THE EFFECT OF CAPITAL EXPENDITURE, ENVIRONMENTAL PERFOMANCE, ENVIRONMENTAL MANAGEMENT SYSTEM, INSTITUTIONAL OWNERSHIP AND INDEPENDENT BOARD OF COMMISSIONERS ON CARBON EMISSION DISCLOSURE

Lilla Desvita[1], Yusro Rahma[2]

Affiliation :

[1,2]Accounting Study Program, Faculty of Economics and Business, Syarif Hidayatullah State Islamic University Jakarta

Article Process :

Received 12-30-2024
Revised 02-27-2025
Accepted 02-27-2025

***Correspondence :**
Lilla.desvita05@gmail.com

DOI : 10.30813/jab.v18i1.7415

Abstract

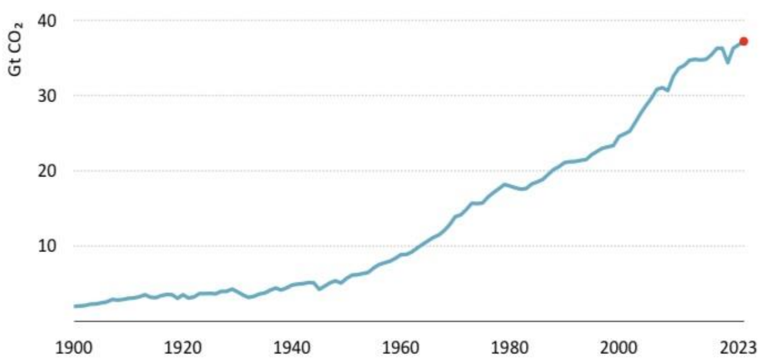
Background: Climate change is a serious global threat. Indonesia has an important role in mitigation efforts. To address this issue, a joint effort is needed from the government, companies, and communities to reduce greenhouse gas emissions, encourage sustainable business practices, and raise awareness of the importance of protecting the environment.
Objective: This study aims to test the influence of capital expenditure, environmental performance, environmental management system, institutional ownership, and independent board of commissioners on carbon emission disclosure.
Research Methods: This study uses secondary data from annual reports and sustainability reports of non-financial companies listed on the Indonesia Stock Exchange (IDX) in 2019-2023 with a total of 105 data selected through a purposive sampling method. The analysis method used to test the hypothesis is multiple linear regression analysis using SPSS version 29.
Research Result: The results of this study indicate that environmental performance and environmental management system have a significant positive effect on carbon emission disclosure. While capital expenditure, institutional ownership, and independent board of commissioners do not affect carbon emission disclosure.
Authenticity/Novelty of Research: This study can contribute to additional literature related to research on carbon emission disclosure in non-financial companies in Indonesia which is still rarely studied. This study also re-evaluates the capital expenditure variable which still has different findings in previous studies and is considered relevant to the company's real actions in reducing environmental impacts and increasing carbon emission transparency.
Keywords: Capital Expenditure, Environmental Performance, Environmental Management System, Institutional ownership, Independent Board of Commissioners and Carbon Emission Disclosure.

Introduction

One of the most widely discussed environmental issues in various countries is global ecological disasters, such as uncontrolled climate change and a significant increase in the average temperature of the earth's surface, often known as global warming (Suherman & Kurniawati, 2023). According to the Intergovernmental Panel on Climate Change (IPCC), the earth's average temperature has increased by one degree Celsius in the last three centuries. This significant increase in temperature is the result of increased concentrations of greenhouse gases in the atmosphere. The burning of fossil fuels and deforestation are two major human activities that contribute to carbon dioxide levels in the atmosphere. CO2 gas trapped in the atmosphere will trap the sun's heat, causing the earth's surface temperature to increase drastically. This phenomenon is known as global warming and has caused significant climate change on a global scale (Florencia & Handoko, 2021).

Based on the latest data from the International Energy Agency (IEA) in 2023, the concentration of carbon dioxide (CO2) gas in the atmosphere again showed a significant increase. Global CO2 emissions were recorded to have increased by 1.1% or equivalent to 410 million metric tons (Mt) compared to the previous year. This figure broke the new highest record of more than 37.4 billion tons (Gt). Carbon emissions from coal contributed more than 65% of the increase in 2023. The following is a picture of the increase in CO2 concentration in the atmosphere.

Gambar 1. Peningkatan Karbondioksida di Atmosfer

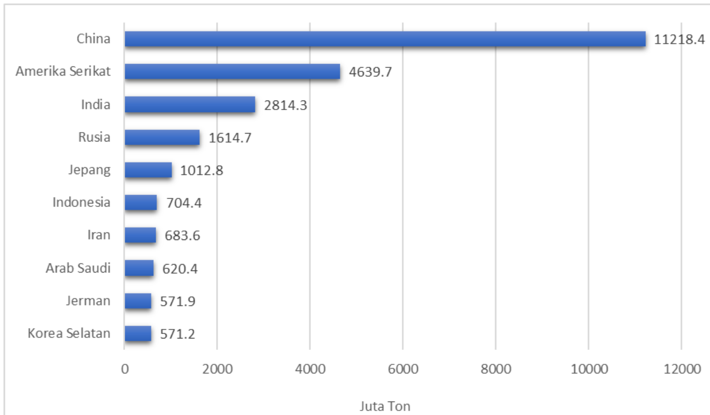


Sumber : *International Energy Agency* (IEA), 2023

According to the data shown in the graph, the concentration of carbon dioxide in the atmosphere continues to increase from year to year due to human activities. The year 2023 was the highest record for carbon dioxide emissions since records began in 1900. The COVID-19 pandemic that hit the world in 2020 caused a temporary decrease in carbon dioxide emissions due to a drastic reduction in human activities. However, when the world economy began to recover and industrial activity increased, emission levels spiked again after the pandemic passed.

