

# WHO'S WATCHING? THE ROLE OF OWNERSHIP AND MEDIA IN DRIVING CARBON EMISSION DISCLOSURE

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## Abstract

**Background:** Global climate change driven by carbon emissions is at a critical stage. Business-sector operations are among the primary contributors to this trend. Therefore, companies are expected to demonstrate responsibility by revealing information related to carbon footprint. Factors that may influence carbon emission disclosure (CED) include ownership structure and media exposure.

**Objective:** This study empirically analyzed the effect of ownership structure and media exposure on corporate CED.

**Research Methods:** The population comprised energy-sector entities officially registered on the Indonesia Stock Exchange (IDX) throughout the 2019–2023 period. This sector is among the primary contributors to the country's carbon emissions. A total of 287 observations were selected from 73 companies through purposive sampling and analysis was conducted through multiple linear regression analysis.

**Research Results:** Government ownership and media exposure had a significant positive effect on CED. Meanwhile, institutional, managerial, foreign, and concentrated ownerships did not show a substantial relationship with the disclosure. These results confirmed that each type of ownership structure had a varying effect on disclosure practices. Furthermore, media exposure had proven to be an essential factor in promoting greater transparency in CED.

**Originality/Novelty of Research:** This study examines five ownership structures: institutional, managerial, concentrated, foreign, and government ownership, while incorporating media exposure as an independent variable.

**Keywords:** carbon emissions disclosure (CED), energy sector, media exposure, ownership structure

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## Introduction

In recent years, environmental issues are gaining public attention worldwide. (Qosasi et al., 2022). An environmental phenomenon currently faced by organizations is climate change (Abbas et al., 2023), with carbon emissions being a major driving factor (Ika et al., 2022). Following the onset of industrialization in the eighteenth century, anthropogenic activity has raised CO<sub>2</sub> levels in the atmosphere by 50% over a span of under 200 years (NASA, 2024).

Companies contribute significantly to carbon emissions and are expected to be more responsible for their business operations (Ika et al., 2022). In the context of mitigation, prior research highlights the importance of reporting information on carbon emissions (Cohen et al., 2023; Safiullah et al., 2022). This

is a scheme that entities can implement to meet stakeholders' interests by increasing transparency and accountability (Solikhah et al., 2021).

Accounting provides rules and guidelines to support transparency and accountability in CED. An example is a rule issued by the IFRS Foundation, which identifies Non-Financial Reporting as a global baseline for sustainability reporting. NFR comprises the disclosure of environmental information, including carbon emission, through frameworks including the Carbon Disclosure Project (CDP) (Shauki, 2022). At the national level in Indonesia, there are also statutory provisions obligating companies to disclose information on carbon emissions. This includes Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 which governs the implementation of Sustainable Finance and SEOJK No. 16 of 2021..

In 2023, Indonesia ranked 8th among countries contributing to global greenhouse gas emissions. (Friedrich et al., 2023). According to a 2022 study by the Ministry of National Development Planning, the energy and transportation sectors were the most significant contributors, accounting for 50.6% of total emissions in 2022 (Fitria, 2024). Indonesia has committed to participating in efforts to combat climate change. (Bappenas, n.d.). However, the CED rate of the country ranks fourth at 44% based on information published by the Global Reporting Index ASEAN (GRI ASEAN) (Yulius et al., 2022). Therefore, researching CED in Indonesia is important.

Systematic literature review was performed using the Scopus database with the keyword "carbon emission disclosure" on November 2, 2024. The results identified 114 articles with only 21 on ownership structure. Among 21 articles, a more detailed systematic literature review was carried out, revealing that 16 of them used ownership structure as an independent variable, with different results. (Bedi & Singh, 2024; Ika et al., 2022; Solikhah et al., 2021; Ika et al., 2024; Wahyuningrum et al., 2024; Riantono & Sunarto, 2022; Darlis et al., 2020; Rama et al., 2020; Hermawan et al., 2018; Abbas et al., 2023; Qosasi et al., 2022; Kim et al., 2021; Putra & Lindrianasari, 2024; Park et al., 2023; Yustina et al., 2024; Fransisca et al., 2024). Therefore, studies analyzing the effect of license structure on CED remain limited, and existing results are inconsistent.

Given this description, research exploring how ownership structure impacts CED practices is still pertinent. Furthermore, the ownership structure variable is important to study as a factor that influence corporate decisions on climate change disclosure (Al Amosh & Mansor, 2021). To enrich the results, another variable such as media exposure was included (Darlis et al., 2020; Ulupui et al., 2020; Saputro & Basuki, 2019; Wahyuningrum et al., 2024; Wedi et al., 2016). Media exposure is an important variable, as rapid advances in technology and information have made it a critical factor in deciding the extent of CED (Ulupui et al., 2020).

