THE FACTORS CAN BE AFFECTING TO CARBON EMISSION DISCLOSURE
(STUDY ON ENERGY SECTOR COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE IN 2019-2021)

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Abstract. Carbon Emission Disclosure is one part of environmental disclosure is means of information and a form of corporate responsibility for the environment where corporate activities. With the increasing intensity of carbon emissions in Indonesia and pressure from the public, environmental disclosure also includes carbon emission disclosure resulting from company activities, but this report is still voluntary. So that many companies do not report on carbon emission disclosure. This purpose of this research is to determine the impact of profitability, company size, environmental performance and institutional ownership on carbon emission disclosure in energy sector companies listed on the Indonesia Stock Exchange in 2019-2021. The methodology that was employed is quantitative, and the research sample was acquired over a three-year period utilizing a purposive sampling strategy and 11 firms. The analysis used is descriptive statistical analysis and panel data regression analysis using the Eviews 12 application. The study results show profitability, company size, environmental performance and institutional ownership simultaneously affect carbon emission disclosure. Partially, profitability, environmental performance and institutional ownership have no effect on carbon emission disclosure, while company size has a positive effect on carbon emission disclosure.

Keywords: carbon emission disclosure; environmental disclosure; environmental performance; institutional ownership

I. INTRODUCTION

The environmental crisis is still a major topic in Indonesia and the world [1], the emphasis is on global warming and climate change as a result of increased greenhouse gas emissions [2]. In addition, continuous exploitation of earth's resources by the mining sector causes environmental degradation. this causes disruption of natural stability due to water and soil pollution and decreased air quality [3]. To reduce environmental pollution, especially in reducing carbon emissions, the government implemented several efforts such as the implementation of the Paris Agreement which resulted in the Nationally Determined Contribution (NDC) agreement is a pledge to decrease carbon emissions by 29% using its own efforts and 41% with significant international collaboration.t and outlined in Law Number 16 of 2016 [4]. This commitment is in line with the implementation of Net Zero Emission (NZE) in 2060, which is a condition where the emissions released do not exceed the limit of the earth's absorption ability, but for this it is quite difficult to do because in Indonesia the majority of electricity distribution still uses coal [5]. In addition, there are also other efforts, namely carrying out the ratification of the Kyoto Protocol through Law Number 17 of 2004 which is implemented through carbon accounting, which requires companies to identify, measure, record, present and publish reports on carbon emissions [6]. SGDs are also inseparable from the topic of the environment whose important point is the management of natural resources and the sustainable

environment to maintain and support quality life in the future [7].

Based on the national Greenhouse Gas (GHG) emission profile in 2019 the energy industry sector level contributed 289,001 $GgCO_2$ and in 2020 reached 293,143 $GgCO_2$, this figure is far compared to the manufacturing industry of 105,641 $GgCO_2$, transportation of 135,217 $GgCO_2$, other sector fuels of 31,942 $GgCO_2$, fugitive emissions (including only CH_4 gas) of 18,341 $GgCO_2$. This proves that the energy sector has a major impact on carbon emissions, because increasing consumption per sector requires more energy. The increase in demand in the energy sector is indeed one of the cornerstones in improving the economy, but on the other hand, environmental pollution resulting from drilling and activities related to production will continuously produce GHG releases into the air, besides that there are other air pollutants in the form of methane (CH_4), carbon dioxide (CO_2) and nitrogen dioxide (N_2O) compounds, these pollutants have a negative impact not only on the environment but health also [8]. Disclosure regarding CED is one form of disclosure of information about the environment. In the disclosure of social responsibility in Indonesia, it has been governed in PSAK 1 Paragraph 9 explained implicitly suggesting disclosure of social responsibility related to the environment and social. Thus, financial statements are used not only by stakeholders, but also by other stakeholders such as suppliers, workers, community customers, and others. [9]. Information on carbon emissions in the sustainability report

supports the implementation of carbon accounting which is the company's responsibility to the environment for the company's activities. In addition, the government also hints at reporting on emissions, namely in Presidential Regulation number 98 of 2021 concerning the Implementation of the Economic Value of Carbon for the Achievement of Contribution Targets and Determined Nationally and Control of Greenhouse Gas Emissions in National Development. In this study, measuring CED was adopted from a check list of request sheets from the Carbon Disclosure Project (CDP) then developed by Choi et al in 2013.

