International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2025, 15(6), 272-280.

The Effect of Environmental Performance, Environmental Management System, and Institutional Ownership on Carbon Emission Disclosure with Media Exposure as a Moderating Variable

Heri Yanto[1], Ain Hajawiyah[1]*, Niswah Baroroh[1], Kardiyem Kardiyem[1], Nur Hayati Abd Rahman[2], Lulus Nona Meliana[1]

[1]Department of Accounting, Faculty of Economics and Business, Universitas Negeri Semarang, Indonesia, [2]Faculty of Business and Management, Universiti Teknologi MARA, Malaysia. *Email: ainhajawiyah@mail.unnes.ac.id

Received: 13 May 2025 **Accepted:** 02 September 2025 **DOI:** https://doi.org/10.32479/ijeep.20659

ABSTRACT

This study examines the effects of environmental performance, environmental management systems, and institutional ownership on carbon emission disclosure. It also investigates the moderating role of media exposure in these relationships. The research population comprises non-financial sector companies listed on the Indonesia Stock Exchange (IDX) from 2021 to 2023. A purposive sampling method was employed, resulting in 174 units of analysis. Secondary data were collected using documentation techniques. The study applies descriptive and inferential analyses, utilizing panel data regression and Moderated regression analysis (MRA) with the EViews software. The results show that environmental performance does not significantly affect carbon emission disclosure. Environmental management systems positively influence carbon emission disclosure, while institutional ownership has a negative impact. Additionally, media exposure does not moderate the relationships between environmental performance, environmental management systems, and institutional ownership with carbon emission disclosure. This study differs from previous research in that it uses specific indicators for environmental performance and includes media exposure as a moderating variable.

Keywords: Carbon Emission Disclosure, Environmental Performance, Environmental Management System, Institutional Ownership, Media Exposure
JEL Classifications: Q56, G32, Q54

1. INTRODUCTION

Climate is a dynamic phenomenon that regularly experiences changes (Harvey, 2016). No one can deny the fact that climate change is currently a serious and urgent challenge (Falloon, 2010). Greenhouse gases (GHG), which include carbon dioxide (CO_2), methane (CH_4), and nitrogen oxides (N_2O), are gases that occur naturally in the atmosphere. Scientists are paying special attention to the increase in these gases. This increase is caused by human activities (anthropogenic). Scientists predict that the Earth's temperature will increase by 1.5°C-4.5°C by 2050, if these gases continue to double in the absence of effective action to reduce anthropogenic greenhouse gas emissions (Christoff, 2014; Falloon, 2010). Global warming is a warming of the world's overall temperature that occurs over a long period (Khare, 2024). Global warming is increasingly becoming a problem that threatens the future of the world (Manurung et al., 2023). Global warming can cause profound environmental changes, impacting human health. This is a threat to human welfare (Baer and Singer, 2016).

This Journal is licensed under a Creative Commons Attribution 4.0 International License

Based on data from REDD (Reduction of Emissions from Deforestation and Forest Degradation), Indonesia contributed 2.05 gigatons of greenhouse gas emissions in 2005. This fact makes Indonesia the third-largest carbon-emission-producing country in the world, after the United States (5.95 gigatons) and China (5.06 gigatons) (Nisak and Yuniarti, 2018). Currently, globally, Indonesia is the 10th most significant contributor to carbon emissions, with 589.5 billion tons of CO_2. The Ministry of Energy and Mineral Resources (ESDM) of the Republic of Indonesia stated that the industrial sector in Indonesia is the most significant contributor of carbon emissions, with 46.35% of which comes from the energy-producing industry, transportation at 26.39%, manufacturing and construction industry at 17.75%, and other sectors contributing 4.63% (Wahyuningrum et al., 2023; Wisevator, 2023).

In addition to the phenomena of climate change and global warming that have been explained, cases of environmental pollution have also occurred in Indonesia, caused by the activities of several non-financial companies, such as water pollution carried out by PT BMB, which was proven to have polluted the environment and dumped waste water into rivers in 2023 (Zahrani, 2024). In addition, air and river water pollution is also carried out by PT Rayon Utama Makmur (RUM) in Sukoharjo Regency, which has been running since 2017. At the same time, pollution was also caused by PT Panggung Jaya Indah Textile (Pajitex) in Pekalongan Regency since 2006. Smoke and coal dust that pollute residents' homes cause residents to experience ARI and itching. The river that is polluted by waste also smells and has a thick color (Alma, 2022).

At the UN (United Nations) Climate Conference held in Copenhagen, December 2009, the international community agreed to limit global warming to below 2°C to avoid the worst impacts of anthropogenic climate change (Christoff, 2014). On December 11, 1977, in Kyoto, Japan, the UNFCCC (United Nations Framework Convention on Climate Change) ratified the Kyoto Protocol, which explains that there are three types of carbon emission reduction efforts that can be carried out flexibly by industrial countries, namely clean development, joint development, and emissions trading (Saputro and Basuki, 2019). In 2004, Indonesia took part in the Kyoto Protocol by issuing Law Number 17 of 2004 in response to growing concerns about implementing sustainable development and participating in efforts to reduce carbon emissions (Abdullah et al., 2020).

In 2015, Indonesia contributed to the Paris Agreement to reduce carbon emissions through its efforts by 26% and through international partnerships in forestry, energy, and industry by 41%. Following up on these efforts, Indonesia then set a target of reducing 29% by 2030 under the INDC (Intended Nationally Determined Contribution) (Putranti and Imansyah, 2017). All companies in Indonesia must contribute and play an active role in this commitment, and integrated efforts are required from the community and companies (Wahyuningrum et al., 2023).

