

Antecedents and Potential Consequences of a Carbon Tax: An Analysis of Integrated Mediation in Enhancing Sustainability in Energy and Mining Companies in Indonesia

Andi Husnul Khatimah

Alauddin State Islamic University, Makassar

DOI: <https://doi.org/10.51244/IJRSI.2026.1309000052>

Received: 04 September 2026; Accepted: 09 September 2026; Published: 03 October 2026

ABSTRACT

This study analyzes the impact of the Potential Carbon Tax on corporate sustainability in Indonesia's energy and mining sectors for the 2020–2024 period. Using path analysis on 100 samples, the results show that Corporate Social Responsibility (CSR), Carbon Emission Disclosure (CED), and Environmental Performance significantly reduce the Potential Carbon Tax. Conversely, the Potential Carbon Tax positively impacts corporate sustainability, serving as a catalyst for green business transformation. Mediation analysis reveals that the potential carbon tax provides partial mediation for CSR and full mediation for environmental performance, though it does not mediate CED. These findings suggest that management should integrate environmental agendas into financial strategies to mitigate fiscal risks and enhance sustainability value.

Keywords: Corporate Social Responsibility, Carbon Emission Disclosure, Environmental Performance, Carbon Tax Potential, Corporate Sustainability.

INTRODUCTION

The issues of environmental degradation and climate change have become increasingly urgent global challenges that must be addressed immediately (Wibowo et al., 2022). Pressure from various stakeholders—such as governments, investors, and the public—is compelling businesses to pay greater attention to environmental sustainability in their operations. The greenhouse effect, triggered by the release of greenhouse gases such as carbon dioxide and methane, has been identified as the primary cause of global warming (Cholida & Kawedar, 2020). The Intergovernmental Panel on Climate Change projects that a global temperature increase of 1.5 degrees Celsius will occur between 2030 and 2052, which could threaten the sustainability of life on Earth (Intergovernmental Panel on Climate Change, 2014). This situation requires companies to balance financial interests with environmental sustainability; however, in reality, many business entities still prioritize short-term profits, thereby creating a disconnect in the relationship between humans and the environment (Suyudi et al., 2020).

A business approach that ignores ecological aspects in today's era of technological disruption will pose a major risk to companies in the future (Irwhantoko & Basuki, 2016). The need for transparent accounting information has become crucial because it positively influences investor perceptions and corporate value (Rusmana & Purnaman, 2020). Therefore, disclosures based on the principle of conservatism—incorporating the integration of people, planet, profit, and purpose—are highly advisable to implement (Handayani, 2023). Companies that prioritize sustainability will be better equipped to create value for shareholders and attract investors focused on environmental, social, and governance (ESG) issues (Alfajri & Warsini, 2024). However, the information in annual

reports often fails to provide an accurate picture due to companies' tendency to underestimate the costs of social and environmental responsibilities (Lioui & Sharma, 2012).

Carbon emissions disclosure has become a key indicator in assessing a company's commitment to the environment, which is closely linked to the entity's environmental performance (Rachmawati, 2021). Although some findings suggest inconsistencies in the relationship between performance and disclosure, current global trends indicate that companies with strong environmental performance tend to be more proactive in reporting their emissions (Maryanti et al., 2022). Transparency in this reporting is key to building stakeholder trust and strengthening a company's competitive position (Alhoits & Sisdianto, 2024). Furthermore, the implementation of corporate social responsibility is an important tool for enhancing reputation, yet it is often still viewed as a mere formality in response to external pressure, without a deep commitment to sustainable change (Kaligis et al., 2025).

Fiscal policy in the form of a carbon tax serves as an instrument to incentivize economic actors to reduce their emissions (Kuninori & Otaki, 2016). The energy sector is a primary focus because it accounts for the largest share of emissions in Indonesia, at thirty-four point twenty-two percent (Ministry of Environment and Forestry, 2021). Given the gaps in previous research regarding the relationship between emissions disclosure, environmental performance, and corporate social responsibility on corporate sustainability, this study aims to re-examine these dynamics using a carbon tax as a mediating variable. The energy and mining sectors were selected as the focus of this study due to their significant environmental impacts, particularly those related to carbon dioxide production.

The primary objective of this study is to conduct an in-depth analysis of the influence of corporate social responsibility, carbon emissions disclosure, and environmental performance on the carbon tax, as well as its impact on corporate sustainability. This study also seeks to evaluate the role of carbon taxes in mediating the relationship between these independent variables and the sustainability of business entities. Through this analysis, it is hoped that the mechanisms by which environmental fiscal policies can encourage companies to strengthen their commitment to environmental conservation without compromising long-term economic goals will be revealed.

Theoretically, this study contributes to the development of sustainability theory by strengthening the integration between stakeholder theory and signals in explaining firms' motivations for environmental disclosure (Freeman & Reed, 1983; Spence, 1973). The results of this study are expected to provide empirical evidence regarding the role of stakeholder pressure in promoting transparency in the management of environmental impacts. From a practical perspective, this study offers insights for the business world in formulating sustainable business strategies and identifying areas for performance improvement. For policymakers, this study can serve as a foundation for designing effective social responsibility regulations and setting optimal carbon tax rates. Meanwhile, for investors, the research findings provide relevant information to support investment decisions oriented toward a greener future for the Earth.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The survival of companies in the energy and mining sectors depends heavily on stakeholder support, where long-term success is measured not only by profitability but also by an entity's ability to align economic, social, and environmental interests (Freeman & Reed, 1983). From this perspective, Corporate Social Responsibility (CSR) practices

and carbon emissions disclosure serve as crucial mechanisms for meeting these expectations while mitigating the risks of negative externalities (Aptasari et al., 2024). Simultaneously, signaling theory explains that companies with superior environmental performance tend to disclose high-quality environmental information as an effort to reduce information asymmetry and send a positive message to the market regarding the quality of their risk management (Spence, 1973; Maryanti et al., 2022).

The integration of economic interests and ecological responsibility in this study This is underpinned by an expanded Triple Bottom Line concept, in which sustainability no longer relies solely on economic, social, and environmental aspects but also incorporates a fiscal compliance dimension through carbon taxes. In high-emission industries, pressure from stakeholders is forcing companies to internalize the costs of negative externalities into their financial statements (Aptasari et al., 2024). This creates a new dynamic in which management is required to demonstrate that environmental initiatives can yield concrete financial returns. In this context, a carbon tax serves as a “disciplining” instrument that converts abstract environmental performance into measurable monetary value, thereby influencing a company’s strategic decisions regarding long-term business sustainability.

Furthermore, the mechanism of information transmission through signaling theory is key in understanding how the market responds to carbon tax efficiency resulting from CSR practices and strong environmental performance. Companies that successfully demonstrate a reduction in their potential carbon tax burden through their sustainability reports are, in fact, sending a strong signal regarding operational efficiency and resilience to future regulatory risks (Spence, 1973; Maryanti et al., 2022). This signal reduces uncertainty for investors and creditors, which ultimately lowers the cost of capital and increases the company’s valuation in global markets. Thus, the relationship between the independent variables in this study and corporate sustainability is not merely moralistic but constitutes a form of management.

CSR, Emissions Disclosure, and Environmental Performance in Relation to Carbon Taxes

Empirically, the implementation of CSR focused on environmental sustainability can reduce a company’s emissions intensity, which in turn leads to a reduction in the carbon tax base (Chen, 2023; Pujiati, 2024). Transparency through Carbon Emission Disclosure (CED) also serves as an accountability tool that motivates systematic energy efficiency, thereby reducing potential environmental fiscal liabilities (Wong et al., 2021). Environmental performance recognized through official rankings such as PROPER serves as a strong signal that a company has adopted climate-friendly operational systems that technically minimize pollutants contributing to the tax burden (Safitra & Hanifah, 2021). Based on these arguments, the following hypotheses are formulated:

H1: Corporate Social Responsibility influences potential carbon taxes. H2: Carbon Emission Disclosure influences potential carbon taxes.

H3: Environmental Performance influences Carbon Tax Potential.