Disclosure regarding CED is important to be disclosed in sustainability reports to energy sector companies, but in practice disclosure regarding carbon emission disclosure is still voluntary, so there are still companies that have not reported, usually companies that report such information are companies whose business is directly related to the environment and natural resources [10]. Voluntary carbon emission disclosures are often made by companies with the aim of protecting the company's reputation and avoiding rejection from the public [11]. Profitability, company size, environmental performance, and institutional ownership are all factors determining carbon emission disclosure [12].

The Company's disclosure of information regarding carbon emissions will assist it in establishing public legitimacy as a kind of corporate accountability to stakeholders. Carbon emissions disclosure is a type of corporation endeavor in generating, maintaining, and legitimizing company participation in environmental responsibility [13]. However, if the company carries out activities that violate applicable norms or the company is not responsible for its activities, there will be a "legitimacy gap". The occurrence of a legitimacy gap is due to the company's indifference to the impact arising from the company's activities and the non-fulfillment of public expectations of the company, the company's activities only focus on maximizing profits [14].

Environmental disclosure is information that contains past, present, and future information about the actions of the firm and its environmental performance as well as information about financial implications based on the results of environmental management decisions or actions by the company, this disclosure is a form of the firm's responsibility to the public to report the activities and impacts of the company's activities have a negative impact on the environment [15]. The company's environmental disclosures include carbon emission disclosures, which discuss greenhouse gas intensity, performance related to carbon emission reduction targets, energy conservation and strategies to protect the environment against the effects of global warming and its impacts and possible climate change [16].

Disclosure of carbon emissions is the disclosure of one form of corporate responsibility to the environment, this is one of the efforts to support the government in reducing carbon emissions and reducing the environmental impact caused by carbon emissions resulting from company operations [17]. Carbon emissions disclosed includes climate change and opportunity risk (CC), calculation of greenhouse gas emissions (GHG), energy consumption (EC), greenhouse gas costs and reductions (RC), accountability of carbon emissions (ACC).

Profitability is a ratio used to measure a company's ability to generate profits from company operations through utilizing its resources to the maximum [18]. Companies with high profitability are considered capable of managing carbon emissions optimally, so this step is taken so that the company gains legitimacy from the community [19]. According to previous research, partial profitability (ROA) has a positive effect on carbon emission disclosure, companies with a high level of profitability will be under pressure from stakeholders to pay more attention to the environment because companies have more resources to be able to carry out *carbon emission disclosure* , it can also increase the allocation of funds for environmental costs so that disclosure regarding *carbon emission disclosure* becomes wider [26].
H_1 : Profitability has a positive effect on carbon emission disclosure.

A company size scale may be used to evaluate a firm's size based on total assets, total sales, and average total assets. [12]. According to previous research, the size of the company as measured by total assets has a positive influence on carbon emission disclosure. Based on this conclusion, companies with large sizes have a large total number of assets so that companies have sufficient resources, companies are better able to provide voluntary disclosures including qualified carbon emission disclosure. [27].
H_2: Company size has a positive effect on carbon emission disclosure.

The implementation of an environmental management system based on ISO 14001 certification is considered to help organizations to improve control by management and can reduce the risk of excessive operating impacts on the surrounding environment [22]. Companies that are ISO 14001 certified tend to have higher levels of environmental disclosure. Companies that are ISO 14001 certified can be an illustration for *carbon emission disclosure*, because ISO 14001 requires reporting waste recycling, reducing air and waste emissions, reusing materials, saving energy and water, and reducing environmental incidents. According to previous research suggesting that partial environmental performance positively affects carbon *emission disclosure*, ISO 14001 certified companies lead to broader carbon emissions disclosures [30].
H_3 : Environmental performance has a positive effect on carbon emission disclosure.

