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Does The Disclosure of Carbon Emissions and Green Investment Affect Corporate Financial Performance (A Case Study of The Mining and Energy Subsectors)

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ABSTRACT
The purpose of the study is to provide empirical evidence on the influences of carbon emission disclosure (CED) and green investment (GI) on financial performance (FP), as well as the impact of GI on CED. The research population consisted of companies in the mining and energy sub-sectors listed on the Indonesia Stock Exchange for the period 2018–2019. The sample selection technique used purposive sampling with a total sample of 162 observations from 27 companies. This study examines the effects of CED and GI on FP before COVID-19, during COVID-19, and in the new normal and post-COVID-19 periods. The results indicate that before and during COVID-19, CED had a significant impact on FP, while GI had no effect. However, in the new normal and post-COVID-19 periods, neither CED nor GI influenced FP. Additionally, GI was found to have an impact on CED.

INTRODUCTION

The FP of mining companies is often influenced by global market dynamics, which can fluctuate significantly. Additionally, the COVID-19 pandemic, that happened in Indonesia in early 2020, led to an economic downturn, particularly in the mining and energy sectors, where sales demand declined for commodities such as fuel, electricity, coal, gold, and natural gas. During COVID-19, the average financial ratios of mining and energy companies decreased due to a significant drop in revenue (M Paschalia Judith, 2020). PWC reported that FP of publicly listed mining companies on the Indonesia Stock Exchange (IDX) in the first quarter of 2020 showed a decline, with revenues of several companies predicted to fall by 10% in 2020. The decline in FP in the mining sector was attributed to commodity price fluctuations and disruptions in the global supply chain due to the pandemic.

The FP of mining companies from 2022 to 2024 has fluctuated significantly due to global economic trends, inflation, and demand shifts driven by the energy transition. In 2022, the revenue of the world's 40 largest mining companies remained stable at $711 billion. However, rising operational costs and economic uncertainty pressured profit margins, with EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) declining from 32% to 29% (PwC, 2023). From 2023 onward, FP has shown diverse signals. Global mining companies' capital expenditures (CapEx) were projected to increase by 6.2% in 2023. However, in 2024 and 2025, CapEx is expected to decline as companies grapple with inflation and economic slowdowns, leading to projected decreases of 1.8% in 2024 and 0.7% in 2025 (mining.com). Climate change poses a significant challenge for companies in the mining and energy sectors, as it can directly impact FP. Climate change is driven by increasing concentrations of greenhouse gases, primarily resulting from human activities and the rapid pace of global industrialization. The exploitation of natural resources has intensified greenhouse gas concentrations, leading to a rise in the frequency and severity of extreme climate events worldwide (IMF, 2017; IPCC, 2014). Globally, thechangeisrecognized as a substantial source of **physical, economic, and social risks**, influencing climate science and policy-making, thus requiring immediate action (Eleftheriadis & Anagnostopoulou, 2014). In recent years, mitigating carbon emissions has played a role in preventing environmental disasters triggered by rising global temperatures (Wu et al., 2023). This urgency is reflected in the **Paris Agreement**, a global commitment by nations to mitigate and reduce carbon emissions.

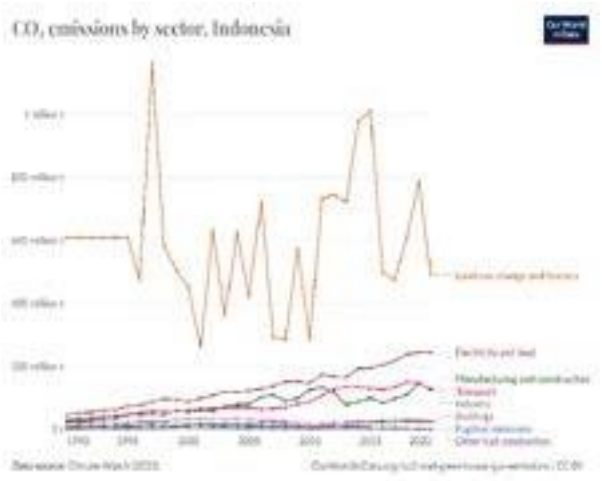

Figure 1. Carbon Emission Graph of Various Industrial Sectors in Indonesia
Source: Climate Watch, 2023

Toaddressclimatechange,companiescantackle this problem by adopting sustainable investment and financial practices, as well as carbon emission disclosures, which can drive FP. Through the Financial Services Authority (OJK), the Indonesian government supports the implementation of the Paris Agreement by promoting sustainable finance initiatives (Maharani et al., 2023). In line with OJK regulations and the Paris Agreement, Indonesia, as a developing country, has incorporated GI as part of its vision to achieve the Golden Indonesian 2045 vision. GI represents corporate efforts to minimize the negative impact of business operations. It is also a strategy for achieving a low-carbon, sustainable economy that provides social, economic, and environmental benefits (Ye & Dela, 2023). Furthermore, GI can stimulate sustainable economic growth and create new job opportunities (Ye & Dela, 2023). The implementation of GI in developing countries can help enhance sustainable economic growth. This approach is also supported by both internal and external stakeholders. Investments in environmental sustainability and corporate social responsibility (CSR) have been shown to improve long-term FP (Rasoulinezhad & Taghizadeh-Hesary, 2022).