Indonesia, as one of the countries with rapid economic growth, is also not free from these environmental issues. As reported on the Sindonews website (2023), it is estimated that IDR 4,002 trillion is needed to achieve clean air quality throughout Indonesia. Furthermore, data from the Statistical Review of World Energy (2024) shows that Indonesia is among the ten countries with the highest carbon emissions in the world in 2023. This indicates that Indonesia's contribution to global climate change is quite large. The following is a ranking of the world's largest carbon dioxide emitting countries throughout 2023:

Gambar 2. Negara Penghasil Emisi Karbon Dioksida Tahun 2023



Sumber : *Statistical Review of World Energy*, 2024

Six of the top 10 countries in terms of global carbon emissions come from the Asian continent. Ironically, Indonesia ranks sixth in global carbon emissions in 2023, despite its reputation as the “lungs of the world” due to its vast tropical rainforests. The report shows that in 2023, Indonesia produced 704.4 million tons of carbon dioxide gas. This fact underlines Indonesia's significant contribution to global climate change, despite its vast natural wealth.

Reported from the databoks.co.id site, the increase in greenhouse gas emissions in Indonesia is dominated by the use of fossil fuels, especially coal. Indonesia's coal production in early December 2023 has exceeded the target set, reaching 703.14 million tons. In addition, high land conversion and deforestation, as well as cases of environmental pollution that are still commonplace in Indonesia, also contribute significantly to increasing emissions and worsening environmental quality. This shows that companies that depend on natural resources often ignore the negative impacts of their operational activities on the environment. Cases of pollution and environmental damage caused by companies indicate that financial gain is still the main priority.

Therefore, to address climate change due to carbon emissions, various agreements and regulations have been made, one of which is the Kyoto Protocol (1997) which requires industrialized countries to reduce greenhouse gas emissions. Indonesia ratified this protocol through Law No. 17 of 2004 and issued regulations such as Presidential Regulation No. 61 of 2011 and Presidential Regulation No. 71 of 2011 for mitigation and inventory of greenhouse gas emissions. The government also invites business actors to disclose their carbon emissions and contribute to sustainable business practices (Maulidiavitasari & Yanthi, 2021). Disclosure of carbon emissions is important for companies to achieve sustainable business. However, in Indonesia, carbon emission reporting is still low due to high calculation and reporting costs, and is still voluntary. Many companies tend to choose not to disclose carbon emissions because they are worried about the negative impact on their financial performance (Amaliyah & Solikhah, 2019). This decision is influenced by various factors such as capital expenditure, environmental performance, environmental management system, institutional ownership, and independent board of commissioners, which will be further examined in this study.

The first factor that is considered to have an effect on carbon emission disclosure is capital expenditure. Companies that are environmentally responsible tend to allocate funds for capital expenditure on environmentally friendly and efficient technologies to reduce carbon emissions. According to research conducted by Karim, et al (2021) and Suryani & Wijayati (2019), capital expenditure has a positive relationship with carbon emission disclosure. Companies with large capital expenditures tend to disclose more information related to carbon emissions because they have the ability to purchase sophisticated equipment that can optimize production, increase efficiency, and reduce carbon dioxide emissions. However, research conducted by Widiyati (2023) and Gusti & Darmawati (2023) showed conflicting results where capital expenditure had no effect on carbon emission disclosure. This is because the purchase of fixed assets, increasing the capacity of fixed assets, and expanding the use of fixed assets are all directed at increasing company profits.

The second factor that is considered to influence carbon emission disclosure is environmental performance. Environmental performance is an assessment of the extent to which a company is able to manage the environmental impacts resulting from its business activities. The better the environmental performance of a company, the more likely the company will openly communicate various relevant environmental issues, such as carbon emission disclosure. Research conducted by Kiswanto (2023), Priliana & Ermaya (2023) and Loru (2023) stated that environmental performance has a significant positive effect on carbon emission disclosure. However, research conducted by Pratiwi, et al (2021) and Putri, et al (2022) showed conflicting results where environmental performance did not have a significant effect on carbon emission disclosure. This is because many companies have not been actively involved in environmental conservation efforts, especially in terms of reducing carbon emissions.

The third factor that is considered to influence carbon emission disclosure is the environmental management system. Companies that have implemented the ISO 14001 environmental management system have more accurate and relevant data to support carbon emission disclosure (Suherman & Kurniawati, 2023). Research conducted by Ferdiani & Mulyani (2023), Suherman & Kurniawati (2023) Rohmah & Nazir (2022), Jannah & Narsa (2021), and Deantari, et al (2019) showed that the environmental management system has a significant positive effect on carbon emission disclosure. However, research conducted by Sari & Sulfitri (2023), Iratiwi & Sulfitri (2023) and Destiyuanita, et al (2022) showed conflicting results where the environmental management system had no significant effect on carbon emission disclosure. Although ISO 14001 provides an environmental management framework, its implementation does not guarantee increased carbon emission disclosure.

The fourth factor that is considered to influence carbon emission disclosure is institutional ownership. Institutional investors act as supervisors and can influence company policies regarding environmental information disclosure (Amaliyah & Solikhah, 2019). Thus, institutional ownership can encourage companies to conduct carbon emission disclosure and other sustainability information more completely and accurately (Putri et al, 2022). According to research conducted by Angelina & Handoko (2023) and Amaliyah & Solikhah (2019), institutional ownership has a significant positive effect on carbon emission disclosure. Greater institutional ownership increases the pressure on companies to disclose carbon emissions. However, research conducted by Suherman & Kurniawati (2023) and Putri, et al (2022) showed conflicting results where institutional ownership did not have a significant effect on carbon emission disclosure. This is because disclosure policies are more influenced by internal management decisions.

The fifth factor that is considered to have an influence on carbon emission disclosure is the independent board of commissioners. Independent commissioners who come from outside the company and are not affiliated with management or majority shareholders are expected to provide objective and independent supervision in order to encourage the company to be more transparent, including in disclosing carbon emissions. Research conducted by Zada & Sari (2024) and Trufvisa & Ardiyanto (2019) states that independent boards of commissioners have a significant positive influence on carbon emission disclosure. Independent commissioners can be drivers of positive change in the company, especially in terms of reducing carbon emissions. However, research conducted by Verginia, et al (2022) and Pramuditya & Budiasih (2020) showed conflicting results where independent boards of commissioners did not have a significant influence on carbon emission disclosure. The low proportion of independent commissioners is thought to be the main obstacle in encouraging carbon emission disclosure.

