The Influence of Carbon Performance, Stakeholder Pressure and ISO 14001 Certification on Carbon Emission Disclosure

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Abstract

This study aimed to determine the effect of carbon performance, stakeholder pressure, and ISO 14001 certification on carbon emission disclosure. In Indonesia, the practice of disclosing carbon emissions is still limited. Based on the sample selection criteria, researchers analyzed ten companies from the energy sector listed on the Indonesia Stock Exchange for the period 2018-2022. The analysis method used is panel data regression analysis. The results of this study indicate that carbon performance and stakeholder pressure do not influence the disclosure of carbon emissions. At the same time, ISO 14001 certification has a significant positive effect on the disclosure of carbon emissions.

Keywords: Carbon Emissions, Carbon Disclosure, Carbon Performance, Stakeholder Pressure, ISO 14001 Certification.

Introduction

Environmental impacts arising from increased corporate activity encourage companies to make disclosures about carbon emissions. Disclosure of carbon emissions involves information about various climate-related activities, such as emissions measurement, company plans, technology investment, trade and carbon offsetting efforts (Jung & Kim, 2020). Entities that have environmental impacts related to carbon emissions need to be aligned in implementing carbon emission reduction programs, both internationally and nationally. The increased focus on greenhouse gas (GHG) emissions also affects the disclosure of information related to GHG emissions. Therefore, entities need to develop strategies to address environmental issues and disclose information about GHG emissions to maintain the company's reputation (Firmansyah et al., 2021).

The theory underlying this research is legitimacy theory. In an effort to gain legitimacy, companies carry out social and environmental activities that have an impact on accounting disclosures in annual reports. This is done to ensure that the company's actions are in accordance with applicable standards and that the existence of the company itself is acceptable (Lestari & Khomsiyah, 2023).Stakeholders require reports on carbon emissions as a tool to evaluate the company's performance in relation to climate change arising to evaluate the company's performance in relation to climate change arising from the effects of the company's operational activities.

Disclosure related to carbon emissions is required in accordance with SEOJK regulation Number 16/SEOJK.04/2021. Ultimately, the Company must provide a report on the amount of carbon emissions generated as part of its responsibility to the environment.

According to information from the Energy Institute, the global energy sector generated a total of 34.37 billion tons of CO2 during 2022. In that year, China was listed as the country that contributed the most carbon emissions from the energy sector, reaching 10.55 billion tons of CO2, equivalent to 30.69% of total global emissions. The United States ranked second, producing 4.82 billion tons of CO2, accounting for about 14% of total global emissions. India and Russia ranked next, with energy sector emissions of 2.59 billion tons of CO2 and 1.45 billion tons of CO2, respectively. Meanwhile, Indonesia ranks sixth globally in terms of energy sector emissions, contributing 691.97 million tons in 2022 (Nabilah Muhamad, 2023). According to a recent study released by the Center for Research on Energy and Clean Air (CREA), the use of the Surabaya coal-fired power plant in Banten Province could contribute to 1,470 deaths each year and cause health losses of around Rp.14.2 trillion. (BBW News Indonesia, 2023). Meanwhile, the 2x1,000 MW Ultra Super Critical (USC) 9 and 10 Steam Power Plant (PLTU) Project in Surabaya, Cilegon, Banten, is recognized as the only PLTU that runs its operations by paying attention to environmentally friendly aspects because it has an emission controller, namely the Electronicstatic Precipitator (ESP). An electronic static Precipitator (ESP) acts as a control device or separator of dust particles from the air by utilizing static electricity; the efficiency of reducing dust from the sewer can reach a level of around 95-99.8 percent. In addition to ESP, emission control in PLTU 9 and 10 includes Flur Gas Desulfurization (FGD), Electro-Static Precipitator, Low NOx Burner and Selective Catalytic Reduction (Kuncahyo, 2023).

