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Abstract

Environmental accounting can support corporate accountability, but its financial associations depend on how practices and disclosures are measured. This study examines financial reporting quality as an intermediary between green accounting practice, carbon accounting disclosure, and sustainable financial performance in Indonesian energy firms. The archival design covers 27 companies and 108 firm-year observations during 2022–2025, analyzed using partial least squares structural equation modeling. The reported estimates associate green accounting practice with reporting quality ($\beta = 0.536$, $p < 0.001$) and carbon disclosure with reporting quality ($\beta = 0.306$, $p = 0.013$). Reporting quality and carbon disclosure are positively associated with financial performance ($\beta = 0.333$, $p = 0.002$; $\beta = 0.346$, $p = 0.004$, respectively). The direct green accounting association is not significant ($\beta = 0.213$, $p = 0.112$). Its indirect association through reporting quality is significant ($\beta = 0.178$, $p = 0.002$), whereas the corresponding carbon disclosure association is not ($\beta = 0.102$, $p = 0.053$). However, conflicting discriminant-validity diagnostics and pooled repeated observations constrain interpretation. The results indicate a provisional reporting-quality pathway rather than an established causal mechanism. The study distinguishes corporate financial outcomes from social welfare and identifies the additional workforce and community evidence needed to assess whether environmental accountability supports an inclusive energy transition.

Keywords: Environmental Accountability; Carbon Reporting; Financial Reporting Quality; Energy Transition; Corporate Performance; Indonesia

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INTRODUCTION

Environmental accountability in the energy sector concerns both the financial position of companies and the people affected by their operations. Accounting can make environmental commitments traceable by connecting resource use, expenditure, and reporting to stakeholder decisions. A stakeholder approach therefore treats sustainability information as relevant to employees, communities, regulators, and capital providers [1], [2]. The distinction matters because profitable energy companies may still impose environmental or social costs that financial ratios do not capture.

Research on energy transitions shows that lower-carbon development does not automatically distribute benefits fairly across social groups [3]. Just-transition scholarship places employment, participation, and governance alongside technological change [4]. Gender-sensitive energy-justice research further distinguishes distributive, procedural, and recognition concerns [5]. These perspectives motivate scrutiny of corporate accountability, but they do not permit firm profitability to be interpreted as evidence of improved welfare. This study addresses the corporate information pathway; workforce and community outcomes remain outside its empirical model.

Disclosure quality is central to that pathway. A review of mandatory sustainability reporting explains why economic consequences depend on reporting incentives, materiality, assurance, and enforcement [6]. IFRS S1 provides an investor-oriented framework for sustainability-related financial information [7], whereas the Global Reporting Initiative addresses organizational impacts on the economy, environment, and people [8]. These frameworks clarify the different purposes of disclosure. They are used here as interpretive context, not as evidence that the sampled firms complied with every requirement.

The financial evidence on green accounting remains heterogeneous. A meta-analysis of 68 studies identifies a generally positive association while documenting variation across measurement choices and study characteristics [9]. In Indonesian mining firms, environmental disclosure and environmental performance were positively associated with financial performance, whereas environmental costs were not statistically significant [10]. Research on large multinational corporations instead reports a negative association between environmental costs and return on capital employed [11]. Other work examines financial performance as part of the relationship between green accounting and sustainable development [12]. These differences make it necessary to distinguish reporting practices, expenditure, and realized environmental outcomes.

Carbon disclosure provides another form of environmental information, but its financial implications cannot be presumed. Evidence from Indonesian consumer-goods firms found no significant carbon-disclosure association with firm value, despite a significant green-accounting association [13]. Energy-sector research has focused on disclosure determinants, including media exposure and board characteristics [14]. Other Indonesian work explicitly examines financial consequences and firm characteristics [15], environmental-performance moderation [16], and the development of the national carbon-disclosure literature [17]. Together, these studies support separating the production of disclosure from the financial associations of the information disclosed.

Financial reporting quality (FRQ) offers a plausible intermediary. International evidence examines the connection between environmental, social, and governance activities and reporting quality [18]. Indonesian energy-sector research has already investigated green accounting, corporate social responsibility disclosure, and financial reporting quality [19]. The contribution of the present study is therefore not the first recognition of this connection. It lies in examining green accounting practice (GAP) and carbon accounting disclosure (CAD) together, with direct and indirect associations with sustainable financial performance (SFP), in 27 Indonesian energy firms during 2022–2025.

