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Corporate Determinants of Carbon Accounting Disclosure: Evidence from Indonesia's Energy Sector

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ABSTRACT

Study's aims: This study aims to examine the effect of company size, environmental performance, institutional ownership, and audit committees on carbon accounting disclosure in energy companies listed on the Indonesia Stock Exchange (IDX) for the period 2019-2022. **Design/Methodology/Approach:** This study uses a quantitative method with purposive sampling. The sample was obtained from the annual reports and sustainability reports of energy companies listed on the Indonesia Stock Exchange (IDX). The population consisted of 84 companies, and the sample was selected based on predetermined criteria, resulting in a sample of 15 companies. **Findings:** The results show that company size has a significant effect on carbon accounting disclosure, while environmental performance, institutional ownership, and audit committees have no effect on carbon accounting disclosure. **Theoretical contribution/Originality:** The findings of this study indicate that larger companies tend to be more transparent in their carbon accounting disclosure than smaller companies. **Practitioner/Policy implication:** This study has implications for companies, regulators, and stakeholders to improve transparency regarding environmental impacts, as well as opening opportunities for further research on other factors that influence carbon accounting disclosure. **Limitation/Implication:** This study only focuses on energy sector companies in Indonesia. Further research should cover a broader sector and refine the methodology.

Keywords: Company size; Environmental performance; Institutional ownership; Audit committee; Carbon accounting disclosure



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Introduction

Climate change has become a very urgent global issue, especially due to increased greenhouse gas (GHG) emissions, which are largely produced by human activities. Indonesia ranks 7th out of 10 countries that produce the most greenhouse gas emissions in the world in 2022. According to Climate Watch data on CNBC news, the largest contributor to greenhouse gas emissions is the energy sector. The sector is able to produce 71.5% of total emissions equivalent to 36.44 gigatons of carbon dioxide equivalent (Gt CO₂e). Meanwhile, based on the Ember Climate report entitled Global Electricity Review 2023, "Indonesia ranks ninth in the largest CO₂ emitter from the electricity sector in the world, reaching 192.7 million tons of CO₂ in 2022" (Putri, 2023).

The energy sector is one of the largest contributors to carbon emissions in the world, and Indonesia is among the countries that make a significant contribution to carbon emissions. The Indonesian government has committed to reducing carbon emissions through various policies, such as those contained in the Nationally Determined Contribution (NDC) (Abi Suroso et al., 2022). However, the company's transparency in disclosing carbon emissions through sustainability reports or carbon accounting disclosures is still very little or minimal, especially in the energy sector listed on the Indonesia Stock Exchange (IDX) (Dewi et al., 2026).

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This study focuses on the factors that affect carbon accounting disclosure in energy sector companies listed on the IDX in the 2019-2022 period. Factors include company size, environmental performance, institutional ownership, and audit committee (Adam et al., 2025). Disclosure of carbon accounting is becoming increasingly important as attention to climate change and the need to mitigate its impact through more responsible business policies and practices. In this study, it is explained that the size of a company often affects the extent to which the company discloses information related to carbon emissions. Larger companies tend to have more resources to implement environmental accounting practices and report their carbon emissions more transparently.

In addition, environmental performance is also an important indicator in carbon accounting disclosure. Companies that have a strong commitment to the environment will be more proactive in reporting the environmental impact of their operations. Institutional ownership also plays a role in encouraging companies to be more transparent in disclosing information related to the environment. Institutional investors, such as insurance companies, often demand detailed reports on a company's environmental performance to ensure that their investments are made in a sustainable company. The audit committee has an important role in ensuring that financial statements, including carbon accounting disclosures, are prepared accurately and in accordance with applicable standards. This research provides implications for companies, regulators, and stakeholders to increase transparency and accountability related to environmental impacts, as well as open up opportunities for further research on other factors that influence carbon accounting disclosure.

