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Green Accounting and Corporate Social Responsibility: Enhancing SDG Commitment in Indonesia's Energy Sector

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ABSTRACT

This study investigates the implementation of Good Governance (GA) and Corporate Social Responsibility (CSR) and their relationship with the commitment of energy sector companies to achieving the Sustainable Development Goals (SDGs). In light of the growing urgency of sustainability challenges in Indonesia—particularly the deterioration of air quality—this research explores how GA and CSR practices influence corporate dedication to the SDGs. The study examines 17 energy companies listed on the Indonesia Stock Exchange (IDX) during the period 2019–2023, selected through purposive sampling. Data were analyzed using WarpPLS 7.0. The findings reveal that both the application of GA and the disclosure of CSR initiatives have a positive impact on a company's commitment to the SDGs. However, CSR does not moderate the relationship between GA and SDG implementation. This study contributes to the academic literature by offering insights into the interplay between GA, CSR, and sustainability, emphasizing the importance of aligning governance and social responsibility strategies to advance sustainable development objectives.

KEYWORDS

SDGs Commitment
Corporate Social Responsibility
Green Accounting
Energy Sector

INTRODUCTION

According to the 2024 Air Quality Life Index (AQLI) report, Indonesia is among the six countries contributing most significantly to global air pollution. Over recent decades, air quality levels in Indonesia during the dry season have averaged between 18 and 22 µg/m³—substantially exceeding the World Health Organization (WHO) advises a safe threshold of 5 µg/m³. (Greenstone, Ganguly, Hasenkopf, Sharma, & Gautam, 2024). On 8 August 2019, Jakarta was named as the city with the highest population in the world, as it reached 73 µg/m³ (Post, 2019). A report published in 2019 by the Global Alliance on Health and Pollution (GAHP) ranked Indonesia fourth globally in terms of pollution-related mortality. Elevated air pollution levels also influence financial behavior within the corporate sector. As environmental costs rise, companies face increased pressure to act responsibly, often leading to higher levels of corporate debt to support necessary environmental compliance (Li, Guo, & Zeng, 2019).

The United Nations (UN) has instituted the Sustainable Development Goals (SDGs) to enhance the well-being of individuals and the planet, comprising a thorough array of objectives designed to tackle various global challenges ("2030 Agenda for Sustainable

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Development," n.d.). Sustainable development is defined by the United Nations (UN) as the ability of future generations to meet their own requirements without compromising the ability of present generations to do so.. (Fallah Shayan, Mohabbati-Kalejahi, Alavi, & Zahed, 2022). As noted by Adam (in De Silva Lokuwaduge, Smark, & Mir, 2022), the Sustainable Development Goals (SDGs) function as a cohesive framework encompassing objectives, targets, and indicators intended to orient governments, businesses, and diverse stakeholders in their efforts to tackle intricate and interconnected global challenges, including poverty alleviation, the reduction of inequality, climate action, and the fostering of peace and justice.

Energy is widely recognized as a key determinant in achieving sustainable development (Zakari, Khan, Tan, Alvarado, & Dagar, 2022). In 2022, Indonesia experienced a 7.7% increase in energy production compared to the previous year (Purmolino & Nafisah, 2023). Furthermore, energy consumption in the country rose significantly, with a 10% increase in 2022 followed by an additional 3% growth in 2023 ("Indonesia Energy Information | Enerdata," 2024). These trends highlight the need for coordinated efforts between government and industry to meet the Sustainable Development Goals (SDGs), which are part of a global agenda. SDG 7 notably emphasizes the obligation to ensure access to affordable, dependable, sustainable, and modern energy for all individuals. One of the ways companies can contribute to this objective is through the implementation of Corporate Social Responsibility (CSR) initiatives. The realization of the SDGs is positively impacted by CSR, according to empirical evidence (Pamungkas, Raihan, Satata, & Kristianto, 2024).

