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Firm Size Moderating-Investor Perception Mediation: Green Accounting, Carbon-Audit Factors on Financial Performance

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ABSTRACT

Purpose: This study examines the effects of green accounting, carbon tax, carbon emission disclosure, audit opinion, and audit quality on financial performance. It also investigates the mediating role of investor perception and the moderating role of firm size in explaining these relationships.
Design/methodology/approach: This study uses panel data from energy sector companies listed on the Indonesia Stock Exchange during 2021–2024. The sample was selected using purposive sampling. Data were analyzed using panel regression models, including the Common Effect Model, Fixed Effect Model, and Random Effect Model, with model selection based on the Chow, Hausman, and Lagrange Multiplier tests. The analysis was conducted using EViews 12.
Findings/Results: The results show that green accounting, carbon tax, carbon emission disclosure, audit opinion, and audit quality have positive and significant effects on financial performance. Firm size strengthens the effects of green accounting and carbon tax on financial performance, but does not significantly moderate the effects of carbon emission disclosure, audit opinion, or audit quality. Investor perception partially mediates the relationships between the independent variables and financial performance, except in the case of audit quality.
Originality/Value: This study highlights the importance of integrating environmental accounting, carbon-related factors, and audit-related variables in explaining financial performance. The findings imply that investor perception and firm size are important mechanisms in strengthening the relationship between sustainability-related practices and firm performance.

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1. Introduction

The growing impacts of climate change have drawn greater global attention to sustainability issues (Abbass et al., 2022). The energy sector remains the primary source of carbon emissions, primarily due to the combustion of fossil fuels (Addo et al., 2023). In 2022, carbon monoxide emissions from fossil fuels increased by approximately 0.8 percent to 1.5 percent. Although the world succeeded in reducing emissions in the Energy Sector by 9 percent in 2010, this figure rose again in 2019, particularly in developing countries.

Increased carbon emissions from energy activities not only harm the environment but also impact corporate economic conditions, particularly Financial Performance, which is now linked to growing demands for sustainable business practices (Ibishova et al., 2024). Financial Performance serves as a key indicator of management effectiveness in achieving corporate goals (Bhakti & Wulandari, 2025). One approach to supporting sustainability is through the implementation of Green Accounting, which involves recording environmental-related costs in financial statements (Gonzalez & Peña-Vinces, 2023). Green Accounting is believed to enhance transparency and strengthen a company's reputation (Melvani & Arsjah, 2025).

Furthermore, according to (Qatrunnada, 2023), the use of environmentally friendly products can improve Financial Performance by promoting cost efficiency. However, research by (Sari & Astari, 2023) presents different results, showing that Green Accounting does not affect Financial Performance because its implementation requires significant costs. These results align with the study (Novovic Buric et al., 2022), which found that companies often minimize expenditures, including those related to Green Accounting, because such costs have the potential to reduce profits.

Carbon Tax policies have begun to be implemented in Indonesia as a step to encourage companies to reduce emissions and adopt environmentally friendly energy sources (Nurhayati et al., 2024). (Rokhmawati, Sarasi, & Berampu, 2024) explains that the Carbon Tax aims to minimize the impact of emissions while strengthening Indonesia's commitment to addressing climate issues. This tax is imposed on activities that generate emissions through the burning of fossil fuels (Kamil et al., 2023). (Adu et al., 2023) found that a Carbon Tax has a negative impact on Financial Performance because it increases operational costs. However, (Liu et al., 2021) reported the opposite, namely that a Carbon Tax can actually promote production efficiency and create new revenue opportunities.

The growing impact of climate change also has a direct effect on a company's Financial Performance (Bauri et al., 2025). Carbon Emission Disclosure serves to evaluate the factors that influence the presentation of emissions information and the quality of such disclosures (Karim et al., 2021). (Emmanuel et al., 2023) found that Carbon Emission Disclosure significantly and positively impacts Financial Performance because the more information a company discloses, the greater its contribution to reducing global emissions. However, (Desai et al., 2022) identified a negative impact on Financial Performance, particularly on ROA, although results vary across industries. Additionally, Audit Opinion also influence Financial Performance over the long term, as they represent the level of reliability of a company's financial statements. Audit Opinion reflect the Auditor's assessment of whether a company's financial statements are presented accurately (Quick, 2022). (Van Linh et al., 2025) found that Audit Opinion have a significant effect on Financial Performance because they indicate an assessment of the fairness of financial information, even though they do not directly evaluate a company's operational results. However, (Muñoz-Izquierdo & Pascual-Ezama, 2024) found a negative

effect, suggesting that a higher Audit Opinion may reduce Financial Performance due to indications of issues in financial management.

Additionally, Audit Quality also influences Financial Performance. Audit Quality refers to the likelihood that an auditor can identify errors in Financial Statements (R. M. A. Zahid et al., 2022). (Dakhli, 2022) , emphasizes that audits conducted by Big Four accounting firms tend to have higher quality. (Yousefi Nejad et al., 2024) indicates that better Audit Quality improves Financial Performance by reducing fraud risk and limiting opportunistic behavior. However, (Stice et al., 2022) states that Audit Quality does not always impact performance because this is highly dependent on the competence of individual auditors.

These various empirical findings suggest that the relationship between sustainability practices, corporate governance, and Financial Performance still yields inconsistent results and requires a more integrated conceptual approach.

Research on the relationship between sustainability practices, corporate governance, and Financial Performance has continued to evolve in recent years, particularly in the high-carbon energy sector. However, most previous studies still tend to treat environmental factors, such as Green Accounting, Carbon Tax, and Carbon Emission Disclosure, as direct determinants of Financial Performance without comprehensively explaining the mechanisms through which these sustainability signals translate into corporate economic responses (Bedi & Singh, 2024); (Emmanuel et al., 2023). On the other hand, research on governance factors, such as Audit Opinion and Audit Quality, is also generally analyzed separately from the sustainability dimension, thus failing to establish an integrated conceptual framework that explains the simultaneous relationship between sustainability practices, governance credibility, and market response to a company's Financial Performance.

Furthermore, previous research still shows inconsistencies in empirical findings regarding the impact of sustainability disclosure and Audit Quality on Financial Performance, particularly among companies in the energy sector that face the pressures of the global energy transition, carbon risks, and increasingly stringent ESG transparency requirements (Dakhli, 2022); (Desai et al., 2022). This situation indicates a theoretical gap the relationship between sustainability practices and Financial Performance is not always direct but can be influenced by how Investors interpret sustainability information and the credibility of corporate governance as signals of a company's long-term prospects.

Based on this gap, this study offers a conceptual contribution through the development of an integrated sustainability-governance-Investor framework that links the dimensions of sustainability, governance credibility, Investor Perceptions, and Financial Performance within a single integrated model. This study positions Green Accounting, Carbon Tax, and Carbon Emission Disclosure as sustainability signals, while Audit Opinion and Audit Quality are positioned as governance credibility signals that influence Investor Perceptions as a market interpretation mechanism before ultimately impacting the company's Financial Performance. In this study, Investor Perception is positioned as a market psychological mechanism that explains how Investors interpret sustainability signals and governance credibility signals in forming investment decisions and assessments of the sustainability prospects of companies in the Energy Sector. Additionally, this study considers Firm Size as a contextual boundary condition that can strengthen or weaken the effectiveness of sustainability practices and governance quality on a company's Financial Performance, given that large-scale companies generally possess greater resources, technological capacity, and public legitimacy pressure compared to small-scale companies. Thus, this study not only examines the direct

relationships among variables but also expands the perspectives of Stakeholder Theory and Signaling Theory to explain how sustainability practices and governance quality translate into economic value for carbon-intensive Energy Sector companies.

The primary novelty of this study lies in the effort to construct a conceptual mechanism explaining that the relationship between sustainability practices and Financial Performance does not occur solely through direct operational effects but also through the processes of trust-building, legitimacy, and Investor Perceptions regarding the company's sustainability prospects. Therefore, this study is expected to provide a theoretical contribution to the development of sustainability accounting and behavioral finance literature, while also offering strategic implications for energy companies in strengthening market legitimacy and long-term competitiveness through credible sustainability and governance practices.

2. Literature Review & Hypothesis Development

Stakeholder Theory (Freeman, 1998) explains that a company is not only accountable to shareholders but also to all parties that can influence or be influenced by the company's activities, such as Investors, the government, the public, creditors, and the social environment. From this perspective, a company's success is not solely measured by its ability to generate profits, but also by its ability to meet Stakeholders' expectations through responsible and sustainable business practices. Therefore, companies are required to maintain Stakeholder legitimacy and trust through information transparency, good governance, and a commitment to environmental sustainability (Mahajan et al., 2023).

In the context of sustainability, this theory emphasizes that companies need to communicate their environmental and social responsibilities to Stakeholders through various forms of sustainability disclosure (Rusu et al., 2024). Practices such as Green Accounting, Carbon Tax, and Carbon Emission Disclosure reflect the company's responsibility for the environmental impacts resulting from its operational activities. Meanwhile, Audit Opinion and Audit Quality represent forms of corporate governance accountability and credibility in ensuring that the information communicated to Stakeholders possesses a high level of reliability. Thus, the implementation of sustainability practices and good governance is expected to enhance Stakeholder trust and strengthen the company's Financial Performance in the long term.

To further explain how this sustainability and governance information translates into the company's economic performance, this study also employs Signaling Theory. This theory posits that companies can reduce information asymmetry by sending signals to external parties through information disclosure and corporate governance practices (Spence, 1978). In the capital market, these signals serve as the basis for Investors in assessing a company's prospects, credibility, and sustainability before making investment decisions. Information perceived as positive by Investors will increase market confidence, strengthen the company's reputation, and ultimately impact the increase in corporate value and Financial Performance.