Measurement remains consequential. A proposed green accounting system emphasizes the traceability of environmental information within accounting processes [20]. However, a disclosure index observes what companies report and cannot establish the quality of unreported implementation. Reverse direction is also plausible: Indonesian research examines financial performance as a determinant of environmental expenditure and disclosure [21], while mining-sector panel research investigates directionality between environmental and financial performance [22]. Differences among environmental, social, and governance ratings illustrate the sensitivity of sustainability measurement to scope and measurement decisions [23]. Greenwashing research further cautions against equating corporate claims with environmental achievement [24].

Theoretical Framework and Hypotheses

The framework combines stakeholder accountability with the informational role of corporate disclosure. Stakeholder interaction can shape sustainable business models [25]; research in heavily polluting firms also connects green accounting, social responsibility disclosure, and sustainable development [26]. Work on small and medium-sized enterprises examines mediating relationships among sustainability, non-financial reporting, and performance [27]. Evidence from Asia and Africa links reporting and assurance adoption to organizational characteristics, including women's representation in governance [28]. These studies support investigating information processes while avoiding a claim that one pathway operates identically across institutional settings.

GAP is expected to be positively associated with FRQ when environmental expenditure and commitments become more visible within corporate reports. A positive GAP–SFP relationship is also plausible if better environmental information supports resource allocation, although expenditure timing can weaken the contemporaneous financial association. CAD may be associated with FRQ through greater reporting discipline and with SFP through reduced informational uncertainty. FRQ is expected to be positively associated with SFP because decision-useful reports can support monitoring and financial planning. Accordingly, the direct hypotheses follow the numbering in Figure 1:

H1: GAP is positively associated with FRQ. H2: GAP is positively associated with SFP. H3: CAD is positively associated with FRQ. H4: CAD is positively associated with SFP. H5: FRQ is positively associated with SFP.

Indirect pathways warrant separate tests. Environmental cost-accounting research has examined environmental performance as a mediator [29], and research on environmental management accounting has investigated green human resource management as an intermediary for organizational behavior [30]. These mechanisms are conceptually different

from FRQ. The present model tests whether reporting quality statistically links the two environmental accounting constructs to financial performance: H6 proposes an indirect GAP–FRQ–SFP association; H7 proposes an indirect CAD–FRQ–SFP association. A significant indirect estimate would be compatible with the proposed pathway, but would not by itself establish temporal or causal mediation.