Institutional ownership will increase supervision more optimally, because management is under greater pressure to make more comprehensive disclosures, including disclosure of carbon emissions. This is also considered as a form of environmental responsibility to improve the company's image. [31] . The wider the disclosure made by the company includes disclosure of company activities and the environment, will be a consideration in determining investment decisions, with disclosure about carbon emissions will increase the value of the company, because the company is not only concerned with financial performance, but also pays attention to the state of

the surrounding environment [17]. Based on the results of previous studies, it shows that institutional ownership has a positive effect on *carbon emission disclosure*, because institutional ownership not only expects profits from the company, but maintains business continuity in the future, so that institutional ownership will put pressure on management to carry out wider disclosures [19]. This is in line with SDG's goal of sustainable development focused on environmental protection, namely development that protects the environment now and in the future.

H_4 : Institutional Ownership has a positive effect on carbon emission disclosure.

II. RESEARCH METHODS

This study applies a quantitative approach, studying a specific population or sample through data collecting utilizing research tools and analyzing quantitative or statistical data with the goal of testing the hypothesis that has been determined based on the relationship of causal symptoms. This study's population consists of all energy sector businesses registered on the Indonesia Stock Exchange in 2019 until 2021. The study sample was chosen using the purposive sampling technique, which is the way of choosing the sample based on a specific review or the sample was altered to the researcher's criteria [25]. There are several sample criteria in this study, as follows: 1) Energy sector companies listed on the Indonesia Stock Exchange during 2019-2021. 2) companies that are consistently listed on the IDX as energy sector companies in 2019-2021. 3) Companies that consistently publish annual reports and sustainability reports during 2019-2021. In terms of meeting the aforementioned criteria, this study obtained a sample of 33 firms.

The dependent factor in this study is carbon emission disclosure, whereas the independent variables are profitability, business size, environmental performance, and institutional ownership. CED is quantified using a check list devised by Choi in 2013, notably by computing the CED index, which assigns a score of 1 to each disclosure item, with a maximum disclosure of 18. [11]. Return on assets (ROA) is used to calculate profitability for the independent variable [26], company size is measured using (Ln) total assets of the company in a particular year [27]. Measurement of environmental performance using ISO 14001, namely as (0) for companies that are not ISO 14001 certified, (1) for companies that implement ISO 14001 and (2) for companies that are ISO 14001 certified [10]. The quantity of share ownership held by institutions is compared to the number of shares outstanding to calculate institutional ownership. [10].

III. RESULTS AND DISCUSSION

A. Descriptive Statistical Analysis

Descriptive statistics are used in analysing data is described by explaining the data that has been gathered.

Table 1. Descriptive Statistic

	(Y)	(X_1)	(X_2)	(X_3)	(X_4)
Mean	0.5960	0.0561	30.6092	1.1515	0.5554
Max	0.8889	0.2853	32.3167	2.0000	0.7319
Min	0.1111	-0.0984	28.4204	0.0000	0.1999
Std. Dev.	0.2497	0.0804	1.1935	0.7953	0.1659

Source: Data processed by author, 2023

Based on the results of descriptive statistics in Table 1.