This study is a development of previous research, namely research conducted by Suherman & Kurniawati (2023) which examined carbon emission disclosure in energy sector companies. The novelty in this study is the object used, namely non-financial companies that have a wider and more diverse scope. In it, there are various types of companies that are not only limited to companies that are intensive in using carbon, but also include companies that are not intensive in using carbon. Thus, this study is expected to provide a more comprehensive and representative understanding of carbon emission disclosure practices in various different industrial sectors. In addition, this study adds a capital expenditure variable that reflects the investment made by the company in fixed assets, including technology and equipment. Companies that care about the environment tend to allocate funds for capital expenditure on cleaner and more efficient technologies, which can ultimately reduce carbon emissions. This can be a positive signal to investors and other stakeholders regarding the company's commitment to sustainability. This signal can improve the company's reputation and attract socially responsible investment. Thus, this variable is considered more relevant and directly related to the company's real actions in reducing its environmental impact and increasing transparency regarding carbon emissions.

Literature Review

Legitimacy Theory

According to Dowling and Pfeffer (1975), as the initiators of legitimacy theory, a company is highly dependent on how far the company's activities are in line with the values and norms adopted by society. Companies need to create harmony between the values contained in their business activities and the norms that apply in the society in which the company operates. Companies that want to gain legitimacy must strive to adapt to their social environment. In other words, companies must become an integral part of the social system of society, one of which is by voluntarily disclosing environmental information, which is one strategy that companies can use to gain recognition and acceptance from society (Angelina & Handoko, 2023). Voluntary disclosure of environmental information is one strategy that companies can use to gain recognition and acceptance from society. One form of voluntary disclosure is carbon emission disclosure. By voluntarily disclosing their carbon footprint, companies not only demonstrate their commitment to the environment, but can also gain a number of benefits such as reduced greenhouse gas emissions, increased stock value in the market, and a better reputation in the eyes of the public (Priliana & Ermaya, 2023).

Stakeholder Theory

Stakeholder theory was put forward by Freeman (1984) who stated that companies do not operate solely to meet the needs of shareholders, but must also pay attention to the interests of various parties related to the company. The main focus of this theory is on managing relationships with its stakeholders who have a significant influence on the sustainability of the company's business, especially those who have control over resources that are vital to the company's operations. As a form of commitment to its stakeholders, companies need to consistently publish transparent reports on their environmental performance. This report not only provides information to stakeholders about the environmental impact of the company's activities, but also shows that the company cares about environmental issues and is willing to be responsible for its actions. By disclosing complete and accurate information related to carbon emissions, companies can build trust and strengthen relationships with stakeholders (Angelina & Handoko, 2023). By disclosing carbon emission data, companies provide transparency to the public regarding the environmental impact of their business activities. This allows stakeholders to assess the extent to which the company carries out its social responsibilities and contributes to environmental conservation.

Hypothesis

Capital Expenditure or commonly called capital expenditure is an investment made by a company to acquire fixed assets or non-current tangible assets that have an economic life of more than one accounting period (Anggraini & Tirtawati, 2021). Capital expenditure is a very crucial process in determining the strategic direction of a company. Investment decisions taken today will have a significant impact on the company's performance in the future. Companies that have a long-term vision and are committed to sustainability will tend to allocate investment funds to more environmentally friendly technologies. Investment in more environmentally friendly equipment not only reduces operating costs but can also reduce carbon emissions produced, thereby contributing to efforts to address climate change. Thus, making wise investment decisions can make a positive contribution to the environment (Suryani & Wijayati, 2023).

Based on stakeholder theory, it states that companies operate not only to provide benefits to shareholders, but also to provide benefits to their stakeholders. In the context of carbon emission disclosure, companies are expected to demonstrate their commitment to sustainability by investing capital expenditure funds for environmentally friendly technology that can minimize carbon emissions produced, so that companies will tend to make carbon emission disclosures. This aims to meet stakeholder expectations that the company cares about environmental issues, so that it can improve the reputation and support of stakeholders for the company. The results of research conducted by Karim, et al (2021), Suryani (2019), Dwinanda & Kawedar (2019), and Selviana & Ratmono (2019) state that capital expenditure has a positive relationship with carbon emission disclosure. This condition can occur because companies that have high capital expenditure can invest in more sophisticated technology, so they tend to have a higher level of operational efficiency and can manage carbon dioxide emissions more effectively. Therefore, the first hypothesis in this study is as follows:

H1 : Capital expenditure has a positive effect on carbon emission disclosure.

Companies are often viewed as organizations related to environmental issues. The production and operational activities of companies that involve the use of natural resources and energy often produce waste and emissions that can pollute the environment and contribute to climate change. Therefore, companies cannot escape the responsibility to manage the environmental impacts caused by their business activities. Companies that have good environmental performance will voluntarily disclose environmental information and their environmental performance. This information covers various aspects, from efforts made to reduce greenhouse gas emissions that contribute to climate change to waste management and sustainable use of natural resources. By disclosing information openly and transparently, companies can build a positive image in the eyes of the public, increase stakeholder trust, and maintain the company's reputation.

According to the legitimacy theory, companies must adjust their business activities to prevailing social values and norms. In the environmental context, companies that produce carbon emissions need to demonstrate their commitment to preserving the environment in order to gain social legitimacy. By disclosing carbon emissions, companies demonstrate their commitment to the environment so that they can increase public trust. Stakeholder theory also emphasizes that companies operate not only to provide benefits to shareholders, but must also provide benefits to their stakeholders. Therefore, companies that have good environmental performance tend to be more open in disclosing information related to carbon emissions, as a form of accountability to their stakeholders. The results of research conducted by Kiswanto, et al (2023), Loru (2023), Priliana & Ermaya (2023), Hidayat, et al. (2022), and Krisnawanto & Solikhah (2019) state that environmental performance has a positive influence on carbon emission disclosure. Therefore, the second hypothesis in this study is as follows:

H2 : Environmental performance has a positive effect on carbon emission disclosure.

