JOURNAL OF GLOBAL ACCOUNTING
11(5) October, 2025.
ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
https://journals.unizik.edu.ng/joga

HYDROCARBON EMISSIONS DISCLOSURE: A STRATEGIC PREDICTOR OF RETURN ON INVESTMENT IN THE NIGERIAN ENERGY INDUSTRY

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CITATION: Ukoh, U.M. & Udeh, F.N. (2025). Hydrocarbon Emissions Disclosure: a Strategic Predictor of Return on Investment in the Nigerian Energy Industry, *Journal of Global Accounting*, 11(5), 119 - 135. Available:https://journals.unizik.edu.ng/joga

ABSTRACT

The study examined the effect of hydrocarbon disclosure on the return on investment of listed energy firms in Nigeria. Ex-post facto research design was deployed. The population comprised eight (8) listed oil and gas firms in Nigeria. A sample size of seven (7) firms were selected using purposive sampling technique. Secondary data were collected from firms' annual reports over a ten year period (2015-2024). The data were analysed using descriptive test while hypotheses were tested using panel estimated generalised least square regression. The findings revealed that hydrocarbon emission disclosure has a positive and significant effect on return on investment of listed energy firms in Nigeria ($\beta = 0.073859$, $p = 0.0056$). This indicates that environmental accountability is gaining economic weight in the investment calculus, suggesting a broader market recognition that sustainability and profitability are not mutually exclusive but potentially reinforcing dimensions of firm performance in resource-dependent economies. It is therefore recommended that the management boards of listed energy firms in Nigeria institutionalize standardized hydrocarbon emission disclosure frameworks within their annual reporting processes to strengthen market confidence, enhance investor trust, and leverage transparency as a driver of sustained financial returns.

Key words: *Energy Firms, Hydrocarbon Emission Disclosure, Return on Investment.*

INTRODUCTION

The Nigerian energy industry, particularly its oil and gas segment, occupies a central position in the nation's economic framework. As one of Africa's largest crude oil producers, Nigeria derives a substantial share of its government revenue, foreign exchange earnings, and gross domestic product from the extraction, processing, and export of hydrocarbons (Enwereazu & Igwe, 2024). This reliance has created a dual reality: while the sector serves as a major driver of economic development, it is also one of the most significant contributors to environmental degradation, largely through the emission of greenhouse gases and other pollutants. In the context of rising global environmental consciousness and domestic regulatory pressures, the

disclosure of hydrocarbon emissions has emerged as both a compliance obligation and a strategic corporate practice. Hydrocarbon emissions, which encompass methane (CH_4), ethane (C_2H_6), and various volatile organic compounds, have considerable implications for climate change and local environmental quality (GRI, 2021). Methane, in particular, has a global warming potential many times greater than carbon dioxide, making its disclosure and management a high-priority concern. In the Nigerian context, the oil and gas industry's operational processes—from exploration to refining—generate a spectrum of hydrocarbon pollutants that not only affect air quality but also pose reputational and financial risks to firms. These risks include potential regulatory fines, reduced investor confidence, and heightened scrutiny from international partners and stakeholders.

Hydrocarbon emissions disclosure involves systematically measuring, recording, and reporting data on such emissions to relevant stakeholders, including regulators, investors, and the public (Habibullah, Mukhzarudfa, & Friyani, 2025). Beyond environmental accountability, disclosure practices can influence corporate financial outcomes. In capital markets increasingly shaped by environmental, social, and governance (ESG) considerations, investors are paying closer attention to how companies manage their environmental impacts. Firms that demonstrate transparency in disclosing their hydrocarbon emissions may attract capital from sustainability-focused investors, improve their creditworthiness, and differentiate themselves competitively in an industry often criticised for its environmental footprint (Ukoh, Nduokafor, & Nworie, 2024).

Return on Investment (ROI) is a fundamental measure of how effectively a company utilises its capital to generate profit (Doobee, Ironkwe, & Nwaiwu, 2024). In the energy sector, ROI not only reflects operational efficiency but also signals management's ability to balance profitability with compliance and stakeholder expectations. The interplay between hydrocarbon emissions disclosure and ROI is complex. On the one hand, establishing disclosure systems may entail significant costs for data acquisition, monitoring technologies, and specialised personnel. On the other hand, transparent reporting can improve operational processes by identifying inefficiencies, lowering waste, and driving innovation in environmental responsibility (Nworie, Cyril-Nwuche & Oduche, 2024), including emission reduction. These operational gains can, in turn, enhance ROI over time. From a strategic standpoint, hydrocarbon emissions disclosure can function as a predictor of ROI because it signals managerial competence, risk awareness, and long-term value orientation. Stakeholders may interpret consistent and detailed disclosure as evidence of effective governance, which

can influence perceptions of firm stability and future profitability (Nyahuna & Doorasamy, 2023; Elom et al., 2025). Moreover, in jurisdictions where environmental regulation is tightening, proactive disclosure can reduce the likelihood of costly non-compliance and position firms advantageously for potential carbon-pricing regimes. In the Nigerian energy industry, where environmental regulations are evolving and enforcement capacity is increasing, such positioning can be particularly advantageous.