CED minimum value is 0.1111, while the maximum value is 0.8889, with the mean value of 0.5960, the standard deviation value is 0.2497<0.5960, this shows that the average value is greater than the standard deviation so that it can be interpreted that the variable data does not vary or group (homogeneous). The profitability variable has a minimum value of -0.0984, a maximum value of 0.2853, and an average value of 0.0561, while the standard deviation value is 0.0804>0.0561, indicating that the average value is less than the standard deviation, indicating that the variable data varies and is not grouped (heterogeneous). Company size has a minimum value of 28.4204 for the company size variable. The greatest possible value is 32.3167. The average value for the company size variable is 30.6092, while the standard deviation is 1.193530.6092, indicating that the average value is larger than the standard deviation, indicating that the data size variable does not change and is grouped (homogeneous). Environmental performance variable has a minimum of 0.0000, while for the value in the company the maximum value is 2.000000. The average value for the environmental performance variable is 1.1515, while the standard deviation value is 0.7953<1.1515. The average value is greater than the standard deviation, which means that the data on the environmental performance variable data does not vary and is grouped (homogeneous). For samples that apply ISO 14001 the percentage is 36% or 12 samples, those that are ISO 14001 certified have a percentage of 39% with 13 sample data and do not apply and are not certified totaling 8 sample data with a percentage of 24%. The minimum value of institutional ownership is 0.1999, and the maximum value is 0.7319. The institutional ownership variable has an average value of 0.5554, with a standard deviation of 0.16590.5554. This signifies that the average value (mean) is larger than the standard deviation value, indicating that the data is consistent and grouped (homogeneous).

B. Test Classical Assumptions

The panel data classic assumption test uses the Linearity test with the Ordinary Least Square (OLS) approach. This test as in panel data regression, the OLS method is used to only conduct multicollinearity tests and heteroscedasticity tests [28].

Multicollinearity Test

Based on table 2, it shows that the multicollinearity test results obtained the value of each independent variable centered variance inflation factor (VIF) $\leq$ 10. So it can be concluded that there is no collinearity between the independent variables in the study, so it can be said that in the study there are no symptoms of multicollinearity.

Table 2. Multicollinearity Test Result

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.781690	753.1840	NA
X_1	0.197188	1.790730	1.191965
X_2	0.000801	724.2904	1.066261
X_3	0.001753	3.275739	1.036077
X_4	0.044892	14.49878	1.154389

Source: Output Result Eviews 12, 2023

Heteroskedasticity Test
Table 3. Heteroskedasticity Test Result

F-statistic	1.062976	Prob. F(4,28)	0.3932
Obs*R-squared	4.350528	Prob. Chi-Square(4)	0.3606
Scaled explained SS	2.274179	Prob. Chi-Square(4)	0.6855

Source: Output Result Eviews 12, 2023

According to table 3, the heteroscedasticity test results reveal a Prob. Chi Square value of 0.3606> 0.05. As a result, there are no signs of heteroscedasticity in the research model.

C. Data Panel Regression Analysis
In determining the best model for panel data regression analysis, model selection tests can be carried out including the Chow test, Hausman Test and Lagrange Multiplier Test.

Method Model Conclusion

Table 4. Model Conclusion

Method	Test	Result
Chow Test	CEM vs FEM	FEM
Hausman Test	FEM vs REM	REM
Lagrange Multiplier Test	CEM vs REM	REM

Source: Output Result Eviews 12 and processed by author, 2023

Based on table 4, it can be concluded that the best model used in panel data regression analysis is the random effect model (REM).

Table 5. Random Effect Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.348992	1.228831	-2.725348	0.0109
X_1	-0.171185	0.418627	-0.408920	0.6857
X_2	0.123427	0.039354	3.136287	0.0040
X_3	0.028814	0.062925	0.457905	0.6506
X_4	0.258164	0.363637	0.709950	0.4836
Weighted Statistics				
Root MSE	0.100654	R-squared		0.299515
Mean dependent var	0.204944	Adjusted R-squared		0.199446
S.D. dependent var	0.122128	S.E. of regression		0.109272
Sum squared resid	0.334333	F-statistic		2.993083
Durbin-Watson stat	1.375675	Prob(F-statistic)		0.035564

Source: Output Result Eviews 12, 2023

The following formula results are derived based on the findings of panel data regression analysis utilizing the random effect model.

$$Y = -3.348992 - 0.171185 (X_1) + 0.123427 (X_2) + 0.028814 (X_3) + 0.258164 (X_4) + \varepsilon$$