The 2030 Agenda for Sustainable Development delineates 17 Sustainable Development Goals (SDGs) that require significant transformations in the global energy system, encompassing the management of synergies and trade-offs (Castor, Bacha, & Fuso Nerini, 2020; Fuso Nerini et al., 2017). Specifically, SDG 7 within the broader SDG framework explicitly addresses the objective of guaranteeing universal access to energy characterized by affordability, reliability, sustainability, and modernity. Achieving the 2030 Agenda requires strong global and national commitments to the effective implementation of the SDGs ("THE 17 GOALS | Sustainable Development," n.d.). According to EY, the complexity of the SDGs demands innovative approaches and collaborative efforts. Their success largely depends on strategic partnerships among governments, the private sector, and civil society (Nechita, Manea, Nichita, Irimescu, & Manea, 2020).

The implementation of the SDGs holds significant importance in the Indonesian context, given the persistent and severe environmental challenges such as air pollution, industrial waste, and deforestation. Companies are key actors in the process of achieving the targets outlined within the SDGs; achieving this can be realized via the implementation of corporate social responsibility (CSR), thereby potentially generating positive environmental effects and bolstering the organization's image and reputation among key stakeholders (Abdurrahman et al., 2022; Bebbington & Unerman, 2018; Fallah Shayan et al., 2022). Despite this potential, CSR implementation in Indonesia faces considerable challenges. For instance, Indonesia ranks lowest among seven Asian countries in CSR performance, despite being the first nation to formally regulate CSR through Law No. 40 of 2007 on Limited Liability Companies (Azzahra, 2016). The growing demand for sustainable business practices has prompted companies to incorporate environmental considerations—commonly referred to as green accounting—into their decision-making processes (Rahman & Islam, 2023). In response, the Indonesian government has repeatedly encouraged industrial firms to meet green industry standards and obtain green industry certification (Damiana, 2024). However, the practical application of green industry principles, including green accounting, remains suboptimal in the country (Wahyuni, Meutia, & Syamsurijal, 2019).

This study seeks to investigate the degree to which the adoption of green accounting and Corporate Social Responsibility (CSR) favorably impacts the attainment of the Sustainable Development Goals (SDGs) in energy sector firms. Furthermore, the research aims to

ascertain if CSR functions as a moderating variable that enhances the relationship between green accounting practices and the achievement of SDG targets. The study's findings are expected to provide crucial insights for policymakers, aiding in the formulation of policies designed to mitigate emissions and environmental waste using accounting-based techniques. Additionally, the study aspires to raise corporate awareness regarding the strategic importance of green accounting, emphasizing its potential to support and advance sustainable development objectives.

LITERATURE REVIEW

Legitimacy Theory

Legitimacy theory is one of the theories often used in social and environmental accounting studies. Originally introduced by Dowling and Pfeffer in 1975, the theory has been further developed in subsequent literature. Gray et al. (1996) describe legitimacy theory as a corporate system that emphasizes the relationship between organizations, government, and society—whether as individuals or collective groups (Joshua, 2011, as cited in Akhter, Hossain, Elrehail, Rehman, & Almansour, 2023) At its core, legitimacy theory is concerned with aligning organizational actions with societal expectations, norms, and values. It posits that companies seek to maintain legitimacy by responding to the evolving demands and perceptions of society (Boshnak, 2022; Y. Lu & Abeysekera, 2014; Pamungkas, Raihan, et al., 2024)

Stakeholder theory

Introduced by Edward Freeman in 1984, stakeholder theory posits that organizations should consider the interests and concerns of all stakeholders, not solely those of shareholders. According to Freeman, stakeholders include all people affected by a company's objectives and actions including local communities, suppliers, workers, consumers, and the environment. (Dewi, Anggara, & Lindrianasari, 2024; Indriastuti, 2023; Rahman & Islam, 2023). In this context, business decisions should be made with careful consideration of stakeholder interests in order to foster stronger relationships, enhance corporate reputation, and ensure long-term sustainability (Dewi et al., 2024)