Environmental Management System or environmental management system is a structured system designed to manage environmental aspects in an organization that includes company structure, responsibilities, activity planning, and company policies or regulations (Suherman & Kurniawati, 2023). The implementation of an environmental management system in accordance with the ISO 14001 standard is concrete evidence of the company's commitment to sustainability and social responsibility. By obtaining ISO 14001 certification, companies show that they have built a structured system to manage the environmental impact of their business activities. In addition, the company also proactively provides transparent information to its stakeholders regarding the efforts that have been made to reduce carbon emissions (Ferdiani & Mulyani, 2023).

Based on the legitimacy theory, companies must adjust their business activities to applicable social values and norms. The environmental management system based on ISO 14001 helps companies meet environmental standards and regulations set by the government and society. By complying with these norms, companies can increase their legitimacy in the eyes of the public. In addition, stakeholder theory also emphasizes that companies operate not only to provide benefits to shareholders, but must also provide benefits to their stakeholders. In the context of carbon emission disclosure, companies that implement the ISO 14001 environmental management system standard will support the systematic collection and reporting of carbon emission data to reduce stakeholder concerns. If stakeholders demand transparency regarding carbon emissions, companies will strive to meet these demands by providing relevant information. Research conducted by Suherman & Kurniawati (2023), Ferdiani & Mulyani (2023), Rohmah & Nazir (2022), and Deantari (2019), states that the environmental management system has a positive relationship with carbon emission disclosure. The ISO 14001 standard provides a systematic framework for companies to manage environmental impacts, including measuring and reporting carbon dioxide emissions. Therefore, the third hypothesis in this study is as follows:

H3 : Environmental management system has a positive effect on carbon emission disclosure.

Institutional ownership is the percentage of a company's shares owned by institutions that can be used to monitor and influence the company's strategic decisions, including financial performance and good corporate governance practices (Putri et al, 2022). When institutional ownership in a company increases, the pressure on management to run the company in a transparent and accountable manner also increases. Institutional ownership will require management to provide more complete and detailed information about the company's performance, including the environmental impact caused by the company's business activities. One important aspect that institutional investors pay attention to is the disclosure of carbon emissions. By disclosing carbon emission data openly, the company demonstrates its commitment to sustainable business practices and cares about the environment. This not only improves the company's reputation in the eyes of the public but can also attract the interest of investors who are increasingly aware of the importance of sustainable investment.

Based on stakeholder theory, it states that companies operate not only to provide benefits to shareholders, but also to provide benefits to their stakeholders. Institutional ownership, which is part of the shareholders, tends to have high expectations regarding transparency and sustainability. They often pressure companies to provide better information about environmental performance, including carbon emissions. They encourage companies to disclose carbon emissions and adopt sustainable practices, so that companies can avoid risks that can harm the value of their investments. The results of research conducted by Angelina & Handoko (2023) and Amaliyah & Solikhah (2019) show that institutional ownership has a positive effect on carbon emission disclosure. This is because institutions as majority shareholders have a great interest in ensuring that the companies they invest in operate sustainably and are environmentally responsible. Thus, institutions tend to encourage companies to adopt more transparent business practices, including carbon emission disclosure. Therefore, the fourth hypothesis in this study is as follows:

H4 : Institutional ownership has a positive effect on carbon emission disclosure.

Financial Services Authority Regulation Number 33/POJK.04/2014 Article 1 paragraph (4) states that independent commissioners are members of the board of commissioners who come from outside the issuer or public company and meet the requirements as independent commissioners as referred to in this Financial Services Authority Regulation (POJK). The presence of independent commissioners will lead the company to implement good corporate governance, thus encouraging the company to implement the principle of transparency by making more disclosures to its stakeholders, through disclosure of carbon emissions. This is done to maintain support and legitimacy from stakeholders. The greater the proportion of independent commissioners, the more likely the company will make environmental disclosures (Amaliyah & Solikhah, 2019).

Based on stakeholder theory developed by Freeman (1984), it states that companies operate not only to provide benefits to shareholders, but also to provide benefits to their stakeholders. In the context of carbon emission disclosure, the independent board of commissioners has the responsibility to oversee management and ensure that the company acts in accordance with the interests of stakeholders. They encourage transparency and accountability in environmental reports, including carbon emission disclosures. This helps companies meet the expectations of their stakeholders. Research conducted by Zada & Sari (2024) and Trufvisa & Ardiyanto (2019) states that independent boards of commissioners have a significant positive influence on carbon emission disclosure. This is because with their expertise and independence, independent commissioners can ensure that companies operate responsibly towards the environment. They act as supervisors who can encourage companies to adopt sustainable business practices and set carbon emission reduction targets. Therefore, the fifth hypothesis in this study is as follows:

H5 : Independent board of commissioner has a positive effect on carbon emission disclosure.

Research Methods

This study is a causality study that will test the hypothesis proposed to assess the relationship between independent variables, namely capital expenditure, environmental performance, environmental management system, institutional ownership, and independent board of commissioners on the dependent variable, namely carbon emission disclosure. Based on the type of research, this is quantitative research. Quantitative research is defined as research that tests data in the form of numbers which are then analyzed according to statistical descriptions (Nugraha et al, 2021).

The population in this study were all non-financial companies listed on the Indonesia Stock Exchange for the period 2019 - 2023. The sampling technique in this study used the purposive sampling method and obtained 105 research data. The criteria used to select the sample were first non-financial companies listed on the Indonesia Stock Exchange consecutively during the period 2019 - 2023, second non-financial companies listed on the Indonesia Stock Exchange by publishing and publishing annual reports and sustainability reports in full during the period 2019 - 2023, and third non-financial companies that have participated in the Company Performance Rating Assessment Program (PROPER) issued by the Ministry of Environment and Forestry for the period 2019 - 2023.

The data collection method used in this study is library research. Library research is data obtained using a library study method. Data sources used include books, scientific journals, theses, the internet, and previous research results that are relevant to the research topic, as well as financial reports and annual reports of non-financial companies listed on the Indonesia Stock Exchange (IDX) in the 2019-2023 period which can be accessed through the official IDX website (www.idx.co.id) and the respective company websites.