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Several previous studies on the impacts of CED and GI on FP have stated different inconsistent results. CED positively affects FP, as measured by return on asset (ROA), return on equity (ROE), return on sales (ROS), and Tobin's Q (Andrian, 2020; Maji & Kalita, 2022); Busch et al., 2022; Ganda & Milondzo, 2018), but Bedi & Singh (2024) reported that CED has a significant negative impact on FP. Nevertheless, Ramadhan et al., 2023 stated carbon emission disclosure does not affect FP (ROA). Lu et al. (2021) suggested that in industries with high carbon intensity, CED does not significantly enhance FP; but in industries with low carbon intensity, CED can improve FP, with the positive effects potentially extending into future periods.

The research results suggested that an increase in green investment can enhance and strengthen long-term FP, reduce environmental violations, and improve environmental performance (Indriastuti & Chariri, 2021; Chariri et al., 2018; Yufeng & Yanbai, 2021). Maharani et al. (2023) found that GI significantly mediates the relationship of political connections to CED. However, Akbar et al., (2021) reported diverse findings. Their study suggested that environmental investment positively affects FP (ROA) and market performance (Tobin's Q) when financial constraints are absent. In contrast, for companies facing financial constraints, environmental investment negatively impacts FP (ROA) and market performance (Tobin's Q). Further studies revealed that green investment positively influences CED (Zhang et al., 2022; Afni et al. 2018; Huang, 2023). However, Zheng & Jin (2023) and Wan & Sheng (2022) reported contradictory results, suggesting that GI negatively affects CED. This research h aims to examine and describe empirical evidence on the impacts of CED and GI on FP, as well as the influence of GI on CED. The study presents a comparative analysis of CED and GI related to FP before, during, and after COVID-19. Additionally, it evaluates the impact of environmental performance across these periods to determine whether companies remained committed to environmental concerns during the pandemic or prioritized financial stability instead.

To comply with Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Institutions, Issuers, and Public Companies (Maharani et al., 2023; OJK), Indonesia has mandated sustainability reports for financial institutions and publicly listed companies since 2019 and registered companies since 2020. Because of COVID-19, nevertheless, the implementation has been postponed until 2021. In the second year of implementation, 88% of the companies had submitted their sustainability reports in 2022. Additionally, this research analyses the impacts of CED on GI in Indonesia's mining and energy sectors.

LITERATURE REVIEWS AND HYPOTHESIS DEVELOPMENTS

Stakeholders Theory

Stakeholder theory studies the role of various parties with vested interests in a company (Osei et al., 2023). This theory asserts that businesses are not only responsible for generating profits through their operations but also for providing benefits to both internal and external stakeholders (Chang et al., 2024). According to this theory, environmentally conscious companies, particularly regarding greenhouse gas (GHG) emissions, and allocate resources for environmental initiatives can enhance stakeholder trust by prioritizing transparency, accountability, and sustainability. Furthermore, (Indriastuti & Chariri, 2021) emphasized that stakeholders play a crucial role in ensuring strong environmental performance. Therefore, companies that embrace sustainable practices can attract investors for GI, improve their reputation, and mitigate legal risks associated with environmental pollution.

The theory states theoretical frameworks for understanding the relationship between green investment, green financing, CSR, and sustainable FP (Acquah et al., 2023). Industries that adopt green accounting and sustainability practices are better equipped to assess their environmental impact and develop long-term strategies that benefit stakeholders (Hörisch et al., 2020). Companies can achieve sustainable performance while enhancing their competitive advantage by considering stakeholder interests, including those related to environmental management and sustainability (Evans et al., 2017). In Indonesia, approximately 70% of companies have disclosed their stakeholder engagement efforts in their sustainability reports. Stakeholder involvement plays a role in

guiding companies' sustainability considerations throughout their value chains (PwC, 2023).

Carbon Emission Disclosure on Financial Performance

Currently, environmental pollution and the increasing globalization of greenhouse gas (GHG) emissions resulting from industrial activities are gaining more attention from industries and governments worldwide. Companies across various countries are making efforts to address environmental issues by disclosing carbon emissions generated from their business activities (Ramadhan et al., 2023). CED also helps bridge the information gap between management and investors, enabling more efficient resource utilization (Ramadhan et al., 2023). According to Dam & Scholtens (2015) and Trinks et al. (2020), as carbon emission costs become more expensive, companies with low-carbon production technologies gain a competitive advantage over those with higher carbon-intensive technologies.