This theory provides insight into the necessity of reconciling the expectations and interests of stakeholders. Such as reducing environmental impacts, companies can address customer and community concerns (Rahman & Islam, 2023). Stakeholder theory is a form of established corporate strategy to increase profits while still considering stakeholder benefits; with this, their relationship will influence each other (Indriastuti, 2023). Therefore, this approach is in line with CSR and sustainability objectives related to social, environmental, and ethical considerations in their business operations (Donaldson & Preston, 1995).

Green Accounting on SDGs Commitment

Green accounting enables firms to quantify environmental implications, including energy usage costs, carbon emissions, and natural resource utilization. It is directly related to the goals of the SDGs. Green accounting enables firms to pinpoint areas for improvement and reduce the negative impact of their operations by focusing on environmental factors (Gray, 2006). The SDGs encompass environmental preservation alongside economic and social concerns. A study from Pramono, Suwarno, Amyar, & Friska (2023), asserts that the adoption of green accounting facilitates organizations in prioritizing actions that advance the attainment of SDG targets more effectively. Not only that, (Sudarminto & Harto, 2023) reveal

the implementation of green accounting can assist companies in preserving the environment and business and minimizing negative impacts on the environment, such as reducing carbon emissions, increasing the efficiency of using natural resources, and optimizing industrial waste management. Consequently, the authors deduce the following hypothesis:

H1: Green accounting positively influences the commitment to SDGs

CSR to SDGs Commitment

CSR and the SDGs are closely interrelated (Abdelhalim & Eldin, 2019). A study by J. Lu, Ren, Lin, He, & Streimikis (2018) found that countries with the highest CSR index rankings also tend to have higher SDG index rankings, particularly among the top four countries. To effectively integrate the SDGs into their operations, companies must first understand their importance. A clear understanding enables companies to take strategic actions in addressing sustainable development challenges and to implement effective measures for achieving the SDGs (ElAlfy, Palaschuk, El-Bassiouny, Wilson, & Weber, 2020). Research by Li et al. (2019) demonstrates that corporations participating in CSR initiatives can facilitate the achievement of SDG objectives, especially SDG 1 (No Poverty) and SDG 4 (Quality Education). Moreover, CSR projects produce beneficial effects, including the enhancement of living quality in adjacent communities, thus facilitating the attainment of SDG 3 (Good Health and Well-Being) and SDG 4 (Quality Education). This finding is further corroborated by the study of Yuliasih & Susetyo (2020). In light of these insights, we propose the following hypothesis:

H2: CSR positively influences the SDGs Commitment

Green Accounting and CSR towards SDGs Commitment

Green accounting is crucial for allowing firms to understand the environmental consequences of their operations. CSR activities, in turn, can be viewed as a demonstration of corporate commitment to societal well-being, particularly through addressing environmental concerns (Liczmańska-Kopcewicz, Mizera, & Pypłacz, 2019). The implementation of green accounting provides valuable insights driven by CSR initiatives, offering data on environmental impacts, while CSR reporting ensures that these insights are effectively utilized to support sustainable business practices. Schaltegger, Freund, & Hansen (2012) highlight that many companies are unaware of their sustainability potential due to inadequacies in their accounting systems. This discovery highlights the significance of documenting and quantifying environmental impacts to proficiently oversee sustainable development.

