

# **THE ROLE OF GREEN TECHNOLOGY IN MEDIATING THE IMPACT OF GCG AND BIODIVERSITY ACCOUNTING ON ENERGY AND MINING SECTOR PERFORMANCE**

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## **ABSTRACT**

This study aims to examine the effect of Good Corporate Governance (GCG) and Biodiversity Accounting on the performance of companies in the energy and mining sectors. This study examines the adoption of green accounting as a mediator between GCG, biodiversity accounting, and company performance. The results showed that GCG and Biodiversity accounting, supported by the adoption of Green accounting, improved company performance. This study uses SEM-PLS to develop specific indicators for latent variables, based on 250 financial statements and sustainability performance. These findings have important implications for companies, governments, and stakeholders in supporting sustainability through the application of GCG principles and green technology. Further Research could extend this review to other sectors and explore the long-term impact of adopting environmentally friendly technologies on company performance.



## **INTRODUCTION**

Good corporate governance (GCG) is a crucial element in public companies in Indonesia that aims to ensure that company activities are transparent, accountable, and responsible (Binh Dao & Tra Nguyen, 2020). Public companies, especially in the energy and mining sectors, currently focus not only on achieving profits but also on environmental issues, particularly biodiversity management (Zai & Widianingsih, 2025b; R. Zhao et al., 2025). Globally, biodiversity is increasingly threatened by large-scale land exploitation for increased productivity in the energy and mining industries (Bach et al., 2025; Guastella et al., 2022; Orazalin et al., 2025; Wang et al., 2020). Thus, special attention is needed across the operational scope, environmental disclosure, and mitigation as a means to anticipate negative impacts.

Energy and mining companies in Indonesia are increasingly aware of the importance of biodiversity disclosure (Zai & Widianingsih, 2025a, 2025b). The Research

shows that the Environmental reporting index of companies listed on the Indonesia Stock Exchange has increased over the past 10 years (Kurnianta & Dianawati, 2020). However, many companies have not yet integrated GCG principles and biodiversity disclosure to improve performance. One obstacle is that the company has not been able to optimise the application of the technology invested in to support biodiversity reporting while meeting one of the GCG principles, namely transparency (N. et al., 2020; Yu et al., 2023). Inappropriate technology (misalignment) and a lack of management commitment are the main problems hindering the implementation of GCG and biodiversity reporting (Yu et al., 2023).

Companies need to effectively adapt the technology they have invested in to align with the needs of GCG implementation and biodiversity disclosure. One effort is the optimisation of the use of environmentally friendly technology (Lee et al., 2023). Optimisation that needs to be done is to integrate technology according to GCG needs and disclosure of biodiversity accounting (biodiversity accounting). The contribution of technology to support GCG and biodiversity accounting disclosure is expected to improve the company's performance.

Literature studies consistently show the positive Influence of GCG on company performance in various sectors (Binh Dao & Tra Nguyen, 2020; Błach et al., 2025; López-Quesada et al., 2018; Luo et al., 2024; Mustafa et al., 2024; N. et al., 2020; Ntim, 2013; Pradhan et al., 2018; Shah & Paliwal, 2022; Sharma et al., 2023; Shungu et al., 2014). GCG mechanisms such as BOC structure, concentrated ownership and meeting frequency show a positive Influence on company performance (Binh Dao & Tra Nguyen, 2020; Błach et al., 2025; López-Quesada et al., 2018; Luo et al., 2024; Mustafa et al., 2024; N. et al., 2020; Ntim, 2013; Pradhan et al., 2018; Shah & Paliwal, 2022; Sharma et al., 2023; Shungu et al., 2014). Then, GCG principles such as accountability, transparency, independence and responsibility can improve company performance (Pradhan et al., 2018).

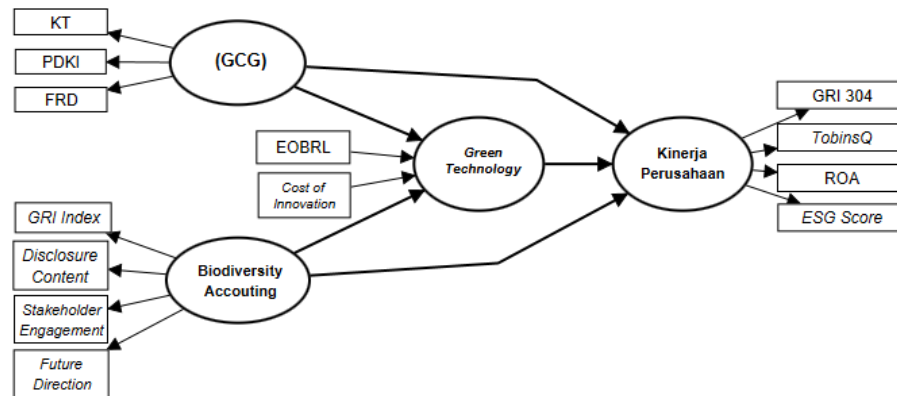
Biodiversity accounting is beginning to be recognised as an important element in measuring companies' environmental performance, but there is no specific measurement framework for biodiversity accounting. However, measuring biodiversity through the GRI index positively affects the company's performance (Bach et al., 2025). Biodiversity accounting measured by Disclosure content also showed an increase in performance (Wang et al., 2020). In addition, stakeholder engagement and future direction in measuring biodiversity accounting showed a positive impact on performance (Orazalin et al., 2025). This study integrates these measurement models into a latent construct for the first time.

