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The Effect of Green Accounting Implementation, Environmental Performance, and Company Size on the Finance Performance of Energy Sector Companies Listed on the Indonesia Stock Exchange for the Period 2022-2024

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Abstract: This study aims to examine the influence of the implementation of green accounting, environmental performance, and company size on financial performance in energy sector companies listed on the Bursa Efek Indonesia during the period 2022-2024. Sampling was conducted using purposive sampling with a sample size of 19 from a total population of 83 companies. The study period of 3 years produced 57 panel data. Data analysis was performed using SPSS version 29 software. The results show that the implementation of green accounting has no effect on financial performance, environmental performance has a negative effect, while company size has a positive effect on financial performance.

Keyword: Green Accounting, Environmental Performance, Company Size, Financial Performance.

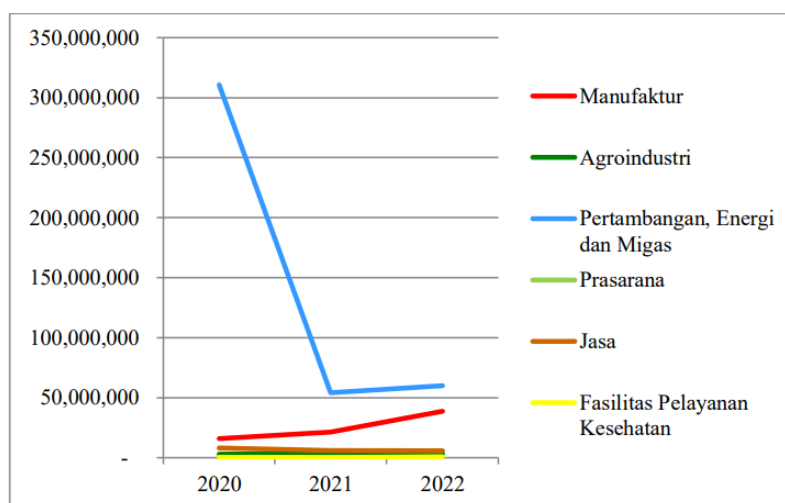
INTRODUCTION

Indonesia is widely recognized as an archipelagic country rich in natural resources derived from various sectors such as agriculture, plantations, livestock, forestry, marine resources, energy, and mining. The energy and mining sectors play a vital role in driving national economic growth but also face serious global challenges, particularly in achieving sustainable resource management. To support national welfare, these sectors must be managed efficiently and responsibly. Companies operating in the energy sector require substantial capital to conduct exploration and resource development (Oktavia, 2019). Although the sector continues to attract investors, its rapid expansion has created significant environmental pressures, making it crucial to strike a balance between economic growth and environmental protection.

Financial performance reflects a company's financial health and evaluates whether its financial activities comply with applicable regulations (Prena, 2021). It is used to assess the

company's ability to generate profits through the effective utilization of its assets. A company that achieves substantial profits indicates strong financial performance, as reflected by a high rate of return on investment.

Statistics Indonesia (BPS) reported that the volume of hazardous and toxic waste (B3) generated by the mining, energy, and oil and gas sectors experienced significant fluctuations 310,657,793 tons in 2020, decreasing sharply to 54,093,048 tons in 2021, and rising again to 60,133,158 tons in 2022 (BPS, 2023). These drastic changes indicate operational dynamics and varying levels of efficiency in waste management within the energy sector. Although there was a decline in waste production during certain periods, the overall volume remains high, showing that environmental management continues to be a serious challenge for the sustainability of the national energy industry. The changes in B3 waste volume can be visualized in the graph below.



Source: Statistics Indonesia (BPS), 2023 (bps.go.id)

Figure 1. Trend of Hazardous and Toxic (B3) Waste Generation

This environmental challenge has also affected corporate financial performance. For instance, PT Adaro Energy Tbk (ADRO) reported a 15.76% decline in revenue to IDR 77.14 trillion and a 35.96% drop in net profit to IDR 18.87 trillion in 2023 compared with the previous year. Similarly, PT Indika Energy Tbk (INDY) experienced a 55.2% decrease in net profit to USD 89.8 million in the first half of 2023 (Saumi, 2023). These decreases were largely influenced by fluctuations in coal prices, higher operational expenses, and environmental compliance costs. PT Medco Energi Internasional Tbk (MEDC) also reported a 37% decline in net profit to USD 330.67 million in 2023, down from USD 530.88 million in the prior year, primarily due to rising production costs and falling energy prices (Malik, 2024). Nevertheless, MEDC remains committed to investing in renewable energy projects such as solar power plants and geothermal developments as part of Indonesia's transition toward clean energy.