Current conditions, with the support of existing commitments, are driving companies to publish reports related to their carbon emissions as an important element in environmental reporting. An accountant also has an important role in disclosing the carbon emissions produced by the company. Accountants are responsible for transparently measuring, recording, and reporting the company's sustainability information, including carbon emissions. In addition, carbon emission reporting carried out periodically by the company every year will show accountability and transparency in the management of carbon emissions (Manurung et al., 2023; Nisak and Yuniarti, 2018; Wahyuningrum et al., 2023).

Research on carbon emission disclosure is fundamental to do. First, the intensity of carbon emission production has increased every year (Andriadi and Werastuti, 2023). The increase was reported by the Indonesian Ministry of Energy and Mineral Resources, which occurred in various sectors. Second, carbon emission disclosure is still little done in Indonesia because this disclosure is voluntary, which causes the implementation of this disclosure to be considered less than optimal (Ummah and Setiawan, 2021). Third, there is a literature gap regarding carbon emission disclosure in previous research (Widarjo et al., 2024).

In general, the factors that encourage companies to disclose carbon emissions are difficult to conclude given the inconsistencies in the research conducted. This is shown in research conducted by Abdullah et al. (2020), Jannah and Narsa (2021), Hidayat et al. (2022), and Wahyuningrum et al. (2023) that environmental performance has a positive effect on carbon emission disclosure. However, research conducted by Ulupui et al. (2020) and Solikhah et al. (2021) shows that environmental performance has a negative effect on carbon emission disclosure.

Other studies have shown that environmental management systems also have an influence on carbon emission disclosure. Based on research conducted by Iswati and Setiawan (2020), Jannah and Narsa (2021), and Widarjo et al. (2024) Environmental management systems have a positive influence on carbon emission disclosure. On the other hand, research conducted by Ummah and Setiawan (2021) and Ika et al. (2024) shows that environmental management systems have a negative impact on carbon emission disclosure.

Then, based on previous research, institutional ownership is another factor influencing carbon emission disclosure. Solikhah et al. (2021), Ika et al. (2022), and Bedi and Singh (2024a) in the research he conducted showed that institutional ownership has a positive effect on carbon emission disclosure. While different results were shown by Wahyuningrum et al. (2024) and Wahyuningrum et al. (2023) in his research, institutional ownership has a negative effect on carbon emission disclosure.

Based on the analysis conducted in previous studies, several factors were found to influence carbon emission disclosure, such as environmental performance, environmental management systems, and institutional ownership. Therefore, this study aims to re-examine the influence of environmental performance, environmental management systems, and institutional ownership in providing deeper insight into the relationship between these variables and carbon emission disclosure. This study uses a moderating variable to evaluate whether the variable can

strengthen or weaken the influence of the independent variable on the dependent variable studied. Media exposure was chosen as a moderating variable because previous research conducted by Ulupui et al. (2020), Puspita et al. (2024), Hidayat et al. (2022), Shao and He (2022), and Wahyuningrum et al. (2024) shows that the variable consistently has a positive influence on carbon emission disclosure.

2. EMPIRICAL REVIEW

Legitimacy theory explains the difference between the values adopted by a company and the values prevailing in society (Dowling and Pfeffer, 1975). This theory emphasizes the interaction between companies and the public, namely when companies try to create harmony between the social values that are part of their business operations and the standards of behavior that already exist in the social system. When this harmony is achieved, the company's legitimacy will be formed. Stakeholder theory defines stakeholders as any group or individual who can influence or be influenced by the achievement of an organization's goals (Freeman, 1984). Stakeholder theory assumes that companies must consider the claims of all parties affected by their actions. In this case, information disclosure is done to meet the various needs of stakeholders.

Environmental performance is the tangible result of a company's efforts to manage the environmental impacts resulting from its operational activities (Schaltegger and Wagner, 2006). Corporate responses to environmental issues are reflected in their environmental performance. Based on legitimacy theory, companies need to align their activities with social expectations, one of which is to protect and preserve the environment. Therefore, companies that have good environmental performance tend to be more active in taking steps that are beneficial to the environment, such as reducing carbon emissions (Solikhah et al., 2021). With solid environmental performance, companies will also be encouraged to be more transparent in reporting their environmental impacts, including disclosure of carbon emissions, as a form of responsibility and an effort to build a positive reputation in the eyes of the public. This is in line with research conducted by Abdullah et al. (2020), Jannah and Narsa (2021), Hidayat et al. (2022), and Wahyuningrum et al. (2023) that environmental performance has a positive effect on carbon emission disclosure.

H_1: Environmental performance has a positive effect on carbon emission disclosure.

An environmental management system is a structured framework to help companies identify, manage, and reduce the environmental impacts resulting from their operational activities (Darnall et al., 2008). A good environmental management system is reflected through ownership of the ISO 14001 certificate because this certification ensures that there is detailed and structured communication in the development of the environmental management system (Iswati and Setiawan, 2020). Legitimacy theory explains that companies strive to gain legitimacy from various parties, including society, government, and other stakeholders (Dowling and Pfeffer, 1975). Companies implementing ISO 14001 can demonstrate their efforts in managing environmental impacts, including reducing carbon emissions, through certification. This standard encourages companies to monitor and manage carbon emissions from their operations systematically. This leads to more transparent disclosure of carbon emissions. This is in line with research conducted by Iswati and Setiawan (2020), Jannah and Narsa (2021), and Widarjo et al. (2024), that the environmental management system positively influences carbon emission disclosure.