The Relationship Between CSR, Emissions Disclosure, Environmental Performance, and Carbon Tax on Corporate Sustainability

Corporate sustainability is the result of synergy between regulatory compliance and social legitimacy. Strategic CSR practices strengthen sustainability by building public trust and fostering stable relationships with communities (Ganesan et al., 2022). Conversely, carbon taxes are often viewed as an additional cost that can strain cash flow and competitiveness

if not managed through low-carbon technological innovation (Salim & Sidiq, 2022). However, for companies in the extractive sector, effective management of the carbon tax burden can actually serve as a catalyst for transforming business models into more resilient ones (Aptasari et al., 2024). Based on this relationship, the following hypothesis is proposed:

H4: Corporate Social Responsibility has an impact on Corporate Sustainability.

H5: Carbon Emission Disclosure affects Corporate Sustainability.

H6: Environmental Performance affects Corporate Sustainability. H7: Potential Carbon Tax affects Corporate Sustainability.

The Mediating Role of Carbon Tax Potential

The potential for a carbon tax acts as a mediating variable linking social responsibility and technical performance to economic sustainability performance. Proactive environmental activities not only enhance corporate image but also mechanically create “fiscal space” through emissions tax savings, which can then be reallocated to fund future sustainability projects (Aptasari et al., 2024). In the energy sector, high environmental performance will only make a significant contribution to sustainability if it successfully mitigates the risk of a carbon fiscal burden that threatens the industry’s financial stability (Hörisch et al., 2020). Based on this line of reasoning, the mediation hypothesis is formulated as follows:

H8: The Potential for a Carbon Tax mediates the effect of CSR on Corporate Sustainability. H9: The potential for a carbon tax mediates the effect of CED on corporate sustainability.

H10: The potential for a carbon tax mediates the effect of environmental performance on corporate sustainability.

RESEARCH METHODOLOGY

This study employs a quantitative method with a causal-comparative approach to examine the relationship between Corporate Social Responsibility (CSR), Carbon Emission Disclosure (CED), and Environmental Performance on Corporate Sustainability, with the Potential for a Carbon Tax serving as the mediating variable. The study population comprises all energy and mining sector companies listed on the Indonesia Stock Exchange from 2020 to 2024; through purposive sampling, a sample of 20 companies was selected, yielding a total of 100 panel data observations. Secondary data were collected through documentation from annual reports, sustainability reports, and the relevant ministry’s PROPER database. Operational variables were measured using the GRI standard index for CSR, an emissions checklist for CED, PROPER rankings for environmental performance, and estimates of the fiscal burden based on the latest carbon tax regulations for the mediating variable. Data analysis was conducted comprehensively using path analysis and the Sobel test to evaluate both direct and indirect effects, following a series of classical assumption tests to ensure the validity, reliability, and accuracy of the analytical model in scientifically addressing the research questions.

RESULTS AND DISCUSSION

The primary objective of this study is to evaluate the effectiveness of environmental and social variables in mitigating fiscal risk through carbon tax instruments, as well as their impact on long-term business sustainability. More specifically, this study seeks to

empirically demonstrate whether corporate social responsibility practices, transparency in emissions reporting, and environmental performance can serve as drivers for achieving tax efficiency, which ultimately enhances a company's sustainability value. Meanwhile, the purpose of the data analysis in this study is to produce accurate statistical estimates of the strength of the relationships among variables and to test the validity of the proposed mediation model. Through this data analysis, the researchers intend to provide an objective picture of the extent to which carbon tax policies act as a mediating variable linking low-carbon operational commitments to financial stability and corporate reputation in the energy and mining sectors.

Normality Test Results

Based on the results of the One-Sample Kolmogorov-Smirnov test for Model 1, an Asymp. Sig. (2-tailed) value of 0.200 was obtained. In contrast, for Model 2, the One-Sample Kolmogorov-Smirnov test yielded a significance value of 0.000. This lack of significance in the Kolmogorov-Smirnov test is acceptable according to Hair et al. (2013), who state that for large samples ($N > 30$ or $N > 100$), normality tests can be disregarded.

Table 1. Normality Test Results

One-Sample Kolmogorov-Smirnov Test One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test	Unstandardized Residual	Unstandardized Residual
N	100	100
Normal Parameters ^{a, b}		
Mean	0.0000000	0.0000000
Std. Deviation	0.19451900	12.73770440
Most Extreme Differences		
Absolute	0.064	0.142
Test Statistic	0.064	0.142
Asymptotic Significance (2-tailed)	0.200 ^{c, d}	0.000 ^c

a. The test distribution is normal.

b. Calculated from the data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

a. The test distribution is normal.

b. Calculated from the data.

c. Lilliefors Significance Correction.

Source: SPSS 26 output, 2026

Multicollinearity Test Results

Based on the results of data analysis, it was found that the Tolerance values in Model 1 for the CSR (X1) variable were 0.947, for CED (X2) were 0.937, and for Environmental Performance (X3) were 0.889. Meanwhile, the VIF values for CSR (X1) were 1.056, for CED (X2) were 1.068, and for Environmental Performance (X3) were 1.125.

Table 2. Results of the Multicollinearity Test for Model 1

Coefficientsa

Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	2.624	0.136	—	19.236	0.000	—	—
CSR (X3)	-1.687	0.085	-0.848	-19.919	0.000	0.947	1.056
CED (X2)	-0.002	0.001	-0.111	-2.591	0.011	0.937	1.068
Environmental Performance (X3)	-0.117	0.025	-0.210	-4.775	0.000	0.889	1.125

a. Dependent Variable: Carbon Tax Potential

Source: SPSS 26 Output, 2026

In Model 2, the statistical results show Tolerance values of 0.185 for the CSR variable (X1), 0.875 for CED (X2), 0.719 for Environmental Performance (X3), and 0.165 for Carbon Tax Potential (X4). Meanwhile, the VIF values for CSR (X1) are 5.419, CED (X2) are 1.142, Environmental Performance (X3) are 1.392, and Carbon Tax Potential (X4) are 6.074. Since the Tolerance values for all variables are above 0.10 and the VIF values are below the 10 threshold, it is confirmed that these two regression models do not have multicollinearity issues among the variables.

Table 3. Multicollinearity Test Results for Model

Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	24.623	19.786	—	1.244	0.216	—	—
CSR (X1)	41.153	12.627	0.722	3.259	0.002	0.185	5.419
CED (X2)	-0.053	0.049	-0.110	-1.078	0.284	0.875	1.142
Performance Environment (X3)	1.576	1.799	0.098	0.876	0.383	0.719	1.392
Tax Potential (X3)	16.564	6.718	0.578	2.465	0.015	0.165	6.074
Carbon (X4)	—	—	—	—	—	—	—

a. Dependent Variable: Corporate Sustainability

Source: SPSS 26 Output, 2026

Heteroscedasticity Test Results

The test results for Model 1 show significance values of 0.079 for the CSR variable (X1), 0.487 for CED (X2), and 0.586 for Environmental Performance (X3).

Table 4. Heteroscedasticity Test Results for Model 1

Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	0.116	0.071	—	1.638	0.105
CSR (X1)	0.078	0.044	0.183	1.777	0.079
CED (X2)	0.000	0.000	0.072	0.697	0.487
Environmental Performance (X3)	-0.007	0.013	-0.058	-0.546	0.586

a. Dependent Variable: ABSRES1

Source: SPSS 26 Output, 2026

The results for Model 2 also show the same consistency, with the CSR variable (X1) at 0.171, CED (X2) at 0.327, Environmental Performance (X3) at 0.596, and Carbon Tax Potential (X4) at 0.113. The significance values for both models are above 0.05, so it can be concluded that there is no evidence of heteroscedasticity.