The following section explains the factors expected to influence CED, namely the independent and control variables. The independent variables comprise five dimensions of ownership structure and media exposure. Recognizing these factors emphasizes their importance and relevance in understanding corporate transparency (Faisal et al., 2018; Velte, 2025). State-owned companies are under greater public scrutiny and are expected to act as role models, thereby motivating the disclosure of information on carbon emissions (Faisal et al., 2018; Velte, 2025). Meanwhile, managerial ownership denotes the percentage of equity controlled by the management team. The correlation between the priorities of managers with the long-term sustainability of a company can serve as motivation for the provision of more environmental disclosure, but the relationship remains ambiguous (Darlis et al., 2020; Velte, 2025).

Concentrated ownership is characterized by shares being controlled by a small group of shareholders. Depending on the entrenchment incentives of controlling shareholders, high concentration can foster long-term decisions geared toward decarbonization or reduce the pressures for accountability and weaken the incentives for disclosure (Yeh & Liao, 2024; Wei et al., 2024). Foreign ownership denotes the proportion of equity held by foreign investors, who often impose greater environmental governance expectations based on the standard of their home countries (Dyck et al., 2019; Meutia et al., 2017). Institutional ownership, reflected by the shares held by companies capable of enhancing corporate governance and encouraging public reporting, is the ownership dimension most commonly associated with carbon disclosure (Darlis et al., 2020; Velte, 2025). Finally, media exposure indicates how much a company's actions are covered by the media. Greater coverage increases public scrutiny and compels the CED data (Ulupui et al., 2020; Wedi et al., 2016).

The analysis includes three control variables to emphasize their importance in isolating the effect of the independent variables. Company size is expected to be positively related to disclosure because larger firms attract heightened public attention and possess more resources to report environmental information (Hermawan et al., 2018). Profitability measured by return on assets is positively associated with disclosure. Highly profitable companies have greater capacity to absorb costs and have a stronger incentive to maintain a good public image (Ulupui et al., 2020). Leverage is indicated by the debt-to-asset ratio, which reflects the degree to which an entity depends on debt funding. It is included to control the effect of capital structure on disclosure decisions (Putri Danduru et al., 2024). The above description encourages greater learning about "Who's Watching? The Role of Ownership and Media in Driving Carbon Emission Disclosure."

## **Literature Review**

Governments have political, economic, and social objectives that must be fulfilled, and regulations are established to protect the public. (Habbash, 2016). Companies with significant government ownership are typically expected to adopt a community-focused approach, as they need to set a good example in the business sector. (Lau et al., 2016). This is realized through government ownership, which motivates information scope expansion to the public as key stakeholders. (Muttakin & Subramaniam, 2015).

Stakeholder theory suggests that reporting on environmental issues should align with government requirements for environmental activities. (Faisal et al., 2018). Substantial shareholders, especially with government ownership, tend to provide oversight that improves climate change mitigation governance. (Fransisca et al., 2024). Furthermore, government ownership can prompt company management to give greater consideration to key government policies related to politics and the environment when conducting business. (Lin & Nguyen, 2022).

Yustina et al. (2024), Fransisca et al. (2024), and Hermawan et al. (2018) identified a positive correlation between government ownership and CED. Government ownership enhances company governance policies, which encourages voluntary disclosure of information about the company's carbon-emission policies (Yustina et al., 2024). Companies owned by the government will face greater public pressure, leading to the frequent disclosure of social information, including carbon emissions. (Fransisca et al., 2024). Rooted in stakeholder theory, governments as dominant shareholders naturally push the companies they own to be more transparent, making it more likely that those companies will openly disclose their carbon emissions to the public. Accordingly, the hypothesis is stated as:

**H1:** *Government ownership has a positive effect on CED.*

Stakeholder theory maintains that institutions operate not solely for their own gain but also to meet the expectations of other important stakeholders (Rama et al., 2020). Managerial shareholders are considered part of the internal organization, which usually corresponds with management approaches and claims (Nuhu & Alam, 2024). However, managerial ownership can still correlate the interests of internal stakeholders and shareholders (Lin & Nguyen, 2022). This is because company management should be in line with social and environmental norms due to community pressure. (Nuhu & Alam, 2024).

Managerial ownership encourages company management to enhance transparency in voluntary reporting, such as carbon emissions, through the incentive of a sense of ownership (Fransisca et al., 2024). It also discourages short-term decision-making in favor of sustainable corporate practices. (Elsayih et al.,

2018). Furthermore, managers who hold shares in the company often steer clear of high-risk decisions more than other managers. (Salehi et al., 2017).

Elsayih et al. (2018) reported that CED is positively influenced by managerial ownership. This type of ownership encourages transparency in terms of financial and non-financial information (Elsayih et al., 2018). The management responsibility is centred on running the company to realize the goals of shareholders, including themselves. (Wardhani & Samrotun, 2020). Grounded in stakeholder theory, managers who hold shares in their own company have a personal stake in its reputation, which naturally drives them to be more open and responsible in disclosing carbon emissions as part of their commitment to both shareholders and the broader community. Accordingly, the hypothesis is stated as:

**H2:** *Managerial ownership has a positive effect on CED.*

Investors holding concentrated shares significantly impact management decisions. (Al-Janadi et al., 2016). With reference to stakeholder theory, companies with concentrated ownership are inclined to reveal less detailed environmental information. This is because as majority shareholders, environmental issues not in line with the financial interests tend to be ignored (Jijian et al., 2021).