H_2: Environmental management systems have a positive effect on carbon emission disclosure.

Institutional ownership refers to the proportion of a company's stock that institutions, such as financial institutions, foundations, or government organizations, own (Li and Zhang, 2010). Based on the stakeholder theory perspective, companies seek to align their activities with stakeholder expectations (Freeman, 1984). High levels of institutional ownership encourage tighter management oversight, which is when institutional investors proactively direct companies to implement carbon emission reduction measures. This is done to reduce the financial losses that investors can experience due to reduced corporate image and competitiveness, if the company is considered environmentally unconcerned by the public (Reenen et al., 2013; Singhania and Bhan, 2024). This is in line with research conducted by Solikhah et al. (2021), Ika et al. (2022), and Bedi and Singh (2024a) that institutional ownership has a positive effect on carbon emission disclosure.

H_3: Institutional ownership has a positive effect on carbon emission disclosure.

Good environmental performance will encourage carbon emission disclosure as a company's step to gain social legitimacy. Based on this, media exposure is an important moderating variable that can strengthen the relationship. Media exposure increases public scrutiny of company performance, especially in environmental matters. When environmental issues receive more attention from the media, companies feel compelled to be more transparent in disclosing carbon emissions. This is done so that companies cannot lose public support and maintain their positive reputation.

H_4: Media exposure can moderate by strengthening the influence of environmental performance on carbon emission disclosure.

Media exposure plays a significant role in strengthening the influence of environmental management systems on carbon emission disclosure. When the media pays more attention to environmental issues, ISO 14001-certified companies feel compelled to disclose their carbon emission information more transparently. This is due to the increasing pressure and expectations of the public, who expect companies to act more openly and responsibly in managing their carbon emissions.

H_5: Media exposure can moderate by strengthening the influence of environmental management systems on carbon emission disclosure.

Institutional ownership plays an important role in encouraging companies to disclose carbon emissions. Institutional investors who are more concerned about sustainability issues will ensure that the companies they invest in are committed to good environmental management, including carbon emission management. Media exposure can strengthen the influence of institutional ownership on carbon emission disclosure. When the media pays great attention to environmental issues, such as carbon emissions, stakeholders' attention to carbon emission management increases.

H_6: Media exposure can moderate the influence of institutional ownership on carbon emission disclosure.

3. METHODS

The data used in this study are secondary data obtained from annual reports and sustainability reports of non-financial companies listed on the IDX (Indonesia Stock Exchange) during 2021-2023, and LSEG Data and Analytics, formerly known as Refinitiv. The sampling technique used is purposive sampling. Based on the criteria, the sample selected was 174 units. This study uses documentation techniques. This study uses panel data regression analysis and moderated regression analysis (MRA) with the EViews program. The sample selection criteria are presented in Table 1.

Table 2 summarizes the operational definition and measurement of the research variables.

4. RESULTS AND DISCUSSION

The following Table 3 presents the results of descriptive analysis of the data.

Based on the results of the model specification test, the fixed effect model (FEM) is selected. It is also concluded that this study has no classical assumption problem. Panel data regression analysis in this study is used to test the effect of environmental performance, environmental management systems, and institutional ownership on carbon emission disclosure with media exposure as a moderating variable. The panel data regression equation is as follows:

Table 1: Research sampling

No.	Criteria	2021	2022	2023	Total
1.	Non-financial sector companies listed on the IDX in the period 2021-2023.	795	795	795	2.385
2.	Non-financial sector companies that did not publish annual and sustainability reports in 2021-2023.	(0)	(2)	(3)	(5)
3.	Non-financial sector companies that do not have an environmental score in the 2021-2023 period.	(730)	(731)	(745)	(2206)
Total		65	62	47	174
Number of final units analyzed					174

Source: Processed Secondary Data, 2025

$$CED_{i,t} = \alpha + \beta_1 EP_{i,t} + \beta_2 EMS_{i,t} + \beta_3 IO_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 ROA_{i,t} + \beta_6 LEV_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$CED_{i,t} = \alpha + \beta_1 EP_{i,t} + \beta_2 EMS_{i,t} + \beta_3 IO_{i,t} + \beta_4 ME_{i,t} + \beta_5 EP*ME_{i,t} + \beta_6 EMS*ME_{i,t} + \beta_7 IO*ME_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 ROA_{i,t} + \beta_{10} LEV_{i,t} + \varepsilon_{i,t} \quad (2)$$

Table 4 shows the result of Equation (1), and Table 5 shows the result of Equation (2).

Moderated regression analysis (MRA) tests whether media exposure can strengthen or weaken the influence of independent variables, namely environmental performance, environmental management systems, and institutional ownership, on the dependent variable, namely carbon emission disclosure. The moderating effect is considered significant if the probability value of the interaction between the independent variable and media exposure is less than the significance level of 0.05. In addition to looking at the probability value, determining the moderation effect also considers the direction and magnitude of the change in the regression coefficient between the models before and after moderation. Whether the interaction strengthens the direction of the positive relationship or weakens it with a negative direction is the key to interpreting the MRA results. The results of the MRA test can be seen in Table 5.

Table 6 shows the summary of the hypothesis testing results in this study.