In 2018-2022, there were 83 energy sector companies. However, only ten companies are consistent in disclosing carbon emissions in sustainability reports. This is not in accordance with Presidential Regulation (PERPRES) No. 98 of 2021 concerning the Implementation of Carbon Economic Value for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development.
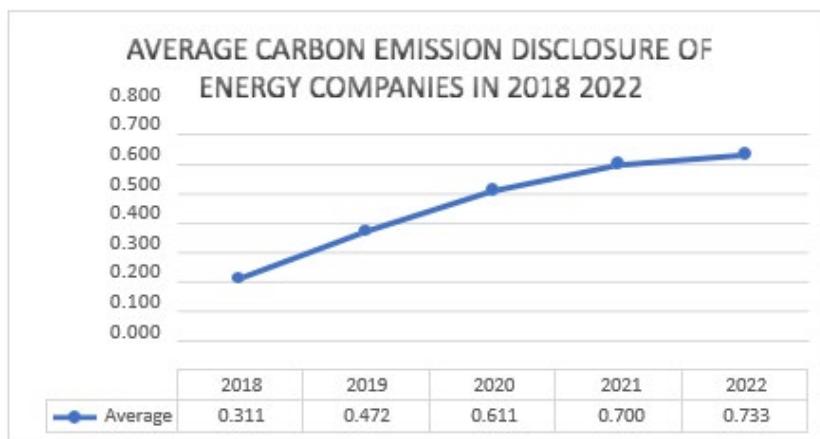

Figure 1. Average Carbon Emissions Disclosure of Energy Sector Companies

Based on the figure above, it can be seen that the average value of carbon emission disclosure disclosed by energy sector companies increases from year to year. The lowest average value of carbon emission disclosure is in 2018, with a value of 0.311, and the highest average value of carbon emission disclosure is in 2022, with a value of 0.733. The increase in the average disclosure of carbon emissions by companies from year to year reflects that companies are starting to realize the importance of disclosure. Although the level of disclosure of carbon emissions from year to year increases, some companies still do not care about the disclosure of carbon emissions, such as Mitrabahtera Segara Sejati Tbk, which only has an average disclosure for five years of 32%. The purpose of disclosing carbon emissions is to signal that the company gets a positive response from investors and company stakeholders. The indicator used in measuring carbon emission disclosure is the carbon emission checklist in accordance with research by Choi et al., (2013). A

checklist containing climate change, carbon emissions and energy use consisting of 5 categories and 18 disclosure items (Choi et al., 2013).

Based on previous studies, several factors are thought to influence the disclosure of carbon emissions in companies, namely carbon performance, stakeholder pressure and ISO 14001 certification. The first factor is carbon performance. Carbon performance is the result of managerial activities related to carbon emissions. The second factor that affects carbon emissions is stakeholders. The government or regulator is one of the other stakeholders who have the authority to encourage companies to be environmentally responsible. The third factor that is thought to influence the disclosure of carbon emissions is ISO 14001. ISO 14001 is a global standard for Environmental Management Systems (EMS) that regulates environmental management by certified companies with corporate support for transparency in environmental management and environmental preservation.

Research conducted by Indriastuti (2021) states that carbon performance has a positive influence on the disclosure of carbon emissions. High levels of carbon emissions encourage companies to make disclosures to avoid bad things in the future. Meanwhile, according to research Iratiwi & Sulfitri (2023) stated that carbon performance does not influence carbon emission disclosure. Companies are worried about disclosing carbon emissions because they avoid losing public trust due to inefficiency in carrying out company operations. Research conducted by Iratiwi & Sulfitri (2023) stated that stakeholder pressure has a positive influence on carbon emissions disclosure. This is because the lower the level of environmental regulations violation in the company, the higher the level of disclosure of carbon emissions. Meanwhile, according to Sandi (2021), stakeholder pressure does not affect carbon emissions disclosure. ISO 14001, adopted by the Indonesian government, is a standard and policy that regulates environmental management by certified companies and supports environmental disclosure and preservation by companies; ISO 14001 certification shows that a company or organization is committed to implementing an environmental preservation management system and environmental awareness. In accordance with research, Rahmawati & Budiwati (2018) that ISO 14001 certification has a positive effect on disclosure of carbon emissions. The implementation of ISO 14001 reflects the Company's commitment to comply with environmental standards and increase transparency in managing its environmental impact. Meanwhile, in research, Iratiwi & Sulfitri (2023) stated that ISO 14001 certification does not influence the disclosure of carbon emissions. Based on the background, inconsistent results, and the limited relationship between carbon performance, stakeholder pressure, ISO 14001 certification and carbon emissions disclosure. Therefore, researchers feel the need to repeat this study using a sample of organizations from the energy sector. Amid the inconsistency of previous research results, the lack of environmental accounting research, and the high carbon emissions of companies, this study aims to analyze and find empirical evidence about companies' efforts to address climate change through the implementation of sustainable business.