From the perspective of Signal Theory, sustainability practices such as Green Accounting, Carbon Tax, and Carbon Emission Disclosure can be viewed as sustainability signals indicating a company's commitment to sustainability and long-term environmental risk management. On the other hand, Audit Opinion and Audit Quality function as governance credibility signals reflecting the level of transparency and reliability of a company's financial reports. Investors then interpret these various signals in forming their perceptions of the company's prospects, which in turn influence investment decisions and the company's Financial Performance. In this relationship, Firm Size also acts as a contextual factor that can

influence the effectiveness of the sustainability and governance signals communicated by the company. Large-scale companies tend to have more adequate resources, higher levels of public exposure, and greater legitimacy pressures to demonstrate credible commitments to sustainability and corporate governance. Therefore, the sustainability and governance signals provided by large companies generally receive more attention and positive responses from Investors compared to small-scale companies.

Green Accounting. Green Accounting is a method used to document and disclose how a company's operational activities impact the environment within its financial statements (Sundarasen et al., 2024). Green Accounting can be viewed as an extension of traditional accounting, which originally focused solely on financial aspects (Dwianika et al., 2024).

Carbon Tax. Carbon Tax is a policy that requires taxpayers to pay the government, without a refund, for the volume of Carbon Emissions generated from production processes (Iqbal & Diana, 2024). The Carbon Tax aims to reduce a country's carbon emissions to net zero (Ahmad et al., 2024). Additionally, the Carbon Tax aims to shift consumer habits from fossil fuels to more environmentally friendly energy sources (J. Yu et al., 2025).

Carbon Emission Disclosure. Carbon Emission Disclosure involves presenting emissions data both historical and projected to encourage Stakeholders to assess the factors, quality, and effectiveness of both mandatory and voluntary disclosures (Almaeda et al., 2023); (Yuliandhari & Ramadhanty, 2024). (Cheng, 2025) explains that carbon emissions stem from human activities that pollute the air, primarily through waste, transportation, energy use, industry, land management, and agriculture, while reporting serves as a means for companies to disclose the emissions generated by their operations.

Audit Opinion. Audit Opinion is a statement issued by an auditor to evaluate whether the audited financial statements comply with applicable standards (Kolisnyk & Shatskov, 2024). Stakeholders often use this opinion as a means of assessing a company's performance, particularly its ability to sustain business operations in the future (Radu & Segalin Zanella, 2023).

Audit Quality. Audit Quality describes how effectively auditors can identify and disclose errors in a company's accounting system (Francis, 2023). The Big Four accounting firms serve as an appropriate indicator because their strong reputations drive them to conduct thorough audits to maintain professional credibility (Kassem & Omoteso, 2024). Essentially, Audit Quality reflects the likelihood that an auditor will detect and report inaccuracies in the accounting process (Quick, 2022).

Financial Performance. Financial Performance reflects how effectively a company manages its resources to generate profits and achieve desired profit levels (Chali & Lakatos, 2024). According to (Lee, 2023), Financial Performance indicates the results of a company's operational activities and illustrates overall financial stability, where good performance signifies a healthy financial position.

Investor Perception. Investor Perception refers to the psychological response formed through the interpretation of financial information available in the market (Persakis & Iatridis, 2023). Investor Perception plays a crucial role in investment decisions as it reflects the level of confidence Investors have in a company's ability to generate value and achieve profitable outcomes (Satpal, 2022). In the context of capital markets, Investor Perception serves as a key mechanism linking sustainability and corporate governance information to a company's economic performance (E. Yu et al., 2021). Investors evaluate a company's financial condition not only based on profitability but also on how the company manages environmental risks,

information transparency, and the quality of its corporate governance (Zhou et al., 2022). In Energy Sector companies with high levels of carbon exposure and ESG pressure, Investors tend to be more sensitive to sustainability signals and governance credibility signals conveyed by the company through Green Accounting practices, Carbon Tax, Carbon Emission Disclosure, Audit Opinion, and Audit Quality. From a Signaling Theory perspective, Investors interpret these signals as indicators of the company's future sustainability prospects, risk levels, and legitimacy before ultimately influencing investment decisions and the company's Financial Performance. Therefore, Investor Perception in this study is positioned as a transmission mechanism explaining how sustainability practices and governance mechanisms translate into corporate economic value.

Firm Size. Firm Size serves as an indicator describing the scale of a company, typically measured by total assets, sales volume, market capitalization, or equity value. Larger companies tend to engage in more activities and have broader access to data that can be shared with external parties such as Investors and creditors (Hung et al., 2021).

This study is based on an integrated conceptual framework that links sustainability practices, governance credibility, Investor Perceptions, and corporate Financial Performance in the context of the carbon-intensive energy sector. Within this framework, Green Accounting, Carbon Tax, and Carbon Emission Disclosure are positioned as sustainability signals reflecting a company's commitment to environmental management, energy efficiency, and long-term sustainability. On the other hand, Audit Opinion and Audit Quality represent governance credibility signals indicating the level of transparency, reliability, and quality of a company's governance in communicating financial information to Stakeholders.

Based on the perspectives of Stakeholder Theory and Signaling Theory, these various sustainability and governance signals will be interpreted by Investors as the basis for assessing a company's prospects, risk levels, and ability to maintain long-term business sustainability. Investors' interpretations of these sustainability practices and governance quality are reflected in Investor Perceptions, which subsequently influence investment decisions, market legitimacy, and the company's Financial Performance. Thus, Investor Perceptions are positioned as the primary mediating mechanism explaining how sustainability practices and governance quality translate into the company's economic outcomes.

Additionally, this study also positions Firm Size as a contextual boundary condition that can influence the effectiveness of the relationship between sustainability practices, governance quality, and Financial Performance. Large firms generally possess greater resources, more adequate technological capacity, higher levels of public exposure, and stronger legitimacy pressures compared to small firms. Therefore, large firms tend to be better able to optimize the implementation of sustainability practices and corporate governance to improve Financial Performance and elicit positive responses from Investors.

This integrated conceptual framework demonstrates that the relationship between sustainability practices, governance quality, and Financial Performance is not merely direct but also involves market interpretation mechanisms and corporate structural conditions. Thus, this study not only offers an empirical test of the relationships among variables but also provides a new conceptual perspective on how companies in the Energy Sector build market legitimacy, Investor trust, and economic value through the integration of credible sustainability practices and corporate governance.

Based on Stakeholder Theory and Signaling Theory, this study constructs an integrated conceptual framework explaining that sustainability practices and corporate governance not

only directly influence Financial Performance but also through market interpretation mechanisms reflected in Investor Perceptions. In this study, Green Accounting, Carbon Tax, and Carbon Emission Disclosure are positioned as sustainability signals reflecting a company's commitment to environmental sustainability. Meanwhile, Audit Opinion and Audit Quality are viewed as governance credibility signals indicating the quality of corporate governance and transparency. All these signals subsequently influence Investor Perceptions and the Financial Performance of companies in the Energy Sector, with Firm Size serving as a contextual boundary condition that reinforces the effectiveness of sustainability practices and governance mechanisms on a company's Financial Performance.

The Impact of Green Accounting on Financial Performance.

Green Accounting is an accounting practice that integrates environmental aspects into a company's operational activities and reporting (Dipta et al., 2025). In the energy sector, the implementation of Green Accounting is becoming increasingly important due to mounting pressure regarding sustainability issues, the energy transition, and the reduction of environmental impacts resulting from a company's operational activities. The implementation of Green Accounting enables companies to improve resource efficiency, reduce long-term environmental costs, and strengthen the company's reputation in the eyes of Investors and Stakeholders (Rahman & Islam, 2023). Additionally, companies that adopt Green Accounting are perceived to have a stronger commitment to business sustainability and environmental risk management, thereby enhancing the company's competitiveness and Financial Performance sustainably (Ewis & Ghanem, 2025). Based on Signaling Theory, the implementation of Green Accounting is viewed as a sustainability signal indicating the company's commitment to environmental responsibility and long-term sustainability. This signal provides positive information to Investors regarding the quality of the company's management in managing environmental risks and maintaining business sustainability, thereby enhancing market confidence and the company's Financial Performance. Previous research indicates that Green Accounting has a positive impact on a company's Financial Performance. (Sari & Astari, 2023) found that the implementation of Green Accounting can improve cost efficiency and enhance a company's Financial Performance. Additionally, (Gonzalez & Peña-Vinces, 2023) explains that Green Accounting can strengthen a company's reputation and create long-term competitive advantages. Research (Melvani & Arsjah, 2025) also indicates that the application of Green Accounting enhances corporate transparency and strengthens Investor confidence in the company.

Based on the above discussion, the following hypothesis can be proposed:

H1: Green Accounting has a positive impact on Financial Performance.

The Impact of Carbon Tax on Financial Performance.

