The influence of the independent board of commissioners, gender diversity, and institutional ownership on carbon emissions disclosure

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Abstract. This research examines the influence of the Independent Board of Commissioners, Gender Diversity, and Institutional Ownership on Carbon Emissions Disclosure. The objects of this research are energy, transportation, and logistics sector companies listed on the Indonesia Stock Exchange (BEI) in 2020-2022. In this research, the samples from 48 companies were selected using purposive sampling. The analysis tool used is SPSS ver. 22. This research found that independent boards of commissioners and gender diversity did not influence carbon emissions disclosure, while institutional ownership positively affected carbon emissions disclosure. K**eywords**: Carbon Emissions Disclosure; Independent Board of Commissioners; Gender Diversity; Institutional Ownership

1 INTRODUCTION

Intergovernmental Panel on Climate Change (IPCC), an international organization that focuses on climate change, released a climate change 2023 synthesis report stating that human activities, especially greenhouse gas emissions, have caused global warming. During 2010-2019, greenhouse gas emissions increased globally [6]. As per Climate Data Watch, Indonesia's greenhouse gas emissions in 2020 amounted to 3.1% of global emissions, making Indonesia the sixth largest producer of greenhouse gas emissions in the world, after China, the United States, India, the European Union, and Russia [1].

The Kyoto Protocol was issued in response to increasing both ongoing climate change and global warming. The official website of the UNFCCC (United Nations Frameworks Conventions on Climate Change) explains that the Kyoto Protocol implements the UN Framework Convention on Climate Change by requiring developed and developing industrial countries, including Indonesia, to limit and reduce the release of greenhouse gases (GHG) in line with their respective stated goals. This convention requires explicitly

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countries to implement policies and measures to reduce the impacts of climate change and provide regular progress reports.

Indonesia then issued Presidential Regulation Number 98 of 2021, which states, "control of Green House Gas (GHG) emissions is carried out with policies in national, central and regional development as well as from, for and by the government, regional governments, business actors and the community." Based on this regulation, business actors need to participate in controlling greenhouse gas emissions by controlling emissions released from their company's operational activities. As the most significant contributor to emissions, companies are responsible for their ability to make money and how their actions affect the ecosystem [17].

To reduce emissions in a company, it is essential to know the carbon footprint emitted. Hence, companies need to calculate and manage an inventory of emissions related to the company's operational activities by disclosing carbon emissions included in the sustainability and annual reports of the company. Carbon emissions disclosure contains an explanation of the total carbon emissions released by the company, including the company's carbon emission reduction strategy. Disclosing carbon emissions that are accurate, transparent, and regularly updated allows companies to understand the impact of company activities on the climate so that they can develop emissions reduction strategies that need to be carried out by the company.

Stakeholder Theory explains that companies need to report relevant information to various stakeholders. In response to stakeholder requests, companies must communicate information regarding social and environmental matters by disclosing carbon emissions [8]. Previous research has highlighted the benefits of increasing voluntary environmental information coverage to increase levels of stakeholder satisfaction.

However, implementing carbon calculations requires high costs, and this can be detrimental to companies, so not every companies decides to reveal its emissions of carbon. In addition, carbon emission declaration is still optional [9]. Because of this, the quantity of businesses that make their emissions of carbon publicly is still relatively small.

Previous research found factors that could encouraging businesses to reduce their carbon emissions. One of them is a separate body of directors, board gender diversity, and institutional ownership.

According to OJK regulations, A member of the board of commissioners who is not affiliated with the issuer or public corporation and fulfills the qualifications to be a separate commissioner is known as an independent commissioner.. An independent board of commissioners can provide more impartial input regarding business performance and operations [5]. Based on stakeholder theory, independent commissioners can increase information transparency for related parties and increase awareness of stakeholder needs, especially in overcoming environmental problems. So, companies with more independent board members will be more likely to disclose carbon emissions. In line with research by [5], [18] explain that the greater the percentage of commissioners that are independent, the greater carbon emissions disclosed by the corporation. Based on this explanation, the researcher conclude that independent board of commissioners influences carbon emissions disclosure.