A high level of carbon efficiency can influence profitability, reflecting the extent to which resources are used efficiently (Trinks et al., 2020a). In stakeholder theory, investors support CED as they think about environmental factors and good corporate governance in their decision-making. CED can enhance FP and increase firm value (Luo & Tang, 2016). Research conducted by Andrian, (2020) and Siddique et al. (2021a) suggested that CED affects FP. Ganda & Milondzo, 2018 revealed that Scopes 1,2, and 3 CED have different effects on FP, as measured by ROE, ROI (Return on Investment), and ROS. Therefore, the hypothesis testing is formulated:

H1: Carbon Emission Disclosure Affects Financial Performance.

Green Investment on Financial Performance

Currently, environmental sustainability is a major concern for governments and industries worldwide. One way to support environmental sustainability is investing in or allocating funds for sustainable and eco-friendly projects. Although GI may lead to increased expenditures for environmental pollution control, when aligned with proper regulations, it can also serve as a catalyst for green economic growth (He et al., 2019). GI represents a company's environmental responsibility toward internal and external stakeholders (Indriastuti & Chariri, 2021). In line with stakeholder theory, companies that allocate funds for eco-friendly projects demonstrate their commitment to environmental preservation. For investors, GI can also enhance competitive advantage (Chen & Ma, 2021). Specifically, the mining and energy subsectors can leverage GI to gain a competitive edge and attract investors by utilizing renewable energy and improving energy efficiency to reduce carbon emissions. The results of the study suggested that GI influences FP, proving that its implementation can lead to financial improvements (Indriastuti & Chariri, 2021; Siedschlag & Yan, 2023; Chen & Ma, 2021). Based on the explanation, the hypothesis testing is formulated:

H2: Green Investment Affects Financial Performance

Green Investment on Carbon Emission Disclosure

GI refers to corporate investments aimed at supporting environmental sustainability, reducing carbon emissions, and improving resource efficiency. According to stakeholder theory, stakeholders influence strategic decision-making regarding social and environmental responsibility. Referring to the theory, managers make strategic decisions and allocate resources in alignment with the demands of stakeholder groups (Maharani et al., 2023). Funding GI that sources from companies, private entities, international organizations, banks, and governments, can often be green bonds. Companies that allocate capital toward GI are expected to contribute to energy consumption control, carbon emission reduction (Zheng & Jin, 2023), and the development of renewable energy to sustain the planet and environmental sustainability. Research by Zheng & Jin (2023) stated that increased GI influences carbon emission disclosure while Maharani et al. (2023) suggested that GI positively impacts CED, with political connections serving as a mediating variable. Based on the explanation, the hypothesis testing is formulated:

H3: Green Investment Influences Carbon Emission Disclosure.

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RESEARCH METHODS

Data and Research Subjects

The study focuses on mining and energy companies due to their direct involvement with natural resources and their impact on environmental pollution and sustainability policies. The data used annual and sustainability reports. The population included mining and energy subsectors listed on IDX from 2018 to 2023. The sampling employed a purposive technique, resulting in a total sample of 162 observations from 27 companies. The criteria of sample selection are based on these two items:

1. Mining and energy companies listed on the IDX from 2018 to 2023.
2. Mining and energy companies listed on the IDX from 2018 to 2023 that participate in the PROPER program.

Multiple Linear Regression Equation

Model 1

$$FP_{it} = \alpha + \beta 1 CED_{it} + \beta 2 GI_{it} + e_{it}$$

Model 2

$$CED_{it} = \beta 1 GI_{it} + e_{it}$$

Measurement Variables

Table 1. Measurement Variables

Variables	Measurement	
Dependent Variables		
FP	$ROE = \frac{\text{Net Income}}{\text{Equity}}$	(Rahmawati et al., 2024; Chen & Ma, 2021)
Independent Variables		
CED	Using dummy variables with Index disclosure. Dummy variables: Disclosed: 1 Not disclosed: 0	(Bae Choi et al., 2013), (Maharani et al., 2023)
GI	This study employs the score from the Company Performance Rating Program (PROPER) issued by the Ministry of Environment and Forestry (KLHK). PROPER serves as an indicator to assess a company's commitment and seriousness in preserving environmental sustainability and complying with applicable environmental regulations. Criteria Proper: Gold:5 Green:4 Blue:3 Red:2 Black:1	(Indriastuti & Chariri, 2021)

RESULTS AND DISCUSSION

Hypothesis Testing

Table 2. Hypothesis Testing for the 2018-2023 Period

Variables	Coefficients	Std. Eror	t-statistic	Probability
Constant	1.519	0.715	2.124	0.0351
CED (X1)	2.540	0.591	4.295	0.000
GI (X2)	-0.442	0.202	-2.187	0.030
Adj. R-Square	0.096			
Prob F (statistic)	0.000			
Observation	162			

Source: Processed by the Researcher, 2024

Based on the hypothesis testing results in Table 2, it is found as follows.