Literature Review and Hypotheses Development

Legitimacy Theory

Dowling and Pfeffer in 1975 first presented the concept of Legitimacy Theory, which states that there is a social agreement between an entity and society in the company's business environment. This concept emphasizes the importance of companies to operate in accordance with social norms and expectations in order to gain and maintain legitimacy from society (Dowling & Pfeffer, 1975). According to Ulum et al. (2021) legitimacy theory is closely related to stakeholder theory. Legitimacy theory states that organizations are continually looking for ways to ensure their operations are within the boundaries and norms that prevail in society. In the framework of organizational systems, this theory indicates that disclosure plays an important role in bridging the relationship between corporate organizations, companies and groups within a community.

Legitimacy theory is able to motivate companies to implement commitments to the environment with the aim of obtaining a good image in the eyes of the public. By disclosing social and environmental information, companies feel that their existence and activities are in line with the norms and regulations that apply in society (Amaliyah & Solikhah, 2019). So it can be concluded that legitimacy theory is a framework used to understand the relationship between organizations, including companies and the community or related parties.

Stakeholder Theory

According to research conducted by Anjilni and Asih (2023), Stakeholder Theory explains that the company's operational goals are not limited to internal interests alone, but involve providing benefits to various parties involved, such as companies or other institutions, as well as external parties, including the government, the private sector, and domestic and foreign entities. In addition, according to Hilmi et al. (2020), Stakeholder Theory directs that a company is not only an entity that focuses on its own profits, but also has the responsibility to provide benefits to the stakeholders involved.

Sustainability Report

According to the Global Reporting Initiative (GRI), sustainability reports the practice of organizational transparency in reporting the economic, environmental, and social impacts caused by activities in the production process, which contribute to a positive or negative impact on sustainable development goals. Business sustainability can be pursued by companies by paying attention to three aspects, namely profit, people (community and social) and planet (environment). One of the steps that companies can take to run a sustainability business is to apply the concept of green accounting (Kusumawati & Murwaningsari, 2023). According to Lako and Sumaryati (2024), Sustainability reporting (SR) is a model of reporting company information to stakeholders that integrates financial reporting, social reporting, environmental reporting, and corporate governance reporting in an integrated reporting package.

Carbon Accounting Disclosure

Carbon emission disclosure (CED) is an entity that transparently and in detail discloses information about how much carbon emissions are generated as part of their operational or business activities. According to Loru (2023), carbon accounting disclosure was developed as a form of accounting treatment for events that have an impact on environmental quality, by presenting how companies manage emissions from operational activities in annual reports and sustainability reports. Financial reporting that includes the disclosure of carbon emissions is an important aspect for the company, as this action can be considered a positive corporate initiative in maintaining the balance of the Earth's ecosystem. Companies are currently facing demands to be more transparent in presenting information related to their operations and responsibilities. The level of transparency and accountability of the company is reflected in the disclosure of information through the annual report, which is divided into two categories, namely mandatory disclosure and voluntary disclosure (Pranasyahputra et al., 2020).

Regulations have regulated the disclosure of information on social and environmental activities Included in PSAK No.1 of IAI (2019 revision) in paragraph 14, which states that some entities also present, from financial statements, environmental reports and value-added statements, especially for industries where environmental factors are significant and when employees are considered as an important group of financial statement users (Amaliyah & Solikhah, 2019). Carbon accounting disclosures are examples of environmental disclosures that are included in supplementary reports in accordance with the Financial Accounting Standards Statement (PSAK). However, because they are voluntary, not every company in the environmentally-related sector reports their carbon accounting disclosures.

The theory of legitimacy describes that large companies get more pressure from the public related to the environmental problems in which the company operates, large companies generally also follow the large number of resources. These large resources are used by large corporations to finance the provision of information and tend to improve the response to the environment. As a response to public pressure, the company made disclosures related to its performance. Companies that have greater resources will be more capable and faster in providing information to external parties. The results of previous research conducted by Widiyani and Meidawati (2023), Nastiti and Hardiningsih (2022), and Sekarini and Setiadi (2022) found evidence that company size affects carbon accounting disclosure, This is because the larger the size of a company, the more likely the company to disclose reports on carbon accounting. Meanwhile, the research conducted by Ramadhan et al. (2021) and Witri Astiti and Wirama (2020) show that the size of the company does not affect the disclosure of carbon accounting. Based on the theory and results of previous research, the author draws the conclusion that Company Size can be a factor causing companies in carbon accounting disclosures, because large companies are more able and more likely to make such disclosures in response to external pressures and to meet the expectations of legitimacy from society.