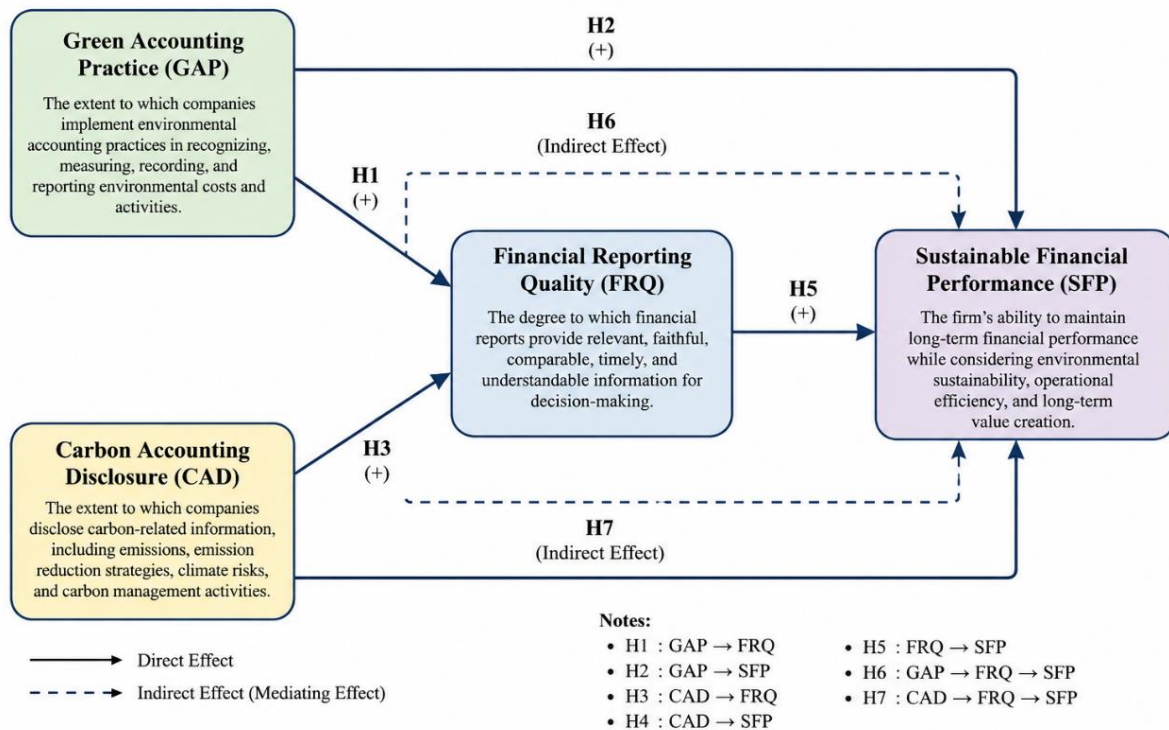


Figure 1. Conceptual framework.

METHODS

Research Design and Analytical Scope

The study uses a quantitative archival design with company-year observations from the Indonesian energy sector. The model relates GAP and CAD to FRQ and SFP, including two indirect pathways. The analysis used SmartPLS 4 and partial least squares structural equation modeling (PLS-SEM). This approach permits joint estimation of measurement and structural relationships, subject to appropriate construct specification and model assessment [31], [32]. Because the variables were measured within the same reporting periods and firms were not randomly assigned to accounting practices, the estimates are interpreted as observational associations.

Data Sources and Sample

The reported sample comprises 27 energy-sector companies listed on the Indonesia Stock Exchange, observed over four fiscal years from 2022 to 2025, yielding 108 firm-year cases. Purposive selection required continuous listing and the corporate reports needed to measure the four constructs. Annual reports, audited financial statements, sustainability reports, and

equivalent environmental disclosures were obtained from the exchange and corporate websites. Cases with unavailable reporting information or incomplete financial data were excluded according to the study record.

The study documentation describes a balanced final sample and states that 2025 observations were included only when the relevant reports were available. It does not provide a company roster, year-specific selection flow, or dated retrieval log. Consequently, the sample totals are retained as reported, but the timing and completeness of the selection process cannot be independently reconstructed from the manuscript. No reports from unrelated studies were substituted for the sampled companies' records.

The 108 cases represent repeated observations of 27 companies rather than 108 independent firms. The original estimation pooled the cases without reported firm effects, year effects, or company-level cluster resampling. This preserves within-company annual variation but does not establish statistical independence. Sample adequacy is therefore not inferred from the ten-times rule or an unreported power calculation. The precision of the estimates is conditional on the original resampling assumptions.

Construct Measurement and Data Collection

Table 1 summarizes the original constructs and indicator domains. GAP, CAD, and FRQ were derived from report content. The analysis used binary coding, assigning 1 when a specified disclosure or criterion was present and 0 when absent, and described disclosure indices as the proportion of applicable criteria satisfied. The study documentation also states that the principal researcher reviewed extracted information twice and reconciled inconsistencies against the reports. This procedure provides within-researcher checking; no independent intercoder agreement coefficient is reported.

Table 1. Construct definitions and measurement domains

Variable	Operational scope	Indicator domains	Reported measurement
GAP	Reported integration of environmental matters into accounting	Cost recognition; environmental investment; management activities; cost reporting; accounting implementation	Report-based binary coding and disclosed-item proportions. The index observes reported practice, not independently verified implementation.
CAD	Public communication of carbon-related information	Emissions; climate risks; reduction targets; management strategy; carbon governance	Binary disclosure coding and the proportion of disclosed carbon items.
FRQ	Decision-useful features observable in audited corporate reports	Relevance; faithful representation; comparability; timeliness; understandability	Binary fulfillment of report-based criteria and disclosure-index scoring. This is not an accrual-quality measure.
SFP	Financial performance	Return on assets; return on equity; net profit	Financial ratios obtained from audited financial statements

Variable	Operational scope	Indicator domains	Reported measurement
	interpreted within the study's sustainability framework	margin; revenue growth; operating cash flow ratio	and entered as indicators of the specified latent construct.