Literature Review

Legitimacy Theory

Legitimacy theory was introduced by Dowling and Pfeffer (1975), who defined it as important for organizations; the limits imposed by social norms and values that prioritize the interests of legitimacy and reactions to these limits encourage the importance of organizational behavior analysis that considers environmental factors (Siladjaja et al., 2023). According to legitimacy theory, companies need to demonstrate that they operate consistently with social values continuously. This is often achieved by using *disclosure* in corporate reports. Disclosure can be used by companies to demonstrate management's concern for social values or to divert the community's attention from the negative impacts of the company's activities (Ulum, 2017).

Stakeholder Theory

Stakeholder theory was introduced by Freeman (1984), who defined it as a conceptual framework that discusses management organizations and business ethics, especially in the context of morals and values that govern the operations of an organization (Werastuti et al., 2023).

Stakeholder theory explains that the company is not only an entity that functions for itself but is more oriented towards providing benefits to various parties who have interests such as shareholders, employees, suppliers, customers, creditors, public interest groups and institutions (Wiratno & Muaziz Fatkhudin, 2020).

Carbon Emissions Disclosure

Carbon emission disclosure is voluntary disclosure, recording and presentation by the company regarding the extent of carbon emissions it produces (Yuliandhari et al., 2023). Disclosure of carbon emissions is the process of informing the level of carbon emissions of a company and setting targets to reduce these emissions. (Cahya, 2017). Carbon Emissions Disclosure is part of carbon accounting, which is the company's responsibility to measure, recognize, record, present and disclose carbon emissions (Irwhantoko & Basuki, 2016). Although, in Indonesia, the disclosure of carbon emissions is still voluntary, now more and more companies are disclosing carbon emissions due to pressure from the public and external parties who are increasingly concerned about the environmental impact caused by company activities (Muhammad & Aryani, 2021).

Carbon Performance

Carbon performance is the result of managerial activities related to carbon emissions, which describe quantitative emissions of climate-changing greenhouse gases as well as measures and processes to reduce emissions from the air (Velte et al., 2020). Companies that have high carbon performance feel motivated to differentiate themselves from other companies that have less satisfactory performance. Such companies are encouraged to maintain and provide information to the public on the improvements made to the company's carbon profile (Wang et al., 2013).

Stakeholder Pressure

The government (regulator) is one of the *stakeholders* that has significant authority to encourage companies to take responsibility for the environment and disclose carbon emissions (Sandi et al., 2021). The government, through its regulations, plays an important role in encouraging companies' concern for the environment in Indonesia (Anggraini & Handayani, 2021). The greater the government's attention to companies, the greater the company's efforts in carrying out its environmental responsibilities (Sandi et al., 2021).

ISO 14001 Certification

Companies that obtain ISO 14001 certificates can serve as indicators that predict carbon emissions disclosure, as the ISO 14001 standard requires reporting on waste recycling, reduction of air and waste emissions, energy and water conservation, and reduction of environmental impacts. This is part of the criteria that make the carbon emission disclosure indicator itself (Lisadi & Luthan, 2023). ISO 14001-certified companies will operate in accordance with ISO 14001 requirements related to management responsibility, commitment, control, training, monitoring and documentation of the management system (Iratiwi & Sulfitri, 2023).

The hypothesis in this study is as follows:

H_a: Carbon Performance, *Stakeholder Pressure, and ISO 14001 Certification simultaneously affect the disclosure of carbon emissions derived from the energy sector's annual report and sustainability report* listed on the IDX for the period 2018-2022.