The representation of women on the company's board is known as gender diversity on the board. This term often speaks of the number of women serving on the board of executives [20]. [19] researched companies in Indonesia from 2015 to 2019, which clarified how the committee of commissioners diversity of genders positively affected carbon emissions disclosure, in keeping with more investigation carried out by [11]. In contrast, research conducted by [10] found that gender diversity had no impact on the reporting of carbon emissions report. According to Liao et al. in [19], compared to men, women have greater concerns worried about the surroundings. Gender differences in how people

approach environmental concerns can have an impact on the kind and extent to which a corporation commits to handling emissions of carbon. Thus, the commission of commissioner' diversity of genders may encourage businesses to voluntarily disclose data regarding the environment. Gender diversity on the board can also offer diverse perspectives and promote an efficient monitoring role in managing relationships among various stakeholders. These justifications support the idea that committees of commissioners with gender diversity might perform better in terms of emissions of carbon than those with fewer diversity of genders. In keeping with more investigation carried out by [10], [11], and [19], which states that board gender diversity influences carbon emissions disclosure. Based on this explanation, the researcher concludes that gender diversity influences on the reporting of carbon emissions report.

According to Fransiska et al. in [4], shares of a corporation held by financial organizations like financial institutions, insurers, and investment firms are referred to as institutional ownership. The pressure exerted by institutional investors to disclose more transparent information encourages companies to disclose carbon information to the public [7]. This aligns with research by [2], which states that institutional ownership influences carbon emissions disclosure. However, [15] found that institutional ownership did not affect on the reporting of carbon emissions report. shares of a corporation held by financial organizations like financial institutions, insurers, and investment firms are referred to as institutional ownership. Based on stakeholder theory, institutional investors are one of the company's stakeholders because they are interested in the company's existence or sustainability. Kim & Lyon in [2] stated that institutional investors' awareness of climate change will increase shareholder value and management awareness of disclosure of environmental issues. As one of the company's stakeholders, in considering decisions regarding the company, institutional investors need to know information about the company's operational activities, among which are the emissions of carbon brought on by the business's operational activities, which can affect the environment. This is in line with research conducted by [7] and [2], who state that institutional ownership affects carbon emissions disclosure. Based on this explanation, the researcher concludes that institutional ownership influences on the reporting of carbon emissions report.

Given the inconsistent results of previous research, this research is interested in re-examining the influence of an independent board of commissioners, gender diversity, and institutional ownership on carbon emissions disclosure.

This research uses a sample of energy, transportation, and logistics companies. Based on research conducted by the Ministry of National Development Planning/Bappenas, it is explained that the energy sector will be the most significant contributor to emissions in Indonesia in 2022. With 50% of all emissions in Indonesia coming from the energy and transportation sectors, it is predicted that this will continue to increase until 2030.

METHOD

The research objects used are companies in the energy, transportation, and logistics sectors based on the Indonesia Stock Exchange Industrial Classification (IDX IC) listed on the Indonesia Stock Exchange (BEI) from 2020 to 2022. This research is quantitative, with the data's results expressed numerically. The type of data used in this research is secondary data. This research uses a sampling technique with the Purposive Sampling method to produce a representative sample. The specified criteria are as follows: Energy, transportation, and logistics sector companies listed on the Indonesia Stock Exchange (by the Indonesia Stock Exchange Industrial Classification -IDX IC) from 2020 to 2022; Companies that publish annual and sustainability reports from 2020 to 2022; Companies that disclose carbon emissions, at least one carbon emission disclosure item, or at least one measure pertaining to global warming or emissions of carbon between 2020 and 2022. The data in this research was obtained from annual sustainability reports sourced from the

official Indonesian Stock Exchange website, www.idx.co.id, and the websites of each company.

This research uses carbon emission disclosure (CED) as the dependent variable. This research measures companies' disclosure of carbon emissions using content analysis issued by the Global Sustainability Standards Board (GSSB), namely GRI 305 concerning emissions.

In this research, the variables used are independent board of commissioners (INDCOM), gender diversity (GENCOM), and institutional ownership (INSOWN). The number of independent commissioners and the total amount of inspectors are used to calculate the quantity of separate commissioner [19]. Based on research by [11], the board of commissioner' diversity of genders is calculated by dividing the number of female commissioners by the total number of the commissioners on the commission. To calculate the ownership of institutions, divide the entire amount of corporate equities divided by total shareholding[15].

2 RESULT

2.1 Descriptive Statistical Test

Table 1 shows that the sample size for this research is 48 companies. The independent board of commissioner's variable has an average value of 0.44 or 44% and a standard deviation of 0.10. The gender diversity variable has an average value of 0.15 and a standard deviation of 0.18. The institutional ownership variable has an average value of 0.73 and a standard deviation 0.20.