Companies with concentrated ownership can have conflicting impact against social and environmental concerns (Lin & Nguyen, 2022). This is because shareholders at high ownership levels often choose strategies that provide short-term financial gains and are less concerned with meeting environmental responsibilities (Chen et al., 2021). In an effort to maximize profits, shareholders at high ownership levels often prioritize self-interests over those of others. (Wei et al., 2024).

Study by Bedi & Singh (2024) identified that CED is negatively affected by concentrated ownership. This arises because concentrated shareholders tend to monopolize information that influences stakeholders' investment decisions (Bedi & Singh, 2024). Furthermore, highly concentrated ownership reduces the importance of social responsibility and accountability because public pressure for disclosure is comparatively limited (Kolsi, 2017). Viewed through the lens of stakeholder theory, when ownership is heavily concentrated, dominant shareholders tend to prioritize their own financial interests over broader stakeholder demands, making them less inclined to openly disclose carbon emissions information that could constrain their decision-making power. Accordingly, the hypothesis is stated as:

**H3:** *Concentrated ownership harms CED.*

Stakeholder theory provides the view that environmental disclosure can meet the expectations of foreign investors, thereby increasing confidence (Bedi & Singh, 2024). Foreign investors require companies to offer detailed environmental disclosures to assess risks and opportunities. (Ezhilarasi & Kabra, 2017).

They can oppose management decisions and encourage accountability for the economic, social, and environmental impacts of the company's activities (Rustam et al., 2019).

A higher level of foreign ownership may increase the pressure on company management to tackle social issues. (Lin & Nguyen, 2022). This is because foreign ownership is highly concerned with the environment, as investors exercise close oversight of company management in conducting social activities (Yani & Suputra, 2020). Based on this type of ownership, companies are encouraged to disclose environmental information, thereby fostering transparency, accountability, and trust (Setiawan et al., 2021).

Kim et al. (2021), Bedi & Singh (2024) discovered a positive link between foreign ownership and the CED. Foreign investors require companies to disclose environmental information to avoid related risks. (Kim et al., 2021). The investors also demand transparency, which tend to increase CED and reduce ambiguity. (Bedi & Singh, 2024). Drawing from stakeholder theory, foreign investors as environmentally conscious stakeholders naturally pressure companies to be more transparent about their carbon emissions to build trust and reduce uncertainty. Accordingly, the hypothesis is stated as:

**H4:** *Foreign ownership has a positive effect on CED.*

Institutional investors are generally viewed as more robust than individual investors (Bedi & Singh, 2024). The presence of institutional investors contributes to management oversight, which increases the effectiveness of corporate oversight (Darlis et al., 2020). Growing awareness of climate change and carbon-related issues among institutional organizations, including those in Indonesia, is reflected in their participation in carbon trading (Wahyuningrum et al., 2024). Furthermore, stakeholder theory offers insights into how institutional investors fit into company dynamics. It states that significant ownership enables the investors to promote carbon emissions reduction as an expression of environmental responsibility (Shiu & Yang, 2017).

Study by Bedi & Singh (2024), Ika et al. (2022), and Solikhah et al. (2021) showed that CED receives a positive boost from institutional ownership. This is driven by investors who require environmentally friendly business operations (Ika et al., 2022). Institutional ownership also leads to more optimal oversight of management (Solikhah et al., 2021).

Institutional investors exert greater influence than individual investors. (Bedi & Singh, 2024). As awareness of climate change and carbon emissions increases, institutional investors tend to demand greater information disclosure (Wahyuningrum et al., 2024). Stricter supervision (Solikhah et al., 2021) and stronger expectations for environmentally friendly company operations (Ika et al., 2022) further encourages CED. Grounded in stakeholder theory, institutional investors as powerful and environmentally conscious shareholders naturally drive companies to strengthen their carbon emissions disclosure through tighter

oversight and a growing demand for sustainable business practices. Accordingly, the hypothesis is stated as:

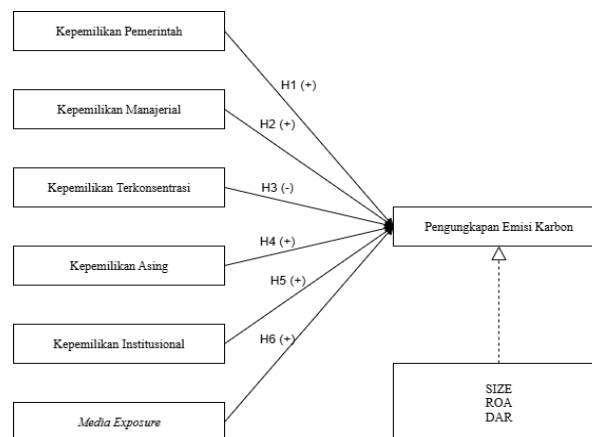
**H5:** *Institutional ownership has a positive effect on CED.*

Media is essential for communicating publicly available information about company operations. (Darlis et al., 2020). Stakeholder theory states that the media is essential in persuading companies to meet their social contracts (Ulupui et al., 2020). The media also shapes public opinion, prompting companies to use it to improve corporate reputation (R. Trianaputri, & D. Djakman, 2019).