Carbon Tax is an environmental policy instrument implemented to reduce carbon emissions and encourage companies to transition toward more environmentally friendly business activities. In the Energy Sector, the implementation of Carbon Tax encourages companies to improve energy efficiency, develop green innovations, and refine operational strategies to reduce carbon emissions. Although in the short term a Carbon Tax may increase a company's operational costs, in the long term this policy can encourage companies to create production efficiencies, strengthen regulatory readiness, and enhance their competitiveness in facing the global energy transition (Rokhmawati, Sarasi, Aulia, et al., 2024). Based on Signaling Theory, a company's compliance with the Carbon Tax policy is perceived as a sustainability signal indicating the company's readiness to navigate the transition toward a low-carbon economy

and manage environmental risks. Such signals can enhance a company's legitimacy and strengthen Investor confidence in the company's sustainability prospects. Previous research indicates that Carbon Tax affects a company's Financial Performance. (Liu et al., 2021) found that Carbon Tax policies can promote production efficiency and create new revenue opportunities for companies. (Rokhmawati, Sarasi, & Berampu, 2024) also explains that a Carbon Tax can strengthen companies' commitment to environmental sustainability and green business transformation. Additionally, (Adu et al., 2023) states that the implementation of carbon policies can influence companies' operational efficiency strategies in addressing global environmental pressures.

Based on this discussion, the following hypothesis can be proposed:

H2: Carbon Tax have a positive effect on Financial Performance.

The Effect of Carbon Emission Disclosure on Financial Performance.

Carbon Emission Disclosure is a form of corporate transparency in disclosing information regarding carbon emissions and the environmental impacts resulting from a company's operational activities (Sasmita et al., 2025). In the Energy Sector, Carbon Emission Disclosure is becoming increasingly important due to growing demands from regulators, Investors, and Stakeholders for sustainability-oriented business practices. Transparency regarding carbon emissions enables companies to enhance market legitimacy, strengthen corporate reputation, and reduce Investor uncertainty regarding the company's environmental risks. The higher the level of a company's Carbon Emission Disclosure, the greater the level of Investor confidence in the company's sustainability commitments. Based on Signaling Theory, Carbon Emission Disclosure functions as a sustainability transparency signal that provides Investors with information regarding the company's ability to manage environmental risks and maintain long-term business sustainability. More extensive Carbon Emission Disclosure is perceived by Investors as a form of transparency and corporate responsibility regarding environmental issues. Previous research indicates that Carbon Emission Disclosure has a positive impact on a company's Financial Performance. (Emmanuel et al., 2023) found that the higher a company's level of Carbon Emission Disclosure, the greater its contribution to global emission reduction and the improvement in the company's Financial Performance. Additionally, (Karim et al., 2021) explains that the quality of Carbon Emission Disclosure can enhance a company's legitimacy in the eyes of Investors and Stakeholders. The study (Desai et al., 2022) also indicates that Carbon Emission Disclosure is associated with market responses and Investor assessments of the company.

Based on this discussion, the following hypotheses can be proposed:

H3: Carbon Emission Disclosure has a positive effect on Financial Performance.

The Effect of Audit Opinion on Financial Performance.

An audit opinion reflects an independent auditor's assessment of the fairness of a company's financial statement presentation in accordance with applicable accounting standards (Lesmana et al., 2024). For companies in the energy sector, which face high levels of operational, environmental, and regulatory oversight risks, the audit opinion serves as a key indicator in assessing the credibility and transparency of a company's financial information. Companies that receive a favorable Audit Opinion tend to be perceived as having better governance quality, thereby enhancing Investor and Stakeholder confidence in the company (R. Zahid et al., 2023). Based on Signaling Theory, the Audit Opinion functions as a governance credibility signal capable of reducing information asymmetry between the company and Investors. A favorable audit opinion assures Investors that the company's financial statements

are presented fairly and reliably, thereby enhancing market legitimacy and the company's Financial Performance. Previous research indicates that Audit Opinion influence a company's Financial Performance. (Van Linh et al., 2025) found that Audit Opinion significantly impact Financial Performance as they reflect the reliability and fairness of the company's financial information. Furthermore, (Quick, 2022) explains that the audit opinion serves as a key indicator in assessing the quality of a company's financial information. The study (Muñoz-Izquierdo & Pascual-Ezama, 2024) also indicates that the audit opinion influences the market's perception of a company's credibility.

Based on this discussion, the following hypotheses can be proposed:

H4: Audit Opinion have a positive effect on Financial Performance.

The Effect of Audit Quality on Financial Performance.

Audit Quality reflects an auditor's ability to detect and report errors or irregularities in a company's financial statements. High-quality audits enhance the reliability of financial statements, reduce the risk of information manipulation, and strengthen Investor confidence in corporate transparency (W.-B. Wang et al., 2022). In the Energy Sector, which faces ESG pressures and high regulatory scrutiny, Audit Quality is a critical factor in maintaining the legitimacy and reputation of corporate governance. The higher a company's Audit Quality, the greater the level of Stakeholder confidence in the quality of the company's financial reporting. According to Signaling Theory, Audit Quality serves as a governance assurance signal indicating that the company possesses credible oversight and governance systems. High-quality audits provide Investors with confidence that a company's financial information is reliable, thereby enhancing the company's reputation and Financial Performance sustainably. Previous research indicates that Audit Quality has a positive impact on a company's Financial Performance. (Yousefi Nejad et al., 2024) found that higher Audit Quality improves a company's Financial Performance by reducing the risk of fraud and opportunistic managerial behavior. Furthermore, (Dakhli, 2022) explains that high-quality audits can strengthen Investor confidence and improve corporate governance. (R. M. A. Zahid et al., 2022) also states that good Audit Quality can enhance the reliability of financial statements and reduce information asymmetry in the market.

Based on this discussion, the following hypothesis can be proposed:

H5: Audit Quality has a positive effect on Financial Performance.

In addition to sustainability practices and corporate governance that directly influence Financial Performance, firm characteristics can also affect the effectiveness of this relationship. In this study, Firm Size is positioned as a contextual factor that can strengthen the relationship between sustainability practices, governance mechanisms, and a firm's Financial Performance.

Firm Size as a Moderating Variable between Green Accounting and Financial Performance.

Firm Size indicates the extent of a company's resources, operational capacity, and ability to execute sustainable business strategies. Large companies tend to have better financial, technological, and human resources capabilities for implementing Green Accounting compared to small companies (Dhar et al., 2021). Additionally, large companies face greater public legitimacy pressures, regulatory oversight, and Investor scrutiny regarding environmental sustainability issues. Therefore, the implementation of Green Accounting in large companies tends to have a stronger impact on enhancing corporate reputation, Investor confidence, and Financial Performance. Based on Stakeholder Theory, large companies have higher levels of public exposure and are thus required to be more accountable for the company's environmental and social aspects. The implementation of Green Accounting in

large corporations serves as a means to meet Stakeholder expectations regarding sustainable business practices, thereby strengthening corporate legitimacy and improving Financial Performance. Previous research indicates that Firm Size amplifies the influence of Green Accounting on a company's Financial Performance. (Gonzalez & Peña-Vinces, 2023) explains that large corporations are more effective at integrating Green Accounting practices into their business strategies. Furthermore, (Melvani & Arsjah, 2025) found that large companies tend to have higher levels of environmental transparency, which has a positive impact on Financial Performance. Research (Mahajan et al., 2023) also indicates that Stakeholder pressure on large companies drives the implementation of more optimal sustainability accounting.

Based on this discussion, the following hypothesis can be proposed:

H6: Firm Size moderates the relationship between Green Accounting and Financial Performance.

Firm Size as a Moderating Variable between Carbon Tax and Financial Performance.

Large-scale companies tend to have better capabilities in addressing Carbon Tax policies compared to small-scale companies. This is because large companies possess more adequate financial resources, technology, and innovation capacity to achieve energy efficiency, invest in green technology, and manage carbon emissions (Gangodawilage, 2024). In the Energy Sector, large companies' ability to adapt to carbon policies can enhance regulatory readiness and corporate competitiveness in facing the global energy transition. Therefore, the impact of the Carbon Tax on Financial Performance tends to be stronger for large-scale companies. Based on Stakeholder Theory, large companies face higher Stakeholder pressure and public scrutiny regarding compliance with environmental regulations. Consequently, large companies tend to be more proactive in managing the impacts of Carbon Tax policies to maintain corporate legitimacy and sustain Stakeholder confidence in the company's business sustainability. Previous research indicates that Firm Size can amplify the influence of environmental policies on a company's Financial Performance. (Liu et al., 2021) found that large companies possess greater capacity to optimize production efficiency through the implementation of carbon policies. Additionally, (Rokhmawati, Sarasi, & Berampu, 2024) explains that companies with substantial resources are better prepared to face Carbon Tax policies and the transition to a low-carbon economy. The study (Adu et al., 2023) also indicates that a company's capacity is a critical factor in determining the success of implementing corporate environmental policies.

Based on this discussion, the following hypothesis can be proposed:

H7: Firm Size can act as a moderating variable between the Carbon Tax and Financial Performance.

Firm Size as a Moderating Variable Between Carbon Emission Disclosure and Financial Performance.

Large-scale companies tend to have a higher level of environmental information disclosure compared to small-scale companies because they face greater Stakeholder pressure and public scrutiny (Chithambo et al., 2021); (Abdi et al., 2021). In the Energy Sector, large companies generally have better resources and reporting systems to disclose carbon emission information transparently. High levels of transparency in Carbon Emission Disclosure among large companies can enhance market legitimacy, strengthen the company's sustainability reputation, and increase Investor confidence in the company. Therefore, the company's size is expected to amplify the impact of Carbon Emission Disclosure on the company's Financial Performance. Based on Stakeholder Theory, large companies bear a greater responsibility toward Stakeholders in providing transparent and accountable environmental information.