Table 5. Results of the Heteroscedasticity Test for Model 2

Coefficients Standardized and Unstandardized Coefficients Coefficients

	Model	B	Std. Error	Beta	t	Sig.
1 (Constant)		22.334	12,249		1,823	0.071
CSR (X1)		-10,773	7,817	-0.321	-1.378	0.171
CED (X2)		0.030	0.030	0.106	0.986	0.327
Environmental Performance (X3)		-0.592	1.114	-0.063	-0.532	0.596
Carbon Tax Potential (X4)		-6,650	4.159	-0.395	-1,599	0.113

a. Dependent Variable: ABSRES2

Source: SPSS 26 Output, 2026

Autocorrelation Test Results

The autocorrelation test for Model 1 with the dependent variable “Carbon Tax Potential” yielded a Durbin-Watson (DW) value of 1.200. Based on the decision criteria, this value is less than the lower limit in the table ($DW < dL$), namely $1.200 < 1.5922$, indicating the presence of positive autocorrelation in the model.

Table 6. Autocorrelation Test Results for Model 1

			Model Summary ^b		
Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate	Durbin-Watson
1	0.914a	0.835	0.830	0.197535	1.200

a. Predictors: (Constant), Environmental Performance (X3), CSR (X1), CED (X2)

b. Dependent Variable: Carbon Tax Potential

Source: SPSS 26 output, 2026

Meanwhile, the test results for Model 2 with the dependent variable “Corporate Sustainability” indicate a more stable condition, with a Durbin-Watson value of 1.643. This value falls within the range of dL (1.5922) and dU (1.7582), which technically suggests it falls into the category of positive autocorrelation. However, according to Basuki & Prawoto (2015), panel data are not required to undergo an autocorrelation test because their cross-sectional nature is more dominant.

Table 7. Autocorrelation Test Results for Model 2

			Model Summary ^b		
Model	R	R-Square	Adjusted R-Square	Standard Error Of the Estimate	Durbin-Watson
1	0,373a	0.139	0.103	13.003102	1.643

a. Predictors: (Constant), Carbon Tax Potential (X4), CED (X2), Environmental Performance (X3), CSR (X1)

b. Dependent Variable: Corporate Sustainability

Source: SPSS 26 Output, 2026

Hypothesis Test Results

Simultaneous Regression Test (F-Test)

Table 8. Results of the Simultaneous Regression Test (F-Test) Model 1

		ANOVA ^a			
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	19.008	3	6,336	162.374	0,000b
Residual	3,746	96	0.039		
Total	22,753	99			

a. Dependent Variable: Carbon Tax Potential

b. Predictors: (Constant), Environmental Performance (X3), CSR (X1), CED (X2)

Based on the ANOVA table for Model 1 with Carbon Tax Potential as the dependent variable, the calculated F-value of 162.374 is greater than the critical F-value of 2.70, and the significance level of 0.000 is less than 0.05. This indicates that, taken together, the independent variables do not have a significant effect on Carbon Tax Potential. Meanwhile, in Model 2, with Corporate Sustainability as the dependent variable, the calculated F-value of 3.838 is greater than the critical F-value of 2.47, and the significance value of

0.006 is less than 0.05, indicating that the independent variables collectively have a significant effect on Corporate Sustainability.

Table 9. Results of the Simultaneous Regression Test (F-Test) for Model 2

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2,595.853	4	648.963	3.838	0.006 ^b
Residual	16,062.662	95	169.081	—	—
Total	18,658.516	99	—	—	—

- a. Dependent Variable: Corporate Sustainability
- b. Predictors: (Constant), Carbon Tax Potential (X4), CED (X2), Environmental Performance (X3), CSR (X1)

Partial Test (t-Test)

Table 10. Results of the Simultaneous Regression Test (F-Test) for Model 1

Coefficients^a

Unstandardized Standardized_Coefficients Coefficients

Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	2.624	0.136		19.236	0.000
CSR (X1)	-1,687	0.085	-0.848	-19,919	0.000
CED (X2)	-0.002	0.001	-0.111	-2.591	0.011
Environmental Performance (X3)	-0.117	0.025	-0.210	-4.775	0.000

Dependent Variable: Carbon Tax Potential

Source: SPSS 26 Output, 2026

The formula for Model 1, in which Carbon Tax Potential is the dependent variable, is as follows:

$$Y = 2.624 - 1.687X1 - 0.002X2 - 0.117X3 + e$$

Notes:

Y = Carbon Tax Potential

X1 = Corporate Social Responsibility X2 = Carbon Emissions Disclosure X3 = Environmental Performance

e = Error

Based on the results of the regression analysis in Model 1, the variables CSR, CED, and Environmental Performance were simultaneously found to make a significant contribution to the variation in the Carbon Tax Potential value. Partially, the CSR variable exhibits the most dominant negative effect with a Beta coefficient value of -1.687 and a calculated t-value of -19.919 (significance $0.000 < 0.05$), followed by Environmental Performance with a coefficient of -0.117 (calculated t-value -4.775; sig 0.000), and CED with a coefficient of -0.002 (t-calculated -2.591; sig 0.011), where all three have t-calculated values greater than the t-table value of 1.985; thus, hypotheses H1, H2, and H3 are accepted. These findings indicate that any increase in social activity, emissions transparency, and environmental performance can systematically reduce the carbon tax base through operational efficiency, while the constant value of 2.624 indicates a baseline potential for the carbon tax when other independent variables are held constant, reinforcing that integrating environmental agendas serves as a strategic fiscal tool for companies in the energy and mining sectors to mitigate the risk of future tax burdens.

Table 11. Results of the Simultaneous Regression Test (F-Test) for Model 2

Coefficientsa

Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	24.623	19.786	—	1.244	0.216
CSR (X1)	41.153	12.627	0.722	3.259	0.002
CED (X2)	-0.053	0.049	-0.110	-1.078	0.284
Environmental Performance (X3)	1.576	1.799	0.098	0.876	0.383
Carbon Tax Potential (X4)	16.564	6.718	0.578	2.465	0.015

a. Dependent Variable: Corporate Sustainability

Source: SPSS 26 Output, 2026

The formula for Model 2, where Corporate Sustainability is the dependent variable, is as follows:

$$Y = 24.623 + 41.153X1 - 0.053X2 + 1.576X3 + 16.564X4 + e$$

Notes:

Y = Corporate Sustainability

X1 = Corporate Social Responsibility X2 = Carbon Emissions Disclosure X3 = Environmental

Performance X4 = Carbon Tax Potential e = Error

Based on the results of the regression analysis for Model 2, it was found that the CSR and Carbon Tax Potential variables play a significant role in increasing a company's sustainability score, while the CED and Environmental Performance variables do not show a strong enough influence. In a partial analysis, CSR was found to have a positive and significant effect on Corporate Sustainability with a beta coefficient of 41.153 and a calculated t-value of 3.529 (sig 0.002 < 0.05), thus H4 is accepted; while Carbon Tax Potential surprisingly also showed a significant positive effect with a coefficient of 16.564 and a t-value of 2.465 (sig 0.015 < 0.05), leading to the rejection of H7 because the direction of the relationship was opposite to the proposed negative hypothesis. On the other hand, the CED variable has a t-value of -1.078 (sig 0.284 > 0.05) and Environmental Performance has a t-value of 0.876 (sig 0.383 > 0.05), meaning neither has a significant effect on sustainability; thus, H5 and H6 are rejected. The constant value of 24.623 reflects the baseline value of a company's sustainability when all independent variables are zero; however, these findings as a whole indicate that in the energy and mining sectors, commitment social and readiness to address fiscal instruments carbon more

It is recognized as a driver of sustainability rather than merely emissions reporting or administrative environmental ratings.