4.1. Environmental Performance's effect on Carbon Emission Disclosure

The first hypothesis (H_1) in this study states that environmental performance positively affects carbon emission disclosure. Based on the hypothesis testing that has been carried out, it is known that environmental performance does not affect carbon emission disclosure. This is indicated by the environmental performance variable, which has a probability value of 0.1257, greater than the significance level of 0.05. Furthermore, these results indicate that environmental performance does not significantly affect carbon emission disclosure. However, the regression coefficient value of 0.001443 indicates a positive direction relationship. Therefore, H_1, which states that environmental performance positively affects carbon emission disclosure, is rejected.

This finding is inconsistent with legitimacy theory, which emphasizes the interaction between companies and the public, namely when companies attempt to create harmony between the social values that are part of their business operations and the standards of behavior that already exist in the social system (Dowling and Pfeffer, 1975). Companies that have good environmental performance tend to be more active in taking steps that are beneficial to the environment, such as reducing carbon emissions (Solikhah et al., 2021). However, when environmental performance does not affect carbon emission disclosure, this indicates that companies do not use environmental transparency to gain or maintain legitimacy. This may be due to the absence of regulations that require specific and standardized carbon emission reporting. Voluntary carbon emission disclosures leave

Table 2: Operational definition and measurement of variables

No.	Variable	Definition	Indicator
		Dependent variable	
1.	Carbon Emissions Disclosure (CED)	Carbon emission disclosure is companies' reporting regarding greenhouse gas emissions resulting from their operational activities (Luo and Tang, 2014).	CED was measured by using a checklist of items developed by Choi et al. (2013) Based on the information request sheet provided by CDP (carbon disclosure project). There are 18 disclosure items. $CED=\frac{\text{Number of items disclosed}}{\text{Maximum number of items}}$ (Choi et al., 2013)
		Independent variables	
1.	Environmental Performance (EP)	Environmental performance reflects a company's ability to reduce negative environmental impacts by implementing sustainable initiatives (Trumpp and Guenther, 2017).	In this study, environmental performance measurement uses an environmental score, part of the ESG score. The environmental dimension includes issues such as climate change, pollution, greenhouse gas emissions, and waste management (Naeem et al., 2022). EP=Environmental score
2.	Environmental Management System (EMS)	An environmental management system is a set of policies, procedures, and practices developed by a company to proactively manage its interactions with the environment (Melnyk et al., 2003).	The environmental management system uses dummy variables. A score of 1 is given if the company has ISO 14001 certification. Conversely, a score of 0 is given to companies that do not have ISO 14001 certification. (Sam and Song, 2022)
3.	Institutional Ownership (IO)	Institutional ownership refers to the ownership of company shares by institutions that aim to achieve strategic, social, or environmental influence, which can drive corporate policies in line with their values (Li and Zhang, 2010).	$\text{Institutional Ownership}=\frac{\text{Number of shares owned by institutions}}{\text{Number of shares outstanding}}$ (Pirzada et al., 2015)
		Moderation variables	
1.	Media Exposure (ME)	Media exposure is a strategic tool for conveying information related to a company's performance, sustainability, or social responsibility, thereby influencing the company's image in the eyes of the public (Gamerschlag et al., 2011).	Media exposure measurement uses a dummy variable. A score of 1 is given to companies that receive media publication, either positive or negative, from external or internal parties, regarding the company's efforts in managing carbon emissions. This publication includes publications in online media. Conversely, a score of 0 is given to companies that do not receive any media publication regarding their efforts in managing carbon emissions (Ulupui et al., 2020)
		Control variables	
1.	Profitability (ROA)	Profitability is the company's ability to generate profits or gains in a specific period through asset management, which reflects the company's efficiency in managing assets to obtain maximum results (Widyastuti et al., 2023).	ROA=Net profit before tax/Total assets (Riantono and Sunarto, 2022)
2.	Company Size (SIZE)	Company size is a characteristic that reflects a company's financial strength (Pratiwi et al., 2021).	SIZE=LN (Total assets) (Kholmi et al., 2020)
3.	Leverage (LEV)	Leverage refers to a company's ability to use borrowed funds to purchase assets, with the expectation that the income generated from those assets will exceed the cost of borrowing (Okeke et al., 2021).	LEV=Total Debt/Total Assets (Widarjo et al., 2024)

Source: Secondary data processed, 2025

Table 3: Results of descriptive statistical tests

Characteristics	CED	EP	EMS	IO	ME	SIZE	ROA	LEV
Mean	0.646232	43.88024	0.683908	0.781075	0.528736	31.18829	0.082552	0.537383
Median	0.666667	43.36738	1.000000	0.894404	1.000000	31.33800	0.073509	0.541654
Maximum	0.944444	89.07982	1.000000	1.000000	1.000000	33.73062	0.746506	0.994773
Minimum	0.055556	5.193487	0.000000	0.001192	0.000000	26.32589	−1.675398	0.049906
Standard deviation	0.180513	22.19759	0.466291	0.254269	0.500614	1.252326	0.180539	0.215162
Skewness	−0.761794	0.168506	−0.791089	−1.467493	−0.115113	−1.019112	−4.790145	−0.211235
Kurtosis	3.299569	1.925736	1.625821	4.011396	1.013256	4.862341	54.33660	2.298279
Observations	174	174	174	174	174	174	174	174

Source: Processed Secondary Data, 2025

companies with no strong incentive to disclose such information (Ika et al., 2022; Solikhah et al., 2021). The results of this study strengthen empirical evidence from previous research conducted by Solikhah et al. (2021) and Ika et al. (2022), which shows that environmental performance does not significantly influence carbon emission disclosure.