Table 2 shows that CED and GI affect the FP of mining and energy companies for the 2018–2023 period. The determination test (R^2) produced a value of 0.096. It indicates that the variations in independent variables state only 9.6% of the FP while the remaining 90.4% are affected by other variables, not covered in the model. For the Goodness of Fit (F-test), the results show a significant value of 0.000, below 0.05. It indicate the independent variables simultaneously affect the dependent variable. In other words, any changes in CED and GI together have an impact on FP.

Carbon Emission Disclosure (CED) has a positive impact (0.000) on the Financial Performance of the mining and energy sector during the 2018-2023 period.

Based on the hypothesis testing, the probability value of CED (0.000) is lower than α (0.05), indicating that CED has a positive impact on FP. It states that CED can influence a company's FP, as reflected in investor and market responses. This finding aligns with stakeholder theory, stating that improving a company's value through FP can be achieved by considering environmental factors. Currently, stakeholders are highly concerned with how companies take their social and environmental responsibilities. Moreover, companies with high profits and large-scale operations tend to find it easier to report carbon emissions.

Research shows that the higher a company's compliance with applicable regulations, the more likely it is to disclose carbon emissions (Rohmah & Nazir, 2022). Trinks et al (2020) found that companies with high carbon efficiency can perform better in short-term operations and gain a competitive advantage in capital markets by systematically reducing environmental risks. The result of the study revealed that Scope 3 emissions (indirect emissions) significantly impact FP, as measured by ROE (Emmanuel et al., 2023). However, it is recommended that management, investors, and relevant stakeholders focus on the emissions of both Scope 1, 2, and 3. Companies with high ROE generate more revenues, and their free cash flow can be used for driving further growth, maintain financial stability, and provide returns to shareholders (Ahsan, 2012).

Green Investment (GI) Positively Affects the Financial Performance of the Mining and Energy Sector for the 2018-2023 Period (0.030)

Based on the hypothesis testing, the probability value of GI (0.030) is smaller than α (0.05), indicating that GI positively affects FP. Implementing GI serves as a long-term strategy to enhance FP. While GI can influence a company's financial outcomes, its impact often requires a considerable amount of time to materialize. This is because it depends on factors such as available capital, stakeholder response, and the actual effectiveness of environmental initiatives in reducing pollution. GI is considered a long-term strategy because it involves environmentally friendly projects that naturally require a significant amount of time to take positive FP impacts. The effect of GI on improving FP is more significant as the investment period extends (Chen & Ma, 2021). Similarly, the study result by Akbar et al. (2021) found that companies without stable FP can significantly enhance their market performance and accounting-based FP (ROA) through increased environmental protection investments. Furthermore, Diantini et al. (2023) suggested that companies with high ROE generally have better environmental performance.

GI plays a role in protecting our planet by reducing carbon emissions and preserving natural resources through environmentally friendly projects. GI is not only about establishing a corporate system that prioritizes sustainability performance, but it also offers a profitable solution by providing higher returns compared to companies that do not prioritize sustainability. Referring to stakeholder theory, companies must think about the interests of stakeholders, which can be achieved through GI. This approach not only addresses environmental concerns but also takes into account investors' expectations for higher returns in the future. Thus, companies that successfully integrate environmental sustainability factors can create corporate value, which ultimately impacts FP. Indriastuti & Chariri (2021) stated that green investment and CSR investments in Indonesia's manufacturing sector can provide a positive perspective to the public, management, and investors as well. In environmental initiatives such as the use of renewable energy and transparent annual reporting, companies can contribute to carbon emission reduction during the production process.

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Table 3. Hypothesis Testing Before, During, and After COVID-19

Variables	Years		
	2018-2019	2020-2021	2022-2023
CED	0.010	0.014	0.276
GI	0.113	0.063	0.466
Observation	54	54	54

Source: Processed by the Researcher, 2024

Based on the comparison results in the Table above, before COVID-19 (2018–2019), during COVID-19 (2020–2021), and in the New Normal period after COVID-19 (2022–2023), there were differences in the effects of Carbon Emission Disclosure (CED) and Green Investment (GI) on Financial Performance.

Table 3 shows that during the pre-COVID-19 in the 2018–2019 period, CED had a value of 0.010, indicating a significant effect on FP, but GI had a value of 0.113, showing no effect on FP. During the COVID-19 of 2020–2021, CED had a value of 0.014, indicating a significant effect on FP, whereas GI had a value of 0.063, indicating no effect on FP. In the New Normal and post-COVID-19 of 2022–2023, CED had a value of 0.276, indicating no effect on FP, and GI had a value of 0.466, also indicating no effect on FP.

The Effect of Carbon Emission Disclosure and Green Investment on Financial Performance Before COVID-19 (2018–2019)

The results of Table 3 indicate that CED has a significant positive effect on the FP of mining and energy. This finding suggests that annual carbon emissions or sustainability reports get a favorable response from the market. According to stakeholder theory, investors and consumers tend to prefer companies that make a high commitment to environmental sustainability. Given that mining and energy companies are directly involved in the extraction of natural resources, they are also expected to take responsibility for environmental management and conservation. This responsibility extends beyond financial profitability to include sustainable business practices that align with environmental and social expectations.