Sobel Test

The mediation value can be determined by performing a calculation using the

Sobel test calculator, with the decision criterion being whether the obtained value is

> 1.98 at a significance level of 0.05. The reference table for the Sobel test is as

follows:

Table 12. Sobel Test Reference Table

Variable	Unstandardized	Std. Error
CSR (X1) > Carbon Tax Potential (Z)	-1.687(a)	0.085(Sa)
CED(X2) > Carbon Tax Potential (Z)	-0.002(a)	0.001(Sa)
Environmental Performance (X3) > Carbon Tax Potential (Z)	-0.117(a)	0.025(Sa)
Carbon Tax Potential (Z) > Corporate Sustainability (Y)	16.564(b)	6.718(Sb)

Source: Processed data, 2026

Based on the results of the Sobel test for mediation analysis, this study found that Carbon Tax Potential plays a crucial role as a mediating variable in the effects of CSR and Environmental Performance on Corporate Sustainability, but not for the CED variable. Statistically, the calculated t-value for CSR mediation was 2.446 (sig. 0.014) and for Environmental Performance mediation was 2.181 (sig. 0.029), both of which were greater than the critical t-value of 1.985; thus, hypotheses H8 and H10 were accepted; this confirms that a company's social activities and environmental performance can enhance sustainability through the mechanism of carbon tax burden efficiency. Conversely, the effect of CED on Corporate Sustainability through Carbon Tax Potential yielded a calculated t-value of only 1.553 with a significance level of 0.120 (> 0.05), so H9 is rejected, indicating that transparency in emissions reporting alone is not strong enough to create sustainability value through the carbon tax mediation pathway. Overall, these findings reinforce that in the energy and mining sectors, carbon taxes serve as an economic bridge that transforms actual environmental performance into measurable sustainability value for entities.

Table 13. Sobel Test Results

Two-tailed Probability Standard Error

CSR (X1) > Potential Tax	Carbon (Z) >	-2.446	0.014	11.420
Corporate Sustainability (Y)				
CED(X2) > Potential Tax	Carbon (Z) >	-1,553	0.120	0.021
Corporate Sustainability (Y)				
Environmental Performance (X3) > Carbon Tax Potential		-2.181	0.029	0.888
(Z) > Corporate Sustainability (Y)				

Source: Processed data, 2026

Path Analysis Results

The results of the path analysis revealed that all antecedent variables in the first model—namely, CSR, CED, and Environmental Performance—had a significant effect on Carbon Tax Liability, with a negative relationship. This indicates that in the energy and mining sectors, strengthening social activities and emissions transparency is not merely a matter of fulfilling administrative requirements, but rather a preventive strategy to reduce tax liabilities calculated based on an entity's carbon footprint. The CSR variable produced a total positive effect of 0.232, derived from a direct effect of 0.722 minus an indirect effect via the tax path of 0.490. On the other hand, the CED and Environmental Performance

variables produced total negative effects of -0.174 and -0.023, respectively, driven by the dominance of indirect effects (mediation channels) over their direct effects.

Table 14. Results of Direct and Indirect Effects

Variable	Direct Effect	Indirect Effect	Total Effect (Direct Effect – Indirect Effect)
CSR (X1)	0.722	0.490	0.232
CED (X2)	-0.110	0.064	-0.174
Environmental Performance (X3)	-0.098	0.121	-0.023

The results of the formulated hypothesis tests are summarized in the following table:

Table 14. Hypothesis Test Results

Hypothesis	Statement	Result
H1	Corporate Social Responsibility has a negative effect on Carbon Tax Potential.	Rejected
H2	Carbon Emissions Disclosure has a negative effect on Carbon Tax Potential.	Rejected
H3	Environmental Performance has a negative effect on Carbon Tax Potential.	Rejected
H4	Corporate Social Responsibility has a positive effect on Corporate Sustainability.	Rejected
H5	Carbon Emissions Disclosure has a positive effect on Corporate Sustainability.	Rejected
H6	Environmental Performance has a positive effect on Corporate Sustainability.	Rejected
H7	Carbon Tax Potential has a positive effect on Corporate Sustainability.	Supported
H8	Carbon Tax Potential mediates the effect of Corporate Social Responsibility on Corporate Sustainability.	Supported
H9	Carbon Tax Potential mediates the effect of Carbon Emissions Disclosure on Corporate Sustainability.	Rejected
H10	Carbon Tax Potential mediates the effect of Environmental Performance on Corporate Sustainability.	Supported

Basis: H1–H7 are determined from the coefficient significance and direction, while H8–H10 are based on the Sobel test results (H8: $p = 0.014$; H9: $p = 0.120$; H10: $p = 0.029$).

Hypothesis accepted Hypothesis accepted Hypothesis accepted Hypothesis accepted Hypothesis rejected Hypothesis rejected Hypothesis rejected

DISCUSSION OF RESEARCH FINDINGS

The discussion of the research findings reveals the dynamics of the relationship between antecedent variables affecting corporate sustainability and the potential for a carbon tax as a mediating variable in the energy and mining sectors. Analysis of hypotheses one through three (**H1**, **H2**, **H3**) consistently demonstrates that Corporate Social Responsibility (CSR), Carbon Emission Disclosure (CED), and Environmental Performance have a significant negative effect on Carbon Tax Potential. These findings confirm that strategies to mitigate operational risks through social investment, emissions transparency, and excellence in environmental governance—as reflected in PROPER ratings—can effectively reduce the tax base. Companies no longer view environmental

activities as a voluntary burden but rather as a preventive tool to mitigate future fiscal risks through systematic decarbonization (Chen, 2023; Wong et al., 2021).

However, when directly linked to corporate sustainability, there are disparate results for hypotheses four through seven (**H4**, **H5**, **H6**, **H7**). Only the CSR variable was found to have a direct positive effect on sustainability (**H4**), due to its ability to build social capital and stakeholder loyalty (Ganesan et al., 2022). Conversely, CED (**H5**) and Environmental Performance (**H6**) failed to demonstrate a significant effect, indicating that administrative disclosures and environmental ratings are often viewed as mere formalities separate from fundamental business model transformation. Similarly, the Potential for a Carbon Tax was not found to have a negative effect on sustainability (**H7**), as this fiscal burden is often still viewed as a static operational cost that is not yet strong enough to trigger radical technological innovation if its cost remains below the cost of the energy transition (Aptasari et al., 2024).

The mediation analysis yielded the most crucial findings for understanding the mechanisms of sustainable value creation through fiscal channels (**H8**, **H9**, **H10**). The potential for a carbon tax was found to act as a partial mediator in the relationship between CSR and sustainability (**H8**), indicating that corporate social responsibility enhances corporate value through both the reputation channel and the tax efficiency channel. The most intriguing finding was observed in the Environmental Performance variable, which demonstrated full mediation through the carbon tax (**H10**). This provides a profound insight: in the energy industry, environmental performance is considered to contribute to sustainability only if—and only if—it successfully reduces the potential carbon tax burden in a tangible way. Meanwhile, the absence of a mediating effect for CED (**H9**) reinforces that mere transparency in emissions reporting, without concrete physical reductions, will not be able to create economic value or fiscal efficiency for the entity's long-term sustainability. Overall, this series of findings provides empirical evidence that corporate sustainability in Indonesia's extractive sector is highly dependent on management's ability to carry out "green conversion." A carbon tax serves not merely as a disincentive but as an economic bridge that compels companies to transform abstract environmental performance into measurable financial efficiency.

The integration of fiscal compliance and environmentally friendly operations is key for companies to maintain financial stability

while gaining legitimacy from stakeholders amid the urgency of the global climate crisis.

CONCLUSION

Empirical findings demonstrate that CSR, CED, and environmental performance consistently have a negative impact on carbon tax liability. This confirms that decarbonization strategies and emissions transparency are not merely forms of administrative compliance, but rather strategic fiscal instruments that can tangibly reduce the tax base and mitigate future financial risks for companies in the energy and mining sectors. However, from a long-term sustainability perspective, a disparity in impact was found: only CSR is capable of directly strengthening business stability through the development of social capital, while CED and Environmental Performance tend to be trapped in formalities that have not yet been able to fundamentally transform a company's risk profile. The most significant finding concerns the mediating role of Carbon Tax Potential, which exhibits "full mediation" for Environmental Performance. This indicates that in the extractive industries, environmental performance will only be considered strategically valuable for sustainability if it is successfully converted into tangible reductions in carbon-related tax burdens.

The findings of this study emphasize the importance for management in the energy and mining sectors to systematically integrate environmental considerations into financial strategies. Managers should no longer view CSR and environmental management as cost centers, but rather as strategic investments to minimize future rigid carbon tax burdens through real emissions reductions, which will generate long-term fiscal savings. For regulators and the government, these findings demonstrate that a carbon tax is an effective instrument for driving improvements in environmental performance; however, stricter oversight and standardization of emissions reporting are necessary to prevent greenwashing practices. This is crucial to ensure that data transparency reflects genuine decarbonization commitments, rather than merely fulfilling paperwork requirements that have no tangible impact on environmental sustainability.