4.2. Environmental Management Systems' effect on Carbon Emission Disclosure

The second hypothesis (H_2) in this study states that the environmental management system positively affects carbon emission disclosure. Based on the hypothesis test that has been conducted, it is known that the environmental management system positively affects carbon emission disclosure. The environmental management system variable shows a probability value of 0.0000, smaller than the significance level of 0.05. This indicates a significant influence of the environmental management system on carbon emission disclosure. The regression coefficient value of 0.235398 also indicates a positive relationship direction. Thus, H2, which states that the environmental management system positively affects carbon emission disclosure, is accepted.

The results of this study are in line with the legitimacy theory, which explains that companies strive to gain legitimacy from various parties, including society, government, and other stakeholders (Dowling and Pfeffer, 1975). ISO 14001, an international standard for environmental management systems, is considered a symbol of a company's commitment to better and responsible environmental management. Companies implementing ISO 14001 can demonstrate their efforts in managing environmental impacts, including reducing carbon emissions, through the certification. The standard encourages companies to monitor and manage carbon emissions from their operations systematically. This leads to more transparent disclosure of carbon emissions (Kurniawan et al., 2024). The findings in this study are consistent with the results of previous research by Iswati and Setiawan (2020), Jannah and Narsa (2021), and Widarjo et al. (2024), which reveal that the environmental management system has a positive influence on carbon emission disclosure.

Table 4: Results of panel data regression analysis

Variable	Coefficient	Standard error	t-statistic	Probability
C	−3.239365	1.261393	−2.568086	0.0117
KL	0.001443	0.000934	1.543850	0.1257
SML	0.235398	0.040467	5.817049	0.0000
KI	−0.175006	0.070012	−2.499653	0.0140
SIZE	0.123055	0.040766	3.018566	0.0032
ROA	−0.065578	0.068550	−0.956650	0.3410
LEV	−0.064124	0.103500	−0.619555	0.5369

Source: Processed Secondary Data, 2025

Table 5: Results of moderated regression analysis

Variable	Coefficient	Standard error	t-statistic	Probability
C	−2.766159	1.274751	−2.169959	0.0324
KL	0.001505	0.001057	1.424349	0.1575
SML	0.215569	0.041187	5.233979	0.0000
KI	−0.103226	0.089700	−1.150798	0.2526
ME	0.048944	0.073439	0.666463	0.5067
KL_ME	−0.000269	0.000714	−0.377610	0.7065
SML_ME	0.063785	0.036099	1.766930	0.0803
KI_ME	−0.079757	0.078655	−1.014010	0.3130
SIZE	0.105857	0.041209	2.568816	0.0117
ROA	−0.056552	0.067720	−0.835077	0.4057
LEV	−0.053545	0.103248	−0.518608	0.6052

Source: Processed Secondary Data, 2025

4.3. Institutional Ownership's effect on Carbon Emission Disclosure

The third hypothesis (H_3) in this study states that institutional ownership positively affects carbon emission disclosure. The results of hypothesis testing indicate that institutional ownership has a negative effect on carbon emission disclosure. This can be seen in the analysis of the institutional ownership variable, which has a probability value of 0.0140 and is smaller than the significance value of 0.05. Furthermore, this indicates a significant influence of institutional ownership on carbon emission disclosure. However, the regression coefficient value of −0.175006 indicates a negative relationship. Therefore, H3, which states that institutional ownership positively affects carbon emission disclosure, is rejected.

The hypothesis test results show that institutional ownership's negative influence on carbon emission disclosure contradicts the stakeholder theory view. According to this theory, companies

Table 6: Summary of hypothesis test results

No.	Hypothesis	Prediction direction PEK	Output			Results
			Direction of results	β	Probability	
1.	H_1=Environmental performance has a positive effect on carbon emission disclosure	+	-	0.001443	0.1257	Rejected
2.	H_2=Environmental management systems have a positive effect on carbon emission disclosure	+	+	0.235398	0.0000	Accepted
3.	H_3=Institutional ownership has a positive effect on carbon emission disclosure	+	-	−0.175006	0.0140	Rejected
4.	H_4=Media exposure can moderate the influence of environmental performance on carbon emission disclosure	+	-	−0.000269	0.7065	Rejected
5.	H_5=Media exposure can moderate by strengthening the influence of environmental management systems on carbon emission disclosure	+	-	0.063785	0.0803	Rejected
6.	H_6=Media exposure can moderate by strengthening the influence of institutional ownership on carbon emission disclosure	+	-	−0.079757	0.3130	Rejected

Source: Processed Secondary Data, 2025

are obliged to pay attention to and fulfil the interests of all stakeholders (Freeman, 1984). As one of the main stakeholders, institutional investors should encourage transparency practices, including disclosure of carbon emissions as part of corporate social responsibility. Institutions play an important role in pressuring companies to pay more attention to the issue of carbon emissions, which is one of the main concerns of the global community today. However, institutional investors are more focused on achieving short-term financial gains. They tend to put less pressure on companies to voluntarily disclose environmental information, such as carbon emissions, because they are considered not to provide direct economic benefits. The findings of this study, which show that institutional ownership has a negative effect on carbon emission disclosure, are in line with research conducted by Oyerogba et al. (2025) and Wahyuningrum et al. (2023).