CED can also provide a competitive advantage in the future. However, Siddiqueetal. (2021) revealed that CED negatively impacts both short-term and long-term FP. Similarly, Ganda & Milondzo (2018) stated that the CED of Scope 1 has a significant negative effect on FP (ROE), while that of Scope 2 has no impact on FP (ROE). The lack of impact from Scope 2 on FFP may be attributed to several factors. One key reason is that most stakeholders, particularly investors, are not as interested in indirect emissions (Ganda & Milondzo, 2018). This could be due to the limited control companies have over Scope 2, as the responsibility primarily lies with external parties. Additionally, companies investing in renewable energy may not experience an immediate or direct impact on their FP.

GI does not affect the FP of mining and energy companies. Out of the companies in the sector, only 27 reported their PROPER rating certificates from the KLHK. This indicates that many companies are not yet prepared to allocate funds for environmental investment. Eyraud et al. (2013) stated that GI is driven by economic growth, a well-functioning financial system with low interest rates, and high fuel prices. The successful implementation of GI also needs government support, particularly in financial policy developments such as green finance, to encourage companies to participate in sustainable investments. Green finance takes a role in supporting green investment, serving as a driving force for environmental sustainability initiatives. Financial support, particularly for eco-friendly projects, can significantly ease the implementation process for companies. Moreover, firms with strong financial health and high profitability are better positioned to take on their environmental responsibilities. However, the study results are different from those of Indriastuti & Chariri, (2021), which revealed that GI positively impacts FP. Their research focused on manufacturing companies and was conducted before COVID-19 during the 2016–2019 period.

The Impact of Carbon Emission Disclosure and Green Investment on Financial Performance During the COVID-19 Period (2020–2021)

The hypothesis testing results in Table 4 report that CED had a significant positive impact on the FP of mining and energy companies during the COVID-19 period. The broader the CED during this period, the greater the improvement in FP. Companies believed that prioritizing environmental aspects, such as greenhouse gas (GHG) emissions, during the COVID-19 crisis would not negatively impact their financial stability.

Instead, they recognized that disclosing carbon emissions during the pandemic could enhance their legitimacy and corporate image among the stakeholders. This finding suggests that companies successfully attracted investor and stakeholder attention by demonstrating a strong commitment to environmental responsibility, even amidst financial uncertainty. Stakeholders believed that companies that truly care about the environment have the potential to generate competitive advantages in the future.

These research findings align with the study by Le & Nguyen-Phung (2024), which revealed that greenhouse gas (GHG) emissions have a significant negative impact on FP, as measured by ROA and ROE. Their further study analysed how reducing GHG intensity could increase firm value in Africa following the Paris Agreement. The Paris Agreement represents a global commitment by companies across various nations to emphasize environmental sustainability and contribute to SDGs achievement. Similarly, Secinaro et al. (2020) revealed that the European companies that comply with GHG reduction policies agreed with the Paris Agreement achieve higher FP growth. These findings suggest that GHG disclosure can influence FP. Companies that report total emissions, total energy consumption, and social and environmental management practices employ a proactive approach to transparency and accountability, that ultimately agrees with SDGs.

GI did not have a significant impact during the COVID-19 period due to financial constraints and the economic crisis caused by the pandemic. Developing or implementing environmentally friendly projects requires substantial funding as well as support from both the government and investors. The size of a company also plays a role in deciding whether it can invest in sustainable initiatives. Larger companies with higher revenues are generally in a better position to finance environmental projects. During the pandemic, economic instability led investors and companies to prioritize operational expenses over green investments. Similarly, governments allocated funds primarily to public health initiatives and short-term economic recovery efforts, rather than supporting long-term environmental investments.

According to Akbar et al. (2021), companies experiencing a financial crisis that engage in environmental investments tend to suffer a decline in market performance. This indicates that companies facing financial difficulties are less likely to receive a positive response from the market and investors if they focus solely on GI. In reality, many companies implement sustainability initiatives to primarily keep their image and legitimacy in the stakeholders, rather than as a core business strategy. Tanjung (2023) revealed that after the COVID-19 period, ESG-focused companies did not gain significant benefits during the financial crisis of 2020–2021. The study also stated that in the early stages, the adoption of sustainable finance in the SRI-KEHATI and IDX30 sectors has taken more time to establish a supportive financial and regulatory environment.

New normal period or after COVID-19 (2022-2023)

The intensity of carbon emission disclosure by companies did not significantly impact the FP of mining and energy companies during the new normal and post-COVID-19 periods (2022–2023). After the COVID-19 pandemic, companies prioritized maximizing shareholder returns over CED. Additionally, CED requires support and accountability from both management and director board. However, corporate management and board committees have demonstrated limited responsibility toward environmental issues. As a result, stakeholders have not responded positively to corporate environmental performance (Daromes et al., 2020).