Table 1. Results Statistics Descriptive

Variable	N	Min	Max	Mean	Std. Dev.
INDCOM	48	0.33	0.67	0.44	0.10
GENCOM	48	0.00	0.75	0.15	0.18
INSOWN	48	0.29	0.99	0.73	0.20
CED	48	0.14	1.00	0.53	0.31

The carbon emissions disclosure variable has an average value of 0.53 and a standard deviation of 0.31. The minimum value of the carbon emissions disclosure variable is 0.14 or 14%, which several companies own; this means that the company discloses carbon emissions at 14%. Meanwhile, the maximum value for carbon emission disclosure is 1.00 or 100% owned by PT Indo Tambangraya Megah Tbk. in 2020, 2021, and 2022, as well as at PT AKR Corporindo Tbk., PT Indika Energi Tbk., and PT Bukit Asam Tbk in 2021 and 2022.

2.2 Normality test

Table 2 shows the asymp values sig 2 tailed is 0.200 > 0.05 (alpha), meaning that the residual data in this study is usually distributed.

Table 2. Results of Normality Test, One Sample Kolmogrov-Smirnov Test

Asymp. Sig (2-tailed)	0.200

2.3 Multicollinearity Test

Table 3 shows that all variables have a tolerance value > 0.1 and a VIF value < 10, meaning that the regression model in this study is free from multicollinearity.

Table 3. Results Test Multicollinearity

Variable	Tolerance	VIF
INDCOM	0.846	1,183
GENCOM	0.997	1,003
INSOWN	0.847	1,181

Heteroscedasticity Test

Table 4 shows that all variables have sig values > 0.05. This means that the regression model in this study does not have heteroscedasticity.

Table 4. Results Test Heteroscedasticity

Variable	Sig
INDCOM	0.200
GENCOM	0.256
INSOWN	0.139

2.4 Autocorrelation Test

Table 5 shows that there was no autocorrelation in this study's regression model. The dU value in the study, which had 48 samples and three independent variables, was 1.6708. The dW value shown in Table 4.5 is 1.919, meaning 1.6708 < dW < 2.3292. So, this research's regression model is free of autocorrelation.

Table 5. Results Test Autocorrelation

Mark dU	Mark dW
1.6708	1,919

2.5 Coefficient of Determination Test

Table 6 shows the Adjusted R Square value of 0.112, meaning that the independent variables in this study, namely independent board of commissioners, gender diversity, and institutional ownership, can explain the dependent variable, namely carbon emission disclosure of 0.112 or 11.2%, and the remaining 88.8%. % explained by other variables not examined in this study.

Table 6. Results Test Coefficient Determination

Dependent Variable: CED	
Adjusted R- Squared	0.112

2.6 Simultaneous Significant Test (F Test)

Table 7 shows a sig value of 0.042 < 0.05 (alpha), meaning that the independent variables in this study, namely the independent board of commissioners, gender diversity, and

institutional ownership, simultaneously influence the dependent variable, namely carbon emissions disclosure.

Table 7. Results F test

Information	Sig
Prob (F- statistic)	0.042

2.7 Partial Significant Test (t-Test)

Table 8 shows that the independent board of commissioner's variable has a sig value of 0.851 > 0.05 with a negative regression coefficient of -0.084. This means that the independent board of commissioner's variable does not affect carbon emissions disclosure, so hypothesis 1 is rejected. Table 8 shows that the gender diversity variable has a sig value of 0.439 > 0.05 with a negative regression coefficient of -0.184. This means that the gender diversity variable does not affect carbon emissions disclosure, so hypothesis 2 is rejected. Table 8 shows that the institutional ownership variable has a sig value of 0.014 <0.05 with a positive regression coefficient of 0.578. This means that the institutional ownership variable positively affects carbon emissions disclosure, so hypothesis 3 is accepted.

Table 8 Results t test

Variable		Coefficient	Prob
INDCOM		0.172	0.579
GENCOM		-0.084	0.851
INSOWN		-0.184	0.439
CED		0.578	0.014

3 Discussion

3.1 The Influence of the Independent Board of Commissioners on Carbon Emission Disclosure

In this research, the results obtained were that the independent board of commissioners' variable did not affect carbon emissions disclosure. The hypothesis test results show that the independent board of commissioner's variable has a sig value of 0.851 > 0.05 with a negative coefficient direction, meaning that hypothesis 1 is rejected.

The results of this research are not in line with research conducted by [10], [5], [18], which states that an independent board of commissioners has a positive influence on carbon emissions disclosure. The results of this research are consistent with research conducted by [19], [15], and [13], which states that the independent board of commissioners does not have a significant influence on carbon emissions disclosure.