The research of Dhar, Sarkar, & Ayittey (2022) shows that implementing green accounting improves a company's sustainable development capabilities and positively correlates with its corporate social responsibility and sustainable development goal competencies. Environmental accounting functions as both a reporting mechanism and a means to enhance accountability and transparency, thereby motivating companies to assume greater responsibility for the social and environmental consequences of their operations (Gray, 2006). In light of these insights, we propose the following hypothesis:

H3: Green accounting moderated by CSR has a positive impact on SDGs Commitment

RESEARCH METHOD

This research utilizes a quantitative methodology, employing secondary data as the primary source, which is gathered through the documentation method. The process consists of several stages: first, the collection of sample data; second, the calculation of index scores

based on data analysis; and third, the testing of the obtained data. The analysis focuses on 17 energy sector companies in Indonesia, all of which are listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The analysis employs data derived from the firms' annual and sustainability reports. The inclusion criteria are as follows: [1] companies within the energy sector that have been listed on the Indonesia Stock Exchange from 2019 to 2023 and consistently release annual reports without omission [2] companies that have published sustainability reports and/or GRI (Global Reporting Initiative) reports consecutively from 2019 to 2023, as detailed in Table 1.

Table 1. Purposive sampling criteria

No	Criteria	Excluded	Total
	Initial sample total		87
1	Companies within the energy sector that have been listed on the Indonesia Stock Exchange from 2019 to 2023 and consistently release annual reports without omission	(30)	57
2	Companies that publish sustainable reports and/or GRI reports during the period 2019 to 2023 consecutively	(40)	17
	Total sampling		17
	Research period (2019-2023)		5
	Total research (17 x 5)		85

The dependent variable in this study is SDG commitment, defined as an assessment of the company's dedication to implementing SDGs through sustainability practices in published sustainability reports (Monteiro, Amor-Esteban, Lemos, & Ribeiro, 2023). SDGs commitment is measured using an index score developed by Nechita et al. (2020). To assess a company's involvement in achieving the SDGs, a score-based methodology is utilized, with a scale ranging from 0 to 5. The use of this index allows for a straightforward comparison of SDGs commitments across different companies.

Table 2. SDG assessment criteria

Score	Description	Detail Description	Example
0	No information provided		
1	SDGs with qualitative targets	There is a narrative description of the company's plan to achieve the target but there is no information on the results of the SDG target.	According to SDG target 12.5, a substantial reduction in waste generation is a critical societal imperative. Companies are encouraged to engage in, support, or initiate projects aimed at minimizing waste production.

Score	Description	Detail Description	Example
2	SDGs with qualitative targets and quantitative efforts invested but without measurable results	A narrative description of the company's plan to take action toward targets: investments have been made, but there is no information regarding progress results.	In accordance with SDG target 12.5, which emphasizes the substantial reduction of waste production as a societal priority, companies have expressed their commitment by engaging in, supporting, or initiating waste reduction projects. Furthermore, they have demonstrated this commitment through financial investment, amounting to X rupiah, directed toward waste reduction initiatives.
	SDGs with quantitative targets but without measurable results	The company has already established quantitative targets as future goals, but there is no information on the progress reports related to achieving those SDG targets.	According to SDG target 12.5, a significant reduction in trash generation is imperative for society, and the corporation intends to achieve a 20% decrease in waste output by 2025.
3	SDGs with qualitative targets and qualitative outcome measurements.	There is a narrative description about the company's planned actions toward achieving the SDG target, and a narrative description of the IMPACT of those actions.	As explained in SDG target 12.5, substantially reducing waste production is a public priority. The company wishes to be involved in/support efforts to reduce waste production, and the entity has succeeded in keeping waste production below regulatory limits/targets have been achieved/partially achieved.
4	SDGs with qualitative targets and quantitative outcome measurements.	There is a narrative description of the company's plan to take action towards the SDG target, and an assessment of the progress toward that SDG target is disclosed.	According to SDG objective 12.5, significantly reducing waste generation is a public priority. The company aims to contribute to the decrease of waste generation and has achieved a 20% reduction, or 4% compared to the previous year.
5	SDGs with quantitative targets and qualitative or quantitative results.	The company has a quantitative objective and a narrative account of the consequences of that activity.. There is an ambition and a quantitative assessment of the results obtained toward progress on the SDG target.	According to SDG objective 12.5, significantly reducing waste generation is a public priority. TThe business wishes to help or take part in cutting waste generation by 50% (by 2025) and the entity has managed to maintain waste production below the limits set by regulations/target achieved/target partially achieved. Alternatively, the company aims to

Score	Description	Detail Description	Example
			assist a 50% reduction in trash output by 2025 and has successfully decreased it by 20% compared to the previous year.