H_{a1}: Carbon Performance has a positive effect on the Disclosure of Carbon Emissions in Energy sector companies on the IDX for the period 2018-2022.

H_{a2}: *Stakeholders'* pressure has a positive effect on the disclosure of Carbon Emissions of Energy sector companies on the IDX for the period 2018-2022.

H_{a3}: ISO 14001 certification has a positive effect on Carbon Emissions disclosure.
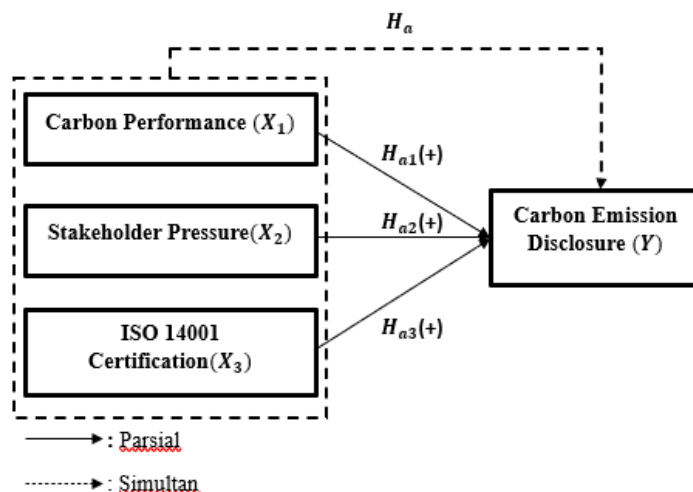

Figure 2. Framework of Thought

Research Method

Population and Sample

Population is a general scope consisting of objects or subjects with certain quantities and characteristics determined by researchers to be investigated and then concluded (Siyoto & Sodik, 2015). The population used in this study is the Energy Sector Companies Listed on the Indonesia Stock Exchange for the 2018-2019 Period. The total population in this study was 83 population. The sample is part of the number and characteristics possessed by the population or is a small part of the population members taken in accordance with certain procedures in order to represent the entire population (Siyoto & Sodik, 2015). Sampling in this study was using a *purposive sampling* technique. The criteria determined in sampling in this study are as follows:

Table 1. Sample Selection Criteria

No.	Sample Selection Criteria	Total
1	Energy sector companies listed on the Indonesia Stock Exchange (IDX) during 2018-2022	**83**
2	Energy sector companies listed on the Indonesia Stock Exchange (IDX) that do not consistently publish annual reports and sustainability reports during the 2018-2022 period.	**(73)**
	Total Company sample	**10**
	Total data processed (10 companies x 5 years)	**50**
	Total observations studied for the period 2018 - 2022	**50**

Source: Author's Processed Funds (2024)

Variable Operationalization

The dependent variable in this study is the disclosure of carbon emissions measured by the content analysis method, which examines the annual report and sustainability report. The ratio of carbon emission disclosure can be measured using the carbon emission disclosure checklist developed by research (Choi et al., 2013). If the company discloses the specified items, it is given a score of 1; if it does not disclose, it is given a score of 0. The total disclosed items are divided by the maximum number of disclosure items with the following formula (Irwhantoko & Basuki, 2016):

$$CED = \frac{number\ of\ items\ disclosed}{total\ disclosure\ items}\ (18)$$

The independent variables in this study are carbon performance, stakeholder pressure and ISO 14001 certification. Carbon performance is the result of managerial activities related to carbon emissions, which describe quantitative emissions of climate-changing greenhouse gases and measures and processes to reduce emissions from the air (Velte et al., 2020). According to Hoffmann & Busch, a company's carbon performance can be seen from its carbon intensity, carbon dependence, carbon exposure and carbon risk. In this study, the carbon performance measurement ratio can be measured using total scope one emissions and total scope two emissions to total sales revenue in the fiscal year (Qian & Schaltegger, 2017). The following carbon performance calculation can be presented with the formula:

$$CP = \frac{total\ emission\ scope\ 1 +\ total\ emission\ scope\ 2}{total\ revenue}$$