The results of this research explain that a greater proportion of independent board of commissioners in a company does not lead to an increase in a company's tendency to disclose carbon emissions. This is influenced by Indonesia's average energy, transportation, and logistics sector companies with a low percentage of independent board of commissioners.

Based on descriptive statistical tests, it produces an average value of 0.44, close to the minimum value of 0.33, indicating that the proportion of independent board of commissioners in the companies in the sample is relatively small. The independent board of commissioners may have limited involvement in company decision-making. [16] found that independent boards are more conservative in disclosing information related to carbon

emissions to stakeholders and that the implementation of disclosing information related to carbon emissions requires official policy support.

3.2 The Effect of Gender Diversity on Carbon Emission Disclosure

This study shows no influence between board gender diversity and carbon emissions disclosure. Based on the hypothesis test results, it shows a sig value of 0.439 > 0.05, with a negative coefficient direction. This shows that gender diversity in board members of commissioners is not yet a relevant factor in disclosing carbon emissions, meaning hypothesis 2 is rejected.

The results of this research are consistent with research conducted by [5], [8], [10], and [14], which stated that gender diversity does not affect carbon emissions disclosure. The results of this research are also different from those conducted by [19] and Monica et al. (2021) [11]. The results of this research also contradict stakeholder theory, which assumes that the involvement of women on the board moderates various stakeholder desires and enables companies to pay more attention to the environment.

This research shows that the proportion of women on the board of commissioners in Indonesia's energy, transportation, and logistics sector companies is still low, so the data cannot show the effect of gender diversity on carbon emissions disclosure. This shows that the presence of women on the board of commissioners is still relatively low, and they still need to have a majority of voting rights when making board decisions.

The descriptive statistical test produces an average value of 0.13, close to the minimum value of 0.00, meaning that the proportion of female boards of commissioners in the companies in the sample is relatively small. This shows that the presence of female board of commissioners in companies in the energy, transportation, and logistics sectors is not significant in influencing the decision of the board of commissionalmaers to disclose their company's carbon emissions.

3.3 The Effect of Institutional Ownership on Carbon Emission Disclosure

This research shows that institutional ownership influences the disclosure of carbon emissions. Based on the hypothesis test results, it shows a sig value of 0.003 <0.05 and has a positive coefficient value. This shows that carbon emissions disclosure tends to be carried out more by companies with greater institutional ownership, meaning hypothesis 3 is accepted.

In stakeholder theory, institutional investors are one of the stakeholders in companies because they are interested in the company's existence or sustainability; institutional investors' awareness of climate change will increase shareholder value and management awareness of disclosure of environmental issues. The existence of institutional ownership can optimize the supervision of management so that companies disclose more information related to the environment.

This is in line with research conducted by [7] and [2] which state that institutional ownership influences carbon emissions disclosure. This aligns with research by [3], which states that with higher institutional ownership, the pressure on company management to carry out corporate social responsibility becomes even more significant.

4 CONCLUSION

This research aims to empirically prove the impact of an independent commitee of commissioner, gender diversity, and institutional ownership on carbon emissions

disclosure. This study makes use of secondary data from firm sustainable development reports and financial statements. The objects of this research are companies in the energy, transportation, and logistics sectors that are registered and publish annual reports on the IDX from 2020 to 2022. In Indonesia, comparatively few businesses still reveal their carbon footprints. This is due to the voluntary nature of carbon emissions disclosure, and its implementation requires high costs, so more companies decide to disclose other information than information about the carbon emissions released by their company. Based on the results of data testing and analysis in this research, this research shows that the reporting emissions of carbon is unaffected by the independent board of commissioners, gender diversity does not affect the disclosure of carbon emissions, and institutional ownership has a positive effect on the disclosure of carbon emissions.

In this research, the author realizes that there are still many limitations. In the research, the independent variables only use independent board of commissioners, board gender diversity, and institutional ownership, which only has an adjusted R of 2, amounting to 20.5%, which means that there are still numerous additional elements that affect the reporting of emissions of carbon that have not been studied. This research does not use control variables to control the effects of other variables that can influence the dependent variable. Suggestions that the author can give are, future research should consider additional variables and potentially use control variables to isolate individual effects further, such as foreign ownership, environmental committees, and media exposure. Future research should add control variables using panel data regression analysis methods. Using panel data analysis can isolate the individual effects of the independent variable on the dependent variable. So you can control the effects of other variables that can influence the dependent variable.

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