The study of environmentally friendly technology shows that the role of technology in operational efficiency is needed (Chen & Ma, 2021; Liu et al., 2024; Xie et al., 2019; Yu et al., 2023). When technology is focused on operational efficiency, it can improve performance (Lee et al., 2023; Nikolaou & Matrakoukas, 2016). Therefore, this study integrates environmentally friendly-based operational efficiency and technology cost allocation as indicators of environmentally friendly technology (Malik et al., 2023). Environmentally friendly technology in this study serves as a mediating variable to examine the extent to which the roles of GCG and biodiversity accounting disclosure can improve company performance (Lehenchuk et al., 2023; Malik et al., 2023).

This research offers a novelty by integrating 3 strategic pillars, namely the role of

GCG, biodiversity Accounting disclosure, and environmentally friendly technology in one structural framework to measure company performance, which has never been done before. This research is important because there is still limited integration between GCG, Biodiversity accounting, and the use of technology in companies' practices in Indonesia, especially in the energy and mining sectors. Considering these three things, they play an important role in improving transparency, accountability, and sustainability, as well as company performance.

### Conceptual Framework



**Figure 1: Conceptual Framework**

### Theory and hypothesis development

Stakeholder theory holds that a company's success is not determined solely by achieving profits, but also by how well it meets the expectations of various parties (Jang, 2022). Good Corporate Governance (GCG) principles, such as transparency, accountability, and responsibility, are essential to meet stakeholder expectations and improve company sustainability. Previous Research has shown a significant relationship between GCG and corporate performance across various sectors. (Binh Dao & Tra Nguyen, 2020) and Błach et al. (2025) show that GCG mechanisms, such as the structure of the Board of Commissioners (BOC), concentrated ownership, and the frequency of meetings, positively Influence company performance. GCG principles such as accountability and transparency have been proven to improve resource management and decision-making, which ultimately impacts improved performance (Pradhan et al., 2018). Effective GCG enables companies to manage risk better, increase credibility in the eyes of stakeholders, and attract greater investment. Therefore, the first hypothesis put forward is: H<sub>1</sub>: Good Corporate Governance (GCG) has a positive effect on company performance.

Insights (RBV) focus on how a company's internal resources and capabilities, including environmental management and sustainability, can create a competitive advantage (Asiaei et al., 2022; Lutfi, 2023). Biodiversity accounting is an essential resource for measuring and managing the environmental impact generated by a company's operations, which, in turn, affects the company's performance. Previous Research has shown that biodiversity accounting is an important element in measuring a company's

environmental performance. Bach et al. (2025) show that companies that actively disclose biodiversity-related information through recognized indicators, such as the GRI Index, tend to perform better in the long run. In addition, Wang et al. (2020) emphasized the importance of disclosing biodiversity content in company reports, which is directly related to stakeholders' perceptions of the company's commitment to sustainability. Biodiversity accounting can be considered a resource that supports sustainability and creates a company's competitive advantage. Better biodiversity disclosure not only improves the company's image but also demonstrates its commitment to better managing environmental risks. Therefore, the hypothesis proposed is:

H<sub>2</sub>: Biodiversity accounting has a positive effect on company performance.

Stakeholder Theory emphasizes that a company's success is not measured solely by financial achievements but also by its ability to meet stakeholder expectations, including environmental sustainability (L. Zhao et al., 2023). Good Corporate Governance (GCG) plays an important role in ensuring that companies act in accordance with sustainability values, including by adopting environmentally friendly technologies. Effective GCG promotes transparency, accountability, and corporate social responsibility, which in turn will influence decisions to adopt technologies that support sustainability. Previous Research has shown that companies with good GCGs are more likely to adopt sustainability practices, including Green technology. Yu et al. (2023) and Binh Dao & Tra Nguyen (2020) state that GCG mechanisms, such as effective board structures and responsible owners, positively influence sustainable investment decisions, including in environmentally friendly technologies. In addition, Lee et al. (2023) show that companies with strong GCG management are more likely to invest in technologies that reduce environmental impact and improve operational efficiency. In this context, companies with strong GCGs are more aware of the importance of sustainability. They are more likely to adopt technologies that mitigate environmental impacts and meet stakeholder sustainability demands. Therefore, the hypothesis proposed is:

H<sub>3</sub>: Good Corporate Governance (GCG) encourages the adoption of Green technology.