Carbon Emission Disclosure by large companies serves as a means of meeting Stakeholders' expectations regarding sustainable business practices, thereby enhancing the company's legitimacy and Financial Performance. Previous research indicates that large companies tend to have higher levels of environmental disclosure compared to small companies. (Karim et al., 2021) explains that Firm Size influences the quality of a company's Carbon Emission Disclosure. Additionally, (Emmanuel et al., 2023) found that companies with higher levels of carbon emissions transparency receive greater legitimacy and a more positive Investor response. The study (Desai et al., 2022) also indicates that firm characteristics, including Firm Size, influence the effectiveness of carbon disclosure on firm value.

Based on this discussion, the following hypothesis can be proposed:

H8: Firm Size moderates the relationship between Carbon Emission Disclosure and Financial Performance.

Firm Size as a Moderating Variable between Audit Opinion and Financial Performance.

Large companies generally have a higher level of operational complexity and Stakeholder oversight compared to small companies. Under these conditions, the audit opinion becomes a critical factor in maintaining the credibility of financial statements and Investor confidence in the company. Large companies that receive a favorable audit opinion tend to find it easier to maintain market legitimacy and enhance Investor confidence because they have a higher level of public exposure (Tran et al., 2025). Therefore, Firm Size is expected to amplify the influence of the audit opinion on a company's Financial Performance. Based on Stakeholder Theory, large firms bear greater responsibility for maintaining transparency and accountability regarding financial information to Stakeholders. A favorable audit opinion for large firms is viewed as fulfilling Stakeholders' expectations regarding the quality of corporate governance, thereby enhancing the firm's legitimacy and Financial Performance. Previous research indicates that firm characteristics can influence the effectiveness of corporate governance on Financial Performance. (Van Linh et al., 2025) found that Audit Opinion have a significant impact on a firm's Financial Performance through enhanced credibility of financial statements. Additionally, (Quick, 2022) explains that Audit Opinion serve as a key indicator in building Stakeholder trust in the firm. The study (Muñoz-Izquierdo & Pascual-Ezama, 2024) also indicates that market perceptions of Audit Opinion may vary depending on company characteristics.

Based on the above discussion, the following hypothesis can be proposed:

H9: Firm Size moderates the relationship between Audit Opinion and Financial Performance.

Firm Size as a Moderating Variable between Audit Quality and Financial Performance.

Large-scale companies generally have higher levels of operational complexity and business risk, thus requiring higher Audit Quality to maintain the credibility of the company's financial statements. High-quality audits of large companies can enhance transparency, reduce the risk of financial statement manipulation, and strengthen Investor confidence in corporate governance (Alhababsah & Yekini, 2021). Therefore, the impact of Audit Quality on Financial Performance is expected to be stronger in large companies compared to small ones. Based on Stakeholder Theory, large companies face higher Stakeholder pressure to maintain the quality of corporate governance and financial information transparency. High Audit Quality serves as a form of protection for Stakeholder interests, thereby strengthening the company's legitimacy and improving its Financial Performance. Previous research indicates that large firms tend to require higher Audit Quality to maintain the credibility of their financial

statements. (Yousefi Nejad et al., 2024) found that Audit Quality can improve Financial Performance by reducing fraud risk and enhancing corporate governance quality. Additionally, (Dakhli, 2022) explains that high-quality audits play a crucial role in boosting Investor confidence in the firm. (R. M. A. Zahid et al., 2022) also indicates that good Audit Quality can improve the reliability of a company's financial information and strengthen the company's legitimacy in the eyes of Stakeholders.

Based on this discussion, the following hypothesis can be proposed:

H10: Firm Size moderates the relationship between Audit Quality and Financial Performance.

In addition to the direct influence and contextual effects of Firm Size, this study also posits Investor Perception as the primary mediating mechanism explaining how sustainability signals and governance credibility signals translate into market responses and firm Financial Performance. In Energy Sector companies facing ESG pressures, environmental risks, and the uncertainty of the global energy transition, Investors tend to be more sensitive to sustainability information and corporate governance quality. Therefore, Investor Perception is viewed as a market psychological mechanism linking sustainability practices and corporate governance to investment decisions and the company's Financial Performance.

Investor Perception as a Mediator between Green Accounting and Financial Performance.

Green Accounting serves not only as a mechanism for recording a company's environmental costs but also as an indicator of the company's commitment to business sustainability and environmental risk management. In the energy sector, the adoption of Green Accounting tends to attract Investor attention because it demonstrates a company's readiness to address ESG pressures and the global energy transition. Investors who view the implementation of Green Accounting positively will increase their level of confidence in the company's long-term prospects, thereby impacting investment decisions and the company's Financial Performance (Berradia, 2026). Therefore, Investor Perception is expected to mediate the relationship between Green Accounting and a company's Financial Performance. Based on Signaling Theory, Green Accounting functions as a sustainability signal that provides information to Investors regarding the company's commitment to environmental responsibility and business sustainability. Investors then interpret this signal as a positive perception of the company, which subsequently influences investment decisions and the company's Financial Performance. Previous research indicates that sustainability practices can influence Investors' perceptions of a company. (Sari & Astari, 2023) found that the implementation of Green Accounting enhances Investors' trust in a company's sustainability. Additionally, (Gonzalez & Peña-Vinces, 2023) explains that Green Accounting can strengthen a company's reputation and enhance its investment appeal. The study (Melvani & Arsjah, 2025) also indicates that a company's environmental transparency can boost legitimacy and elicit positive Investor responses toward the company.

Based on this description, the following hypothesis can be proposed:

H11: Investor Perception mediates the relationship between Green Accounting and Financial Performance.

Investor Perception as a Mediator between Carbon Tax and Financial Performance.

The implementation of a Carbon Tax encourages companies to improve energy efficiency, reduce carbon emissions, and transition toward sustainable business practices. In the energy sector, a company's ability to navigate Carbon Tax policies can influence Investor Perceptions regarding the company's readiness to address the low-carbon energy transition. Investors tend

to respond positively to companies that can effectively manage the impacts of carbon policies, as they are perceived to have better sustainability prospects and environmental risk management (Y. Wang et al., 2022). Therefore, Investor Perception is expected to mediate the relationship between Carbon Tax and a company's Financial Performance. Based on Signaling Theory, a company's compliance with Carbon Tax policies is perceived as a sustainability signal indicating the company's readiness to manage environmental risks and navigate the transition to a low-carbon economy. This signal then shapes Investors' positive perceptions of the company's business sustainability, which in turn impacts improved Financial Performance. Previous research indicates that environmental policies can influence market perceptions of companies. (Liu et al., 2021) found that the implementation of a Carbon Tax can drive production efficiency and enhance a company's competitiveness in the long term. Additionally, (Rokhmawati, Sarasi, & Berampu, 2024) explains that compliance with carbon policies can strengthen a company's sustainability image in the eyes of Investors. Research (Adu et al., 2023) also indicates that a company's carbon management strategy can influence Investors' responses to the company.

Based on this discussion, the following hypothesis can be proposed:

H12: Investor Perceptions mediate the relationship between Carbon Tax and Financial Performance.

Investor Perceptions as a Mediator Between Carbon Emission Disclosure and Financial Performance.

Carbon Emission Disclosure is a form of corporate transparency in disclosing information regarding carbon emissions and a company's environmental impact. In the energy sector, transparency in Carbon Emission Disclosure is a critical factor in building Investor trust, as it relates to environmental risk management and the company's business sustainability. Investors tend to view companies with high levels of Carbon Emission Disclosure as more responsible, transparent, and better prepared in terms of ESG. Positive Investor Perceptions of a company's environmental transparency can enhance market legitimacy and positively impact the company's Financial Performance (Reber et al., 2021). Based on Signaling Theory, Carbon Emission Disclosure functions as a sustainability transparency signal that provides Investors with information regarding the quality of a company's environmental management and business sustainability. The higher a company's level of carbon emissions transparency, the more positive Investors' perceptions of the company become, thereby enhancing the company's Financial Performance. Previous research indicates that Carbon Emission Disclosure can influence Investors' perceptions of a company. (Emmanuel et al., 2023) found that Carbon Emission Disclosure enhances corporate legitimacy and elicits positive Investor responses toward the company. Additionally, (Karim et al., 2021) explains that the quality of Carbon Emission Disclosure can improve corporate transparency and reduce Investor uncertainty regarding the company's environmental risks. The study (Desai et al., 2022) also indicates that carbon disclosure is associated with market assessments of corporate sustainability.

Based on this description, the following hypothesis can be proposed:

H13: Investor Perception mediates the relationship between Carbon Emission Disclosure and Financial Performance.

Investor Perception as a Mediator between Audit Opinion and Financial Performance.

An audit opinion reflects the level of fairness and reliability of a company's financial statements. In the energy sector, where risk levels and regulatory oversight are high, the audit

opinion is a critical factor in building Investor confidence in the credibility of a company's financial information. Investors tend to respond positively to companies that receive a favorable audit opinion, as they are perceived to have better governance and information transparency. Investors' positive perceptions of the credibility of the company's financial statements can subsequently enhance investment decisions and the company's Financial Performance. Based on Signaling Theory, the Audit Opinion functions as a governance credibility signal that assures Investors that the company's financial statements are presented fairly and reliably. This signal fosters positive Investor Perceptions of the company's governance quality, which in turn impacts the improvement of the company's Financial Performance. Previous research indicates that Audit Opinion can influence market perceptions of a company. (Van Linh et al., 2025) found that Audit Opinion significantly affect a company's Financial Performance by enhancing the credibility of financial statements. Additionally, (Quick, 2022) explains that Audit Opinion serve as a key indicator in building Investor trust in a company. The study (Muñoz-Izquierdo & Pascual-Ezama, 2024) also shows that Investor Perceptions of Audit Opinion can influence the market's response to a company. Based on the above, the following hypothesis can be proposed:

H14: Investor Perception mediates the relationship between Audit Opinion and Financial Performance.