Media reporting can exert social pressure on companies (Li et al., 2017). Greater *exposure* increases stakeholders demand for corporate information (Dienes et al., 2016). As stakeholders, the public uses the media to pressure companies to increase transparency in conveying environmental information (Sriningsih & Wahyuningrum, 2022).

Study by Wahyuningrum et al. (2024), Darlis et al. (2020), Ulupui et al. (2020), and Wedi et al. (2016) suggests that *media exposure* positively influence CED. When public attention on companies increases, it enhances response to public demands (Wahyuningrum et al., 2024). The media is also important in providing more information to elicit investor response, thereby increasing awareness of the need to publish sustainable environmental activities (Darlis et al., 2020). Companies that are frequently covered by the media are inclined to publish increasingly comprehensive disclosures pertaining to carbon emissions (Ulupui et al., 2020). Rooted in stakeholder theory, greater media exposure amplifies public pressure on companies, compelling them to be more transparent about their carbon emissions to meet stakeholder expectations. Accordingly, the hypothesis is stated as:

**H6:** *Media exposure has a positive effect on CED.*



**Figure 1. Research Framework**

## Research Methods

The population were energy sector companies listed on the IDX in the 2019-2023 period. Sample selection was determined by applying a *purposive sampling* method. The criteria considered were (1) listing on IDX in the period 2019-2023, (2) publication of an *Integrated Report (IR)*, *Sustainability Report (SR)*, or *Annual Report (AR)* between 2019 and 2023, (3) availability of complete information related to the study variables.

CED was the dependent variable and is measured based on criteria designed by (Choi et al., 2013). This measurement was divided into five groups, namely climate change risks and opportunities (CC), greenhouse gas (GHG) emissions calculations, energy consumption (EC) calculations, emission reduction efforts and related costs (RC), as well as carbon emissions accountability (ACC). In total, 18 indicator items were used to assess the level of corporate CED.

The independent variables include ownership structure and media exposure. Ownership structure variables such as government, managerial, concentrated, foreign, and institutional are measured by the proportion of shares controlled by the government (Bedi & Singh, 2024), the board of directors and company management (Darlis et al., 2020), substantial investors owning at least 5% (Ika et al., 2022), foreign shareholders (Kim et al., 2021), and institutions (Jaggi et al., 2018), respectively. Media exposure is quantified with a dummy variable, where a score of 1 indicates that the media reports on companies involved carbon emissions, and 0 means it does not (Darlis et al., 2020; Ulupui et al., 2020).

Control variables including company size, profitability, and leverage were measured by the natural logarithm of full assets (Rama et al., 2020), *Return on Assets (ROA)* (Ulupui et al., 2020), and *the Debt to Asset Ratio (DAR)* (Rama et al., 2020), respectively.

**Table 2. Variable Measurement**

| No. | Variable                        | Acronym   | Measurement Indicators                                                                |
|-----|---------------------------------|-----------|---------------------------------------------------------------------------------------|
| 1.  | Carbon Emissions Disclosure (Y) | CED       | $CED = \frac{\text{Total disclosure items}}{18} \times 100$                           |
| 2.  | Government Ownership (X1)       | GOV_OWN   | $Gov\_Own = \frac{\text{Government Ownership}}{\text{Outstanding share}} \times 100$  |
| 3.  | Managerial Ownership (X2)       | MAN_OWN   | $Man\_Own = \frac{\text{Managerial ownership}}{\text{Outstanding share}} \times 100$  |
| 4.  | Concentrated Ownership (X3)     | BLOCK_OWN | $Block\_Own = \frac{\text{Ownership above 5\%}}{\text{Outstanding share}} \times 100$ |

| No. | Variable                     | Acronym   | Measurement Indicators                                                                                                                                    |
|-----|------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.  | Foreign Ownership (X4)       | FOR_OWNS  | $For\_Own = \frac{Foreign\ ownership}{Outstanding\ share} \times 100$                                                                                     |
| 6.  | Institutional Ownership (X5) | INST_OWNS | $Inst\_Own = \frac{Institutional\ ownership}{Outstanding\ share} \times 100$                                                                              |
| 7.  | Media Exposure (X6)          | MED_EXP   | A value of 1 is given if there is media that publishes information about companies related to carbon emissions, and a value of 0 if the opposite is true. |
| 8.  | Company Size                 | SIZE      | $Size = \ln(Total\ asset)$                                                                                                                                |
| 9.  | Profitability                | ROA       | $ROA = \frac{Net\ Profit}{Total\ Asset} \times 100$                                                                                                       |
| 10. | Leverage                     | DAR       | $DAR = \frac{Debt}{Total\ asset}$                                                                                                                         |