RBV emphasizes that companies with good resources and capabilities can create a long-term competitive advantage (Asiaei et al., 2022; Lutfi, 2023). In this case, biodiversity accounting can be considered an important resource that helps companies identify and manage environmental risks and develop more effective sustainability strategies. Well-managed biodiversity opens the door to adopting environmentally friendly technologies that can improve companies' long-term efficiency and performance. Previous Research has shown that companies that focus on biodiversity are more likely to adopt environmentally friendly technologies to reduce the impact of their operations on the environment (Wang et al., 2020; Zhao et al., 2025). Biodiversity accounting can be an important driver for companies to adopt environmentally friendly technologies. By effectively disclosing and managing biodiversity, companies will become more aware of the importance of technologies that support sustainability. Therefore, the hypothesis proposed is:

H<sub>4</sub>: Biodiversity accounting encourages companies to adopt Green technology.

In the Resource-Based View, environmentally friendly technology is an important resource that can improve operational efficiency and reduce environmental impacts,

thereby contributing to improved company performance (Lutfi et al., 2023; Utomo et al., 2019). Eco-friendly technology not only helps companies manage natural resources more efficiently but can also improve their reputation in the eyes of stakeholders and increase competitiveness in the market. Previous Research has shown that environmentally friendly technology improves company performance, both in operations and corporate reputation. Chen & Ma (2021) and Liu et al. (2024) show that adopting green technologies can improve operational efficiency, reduce long-term costs, and enhance stakeholders' perceptions of a company's commitment to sustainability. Yu et al. (2023) also noted that companies that invest in green technologies tend to perform better in the long run because they can meet increasingly stringent environmental standards. Based on RBV theory and previous Research, environmentally friendly technology can improve company performance by reducing costs, increasing operational efficiency, and enhancing company reputation. The use of environmentally friendly technology helps companies to reduce their carbon footprint and increase their competitiveness in a global market that increasingly prioritizes sustainability. Therefore, the hypothesis proposed is:

H<sub>5</sub>: Green technology has a positive effect on company performance.

In the context of Stakeholder Theory and the resource-based view (RBV), green technologies can act as mediators that strengthen the relationships among Good Corporate Governance Good GCG encourages companies to adopt technologies that support environmental sustainability and efficiency, thereby improving company performance (GCG), biodiversity accounting, and corporate performance (Bouaziz et al., 2024; Francoeur et al., 2008; Lutfi et al., 2023; Reith et al., 2020; Thuan et al., 2022). Likewise, effective Biodiversity Management encourages companies to invest in environmentally friendly technologies, thereby further improving the company's efficiency and operational performance. Therefore, the hypothesis proposed is:

H<sub>6</sub>: Green technology mediates the relationship between Good Corporate Governance (GCG) and company performance.

H<sub>7</sub>: Green technology mediates the relationship between biodiversity accounting and company performance.

## **METHODS**

This study uses a quantitative approach with Partial Least Squares Structural Equation Modeling (PLS-SEM) to test relationships among constructs in structural models and to analyze the causal relationships among the variables. The secondary data used in this study are financial statements and sustainability reports from 250 companies in the energy and mining sectors during the 2019-2023 period (J. Hair & Alamer, 2022; J. F. Hair et al., 2019; Hair Junior et al., 2014). The variables tested included Good Corporate Governance (GCG), Biodiversity Accounting, environmentally friendly technology, and company performance. GCG is measured through the proportion of an independent board of commissioners, the frequency of board of directors meetings, and concentrated ownership. In contrast, Biodiversity Accounting is measured by the GRI index, Disclosure content, Stakeholder engagement, and future direction. Green technologies are measured by Environmentally Based Operational Efficiency (EOBRL) and innovation cost allocation, and act as a mediating variable. The company's performance is measured by

ESG score indicators, Tobin's Q, ROA, and GRI 304. The data recapitulation was carried out in Microsoft Excel, and the analysis used SmartPLS to test the relationships among variables and the mediating effect.