Investor Perception as a Mediator between Audit Quality and Financial Performance.

Audit Quality reflects an auditor's ability to detect and report errors or irregularities in a company's financial statements. High-quality audits enhance the transparency and reliability of financial statements, thereby strengthening Investor confidence in the company (Alsmady, 2022). In the energy sector, which faces ESG pressures and intense regulatory scrutiny, Audit Quality is a critical factor in maintaining a company's legitimacy in the eyes of Investors and Stakeholders. Investors who view a company's Audit Quality positively tend to have higher levels of trust in the quality of the company's governance, which can influence investment decisions and the company's Financial Performance. Based on Signaling Theory, Audit Quality functions as a governance assurance signal indicating that the company possesses credible oversight and governance systems. This signal fosters positive Investor Perceptions regarding the transparency and reliability of corporate information, which ultimately enhances the company's Financial Performance. Previous research indicates that Audit Quality can influence Investor confidence in a company. (Yousefi Nejad et al., 2024) found that high Audit Quality improves Financial Performance by reducing fraud risk and enhancing corporate governance quality. Furthermore, (Dakhli, 2022) explains that high-quality audits can increase Investor confidence in the credibility of a company's financial statements. The study (R. M. A. Zahid et al., 2022) also indicates that good Audit Quality can reduce information asymmetry and enhance a company's legitimacy in the eyes of Stakeholders.

Based on this description, the following hypothesis can be proposed:

H15: Investor Perception mediates the relationship between Audit Quality and Financial Performance.

Figure 1. Research Model

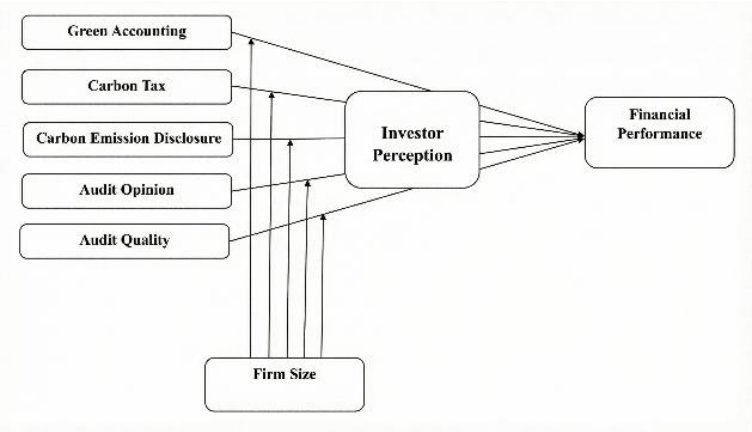

Figure 1 illustrates this research model, depicting the integrated relationship between sustainability practices, governance credibility, Investor Perception, and the Financial Performance of companies in the Energy Sector. Green Accounting, Carbon Tax, and Carbon Emission Disclosure are positioned as sustainability signals, while Audit Opinion and Audit Quality are positioned as governance credibility signals that influence Investor Perception and the company's Financial Performance. Additionally, Firm Size acts as a contextual boundary condition that reinforces the relationship between sustainability practices, governance mechanisms, and the company's Financial Performance.

3. Methodology

The sampling technique used in this study is purposive sampling with the following criteria: (1) Companies in the Energy Sector that provided complete Annual Reports for the years 2021 through 2024, (2) companies that were consistently listed in the IDX Energy Sector from 2021 to 2024, and (3) companies that published complete Sustainability Reports for the same period. The data analysis method used is panel data regression, following previous studies (Perangin-Angin & Choiriah, 2024); (Maharani & Setyaningsih, 2023), as this method provides a more comprehensive understanding of how these variables interact.

The analysis begins with descriptive statistics to identify the characteristics of the data, followed by the selection of a panel regression model using CEM, FEM, and REM. The Chow's test is applied to choose between CEM and FEM, the Hausman test to determine whether FEM or REM is more appropriate, and the Lagrange Multiplier test to compare CEM and REM. If the selected model is CEM or FEM, classical assumption tests for multicollinearity and heteroscedasticity are conducted (Satyahadewi et al., 2023). The next stage involves hypothesis testing, including the F-test to analyze the simultaneous effect of Independent Variables on the Dependent Variable, the t-test to assess the effect of each variable individually, and the R^2 value to determine how well the model explains the variation in the Dependent Variable (Sureiman & Mangera, 2020). The final stage consists of analyzing the regression results of the selected model to identify the direction and significance of each variable's influence, then comparing them with previous studies to strengthen the empirical findings. **Table 1** shows the measurements of each variable examined in this study.

The equation is:

Moderation Model:

$$KK_{it} = \alpha + \beta_1 GA_{it} + \beta_2 CT_{it} + \beta_3 CED_{it} + \beta_4 OA_{it} + \beta_5 KA_{it} + \beta_6 GA_{it} \_UP + \beta_7 CT_{it} \_UP + \beta_8 CED_{it} \_UP + \beta_9 OA_{it} \_UP + \beta_{10} KA_{it} \_UP + \varepsilon_{it} \quad (1)$$

Mediation Model:

Model Equation 1

$$PI_{it} = \alpha + \beta_1 GA_{it} + \beta_2 CT_{it} + \beta_3 CED_{it} + \beta_4 OA_{it} + \beta_5 KA_{it} + \varepsilon_{it} \quad (2)$$

Model Equation 2

$$KK_{it} = \alpha + \beta_1 GA_{it} + \beta_2 CT_{it} + \beta_3 CED_{it} + \beta_4 OA_{it} + \beta_5 KA_{it} + \beta_6 PI_{it} + \varepsilon_{it} \quad (3)$$

Table 1. The Operationalization of Variables

Variable	Definition	Measurement	Reference
Dependent			
Financial Performance	Financial Performance is the result of a structured evaluation conducted by independent auditors and internal teams to determine how effectively a company applies accounting principles, financial procedures, internal controls, reporting systems, and compliance with regulations.	ROA = Net Income for the Current Year / Total Assets	(Ramadhani et al., 2022)
Independent			
Green Accounting	Green Accounting is a reporting method that incorporates a company's environmental impact into its financial records , with the aim of identifying ecological costs, enhancing transparency, and guiding decision-making that supports long-term sustainability.	Dummy Variable: Value 0 = For companies that do not have environmental cost components, waste recycling, or environmental research and development in their Annual Report. Value 1 = For companies that include environmental costs, waste recycling, or environmental research and	(Rosaline & Wuryani, 2020)

Variable	Definition	Measurement	Reference
		development in their Annual Report.	
Carbon Tax	A Carbon Tax is a policy that requires taxpayers to pay the government based on the amount of carbon emissions generated from production processes, without a refund mechanism.	**Carbon Tax** = Total Emissions (Tons of CO2e) - Emissions Cap (Tons of CO2e) = Emissions Deficit (Tons of CO2e) **Gross Carbon Tax =** Emission Deficit (Tons of CO2e) × Carbon Tax Rate (Tons of CO2e) **Gross Carbon Tax Still Owing =** Gross Carbon Tax - SIE Reduction	(Barus & Wijaya, 2022)
Carbon Emission Disclosure	Carbon Emission Disclosure is an environmental policy instrument that calculates payment amounts based on historical carbon emissions performance, past greenhouse gas volumes, and future emissions projections based on production models or economic scenarios.	CED = Total Disclosed Items / Total Disclosure Items (18)	(Saraswati et al., 2021)
Audit Opinion	An audit opinion is a critical component of an independent auditor's report. In performing their duties, auditors not only verify financial figures but also ensure that financial statements accurately reflect the company's financial position, operating results, and cash flows, free from material misstatements, by applying specific judgment criteria.	Dummy Variables: 1 = Unqualified Opinion (WTP) 0 = Non-Unqualified Opinion	(Lu et al., 2025)
Audit Quality	The audit opinion is a critical	Dummy Variable:	(Sunarsih et

Variable	Definition	Measurement	Reference
	element of the independent auditor's report. In their evaluation, auditors not only verify financial data but also ensure that financial statements accurately reflect the company's financial position, operating results, and cash flows without material misstatements, using specific assessment criteria.	1 = Big 4 Public Accounting Firm 0 = Non-Big 4 Public Accounting Firm	al., 2021)
Moderation			
Firm Size	Firm Size is a metric used to indicate the size of a business entity, typically assessed based on total assets, sales volume, market capitalization, or the amount of equity held.	Firm Size = Ln (Total Assets)	(Wirianata et al., 2024)
Mediation			
Investor Perception	Investor Perception is an emotional response that arises as a result of an Investor's interpretation of financial data circulating in the market.	IPR = Trading Volume - Trading Volume Note: IPR: Investor Perception of the Offer-to-Buy Ratio: Stock Purchase Volume Selling Volume: Volume of Stock Sold	(Harimbawa & Sulindawati, 2022)

4. Result and Discussion

Result

Table 2. Descriptive Statistical Analysis

	KK	GA	CT	CED	OA	KA	PI	UP
Min	-0.410	0.000	13.838	0.666	0.000	0.000	-8,451	18,413
Max	0.616	1,000	28,789	0.833	1,000	1,000	21,269	31,445
Mean	0.100	0.705	23.517	0.775	0.857	0.401	4.248	22,847
Obs	112	112	112	112	112	112	112	112

Source: EViews 12 output

Table 2 presents descriptive statistics for all variables in this study. Financial Performance (FP) ranges from -0.410 to 0.616, with a mean of 0.100, indicating that companies in the Energy

Sector generally maintain positive Financial Performance, although the variation among companies is quite wide. The Green Accounting (GA) variable recorded an mean of 0.705, indicating that most companies in the sample have implemented Green Accounting practices. Moving on to other variables, Carbon Tax (CT) shows an mean of 23.517 within a range of 13.838 to 28.789, reflecting significant diversity in Carbon Tax burdens among companies. Carbon Emission Disclosure (CED) has an mean of 0.775, indicating a relatively high level of disclosure among the sample. Audit Opinion (OA) mean 0.857, meaning the majority of companies receive an unqualified audit opinion. Audit Quality (KA), on the other hand, recorded an mean of only 0.401, indicating that companies audited by Big Four accounting firms remain a minority in this sample. Finally, Investor Perception (IP) has an mean of 4.248, while Firm Size (FS) mean 22.847. The relatively high Firm Size figure reflects the dominance of large-scale firms in the research sample.