Source: (Nechita et al., 2020)

The independent variable used is green accounting, defined as the total cost incurred by a company to preserve and maintain the environment as a result of business decisions or through non-monetary actions such as waste management, pollution emission reduction efforts, or restoration due to ecosystem degradation (Dewi et al., 2024; Kumar, Jat, & Sharma, 2016; Rounaghi, 2019). To measure green accounting as an independent variable, a dummy variable is used, in line with the study by Wati, Chandra, Irman, & Rahman (2024). Measurement is based on whether the company reports environmental costs in its annual report or financial position statement—if yes, it is assigned a value of 1; if not, a value of 0.

Table 3. Environmental Cost Criteria

Environmental Cost (in Annual Report)
1. Rehabilitation, afforestation, and environmental maintenance costs 2. Environmental provisions/costs, such as for reclamation or dismantling 3. Costs for waste and pollution treatment

Source: (Pamungkas, Raihan, et al., 2024)

This analysis incorporates CSR disclosure as a moderating variable alongside green accounting. CSR disclosure is the manner in which firms inform the public and stakeholders of their social and environmental obligations.. (Dhar et al., 2022; Tibiletti, Marchini, Furlotti, & Medioli, 2021). The measurement used is the Global Reporting Initiatives Generation 4 (GRI G4) indicators. This choice of measurement is consistent with previous studies by (Afrizal, Eka Putra, Yuliusman, & Hernando, 2020; Firmansyah & Estutik, 2020; Mayorova, 2019). The calculation of this variable uses a dichotomous approach or dummy variable (Haniffa & Cooke, 2005). Each revealed GRI indicator in the sustainability report will receive a score of 1, while non-disclosure would yield a score of 0. Subsequently, the aggregate disclosure score for each company will be calculated by summing these individual indicator scores. Finally, a normalized disclosure index will be calculated by dividing the total number of revealed items by the total number of relevant CSR disclosure items.

The formula for calculating corporate social responsibility disclosure as proposed by Haniffa and Cooke is as follows:

$$CSRDj = \frac{\sum Xij}{Nj}$$

Description:

CSRDj = Corporate Social Responsibility Disclosure

$\sum Xij$ = Number of GRI index items disclosed

Nj = Total number of GRI G4 index items

RESULTS

The research data's descriptive test findings are shown in Table 4. Based on the data gathered, the mean of green accounting is 0.576, while the mean of CSR is 0.355. This outcome indicates the adoption of green accounting and corporate social responsibility in Indonesian energy firms needs to be improved, especially when compared to the maximum values of each variable. On the other hand, the mean for the SDGs variable is relatively high compared to the others, indicating that companies are making efforts to commit to implementing the SDGs for their sustainability. With a median value of 4, higher than the mean, the figure suggests that some companies are actively engaged in the implementation of the SDGs.

Table 4. Descriptive statistics results

	GA	CSR	SDGs
N	85	85	85
Mean	0.576	0.355	3.035
SD	0.497	0.237	2.124
Min	0	0	0
Max	1	0.769	5
Median	1	0.385	4

Testing and data processing in this research were conducted using WarpPLS 7.0. The structural test results state that the R-square for the SDGs variable is 0.469, which means that 46.9% of its variability can be explained by the independent variables (green accounting and CSR). This value indicates a fairly good relationship, although 53.1% of the variability is still unexplained by the independent variables. The model fit test results in Table 5 show that the Goodness of Fit (GoF) value is 0.685, suggesting that the model is suitable for use.