H₁: There is an effect of Company Size on Carbon Accounting Disclosures.

Environmental performance is a company's effort to create a better environment (Hilmi et al., 2020). In accordance with the theory of legitimacy, that the social relationship between the company and society

requires the company to meet the applicable norms. One of the strategies that can be adopted is to protect the environment, which reflects the company's dedication to sustainability and seeks to gain support from stakeholders and community validation through government programs such as PROPER. This action is expected to increase the company's attention to the community's social norms and values, so that it can more effectively participate in various government programs (Melja et al., 2022). This research is in line with the research Hilmi et al. (2020) and Melja et al. (2022) which in the study, it was found that environmental performance has a positive and significant impact on the level of carbon accounting disclosure, this is because the better the environmental performance of a company, the more extensive the company's carbon accounting disclosure will be.

H₂: There is an effect of Environmental Performance on Carbon Accounting Disclosure.

Stakeholder theory explains the relationship between business entities and stakeholders, where through this relationship, management strives to be transparent about all company activities. Institutional ownership is the ownership of outstanding shares of companies (Amaliyah & Solikhah, 2019). Institutional ownership will increase more effective supervision, which will certainly ensure the welfare of shareholders (Anjilni & Asih, 2023b). Research conducted by Nilasakti et al. (2024) explains that institutional ownership has a negative or no effect on carbon accounting disclosure. On the other hand, research that has been conducted by Anjilni and Asih (2023) and Amaliyah and Solikhah (2019) found that institutional ownership has a positive effect on carbon accounting disclosure, because the greater the number of constitutional ownership, the more transparent companies will be more transparent in carbon accounting disclosure. This makes management more responsible and open in providing information about the environment.

H₃: There is an influence of Institutional Ownership on Carbon Accounting Disclosures.

The audit committee has an important role in implementing the principles of good corporate governance. According to Roberts (1992) the definition of a stakeholder is a group that can give or be affected by the company's goals (Nilasakti et al., 2024). According to the National Committee for Governance Policy (2006) through the Good Corporate Governance guidelines that it published, it shows that the audit committee is also a stakeholder because of its role in assisting the duties of the company's commissioners regarding internal supervision (Nilasakti et al., 2024). Previous research conducted by Anjilni and Asih (2023); Pramuditya and Budiasih (2020); Amaliyah and Sholikhah (2019) stated that the audit committee has a positive influence on the disclosure of carbon accounting, The more often the Audit Committee holds meetings, the Audit Committee will tend to have opinions more often to produce decisions that must be taken to maximize the interests of the company by disclosing carbon emissions. This shows the importance of the active role of the Audit Committee in supervising and encouraging corporate transparency regarding environmental impacts.

H₄: There is an influence of the Audit Committee on Carbon Accounting Disclosures.

Methods

The population of this study is all Energy sector companies listed on the Indonesia Stock Exchange (IDX) as many as 84 companies. The criteria for determining this research sample are Energy Sector Companies listed on the Indonesia Stock Exchange (IDX), which publish financial statements (annual report) and Sustainability Reports (sustainability report) in full according to the year of observation, and companies that implicitly and explicitly disclose carbon emissions (at least one policy related to carbon emissions). Based on the criteria, a research sample of 15 companies was obtained with the number of data used as observation for 4 years, namely 2019-2022, which was 60 data.

Table 1 is a summary of the carbon accounting disclosure scores, Company Size, Environmental Performance, Institutional Ownership, and Audit Committees. The disclosure of carbon accounting using the measurement of carbon emission disclosure using the index adopted from the study (Bae Choi et al., 2013).

The developed index consists of five major categories related to climate change and carbon emissions, namely climate change, energy consumption, greenhouse gas emissions, carbon emission accountability, and greenhouse gas reduction and costs. Company size is a ratio used to measure the size and size of a company, usually expressed through total assets or total net sales (Nastiti & Hardiningsih, 2022). Environmental performance can be measured using the PROPER proxy, the higher the PROPER value obtained by a company, the higher the level of environmental disclosure. Institutional ownership is a form of partnership or cooperative relationship related to the ownership of shares by institutional institutions (Angelina & Handoko, 2023).