Table 3. Summary of Panel Data Estimation Model Techniques

No.	Method	Testing	Prob.	Result
1.	Chow Test	CEM vs. FEM	0.059 > 0.05	CEM
2.	Hausman Test	REM vs FEM	0.897 > 0.05	REM
3.	Lagrange Multiplier Test	CEM vs REM	0.101 > 0.05	CEM

Source: Data Analysis

Table 3 shows the results of the three tests conducted. It can be concluded that the panel data regression model used to test the hypotheses and formulate the panel data regression equation is the Common Effects Model (CEM). This indicates that the regression equation in this study is more accurately estimated using the Common Effects Model (CEM).

Table 4. Results of the t-test, F-test, and R^2 Test **(CEM/Common Effects Model)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.129	0.039	0.001	0.001
GA	0.132	0.058	2.253	0.026
CT	0.140	0.063	2.221	0.028
CED	0.108	0.047	2.259	0.026
OA	0.273	0.053	5.066	0.000
KA	0.089	0.042	2.093	0.038
GA_UP	0.155	0.053	2.919	0.004
CT_UP	0.080	0.035	2.285	0.024
CED_UP	0.016	0.038	0.432	0.666
OA_UP	-0.068	0.043	-1.578	0.117
KA_UP	0.012	0.045	0.265	0.790
Root MSE	0.254	R-squared	0.902	
Mean dependent var	0.516	Adjusted R-squared	0.892	
S.D. dependent var	0.817	S.E. of regression	0.267	
Akaike info criterion	0.293	Sum squared resid	7.226	
Schwarz criterion	0.560	Log-likelihood	-5.443	
Hannan-Quinn criter	0.401	F-statistic	93.610	
Durbin-Watson stat	1.805	Prob(F-statistic)	0.000	

Source: EViews 12 Output

Table 4 presents the t-test results for each independent variable. GA, CT, CED, OA, and KA recorded probability values of 0.026, 0.028, 0.026, 0.000, and 0.038, respectively, all below 0.050. This confirms that Green Accounting practices, Carbon Tax policies, Carbon Emission Disclosure, Audit Opinion, and Audit Quality each have a positive and significant impact on

Financial Performance. Regarding interaction terms, GA_UP (p = 0.004) and CT_UP (p = 0.024) are both significant, meaning that Firm Size amplifies the effects of Green Accounting and Carbon Tax on Financial Performance. However, the interactions between CED_UP, OA_UP, and KA_UP yield probability values above 0.050, indicating that Firm Size does not amplify the relationship between these three variables and Financial Performance. This partial finding is further supported by an F-statistic of 93.610 with a probability of 0.000, well below the 0.050 threshold. These results confirm that all independent variables namely GA, CT, CED, OA, KA, GA_UP, CT_UP, CED_UP, OA_UP, and KA_UP collectively have a significant influence on Financial Performance. The R-squared value of 90.261% and the adjusted R-squared of 89.297% further indicate that nearly all of the variation in Financial Performance is explained by the model.

Table 5. Normality Test Results

Jarque-Bera	2.409
Probability	0.299

Source: EViews 12 Output

Table 5 presents the results of the Normality Test, where the significance value of 0.299 exceeds the threshold of 0.050, confirming that the data meets the assumption of normality.

Table 6. Results of the Heteroscedasticity Test

Heteroscedasticity Test: Glejser			
F-statistic	0.913	Prob. F(5,106)	0.475
Obs*R-squared	4.624	Prob. Chi-square(5)	0.463
Scaled explained SS	5.130	Prob. Chi-Square(5)	0.400

Source: EViews 12 output

Table 6 presents the results of the heteroscedasticity test, which shows a Chi-Square Prob. for the Obs*R-squared value of 0.463, which exceeds 0.050. These results indicate that the residuals satisfy the homogeneity assumption, meaning no heteroscedasticity issues were detected in the data.

Table 7. Results of the Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.000	1.366	NA
GA	0.002	3,365	2,807
CT	0.004	5,591	4,182
CED	0.001	2,516	2,025
OA	0.003	5,429	4,556
KA	0.001	3,120	2,773

Source: EViews 12 output

Table 7 reports the results of the multicollinearity test, in which all VIF values are below 10. This confirms that there are no multicollinearity issues among the independent variables.

Table 8. Summary of Hypotheses for **Independent, Dependent, and Moderating Variables**

Hypothesis	Coefficient	Std. Error	t-Statistic	Prob.	Result
H1: GA → KK	0.132	0.058	2.253	0.026	Accepted
H2: CT → KK	0.140	0.063	2.221	0.028	Accepted
H3: CED → KK	0.108	0.047	2.259	0.026	Accepted
H4: OA → KK	0.273	0.053	5.066	0.000	Accepted
H5: KA → KK	0.089	0.042	2.093	0.038	Accepted

Hypothesis	Coefficient	Std. Error	t-Statistic	Prob.	Result
H6: GA_UP → KK	0.155	0.053	2.919	0.004	Accepted
H7: CT_UP → KK	0.080	0.035	2.285	0.024	Accepted
H8: CED_UP → KK	0.016	0.038	0.432	0.666	Rejected
H9: OA_UP → KK	-0.068	0.043	-1.578	0.117	Rejected
H10: KA_UP → KK	0.012	0.045	0.265	0.790	Rejected
R-squared			0.902		
Adjusted R-squared			0.892		
S.E. of regression			0.267		
Sum squared resid			7.226		
Log likelihood			-5.443		
F-statistic			93,610		
Prob(F-statistic)			0.000		

Source: EViews 12 Output

Table 8 summarizes the results of the hypothesis testing for all variables. GA, CT, CED, OA, and KA each show a positive and significant effect on Financial Performance (KK), with probability values of 0.026, 0.028, 0.026, 0.000, and 0.038, respectively. Since all values are below 0.050, hypotheses H1 through H5 are accepted. These results confirm that Green Accounting practices, Carbon Tax policies, Carbon Emission Disclosure, Audit Opinion, and Audit Quality all contribute to improving a company's Financial Performance. Regarding the moderating role of Firm Size (UP), the interaction terms GA_UP (p = 0.004) and CT_UP (p = 0.024) are both significant, supporting H6 and H7. This implies that larger firms are better positioned to maximize the impact of Green Accounting and Carbon Tax on Financial Performance. However, the interactions CED_UP, OA_UP, and KA_UP yielded probability values above 0.050, so H8, H9, and H10 are rejected. Firm Size does not moderate the relationship between these three variables and Financial Performance.

Table 9. Summary of **Independent, Dependent, and Mediation Hypotheses**

Hypothesis	A	B	S_A	S_B	Test statistic	Std. Error	p-value:	Result
H11: GA → PI → KK	0.554	0.212	0.098	0.052	3.306	0.035	0.000	Accepted
H12: CT → PI → KK	0.183	0.212	0.062	0.052	2.390	0.016	0.016	Accepted
H13: CED → PI → KK	0.139	0.212	0.046	0.052	2.235	0.013	0.025	Accepted
H14: OA → PI → KK	0.225	0.212	0.054	0.052	2.914	0.016	0.003	Accepted
H15: KA → PI → KK	0.087	0.212	0.042	0.052	1.846	0.009	0.064	Rejected

Source: Sobel Test Calculator

Table 9 reports the results of the Sobel test, which indicate that Investor Perception (IP) significantly mediates several relationships between the independent variables and Financial Performance (FP). The t-values for Green Accounting (GA), Carbon Tax (CT), Carbon Emission Disclosure (CED), and Audit Opinion (OA) are 3.306, 2.390, 2.235, and 2.914, respectively, all exceeding the critical t-value of 1.960 at the 5% significance level. These results confirm that Investor Perception significantly mediates the influence of these four variables on Financial Performance, thus accepting hypotheses H11 through H14. However, Audit Quality (KA) shows a different result. Its t-value of 1.846 is below the threshold of 1.960, meaning that Investor Perception does not significantly mediate the relationship between Audit Quality and Financial Performance. Consequently, hypothesis H15 is rejected.

Overall, the results of this study indicate that sustainability practices and corporate governance play an increasingly strategic role in improving the Financial Performance of companies in the Energy Sector. The finding that all Independent Variables namely Green

Accounting, Carbon Tax, Carbon Emission Disclosure, Audit Opinion, and Audit Quality exhibit a positive influence on Financial Performance indicates that the market and Investors are beginning to view sustainability practices and governance quality not merely as corporate cost burdens, but as sources of legitimacy, market trust, and long-term competitive advantage. In the Energy Sector, which has high levels of carbon exposure and ESG pressure, companies capable of demonstrating credible commitments to sustainability and governance tend to receive a more positive response from Investors compared to companies that lack transparency regarding environmental and corporate governance issues.