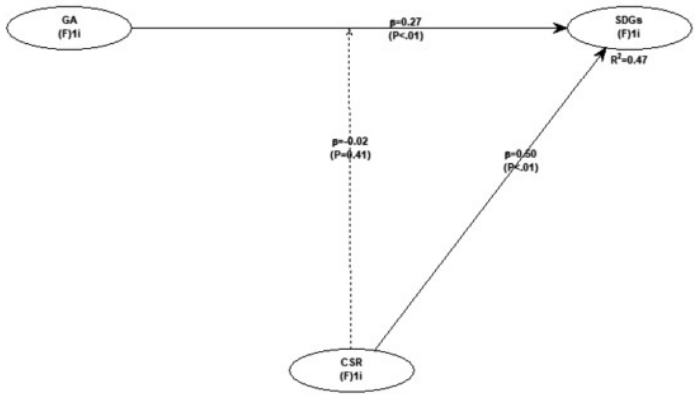
Figure 1 shows the data testing results using WarpPLS 7.0 with path coefficients. Path coefficients are used to observe the influence of one construct on another through parameters and p-values (Adnyana, Adiputra, & Musmini, 2024). P-values represent the significance level used to test whether a hypothesis is accepted or rejected. The hypothesis will be accepted if the p-values are <0.05 and rejected or not supported if they are if >0.05.

Table 5. Model Fit Test Results

Model Fit and Quality Index	Index	Criteria	Result
Average path coefficient (APC)	0.264	P=0.003	Fit model
Average R-squared (ARS)	0.469	P<0.001	Fit model
Average adjusted R-squared (AARS)	0.449	P<0.001	Fit model
Average block VIF (AVIF)	1.636	If <= 5, ideally <= 3.3	Fit model
Average full collinearity VIF	1.578	If <= 5, ideally <= 3.3	Fit model

(AFVIF)			
Tenenhaus GoF (GoF)	0.685	small >= 0.1, medium >= 0.25, large >= 0.36	Fit model
Sympson's paradox ratio (SPR)	1	If >= 0.7, ideally = 1	Fit model
R-squared contribution ratio (RSCR)	1	Acceptable If >= 0.9, ideally = 1	Fit model
Statistical suppression ratio (SSR)	1	Acceptable If >= 0.7	Fit model
Nonlinear bivariate causality direction ratio (NLBCDR)	1	Acceptable If >= 0.7	Fit model

Figure 1. Research result



DISCUSSION

The Influence of Green Accounting on SDG Commitment

The initial hypothesis posits a positive correlation between green accounting practices and the commitment to SDGs commitment. Path coefficient analysis yielded a value of 0.269, indicating a positive effect of green accounting on SDG commitment. Furthermore, the P-value of 0.004, which falls below the significance threshold of 0.05, substantiates a statistically significant influence of green accounting on SDG commitment. This study's results support research by (Pamungkas, Raihan, et al., 2024; Wiredu, Osei Agyemang, & Agbadzidah, 2023), which reveals that green accounting can positively impact the achievement of SDGs in companies. Companies may decrease their environmental effects caused by operational activities by implementing green accounting practices and supporting

sustainability practices, such as through reclamation and rehabilitation/reforestation processes in areas previously used for dredging or mining.

According to legitimacy theory, firms must adhere to established standards to fulfill societal expectations. Green accounting helps achieve the SDGs and aids companies in gaining public trust. Using green accounting can also assist the company to show that it aligns with environmental requirements and enhance its reputation.

The Influence of CSR on SDG Commitment

The second hypothesis states that CSR positively influences SDG commitment. The outcomes of the path coefficient test indicate a value of 0.499, which suggests that CSR positively affects SDG commitment. This research also determined that corporate social responsibility significantly impacts commitment to SDG commitment, as evidenced by the P-value test result of <0.05, specifically <0.001. The results of this research support the study by (Abdurrahman et al., 2022), which explains that CSR implementation positively impacts SDG commitment. Nevertheless, the findings of this study were found to differ from those of (Apriliyani & Novita, 2019), which explains that not all CSR programs have a significant contribution to achieving SDG commitment.