Such phenomena highlight that sustainability initiatives often require substantial short-term costs, even though they can yield long-term benefits. This underscores the importance of implementing Green Accounting, an accounting approach that integrates environmental aspects into corporate financial reporting. Green Accounting enables management to identify, measure, and disclose environmental costs and benefits arising from business activities (Rizki et al., 2023). Tiara and Virna (2022) further define green accounting as part of corporate social responsibility—an initiative that combines economic goals with environmental stewardship. Hence, adopting Green Accounting is expected to enhance long-

term business sustainability and financial performance by managing social and environmental issues more effectively.

The development of Green Accounting is driven by the growing awareness of corporate responsibility toward the environment and society. It also responds to the need for non-financial reporting, which has often been overlooked in conventional accounting systems (Ningsih & Rachmawati, 2017). In addition to internal awareness, external pressures from regulators, consumers, and investors have encouraged companies to adopt sustainable financial practices. The Financial Services Authority of Indonesia (OJK), through Regulation No. 51/POJK.03/2017, mandates financial institutions and public companies to integrate economic, financial, social, and environmental performance in their sustainability reports, following the Global Reporting Initiative (GRI) standards.

Apart from Green Accounting, environmental performance is also an essential variable representing how effectively companies manage the environmental impacts of their operations. Environmental performance can be assessed through indicators such as resource efficiency, emission reduction, and waste management (Pujiasih, 2020). These indicators are part of the Program for Pollution Control, Evaluation, and Rating (PROPER), which encourages companies to continuously improve their environmental performance. A strong environmental performance not only demonstrates regulatory compliance but also enhances corporate reputation and stakeholder trust.

The third variable, firm size, represents the scale and capacity of a company's operations. It can be measured by total assets, net sales, or market capitalization, which reflect a firm's ability to manage risks and compete in the market (Indriyani et al., 2023; Yusdianto & Ramadhoni, 2022). Larger companies generally possess more substantial resources, allowing them to better adapt to environmental regulations and sustainability initiatives (Mabruroh, 2022; Arisandy & Eka, 2022).

Previous empirical studies have produced mixed findings regarding the relationship between Green Accounting, environmental performance, firm size, and financial performance. Afrida & Setyorini (2024) found a significant positive effect of Green Accounting on financial performance, whereas Hidayat & Aris (2023) emphasized the role of environmental performance in improving corporate profitability. Rahmadita & Amri (2024) observed that firm size significantly affects financial performance both partially and simultaneously. In contrast, Suryaningrum & Ratnawati (2024) reported no significant influence of Green Accounting and environmental performance on financial performance, while Lutfiana & Hermanto (2021) found no effect of firm size. These inconsistent findings reveal a research gap that warrants further investigation.

This study refers to Ramadhani et al. (2022), who examined the effect of Green Accounting and environmental performance on financial performance with corporate governance as a moderating variable. Their findings indicated a positive relationship among these variables and the strengthening effect of corporate governance. However, the present study differs in terms of scope and focus by incorporating firm size as an independent variable and focusing on energy sector companies listed on the Indonesia Stock Exchange (IDX) for the 2022–2024 period.

Therefore, this study aims to analyze the effect of Green Accounting implementation, environmental performance, and firm size on financial performance among energy companies in Indonesia. The findings are expected to contribute empirical evidence to the growing body of literature on green accounting and provide practical insights for companies seeking to achieve balanced and sustainable financial and environmental performance.

METHOD

In the study "The Effect of Green Accounting Implementation, Environmental Performance, and Firm Size on the Financial Performance of Energy Sector Companies Listed on the Indonesia Stock Exchange (IDX) for the Period 2022–2024", a quantitative research method was employed using a multiple linear regression analysis approach. The population in this study consists of all energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period, totaling 83 companies. The sampling technique applied was purposive sampling, which involves selecting samples based on specific criteria relevant to the research objectives.