S*takeholder* pressure is a motivator for efforts to reduce and disclose carbon emissions where businesses are forced to comply with these provisions (Dewi et al., 2019). In this study, what is meant by *stakeholder* pressure is government regulation, in more detail, namely government regulations governing companies in Indonesia related to environmental conservation and management. The government, through its regulations, plays an important role in encouraging companies' concern for the environment in Indonesia (Anggraini & Handayani, 2021).In this study, *stakeholder* pressure can be measured by looking at the sustainability report. If the company does not violate government regulations, it is given a number 1, and if the company violates it, it is given a number 0 (Anggraini & Handayani, 2021).

ISO 14001 is an international standard certification that supports the management of environmental management systems in companies. ISO 14001 also provides guidelines for implementing and improving EMS (Enviromental Management System) (Purwanto et al., 2021). Companies that adopt the ISO 14001 standard demonstrate involvement in sustainability improvement efforts and are gradual and oriented towards conformity rather than performance. Certified companies will make environmental disclosures with a high level of quality (Rahmawati & Budiwati, 2018).The variable used to measure the ISO 14001 certification variable is a *dummy* variable. Where if the company has ISO 14001 certification, it will be given a value of 1, while if the company does not have ISO 14001 certification, it will be given a value of 0 (Iratiwi & Sulfitri, 2023). The data analysis technique used for this research uses quantitative analysis techniques using descriptive statistical calculation techniques. The method used in this research is the panel data regression analysis method. This study uses *Eviews* 12 *software* as a tool for calculating statistical data. The panel data regression equation used in this study is as follows:

$$Y = \alpha + \beta_1 CP1_{it} + \beta_2 TS2_{it} + \beta_3 ISO3_{it} + e$$

Description:
Y: *Carbon Emission Disclosure*
α: Constant
CP: *Carbon* Performance TS: *Stakeholders* Pressure ISO: ISO 14001 Certification
β_1: Carbon Performance Regression Coefficient
β_2: Regression   Coefficient of *Stakeholders* Pressure
β_3: Regression Coefficient of ISO 14001 Certification

t: Period *t*

i: The *i-th* company

e: *Error Term*

Result and Discussion

Descriptive Statistical Analysis

Descriptive statistics is an approach related to collecting and presenting data so that it provides useful information. With descriptive statistics, data can be presented in a brief and organized manner and is able to convey the core information of the data set at hand. The information obtained from descriptive statistics involves the size of the data center, the size of the data distribution, and the tendency of a data group (Ghodang & Hantono, 2020). In this study, the measurement scales used are ratio and nominal scales. The ratio variables contained in this study are disclosure of carbon emissions and carbon performance. The following are the results of ratio-scale descriptive statistical testing:

Table 2. Descriptive Statistics of Ratio

Variables	Mean	Maximum	Minimum	St.dev
Carbon Emissions Disclosure	0,575556	0,888889	0,055556	0,216990
Carbon Performance	0,097939	1,405748	0,00000	0,315495

Source: Author's Processed Data (2024)

Based on the test results of descriptive statistics on a ratio scale in Table 2, it can be concluded that the carbon emission disclosure variable shows an average value of 0.575556 and a standard deviation value of 0.216990. The average value of carbon emission disclosure exceeds the standard deviation value, indicating that the carbon emission disclosure variable data tends to group or not vary. PT Medco Energi Internasional Tbk obtained the maximum value of carbon emission disclosure in 2022 with a value of 0.888889, indicating that the company has a high level of carbon emission disclosure. Meanwhile, PT Mitrabahtera Segara Sejati Tbk obtained the minimum value of carbon emission disclosure in 2018 and 2019 with a value of 0.055556, indicating that the company has a low level of carbon emission disclosure. Based on the ratio-scale descriptive statistical test data in Table 2, it can be concluded that the carbon performance variable has a mean of 0.097939 and a standard deviation of 0.315495. The maximum value of carbon performance obtained by PT Indo Tambangraya Megah Tbk in 2020 amounted to 1.405748. PT Mitrabahtera Segara Sejati Tbk obtained the minimum value in 2018 and 2019 with a value of 0.00000. Descriptive statistical analysis on nominal variables aims to describe the characteristics of the research variable data. The nominal scale variables in this study are the variables of stakeholder pressure and ISO 14001 certification. The following are the results of nominal descriptive statistical testing:

Table 3. Nominal Descriptive Statistics

Stakeholders Pressure		
Value	Total	Percentage
0	7	14%
1	43	86%
Total	50	100%
ISO 14001 Certification		
Value	Total	Percentage
0	6	12%
1	44	88%
Total	50	100%

Source: Author's Processed Data (2024)

Based on Table 3 in this study, the measurement of stakeholder pressure uses dummy variables, where a value of 1 indicates that the company does not violate government regulations related to the environment, and a value of 0 indicates that the company violates government regulations related to the environment. From this data, it can be concluded that from a total of 50 sample data of energy sector companies listed on the Indonesia Stock Exchange for the period 2018-2022, there are 7 data or 14% of companies violating government regulations related to the environment, while 43 data or 86% of companies do not violate government regulations related to the environment. Based on Table 3 in this study, the measurement of the ISO 14001 certification variable uses a dummy variable, where a value of 1 indicates that the company has ISO 14001 certification, and a value of 0 indicates that the company does not have ISO 14001 certification. From this data, it can be concluded that of the 50 sample data for energy sector companies listed on the Indonesia Stock Exchange for the period 2018-2022, there are 6 data or 12% of companies that do not have ISO 14001 certification, while 44 data or 88% of companies already have ISO 14001 certification.

Classical Assumption Test and Model Selection Test

Classical assumption testing aims to ensure that the regression equation obtained has accuracy in estimates that are free from bias and consistent (Waty et al., 2023).The Classical Assumption Test used in this study uses the *Ordinary Least Squared* (OLS) approach, which includes the Normality Test, Heteroscedasticity Test, Autocorrelation Test, and Multicollinearity Test. In panel data regression, the assumption tests used are the multicollinearity test and the heteroscedasticity test.

Multicollinearity Test

The multicollinearity test is used to evaluate the correlation between independent variables. In this study, multicollinearity was evaluated using the tolerance value and *Variance Inflation Factor* (VIF). If the VIF value < 10, it is stated that there is no multicollinearity, while if the VIF value> 10, it is stated that there is multicollinearity.

Table 4. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.007969	18.7107	nan
X1	0.005766	1.61157	1.452417
X2	0.004767	9.451331	1.470207
X3	0.0038	7.732436	1.030991

Source: Data Processed by the Author (2024)

Based on Table 4, the Centered VIF value shows that the value of the independent variables, namely Carbon Performance (X1), *Stakeholders* Pressure (X2), and ISO 14001 Certification (X3), has a VIF value of less than 10, can be concluded that the model does not have a multicollinearity problem and shows that the data analyzed meets the assumptions of the multicollinearity test.

Heteroscedasticity Test

The heteroscedasticity test is used to evaluate whether there are differences in these variants of residuals between observations in the regression method (Ghozali, 2018, p. 137). This study uses the *White* test to detect the presence of heteroscedasticity. *White's* test results in the conclusion that when the probability value ≥ 0.05, it can be concluded that there is no heteroscedasticity problem.

Table 5. Heteroscedasticity Test

F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square(6)	Scaled explained SS	Prob. Chi-Square(6)_2
0.375911	0.8897	2.521297	0.8661	1.883065	0.9301

Source: Data Processed by the Author (2024)

Table 5 shows that the Chi-Square probability value on Obs * R-squared is 0.8661. This value is greater than 0.05 and indicates that this study does not have a heteroscedasticity problem.

Chow Test

The chow test is used to determine which regression method is more suitable between *common effect* and *fixed effect*. If the probability value (*cross-section F*) < 0.05, then H0 is rejected so that the *fixed effect model is* used. However, if the probability value (*cross-section F*) > 0.05, then H0 is accepted so that the *common effect* model is used.