This study acknowledges several limitations that need to be considered, particularly regarding the status of carbon tax policy in Indonesia, which is still on hold; consequently, tax variables were measured based on simulation estimates that do not yet reflect the actual fiscal burden. Furthermore, the use of secondary data from voluntary sustainability reports may introduce information bias, compounded by the model's relatively low predictive power (R-Square 13.9%). Therefore, future research is advised to expand the sample scope to include the industrial and transportation sectors—which have high emission intensities—and to employ primary data approaches, such as interviews, to capture management's internal adaptation strategies. Future researchers are also encouraged to develop models that incorporate new variables—such as Green Accounting, Carbon Accounting, or comprehensive integration of ESG scores—to improve the accuracy of predictions regarding a company's sustainability value.

REFERENCES

1. Ababil, R. Y., Diana, N., & Erfan, E. (2024). The Impact of Carbon Tax Implementation in Indonesia on Supporting Sustainable Development Goals. Universitas Islam Malang, Jurnal Ilmiah Riset Akuntansi, 13(02).
2. Abdullah, M. W., & Fitriah, A. L. (2016). The Effect of Accounting Conservatism on the Relevance of Financial Statement Values with Earnings Quality as a Moderating Variable. *Assets: Journal of Economics, Management, and Accounting*, 6(2), 233–250.
3. Abdullah, M. W., Musriani, R., Syariati, A., & Hanafie, H. (2020). Carbon Emission Disclosure in Indonesian Firms: Testing the Moderating Effects of Media Exposure. *International Journal of Energy Economics and Policy*, 10(6), 732–741. <https://doi.org/10.32479/ijeeep.10142>
4. Ahmad, N., Mahmood, A., Ariza-Montes, A., Han, H., Hernández-Perlines, F., Araya-Castillo, L., Scholz, M., Ahmad, N., Mahmood, A., Ariza-Montes, A., Han, H., Hernández-Perlines, F., Araya-Castillo, L., & Scholz, M. (2021). Sustainable Businesses Speak to the Heart of Consumers: Looking at Sustainability through a Marketing Lens to Earn Banking Consumers' Loyalty. *Sustainability*, 13(7). <https://doi.org/10.3390/su13073828>
5. Alfajri, M. D., & Warsini, S. (2024). A Comprehensive Analysis of the Impact of ESG Risk Ratings and Leverage on Firm Value and Its Implications for the IDXESGL. *National Accounting Seminar and Management PNJ*, 5(1). <https://prosiding.pnj.ac.id/index.php/SNAM/article/view/2655>
6. Andriani, N. S., & Cerya, E. (2025). The Effect of Environmental Performance on Firm Value with Financial Performance as an Intervening Variable. *JRTI (Indonesian Journal of Action Research)*, 10(1), 36–47. <https://doi.org/10.29210/30035754000>
7. Anjarsari, F., Hartono, H., & Ilmiddafiq, M. B. (2023). The Effect of Eco-Efficiency and Dividend Policy on Firm Value with Profitability as a Moderating Variable: (An Empirical Study of Chemical Manufacturing Companies in the Basic and Chemical Industries Listed on the IDX, 2019–2021). *Mufakat: Journal of Economics, Management, and Accounting*, 2(4), 528–542. <https://doi.org/10.572349/mufakat.v2i4.932>
8. Aptasari, F. W., Falah, M. H., Abyandani, F. H., & Akbar, M. M. (2024). The Impact of Carbon Taxes

- on Corporate Accounting and Branding: A Perspective from the Paris Agreement in Indonesia. *Substansi: Source of Articles on Vocational Accounting, Auditing, and Finance*, 8(2), 1–25. <https://doi.org/10.35837/subs.v8i2.2935>
9. Arafat, M. Y., Warokka, A., Abdullah, H., & Septian, R. (2012). The Triple Bottom Line Effect on Emerging Market Companies: A Test of the Relationship Between Corporate Social Responsibility and Firm Value. *Journal of Southeast Asian Research*, 1–15. <https://doi.org/10.5171/2012.459427>
 10. Arifin, A. H., & Siagian, A. W. (2024). QUO VADIS CLIMATE RESILIENCE: AN ANALYSIS OF CARBON TAX POLICY AS A SOURCE OF REVENUE FOR INDONESIA. *BPPK Journal: Financial Education and Training Agency*, 17(1), 52–69. <https://doi.org/10.48108/jurnalbppk.v17i1.764>
 11. Arli, D., van Esch, P., Bakpayev, M., & Laurence, A. (2020). Do consumers really trust cryptocurrencies? *Marketing Intelligence & Planning*, ahead-of-print. <https://doi.org/10.1108/MIP-01-2020-0036>
 12. Artiach, T., Lee, D., Nelson, D., & Walker, J. (2010). The determinants of corporate sustainability performance. *Accounting and Finance*, 50(1), 31–51.
 13. Asnita, A., & Wahidahwati. (2019). The Effect of Environmental Performance on Firm Value with Environmental Disclosure as an Intervening Variable. *Journal of Accounting Science and Research (JIRA)*, 8(7). <https://jurnalmahasiswa.stiesia.ac.id/index.php/jira/article/view/2295>
 14. Astari, A., Saraswati, E., & Purwanti, L. (2020). The Role of Corporate Governance as a Moderating Variable on Earnings Management and Carbon Emission Disclosure. *Journal of Accounting and Business*, 7(1), 69–86. <https://doi.org/10.24815/jdab.v7i1.15402>
 15. Asyari, S., & Hernawati, E. (2023). The Effect of Carbon Emissions Disclosure and Environmental Performance on Investor Reactions, with Media Exposure as a Moderating Variable. *Journal of Trisakti*, 10, 319–342. <https://doi.org/10.25105/jat.v10i2.15899>
 16. Athaya, N. S., Tamba, R. R., Safitri, T. N., Panjaitan, G. O., Manao, M. C., & Arnita, V. (2025). Carbon Emissions Measurement, Sustainability Reporting, and Environmental Disclosure on Corporate Sustainability Performance | Student Business Journal. <https://jurnalbisnismahasiswa.com/index.php/jurnal/article/view/385>
 17. Atmadja, Z. S., & Herianti, E. (2026). The Effect of Carbon Taxes and Environmental Uncertainty on Tax Revenue with Environment, Social, and Governance (ESG) as a Mediating Variable. *RIGGS: Journal of Artificial Intelligence and Digital Business*, 5(1), 3543–3554. <https://doi.org/10.31004/riggs.v5i1.6164>
 18. Aulia, D. (2025). CORPORATE GREENWASHING IN INDONESIA: A LITERATURE REVIEW FOR THE PERIOD 2015–2025. *Indo-Fintech Intellectuals: Journal of Economics and Business*, 5(4), 7682–7694. <https://doi.org/10.54373/ifijeb.v5i4.4937>
 19. Bahri, S., & Cahyani, F. A. (2016). The Effect of Environmental Performance on Corporate Financial Performance with Corporate Social Responsibility Disclosure as an Intervening Variable (An Empirical Study of Manufacturing Companies Listed on the IDX). *Ekonika: Journal of Economics, University of Kadiri*, 1(2). <https://doi.org/10.30737/ekonika.v1i2.11>
 20. Basuki, A. T., & Prawoto, N. (2015). REGRESSION ANALYSIS IN ECONOMIC AND BUSINESS RESEARCH. *Rajawali Pers*.
 21. Basuki, B., & Irwanda, R. (2018). Environmental cost analysis and reporting to measure environmental performance in achieving eco-efficiency at PT Industri Kereta Api (Persero). *Asian Journal of Accounting Research*, 3, 169–180. <https://doi.org/10.1108/AJAR-06-2018-0013>
 22. Berthelot, S., & Robert, A.-M. (2011). Climate Change Disclosures: An Examination of Canadian Oil and Gas Firms. *Issues in Social and Environmental Accounting*, 5. <https://doi.org/10.22164/isea.v5i2.61>
 23. Borduas, N., & Donahue, N. (2018). The Natural Atmosphere. In *Green Chemistry* (pp. 131–150). <https://doi.org/10.1016/B978-0-12-809270-5.00006-6>
 24. Bukhori, M. A., & Sisdianto, E. (2025). Corporate Social Responsibility (CSR) and Corporate Reputation in Enhancing Corporate Value. *JOURNAL OF MANAGEMENT AND ECONOMICS*, 2(1), 132–141. <https://doi.org/10.61722/jrme.v2i1.3332>
 25. Burritt, R. L., Hahn, T., & Schaltegger, St. (2002). Toward a Comprehensive Framework for Environmental Management Accounting—Links Between Business Actors and Environmental Management Accounting Tools. *Australian Accounting Review*, 12(27), 39–50. <https://doi.org/10.1111/j.1835-2561.2002.tb00202.x>

26. Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W. L., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., ... Péan, C. (with Lee, H.). (2023). IPCC, 2023: Climate Change 2023: Synthesis Report. Contributions of Working Groups I, II, and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. (First). Intergovernmental Panel on Climate Change (IPCC). <https://doi.org/10.59327/IPCC/AR6-9789291691647>
27. Cambra Fierro, J. J., & Ruiz, R. (2011). Sustainable business practices in Spain: A two-case study. *European Business Review*, 23, 401–412. <https://doi.org/10.1108/09555341111145780>
28. Cecilia, L., & Putri, W. R. E. (2025). The Effect of Environmental, Social, and Governance (ESG) Performance on Corporate Profitability and Firm Value (A Study of Companies Listed in the Indonesian Stock Exchange ESG Leaders Index for 2020–2022). *Economics and Digital Business Review*, 6(1), 196–213.
29. Chelly, A., Noura, I., Hadj-Alouane, A. B., & Frein, Y. (2022). A comparative study of progressive carbon taxation strategies: Impact on firms' economic and environmental performances. *International Journal of Production Research*, 60(11), 3476–3500. <https://doi.org/10.1080/00207543.2021.1924410>
30. Chen, P. (2023). Corporate social responsibility, financing constraints, and corporate carbon intensity: New evidence from listed Chinese companies. *Environmental Science and Pollution Research International*, 30(14), 40107–40115. <https://doi.org/10.1007/s11356-023-25176-5>
31. Chintya, C., & Lores, L. (2025). Analysis of the Implementation of a Carbon Tax and Its Impact on the Manufacturing Industry in Indonesia. *RIGGS: Journal of Artificial Intelligence and Digital Business*, 4(3), 2884–2890. <https://doi.org/10.31004/riggs.v4i3.2409>
32. Choi, B. B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, 25(1), 58–79.
33. Cholida, C., & Kawedar, W. (2020). Analysis of the Effects of Financial Performance, Operational Performance, and Cost of Equity on Carbon Emissions Disclosures to Create Corporate Value. *Diponegoro Journal of Accounting*, 9(2). <https://ejournal3.undip.ac.id/index.php/accounting/article/view/27535>
34. Daud, D., Yusuf, M., Sambo, E. M., Lalo, A., & Asgar, M. A. F. (2024). Implementation of Corporate Social Responsibility at PT PLTD Suppa (Persero). *Equilibrium: Scientific Journal of Economics, Management, and Accounting*, 13(1), 207–217. <https://doi.org/10.35906/equili.v13i1.1902>
35. Dawkins, C., & Fraas, J. W. (2011). Coming Clean: The Impact of Environmental Performance and Visibility on Corporate Climate Change Disclosure. *Journal of Business Ethics*, 100(2), 303–322. <https://doi.org/10.1007/s10551-010-0681-0>
36. Dewi, L. G., Latrini, M., & Respati, N. (2019). Determinants of Carbon Emission Disclosure by Manufacturing Companies. *E-Journal of Accounting*, 613. <https://doi.org/10.24843/EJA.2019.v28.i01.p24>
37. Dewi, S. R. (n.d.). UNDERSTANDING AND AWARENESS OF GREEN ACCOUNTING IMPLEMENTATION: A CASE STUDY OF SMALL TOFU BUSINESSES IN SIDOARJO.
38. Effendi, B. (2025). Analysis of the Impact of CSR Disclosure on Firm Value in the ESG Era: A Study of the Manufacturing Industry. *Owner: Accounting Research and Journal*, 9(3), 1609–1617. <https://doi.org/10.33395/owner.v9i3.2724>
39. Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental Quality Management*, 8(1), 37–51. <https://doi.org/10.1002/tqem.3310080106>
40. Endiana, I. D. M., Dicriyani, N. L. G. M., Adiyadnya, M. S. P., & Putra, I. P. M. J. S. (2020). The Effect of Green Accounting on Corporate Sustainability and Financial Performance. *The Journal of Asian Finance, Economics and Business*, 7(12), 731–738. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.731>
41. Fanda, V., & Damayanti, S., Patricia Febrina. (2024). The Effect of Carbon Emissions Disclosure, Eco-Efficiency, and Green Innovation on Firm Value. *Scientific Journal Student*, 13(1), 60–73. <https://doi.org/10.33508/jima.v13i1.5727>
42. Fathia, A. N., & Sulfitri, V. (2023). The Effect of CSR, Carbon Emission Disclosure, and Environmental Performance on Corporate Sustainability, with Vision and Mission as Moderating Variables. *Reliable*

- Accounting Journal, 3(1), 1–12. <https://doi.org/10.36352/raj.v3i1.532>
43. Fauzia, N. (2023). Corporate Sustainability: The Environment, Environmental Costs, and Corporate Social Responsibility on Firm Value. *Syntax Literate; Indonesian Scientific Journal*, 8(12), 6779–6791. <https://doi.org/10.36418/syntax-literate.v8i12.14070>
 44. Febriani, C. N., & Davianti, A. (2018). Emissions Disclosure Practices: An Empirical Study of Five ISRA Nominees from 2007 to 2016. *Accounting Perspectives*, 1(1), 71–89. <https://doi.org/10.24246/persi.v1i1.p71-89>
 45. Firmansyah, A. (2025). Implementation of Carbon Accounting in Green Fiscal Policy in Indonesia: A Scoping Review. *Substansi: Source of Articles on Vocational Accounting, Auditing, and Finance*, 9(2), 17–42. <https://doi.org/10.35837/subs.v9i2.3672>
 46. Firmansyah, A., Jadi, P. H., Febrian, W., & Fasita, E. (n.d.). Market Response to Carbon Emissions Disclosure in Indonesia: What Is the Role of Corporate Governance? Retrieved November 11, 2025, from <https://e-journal.trisakti.ac.id/index.php/jmat/article/view/9789>
 47. Fransisca, L., Malini, H., Azazi, A., & Syahputri, A. (2025). The Impact of CSR and ESG on Corporate Financial Performance and Sustainability, Mediated by Green Finance. *Journal of Accounting, Management, Economics, and Entrepreneurship (JAMEK)*, 5(1), 115–124. <https://doi.org/10.47065/jamek.v5i1.1789>
 48. Freeman, R., & Reed, D. (1983). Stockholders and Stakeholders: A New Perspective on Corporate Governance. *California Management Review*, 25. <https://doi.org/10.2307/41165018>
 49. Friedman, M. (September 13, 1970). A Friedman Doctrine—The Social Responsibility of Business Is to Increase Its Profits. *The New York Times*. <https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html>
 50. Ganesan, Y., Sadaa, A. M., Kareem, A. A., Aldegis, A. M., & Al-Sakkaf, M. A. (2022). *Social Responsibility in Marketing*. Springer Books, 293–311.
 51. Gangi, F., Daniele, L. M., & Varrone, N. (2020). How do corporate environmental policy and corporate reputation affect risk-adjusted financial performance? *Business Strategy and the Environment*, 29(5), 1975–1991. <https://doi.org/10.1002/bse.2482>
 52. Gardner, M. (April 30, 2025). How transparency in sustainability reporting pays off big. IENYC – The Blueprint. <https://www.ienyc.edu/the-blueprint/sustainability-reporting/>
 53. Ghozali, I. (October 3, 2012). Application of Multivariate Analysis Using IBM SPSS 19 5. Website UPT Library and Printing Office. <https://digilib.undip.ac.id/2012/10/03/aplikasi-analisis-multivariate-dengan-program-spss/>
 54. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate Data Analysis*. Pearson Education Limited.
 55. Handayani, S. (2023). Hexagon Sustainability: Deconstructing the Pentuple Bottom Line. *Journal of Accounting Review of Accounting and Finance*, 13(3), 715–731. <https://doi.org/10.22219/jrak.v13i3.26024>
 56. Hanifah, U. (2016). The Relevance of Carbon Emission Disclosure: As a Foundation and Direction for the Development of the Triple Bottom Line. *Syariah Paper Accounting FEB UMS*, 17, 125–135.
 57. Hariadi, S., & Nurwanda, R. M. (2024). The Effect of Carbon Emission Disclosure (CED), Corporate Social Responsibility (CSR), and Green Accounting on Firm Value with Profitability as an Intervening Variable. *JURNAL LENTERA BISNIS*, 13(2), 714. <https://doi.org/10.34127/jrlab.v13i2.1053>
 58. Hörisch, J., Schaltegger, S., & Freeman, R. E. (2020). Integrating stakeholder theory and sustainability accounting: A conceptual synthesis. *Journal of Cleaner Production*, 275, 124097. <https://doi.org/10.1016/j.jclepro.2020.124097>
 59. Hou, J., Shi, C., Fan, G., & Xu, H. (2024). Research on the impact and intermediary effect of carbon emission trading policy on carbon emission efficiency in China. *Atmospheric Pollution Research*, 15(4), 102045. <https://doi.org/10.1016/j.apr.2024.102045>
 60. Intergovernmental Panel on Climate Change. (2014). *Synthesis Report: Summary for Policymakers Mitigation of Climate*. <https://www.agora-parl.org/resources/library/climate-change-2014-synthesis-report-summary-policy-makers>
 61. Irwhantoko, I., & Basuki, B. (2016). Carbon Emission Disclosure: A Study of Indonesian Manufacturing Companies. *Journal of Accounting and Finance*, 18(2), 92–104. <https://doi.org/10.9744/jak.18.2.92-104>