The analysis tool used in this study is multiple regression analysis with the help of the IBM Statistic Package for Science (SPSS) Version 29 program. The data analysis technique used by the author in this study uses descriptive statistics, classical assumption tests and hypothesis tests.

The variables used in this study consist of independent variables and dependent variables. The precise measurement of the variables is:

Tabel 1. Operational Measurement of Variables

No.	Variable	Measurement	Scale
1.	*Carbon Emission Disclosure* (Choi *et al*, 2013)	$CED = \frac{\sum di}{\text{M}} \text{ x } 100\%$	Ratio
2.	*Capital Expenditure* (Widiyati, 2019)	$CAPEX = \frac{\text{Total Fixed Assets}}{\text{Total Assets}}$	Ratio
3.	*Environmental Perfomance* (Ministry of Environment and Forestry)	PROPER, with a scoring method for each category, consists of gold=5, green=4, blue=3, red=2, black=1	Nominal
3.	*Environmental management System* (Jannah & Narsa, 2021)	Companies that have ISO 14001 certification are given a score of 1 and companies that do not have ISO 14001 certification are given a score of 0.	Nominal
5.	Institutional Ownership (Amaliyah & Solikhah, 2019)	$\text{KI} = \frac{\Sigma \text{ Institutional Shares}}{\Sigma \text{ Outstanding Shares}}$	Ratio
6.	Independent Board of Commissioners (Pramuditya & Budiasih, 2020)	$\text{KI} = \frac{\Sigma \text{ Independent Commissioner}}{\Sigma \text{ Board of Commissioners}}$	Ratio

Source: Processed from various references

Result and Discussion

Results

Descriptive statistical analysis was conducted to provide a statistical description of the distribution of each variable used in this study. The information obtained in this descriptive statistic includes the average value (mean), the highest value (maximum), the lowest value (minimum), standard deviation, range (kurtosis), and the level of skewness and sharpness of the data distribution.

Table 2. Descriptive Statistical Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
CAPEX	105	0,1347	0,7904	0,371117	0,1602725
PROPER	105	2	5	3,70	0,831
EMS	105	0	1	0,80	0,402
KI	105	0,4391	0,9866	0,686795	0,1312456
DKI	105	0,2500	0,6667	0,421840	0,0928861
CED	105	0,1111	0,8889	0,618513	0,1884119

Source : Output SPSS 29, 2024

Based on the results of the descriptive statistical test in Table 2, it shows that the capital expenditure variable has a minimum value of 0.1347, a maximum value of 0.7904, an average value of 0.371117 and a standard deviation of 0.1602725. The environmental performance variable has a minimum value of 2, a maximum value of 5, an average value of 3.70 and a standard deviation of 0.831. The environmental management system variable has a minimum value of 0, a maximum value of 1, an average value of 0.80 and a standard deviation of 0.402. The institutional ownership variable has a minimum value of 0.4391, a maximum value of 0.9866, an average value of 0.686795 and a standard deviation of 0.1312456. The independent board of commissioners variable has a minimum value of 0.25, a maximum value of 0.6667, an average value of 0.421840 and a standard deviation of 0.0928861. The carbon emission disclosure variable has a minimum value of 0.1111, a maximum value of 0.8889, an average value of 0.618513 and a standard deviation of 0.1884119.

Before conducting multiple regression analysis test, the data used in this study have passed the classical assumption test which includes Normality Test, Multicollinearity Test, Heteroscedasticity Test, Autocorrelation Test.So that it has fulfilled the requirements for multiple regression analysis tests to see the effect of independent variables on the dependent variable.

The determination coefficient test (R^2) in this study was conducted to measure the ability of independent variables to explain variations in dependent variables. This test helps assess the strength of the regression model and how much influence the independent variables have on the dependent variable as a whole.

Table 3. Coefficient of Determination Test (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,439	0,243	0,205	0,14503

Source : Output SPSS 29, 2024

Based on Table 3, it shows that the Adjusted R^2 value obtained is 0.205 or 20.5%. This indicates that the variation of independent variables, namely capital expenditure, environmental performance, environmental management system, institutional ownership and independent board of commissioners are only able to explain the dependent variable, namely carbon emission disclosure, by 20.5%. While the remaining 79.5% is explained by other variables that are not analyzed in this study.

The F test is used to simultaneously test whether all independent variables in the regression model have a significant effect on the dependent variable (Ghozali, 2018). If the significance value of the F test

<0.05, then the regression model used in the study to predict all independent variables has a simultaneous effect on the dependent variable.

Table 4. F Statistical Test Results

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	0,662	5	0,132	6,297	<0,001
Residual	2,061	98	0,021		
Total	2,724	103			

Source : Output SPSS 29, 2024

In table 4 above, we can see that the calculated F value is 6.297 with a significance value of <0.001, which is smaller than 0.05. Therefore, it can be concluded that the variables of capital expenditure, environmental performance, environmental management system, institutional ownership, and independent board of commissioners have a simultaneous effect on carbon emission disclosure.

The T-statistic test in this study is used to see how much influence each independent variable has on the dependent variable. If the t-test results obtain a significance value of a variable <0.05, then it can be concluded that there is a partial or individual influence between the independent variable and the dependent variable.

Table 5. T Statistical Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0,206	0,097		2,119	0,037
	CAPEX	0,144	0,162	0,100	0,890	0,376
	PROPER	0,057	0,024	0,230	2,320	0,022
	EMS	0,158	0,062	0,281	2,565	0,012
	KI	-0,228	0,175	-0,135	-1,307	0,194
	DKI	0,031	0,185	0,15	0,168	0,168

Source : Output SPSS 29, 2024

Based on the results of the t statistics in table 5 above, it shows that the two independent variables, namely environmental performance, have a significance value of 0.022 and the environmental management system has a significance value of 0.012. This means that both variables have a significant effect on carbon emission disclosure because these variables have a significance value below 0.05. While other independent variables such as capital expenditure have a significance value of 0.376, institutional ownership has a significance value of 0.194, and the independent board of commissioners has a significance value of 0.867.