Table 6 Chow Test

Cross-section F	d.f.	Prob.	Cross-section Chi-square	d.f.2	Prob.2
5.000744	(8,33)	0.0004	35.731505	8	0.0

Source: Data Processed by the Author (2024)

Based on Table 6, the Chow test results show a probability value ((*cross-section F*) of 0.0004. Since the value is smaller than 0.05, hypothesis H0 is rejected, and hypothesis H1 is accepted. This indicates that the model used is a *fixed-effect model*. Furthermore, the Hausman test is conducted because the selected model is a *fixed effect model*.

Hausman Test

The Hausman test is used to determine the more suitable regression method between a *fixed effect* or *random effect* that is most appropriate to use in estimating panel data. (Lasiyama et al., 2022). If the probability value > 0.05, then H0 is accepted and uses the random effect model, while if the probability value <0.05, then it is accepted and uses the *fixed effect* model.

Table 7. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.35879	3	0.5014

Source: Data Processed by the Author (2024)

Table 7 shows the results of the Hausman test, which shows a probability of 0.5014. Because the probability value is greater than 0.05, H0 is accepted. This indicates that the panel data regression model used in this study is a random effect model. Based on the test results from the Chow test and Hausman test, the appropriate model used in this study is the random effect model. The following are the results of the regression test using the random effect model.

Table 8. Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.492782	0.084064	5.862003	0.0
X1	-0.044392	0.099958	-0.444104	0.6593
X2	-0.034559	0.060187	-0.574193	0.569
X3	0.194279	0.053052	3.662051	0.0007
Effect Spesification				
			S.D.	Rho
Cross-section random			0.112795	0.5417
Idiosyncratic random			0.103747	0.4583
Weighted Statistics				
R-squared	0.233068	Mean dependent var		0.238581

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Adjusted R-Squared	0.200560	S.D. dependent var		0.115123
S.E. of regression	0.102933	Sum squared resid		0.434403
F-statistic	4.679518	Durbin-Watson stat		1.350841
Prob(F-statistic)	0.006682			
Unweighted Statistics0.627161				
R-squared	0.228932	Mean dependent var		0.627161
Sum squared resid	0.844437	Durbin-Watson stst		0.694913

Source: Data Processed by the Author (2024)

Based on the results of the *random effect model* in Table 8, which explains the effect of carbon performance, stakeholder pressure, and ISO 14001 certification on the disclosure of carbon emissions in energy sector companies listed on the Indonesia Stock Exchange in 2018-2022, the following panel data regression model equation is formulated.

CED = 0.492781855517 - 0.044391845093*CP - 0.034559004545*TS + 0.194278828916*ISO + e

The constant value of 0.492781855517 indicates if the independent variable, namely carbon performance, stakeholder pressure and ISO 14001 certification, is zero. Carbon Performance (X1) has a value of -0.044391845093 with a negative sign, indicating that if there is a change in carbon performance, the disclosure of carbon emissions will decrease by 0.044391845093. Stakeholder Pressure (X2) has a value of -0.034559004545 with a negative sign, indicating that if there is a change in stakeholder pressure, the disclosure of carbon emissions will decrease by 0.034559004545. ISO 14001 certification has a value of 0.194278828916 with a positive sign, indicating that if there is a change in the increase in ISO 14001 certification, the disclosure of carbon emissions will increase by 0.194278828916.

Regression Test Results
Coefficient of Determination

The range of coefficient of determination value ranges from 0 to 1 with the assumption that ($0 \leq r^2 \geq 1$). The coefficient of determination value that is close to one indicates that there is a large influence of the independent variable on the dependent variable. In contrast, if the coefficient value is close to zero, it indicates that the influence of the independent variable on the dependent variable is small. Based on Table 8, the test results of the coefficient of determination ($R^{2)}$ The coefficient of determination test results show that the *adjusted R-squared* value is obtained at 0.200560 or 20.056%. This indicates that independent variables such as carbon performance, stakeholder pressure, and ISO 14001 certification are only able to explain about 20.056% of the independent variable, namely disclosure of carbon emissions. Other variables outside the study explain the remaining 79.944%.