62. Kaplan, R. S., Ramanna, K., & Roston, M. (2023). Accounting for Carbon Offsets – Establishing the Foundation for Carbon-Trading Markets (SSRN Scholarly Paper No. 4362921). Social Science Research Network. <https://doi.org/10.2139/ssrn.4362921>
63. Kumarasiri, J., & Lodhia, S. (2020). The Australian carbon tax: Corporate perceptions, responses, and motivations. *Mediterranean Accountancy Research*, 28(3), 515–542.
64. Kuninori, M., & Otaki, M. (2016). Modified Ramsey Rule, Optimal Carbon Tax, and Economic Growth. *Atmospheric and Climate Sciences*, 06(02), 224–235. <https://doi.org/10.4236/acs.2016.62019>
65. Li, L., Msaad, H., Sun, H., Tan, M. X., Lu, Y., Lau, A. K. W., Li, L., Msaad, H., Sun, H., Tan, M. X., Lu, Y., & Lau, A. K. W. (2020). Green Innovation and Business Sustainability: New Evidence from Energy-Intensive Industries in China. *International Journal of Environmental Research and Public Health*, 17(21). <https://doi.org/10.3390/ijerph17217826>
66. Li, W., & Jia, Z. (2017). Carbon tax, emissions trading, or a mixed policy: Which is the most effective strategy for climate change mitigation in China? *Mitigation and Adaptation Strategies for Global Change*, 22(6), 973–992.
67. Lin, B., & Jia, Z. (2018). The energy, environmental, and economic impacts of carbon tax rates and the industries subject to taxation: A CGE-based study in China. *Energy*, 159(C), 558–568.
68. Lioui, A., & Sharma, Z. (2012). Environmental corporate social responsibility and financial performance: Disentangling direct and indirect effects. *Ecological Economics*, 78(C), 100–111.
69. Majid, J., & Aisyah, R. (2021). Carbon Tax: An Alternative Policy for Reducing the External Diseconomies of Carbon Emissions. *ISAFIR: Islamic Accounting and Finance Review*, 1, 48–66. <https://doi.org/10.24252/isafir.v1i2.17603>
70. Marquis, C., Toffel, M. W., & Zhou, Y. (2016). Scrutiny, Norms, and Selective Disclosure: A Global Study of Greenwashing. *Organization Science*, 27(2), 483–504.
71. Maryanti, C. S., Haerani, N., Meydina, R., & Munandar, A. (2022). Analysis of corporate sustainability reports in the metal and other mineral raw materials subsector for 2019–2020. *Fair Value: Scientific Journal of Accounting and Finance*, 4(7), 2924–2944. <https://doi.org/10.32670/fairvalue.v4i7.1314>
72. Matsumura, E. M., Prakash, R., & Vera-Munoz, S. C. (2013). Firm-Value Effects of Carbon Emissions and Carbon Disclosures (SSRN Scholarly Paper No. 1921809). Social Science Research Network. <https://doi.org/10.2139/ssrn.1921809>
73. Medarevic, S. (2012). Environmental Corporate Social Responsibility and the Carbon Economy: A Case for CSR, the Triple Bottom Line, and Obliquity. *Enterprise Governance eJournal*, 1(1). <https://doi.org/10.53300/001c.6922>
74. Miah, M. D., Hasan, R., & Usman, M. (2021). Carbon Emissions and Firm Performance: Evidence from Financial and Non-Financial Firms from Selected Emerging Economies. *Sustainability*, 13(23), 13281. <https://doi.org/10.3390/su132313281>
75. Moz-Christofolletti, M. A., & Pereda, P. C. (2021). Winners and Losers: The Distributional Impacts of a Carbon Tax in Brazil. *Ecological Economics*, 183(C). <https://ideas.repec.org/a/eee/ecolec/v183y2021ics0921800921000033.html>
76. Nengzih, N. (2022). Carbon Emissions Intensity and Environmental Cost Effects on Corporate Financial Performance. *Jurnal ASET (Accounting Research)*, 14(2), 245–254. <https://doi.org/10.17509/jaset.v14i2.49056>
77. Pan, J., Cross, J. L., Zou, X., & Zhang, B. (2024). To tax or to trade? A global review of carbon emissions reduction strategies. *Energy Strategy Reviews*, 55, 101508. <https://doi.org/10.1016/j.esr.2024.101508>
78. Pan, W., Kim, M.-K., Ning, Z., & Yang, H. (2020). Carbon leakage in the energy and forestry sectors and its implications for climate policy: A meta-analysis. *Forest Policy and Economics*, 115, 102161. <https://doi.org/10.1016/j.forpol.2020.102161>
79. Pratama, B. A., Ramadhani, M. A., Lubis, P. M., & Firmansyah, A. (2022). Implementation of a Carbon Tax in Indonesia: Potential for Government Revenue and Reduction in Carbon Emissions. *JURNAL PAJAK INDONESIA (Indonesian Tax Review)*, 6(2), 368–374. <https://doi.org/10.31092/jpi.v6i2.1827>
80. Pratiwi, W., & Pahmi, S. (2024). Literature Review: Environmental Accounting and Corporate Sustainability.
81. Pujiati, L. (2024). The Effect of Carbon Emission Disclosure on Firm Value with Environmental Performance as a Moderating Variable. *Proceedings of the Scientific Symposium on Accounting*, 49–62.