All four constructs were specified reflectively in the original model, with five indicators each. This specification is retained to preserve the reported analysis; it is not established merely by high loadings. Environmental activities and financial ratios may represent different components rather than interchangeable manifestations of one latent attribute. Moreover, the item-level coding rules, subitem denominators, exact cash-flow-ratio formula, treatment of negative equity, and preprocessing of financial ratios are not documented in sufficient detail for full replication. Conventional financial ratios do not directly measure emissions reduction, social inclusion, or resilience beyond the observed period.

Data Analysis and Inference

The reported assessment comprises outer loadings, average variance extracted (AVE), Cronbach's alpha, composite reliability, the Fornell–Larcker matrix, the heterotrait–monotrait ratio (HTMT), and inner variance inflation factors (VIF). Construct separation requires evidence beyond internal consistency [33]. Structural summaries comprise coefficients of determination (R^2), adjusted R^2 , effect sizes (f^2), direct path estimates, and specific indirect estimates. The study documentation reports 5,000 bootstrap resamples, with inference based on the reported p-values and 95% confidence intervals at a 0.05 significance level. Values printed as 0.000 are displayed as $p < 0.001$.

The analysis is reported without imputing missing statistics. No new estimates, descriptive statistics, confidence intervals for indirect paths, or robustness checks were calculated because the retained study record contains summary outputs rather than the coded dataset and model project. The study documentation includes a table labeled Q^2 , but its generating procedure is insufficiently documented and includes values for exogenous constructs. These values are retained for transparency and are not treated as validated out-of-sample predictive accuracy. Prediction requires an explicitly documented assessment design, such as cross-validated predictive testing [34].

Ethical Considerations

The study uses publicly available corporate reports and does not describe recruitment of human participants, collection of personal information, or access to confidential corporate records. The study documentation states that formal ethical approval was not required. No approval identifier or independent institutional determination is supplied, and none is inferred here. Published findings used for contextual comparison remain separate from the study's observations.

RESULTS AND DISCUSSION

Results

Indicator Loadings and Internal Consistency

The reported outer loadings range from 0.914 to 0.964 (Table 2). AVE values range from 0.864 to 0.909 (Table 3), indicating substantial shared indicator variance under the specified reflective model. Composite reliability ranges from 0.970 to 0.980, and Cronbach's alpha from 0.961 to 0.975 (Table 4). These estimates indicate high internal consistency, but values near 1 also warrant consideration of item redundancy. They do not resolve whether the constructs are empirically distinct or appropriately specified.

Table 2. Indicator loadings

Indicator suffix	GAP	CAD	FRQ	SFP
1	0.964	0.948	0.922	0.930
2	0.942	0.944	0.929	0.922
3	0.952	0.955	0.914	0.936
4	0.955	0.925	0.948	0.939
5	0.954	0.931	0.935	0.944

Note: Suffixes 1–5 identify the five indicators within each construct (e.g., GAP1–GAP5). All loadings exceed 0.70.

Table 3. Average variance extracted

Construct	AVE
GAP	0.909
CAD	0.885
FRQ	0.864
SFP	0.872

Table 4. Internal consistency estimates

Construct	Cronbach's Alpha	Composite Reliability	Interpretation
Green Accounting Practice	0.975	0.980	Reliable
Carbon Accounting Disclosure	0.968	0.975	Reliable
Financial Reporting Quality	0.961	0.970	Reliable
Sustainable Financial Performance	0.963	0.972	Reliable

Discriminant Validity and Collinearity

The two discriminant-validity tables do not support an unqualified validity claim. In Table 5, the FRQ–SFP correlation is 0.974 and the GAP–SFP correlation is 0.985. Both exceed the relevant square roots of AVE on the diagonal. The CAD–SFP correlation of 0.932 is also very close to the SFP diagonal value of 0.934. In Table 6, GAP–CAD has an HTMT value of 0.906, exceeding the commonly used 0.90 benchmark. The lower HTMT values for several SFP pairs do not reconcile the conflicting Fornell–Larcker results. Without the original indicator data, the reason for the discrepancy cannot be established.