### Data Analysis Method

Quantitative approach was adopted and processed the data in EViews 12. Furthermore, analysis was conducted using multiple linear regression as follows.

$$CED = \alpha + \beta_1 GOV\_OWN + \beta_2 MAN\_OWN + \beta_3 BLOCK\_OWN + \beta_4 FOR\_OWN + \beta_5 INST\_OWN + \beta_6 MED\_EXP + \beta_7 SIZE + \beta_8 ROA + \beta_6 DAR + \varepsilon \dots\dots\dots(1)$$

Explanation: CED is Carbon Emissions Disclosure,  $\alpha$  is Constant,  $\beta$  is Regression Coefficient, GOV\_OWNS is Government Ownership, MAN\_OWNS is Managerial Ownership, BLOCK\_OWNS is Concentrated Ownership, FOR\_OWNS is Foreign Ownership, INST\_OWNS is Institutional Ownership, MED\_EXP is Media Exposure, SIZE is Company Size, ROA is Return on Assets, DAR = Debt to Asset Ratio,  $\varepsilon$  is Error Data analysis was conducted in several stages, comprising descriptive statistical analysis, classical assumption testing, and hypothesis testing.

## Results and Discussion

### Result

Table 2 presents the sampling results in this study. The study used *unbalanced panel data* from 2019 to 2023 and the total population was 378. However, 91 data points did not meet the sampling criteria, leaving 287 observations.

**Table 2. Determination of Research Sample**

| No                                   | Sample Selection Criteria                                                                                                            | Year      |           |           |           |           | Total      |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|------------|
|                                      |                                                                                                                                      | 2019      | 2020      | 2021      | 2022      | 2023      |            |
| 1                                    | Number of energy sector companies on the IDX as of December 31, 2019-2023                                                            | 68        | 69        | 75        | 81        | 85        | 378        |
| 2                                    | Number of companies that do not publish a complete <i>integrated report</i> , <i>sustainability report</i> , or <i>annual report</i> | (13)      | (12)      | (11)      | (10)      | (10)      | (56)       |
| 3                                    | Number of companies that did not provide complete information related to the variables tested in the 2019-2023 period                | (8)       | (7)       | (7)       | (9)       | (4)       | (35)       |
| <b>Number of Annual Observations</b> |                                                                                                                                      | <b>47</b> | <b>50</b> | <b>57</b> | <b>62</b> | <b>71</b> | <b>287</b> |
| <b>Number of Observations</b>        |                                                                                                                                      |           |           |           |           |           | <b>287</b> |

Source: Eviews data processing results, 2025

**Descriptive Statistics****Table 3. Descriptive Statistical Analysis**

| Variable  | N   | Min       | Maximum    | Mean      | Std. Deviation |
|-----------|-----|-----------|------------|-----------|----------------|
| CED       | 287 | 0.00000   | 94.444440  | 28.939220 | 28.284910      |
| Inst_Own  | 287 | 0.000000  | 100.00     | 77.587940 | 22.708110      |
| Man_Own   | 287 | 0.00      | 76.130000  | 5.391786  | 13.788230      |
| Block_Own | 287 | 19.094000 | 100.000000 | 70.439930 | 17.849130      |
| For_Own   | 287 | 0.0000    | 98.858200  | 21.767430 | 23.301620      |
| Gov_Own   | 287 | 0.000000  | 5.420000   | 0.043446  | 0.359900       |
| Med_Exp   | 287 | 0.00000   | 1.000000   | 0.236934  | 0.425944       |
| Size      | 287 | 24.89148  | 33.82483   | 28.96288  | 1.766403       |
| ROA       | 287 | -73.29000 | 61.76      | 6.108603  | 15.05863       |
| DAR       | 287 | 0.000300  | 3.040000   | 0.472070  | 0.306754       |

Source: Eviews data processing results, 2025

CED, as a dependent variable, has an average, range, and standard deviation of 28.9392, 94.4444 to 0.0000, and 28.2849, respectively. This indicates that, on mean, energy sector companies documented on the IDX disclose about 28.94% of their carbon emissions information. Some did not report any information, including PT MNC Energy Investments Tbk in 2023.