This means that the three independent variables do not have a significant effect on carbon emission disclosure because these variables have a significance value greater than 0.05. Based on the results of the t statistics in table 5 above, it can be concluded that the resulting multiple regression equation is as follows.

$$\mathbf{Y = 0{,}206\ \alpha + 0{,}144X_1 + 0{,}057X_2 + 0{,}158X_3 - 0{,}228X_4 + 0{,}031X_5 + e}$$

Discussion

The Influence of Capital Expenditure on Carbon Emission Disclosure

Based on the results of statistical tests in table 5, it shows that capital expenditure has a significance value of 0.376, which is above the standard significance value of 0.05. In addition, the unstandardized coefficient beta value is positive at 0.063. Based on these results, it can be concluded that **H_1 is rejected** or it can be stated that capital expenditure does not affect carbon emission disclosure. This means that high or low capital expenditure does not affect companies to disclose carbon emissions. The results of this study contradict stakeholder theory, where in making decisions regarding capital expenditure, companies need to consider how the investment will affect their stakeholders, including in terms of investing in environmentally friendly technology used to minimize carbon dioxide gas produced by the company. However, in this case, the company has not utilized capital expenditure for environmental activities but is more focused on the company's financial gain. Companies do not direct their capital expenditure to projects that have a direct impact on reducing carbon emissions, but rather focus on expanding production capacity, developing new products or improving infrastructure without considering environmental aspects. The results of this study are supported by research conducted by Widiyati (2023) and Gusti & Darmawati (2023) which shows that capital expenditure has no effect on carbon emission disclosure.

The Influence of Environmental Perfomance on Carbon Emission Disclosure

Based on the results of the statistical test in table 5, it shows that environmental performance has a significance value of 0.022. This proves that the level of significance obtained is below the standard significance value, which is 0.05. In addition, the unstandardized coefficient beta value is positive at 0.057. Based on these results, it can be concluded that **H_2 is accepted** or it can be stated that environmental performance has a significant positive effect on carbon emission disclosure. This means that the better the environmental performance of a company, the higher the level of carbon emission disclosure made. The results of this study are supported by legitimacy theory and stakeholder theory. Legitimacy theory explains that companies disclose environmental information to gain and maintain legitimacy from the community. This disclosure is proof that the company cares about the environment and seeks to gain the trust of stakeholders. Meanwhile, stakeholder theory emphasizes that companies need to provide benefits to all stakeholders. By disclosing carbon emission information, companies show that they are not only focused on financial gain, but also care about the environmental impact of their business activities. This transparency can strengthen the company's relationship with stakeholders and increase their support for the company. The results of this study are supported by research conducted by Kiswanto, et al (2023), Loru (2023), Priliana & Ermaya (2023), and Krisnawanto (2019) which showed the same results where environmental performance had a significant positive effect on carbon emission disclosure.

The Influence of Environmental Management System on Carbon Emission Disclosure

Based on the results of the statistical test in table 5, it shows that environmental performance has a significance value of 0.012. This proves that the level of significance obtained is below the standard significance value, which is 0.05. In addition, the unstandardized coefficient beta value is positive at 0.158. Based on these results, it can be concluded that **H_3 is accepted** or it can be stated that the environmental management system has a significant positive effect on carbon emission disclosure. This means that companies that have implemented an environmental management system will be higher in disclosing their carbon emissions than companies that have not implemented an environmental management system. The implementation of the ISO 14001 environmental management system encourages companies to increase transparency regarding their environmental performance. Companies with this system also voluntarily disclose carbon emission data, thus presenting credible greenhouse gas information (Rohmah & Nazir, 2022). This study is supported by legitimacy theory and stakeholder theory. Legitimacy theory explains that the implementation of ISO 14001 shows the company's contribution to environmental management and alignment with the sustainability values of society. The greater the company's efforts to protect the environment, the greater the trust and support of the community. Stakeholder theory explains that the implementation of an environmental management system is driven by external pressure from stakeholders. Companies that implement ISO 14001 are generally more transparent in reporting greenhouse gas emission data, thus building trust with stakeholders. The results of this study are supported by research conducted by Suherman & Kurniawati (2023), Ferdiani & Mulyani (2023), Rohmah & Nazir (2022), Jannah & Narsa (2021), and Deantari, et al (2019) which show that the environmental management system has a significant positive effect on carbon emission disclosure.

The Influence of Institutional Ownership on Carbon Emission Disclosure

Based on the results of the statistical test in table 5, it shows that institutional ownership has a significance value of 0.194. This proves that the level of significance obtained is above the standard significance value, which is 0.05. In addition, the unstandardized coefficient beta value is negative at -0.228. Based on these results, it can be concluded that **H_4 is rejected** or it can be stated that institutional ownership does not have a significant effect on carbon emission disclosure. This shows that institutional ownership cannot make companies more open and transparent in disclosing carbon emissions. This study does not support the stakeholder theory which states that there is a close relationship between companies and stakeholders regarding the transparency of company activities, especially in disclosing carbon emissions. Institutional shareholders generally focus more on the company's financial performance, because this is directly related to the potential return on investment, so they tend to ignore the environmental impact aspects of the company's operational activities. Meanwhile, control and supervision related to environmental performance, including disclosure of carbon emissions, are usually carried out by the company's internal management. Therefore, high institutional ownership cannot be used as a benchmark for companies to disclose carbon emissions. The results of this study are supported by research conducted by Suherman & Kurniawati (2023), Yuliandhari & Ayustyara (2023), and Putri, et al (2022) which state that institutional ownership does not have a significant influence on carbon emission disclosure.

The Influence of Independent Board of Commissioners on Carbon Emission Disclosure

Based on the results of the statistical test in table 5, it shows that the independent board of commissioners has a significance value of 0.867. This proves that the level of significance obtained is above the standard significance value, which is 0.05. In addition, the unstandardized coefficient beta value is negative at 0.031. Based on these results, it can be concluded that **H_5 is rejected** or it can be stated that the independent board of commissioners does not have a significant effect on carbon emission disclosure. This finding is not in accordance with stakeholder theory, which states that companies must provide benefits to stakeholders. The presence of independent commissioners will lead companies to implement good corporate governance, thus encouraging companies to implement the principle of transparency by making more disclosures to their stakeholders, through carbon emission disclosures. However, in this study, independent commissioners were unable to encourage companies to disclose carbon emissions because the average proportion of independent commissioners in the companies studied was still very low, which was 0.43. As a result, supervision of management performance in terms of sustainability becomes less effective, so that company management tends to be less motivated to voluntarily disclose carbon emissions. The results of this study are supported by research conducted by Setiawan, et al (2022), Verginia, et al (2022), Pramuditya & Budiasih (2020), and Amaliyah & Solikhah (2019) which state that independent boards of commissioners do not have a significant influence on carbon emission disclosure.