Table 5. Fornell–Larcker matrix as reported

	CAD (X2)	FRQ (Z)	GAP (X1)	SFP (Y)
CAD (X2)	0.941			
FRQ (Z)	0.778	0.930		
GAP (X1)	0.880	0.805	0.953	
SFP (Y)	0.932	0.974	0.985	0.934

Note: Diagonal entries are the reported square roots of AVE; off-diagonal entries are the reported construct correlations.

Table 6. Heterotrait–monotrait ratios as reported

	CAD (X2)	FRQ (Z)	GAP (X1)	SFP (Y)
CAD (X2)				
FRQ (Z)	0.807			
GAP (X1)	0.906	0.832		
SFP (Y)	0.820	0.803	0.810	

Table 7 reports inner VIF values between 3.029 and 4.725. Although these values are below 5, they indicate appreciable overlap among predictors and do not establish the absence of collinearity concerns under stricter criteria. The structural estimates below are therefore presented conditionally, rather than as results from a fully validated measurement model.

Table 7. Inner variance inflation factors

	CAD (X2)	FRQ (Z)	GAP (X1)	SFP (Y)
CAD (X2)		4.441		4.725
FRQ (Z)				3.029
GAP (X1)		4.441		4.311
SFP (Y)				

Explained Variance and Effect Sizes

The model reports $R^2 = 0.670$ for FRQ and $R^2 = 0.699$ for SFP, with adjusted values of 0.664 and 0.690, respectively (Table 8). These summarize in-sample explained variance. They should not be interpreted as the proportion of long-term sustainability or social welfare explained by environmental accounting.

Table 8. Explained variance

Endogenous Construct	R^2	Adjusted R^2	Interpretation
Financial Reporting Quality	0.670	0.664	Moderate
Sustainable Financial Performance	0.699	0.690	Moderate

Reported f^2 values range from 0.028 to 0.196 (Table 9). GAP has the largest incremental association with FRQ, whereas its incremental association with SFP is small. The remaining effects are also small under the original classification. Statistical significance should therefore be considered alongside the modest incremental contribution of most paths.

Table 9. Reported structural effect sizes

Structural Relationship	f ²	Effect Size
Green Accounting Practice → Financial Reporting Quality	0.196	Medium
Green Accounting Practice → Sustainable Financial Performance	0.028	Small
Carbon Accounting Disclosure → Financial Reporting Quality	0.064	Small
Carbon Accounting Disclosure → Sustainable Financial Performance	0.084	Small
Financial Reporting Quality → Sustainable Financial Performance	0.122	Small

Table 10. Values labeled Q² in the original analysis

Construct	Q ²
GAP	0.428
CAD	0.590
FRQ	0.572
SFP	0.600

Table 10 preserves the reported values: GAP = 0.428, CAD = 0.590, FRQ = 0.572, and SFP = 0.600. The table alone does not identify whether these represent construct redundancy, communality, or another prediction-related output. Because GAP and CAD are exogenous in the specified structural model, their inclusion also prevents an unqualified endogenous-prediction interpretation. No predictive-performance conclusion is drawn from these entries.

Direct and Indirect Associations

Table 11 presents the five direct paths, numbered consistently with **Figure 1**. GAP–FRQ, CAD–FRQ, CAD–SFP, and FRQ–SFP are statistically significant in the reported bootstrap analysis. The GAP–SFP estimate is positive but not significant. Its reported confidence interval includes zero. All direct-path interpretations use the estimates in **Table 11**.

Table 11. Direct path estimates and reported bootstrap inference

H	Path	β	t	p	95% CI	Decision
H1	GAP → FRQ	0.53 6	5.35 2	<0.00 1	0.338 to 0.730	Supported
H2	GAP → SFP	0.21 3	1.59 1	0.112	-0.002 to 0.452	Not Supported
H3	CAD → FRQ	0.30 6	2.48 6	0.013	0.079 to 0.507	Supported
H4	CAD → SFP	0.34 6	2.89 1	0.004	0.125 to 0.566	Supported
H5	FRQ → SFP	0.33 3	3.15 2	0.002	0.135 to 0.486	Supported

Note: β denotes the standardized path coefficient; CI denotes confidence interval. Significance refers to the original pooled bootstrap analysis and does not incorporate an independently verified correction for repeated observations.