Information:
- Y = Carbon Emission Disclosure
- X_1 = Profitability
- X_2 = Company Size
- X_3 = Environmental Performance
- X_4 = Institutional Ownership
- ε = Error

The explanation of the equation above is:
a. The constant coefficient is -3.348992 which means that if the variables of profitability, company size, environmental performance, institutional ownership have a value of 0 and are constant, then the CED disclosure variable will be worth -3.348992.
b. The profitability regression coefficient value is -0.171185, so that each unit increase in profitability with other variables constant, the CED value will increase by -0.171185.
c. The company size regression coefficient value is 0.123427, so that each increase in company size by one unit with other variables held constant, the CED value will increase by 0.123427.
d. The environmental performance regression coefficient value is 0.028814, so that each increase in environmental performance by one unit with other variables held constant, the CED value will increase by 0.028814.
e. The regression coefficient value of institutional ownership is 0.258164, so that each increase in institutional ownership by one unit with other variables held constant, the CED value will increase by 0.258164.

Table 6. Coefficient Determination Result

Root MSE	0.100654	R-squared	0.299515
Mean dependent var	0.204944	Adjusted R-squared	0.199446
S.D. dependent var	0.122128	S.E. of regression	0.109272
Sum squared resid	0.334333	F-statistic	2.993083
Durbin-Watson stat	1.375675	Prob(F-statistic)	0.035564

Source: Output Result Eviews 12, 2023

According to table 6, the adjusted R-square value is 0.199446 or 19.94%, implying that profitability, company size, environmental performance, and institutional ownership can explain 19.94% of carbon emission disclosure, while the remaining 80.06% is explained by variables outside of the research.

Table 7. Simultaneous Test Result

Root MSE	0.100654	R-squared	0.299515
Mean dependent var	0.204944	Adjusted R-squared	0.199446
S.D. dependent var	0.122128	S.E. of regression	0.109272
Sum squared resid	0.334333	F-statistic	2.993083
Durbin-Watson stat	1.375675	Prob(F-statistic)	0.035564

Source: Output Result Eviews 12, 2023

Based on table 7, it can be seen that the Prob (F-statistic) value is 0.035564 so that it can be interpreted that the probability value <0.05, then H_{a5} is accepted, which means that the independent variables used in the study are profitability, company size, environmental performance and institutional ownership all have a simultaneous effect on the dependent variable, namely carbon emission disclosure.

Table 8. Partial Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.348992	1.228831	-2.725348	0.0109
X_1	-0.171185	0.418627	-0.408920	0.6857
X_2	0.123427	0.039354	3.136287	0.0040
X_3	0.028814	0.062925	0.457905	0.6506
X_4	0.258164	0.363637	0.709950	0.4836

Source: Output Result Eviews 12, 2023

The Effect of Profitability on Carbon Emission Disclosure

According to the partial test findings shown in table 8, the probability value on the profitability variable is 0.6857 or more than 0.05, with a regression coefficient value of -0.171185. According to the likelihood value, H_{a1} is rejected and H_{01} is approved, implying that the profitability variable has no influence on carbon emission disclosure. The findings of this investigation are consistent with previous studies [29]. According to the research findings, partial profitability has little influence on carbon emission disclosure. Financial success as measured by ROA is not always appropriate to determine whether corporations should report carbon emissions more broadly or not. This statement is consistent with the findings of studies undertaken by [11] and [29] which states that companies with high profitability values believe that disclosing carbon emission disclosure might put at risk and disrupt information about the company's financial performance achievements, whereas companies with low financial performance use carbon emission disclosure to gain legitimacy from the community.