This study utilized secondary data, which refers to data that had already been published or made available. The data were obtained from the companies' annual reports and sustainability reports, accessed through the official websites of the respective companies as well as the official website of the Indonesia Stock Exchange. The data covered the period from 2022 to 2024.

The data analysis process was carried out using SPSS (Statistical Product and Service Solutions) software version 29, which facilitated the statistical processing and analysis of the data. Through this method, the study aims to identify and measure the influence of the independent variables—green accounting implementation, environmental performance, and firm size—on the dependent variable, namely the financial performance of energy sector companies listed on the IDX.

RESULT AND DISCUSSION

Legitimacy Theory

Legitimacy theory was first introduced by Dowling and Pfeffer (1975), stating that legitimacy is an essential resource for a company to maintain its sustainability and growth. Firms must align their objectives and activities with the social values and norms of the community in which they operate. When a company's actions are consistent with social expectations, legitimacy is achieved; otherwise, its continuity may be threatened (Dowling & Pfeffer, 1997; Chariri, 2008).

This theory explains that corporate social responsibility (CSR) disclosure is a strategy used by firms to gain legitimacy from society (Deegan & Brown, 1996). Larger firms tend to have greater social responsibility than smaller ones (Cheers, 2011), and poor environmental performance can threaten a company's social legitimacy. Consequently, environmental disclosures in annual reports serve as a means to maintain legitimacy. Since social norms evolve over time, companies must continuously adapt to remain legitimate (Suaryana, 2011).

Stakeholder Theory

The stakeholder concept was first introduced by the Stanford Research Institute (SRI) and further developed by Freeman (1984), emphasizing that a company's existence depends on the support of various stakeholders involved in or affected by its operations. Stakeholder theory provides a framework for understanding the relationship between green accounting, environmental performance, firm size, and financial performance.

The implementation of green accounting reflects a company's response to stakeholder demands for environmental transparency, while good environmental performance demonstrates a commitment to social and environmental responsibility. Larger companies typically face greater pressure to adopt sustainable practices due to their broader operational impacts.

Agency Theory

Agency theory was first introduced by Alchian and Demsetz (1972) and later developed by Jensen and Meckling (1976). This theory describes the contractual relationship between principals (shareholders) and agents (managers), where the agent is authorized to make decisions on behalf of the principal to achieve common goals. The principal compensates the agent for performing tasks in the principal's interest (Anthony & Govindarajan, 1995; Hendricksen & Van Breda, 2002).

In the corporate context, this theory highlights the potential conflict of interest between owners and management. Mechanisms such as green accounting and environmental performance disclosure can help reduce information asymmetrical and enhance principal trust in the agent's performance.

Financial Performance

Financial performance reflects a company's effectiveness and efficiency in achieving its objectives (Surifah, 2002). According to Beaver (1967), it results from managerial decisions involving investment, operational, and financing activities. It is measured in monetary terms and presented in financial statements such as balance sheets, income statements, and cash flow reports (Callahan, 2007).

The primary goals of financial performance measurement are to improve operational activities and demonstrate credibility to investors and the public (Beaver, 1967). In this study, financial performance is measured using the profitability ratio Net Profit Margin (NPM), which represents the percentage of net income to revenue. A higher NPM indicates better profitability (Kasmir, 2012).

Green Accounting

Green accounting, also known as environmental accounting, is an accounting system that identifies, measures, and reports the environmental impacts of a company's operations. According to Ikhsan (2009), it involves efforts to prevent or minimize environmental damage and restore adverse impacts.

The implementation of green accounting enables companies to manage environmental costs efficiently and enhance transparency toward stakeholders through social and environmental reporting. Thus, green accounting serves both as a control mechanism and a form of corporate accountability for environmental sustainability.

Environmental Performance

Environmental performance reflects the extent to which a company manages and controls its environmental impact. Evaluation is based on environmental policies, objectives, and quantitative indicators. The purpose is to identify environmental risks, assess actual outcomes, and explore opportunities for improving efficiency and profitability (Dianty & Nurrahim, 2022).