Descriptive statistical analysis revealed that institutions held a 77.59% ownership share in energy sector companies recorded on the IDX, with ownership concentration at 70.44%. This level aligns with Ismail et al. (2018), who observed that developing countries tend to have higher ownership concentration compared to developed nations, where company shares are spread among numerous shareholders. The final independent variable is media exposure, which had a min value of 0.0000 for PT Alfa Energi Investama Tbk 2023 and a max of 1.0000 for PT AKR Corporindo Tbk, with an mean of 0.2369 and a standard deviation (SD) of 0.4259. This showed that PT Alfa Energi Investama Tbk had not received media coverage related to the carbon-emission policies, while PT AKR Corporindo received the opposite. The level of media exposure was only 23.69%, and some companies have received none.

The control variable, namely company size, had a minimum value, maximum value, an average, and a standard deviation of 24.8915, 33.8248, 28.9629, and 1.7664, respectively. The minimum value was identified in PT Perdana Karya Perkasa Tbk, 2021, which occurred due to a 5.91% decrease in total assets. Meanwhile, the maximum value was identified in PT Astrindo Nusantara Infrastruktur Tbk, 2022. This was influenced by the acquisition of PTT Mining Ltd in response to opportunities in the coal industry.

Profitability (ROA) ranged from -73.2900 to 61.7600 with an average of 6.1086 and a standard deviation of 15.0586. The minimum value was identified in PT Ratu Prabu Energi Tbk, 2020, due to significant losses and a 52.23% decline in assets. Meanwhile, the maximum value was identified in PT Golden Energy Mines Tbk, 2022, due to a 96.67% surge in profits compared to the previous year. *Leverage* (DAR) ranged from 0.0003 to 3.0400, with an average of 0.4721 and a standard deviation of 0.3066. The minimum value was observed in PT Sumber Energi Andalan Tbk, 2019, driven by a decrease in liabilities due to improved management efficiency. The maximum value was observed in PT Capitol Nusantara Indonesia Tbk, 2022, driven by a larger decrease in assets than in liabilities.

### **Hypothesis Testing**

The first step in data processing was selecting a regression model. The test results showed that the random-effect model was the best fit. After selecting the regression model, classical assumption tests were conducted. These include tests for normality, autocorrelation, multicollinearity, and heteroscedasticity. The results showed that the study data passed the classical assumption tests.

The *adjusted R-squared* value was 0.4006 (40.06%), suggesting that the independent and controlled variables explained 40.06% of the CED variable. The remaining 59.94% was explained by factors not discussed in this study. Table 5 showed that the probability value (F-statistic) was 0.0000, below the  $\alpha =$

0.05 level. These results reflect that the independent and control variables jointly influenced CED and the model used in the study was appropriate.

**Table 4. Results of Multiple Linear Regression Test  
(Random Effect Model)**

| Variable                        | Coefficient | Std. Error | t-Statistic | Prob.     |
|---------------------------------|-------------|------------|-------------|-----------|
| C                               | -197.5411   | 32.38384   | -           | 0.0000    |
| Gov_Own                         | 7.517032    | 3.056111   | 2.459672    | 0.0073*** |
| Man_Own                         | -0.016323   | 0.114320   | -           | 0.4433    |
| Block_Own                       | 0.033740    | 0.097601   | 0.345697    | 0.3649    |
| For_Own                         | 0.033781    | 0.062889   | 0.537154    | 0.2958    |
| Inst_Own                        | -0.081078   | 0.072709   | -           | 0.1329    |
| Med_Exp                         | 19.09575    | 2.821461   | 6.768038    | 0.0000*** |
| Size                            | 7.752015    | 1.080674   | 7.173314    | 0.0000*** |
| Profitability                   | 0.182838    | 0.091526   | 1.997665    | 0.0234**  |
| DAR                             | -0.978817   | 4.385236   | -           | 0.4118    |
| Adjusted R-Squared              | 0.400619    |            |             |           |
| Probability (F-Statistic)       | 0.0000      |            |             |           |
| <b>Chow Test</b>                |             |            |             |           |
| Cross-section Chi-Square Prob.  | 0.0000      |            |             |           |
| <b>Hausman Test</b>             |             |            |             |           |
| Cross-section random Prob.      | 0.2441      |            |             |           |
| <b>Lagrange Multiplier Test</b> |             |            |             |           |
| Breusch Pagan                   | 0.0000      |            |             |           |

\*\*: 5%, \*\*\*: 1%

Source: EvIEWS data processing results, 2025

## **Discussion**

### **The Effect of Government Ownership on CED**

The government ownership variable had a probability of 0.0073 with a coefficient of 7.5170. This indicated that government ownership positively influences CED. The outcome aligns with stakeholder theory, stating that reports regarding the environment can meet government demands for environmental activities (Faisal et al., 2018). In confirmation, Fransisca et al. (2024), Saeed et al. (2024), Yustina et al. (2024) showed that CED was positively affected by government ownership. Fransisca et al. (2024) argue that the positive effect was attributed to the higher pressure and expectations from the public. Consequently, government-owned companies often serve as unwitting role models for others. These high public expectations enhance the reporting of company social responsibility information, including CED (Fransisca et al., 2024).