Additionally, the research findings indicate that Firm Size only strengthens certain specific relationships, particularly regarding sustainability practices such as Green Accounting and Carbon Tax, but does not strengthen all relationships among the study variables. This finding suggests that large firms tend to possess better resources, technological capacity, and regulatory readiness in implementing sustainability practices compared to small firms. However, regarding governance aspects such as Audit Opinion and Audit Quality, Investors tend to view Audit Quality as a relatively universal minimum standard of corporate governance that applies regardless of Firm Size. This pattern suggests that the effectiveness of sustainability practices is more influenced by organizational capacity and public legitimacy pressures, whereas governance mechanisms are viewed as basic requirements that all companies must possess, irrespective of their scale.

The findings of this study also confirm that Investor Perceptions play a crucial role as a market interpretation mechanism in linking sustainability signals and governance credibility signals to a company's Financial Performance. Investors in the Energy Sector no longer consider only short-term profitability but also assess a company's ability to manage environmental risks, maintain transparency, and ensure long-term business sustainability. Consequently, companies that build Investor trust through credible sustainability and governance practices tend to achieve greater market legitimacy, investment appeal, and sustained Financial Performance.

The broader implications of these research findings indicate that the transition toward sustainable business practices in the Energy Sector can no longer be viewed as a voluntary choice for companies, but rather as a strategic necessity to maintain market legitimacy and long-term competitiveness. Therefore, companies, regulators, auditors, and Investors need to build a more transparent, credible, and integrated sustainability governance ecosystem to support the acceleration of the transition toward a low-carbon economy and sustainable investment.

Thus, the findings of this study indicate that the integration of sustainability practices, governance quality, and Investor trust has become a strategic factor in fostering the competitiveness and sustainability of companies in the energy sector amid increasing ESG pressures and the global energy transition.

Discussion

The test results show that Green Accounting has a positive and significant effect on Financial Performance, as its significance level is less than 0.05. This finding indicates that the implementation of sustainability-based accounting practices is no longer viewed as an additional burden on companies but rather as a business strategy capable of creating operational efficiency, enhancing corporate reputation, and strengthening long-term competitiveness. In Energy Sector companies, the application of Green Accounting also reflects the company's ability to manage environmental risks and meet the increasingly high

sustainability demands from Investors and regulators. From a Stakeholder Theory perspective, companies strive to meet Stakeholder expectations through transparency and environmental responsibility. Meanwhile, based on Signaling Theory, the implementation of Green Accounting serves as a sustainability signal, demonstrating the company's commitment to long-term sustainability, thereby enhancing Investor confidence and market legitimacy. These findings align with the study (Sari & Astari, 2023), which indicates that the implementation of Green Accounting can improve cost efficiency and a company's Financial Performance, and is supported by (Gonzalez & Peña-Vinces, 2023), which explains that Green Accounting can strengthen a company's reputation and business sustainability.

Furthermore, the test results indicate that the Carbon Tax has a positive and significant effect on Financial Performance with a significance level of less than 0.05. This finding suggests that the implementation of carbon policies is not always perceived as an additional operational cost but can also encourage companies to pursue energy efficiency, environmentally friendly technological innovation, and a transition toward sustainable business practices. In the Energy Sector, pressure to reduce carbon emissions drives companies to improve production efficiency and regulatory readiness, thereby creating long-term competitive advantages. From a Signaling Theory perspective, a company's compliance with Carbon Tax policies serves as a sustainability signal, demonstrating its readiness to navigate the transition to a low-carbon energy system and manage environmental risks. This enhances the company's legitimacy and strengthens Investor confidence in its long-term prospects. These findings align with the study (Liu et al., 2021), which found that a Carbon Tax can drive production efficiency and create new revenue opportunities for companies, as well as with (Rokhmawati, Sarasi, & Berampu, 2024), which explains that Carbon Tax policies can strengthen companies' commitment to environmental sustainability.

Furthermore, the test results indicate that Carbon Emission Disclosure has a positive and significant effect on Financial Performance with a significance level of less than 0.05. This finding suggests that a company's transparency in disclosing carbon emission information is perceived as a form of commitment to environmental responsibility and long-term business sustainability. The higher the level of Carbon Emission Disclosure a company engages in, the higher the level of Investor trust and the company's legitimacy in the eyes of the market. From the perspective of Signaling Theory, Carbon Emission Disclosure functions as a sustainability transparency signal that provides information regarding the company's ability to manage environmental and regulatory risks in the future. Furthermore, from the perspective of Stakeholder Theory, Carbon Emission Disclosure serves as a form of corporate accountability to Stakeholders regarding the environmental impacts resulting from the company's operational activities. These research findings align with the (Emmanuel et al., 2023), which found that Carbon Emission Disclosure has a positive impact on Financial Performance by enhancing the company's contribution to global emission reduction.

Furthermore, the test results indicate that the Audit Opinion has a positive and significant effect on Financial Performance with a significance level of less than 0.05. This finding suggests that a favorable Audit Opinion is perceived as an indicator of the credibility and reliability of a company's financial statements. Investors tend to trust companies that receive a favorable Audit Opinion more, as they are perceived to have more transparent corporate governance and financial reporting quality. From a Signaling Theory perspective, the Audit Opinion functions as a governance credibility signal capable of reducing information asymmetry between the company and Investors. Additionally, from a Stakeholder Theory perspective, a

favorable Audit Opinion reflects the company's accountability to its Stakeholders. In the Energy Sector, which is characterized by high levels of risk and regulatory oversight, the credibility of financial reports is a critical factor in maintaining a company's legitimacy in the eyes of the market. The findings of this study align with the (Van Linh et al., 2025), which found that Audit Opinion significantly influence Financial Performance by indicating the level of reasonableness and reliability of a company's financial information.

Furthermore, the test results indicate that Audit Quality has a positive and significant effect on Financial Performance, with a significance level of less than 0.05. This finding suggests that high-quality audits can enhance the reliability of financial statements and strengthen Investor confidence in the company. Good Audit Quality can also reduce the risk of financial statement manipulation and lower the level of information asymmetry between the company and Investors. From the perspective of Signaling Theory, Audit Quality serves as a governance assurance signal indicating that the company possesses credible oversight and governance systems. Meanwhile, based on Stakeholder Theory, high-quality audits reflect the company's protection of Stakeholders' interests through the provision of reliable and transparent information. The results of this study align with the (Yousefi Nejad et al., 2024), which indicates that high Audit Quality can improve Financial Performance by reducing the risk of fraud and opportunistic managerial behavior.

Furthermore, the results of the moderation test indicate that Firm Size strengthens the effect of Green Accounting on Financial Performance with a significance level of less than 0.05. This finding suggests that large firms possess better resources, technological capacity, and financial capability to implement Green Accounting practices compared to small firms. Large companies also face higher public legitimacy pressures and Stakeholder oversight, making them more motivated to demonstrate a commitment to sustainability. From a Stakeholder Theory perspective, large companies tend to be more proactive in meeting Stakeholder expectations regarding sustainable business practices. Additionally, based on Signaling Theory, the implementation of Green Accounting in large companies serves as a stronger sustainability signal because it is more likely to attract the attention of Investors and the market. These findings support the research (Gonzalez & Peña-Vinces, 2023), which indicates that large firms are more effective in integrating Green Accounting to enhance corporate economic value.

Furthermore, the test results indicate that Firm Size amplifies the effect of the Carbon Tax on Financial Performance with a significance level below 0.05. This finding suggests that large firms possess greater capacity to adapt to carbon policies through energy efficiency, green technology investments, and operational innovations. Large companies also tend to have stronger regulatory readiness and funding capabilities in facing the pressures of the low-carbon energy transition. From a Signaling Theory perspective, large companies' ability to comply with Carbon Tax policies is perceived by Investors as a signal of better sustainability readiness and environmental risk management. These research results align with the (Liu et al., 2021), which indicates that companies with substantial resources are better able to optimize carbon policies into long-term competitive advantages.

Furthermore, the test results indicate that Firm Size does not amplify the effect of Carbon Emission Disclosure on Financial Performance, as the significance level is greater than 0.05. This finding suggests that transparency in Carbon Emission Disclosure has become a common requirement for companies in the Energy Sector, regardless of their size. Investors tend to view Carbon Emission Disclosure as a company's minimum responsibility regarding

environmental issues. From a Stakeholder Theory perspective, all companies remain obligated to maintain environmental legitimacy in the eyes of Stakeholders regardless of Firm Size. These research findings support (Desai et al., 2022), which indicate that the impact of Carbon Emission Disclosure on Financial Performance may vary across companies and industries.

Furthermore, the test results indicate that Firm Size does not amplify the effect of Audit Opinion on Financial Performance, as the significance level is greater than 0.05. This finding suggests that Investors tend to view Audit Opinion as a minimum governance standard that applies relatively uniformly across all firms, whether large or small. From a Signaling Theory perspective, the Audit Opinion still functions as a governance credibility signal, but the strength of that signal is not significantly influenced by Firm Size. The results of this study indicate that the quality and reliability of financial statements are of greater concern to Investors than the size of the firm.

Furthermore, the test results indicate that Firm Size does not moderate the effect of Audit Quality on Financial Performance, as the significance level is greater than 0.05. This finding suggests that Investors view Audit Quality as a fundamental requirement of corporate governance that all firms must meet, regardless of Firm Size. From a Stakeholder Theory perspective, high-quality auditing is a form of corporate accountability to Stakeholders that applies universally. Therefore, the influence of Audit Quality on Financial Performance tends to be relatively consistent and is not affected by the size of the company.