From a legitimacy theory perspective, CSR serves as an important tool for companies to conduct operations in line with societal expectations. As companies become more transparent in their social responsibility reporting, they will increasingly strive to achieve the commitments contained in the SDGs. These commitments are reflected in an international standard, the Global Reporting Initiative (GRI) Index. Moreover, from the standpoint of stakeholder theory, corporations that adopt CSR demonstrate a commitment not only to financial matters but also to social and environmental concerns.

The Moderating Effect of CSR on the Relationship Between Green Accounting and SDG Commitment

According to the third hypothesis, the correlation between green accounting and the SDG commitment can be moderated by CSR. Table 6 indicates that the relationship between green accounting and commitment to the SDGs is not influenced by CSR. The results of the route coefficient test demonstrate that CSR does not significantly influence the relationship between green accounting and SDG commitment, yielding a value of -0.024. The correlation between green accounting and SDG commitment is not substantially affected by CSR, as evidenced by a P-value of 0.413, exceeding the 0.05 threshold. This runs counter to studies by (Pamungkas, Raihan, et al., 2024; Pamungkas, Satata, Raihan, Kristianto, & Oktafiyani, 2024), which determined that the CSR variable may diminish the correlation between SDG commitment and green accounting.

According to stakeholder theory, businesses must answer to all parties involved, including the environment. The business can utilize green accounting to report environmental impacts if it can successfully execute corporate social responsibility. CSR ought to assist businesses in fulfilling their SDG commitments. This research suggests, however, that a company's high CSR openness and adoption of green accounting do not necessarily translate into a high level of SDG commitment. CSR measurement may not be relevant to the latest sustainability reports, or companies' disclosures may be formal and not substantive. Nevertheless, both the increase in CSR transparency and the application of green accounting in hypotheses 1 and 2 have shown positive results toward increasing corporate commitment to the SDGs.

Table 6. Hypothesis Summary

Hypothesis	Criteria (P-value)	Result (P-value)	Description
H1: Green accounting positively influences the commitment to SDGs	<0,05	0,004	Accepted
H2: CSR positively influences to SDGs Commitment	<0,05	<0,001	Accepted
H3: Green accounting moderated by CSR has a positive influence on SDGs Commitment.	<0,05	0,413	Rejected

CONCLUSION

According to the study's findings, energy businesses, one of the industries that contributes most to Indonesia's pollution, benefit from using green accounting since it strengthens their commitment to achieving the SDGs. This means that companies that disclose environmental costs in their sustainability reports have a higher commitment to implementing the SDGs. Furthermore, the study shows that companies transparently disclosing CSR demonstrate a strong commitment to implementing SDGs.

MANAGERIAL IMPLICATION

This study aims to show how a company's commitment to the SDGs is impacted by CSR and green accounting. Several implications we suggest are: first, company management can adopt stricter sustainability reporting standards and integrate environmental aspects into accounting. Second, companies should strengthen their CSR programs focused on supporting the achievement of the SDGs and ensuring that these align with the company's operations for sustainable impact. Lastly, companies should develop clear indicators to measure and report their commitment to the SDGs. Such goals can be achieved through comprehensive and transparent sustainability reporting, which enhances accountability and builds stakeholder trust.

LIMITATION AND FUTURE RESEARCH

The constraints of this investigation is the lack of complete data, which constrained the analysis to a limited sample. This is because not all companies in the energy sector published sustainability reports consecutively from 2019 to 2023. It is hoped that future research will use a larger sample size and more diverse sectors. Control variables, such as Environment, Social, and Governance (ESG), company size, and government pressure or regulations, could also be added so that the relationships between the variables can be better understood.

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