4.4. The Media Exposure's Moderation Role on the effect of Environmental Performance on Carbon Emission Disclosure

This study's fourth hypothesis (H_4) states that media exposure can moderate by strengthening the influence of environmental performance on carbon emission disclosure. Based on the results of the hypothesis testing that has been carried out, it is known that media exposure cannot moderate by strengthening the influence of environmental performance on carbon emission disclosure. Furthermore, the regression coefficient value for the interaction between environmental performance and media exposure is −0.000269 with a probability value of 0.7065, greater than the significance limit of 0.05. This indicates that the interaction is not significant. Meanwhile, before being moderated by media exposure, the regression coefficient value for environmental performance was 0.001505 with a probability of 0.1575, which was also insignificant. Although the direction of the coefficient changed from positive to negative after the interaction, the change did not have a statistically significant effect. Thus, H_4, which states that media exposure can moderate by strengthening the influence of environmental performance on carbon emission disclosure, is rejected.

These findings are inconsistent with legitimacy theory, which states that companies will try to conform to social expectations through transparency practices and disclosure of information to gain or maintain legitimacy from the public. According to this theory, when the media magnifies environmental issues, companies should be encouraged to disclose more information related to carbon emissions as a form of accountability and an effort to maintain their image in the eyes of the public. However, the test results show that media pressure is not strong enough to influence disclosure decisions, indicating that legitimacy is not always the main driver in this context. The existence of media exposure does not directly influence companies to disclose carbon emissions, even though the company has shown good environmental performance. Companies do not feel enough public pressure to adjust their reporting strategies. Although the media can increase public scrutiny of a company's environmental performance, its existence does not have coercive power, like government agencies or regulators, so companies can choose to be selective about media pressure, especially if the news does not directly impact financial performance.

4.5. The Media Exposure's Moderation Role on the effect of Environmental Management Systems on Carbon Emission Disclosure

The fifth hypothesis (H_5) in this study states that media exposure can moderate by strengthening the influence of the environmental management system on carbon emission disclosure. Based on the hypothesis testing that has been done, it is known that media exposure cannot moderate, either strengthening or weakening, the influence of the environmental management system on carbon emission disclosure. The test results show that the value of the interaction regression coefficient between the environmental management system and media exposure is 0.063785 with a probability of 0.0803, which is greater than the significance of 0.05, meaning it is insignificant. Before the interaction, the environmental management system had a coefficient of 0.215569 with a probability value of 0.0000, which is smaller than the significance of 0.05, which means it is statistically significant. However, after being moderated by media exposure, its influence becomes insignificant. Thus, H5, which states that media exposure can moderate by strengthening the influence of the environmental management system on carbon emission disclosure, is rejected.

These findings are inconsistent with the legitimacy theory, which states that companies will be motivated to disclose social and environmental information in response to pressure from society and the media to gain or maintain legitimacy. The rejection of the fourth hypothesis shows that media exposure cannot moderate, either strengthening or weakening, the influence of the environmental management system on carbon emission disclosure. The ineffectiveness of this moderation is because the existence of the media does not guarantee effective pressure on companies to strengthen the influence of the environmental management system on carbon emission disclosure. This shows that social legitimacy through the media is weak, if not supported by intense external pressure, such as regulatory demands. Companies with a good environmental management system, namely ISO 14001 certification, consider that they have met the expectations of formal environmental legitimacy. Therefore, even though there is media attention to the issue of carbon emissions, companies do not feel the need to make additional disclosures because they have relied on the certification as a form of legitimate environmental responsibility.

4.6. The Media Exposure's Moderation Role on the effect of Institutional Ownership on Carbon Emission Disclosure

This study's sixth hypothesis (H_6) states that media exposure can moderate by strengthening the influence of environmental performance on carbon emission disclosure. The hypothesis test results show that media exposure cannot moderate, either strengthening or weakening, the influence of institutional ownership on carbon emission disclosure. The analysis results show that the regression coefficient value of the interaction between institutional ownership and media exposure is −0.079757 with a probability value of 0.3130, which is greater than the significance of 0.05, meaning it is insignificant. Before the interaction, the regression coefficient of institutional ownership was −0.103226 with a probability value of 0.2526, greater than the

significance of 0.05, which is also insignificant. The direction of the coefficient remains negative, both before and after moderation, but is not statistically strong enough to indicate a moderation effect. Thus, H_6, which states that media exposure can moderate by strengthening the influence of institutional ownership on carbon emission disclosure, is rejected.

These findings contradict the legitimacy theory, which states that companies will increase transparency and disclosure of information, including carbon emissions, to gain social support and maintain legitimacy in the eyes of the public. Media exposure cannot moderate the effect of institutional ownership on carbon emissions disclosure because media attention is not strong enough to change institutional investors' preferences and behavior in encouraging carbon emissions disclosure. The characteristics of institutional investors are that they are more focused on financial performance as the main priority. Suppose carbon emissions disclosure is not considered to impact financial performance or stock value directly. In that case, even media exposure will not be enough to motivate institutional investors to pressure companies to be more transparent in disclosing carbon emissions.

5. CONCLUSION AND RECOMMENDATIONS

The results of this study indicate that environmental performance has no significant effect on carbon emission disclosure. Environmental management systems positively influence carbon emission disclosure, while institutional ownership has a negative impact. Furthermore, media exposure does not moderate the effects of environmental performance, environmental management systems, or institutional ownership on carbon emission disclosure. Companies that have implemented internationally certified environmental management systems, such as ISO 14001, are encouraged to continue leveraging these certifications to enhance their credibility and increase carbon emission disclosure as part of their environmental responsibility. This recommendation is based on the empirical finding that environmental management systems significantly affect carbon emission disclosure.