Table 1 Variable Operationalization

Variabel	Indicator/Item
Carbon Accounting Disclosure	Carbon Emission Disclosure (CED)
Company Size	$\ln(\text{TotalAsset})$
Environmental Performance	The company's PROPER color rating 0= not a participant 1= very bad/ black 2= bad/ red 3= good/ blue 4= very good/ green 5= very good/ gold
Institutional Ownership	$\frac{\Sigma \text{Institutional Share Ownership}}{\Sigma \text{Outstanding Shares}}$
Audit Committee	Number of Meetings in 1 year

Results

Table 2 shows that the Carbon Accounting Disclosure Variable has a minimum value of 0.11 and a maximum value of 0.94 with an average value of 0.5601 greater than the standard deviation of 0.25023. The company size variable has a minimum value of 13.96 and a maximum value of 22.74 with an average value of 19.8337 greater than the standard deviation of 2.31750. The Environmental Performance variable has a minimum value of 0.00 and a maximum value of 5.00 with an average value of 2.3833 greater than the standard deviation of 2.08377. The Institutional Ownership variable has a minimum value of 0.20 and a maximum value of 0.90 with an average value of 0.5881 greater than the standard deviation of 0.18073. The Audit Committee variable has a minimum value of 0.00 and a maximum value of 60.00 with an average value of 13.5500 greater than the standard deviation of 13.90089.

Table 2 Descriptive Statistics

	Mean	Std. Dev	Min	Max
Carbon Accounting Disclosure	0,5601	0,25023	0,11	0,94
Company Size	19,8337	2,31750	13,96	22,74
Environmental Performance	2,3833	2,08377	0,00	5,00
Institutional Ownership	0,5881	0,18073	0,20	0,90
Audit Committee	13,5500	13,90089	0,00	60,00
N= 60				

Regression Analysis

The results of the regression analysis in Table 3 indicate the significance value of the company's size to the carbon accounting disclosure of $0.022 < 0.05$ and the calculation value of $2.363 > \text{table } 1.673$, so that it can be concluded that H_1 is accepted. These results state that the size of the company has a significant effect on carbon accounting disclosure. the significance value of Environmental Performance on carbon accounting disclosure is $0.117 > 0.05$ and the calculation value is $1.592 < \text{table } 1.673$ so that it can be concluded that H_2 is

rejected, so that the results obtained state that environmental performance has no effect on carbon accounting disclosure. The significance value of Institutional Ownership on carbon accounting disclosure is $0.491 > 0.05$ and the calculation value is $-0.694 < 1.673$ so that it can be concluded that H_3 is rejected, so that the results obtained state that institutional ownership has no effect and is negative on carbon accounting disclosure. The significance value of the Audit Committee on the disclosure of carbon accounting is $0.890 > 0.05$ and the value of $T_{\text{cal}} -0.139 < 1.673$ so that it can be concluded that H_4 is rejected, so that the results obtained state that the audit committee has no effect and is negative on the disclosure of carbon accounting.

Table 3 Regression Analysis

Independent Variables	Coefficin	t	p-value
Company Size	0,034	2,363	0,022
Environmental Performance	0,025	1,592	0.117
Institutional Ownership	-0,119	-0,694	0,491
Audit Committee	0.000	-0.139	0,890

Discussions

The size of the company influences the company to conduct carbon accounting disclosures. This is in line with the theory of legitimacy that large corporations tend to disclose more information related to the environment in order to maintain trust and support from the public. In addition, large companies are usually more closely supervised by outsiders compared to small companies because large companies have higher accountability and visibility, so companies are encouraged to be more transparent in reporting on the corporate environment. The results of this study are consistent with previous research researched by Widiyani and Meidawati (2023), Sekarini and Setiadi (2022), Nastiti and Hardiningsih (2022) which explained that company size affects carbon accounting disclosure. So it can be interpreted that large companies are more transparent in their environmental reporting due to pressure from stakeholders and regulators, this suggests that company size is an important factor in determining the level of disclosure of carbon accounting.