## RESULTS AND DISCUSSION

### Statistics descriptive

**Figure 1 Statistic descriptive**

| Indicator Name                               | Variables               | Mean  | Min   | Max   | SD    | N   |
|----------------------------------------------|-------------------------|-------|-------|-------|-------|-----|
| Proportion of Independent Commissioners      | GCG                     | 0.42  | 0.2   | 0.83  | 0.26  | 250 |
| Frequency of Board Meetings                  | GCG                     | 0.53  | 0.2   | 0.7   | 0.016 | 250 |
| Concentrated Ownership                       | GCG                     | 0.42  | 0.2   | 0.83  | 0.26  | 250 |
| Biodiversity Accounting (Content)            | Biodiversity Accounting | 0.484 | 0.129 | 0.762 | 0.022 | 250 |
| Biodiversity Accounting (GRI Index)          | Biodiversity Accounting | 0.428 | 0.021 | 0.443 | 0.007 | 250 |
| Stakeholder Engagement                       | Biodiversity Accounting | 0.53  | 0.1   | 0.75  | 0.17  | 250 |
| Future Direction                             | Biodiversity Accounting | 0.49  | 0.12  | 0.8   | 0.18  | 250 |
| Environmental Operational Efficiency (EOBRL) | Green Technology        | 45.3  | 10.5  | 90.7  | 14.2  | 250 |
| Innovation Cost Allocation                   | Green Technology        | 0.15  | 0.01  | 0.5   | 0.08  | 250 |
| ESG Score                                    | Company Performance     | 0.21  | 0.021 | 0.771 | 0.002 | 250 |
| Tobin's Q                                    | Company Performance     | 1.08  | 0.4   | 1.85  | 0.26  | 250 |
| ROA (Return on Assets)                       | Company Performance     | 0.05  | -0.1  | 0.15  | 0.03  | 250 |
| GRI 304 (Biodiversity Impact)                | Company Performance     | 0.35  | 0.02  | 0.65  | 0.13  | 250 |

Source: Output SmartPLS 4.0 (2025)

This table presents descriptive statistics for the indicators used in the study. Good Corporate Governance (GCG) shows consistency with an average value of 0.42 to 0.53. Biodiversity Accounting records an average value of 0.428-0.53, indicating a moderate level of biodiversity disclosure. Green technology has significant variation in EOBRL

(45.3) and innovation cost allocation (0.15). The company's performance is measured by ESG, Tobin's Q, ROA, and GRI 304, with values indicating variations in financial performance and sustainability. All variables are using a sample of 250.

### Partial Least Square-Structural Equation Modelling

#### Outer model

Table 2 shows the loading factors for each indicator used in the study; all are above 0.70, indicating that the indicators are valid. Good Corporate Governance (GCG), Biodiversity, Green Technology (GTech), and Performance all have indicators with high loadings, indicating that each construct is well measured. All the indicators listed in this table are valid and reliable for measuring the variables under study.

**Tabel 2. Convergent Validity**

| Indicator Name                          | GCG  | Biodiversity | GTech | Performance | Decisions |
|-----------------------------------------|------|--------------|-------|-------------|-----------|
| Proportion of Independent Commissioners | 0.78 |              |       |             | Valid     |
| Frequency of Board Meetings             | 0.72 |              |       |             | Valid     |
| Concentrated Ownership                  | 0.75 |              |       |             | Valid     |
| Content                                 |      | 0.83         |       |             | Valid     |
| GRI Index                               |      | 0.8          |       |             | Valid     |
| Stakeholder Engagement                  |      | 0.77         |       |             | Valid     |
| Future Direction                        |      | 0.79         |       |             | Valid     |
| EOBRL                                   |      |              | 0.85  |             | Valid     |
| Innovation                              |      |              | 0.82  |             | Valid     |
| Cost Allocation                         |      |              |       |             |           |
| ESG Score                               |      |              |       | 0.74        | Valid     |
| Tobin's Q                               |      |              |       | 0.8         | Valid     |
| ROA                                     |      |              |       | 0.76        | Valid     |
| GRI 304                                 |      |              |       | 0.79        | Valid     |

Source: Output SmartPLS 4.0 (2025)

Results (AVE) in Table 3. Indicate that all constructs in this model have good convergent validity. The AVE values for GCG (0.788), Biodiversity Accounting (0.761), and Green Technology (0.871) (all more than 0.70), which is indicative of validity and reliability.

**Table 3 AVE Validity Convergent**

| Average variance extracted |       |             |
|----------------------------|-------|-------------|
| Laten Constructs           | (AVE) | Description |

|              |       |       |
|--------------|-------|-------|
| GCG          | 0.788 | valid |
| Biodiversity |       | valid |
| Accounting   | 0.761 |       |
| Green        |       | valid |
| Technology   | 0.871 |       |

Sumber: output SmartPLS 4.0 (2025)

From Table 4, it can be seen that the loading factor for each indicator in the relevant constructs is higher than in the other constructs. For example, the Proportion of Independent Commissioners indicator has a loading factor of 0.81 on GCG, but much lower on Biodiversity (0.29), GTech (0.32), and Performance (0.18). This result indicates that the indicator is more effective in measuring GCG than other constructs. In other words, the indicators within this table have good discriminative validity, as they are more relevant for measuring the latent constructs of each one, ensuring there is no overlap between the different constructs.