Conclusion

This study aims to determine the influence of capital expenditure, environmental performance, environmental management system, institutional ownership, and independent board of commissioners on carbon emission disclosure. Based on the data analysis that has been done, it can be concluded that environmental performance and environmental management system have a positive and significant effect on carbon emission disclosure. This means that the better the environmental performance and environmental management system of the company, the higher the level of carbon emission disclosure that is carried out. While capital expenditure, institutional ownership and independent board of commissioners do not affect carbon emission disclosure. This means that high or low capital expenditure, institutional ownership and independent board of commissioners do not affect the company to carry out carbon emission disclosure.

The results of this study are expected to provide input for companies to further increase transparency in all company activities, one of which is by conducting environmental disclosures, namely carbon emission disclosures. This can increase the trust of investors, consumers, and the general public in the company's commitment to dealing with climate change. In addition, this study can also be used as a consideration for investors in making the right investment in companies that care more about the environment in order to preserve nature. This is because the problem of climate change, global warming has become an increasingly widespread issue and attracts international reactions. So by prioritizing investment in environmentally friendly companies, it will be able to increase the number of companies that care more about nature, more environmentally friendly products will be produced, and ultimately the balance between the three basic pillars of business including profit, people, and planet is achieved.

Reference

Anggraini, A., & Tirtawati, D. I. (2021). Pengaruh Internal Cash Flow, Sales Growth, Investment Opportunity terhadap Capital Expenditure. *Jurnal Semarak Ilmiah,* 107-129. https://doi.org/10.32493/smk.v1i1.9352

Amaliyah, I., & Solikhah, B. (2019). Pengaruh Kinerja Lingkungan dan Karakteristik Corporate Governance Terhadap Pengungkapan Emisi Karbon. *Journal of Economic, Management, Accounting and Technology*, 2(2), 129-141. https://doi.org/10.32500/jematech.v2i2.720

Angelina., & Handoko, J. (2023). Pengaruh Kepemilikan Institusional, Komite Audit, dan Kinerja Lingkungan terhadap Pengungkapan Emisi Karbon. *Kompartemen: Jurnal Ilmiah Akuntansi*, 21(1), 49-68. 10.30595/kompartemen.v21i1.15834

Apriliana, E., Ermaya, H. N. L., Septyan, K. (2019). Pengaruh Tipe Industri, Kinerja Lingkungan, Dan Profitabilitas Terhadap Carbon Emission Disclosure. *Widyakala Journal*, 6(1), 84-95. https://doi.org/10.36262/widyakala.v6i1.149

Deantari, S. A. O., & Pinasti, M., & Herwiyanti, E. (2019). Faktor-Faktor Yang Mempengaruhi Pengungkapan Emisi Gas Rumah Kaca Dari Perspektif Akuntansi Hijau. *EQUILIBRIUM: Jurnal Ekonomi Syariah*, 7(1), 88-111. 10.21043/equilibrium.v7i1.5225

Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational Behavior. *Pacific Sociological Review*, 18 (1), 122–136. https://doi.org/10.2307/1388226

Dwinanda, I. R., & Kawedar, W. (2019). Pengaruh Belanja Modal, Umur Perusahaan, Pertumbuhan, Dan Rasio Utang Terhadap Pengungkapan Emisi Karbon Dan Reaksi Saham. *Diponegoro Journal of Accounting*, 8(4), 1-12. http://ejournal-s1.undip.ac.id/index.php/accounting

Ferdiani, A. M., & Mulyani, S. D. (2023). Pengaruh Social Performance, Media Exposure, Dan Sistem Manajemen Lingkungan Terhadap Pengungkapan Emisi Karbon. *Jurnal Ekonomi Trisakti*, 3(2), 3373-3382. https://doi.org/10.25105/jet.v3i2.18015

Florencia, V., & Handoko, J. (2021). Uji Pengaruh Profitabilitas, Leverage, Media Exposure Terhadap Pengungkapan Emisi Karbon Dengan Pemoderasi. *Jurnal Riset Akuntansi Dan Keuangan*, 9(3), 583–598. https://doi.org/10.17509/jrak.v9i3.32412

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Cambridge University Press.

Ghozali, I. (2018). *Aplikasi Analisis Multivariate dengan Program IBM SPSS 25 (9th ed)*. Badan Penerbit Universitas Diponegoro.

Gusti, R. B. A., & Darmawati, D. (2023). Peran Direksi Wanita Dalam Memoderasi Pengaruh Kondisi Keuangan Terhadap Carbon Emission Disclosure. *Jurnal Ekonomi Trisakti*, 3(2), 3619-3630. https://doi.org/10.25105/jet.v3i2.18045

Hidayat., et al. (2022). Investigating In Disclosure Of Carbon Emissions: Influencing The Elements Using Panel Data. *Jurnal Reviu Akuntansi dan Keuangan*, 12(2), 721-732. https://doi.org/10.22219/jrak.v12i3.23072

International Energy Agency (Iea). (2023). *Co2 Emissions In 2023*. https://Www.Iea.Org/Reports/Co2-Emissions-In-2023

Jannah, A. N. K., & Narsa, I. M. (2021). Factors That Can Be Predictors of Carbon Emissions Disclosure. *Jurnal Akuntansi Universitas Tarumanegara*, 15(1), 70-84. https://doi.org/10.24912/ja.v25i1.725

Karim, A. E., Albitar, K., & Elmarzouky, M. (2021). A novel measure of corporate carbon emission disclosure, the effect of capital expenditures and corporate governance. *Journal of Environmental Management*, 290. https://doi.org/10.1016/j.jenvman.2021.112581