The mining and energy industries can make the largest contributors to carbon emissions. While carbon emission disclosure can help improve FP in the short term, the increase in FP remains relatively low (Lu et al., 2021). This also suggests that even though companies disclose their carbon emissions, the overall FP is not directly impacted (Ramadhan et al., 2023). Moreover, while CED has increased, they do not always correlate with a significant reduction in emissions. Therefore, companies need strategic policies to effectively reduce carbon emissions each year, particularly through green technology and innovation.

GI did not significantly affect the FP of mining and energy companies during the new normal and post-COVID-19 period (2022-2023). This may be because companies focused on restoring

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their financial stability after the pandemic. A study by Chen & Ma (2021), which used ROE as a metric, suggests that this phenomenon is driven by the prioritization of shareholder wealth and profit maximization. Shareholders often push companies to focus on short-term FP, particularly net profit growth, which can result in green investments having little to no immediate impact on FP. Additionally, evaluating the impact of green investments takes time, as their long-term benefits may not be immediately visible. However, GI remains a crucial factor for future financial and environmental sustainability.

Green Investment Affects Carbon Emission Disclosure

Table 4. Hypothesis Testing GI on CED Disclosure

Variables	Coefficients	Std Eror	t-statistic	Prob
Constant	-0.149	0.111	-1.342	0.181
GI	0.090	0.030	2.984	0.003
Adj. R-Square	0.046			
Prob F (statistic)	0.003			
Observation	162			

Source: Processed by the Researcher, 2024

Table 4 shows that GI with a value of 0.003 makes a significant impact on CED. The determination test (R^2) produced an Adjusted R Square value of 0.046. It means variations in the independent variables state only 4.6% of the CED whereas the remaining 95.4% are affected by other variables, not covered in the model. For the Goodness of Fit (F-test), the result shows a significant value of 0.003, which is below 0.05.

The results of the test indicate that GI has a positive effect on CED. The implementation of GI can help reduce greenhouse gas (GHG) emissions. Environmentally friendly projects, such as renewable energy initiatives that utilize solar panels, contribute to reducing GHG emissions to be the main cause of global warming. Although CED in Indonesia has been voluntary, an increasing commitment to environmental sustainability has led many companies to transparently report their carbon emissions in sustainability reports. Furthermore, the OJK Regulation No. 51 of 2017 on the Implementation of Sustainable Finance for Financial Services Institutions, *Emiten*, and Public Companies encourages publicly listed companies to publish sustainability reports, covering aspects of social and environmental responsibility. This regulation is expected to enhance corporate transparency and accountability in addressing environmental concerns while fostering a more sustainable business environment.

According to stakeholder theory, companies disclose information by considering factors such as alignment with stakeholder interests and environmental threats (Maharani et al., 2023). GI refers to investments aimed at addressing climate change by reducing GHG emissions without significantly compromising production and consumption (Afni et al., 2018). GI can take various forms, including eco-friendly product innovations and green financing, both of which are intended to reduce carbon emissions. This is consistent with Maharani et al. (2023), who suggest that environmentally friendly investments encourage companies to optimize green technologies without causing carbon emissions while adding value through the *reduce, reuse, recycle*, and *recovery* (4R) concepts. Therefore, it is crucial to have directors and executives who are committed to environmental sustainability to enhance the quality of CED.

CONCLUSION

The objective of the study is to analyse the impact of CED and GI on the FP of companies, specifically in the mining and energy subsectors listed on the IDX from 2018 to 2023. The results revealed that CED positively influences FP. This suggests that transparency in emission management can enhance investor and stakeholder trust, ultimately leading to long-term financial growth. However, CED does not significantly impact companies facing financial constraints.

GI has a significant positive impact on FP. Companies that commit to investing in environmentally friendly projects tend to experience financial growth. However, the GI may take a long time to increase an FP. Furthermore, FP acts as a mediator that strengthens the relationship of CED to FP. This indicates that companies investing in environmental sustainability not only mitigate negative environmental impacts but also enhance FP over time.

LIMITATION

This study is limited to these items. First, it only employs two independent variables for examining the impact of corporate sustainability and environmental responsibility on FP. Second, the availability of data is limited, particularly for companies participating in and disclosing their involvement in the PROPER program, resulting in a small sample size. Additionally, this study solely focuses on the mining and energy subsector, which may not fully represent the broader economic landscape. Future research is encouraged to expand the scope by including companies from other developing countries and incorporating additional variables that could enhance FP, environmental sustainability, and green finance initiatives.

REFERENCE

Acquah, I. S. K. , Baah, C., Agyabeng‐Mensah, Y., & Afum, E. (2023). Green procurement and green innovation for green organizational legitimacy and access to green finance: The mediating role of total quality management. *Global Business and Organizational Excellence*, *42*(3), 24–41.