**Table 4 AVE Discriminant validity**

| <b>Indicator Name</b>                   | <b>GCG</b> | <b>Biodiversity</b> | <b>Gtech</b> | <b>Performance</b> |
|-----------------------------------------|------------|---------------------|--------------|--------------------|
| Proportion of Independent Commissioners | 0.81       | 0.29                | 0.32         | 0.18               |
| Frequency of Board Meetings             | 0.76       | 0.22                | 0.15         | 0.21               |
| Concentrated Ownership                  | 0.79       | 0.28                | 0.2          | 0.17               |
| Content                                 | 0.25       | 0.84                | 0.3          | 0.21               |
| GRI Index                               | 0.24       | 0.81                | 0.32         | 0.22               |
| Stakeholder Engagement                  | 0.27       | 0.79                | 0.31         | 0.19               |
| Future Direction                        | 0.26       | 0.8                 | 0.35         | 0.2                |
| EOBRL                                   | 0.22       | 0.34                | 0.87         | 0.24               |
| Innovation                              | 0.23       | 0.31                | 0.82         | 0.25               |
| Cost Allocation                         |            |                     |              |                    |
| ESG Score                               | 0.21       | 0.24                | 0.33         | 0.77               |
| Tobin's Q                               | 0.18       | 0.21                | 0.3          | 0.81               |
| ROA                                     | 0.22       | 0.25                | 0.33         | 0.74               |
| GRI 304                                 | 0.19       | 0.8                 | 0.3          | 0.78               |

Source: Output SmartPLS 4.0 (2025)

### Reliability

Table 5 is Composite reliability in this research, shows that all variables have a Cronbach's alpha value greater than 0.70, with effective corporate governance (0.87),

accounting for biodiversity (0.84), green technology (0.85), and corporate efficiency (0.82) showing high internal consistency. Overall, these results show that the measurement indicators have good consistency.

**Table 5. Composite Reliability**

| <b>Variable</b>           | <b>Cronbach's Alpha</b> | <b>(rho_a)</b> | <b>(rho_c)</b> |
|---------------------------|-------------------------|----------------|----------------|
| Good Corporate Governance | 0.87                    | 0.9            | 0.92           |
| Biodiversity Accounting   | 0.84                    | 0.88           | 0.91           |
| Green Technology          | 0.85                    | 0.89           | 0.91           |
| Company Performance       | 0.82                    | 0.86           | 0.89           |

**Tabel 6. Path Analysis**

| <b>Path</b>                                    | <b>Original sample (O)</b> | <b>T statistics ( O/STDEV )</b> | <b>P values</b> |
|------------------------------------------------|----------------------------|---------------------------------|-----------------|
| GCG -> Company Performance                     | 0.102                      | 0.270                           | 0.149           |
| GCG -> Gtech                                   | 0.290                      | 3.293                           | 0.000           |
| Biodiversity Accounting -> Company Performance | 0.012                      | 0.214                           | 0.545           |
| Biodiversity Accounting -> Gtech               | 0.160                      | 2.311                           | 0.000           |
| Gtech -> Company Performance                   | 0.231                      | 2.250                           | 0.000           |

*Sources: output SmartPLS 4.0 (2026)*

The SEM-PLS analysis results in Table 6 show that Good Corporate Governance (GCG) does not affect the company's performance. On the other hand, GCG has a significant Influence on Green Technology. Biodiversity accounting has a significant effect on Green Technology and company performance. Then, Green technology has a positive Influence on the performance of industrial and mining companies.

**Table 7. Mediation Effect**

| <b>Indirect effect (Mediation)</b>                     | <b>Original sample (O)</b> | <b>P values</b> |
|--------------------------------------------------------|----------------------------|-----------------|
| GCG -> Gtech -> Company Performance                    | 0.681                      | 0.000           |
| Biodiversity Accounting -> Gtech-> Company Performance | 0.541                      | 0.000           |

*Sources: output SmartPLS 4.0 (2026)*

The mediation results in Table 7 indicate that Green Technology mediates the effects of exogenous variables in this study. First, Green Technology mediates a positive relationship between GCG and company performance. Second, Green Technology mediates Biodiversity Accounting for company performance. These two results confirm that Green Technology plays an important role in improving the company's performance through mediation.

## **Discussion**

The results of this study confirm that Good Corporate Governance (GCG) positively influences company performance. Companies with good GCG mechanisms, such as transparency, accountability, and responsibility, tend to be better able to manage risk, make more efficient decisions, and attract greater investment. Previous research by Binh Dao & Tra Nguyen (2020) and Błach et al. (2025) also supports these findings, showing that GCG mechanisms, including the board of Commissioners' structure and meeting frequency, are directly related to better corporate performance. In the energy and mining sectors, which face stringent environmental and regulatory challenges, effective GCG is essential to ensure companies can survive and thrive in the long term while maintaining good relationships with stakeholders and meeting sustainability standards.

Biodiversity accounting has a positive effect on company performance. Companies that actively disclose their impact on biodiversity. Research by Bach et al. (2025) and Wang et al. (2020) confirmed that effective biodiversity management and reporting not only improve companies' image but also strengthen their position in addressing environmental challenges. In the energy and mining sectors, which are often involved in activities that pose significant environmental risks, effective biodiversity management not only reduces potential environmental risks but also improves companies' long-term performance, increasing their competitiveness in a global market that increasingly prioritizes sustainability.