The Effect of Company Size on Carbon Emission Disclosure

According to the partial test findings shown in table 8, the probability value on the firm size variable is 0.0040 or less than 0.05, with a regression coefficient value of 0.123427. According to this probability value, H_{02} is rejected and H_{a2} is approved, indicating that the firm size variable has a favourable influence on carbon emission disclosure. The findings of this study are consistent with prior studies undertaken by [20] and [21] This claims that company size has an impact on carbon emission disclosure. Large corporations have a higher influence on environmental pollution, therefore there is a compelling motive for them to strengthen their environmental response; one form of corporate responsibility is revealing carbon emission disclosure. This remark is consistent with the statements made by [29] and [8] the large corporations have adequate resources and tend to publish carbon emission disclosure more publicly since the larger the company, the more pollution that impacts the environment. This also supports the legitimacy theory, which claims that firms would endeavour to comply with

current societal standards and disclose information such as carbon reporting to acquire credibility from society.

The Effect of Environmental Performance on Carbon Emission Disclosure

According to the partial test findings shown in table 8, the probability value on the environmental performance variable is 0.6506 or more than 0.05, with a regression coefficient value of 0.028814. According to the likelihood value, H_{a3} is rejected and H_{03} is approved, indicating that the environmental performance measure has no influence on carbon emission disclosure. Based on the findings of this study and earlier studies by [17] This says that incomplete environmental performance has no impact on carbon emission disclosure. Environmental performance as assessed by ISO 14001 implementation is focused on the environmental management system, however it does not force firms to disclose carbon emission disclosure. Furthermore, carbon emission disclosure is currently optional or voluntary, and there are no legislation requiring carbon emission disclosure reporting. This demonstrates that firms who are ISO 14001 certified do not necessarily make broader disclosures, but if the company reveals more broadly, it suggests that the company is more concerned and responsible for the environment, allowing the corporation to achieve public legitimacy more readily [23].

The Effect of Institutional Ownership on Carbon Emission Disclosure

According to the partial test findings and explanation in table 8, the probability value on the institutional ownership variable is 0.4836 or more than 0.05, with a regression coefficient value of 0.0258164. According to this probability value, H_{a4} is rejected and H_{04} is accepted, indicating that the institutional ownership variable has no influence on carbon emission disclosure. Based on the findings of this study, as well as prior studies by [30] and [17] It claims that partially institutional ownership has no impact on carbon emission disclosure. This demonstrates that institutional ownership cannot be used to justify the company's obligation to disclose carbon emissions more broadly. This remark is consistent with the statement made by [17] that institutional ownership tends to pay more attention to financial performance because it is concerned with investing in companies that override the environmental impact of company operations, besides that institutional parties are not comprehensive in supervising the environment. Control and supervision in environmental performance including carbon emission disclosure tends to be carried out by internal companies or management as a form of responsibility to society, stakeholders, government recommendations such as the implementation of SDG's, this is done to protect the company from negative issues and opinions as a result of the publication of the report, such as the issue of excessive environmental pollution and impact on society as a result of company operations.

IV. CONCLUSION

Based on the analysis and discussion of hypothesis testing, it can be concluded that profitability, environmental performance, institutional ownership have no effect on carbon emission disclosure. Companies with high profitability values cannot be a measure that the company will disclose carbon emissions more widely. Companies that are ISO 14001 certified and implement an environmental management system cannot be a benchmark that the company will report wider carbon emissions, and institutional ownership of the company cannot encourage wider disclosure because control in the report is fully controlled by management. Meanwhile, the company size variable has a positive effect on carbon emission disclosure. This is because company size is closely related to the impact of environmental pollution due to company activities so that extensive disclosure of carbon emission disclosure is considered important. Therefore, further researchers can carry out research in other sectors with a longer period of time, besides that, they can also conduct research with environmental performance variables using PROPER proxies.

REFERENCES

[1]   Greenpeace Indonesia, "Tantangan kita bersama di tahun 2020," *Greenpeace Indonesia*, 2020.

[2]   IESR, "Potensi Penurunan Emisi Indonesia Melalui Perubahan Gaya Hidup Individu," *Institute for Essenstial Service Reform*, 2020.

[3]   Bhrinstitue.id, "Dampak Industri Pertambangan Terhadap Lingkungan dan Hak Asasi Manusia," *Kabar BHR*, 2021.