Kiswanto., Widhiastuti, R., & Safitri, M. A. (2023). Institutional Ownership in Encouraging Carbon Emission Disclosure for Mining Companies, Basic Industries and Chemicals in Indonesia. *Journal of Environmental Management and Tourism*, 15(3), 632-644. https://doi.org/10.14505/jemt.v14.3(67).03

Krisnawanto, K., & Solikhah, B. (2019). The Determinants of Carbon Emission Disclosure Moderated by Institutional Ownership. *Accounting Analysis Journal*, 8(2), 135-142. https://doi.org/10.15294/aaj.v8i2.32347

Loru, T. S. (2023). Pengaruh Tipe Industri, Media Exposure Dan Kinerja Lingkungan Terhadap Pengungkapan Emisi Karbon. *Jurnal Akuntansi Bisnis*, 16(1), 66-82. http://dx.doi.org/10.30813/jab.v16i1.3838

Maulidiavitasari, J., & Yanthi, M. D. (2021). Pengaruh Kinerja Lingkungan terhadap Carbon Emission Disclosure dengan Dewan Komisaris sebagai Variabel Moderasi. *Jurnal Akuntabilitas*, 15(1), 1-18. https://doi.org/10.29259/ja.v15i1.11849

Nugraha, N. M., Susanti, N., & Rhamadan Setiawan, M. (2021). Pengaruh Struktur Modal, Perputaran Modal Kerja, dan Ukuran Perusahaan Terhadap Nilai Perusahaan. Owner, 5(1), 208–218. https://doi.org/10.33395/owner.v5i1.383

Otoritas Jasa Keuangan. (2014). *Peraturan Otoritas Jasa Keuangan Nomor 33/POJK.04/2014 tentang Direksi dan Dewan Komisaris Emiten atau Perusahaan Publik*. Jakarta: Otoritas Jasa Keuangan.

Rohmah, D. F. N., & Nazir, N. (2022). Pengaruh Kinerja Keuangan, Kinerja Lingkungan, Sistem Manajemen Lingkungan, Kepemilikan Manajerial Dan Reputasi Kap Terhadap Carbon Emission Disclosure. *Jurnal Ekonomi Trisakti*, 2(2), 749-762. https://doi.org/10.25105/jet.v2i2.14485

Pramuditya, I. D. G. N. E. C., & Budiasih, I. G. A. N. (2020). Dampak Mekanisme Good Corporate Governance pada Carbon Emission Disclosure. *E-Jurnal Akuntansi*, 30(12), 3052-3065.

Priliana, S. A., & Ermaya, H. N. L. (2023). Carbon Emission Disclosure: Kinerja Lingkungan, Carbon Performance Dan Board Diversity. *Jurnal Akuntansi Kajian Ilmiah*, 10(2), 216-233. https://doi.org/10.30656/jak.v10i2.4482

Putri, N. A., Pamungkas., & Suryaningsum, S. (2022). Pengaruh Kepemilikan Institusional, Kinerja Lingkungan, Profitabilitas, dan Pertumbuhan Terhadap Carbon Emission Disclosure. *Jurnal Akuntansi Bisnis*, 202(2), 183-199. https://doi.org/10.24167/jab.v20i2.4826

Selviana & Ratmono, D. (2019). Pengaruh Kinerja Karbon, Karakteristik Perusahaan Dan Kinerja Lingkungan Terhadap Pengungkapan Emisi Karbon. *Diponegoro Journal of Accounting*, 8(3), 1-10.

Setiawan, I., Gunawan, A., & Djunaidy. (2022). Analisis Pengungkapan Emisi Gas Karbon Ditinjau Dari Profitabilitas, Ukuran Perusahaan Dan Proporsi Komisaris Independen. *Jurnal Bisnis, Logistik, dan Supply Chain*, 2(1), 9-16. https://doi.org/10.55122/blogchain.v2i1.401

Statistical Review Of World Energy 2024 In Collaboration With Kpmg & Kearney (73th Ed.). *Energy Institute*. Https://Www.Energyinst.Org/

Suryani, R., & Wijayati, F. L. (2019). Large Determinant of Greenhouse Gas Emissions Disclosure in Indonesia. *Jurnal Riset Akuntansi dan Keuangan Indonesia*, 4(2), 101-117. https://doi.org/10.23917/reaksi.v4i2.8545

Suherman, Y., & Kurniawati. (2023). Pengaruh Profitabilitas, Environmental Management System, Kepemilikan Institusional Dan Komite Audit Terhadap Carbon Emissions Disclosure. *Jurnal Aplikasi Akuntansi*, 8(1), 142-156. https://doi.org/10.29303/jaa.v8i1.289

Trufvisa, U. S., & Ardiyanto, M. D. (2019). Pengaruh Karakteristik Dewan Komisaris Terhadap Pengungkapan Emisi Karbon. *Diponegoro Journal Of Accounting*, 8(3), 1-11.

Verginia, M., Febrianto, R., & Fontanella, A. (2022). Pengaruh Gender Diversity Dan Board Independence Terhadap Emisi Karbon Dengan Media Exposure Sebagai Moderasi. Jurnal Akuntansi dan Ekonomika, 12(2), 238-246. https://doi.org/10.37859/jae.v12i2.4209

Widiyati, D. (2023). Contributing Factors of Carbon Emission Disclosure: Evidence From Transportation Companies In Indonesia. *Atestasi: Jurnal Ilmiah Akuntansi*, 6(1), 377-390. https://doi.org/10.57178/atestasi.v6i1.1

Yuliandhari, W. S., & Ayustyara, D. (2023). The Factors Can Be Affecting To Carbon Emission Disclosure (Study On Energy Sector Companies Listed On The Indonesia Stock Exchange In 2019-2021). *Journal of Humanities and Social Studies*, 7(2), 609-615. https://doi.org/10.33751/jhss.v7i2.7753

Zada, Q. A., & Sari, S. P. (2024). Dampak Mekanisme Good Corporate Governance pada Carbon Emission Disclosure. *Jurnal Ilmiah MEA (Manajemen, Ekonomi, dan Akuntansi)*, 8(2), 1986-2006.