Despite the growing recognition of environmental transparency as a business imperative, empirical evidence on the financial implications of hydrocarbon-specific disclosures in Nigeria remains limited. Much of the existing literature has examined aggregated carbon emissions or broader greenhouse gas disclosures without isolating the effects of hydrocarbons on financial metrics like ROI (Aniefor, Onatuyeh, Aruobogha, & Orife, 2023). This gap is significant because hydrocarbons represent a distinct class of emissions with unique regulatory, environmental, and operational considerations. Furthermore, prior studies often concentrate on return on assets, return on equity, or firm value, leaving ROI relatively underexplored as a dependent variable in the disclosure–performance nexus. Another critical research gap lies in the temporal scope of prior investigations. Many studies have excluded the most recent financial years, thereby overlooking potential shifts in market sentiment, regulatory approaches, and investor behaviour that have occurred in the wake of the Paris Agreement's implementation and the surge in ESG investment strategies. Incorporating the most current data allows for a more accurate assessment of how hydrocarbon disclosure practices align with contemporary financial realities.

In the Nigerian context, the need to explore this linkage is heightened by the country's heavy dependence on oil revenues and its simultaneous vulnerability to climate change impacts. Environmental degradation caused by hydrocarbon emissions has localised consequences, such as damage to agricultural productivity, water contamination, and adverse public health outcomes, which in turn can erode the social licence to operate for energy firms. The reputational costs associated with these issues may influence investor decisions and, by extension, a firm's ROI. Consequently, understanding whether hydrocarbon emissions disclosure serves merely as a compliance mechanism or as a strategic driver of financial performance is vital for both academic inquiry and industry practice. This study is therefore positioned at the intersection of environmental accountability and financial performance in Nigeria's energy sector. By focusing specifically on hydrocarbon emissions disclosure as a potential strategic predictor of ROI, it seeks to provide evidence that could inform both

corporate policy and stakeholder evaluation frameworks. Through empirical analysis of listed energy firms, the research will contribute to the broader discourse on how targeted environmental disclosures can shape profitability and long-term value creation in resource-dependent economies.

Objective

The objective of the study is to examine the effect of hydrocarbon emission disclosure on the return on investment of listed energy firms in Nigeria.

LITERATURE REVIEW

LITERATURE REVIEW

Hydrocarbon Emission Disclosure

Hydrocarbon disclosure involves the systematic reporting of the types and quantities of hydrocarbon compounds that an organisation emits, manages, or produces as part of its operational activities (King & Durham, 2017). Hydrocarbons—organic compounds composed solely of hydrogen and carbon—are prevalent in petroleum and natural gas and may occur in gaseous, liquid, or solid forms. Examples include methane, ethane, propane, butane, and various volatile organic compounds (VOCs). This form of disclosure is particularly significant in industries such as oil and gas, petrochemicals, and energy, where hydrocarbons are central to production processes and frequently released into the atmosphere or the surrounding environment (Ghosh, 2016). The importance of disclosing hydrocarbon data is anchored in its relevance to environmental protection, regulatory adherence, and corporate transparency. Methane, for instance, is a highly potent greenhouse gas with a considerable contribution to climate change (King & Durham, 2017). Furthermore, VOCs interact with nitrogen oxides in the presence of sunlight to create ground-level ozone, a primary constituent of smog. Such emissions not only degrade environmental quality but also present risks to public health. By reporting hydrocarbon emissions, organisations can measure and track their environmental footprint, meet statutory limits set by regulators, and adopt mitigation strategies to reduce harm (Ghosh, 2016).