Government-owned business entities operate under strict supervision and accountability, ensuring transparent reporting on environmental risks and impacts (Saeed et al., 2024). This condition showed that higher government ownership will motivate active publication of information pertaining to carbon emissions. (Yustina et al., 2024). The government is the primary driver of companies' attention to CED (Hermawan et al., 2018). This type of ownership compels companies to act in accordance with laws and regulations governing the disclosure practice (Yustina et al., 2024). Even though CED in Indonesia remains voluntary (Riantono & Sunarto, 2022), government ownership will serve as encouragement to companies.

### **The Effect of Managerial Ownership on CED**

Managerial ownership had a probability of 0.4433 and a coefficient of -0.0163, signifying a lack of correlation with CED. This result is aligned with the results of Darlis et al. (2020), Fransisca et al. (2024), Salehi et al. (2017), and Solikhah et al. (2021), who observed no correlation between managerial ownership and CED. Darlis et al. (2020) stated that this type of ownership does not necessarily improve environmental performance reporting. Salehi et al. (2017) stated that managerial ownership does not affect CED. This is because managers focus on mandatory disclosures required by regulatory bodies and policymakers, such as the Stock Exchange, rather than the voluntary counterpart.

### **The Effect of Concentrated Ownership on CED**

Concentrated ownership had a probability value of 0.3649 and a coefficient of 0.0337, signifying a lack of correlation with CED. This result is corroborated through the research by Ika et al. (2022) and Wei et al. (2024), where no relationship was observed. This is because a high proportion of concentrated ownership will lead to less concern for accountability, thereby limiting the motivation to participate in

environmental information disclosure (Wei et al., 2024). Furthermore, companies with concentrated ownership may feel no need to disclose environmental activities to external parties (Muttakin & Subramaniam, 2015). This is because external parties or other investors are a minority group. Therefore, companies are not very active in environmental disclosure to avoid the associated costs (Muttakin & Subramaniam, 2015). Chen et al. (2021) argue that when a company's resources are limited, major shareholders are more tend to choose strategies capable of generating significant financial returns and place less emphasis on environmental responsibility.

### **The Effect of Foreign Ownership on CED**

Foreign ownership showed a probability of 0.2958 and a coefficient of 0.0338, indicating no significant impact on CED. The result corresponds with Putra & Lindrianasari (2024) and Ika et al. (2022), who identified no correlation. Geographical distance between investors and company locations, differences in policies, and variations in decision-making reduce the effect of foreign ownership on CED to be insignificant (Putra & Lindrianasari, 2024). The origin country of foreign investors may influence their attitudes toward environmental issues, thereby limiting the effect of foreign ownership on environmental revelation (Meutia et al., 2017). Dyck et al. (2019) propose that European foreign investors significantly enhance environmental and social performance, while investors from other regions have minimal or no impact.

### **The Effect of Institutional Ownership on CED**

Institutional ownership has a 0.1329 probability and a coefficient of  $-0.0811$ , suggesting it doesn't significantly affect CED. This finding aligns with previous reports by Darlis et al. (2020), Hermawan et al. (2018), Halimah and Yanto (2018), Rama et al. (2020), Riantono and Sunarto (2022), Ika et al. (2024), and Wahyuningrum et al. (2024), all of which found no significant link between institutional ownership and CED. Institutional ownership enhances corporate oversight which primarily aims to maximize shareholder wealth rather than promote CED (Darlis et al., 2020), (Rama et al., 2020). The insignificant effect may also reflect limited institutional concern for environmental issues, reducing the perceived importance of carbon emission reduction for long-term profitability (Wahyuningrum et al., 2024).

### **The Effect of Media Exposure on CED**

The probability value for media exposure is 0.0000, with a coefficient of 19.0958, signifying a positive correlation between media exposure and CED. This corresponds with stakeholder theory, which view the media as exerting pressure on companies to meet the social contracts with various stakeholders

(Ulupui *et al.*, 2020). The media may prompt companies to disclose their environmental activities in order to elicit positive responses from stakeholders (Wedi *et al.*, 2016). Media exposure increases CED practices due to higher public scrutiny (Wahyuningrum *et al.*, 2024).

Darlis *et al.* (2020), Ulupui *et al.* (2020), Wahyuningrum *et al.* (2024), and Wedi *et al.* (2016) stated that carbon emission disclosure is positively affected by *media exposure*. Darlis *et al.* (2020) explain that the media is important for providing investors with more information, thereby increasing companies' awareness of the need to disclose environmental sustainability activities. Rapid advances in technology and information encourage businesses to disclose more details concerning their carbon emissions (Ulupui *et al.*, 2020). This is attributable to the fact that advances in technology and information intensifies media attention on companies, thereby increasing the motivation to disclose information (Ulupui *et al.*, 2020).