Furthermore, the test results indicate that Investor Perception mediates the effect of Green Accounting on Financial Performance with a significance level of less than 0.05. This finding suggests that the implementation of Green Accounting does not directly improve a company's Financial Performance but first fosters positive Investor Perceptions regarding the company's commitment to sustainability. In the Energy Sector, Green Accounting practices are perceived by Investors as an indicator of a company's ability to manage environmental risks, enhance transparency, and ensure long-term business sustainability. From a Signaling Theory perspective, Green Accounting functions as a sustainability signal that provides positive information regarding management quality and the company's readiness to address ESG pressures and the global energy transition. Investors then interpret these signals as a positive outlook for sustainability, thereby boosting market confidence, investment interest, and corporate legitimacy which ultimately leads to improved Financial Performance. Additionally, from a Stakeholder Theory perspective, companies that meet Stakeholders' sustainability expectations tend to secure stronger market support. These research findings align with the study (Sari & Astari, 2023), which demonstrates that Green Accounting can enhance corporate value by increasing Investor confidence in the company's business sustainability.

Furthermore, the test results indicate that Investor Perception mediates the effect of the Carbon Tax on Financial Performance with a significance level of less than 0.05. This finding suggests that the Carbon Tax policy is not merely viewed as an additional cost burden for the company but also as an indicator of the company's readiness to navigate the transition toward a low-carbon economy. Investors tend to respond positively to companies that can adapt to carbon policies through energy efficiency, green technology innovation, and better environmental risk management. From the perspective of Signaling Theory, compliance with the Carbon Tax serves as a sustainability signal demonstrating the company's commitment to environmental regulations and long-term sustainability. Positive Investor Perceptions of the company's sustainability readiness subsequently enhance market legitimacy and investment appeal, leading to improved Financial Performance. Furthermore, from a Stakeholder Theory

perspective, companies that meet regulatory demands and Stakeholders' environmental expectations tend to receive better market support. These findings are supported by the study (Liu et al., 2021), which found that carbon policies can drive production efficiency and enhance a company's long-term economic opportunities.

Furthermore, the test results indicate that Investor Perception mediates the effect of Carbon Emission Disclosure on Financial Performance with a significance level of less than 0.05. This finding suggests that a company's transparency in disclosing carbon emission information fosters positive Investor Perceptions regarding the company's sustainability commitments. Investors tend to view companies with high levels of Carbon Emission Disclosure as more transparent, responsible, and better prepared in terms of ESG to address environmental risks and global regulatory pressures. From a Signaling Theory perspective, Carbon Emission Disclosure functions as a sustainability transparency signal that provides information regarding the quality of a company's environmental management. Investors then respond to this signal through increased market confidence and investment interest, which in turn leads to improved corporate Financial Performance. Furthermore, based on Stakeholder Theory, Carbon Emission Disclosure represents a form of corporate accountability in response to Stakeholder demands regarding environmental sustainability. The results of this study are consistent with the (Emmanuel et al., 2023), which found that Carbon Emission Disclosure can improve a company's Financial Performance by enhancing the company's legitimacy and reputation in the eyes of Investors.

Furthermore, the test results indicate that Investor Perception mediates the effect of Audit Opinion on Financial Performance, with a significance level of less than 0.05. This finding suggests that a favorable audit opinion fosters positive Investor Perceptions regarding the credibility and reliability of a company's financial statements. Investors tend to trust companies that receive an unqualified audit opinion more, as they are perceived to have better corporate governance and financial transparency. From the perspective of Signaling Theory, the audit opinion functions as a governance credibility signal that reduces information asymmetry between the company and Investors. Investors' positive perceptions of the credibility of these financial statements subsequently enhance market confidence, strengthen the company's reputation, and improve investment decisions, which in turn lead to improved Financial Performance. Furthermore, based on Stakeholder Theory, a favorable audit opinion reflects the company's accountability to Stakeholders through the presentation of reliable and transparent financial statements. These findings align with the (Van Linh et al., 2025), which demonstrates that an audit opinion significantly influences Financial Performance by enhancing Investors' confidence in the quality of the company's information.

Furthermore, the test results indicate that Investor Perception fails to mediate the effect of Audit Quality on Financial Performance, as the significance level is greater than 0.05. This finding suggests that Investors tend to view Audit Quality as a minimum governance standard that all companies must possess, and thus it does not always serve as the primary factor in shaping investment perceptions. Although Audit Quality can enhance the reliability of financial statements and reduce the risk of information manipulation, Investors in the Energy Sector likely prioritize other factors such as profitability, business prospects, and the company's sustainability commitments when making investment decisions. From a Signaling Theory perspective, Audit Quality still functions as a governance assurance signal. However, the strength of this signal is not yet dominant enough to directly influence Investor Perception. Furthermore, based on Stakeholder Theory, high-quality audits are viewed as a general

corporate governance obligation and thus do not always create perceptual differentiation in the eyes of Investors. These findings align with the (Stice et al., 2022), which states that Audit Quality does not always have a direct impact on firm performance because its influence depends heavily on the firm's specific conditions and Investors' interpretation of available information.

5. Conclusion and Suggestion

The research findings confirm that Green Accounting, Carbon Tax, Carbon Emission Disclosure, Audit Opinion, and Audit Quality each have a positive and significant impact on a company's Financial Performance. These findings are consistent with previous research emphasizing the role of cost efficiency, regulatory compliance, and fraud prevention in driving better corporate outcomes. Firm Size strengthens the relationship between Green Accounting and Carbon Tax with Financial Performance, but its moderating effect does not apply to Carbon Emission Disclosure, Audit Opinion, or Audit Quality. Specifically, for Audit Opinion, larger Firm Size may even reduce its influence on Financial Performance. Investor Perception acts as the primary mediator between Green Accounting, Carbon Tax, Carbon Emission Disclosure, and Audit Opinion and Financial Performance. These findings align with the Stakeholder Theory (Freeman, 1998), which emphasizes that Stakeholder trust plays a central role in shaping corporate success. However, Investor Perception does not mediate the relationship between Audit Quality and Financial Performance, as this relationship depends more on actual Financial Performance than on perception. Overall, these findings highlight the need for companies to integrate sustainable practices and transparent audits to strengthen their Financial Performance and build stronger Investor trust through responsible financial management.

From a theoretical perspective, the findings of this study not only reinforce Stakeholder Theory but also expand the perspective of Signaling Theory by explaining that sustainable practices and corporate governance function as sustainability signals and governance credibility signals that influence Investor Perceptions and a company's Financial Performance. These findings indicate that Stakeholder trust and Investors' positive interpretations of a company's environmental commitments, transparency, and governance quality are critical factors in building market legitimacy and corporate economic value, particularly within the carbon-intensive Energy Sector. Additionally, this study demonstrates that Firm Size acts as a contextual boundary condition that influences the effectiveness of sustainability practices on Financial Performance. Practically, these findings suggest that companies in the Energy Sector need to view sustainability practices and corporate governance not merely as a form of regulatory compliance, but as a long-term business strategy to build market legitimacy, enhance Investor trust, and strengthen the company's competitiveness amid increasing ESG pressures and the global energy transition. The implementation of Green Accounting, transparency in Carbon Emission Disclosure, and the enhancement of Audit Quality and corporate governance can serve as strategic instruments in building a company's sustainability reputation and Investor trust. Additionally, companies must develop more transparent and credible sustainability communication strategies so that the sustainability signals and governance credibility signals they convey can be interpreted positively by Investors and Stakeholders.

From a policy perspective, the findings of this study imply that regulators and policymakers need to strengthen sustainability policies, ESG transparency, and regulations related to Carbon Emission Disclosure, particularly in sectors with high carbon intensity such as the energy sector. Furthermore, incentive policies for companies that implement sustainable practices and credible corporate governance are also crucial to accelerating the transition toward a low-carbon economy. These findings also highlight the importance of the role of auditors and supervisory bodies in improving the quality of corporate sustainability information transparency to strengthen Investor protection and market stability.

This study also makes a theoretical contribution through the development of an integrated sustainability-governance-Investor framework, which explains that the relationship between sustainability practices, corporate governance, and Financial Performance occurs not only directly but also through the mechanism of Investor Perception formation specifically, the market's interpretation of a company's sustainability signals and governance credibility signals. Furthermore, this study demonstrates that Firm Size acts as a contextual boundary condition that influences the effectiveness of sustainability practices on the Financial Performance of firms in the energy sector. Thus, this study expands the perspectives of Stakeholder Theory and Signaling Theory in explaining how sustainability practices and corporate governance are translated into economic value and market legitimacy for carbon-intensive energy sector firms.

For future research, it is recommended to expand the sample to other industrial sectors, extend the observation period, and include additional variables such as ESG Scores, Innovation Capability, and Corporate Social Responsibility (CSR) to enrich the empirical understanding of these relationships. The application of more advanced analytical methods, such as Structural Equation Modeling (SEM), would also allow for a more comprehensive examination of the causal relationships among these variables.

6. Limitations and Future Research

This study has several limitations that should be noted. The observation period is relatively short, the focus is limited to the Energy Sector, and the data relies entirely on secondary sources from company reports. These limitations may not fully reflect conditions in other sectors. Future research should address these gaps by extending the time frame, broadening the sectoral scope, and applying a more diverse range of analytical approaches. This will yield more representative results and contribute more meaningfully to the development of sustainable accounting in Indonesia.

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