Afni, Z., Gani, L., Djakman, C. D., & Sauki, E. (2018). The Effect of Green Strategy and GreenInvestment Toward Carbon Emission Disclosure. *The International Journal of Business Review (The Jobs Review)*, *1*(2), 97–112. https://doi.org/10.17509/tjr.v1i2.13879

Akbar, A., Jiang, X., Qureshi, M. A., & Akbar, M. (2021). *Does corporate environmental investment impede financial performance of Chinese enterprises? The moderating role of financial constraints*. https://doi.org/10.1007/s11356-021-14736-2/Published

Andrian, T. (2020). *Linking Corporate Carbon Emission, Social Responsibility Disclosure and Firm Financial Performance*. https://www.researchgate.net/publication/342437520

Bae Choi, B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, *25*(1), 58–79. https://doi.org/10.1108/01140581311318968

Bedi, A., & Singh, B. (2024). Exploring the impact of carbon emission disclosure on firm financial performance: moderating role of firm size. *Management Research Review*. https://doi.org/10.1108/MRR-01-2023-0015

Busch, T., Bassen, A., Lewandowski, S., & Sump, F. (2022). Corporate Carbon and Financial Performance Revisited. *Organization and Environment*, *35*(1), 154–171. https://doi.org/10.1177/1086026620935638

Chen, Y., & Ma, Y. (2021). Does green investment improve energy firm performance? *Energy Policy*, *153*. https://doi.org/10.1016/j.enpol.2021.112252

Daromes, F. E., Ng, S., & Wijaya, N. (2020). Carbon Emissions Disclosure as Mechanism to Increase Environmental Performance and Control of Idiosyncratic Risk: How They Impact Firm Value. *Indonesian Journal of Sustainability Accounting and Management*, *4*(2), 227. https://doi.org/10.28992/ijsam.v4i2.299

Eleftheriadis, I. M., & Anagnostopoulou, E. G. (2014). Relationship between corporate climate change disclosures and firm factors. *Business Strategy and the Environment*, *24*(8), 780–789.

Emmanuel, Y. L., Adenikinju, O., Doorasamy, M., Ayoola, T. J., Oladejo, A. O., Kwarbai, J. D., & Otekunrin, A. O. (2023). Carbon Emission Disclosure and Financial Performance of Quoted Nigerian Financial Services Companies. *International Journal of Energy Economics and Policy*, *13*(6), 628–635. https://doi.org/10.32479/ijeep.14895

Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E. A., & Barlow, C. Y. (2017). Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models. *Business Strategy and the Environment*, *26*(5), 597–608. https://doi.org/10.1002/bse.1939

Ganda, F., & Milondzo, K. S. (2018). The impact of carbon emissions on corporate financial performance: Evidence from the South African Firms. *Sustainability (Switzerland)*, *10*(7). https://doi.org/10.3390/su10072398

He, L., Zhang, L., Zhong, Z., Wang, D., & Wang, F. (2019). Green credit, renewable energy investment and green economy development: Empirical analysis based on 150 listed companies of China. *Journal of Cleaner Production*, *208*, 363–372. https://doi.org/10.1016/J.JCLEPRO.2018.10.119

Hörisch, J., Schaltegger, S., & Freeman, R. E. (2020). Integrating stakeholder theory and sustainability accounting: A conceptual synthesis. *Journal of Cleaner Production*, *275*. https://doi.org/10.1016/j.jclepro.2020.124097

Huang, Z. (2023). Does green investment reduce carbon emissions? New evidence from partially linear functional-coefficient models. *Heliyon*, *9*(9). https://doi.org/10.1016/j.heliyon.2023.e19838

IMF, I. (2020). *World economic outlook update June 2020. World Economic Outlook World Economic Outlook Update, June 2020: A Crisis Like No Other, An Un-certain Recovery*.

Indriastuti, M., & Chariri, A. (2021). The role of green investment and corporate social responsibility investment on sustainable performance. *Cogent Business and Management*, *8*(1). https://doi.org/10.1080/23311975.2021.1960120

IPCC. (2014). *Contribution of working group II to the fifth assessment report of the inter-governmental panel on climate change. In: Climate Change 2014: Im-pacts, Adaptation, and Vulnerability. Part B: Regional Aspects. AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability — IPCC*.