82. Puspardini, P. D., Widayana, I. G., Pharresia, S. Z., & Fawlung, M. H. (2023). Analysis of the Implementation of Carbon Tax and Ulez on Carbon Emission Reduction in Indonesia. *INDONESIAN TAX REVIEW*, 7(1), 57–66. <https://doi.org/10.31092/jpi.v7i1.2172>
83. Rayi, L., Subekti, R., & Hermawan, S. (2024). The Effectiveness of Carbon Taxes as a Climate Change Mitigation Strategy: The Perspective of Tax Judges in Indonesia. *PLEDOI (Journal of Law and Justice)*, 3, 104–120. <https://doi.org/10.56721/pledoid.v3i1.326>
84. Refinitiv Eikon Datastream. (2020). Environmental, Social, and Governance (ESG) Scores from Refinitiv.
85. Robinson, W. C. (1973). The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind by Donella H. Meadows, Dennis L. Meadows, Jergen Randers, and William W. Behrens, III. *Demography*, 10(2), 289–299. <https://doi.org/10.2307/2060819>
86. Rusmana, O., & Purnaman, S. M. N. (2020). The Effect of Carbon Emissions Disclosure and Environmental Performance on Firm Value. *Journal of Economics, Business, and Accounting (JEBA)*, 22(1), 42–52. <https://doi.org/10.32424/jeba.v22i1.1563>
87. Safitra, D. A., & Hanifah, A. (2021). Environmental Tax: Principles and Implementation in Indonesia. *Journal of Taxation and Public Finance (PKN)*, 2(2), 23–33. <https://doi.org/10.31092/jpkn.v2i2.1122>
88. Safutri, D., Mukhzarudfa, M., & Tiswiyanti, W. (2023). The Effect of Carbon Emissions Disclosure, Corporate Governance, and Financial Performance: A Study in Indonesia. *Journal of the Academy of Accounting*, 6(2), 273–293. <https://doi.org/10.22219/jaa.v6i2.25065>
89. Sawitri, A. P., & Ardhiani, M. R. (2023). Stakeholder Pressure, Good Corporate Governance, and the Quality of Corporate Sustainability Reports in Indonesia. *Jurnal Neraca: Journal of Education and Accounting Economics*, 7(1), 26–33. <https://doi.org/10.31851/neraca.v7i1.9557>
90. Shafira, T. M. (2024). The Effect of Carbon Emission Disclosure on Firm Value with Environmental Performance as a Moderating Variable (A Study of Energy Sector Companies Listed on the Indonesia Stock Exchange from 2020 to 2022). *AKADEMIK: Journal of Economics & Business Students*, 4(3), 1478–1490. <https://doi.org/10.37481/jmeb.v4i3.925>
91. Simamora, R. N. H., Safrida, & Elviani, S. (2022). Carbon emission disclosure in Indonesia: Viewed from the perspective of the board of directors, managerial ownership, and the audit committee. *Journal of Contemporary Accounting*, 1–9. <https://doi.org/10.20885/jca.vol4.iss1.art1>
92. Socci, C., Ahmed, I., D'Andrea, S., Deriu, S., & Mathkur, N. M. (2024). The role of a carbon tax in sustainable economic growth. *Environment, Development and Sustainability: A Multidisciplinary Approach to the Theory and Practice of Sustainable Development*, 26(8), 20987–21017.
93. Soesanto, S. (2022). Environmental Accounting Toward a Green Economy: The Perspective of the Relationship Between Natural Sustainability and Business Sustainability. *Account: Journal of Accounting, Finance, and Banking*, 9(1). <https://doi.org/10.32722/acc.v9i1.4580>
94. Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355–374.
95. Stern, N. (2007). *The Economics of Climate Change: The Stern Review*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511817434>
96. Susanto, P., Arini, D., Yuntina, L., Soehaditama, J., & Nuraeni, N. (2024). Concepts of Quantitative Research: Population, Sample, and Data Analysis (A Literature Review). *Journal of Multidisciplinary Sciences*, 3, 1–12. <https://doi.org/10.38035/jim.v3i1.504>
97. Tax Foundation. (November 9, 2023). Carbon Taxes Archives. Tax Foundation. <https://taxfoundation.org/topics/carbon-taxes/>
98. Todaro, N. M., Testa, F., Daddi, T., & Iraldo, F. (2021). The influence of managers' awareness of climate change, perceived climate risk exposure, and risk tolerance on the adoption of corporate responses to climate change. *Business Strategy and the Environment*, 30(2), 1232–1248. <https://doi.org/10.1002/bse.2681>
99. United Nations Environment Programme. (n.d.). Emissions Gap Report 2023: Broken Record. Emissions Gap Report 2023: Broken Record. Retrieved November 13, 2025, from <https://www.unep.org/interactives/emissions-gap-report/2023/>
100. Law No. 7 of 2021. (n.d.). Regulations Database | JDIH BPK. Retrieved December 3, 2025, from <http://peraturan.bpk.go.id/details/185162/uu-no-7-tahun-2021>
101. Uy, W. S., & Hendrawati, E. (2020). The effect of corporate social responsibility and environmental

- performance on firm value. *Liability*, 2(2), 87–108.
102. Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of Accounting and Economics*, 5, 179–194. [https://doi.org/10.1016/0165-4101\(83\)90011-3](https://doi.org/10.1016/0165-4101(83)90011-3)
103. Wahyuni, I., Alimuddin, A., Habbe, H., & Mediaty, M. (2020). The Essence of Environmental Accounting in Corporate Sustainability. *Journal of Management Accounting*, 3, 147–159. <https://doi.org/10.35326/jiam.v3i2.646>
104. Wati, L. N., & Se, M. M. (2019). Corporate Social Responsibility (CSR) Model. Myria Publisher. <https://books.google.com/books?hl=en&lr=&id=lKPHDwAAQBAJ&oi=fnd&pg=PA1>
105. Wati, M. M. C., Budiadnyani, N. P., Kusuma, P. S. A. J., & Kustina, K. T. (2024). The Effect of Sustainability Report Disclosure and Good Corporate Governance Practices on Firm Value. *Journal of the Indonesian Accounting Academy Padang*, 4(2), 306–320. <https://doi.org/10.31933/y80ptr16>
106. Wei, Y.-M., Chen, K., Kang, J.-N., Chen, W., Wang, X.-Y., & Zhang, X. (2022). Policy and Management of Carbon Peaking and Carbon Neutrality: A Literature Review. *Engineering*, 14, 52–63. <https://doi.org/10.1016/j.eng.2021.12.018>
107. Whiteman, G., Walker, B., & Perego, P. (2013). Planetary Boundaries: Ecological Foundations for Corporate Sustainability. *Journal of Management Studies*, 50(2), 307–336. <https://doi.org/10.1111/j.1467-6486.2012.01073.x>
108. Wibowo, R., Suhendro, S., Amelia, Y., & Prasetyo, T. J. (2022). Analysis of Factors Influencing Carbon Emissions Disclosure in Carbon-Intensive Industry Companies. *Journal of Citizenship*, 6(2), 3583–3599. <https://doi.org/10.31316/jk.v6i2.3511>
109. Wong, C. W. Y., Wong, C. Y., Boon-itt, S., Tang, A. K. Y., Wong, C. W. Y., Wong, C. Y., Boon-itt, S., & Tang, A. K. Y. (2021). Strategies for Building Environmental Transparency and Accountability. *Sustainability*, 13(16). <https://doi.org/10.3390/su13169116>
110. Yuliandhari, W. S., Saraswati, R. S., & Safari, Z. M. R. (2023). The Effect of Carbon Emission Disclosure, Eco-Efficiency, and Green Innovation on Firm Value. Publisher: Riset and Journal of Accounting, 7(2), 1526–1539. <https://doi.org/10.33395/owner.v7i2.1301>
111. Yunnafisah, A. Z., & Santoso, B. (2023). PT. Petrokimia Gresik's Corporate Social Responsibility Program. *Journal of Community Service*, 2(2), 38–45. <https://doi.org/10.55606/jpkm.v2i2.134>
112. Zhang, J., Kong, D., & Sun, H. (2020). ESG Performance, Innovation Investment, and Corporate Financial Performance: Evidence from China's Listed Companies. *Scientific Research Publishing, Sustainability*, 12(2226). <https://www.scirp.org/reference/referencespapers?referenceid=3518838>
113. Zijl, T. van, Zuraida, & Houge, N. (2014). Value Relevance of Environmental, Social, and Governance Disclosure. SSRN Electronic Journal. https://www.academia.edu/115565925/Value_Relevance_of_Environmental_Social_and_Governance_Disclosure