F Statistical Test

Simultaneous hypothesis testing (F-test), commonly referred to as the regression coefficient test, is used to determine whether the independent variable has a simultaneous influence on the dependent variable. Table 8 shows the results of the simultaneous significance test (*F-test)* that the probability value (*F-statistic*) is 0.006682, which shows a value lower than 0.05 so that Ha is accepted and H0 is rejected. Therefore, carbon performance, stakeholder pressure, and ISO 14001 certification simultaneously affect the disclosure of carbon emissions.

Statistical Test t

Partial hypothesis testing (t-test) is used to determine whether the independent variable has a

partial influence on the dependent variable. The t-test can be seen in Table 8. The effect of carbon performance (X1) on carbon emission disclosure shows a probability value of 0.6593 > 0.05. The probability value greater than 0.05 indicates that H0 is accepted and Ha is rejected. This indicates that the carbon performance variable does not affect the disclosure of carbon emissions. The effect of stakeholder pressure (X2) on the disclosure of carbon emissions shows a probability value of 0.5690> 0.05. A probability value greater than 0.05 indicates that H0 is accepted and Ha is rejected. This indicates that the carbon performance variable does not affect the disclosure of carbon emissions. The effect of ISO 14001 certification (X3) on the disclosure of carbon emissions shows a probability value of 0.0007 <0.05. A probability value smaller than 0.05 indicates that H0 is rejected and Ha is accepted. This shows that the ISO 14001 certification variable affects the disclosure of carbon emissions.

Discussion
Effect of Carbon Performance on Carbon Emissions Disclosure

Based on the partial test results in Table 8, the carbon performance variable (X1) has a significance value of 0.6593, which is higher than 0.05. This shows that H0 is accepted, which is not in line with the hypothesis proposed by the researcher, which means that carbon performance partially does not affect carbon emission disclosure. This is in line with research by Ratmono (2021) and Iratiwi & Sulfitri (2023) explained that carbon performance does not influence carbon emission disclosure. This is because companies that have high emission intensity feel worried about disclosing carbon emissions; companies want to avoid loss of public trust due to inefficiency in carrying out company operations.

The Effect of Stakeholder Pressure on Carbon Emissions Disclosure

Based on the partial test results in Table 8, the stakeholder pressure variable (X2) has a significance value of 0.5690, which is higher than 0.05. This shows that H0 is accepted, not in line with the hypothesis proposed by the researcher, which means that stakeholder pressure partially does not affect the disclosure of carbon emissions. This is in line with research by (Sandi et al., 2021)explained that stakeholder pressure does not influence the disclosure of carbon emissions. This is because even though the company violates government regulations related to the environment, the company still discloses carbon emissions consistently.

Effect of ISO 14001 Certification on Carbon Emissions Disclosure

Based on the partial test results in Table 8, the ISO 14001 certification variable (X3) has a significance value of 0.0007, which is lower than 0.05. This shows that H0 is rejected and Ha is accepted, in line with the researcher's hypothesis, meaning that ISO 14001 certification affects the disclosure of carbon emissions. This is in line with research by (Rahmawati & Budiwati, 2018), which explains that ISO 14001 certification has a positive effect. ISO 14001 implementation reflects the company's commitment to complying with environmental standards and increasing transparency in managing its environmental impact.

Conclusion

This study involves three independent variables and one dependent variable. The independent variables are carbon performance, stakeholder pressure, and ISO 14001 certification, while the dependent variable is carbon emission disclosure. This study aims to determine the effect of independent variables on the dependent variable, both simultaneously and partially. The data used comes from the *annual report* and *sustainability report of* energy sector companies listed on the Indonesia Stock Exchange in 2018-2022 and the company's official *website*. Based on simultaneous hypothesis testing, it proves that the carbon performance variable, stakeholder pressure and ISO 14001 certification

influence the disclosure of carbon emissions in energy sector companies listed on the Indonesia Stock Exchange in 2018-2022. While in partial hypothesis testing the variables of carbon performance and stakeholder pressure do not affect the disclosure of carbon emissions.

Reference

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