In Indonesia, environmental performance is assessed through the Company Performance Rating Program in Environmental Management (PROPER), initiated by the Ministry of Environment and Forestry in 2002. The program evaluates compliance with waste management, pollution control, and Environmental Impact Analysis (AMDAL). The ratings—gold, green, blue, red, and black—indicate the company's level of environmental compliance (Eni, 2020). According to Regulation No. 6 of 2013, companies rated red are subject to guidance for improvement, while those rated black are referred for legal action.

Classical Assumption Tests

The classical assumption test aims to ensure that the regression model produces accurate, unbiased, and consistent estimates. This test includes several aspects, namely the normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test. The results of the classical assumption test in this study are presented as follows.

Normality Test

Table 1. Results of the One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Tes			Unstandardied Residual
N			51
Normal Parameter ^{a,b}	Mean		.0000000
	Std. Deviation		1.22750580
	Absolute		.089
	Positive		.089
	Negative		-.063
Tes Statistic			.089
Asymp. Sig. (2-tailed) ^c			.200 ^d
Monte Carlo Sig. (2-tailed) ^c	Sig.	Low Bound	.376
	99% Confidence Interva	Upper Bound	.401
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			

The normality test aims to determine whether the residuals are normally distributed. The Kolmogorov–Smirnov goodness-of-fit test was applied with a significance level of 0.05. The result showed an Asymp. Sig. (2-tailed) value of 0.200, which is greater than 0.05, indicating that the residuals are normally distributed and the model meets the normality assumption.

Multicollinearity Test

Table 2. Results of the Multicollinearity Test

		Untandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	-21.567	3.577		-6.030	<.001		
	GA	.122	1.294	.010	.094	.925	.977	1.024
	KL	-.565	.238	-.263	-2.378	.022	.928	1.077
	UK	.702	.111	.695	6.341	<.001	.942	1.062

The multicollinearity test examines correlations among independent variables. The results indicate tolerance values of 0.977 for Green Accounting, 0.928 for Environmental Performance, and 0.942 for Firm Size, with corresponding VIF values of 1.024, 1.077, and 1.062. Since all tolerance values exceed 0.10 and all VIF values are below 10, the regression model is free from multicollinearity problems.

Heteroscedasticity Test

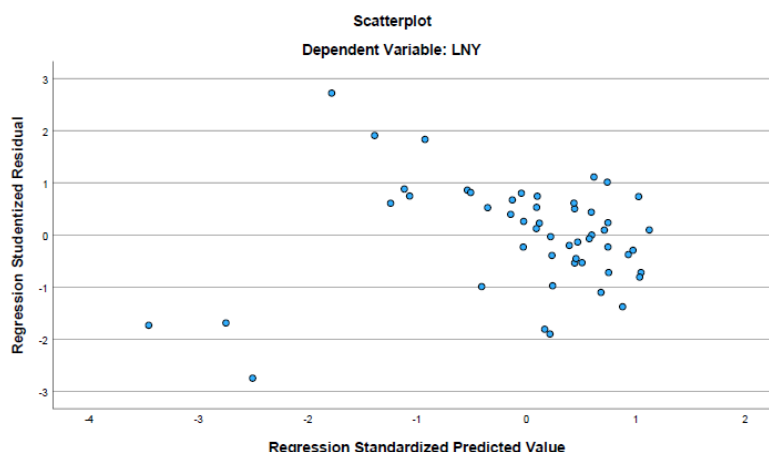


Figure 2. Results of the Heteroscedasticity Test

Heteroscedasticity was tested using a scatter plot between standardized residuals and predicted values. The scatter plot shows a random distribution of points above and below the zero line, with no discernible pattern, indicating the absence of heteroscedasticity and confirming that the model satisfies the homoscedasticity assumption.

Autocorrelation Test

Table 3. Results of the Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.684 ^a	.468	.434	1.26608	.948

a. Predictors: (Constant), Company Size, Green Accounting, Environmental Performance
b. Dependent Variable: LNY

Autocorrelation was tested using the Durbin–Watson (DW) statistic. The obtained DW value of 0.948 falls within the acceptable range of -2 to $+2$, indicating no autocorrelation in the regression model. Therefore, the model satisfies all classical assumptions required for multiple linear regression analysis.