This study concludes that good corporate governance (GCG) can positively influence the adoption of green technology. GCG, through principles of transparency and accountability, creates an environment that supports sustainability, thereby increasing companies' likelihood to invest in technologies that reduce environmental impact. These findings are in line with Research by Yu et al. (2023) and Binh Dao & Tra Nguyen (2020), which shows that companies with good GCGs are more active in adopting sustainability practices, including green technologies. In the energy and mining sectors, where environmental impact is enormous, the adoption of green technology is not only an effort to comply with regulations but also an important business strategy to increase efficiency and competitiveness.

The results of this study confirmed that biodiversity accounting positively influences the adoption of green technology. Good biodiversity management, supported by transparent and effective disclosure, helps companies recognize the importance of sustainability and reduce negative environmental impacts. Previous research by Wang et al. (2020) and Zhao et al. (2025) confirmed that companies active in biodiversity management are more likely to invest in green technologies to reduce their environmental

footprint. In the energy and mining sectors, green technologies are critical to reducing operational impacts on the environment, and biodiversity accounting can raise awareness and facilitate their adoption in support of sustainability.

This study shows that Green Technology has a positive effect on company performance. Green Accounting can help reduce the environmental impact of energy and mining companies. In addition, green accounting can improve operational efficiency and reduce costs. Chen & Ma (2021) and Liu et al. (2024) support this finding, showing that companies that adopt green accounting tend to perform better, both in operational efficiency and in stakeholder perceptions of company reputation. In the energy and mining sectors, which rely heavily on Natural Resources and have a significant impact on the environment, the adoption of green technologies is key to improving companies' competitiveness and sustainability while meeting regulatory requirements and stakeholder expectations.

Green Technology mediates Good Corporate Governance (GCG) and company performance. GCG provides an important role in improving the company's performance through supporting the adoption of green technology. On the other hand, Green technology can improve performance optimally, especially in sustainability, to actualize corporate governance in a structured, modern, and effective manner. Research by Yu et al. (2023) and Lee et al. (2023) shows that effective GCG increases the likelihood of investing in green technologies, which directly affects the company's performance. In the energy and mining sectors, good GCG management not only improves transparency and accountability but also ensures that companies' investment decisions support sustainability and improve long-term performance.

The study also found that Green Technology mediates the relationship between biodiversity accounting and corporate performance. The effectiveness of biodiversity disclosure can be achieved by the adoption of green technology, which can then improve the company's performance. These findings are in line with the research of Wang et al. (2020) and Zhao et al. (2025), which shows that effective biodiversity management can be a driver for the adoption of green technologies that improve the efficiency and sustainability of companies. In the energy and mining sectors, green technology is an important tool for helping companies meet applicable regulations, promote green principles, and achieve effective management, thereby reducing the risk of failure.

## **CONCLUSION**

This study shows that Good Corporate Governance (GCG), Biodiversity Accounting, and Green Technology significantly affect the company's performance. Good GCG encourages the adoption of Green Technology, which ultimately improves the company's performance. In addition, effective Biodiversity Management also accelerates the adoption of environmentally friendly technologies. This finding confirms the importance of GCG management and Biodiversity Accounting in improving companies' competitiveness and performance, especially in sectors that prioritize sustainability.

The research is limited to the energy and mining sectors with secondary data that may not fully reflect the company's operational conditions. Further research is needed to examine other sectors and the long-term impact of Green Technology on company

performance. Companies are advised to integrate GCG and Biodiversity Accounting in their sustainability strategies, while the government can support the adoption of Green Technology through appropriate policies and incentives.

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## REFERENCES

- Asiaei, K., Bontis, N., Alizadeh, R., & Yaghoubi, M. (2022). Green intellectual capital and environmental management accounting: Natural resource orchestration in favor of environmental performance. *Business Strategy and the Environment*, 31(1), 76–93. <https://doi.org/10.1002/bse.2875>
- Bach, T. N., Hoang, K., & Le, T. (2025). Biodiversity risk and firm performance: Evidence from US firms. *Business Strategy and the Environment*, 34(1), 1113–1132. <https://doi.org/10.1002/bse.4039>
- Binh Dao, T. T., & Tra Nguyen, T. (2020). A meta-analysis of corporate governance and firm performance. *Journal of Governance and Regulation*, 9(1), 18–34. <https://doi.org/10.22495/jgrv9i1art2>
- Błach, J., Bukalska, E., Kaźmierska-Jóźwiak, B., & Pesa, A. R. (2025). Sustainability performance, corporate governance, and financial performance: Evidence from Poland and Central European listed companies. *Journal of Entrepreneurship, Management and Innovation*, 21(1), 58–80. <https://doi.org/10.7341/20252114>
- Bouaziz, S. M., Abdellatif, K., & Tarik, M. (2024). Sonic Exploration: Orchestrating Operational Risks Through Internal Audit. In C. S.D. & B. S. (Eds.), *Springer Proceedings in Business and Economics* (pp. 343–364). Springer Nature. [https://doi.org/10.1007/978-3-031-56007-1\\_21](https://doi.org/10.1007/978-3-031-56007-1_21)
- Chen, Y., & Ma, Y. (2021). Does green investment improve energy firm performance? *Energy Policy*, 153. <https://doi.org/10.1016/j.enpol.2021.112252>
- Francoeur, C., Labelle, R., & Sinclair-Desgagné, B. (2008). Gender diversity in corporate governance and top management. *Journal of Business Ethics*, 81(1), 83–95. <https://doi.org/10.1007/s10551-007-9482-5>
- Guastella, G., Mazzarano, M., Pareglio, S., & Spani, R. C. (2022). Do environmental and emission disclosure affect firms' performance?: Evidence from sectorial micro data. *Eurasian Business Review*, 12(4), 695–718. <https://doi.org/10.1007/s40821-021->

