). In the view of legitimacy theory, companies strive to align their operations with societal norms and expectations to gain social recognition.(Akhter et al., 2023). Companies with high emissions tend to increase carbon disclosure as a legitimacy communication strategy to preserve the company's reputation and value.(Liu et al., 2023).

Pressure from parties such as investors, regulatory authorities and the public is motivating



companies to be more open in disclosing carbon emissions.(Dewi et al., 2025). Furthermore, aspects such as the role of the media and corporate governance structures also reinforce this drive. Thus, carbon recording, in its implementation, serves not only as a reporting tool but also as a strategy for building legitimacy and maintaining relationships with relevant parties.(N et al., 2025)This shows that the reason for gaining legitimacy is one of the main factors in the implementation of carbon recording in the oil and gas industry.(Sari et al., 2025).

The Role of Regulation in Encouraging Carbon Accounting Practices

Regulation is also a crucial element in encouraging the implementation of carbon accounting. However, in Indonesia, carbon emissions reporting is still optional and has not been specifically regulated as a mandatory requirement.(Tarigan et al., 2024)This situation results in low carbon reporting rates, despite visible improvements over time. This situation demonstrates that in the absence of strict regulations, companies have considerable freedom to determine how transparent they will be. Consequently, the implementation of carbon accounting tends to vary and is heavily influenced by both internal company characteristics and external pressures.(Izzo et al., 2026).

In countries with stricter regulations, carbon emissions disclosure has increased significantly after the reporting requirement was implemented.(Gezgin et al., 2024)This indicates that regulation plays an important role in improving the consistency, quality, and comparability of carbon information.(Papafloratos & Pantazi, 2025)Thus, it can be concluded that in Indonesia, regulations have not yet served as the primary driver for carbon accounting practices. Regulation remains supportive, while the primary motivation remains the company's need to gain legitimacy from stakeholders.(Ayodele et al., 2026).

The Impact of Carbon Accounting on Corporate Performance and Sustainability

Carbon accounting has a complex impact on the performance and survival of the company, because it can increase transparency, stakeholder trust, as well as assist in decision making and improve operational efficiency.(N et al., 2025)Carbon accounting makes a positive contribution to sustainability by increasing the efficiency of energy use and managing emissions.(Sharaf-Addin, 2024)Therefore, carbon accounting is not just a reporting tool, but also an important part of a company's sustainability strategy.

However, some studies indicate that carbon recording can have a negative impact on financial performance in the short term due to the high costs of implementation and compliance.(Downar et al., 2021). In addition, disclosures related to carbon emissions do not always directly impact company value, especially if they are not accompanied by real sustainability practices.(Harnida et al., 2025). In the long term, the benefits of carbon recording are more visible through improved reputation, investor confidence, and business sustainability.(Krasodomska et al., 2025)Therefore, carbon recording can be considered a strategic investment that supports the transition to a low-carbon economy.

Conclusion

This study concludes that carbon accounting practices in the Indonesian oil and gas industry are driven more by corporate legitimacy strategies than by weak and optional regulatory obligations. Key findings suggest that pressure from stakeholders, such as investors and the public, drives carbon emissions disclosure to maintain reputation and trust, while simultaneously generating a dual impact of short-term costs and long-term benefits such as operational efficiency and business sustainability.

However, the study's limitations lie in its qualitative literature approach, which relies on secondary sources from 2021-2026, making it susceptible to publication bias and a lack of primary empirical data from local companies. Future research suggests adopting longitudinal case studies or quantitative analysis on specific companies to compare regulatory dynamics post-2026. Practically, these results imply the need for regulators to strengthen mandatory carbon reporting guidelines, while companies can leverage carbon accounting as a strategic investment to enhance competitiveness and transition to a low-emission economy.



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