[4]   Bappenas, "Diskusi NDC dalam Upaya Mengurangi Emisi Nasional," *Kementrian PPN/Bappenas*, 2018.

[5]   K. Laia, "Industri Batu Bara Masih Ekspansi di Tengah Darurat Iklim," *BETAHITA.ID*, 2022.

[6]   I. Irwhantoko and B. Basuki, "Carbon Emission Disclosure: Studi pada Perusahaan Manufaktur Indonesia," *J. Akunt. dan Keuang.*, vol. 18, no. 2, pp. 92–104, 2016, doi: 10.9744/jak.18.2.92-104.

[7]   Bappenas, "Sekilas SDGs," *Kementrian PPN/Bappenas*, 2019.

[8]   D. I. Trilestari and H. Murwanto, "Impact of industry Type, Company Size, Profitabilitas and Leverage to Carbon Emission Disclosure," vol. 1, no. 4, pp. 53–66, 2022, doi: https://doi.org/10.5555/ijosmas.v3i4.213.

[9]   B. T. Cahya, "Carbon Emission Disclosure: Ditinjau Dari Media Exposure, Kinerja Lingkungan dan Karakteristik Perusahaan Go Public Berbasis Syariah Di Indonesia," *Nizham J. Islam. Stud.*, vol. 4, no. 2, pp. 170–188, 2017.

[10]   I. Amaliyah and B. Solikhah, "Pengaruh Kinerja Lingkungan dan Karakteristik Corporate Governance Terhadap Pengungkapan Emisi Karbon," *J. Econ. Manag. Account. Technol.*, vol. 2, no. 2, pp. 129–141, 2019, doi: 10.32500/jematech.v2i2.720.

[11]   D. N. Pratiwi, "Implementasi Carbon Emission Disclosure di Indonesia," *J. Ilm. Akunt. dan Bisnis*, vol.

13, no. 2, pp. 101–112, 2018, doi: https://doi.org/10.24843/JIAB.2018.v13.i02.p04.

[12]   I. A. P. O. Y. Dewi and G. W. Yasa, "Pengaruh Ukuran Perusahaan, Profitabilitas, Tipe Industri, Dan Kinerja Lingkungan Terhadap Environmental Disclosure," vol. 20, no. 3, pp. 2362–2391, 2017.

[13]   M. Kholmi, A. D. S. Karsono, and D. Syam, "Environmental Performance, Company Size, Profitability, And Carbon Emission Disclosure," *J. Reviu Akunt. dan Keuang.*, vol. 10, no. 2, p. 349, 2020, doi: 10.22219/jrak.v10i2.11811.

[14]   I. M. Narsa and rini N. K. Jannah, "Factors That Can Be Predictors of Carbon Emissions Disclosure," *J. Akunt.*, vol. 25, no. 1, p. 70, 2021, doi: 10.24912/ja.v25i1.725.

[15]   Widyawati and P. Hardiningsih, "Apakah Kinerja Lingkungan Mempengaruhi Pengungkapan Lingkungan?," *J. Akunt. dan Pajak*, vol. 22, no. 2, pp. 912–925, 2022, doi: http://dx.doi.org/10.29040/jap.v22i2.4000.

[16]   N. N. Witri Astiti and D. G. Wirama, "Faktor-Faktor yang Memengaruhi Pengungkapan Emisi Karbon pada Perusahaan yang Terdaftar di Bursa Efek Indonesia," *E-Jurnal Akunt.*, vol. 30, no. 7, p. 1796, 2020, doi: 10.24843/eja.2020.v30.i07.p14.

[17]   N. A. Putri, N. Pamungkas, and S. Suryaningsum, "Pengaruh Kepemilikan Institusional, Kinerja Lingkungan, Profitabilitas, dan Pertumbuhan Terhadap carbon emission disclosure," *J. Akunt. Bisnis*, vol. 20, no. 2, pp. 183–199, 2022, doi: 10.24167/jab.v20i2.4826.