Descriptive Statistics Analysis

Table 4. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Green Accounting	51	0	1	.98	.140
Environmental Performance	51	3	5	3.71	.782
Company Size	51	25.41	32.44	30.4876	1.66599
Financial performance	51	.000	.987	.22816	.223404
Valid N (listwise)	51				

Sumber: Data was processed using SPSS, 2025

Descriptive statistical analysis was conducted to provide an overview of the research data characteristics. After removing outliers, a total of 51 samples were analyzed. The Green Accounting variable had a mean value of 0.98 and a standard deviation of 0.14, indicating homogeneity across companies. The Environmental Performance variable had a mean of 3.71 and a standard deviation of 0.78, showing relatively high variability. The Firm Size variable had a mean of 30.49 and a standard deviation of 1.67, suggesting stable firm characteristics.

The Financial Performance, measured by Net Profit Margin, showed consistent values across the sample.

Multiple Linear Regression Analysis

Table 5. Results of Multiple Linear Regression Analysis

Model		Untandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-21.567	3.577		-6.030	<.001
	GA	.122	1.294	.010	.094	.925
	KL	-.565	.238	-.263	-2.378	.022
	UK	.702	.111	.695	6.341	<.001

a. Dependent variable. *Earnings management*

The regression analysis produced the following equation:

$$Y = -21.567 + 0.122(GA) - 0.565(EP) + 0.702(FS)$$

Interpretation:

1. The Green Accounting coefficient (0.122) is positive, indicating that greater implementation of Green Accounting tends to improve financial performance.
2. The Environmental Performance coefficient (-0.565) is negative, suggesting that improved environmental performance may temporarily reduce financial performance due to additional compliance costs.
3. The Firm Size coefficient (0.702) is positive, meaning that larger firms tend to achieve better financial performance.

Partial Significance Test (t-test)

Table 6. Results of T-Test

Model		Untandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-21.567	3.577		-6.030	<.001
	GA	.122	1.294	.010	.094	.925
	KL	-.565	.238	-.263	-2.378	.022
	UK	.702	.111	.695	6.341	<.001

The results show that *Green Accounting* has no significant effect on financial performance ($p = 0.925 > 0.05$). In contrast, *Environmental Performance* ($p = 0.022 < 0.05$) and *Firm Size* ($p = 0.001 < 0.05$) have a significant effect on financial performance.

Coefficient of Determination (R^2)

Table 7. Results of Coefficient of Determination Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.684 ^a	.468	.434	1.26608	.947

The Adjusted R Square value of 0.434 indicates that 43.4% of the variation in financial performance can be explained by Green Accounting, Environmental Performance, and Firm Size, while the remaining 56.6% is influenced by other factors outside the model.

The first hypothesis (H1) states that green accounting affects financial performance. The results show that green accounting has no significant effect on financial performance, with a regression coefficient of 0.122 and a significant value of 0.925. This indicates that

environmental costs, which are expected to act as long-term investments, are still perceived as additional expenses that reduce profitability. The finding is consistent with Suryaningrum and Ratnawati (2024) and Cahyani and Puspitasari (2023), who found that companies tend to avoid voluntary green accounting reporting because it offers no direct financial benefit.

The second hypothesis (H2) indicates that environmental performance affects financial performance. The regression coefficient of -0.565 and a significance value of 0.022 show a significant but negative relationship. This suggests that higher environmental performance can reduce short-term profitability due to increased compliance and operational costs. The result supports Alareeni and Hamdan (2020) and Ilmi and Dizar (2025), who argue that while environmental efforts enhance corporate image, they also create additional expenses that suppress financial outcomes in the short run.

The third hypothesis (H3) suggests that firm size influences financial performance. The regression coefficient of 0.700 and a significance value of 0.001 indicate a positive and significant relationship. Larger firms tend to achieve higher profitability due to greater asset utilization, financing access, and operational efficiency. This finding aligns with Ibnu Fajar et al. (2025) and Nirwani and Kartini (2022), who highlight that firm size strengthens financial performance through better resource management and market credibility.

CONCLUSION

This study aims to examine the effect of green accounting, environmental performance, and firm size on financial performance in energy sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period. Based on the results of statistical testing using SPSS, the findings indicate that green accounting has no significant effect on profitability, as its impact is not directly observable in the short term. Environmental performance negatively affects financial performance, while firm size has a positive effect on profitability, as larger companies tend to attract more investors and possess greater capacity to enhance their financial performance.

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