### **The Effect of Control Variables (Firm Size, Profitability, and Leverage)**

The partial regression test results showed that the company size control variable had a p-value of 0.0000 and a coefficient of 7.7520 (Table 5). This suggest that company size was positively correlated with CED. Large companies are generally under greater public scrutiny and stakeholder oversight, creating stronger incentive to voluntarily disclose high-quality environmental information (Hermawan *et al.*, 2018).

Profitability has a p-value of 0.0234 and a coefficient of 0.1828, suggesting a positive correlation with CED. This result showed that higher company profit lead to optimal carbon emissions reporting intensity. Business entities with strong financial performance are typically more proactive in disclosing information related to emissions, to cultivate a positive image and increase public trust, which supports the operational sustainability (Ulupui *et al.*, 2020).

*Leverage*, has a probability of 0.4118 and a coefficient of -0.9788, suggesting no correlation with CED. The results showed that a company's leverage level does not significantly affect CED practices. Environmental information reporting is not solely influenced by financial structure but is also determined by the ethical commitment and moral principles management upholds in performing corporate social responsibility. (Putri Danduru *et al.*, 2024).

## **Conclusion**

In conclusion, this study examined how ownership structure and media exposure influence CED practices among energy sector companies documented on the IDX from 2019 to 2023. The independent variables include government, managerial, foreign, concentrated, and institutional ownership, as well as media exposure. Company size, profitability, as well as leverage were the control variables.

Government ownership and *media exposure* had a positive impact on carbon emissions reporting practices. These variables an important roles in promoting transparency around carbon emissions. Increased media exposure encouraged companies to improve the disclosure of information related to carbon emission.

Managerial, concentrated, foreign, and institutional ownerships had no effect on CED. These variables were not confirmed as driving factors for CED. Changes in the proportions of managerial, concentrated, foreign, and institutional ownerships predented no significant effect.

Control variables, such as company size and profitability, are positively associated with CED. This implied that the larger a company's operations, the higher its profits and greater the tendency of disclosing the required information. Companies with small assets and low profitability tend to have limited disclosure levels. Meanwhile, leverage presented no significant effect, signifying that a business organization's debt level does not determine its choice to report carbon emissions.

The results described were expected to make a positive contribution both practically and theoretically. In practice, the results serve as a reference for investors assessing the feasibility of investments in the energy sector. The quality of companies' environmental information disclosure, particularly CED should be considered, as a form of accountability for sustainability issues. For companies in the energy sector, the results can serve as strategic input to improve environmental transparency, respond to stakeholder demands, and strengthen the company's public image.

Theoretically, this study enrich stakeholder theory, especially within the realm of environmental information disclosure. The discovery of a substantial effect of government ownership on CED reinforced the view that stakeholders from both internal and external environments play an pivotal role in encouraging corporate openness practices. The positive effect of media exposure on CED confirmed the ability of the media to exert social pressure through greater public scrutiny of corporate activities. High exposure increased demands for accountability and transparency, thereby encouraging companies to voluntarily disclose valuable information to the public and investors.

The results reinforced the relevance of *stakeholder* theory in explaining carbon emission disclosure practices. It also expand the theoretical scope that shows the importance of interactions between internal company factors, namely ownership structure, and external influences, including *media exposure*, in shaping corporate transparency behavior.

This study has a number of constraints requiring attention. First, the sources of carbon-emission disclosure data remain inconsistent, with the use *annual*, *integrated*, or *sustainability reports*. This is because, during the 2019-2023 period, many companies had not published *sustainability reports*. Future

study is expected to collect data consistently, by using sustainability reports as the sole data source given the comprehensive nature.

Second, the study used publicly available secondary data, while internal company information on carbon emissions and the management's perceptions of the environment were not considered. This is because the sample companies were not accessible in this regard. Future investigation could also consider direct collaboration with the sample companies to obtain internal information and in-depth details regarding management's perceptions of the environment. Finally, data on ownership structure were collected only from annual reports, without further investigation into *ultimate ownership*. Therefore, future study could also investigate *ultimate ownership*.

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### **Author's Contribution**

Intan Permata Sari and An Nurrahmawati contributed equally to this work. Both authors were jointly involved in the conceptualization of the study, the development of the research design and methodology, data collection and curation, formal analysis and interpretation of the results, and the preparation of the original draft as well as its review and editing. Both authors have read, critically revised, and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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### **Conflicts of Interes**

There is no conflict of interest disclosed by the writers. The funders were not involved in the study's design, data collection, analysis, or interpretation, manuscript writing, or decision to publish the findings.

### **Declaration about Generative AI Tools**

The authors declare that no generative artificial intelligence (AI) tools or AI-assisted technologies were used at any stage of this study. The research design, data collection, data processing, statistical analysis, interpretation of the results, and the writing of this manuscript were carried out entirely by the authors. No generative AI tool was used to generate, summarize, paraphrase, translate, or edit any part of the text, tables, or figures presented in this article. The authors take full responsibility for the integrity, originality, and accuracy of the entire content of this manuscript.