Table 12. Specific indirect associations

H	Indirect path	β	t	p	Decision
H6	GAP $\rightarrow$ FRQ $\rightarrow$ SFP	0.178	3.118	0.002	Supported
H7	CAD $\rightarrow$ FRQ $\rightarrow$ SFP	0.102	1.937	0.053	Not supported

The GAP–FRQ–SFP indirect estimate is 0.178 ($p = 0.002$), while CAD–FRQ–SFP is 0.102 ($p = 0.053$; Table 12). Both are numerically consistent, after rounding, with the products of their component direct paths. The latter does not meet the 0.05 threshold. Nevertheless, one significant indirect path and one nonsignificant indirect path do not establish that the two pathways differ statistically; that conclusion would require a direct comparison. The results also do not demonstrate that an unmeasured external-signaling mechanism accounts for the CAD association.

Discussion

Reporting Quality as a Provisional Information Pathway

The reported pattern is compatible with the proposition that environmental accounting becomes financially relevant partly through the quality of corporate information. GAP is associated with FRQ, and the corresponding indirect association with SFP is significant. However, the nonsignificant direct estimate does not demonstrate that green accounting has no financial benefit, nor that reporting quality is its exclusive mechanism. The confidence interval permits effects of different practical magnitudes, while unresolved construct overlap limits the interpretation of separate path coefficients.

This qualification is consistent with the mixed literature. Indonesian mining evidence distinguishes significant disclosure and environmental-performance associations from nonsignificant environmental-cost associations [10]. Research on multinational firms documents a negative environmental-cost association [11]. Differences in expenditure timing, reporting measures, and financial outcomes offer plausible explanations for divergent results, but those explanations were not separately tested here. Research comparing accounting and market performance across industry groups further reinforces the need to specify which financial outcome is being explained [35].

FRQ in this study is a disclosure-based assessment of qualitative reporting characteristics. It differs from earnings-management or accrual-based operationalizations used in financial-reporting research [18]. Consequently, agreement in the direction of a relationship does not establish equivalence between measures. A stronger test of the proposed information pathway would compare alternative FRQ measures, justify the reflective specification, and separate accounting practices from the disclosures used to observe them.

Carbon Disclosure and the Limits of Signaling Explanations

CAD has a positive reported direct association with SFP, whereas its indirect association through FRQ does not meet the conventional significance threshold. This pattern permits an

informational interpretation, but no investor reactions, financing conditions, or stakeholder perceptions were measured. External signaling is therefore a plausible explanation rather than an observed intervening process. The finding also differs from the nonsignificant carbon-disclosure relationship reported for Indonesian consumer-goods firms [13], illustrating why financial consequences should not be generalized across sectors and outcome measures.

The model does not distinguish substantive carbon management from more extensive communication. Sustainability ratings can diverge because of their measurement choices [23], and greenwashing can occur at both corporate-claim and implementation levels [24]. A higher CAD score should therefore be read as more disclosure within the coding framework, not as verified emissions reduction. Reporting incentives, governance, and environmental performance may shape the observed associations and remain potential omitted influences.

Organizational Learning and Reporting Capacity

A practical implication is to strengthen the connection between accounting teams and staff responsible for environmental information. Professional-competency research in natural resource extraction connects technical capabilities with environmental, social, and governance responsibilities [36]. Environmental management accounting research also identifies human resource practices as a relevant organizational mechanism [30]. These perspectives support examining training, role clarity, and information controls when improving corporate reporting, although the present dataset contains no direct measures of these capacities.

Two Indonesian studies involving Aridan offer bounded support for this capacity-building perspective. Research in technology firms links digital human resource management, empowerment, career development, knowledge innovation, and engagement [37]. An educational development study validates a digital-literacy module concerned with evaluating online information and avoiding hoaxes [38]. The former informs organizational-learning questions, while the latter offers an example of structured information-literacy development. Neither establishes an accounting-performance effect in energy firms. Together with work on digital-literacy indicators for sustainable development [39], they motivate testing whether targeted reporting education improves evidence appraisal, traceability, and consistency across financial and environmental reports.