The Adjusted R-squared value in this study is 88.17%, indicating that 11.83% of the variance in carbon emission disclosure remains unexplained and may be accounted for by other factors. Therefore, future research should expand and refine the model by incorporating additional independent variables to improve the explanatory power and gain a more comprehensive understanding of the determinants of carbon emission disclosure. This study has certain limitations, particularly in measuring the carbon emission disclosure variable, which is based on a checklist developed by the carbon disclosure project (CDP). Although this method is widely adopted in related research, it inherently involves a degree of subjectivity, as researchers must interpret the information disclosed by companies. As a result, the extent of carbon emission disclosure assessed may vary between studies, depending on each researcher's individual judgment and interpretation.

REFERENCES

Abdullah, M.W., Musriani, R., Syariati, A., Hanafie, H. (2020), Carbon emission disclosure in Indonesian firms: The test of media-exposure moderating effects. International Journal of Energy Economics and Policy, 10(6), 732-741.

Alma, I. (2022), Bertahun-tahun Menjadi Korban Pencemaran Lingkungan, Warga Sukoharjo dan Pekalongan Laporkan PT Rum dan PT Pajitex Sebagai Korporasi Pencemar Lingkungan Kepada KLHK, Komnas HAM, dan Komnas Perempuan. WALHI. Available from: https://www.walhi.or.id

Andriadi, K.D., Werastuti, D.N.S. (2023), Determinants of carbon emission disclosure: A study on non-financial public companies in Indonesia. Rnal Ilmiah Akuntansi, 8(1), 287-310.

Baer, H.A., Singer, M. (2016), Global Warming and the Political Ecology of Health. New York: Routledge.

Bedi, A., Singh, B. (2024), Does ownership structure affect carbon emission disclosure? Asian Review of Accounting, 33, 72-88.

Choi, B.B., Lee, D., Psaros, J. (2013), An analysis of Australian company carbon emission disclosures. Pacific Accounting Review, 25(1), 58-79.

Christoff, P. (2014), Four Degrees of Global Warming. London: Routledge.

Darnall, N., Henriques, I., Sadorsky, P. (2008), Do environmental management systems improve business performance in an international setting? Journal of International Management, 14(4), 364-376.

Dowling, J., Pfeffer, J. (1975), Organizational legitimacy: Social values and organizational behavior. The Pacific Sociological Review, 18(1), 122-136.

Falloon, P. (2010), Global warming and climate change: Ten years after Kyoto and still counting. Journal of Environmental Quality, 39(3), 1115.

Freeman, R.E. (1984), Strategic Management: A Stakeholder Approach. Boston: Pitman.

Gamerschlag, R., Moller, K., Verbeeten, F. (2011), Determinants of voluntary CSR disclosure: Empirical evidence from Germany. Review of Managerial Science, 5, 233-262.

Harvey, L.D.D. (2016), Global Warming The Hard Science. Oxford: Oxford University Press.

Hidayat, I., Ismail, T., Taqi, M., Yulianto, A.S. (2022), Investigating the disclosure of carbon emissions: Influencing the elements using panel data. Jurnal Reviu Akuntansi Dan Keuangan, 12(2), 721-732.

Ika, S.R., Puisi, P., Vitaningsih, C.W., Ducati, D., Widiagdo, A.K. (2024), Carbon Emission Disclosure in the Agriculture Industry in Indonesia: The Determinant Factors. In: IOP Conferences Series: Earth and Environmental Science.

Ika, S.R., Yuliani, Y., Okfitasari, A., Widagdo, A.K. (2022), Factors Influencing Carbon Emissions Disclosures in High-Profile Companies: Some Indonesian Evidence. In: IOP Conferences Series: Earth and Environmental Science.

Iswati, S., Setiawan, P. (2020), Green earth: Carbon emission, ISO 14001, governance structures, military connected from the manufacturing industries in Indonesia. Journal of Accounting and Investment, 21(1), 1-18.

Jannah, A.N.K., Narsa, I.M. (2021), Factors that can be predictors of carbon emissions disclosure. Jurnal Akuntansi, 25(1), 70-84.

Khare, N. (2024), Polar Ice and Global Warming in Cryosphere Regions. Boca Raton: CRC Press.

Kholmi, M., Karsono, A.D.S., Syam, D. (2020), Environmental performance, company size, profitability, and carbon emission disclosure. Jurnal Reviu Akuntansi Dan Keuangan, 10(2), 349-358.

Kurniawan, R.R., Widagdo, A.K., Ika, S.R. (2024), Determinants of carbon emission disclosure: Study of Indonesian stock exchange mining companies. E3S Web of Conferences, 01003, 577.

Li, W., Zhang, R. (2010), Corporate social responsibility, ownership structure, and political interference: Evidence from China. Journal of Business Ethics, 96, 631-645.

Luo, L., Tang, Q. (2014), Does voluntary carbon disclosure reflect underlying carbon performance? Journal of Contemporary Accounting and Economics, 10(3), 191-205.

Manurung, D.T.H., Hidayah, N., Setiany, E., Saputra, K.A.K., Hapsari, D.W. (2023), Does carbon performance and green investment affect carbon emission disclosure? Journal of Environmental Accounting and Management, 10(4), 335-344.

Melnyk, S.A., Sroufe, R.P., Calantone, R. (2003), Assessing the impact of environmental management systems on corporate and environmental performance. Journal of Operations Management, 21, 329-351.

Naeem, N., Cankaya, S., Bildik, R. (2022), Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets. Borsa Istanbul Review, 22, S128-S140.