Lu, Zhu, N., & Zhang, J. (2021). The impact of carbon disclosure on financial performance under low carbon constraints. *Energies*, *14*(14). https://doi.org/10.3390/en14144126

M Paschalia Judith. (2020, August). *Pandemi Menghadang Investasi dan Ekspansi Sektor Pertambangan*. Diunduh tanggal 10 Februari 2025. Pandemi Menghadang Investasi dan Ekspansi Sektor Pertambangan - Kompas.id

Maharani, A., Agustia, D., & Qomariyah, A. (2023). The mediating role of green investment in political connection and carbon information disclosure: Empirical evidence in emerging stock market. *Cogent Business and Management*, *10*(3). https://doi.org/10.1080/23311975.2023.2264004

Maji, S. G., & Kalita, N. (2022). Climate change financial disclosure and firm performance: empirical evidence from Indian energy sector based on TCFD recommendations. *Society and Business Review*, *17*(4), 594–612. https://doi.org/10.1108/SBR-10-2021-0208

MIND ID. (2023). *MIND ID Bukukan Pertumbuhan Kinerja Keuangan 4 Tahun Terakhir.* MIND ID Bukukan Pertumbuhan Kinerja Keuangan 4 Tahun Terakhir.

Osei, A., Osei Agyemang, A., Amoah, J., & Sulemana, I. (2023). Empirical study on the impact of working capital management on going concern of manufacturing firms in Ghana. *Cogent Business and Management*, *10*(2). https://doi.org/10.1080/23311975.2023.2218177

PwC. (2023a). *Perusahaan tambang manfaatkan ko-moditas yang melakukan transisi en-ergi, meskipun jalan menuju emisi net zero masih berliku: Laporan tahunan PwC Mine ke-20*. https://www.pwc.com/id/en/media-centre/press release/2023/indonesian/perusahaan-tambang-manfaatkan-komoditas-yang-melakukan-transisi-energi-meskipun-jalan-menuju-emisi-net-zero-masih-berliku-laporan-tahunan-pwc-mine-ke-20.html/ 13 diakses Oktober 2024

PwC. (2023b). *Tren dan Arah Sustainability Report Indonesia di Masa Mendatang*. https://www.pwc.com/id/en/media-centre/press-release/2023/indonesian/tren-dan-arah-sustainability-report-indonesia-di-masa-mendatang.html

Ramadhan, P., Rani, P., & Wahyuni, E. S. (2023). Disclosure of Carbon Emissions, Covid-19, Green Innovations, Financial Performance, and Firm Value. *Jurnal Akuntansi Dan Keuangan*, *25*(1), 1–16. https://doi.org/10.9744/jak.25.1.1-16

Rasoulinezhad, E., & Taghizadeh-Hesary, F. (2022). Role of green finance in improving energy efficiency and renewable energy development. *Energy Efficiency*, *15*(2). https://doi.org/10.1007/s12053-022-10021-4

Rohmah, D. F. N., & Nazir, N. (2022). Pengaruh Kinerja Keuangan, Kinerja Lingkungan, Sistem Manajemen Lingkungan, Kepemilikan Manajerial dan Reputasi KAP Terhadap Carbon Emission Disclosure. *Jurnal Ekonomi Trisakti* , *2*(2).

Siddique, M. A., Akhtaruzzaman, M., Rashid, A., & Hammami, H. (2021). Carbon disclosure, carbon performance and financial performance: International evidence. *International Review of Financial Analysis*, *75*, 101734. https://doi.org/10.1016/J.IRFA.2021.101734

p-ISSN:1411-6510
e-ISSN :2541-6111

Siedschlag, I., & Yan, W. (2023). Do green investments improve firm performance? Empirical evidence from Ireland. *Technological Forecasting and Social Change*, *186*. https://doi.org/10.1016/j.techfore.2022.122181

Sun, Y., Yang, Y., Huang, N., & Zou, X. (2020). The impacts of climate change risks on financial performance of mining industry: Evidence from listed companies in China. *Resources Policy*, *69*. https://doi.org/10.1016/j.resourpol.2020.101828

Trinks, A., Mulder, M., & Scholtens, B. (2020). An Efficiency Perspective on Carbon Emissions and Financial Performance. *Ecological Economics*, *175*. https://doi.org/10.1016/j.ecolecon.2020.106632

United Nations Climate Change. (2023). *The Human Fingerprint on Greenhouse Gases*. https://www.un.org/en/global-issues/climate-change

Wan, Y., & Sheng, N. (n.d.). *Clarifying the relationship among green investment, clean energy consumption, carbon emissions, and economic growth: a provincial panel analysis of China*. https://doi.org/10.1007/s11356-021-16170-w/Published

Wu, M., & Gao, Q. (2020). Using live video streaming in online tutoring: Exploring factors affecting social interaction. *International Journal of Human–Computer Interaction*, *36*(10), 964–977.

Ye, J., & Dela, E. (2023). The Effect of Green Investment and Green Financing on Sustainable Business Performance of Foreign Chemical Industries Operating in Indonesia: The Mediating Role of Corporate Social Responsibility. *Sustainability (Switzerland)*, *15*(14). https://doi.org/10.3390/su151411218

Zheng, S., & Jin, S. (2023). Is corporate green investment a determinant of corporate carbon emission intensity? A managerial perspective. In *Heliyon* (Vol. 9, Issue 12). Elsevier Ltd. https://doi.org/10.1016/j.heliyon.2023.e22401