Environmental performance has no effect on carbon accounting disclosures. The results of this study are not in accordance with the legitimacy theory that states that companies with good environmental performance should be more widely disclosed in carbon accounting carried out by those companies. This can happen because there may still be many sample companies that are not registered PROPER. This condition is because registering for PROPER requires considerable costs, so companies tend to pay attention to financial performance rather than environmental performance. This research is in accordance with previous research researched by Sekarini and Setiadi (2022), Putri et al. (2022), and Amaliyah and Solikhah (2019) which stated that environmental performance does not affect carbon accounting disclosure. Because even though the company has good performance, it does not encourage companies to disclose carbon accounting more often. This is because in Indonesia it is still not a priority and often ignores environmental sustainability. Investors also tend to pay less attention to environmental disclosures made by companies, investors are more focused and interested in the company's financial condition (Putri et al., 2022).

Institutional ownership has no effect and has a negative impact on carbon accounting disclosures. The results of this study are not in line with the stakeholder theory that the more constitutional ownership, the more transparent the company will be in the disclosure of carbon accounting. However, this study shows that high institutional ownership does not necessarily mean that companies will be more transparent in carbon accounting disclosures. This is because institutional investors still consider that carbon accounting disclosure is less able to increase the company's value compared to other factors such as profitability (Nilasakti et al., 2024), or perhaps institutional investors are more focused on financial performance than environmental aspects, so they pay less attention or pressure to companies to disclose carbon accounting information broadly. This study is in accordance with previous research researched by Nilasakti et al. (2024), Putri et al. (2022), Suherman and Kurniawati (2023), and Nabila and Frido (2024) showing that institutional ownership

does not affect carbon accounting disclosures but the difference from this study is that the coefficient is negative.

The Audit Committee does not affect and negatively affect the disclosure of carbon accounting. This explains that although audit committees hold frequent meetings, they are not always more active in disclosing information related to carbon accounting. So that the existence of an audit committee in a company does not significantly affect the level of transparency and accountability of companies regarding carbon accounting disclosures in their financial statements and sustainability reports. According to Tobing et al., (2019) this is due to the ineffectiveness of meetings held by audit committees, where audit committee members tend to prioritize their personal or group interests over corporate interests. In addition, audit committees focus more on the supervision of financial statements than on the disclosure of social and environmental information. This research is in line with previous research researched by Tobing et al., (2019) whose research results showed that audit committees have no influence on carbon accounting disclosures.

Conclusion

This study aims to determine the influence of Company Size, Environmental Performance, Institutional Ownership, and Audit Committee on Carbon Accounting Disclosure in Energy sector companies listed on the Indonesia Stock Exchange for the period 2019-2022. First, the size of the company has a positive effect on carbon accounting disclosure. This result explains that the larger the size of the company, the larger the company will be able to carry out carbon accounting disclosures. Second, Environmental performance does not affect carbon accounting disclosures. These findings suggest that companies with good environmental performance do not necessarily disclose carbon accounting more often. This is due to a lack of pressure from stakeholders. Third, institutional ownership does not affect carbon accounting disclosures. This research shows that institutional investors still consider that carbon accounting disclosures do not contribute much to increasing company value compared to other factors such as profitability. Thus, high levels of institutional ownership do not necessarily have an impact on increased carbon accounting disclosure. Fourth, the audit committee does not affect the disclosure of carbon accounting. These findings suggest that although audit committees hold frequent meetings, they are not necessarily associated with increased disclosure of information related to carbon accounting. So that the existence of an audit committee in a company does not significantly affect the level of transparency and accountability of companies related to carbon accounting in their financial statements and sustainability reports.

From a policy perspective, regulators should strengthen the carbon accounting disclosure framework to ensure transparency and accountability, which applies to both large and small companies without exception. In addition, this research is limited to energy sector companies in Indonesia and there are still many companies that have not disclosed carbon accounting. Further research should expand its scope to include companies in other sectors listed on the IDX. Overall, this study provides a foundation for a more in-depth exploration of the factors influencing carbon accounting disclosures by companies. And with this research, it is hoped that it can make policymakers to tighten regulations on carbon accounting disclosure, especially for companies listed on the IDX.

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Conflict of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study, the collection, analysis, or interpretation of data, the writing of the manuscript, or the decision to publish the results.