00195-9

- Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/https://doi.org/10.1016/j.rmal.2022.100027>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hair Junior, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). *Los Angeles: SA*.
- Jang, Y. J. (2022). The Role of Stakeholder Engagement in Environmental Sustainability: A Moderation Analysis of Chain Affiliation. *Journal of Hospitality and Tourism Research*, 46(5), 1006–1026. <https://doi.org/10.1177/1096348020936348>
- Kurnianta, B., & Dianawati, W. (2020). The impact of Eco-efficiency on firm value and firm size: An Indonesian study. *International Journal of Innovation, Creativity and Change*, 13(4), 482–495. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85087045206&partnerID=40&md5=66ff6365d33a06dac51d24a54c08d7e7>
- Lee, J., Chung, H., & Cho, N.-E. (2023). The Effects of Operational Efficiency and Environmental Risk on the Adoption of Environmental Management Practices. *Sustainability (Switzerland)*, 15(22). <https://doi.org/10.3390/su152215869>
- Lehenchuk, S., Zhyhlei, I., Ivashko, O., & Gliszczynski, G. (2023). The Impact of Sustainability Reporting on Financial Performance: Evidence from Turkish FBT and TCL Sectors. *Sustainability (Switzerland)*, 15(20). <https://doi.org/10.3390/su152014707>
- Liu, L., Feng, A., & Liu, M. (2024). The effect of green innovation on corporate financial performance: Does quality matter? *Finance Research Letters*, 62. <https://doi.org/10.1016/j.frl.2024.105255>
- López-Quesada, E., Camacho-Miñano, M.-D.-M., & O. Idowu, S. (2018). Corporate governance practices and comprehensive income. *Corporate Governance (Bingley)*, 18(3), 462–477. <https://doi.org/10.1108/CG-01-2017-0011>
- Luo, Z., Li, Y., Nguyen, L. T., Jo, I., & Zhao, J. (2024). The Moderating Role of Country Governance in the Link between ESG and Financial Performance: A Study of Listed Companies in 58 Countries. *Sustainability (Switzerland)*, 16(13). <https://doi.org/10.3390/su16135410>
- Lutfi, A. (2023). *Green Environmental Management System to Support Envi-Ronmental Performance: What Factors Influencing SMEs to Adopt Green Innovations?* <https://doi.org/10.20944/preprints202306.1520.v1>
- Lutfi, A., Alqudah, H., Alrawad, M., Alshira'h, A. F., Alshirah, M. H., Almaiah, M. A., Alsyouf, A., & Hassan, M. F. (2023). Green Environmental Management System to Support Environmental Performance: What Factors Influence SMEs to Adopt Green Innovations? *Sustainability*. <https://doi.org/10.3390/su151310645>
- Malik, F., Wang, F., Li, J., & Naseem, M. A. (2023). Impact of Environmental Disclosure on Firm Performance: The Mediating Role of Green Innovation. *Revista de Contabilidad-Spanish Accounting Review*, 26(1), 14–26.