Nisak, K., Yuniarti, R. (2018), The Effect of Profitability and Leverage on the Carbon Emission Disclosure on Companies That Registered Consecutively in the Sustainability Reporting Award Period 2014-2016. In: IOP Conferences Series: Earth and Environmental Science.

Okeke, L.N., Ezejiofor, R.A., Okoye, N.J. (2021), Leverage and cash ratio: An empirical study of conglomerate firms in Nigeria. American Journal of Contemporary Management Sciences Research, 2021, 76-84.

Oyerogba, E.O., Olugbenro, S.K., Omojola, S.O., Wright, O., Aregbesola, O.D., Akinsola, T.O., Amu, I. (2025), The role of ownership structure on carbon emission disclosure quality of the listed oil and gas companies in Nigeria. International Journal of Energy Economics and Policy, 15(1), 25-35.

Pirzada, K., Zulkhairi, M., Mustapha, B., Wickramasinghe, D. (2015), Firm performance, institutional ownership and capital structure: A case of Malaysia. Procedia-Social and Behavioral Sciences, 211, 170-176.

Pratiwi, L., Maharani, B., Sayekti, Y. (2021), Determinants of carbon emission disclosure: An empirical study of Indonesian manufacturing companies. The Indonesian Accounting Review, 11(2), 197-207.

Puspita, M.E., Ratmono, D., Tantri, M., Julianto, Y., Ridhasyah, R. (2024), Carbon emission accounting disclosure: An empirical analysis during the COVID-19 pandemic period in a developing country. International Journal of Energy Economics and Policy, 14(2), 37-45.

Putranti, T.M., Imansyah, M.H. (2017), The change of CO_2 emission on manufacturing sectors in Indonesia: An input-output analysis. AIP Conference Proceedings, 1918(1), 020005.

Reenen, J.V., Aghion, P., Zingales, L. (2013), Innovation and institutional ownership. American Economic Review, 103(1), 277-304.

Riantono, I.E., Sunarto, F.W. (2022), Factors affecting the intentions of Indonesian companies to disclose carbon emissions. International Journal of Energy Economics and Policy, 12(3), 451-459.

Sam, A.G., Song, D. (2022), ISO 14001 certification and industrial decarbonization: An empirical study. Journal of Environmental Management, 323, 116169.

Saputro, B.T., Basuki, B. (2019), Carbon emission disclosure in manufacturing companies in Indonesia. Indian Journal of Public Health Research and Development, 10(6), 1422-1427.

Schaltegger, S., Wagner, M. (2006), Managing sustainability performance measurement and reporting in an integrated manner. Sustainability accounting as the link between the sustainability balance scorecard and sustainability reporting. Sustainability Accounting and Report, 55, 376-390.

Shao, J., He, Z. (2022), How does social media drive corporate carbon disclosure? Evidence from China. Frontiers in Ecology and Evolution, 8, 1-16.

Singhania, M., Bhan, I. (2024), Firm ownership structure and voluntary carbon disclosure: A systematic review and meta-analysis. Sustainability, Accounting, Management, and Policy Journal, 2040-8021. doi: 10.1108/SAMPJ-08-2023-0613

Solikhah, B., Wahyuningrum, I.F.S., Yulianto, A., Sarwono, E. (2021), Carbon Emission Report: a Review based on Environmental Performance, Company Age, and Corporate Governance. In: IOP Conferences Series: Earth and Environmental Science.

Trumpp, C., Guenther, T. (2017), Too little or too much? Exploring U-shaped relationships between corporate environmental performance and corporate financial performance. Business Strategy and the Environmental, 26(1), 49-68.

Ulupui, I.G.K.A., Maruhawa, D., Purwohedi, U., Kiswanto. (2020), Carbon emission disclosure, media exposure, environmental performance, characteristics of companies: Evidence from non-financial sectors in Indonesia. Journal of Accounting and Auditing: Research and Practice, 2020, 628159.

Ummah, Y.R., Setiawan, D. (2021), Do board of commissioners characteristics and international environmental certification affect carbon disclosure? Evidence from Indonesia. Jurnal Dinamika Akuntansi Dan Bisnis, 8(2), 215-228.

Wahyuningrum, I.F.S., Hidayah, R., Ihlashul'amal, M., Sriningsih, S., Setyadharma, A. (2023), The practice of disclosing carbon emissions in developing countries: Evidence from Indonesia. E3S Web of Conferences, 448, 03017.

Wahyuningrum, I.F.S., Ihlashul, M., Utami, S., Djajadikerta, H.G. (2024), Determinants of carbon emission disclosure and the moderating role of environmental performance. Cogent Business and Management, 11(1), 2300518.

Widarjo, W., Sudaryono, E.A., Kurniawati, E.M., Putra, A.A., Wibawa, B.A. (2024), Carbon emission disclosure by non-financial companies in Indonesia: A perspective of stakeholder theory. Jurnal Akuntansi Dan Bisnis, 24(1), 18-30.

Widyastuti, A., Cahyani, S.E., Ulum, I. (2023), The moderating role of environmental performance in the effect of profitability, liquidity, and growth opportunities for disclosure on carbon emission. Jurnal Ilmiah Akuntansi, 8(1), 167-190.

Wisevator. (2023), CO_2 Emissions by Country. Available from: https://wisevator.com/country-rankings/co2-emission-by-country

Zahrani, H.A. (2024), Pencemaran Oleh Pabrik Sawit PT BMB di Kecamatan Mahuning, Gunung Mas. Netralnews.Com. Available from: https://www.netralnews.com