Social Welfare and Gender Responsive Accountability

Corporate financial continuity may affect the resources available for employment, training, environmental remediation, and community programs. Yet profitability alone provides no evidence about who receives those resources or bears operational risks. Research on coal transitions documents gendered power asymmetries [40]. The appropriate policy question is therefore whether company reporting makes employment conditions, access to retraining, community participation, and the distribution of transition costs visible, alongside financial and carbon information.

The study supports treating these matters as a separate accountability agenda rather than including them implicitly within SFP. Corporate reports could connect environmental expenditure to separately verified workforce and community outcomes, with gender-disaggregated measures where appropriate. Such reporting would permit evaluation of who benefits from corporate sustainability activities and whether information is accessible to

affected groups. These are recommendations for measurement and governance; no improvement in women's welfare, educational access, or community wellbeing is established by the present financial model.

Contribution and Boundary Conditions

The study's contribution is an integrated, sector-specific account of the reported direct and indirect associations among two environmental accounting constructs, reporting quality, and financial performance. It also clarifies the boundary between corporate financial outcomes and broader welfare claims. Its contribution remains conditional: the original diagnostics do not establish a fully valid measurement model, and pooled contemporaneous data cannot establish the direction of the proposed mechanism. These qualifications affect the strength of the empirical claim rather than the relevance of investigating the information pathway.

CONCLUSION

For 27 Indonesian energy firms observed during 2022–2025, the reported model associates both green accounting practice and carbon disclosure with financial reporting quality. Carbon disclosure and reporting quality are positively associated with the financial-performance construct. The green-accounting indirect association through reporting quality is significant, while its direct association and the carbon-disclosure indirect association are not significant at the 0.05 level. This pattern is consistent with a provisional information pathway. It does not establish causal mediation, durable financial resilience, or social welfare gains. The practical implication is to connect environmental accounting records with decision-useful financial information and to evaluate distributional outcomes separately. Reporting systems can make environmental commitments more transparent, but evidence of an inclusive transition additionally requires workforce, community, and gender-sensitive outcome measures. Reconciled measurement diagnostics and estimation that accounts for repeated company observations are necessary before the reported pathways can support stronger empirical conclusions.

LIMITATIONS

The main limitation is unresolved measurement validity. The reported Fornell–Larcker and HTMT results do not consistently establish construct separation, and very high reliability raises potential redundancy concerns. The reflective treatment of distinct financial ratios and environmental activities also requires stronger justification. Without the item-level dataset and model project, these issues cannot be resolved by editorial changes or by borrowing coefficients from published studies. The analysis pools four observations per company and reports no cluster-aware bootstrap, firm effects, year effects, or temporal ordering. Standard errors may therefore be sensitive to within-firm dependence. Omitted factors, including company size, commodity prices, leverage, governance, and environmental exposure, may account for part of the reported relationships. The source also lacks the sample roster, complete coding manual, descriptive-statistics table, and a reproducible prediction procedure. These omissions restrict independent replication and prevent a complete assessment of selection and measurement bias. Finally, report-based measures capture disclosed information rather than

independently audited environmental implementation. The four-year financial indicators do not directly measure long-term sustainability, emissions performance, or social welfare. Future research can address these limitations through transparent report-level data, alternative construct specifications, longitudinal and cluster-aware estimation, and direct measures of employee and community outcomes. Extensions should test gender and welfare relationships rather than assume that corporate financial gains are distributed inclusively.

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AUTHOR CONTRIBUTIONS

K.S. conceptualization, methodology, data collection, formal analysis, interpretation, and writing of the original draft. S.S.S. methodology, validation of analytical procedures, interpretation, and critical review. D.P. supervision, theoretical development, conceptual-framework refinement, interpretation, and substantive revision. L.T.T. literature review, data validation, editing, language refinement, and proofreading. These roles follow the contribution statement supplied with the original manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

ChatGPT assisted with language editing, structural refinement, and reference organization. Responsibility for the accuracy of the content, citations, and interpretations, and for approval of the final manuscript, rests with the authors.

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