- <https://doi.org/10.6018/rcsar.407921>
- Mustafa, F. M., Al-Kanani, M. F. H., Subhe, A., & Hassan, N. F. (2024). Impact of Corporate Governance on Accounting Conservatism and Company Performance. *Journal of Ecohumanism*, 3(5), 559–577. <https://doi.org/10.62754/joe.v3i5.3923>
- N., W., C., M., & Blessing, M. (2020). Literature Review of the Effect of Corporate Governance on Financial Performance of Commercial Banks in a Turbulent Economic Environment. *Academy of Strategic Management Journal*, 19(3), 1–9. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85098733212&partnerID=40&md5=e219827533736a36c2c1f621dd33d308>
- Nikolaou, I. E., & Matrakoukas, S. I. (2016). A framework to measure eco-efficiency performance of firms through EMAS reports. *Sustainable Production and Consumption*, 8, 32–44. <https://doi.org/10.1016/j.spc.2016.06.003>
- Ntim, C. G. (2013). An integrated corporate governance framework and financial performance in South African-listed corporations. *South African Journal of Economics*, 81(3), 373–392. <https://doi.org/10.1111/j.1813-6982.2011.01316.x>
- Orazalin, N. S., Ntim, C. G., & Kalimilo Malagila, J. (2025). Corporate governance, national governance quality, and biodiversity reporting: Global evidence. *Journal of International Accounting, Auditing and Taxation*, 58. <https://doi.org/10.1016/j.intaccaudtax.2024.100669>
- Pradhan, R. S., Shah, M. K., Bhandari, N., Mahato, N. P., Adhikari, N., & Bam, N. (2018). The impact of corporate governance on efficiency of Nepalese commercial banks. In *Business Governance and Society: Analyzing Shifts, Conflicts, and Challenges* (pp. 351–376). Palgrave Macmillan. [https://doi.org/10.1007/978-3-319-94613-9\\_20](https://doi.org/10.1007/978-3-319-94613-9_20)
- Reith, R., Buck, C., Eymann, T., & Lis, B. (2020). Integrating privacy concerns into the unified theory of acceptance and use of technology to explain the adoption of fitness trackers. ... *of Innovation and Technology* .... <https://eprints.qut.edu.au/205359/>
- Shah, A., & Paliwal, U. L. (2022). Corporate governance and financial performance - a study of the Indian drug and pharmaceutical industry. *International Journal of Economics and Business Research*, 24(3), 357–373. <https://doi.org/10.1504/IJEBr.2022.125394>
- Sharma, R. B., Al-Jalahma, A., Kukreja, G., & Almoosawi, Z. S. M. (2023). Impact of Corporate Governance on Financial Performance: Empirical Evidence of the Selected Telecommunication Companies of GCC. In A. B., H. A., K. R., & K. R.E. (Eds.), *Lecture Notes in Networks and Systems: Vol. 621 LNNS* (pp. 643–655). Springer Science and Business Media Deutschland GmbH. [https://doi.org/10.1007/978-3-031-26956-1\\_60](https://doi.org/10.1007/978-3-031-26956-1_60)
- Shungu, P., Ngirande, H., & Ndlovu, G. (2014). Impact of corporate governance on the performance of commercial banks in Zimbabwe. *Mediterranean Journal of Social Sciences*, 5(15), 93–105. <https://doi.org/10.5901/mjss.2014.v5n15p93>
- Thuan, P. Q., Khuong, N. V., Anh, N. D. C., Hanh, N. T. X., Thi, V. H. A., Tram, T. N. B., & Han, C. G. (2022). The Determinants of the Usage of Accounting Information Systems toward Operational Efficiency in Industrial Revolution 4.0: Evidence from an Emerging Economy. *Economies*, 10(4). <https://doi.org/10.3390/economies10040083>

- Utomo, M. N., Kaujan, & Pratiwi, S. R. (2019). Peran Kepemilikan Terkonsentrasi Terhadap Nilai Perusahaan Dengan Efisiensi Operasional Sebagai Variabel Mediasi. *Jurnal Riset Akuntansi Dan Keuangan*, 7(3), 583–600. <https://doi.org/10.17509/jrak.v7i3.17602>
- Wang, S., Wang, H., Wang, J., & Yang, F. (2020). Does environmental information disclosure contribute to improve firm financial performance? An examination of the underlying mechanism. *Science of the Total Environment*, 714. <https://doi.org/10.1016/j.scitotenv.2020.136855>
- Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of Business Research*, 101, 697–706. <https://doi.org/10.1016/j.jbusres.2019.01.010>
- Yu, B., Liu, L., & Chen, H. (2023). Can green finance improve the financial performance of green enterprises in China? *International Review of Economics and Finance*, 88, 1287–1300. <https://doi.org/10.1016/j.iref.2023.07.060>
- Zai, S. N. P., & Widianingsih, Y. P. N. (2025a). Accounting Profession Journal (APAJI), Vol. 4 No 1, Bulan Januari 2022. *Accounting Profesion Journal*, 7(1), 42–51. <https://www.ojsapaji.org/index.php/apaji/article/view/271/166>
- Zai, S. N. P., & Widianingsih, Y. P. N. (2025b). Readyness for Biodiversity Accounting Disclosure in Corporations Towards Future Hilirization. *Dinasti International Journal of Economics, Finance & Accounting*, 6(1 SE-Articles), 220–233. <https://doi.org/10.38035/dijefa.v6i1.3893>
- Zhao, L., Yang, M. M., Wang, Z., & Michelson, G. (2023). Trends in the Dynamic Evolution of Corporate Social Responsibility and Leadership : A Literature Review and Bibliometric Analysis. *Journal of Business Ethics*, 182(1), 135–157. <https://doi.org/10.1007/s10551-022-05035-y>
- Zhao, R., Mou, Y., & Yu, X. (2025). Analysis of the moderating effects of environmental regulations on green accounting information disclosure and financial performance of heavily polluting enterprises. *Finance Research Letters*, 72. <https://doi.org/10.1016/j.frl.2024.106493>