[18]   Hery, *Analisis Laporan Keuangan*, Cetakan ke. Jakarta: PT Grasindo, 2019.

[19]   K. Jati, L. Agustina, E. Setyarini, and R. Siwi, "Can Environmental Performance Improve Disclosure of Carbon Emissions in Mining Companies in Indonesia?," 2022, doi: 10.4108/eai.27-7-2021.2316890.

[20]   M. Yusuf, "Determinan Carbon Emission Disclosure Di Indonesia," *J. Akunt. dan Audit.*, vol. 17, no. 1, pp. 131–157, May 2021, doi: 10.14710/jaa.17.1.131-157.

[21]   S. D. A. Putri and Muhammad Nuryatno Amin, "Pengaruh Ukuran Perusahaan, Leverage, dan Profitabilitas Terhadap Carbon Emission Disclosure," *J. Ekon. Trisakti*, vol. 2, no. 2, pp. 1155–1164, Oct. 2022, doi: 10.25105/jet.v2i2.14526.

[22]   P. Setiawan and S. Iswati, "Carbon Emissions Disclosure, Environmental Management System, and Environmental Performance: Evidence from the Plantation Industries in Indonesia," *Indones. J. Sustain. Account. Manag.*, vol. 3, no. 2, p. 215, 2019, doi: 10.28992/ijsam.v3i2.99.

[23]   E. P. Rini, F. Pratama, and M. Muslih, "Pengaruh Growth, Firm Size, Profitability, Dan Environmental Performance Terhadap Carbon Emission Disclosure Perusahaan Industri High Profile Di Bursa Efek Indonesia," *JIMEA J. Ilm. MEA (Manajemen, Ekon. dan Akuntansi)*, vol. 5, no. 3, pp. 1101–1117, 2021, doi:

https://doi.org/10.31955/mea.v5i3.1427.

[24] D. A. Almuaromah and Wahyono, "Pengaruh kinerja lingkungan, kepemilikan institusional, kepemilikan manajerial, profitabilitas dan Leverage," *J. Ekon. dan Bisnis*, vol. 10, no. 1, pp. 578–586, 2022, doi: https://doi.org/10.34308/eqien.v10i1.579.

[25] Sugiyono, *Buku Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, 2019.

[26] E. Apriliana, H. N. L. Ernaya, and K. Septyan, "Pengaruh Tipe Industri, Kinerja Lingkungan, Dan Profitabilitas Terhadap Carbon Emission Disclosure," *Widyakala J.*, vol. 6, no. 1, p. 84, 2019, doi: 10.36262/widyakala.v6i1.149.

[27] S. Mujiani, J. Juardi, and F. Fauziah, "Determinan Carbon Emission Disclosure Pada Perusahaan Bumn Yang Terdaftar Di Bursa Efek Indonesia Periode 2013-2017," *JIAFE (Jurnal Ilm. Akunt. Fak. Ekon.*, vol. 5, no. 1, pp. 53–64, 2019, doi: 10.34204/jiafe.v5i1.1542.

[28] A. T. Basuki and N. Prawoto, *Analisis Regresi Dalam Penelitian Ekonomi & Bisnis*. Jakarta: PT Raja Grafindo Persada, 2016.

[29] N. P. E. Dewayani and N. M. D. Ratnadi, "Pengaruh Kinerja Lingkungan, Ukuran Perusahaan, Profitabilitas dan Pengungkapan Emisi Karbon," *E-Jurnal Akunt.*, vol. 31, no. 4, pp. 836–850, 2021, doi: 10.24843/eja.2021.v31.i04.p04.

[30] P. R. Mustar, D. Arieftiara, and R. Fahria, "Pengaruh profitabilitas, efektivitas dewan komisaris dan kepemilikan institusional terhadap pengungkapan emisi," *Pros. Bus. Manag. Econ. Account. Natl. Semin.*, vol. 1, pp. 1449–1459, 2020.