Within corporate sustainability frameworks, hydrocarbon disclosure is often integrated into environmental impact assessments, emissions inventories, and sustainability reports. Such transparency allows stakeholders—including regulators, investors, customers, and local communities—to evaluate a company's environmental responsibility. Detailed and credible disclosures reinforce stakeholder trust, especially in a climate where environmental

JOURNAL OF GLOBAL ACCOUNTING
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https://journals.unizik.edu.ng/joga

stewardship and climate-related risks are of growing concern (King & Durham, 2017). From an operational standpoint, hydrocarbon disclosure also functions as a strategic tool for risk management and efficiency improvement. Knowledge of emission volumes and types informs investment in emissions control technologies, leak detection systems, and energy optimisation initiatives (Ghosh, 2016). Comprehensive reporting can mitigate exposure to legal sanctions, financial liabilities, and reputational losses linked to environmental non-compliance.

Ultimately, hydrocarbon disclosure reflects an organisation's alignment with sustainable development principles and responsible resource use (King & Durham, 2017). Transparent reporting not only satisfies regulatory requirements but also contributes to global efforts aimed at reducing environmental degradation, promoting sustainability, and advancing the transition to a low-carbon economy.

H_0: Hydrocarbon emission disclosure does not significantly affect the return on investment of listed energy firms in Nigeria.

Return on Investment

Return on Investment (ROI) refers to a measure used to evaluate the profitability or efficiency of an investment relative to its cost (Nworie, Mmadubuobi & Muojekwu, 2023). It is essentially an indicator of how much benefit, expressed in financial terms, has been gained from an investment when compared to the resources expended in acquiring or implementing it. ROI is commonly expressed as a percentage and serves as a simple, comparative tool to assess whether the allocation of funds has generated adequate financial returns (Oti, Effiong & Tapang, 2012). This measure serves a dual purpose: it evaluates past investment decisions and also guides future ones. When an organisation undertakes a project, acquires assets, or invests in new ventures, management often requires a way to assess whether such an action has generated sufficient earnings to justify the resources committed (Ofulue, Okike, Nworie & Nworie, 2025). ROI provides a straightforward numerical representation of this evaluation by relating net returns to the original investment amount (Fajinmi, 2016). For example, if a business invests in a new production line, the ROI calculation would compare the profit earned from the additional output to the expenditure on the new equipment, labour, and associated costs.

Beyond its quantitative expression, ROI embodies the principle of efficiency in the use of resources. In highly competitive business environments, organisations aim to ensure that every monetary allocation yields value that exceeds its cost. Investors also depend heavily on ROI to decide whether to retain, increase, or withdraw their capital from a venture (Oti,

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Effiong & Tapang, 2012). This makes ROI not only a measure of performance but also a communication tool between companies and their stakeholders, signalling the level of profitability that has been achieve

Theoretical Review

Stakeholder Theory

The Stakeholder Theory was first articulated by R. Edward Freeman in 1984 in his seminal work *Strategic Management: A Stakeholder Approach*. The theory emerged in response to the limitations of the traditional shareholder-centric view of the firm, which primarily focused on maximising shareholder wealth. The central postulation of Stakeholder Theory is that a firm should create value not only for its shareholders but also for a wide range of stakeholders, including employees, customers, suppliers, government agencies, communities, and the environment (Nworie & Orji-Okafor, 2024). According to the theory, managers must recognise and address the interests, rights, and expectations of these various groups because they all have a stake in the organisation's operations and outcomes. The theory asserts that long-term success and sustainability are achieved when companies manage their stakeholder relationships responsibly, transparently, and ethically. In this sense, corporate decisions—such as disclosing environmental performance—should reflect the firm's accountability to a broader constituency beyond investors alone (Anaike, Nworie & Ochuka, 2024).

Stakeholder Theory is highly relevant to the study of carbon emission disclosure and financial performance of listed oil and gas companies in Nigeria. In an industry known for its significant environmental impact, stakeholders such as environmental regulators, local communities, investors, and advocacy groups demand transparency in carbon emission practices. The theory provides a conceptual framework for understanding how meeting these stakeholders' expectations through carbon emission disclosure can enhance a company's legitimacy, reduce reputational risks, and potentially improve financial outcomes. By applying Stakeholder Theory, the study explores how environmental accountability can influence stakeholder trust and, consequently, firm performance in the context of Nigeria's oil and gas sector.

Empirical Review

The reviewed empirical studies reveal a mixed but generally positive relationship between carbon disclosure, emission control, and firm performance, though the magnitude and statistical significance of these effects vary across contexts and industries. Several studies in Nigeria, such as those by Nwokeogu et al. (2024), Obafemi and Oyedepo (2024), Okike et al.

(2024), and Aniefor et al. (2023), consistently indicate that carbon management practices, emission transparency, and environmental disclosures significantly enhance profitability and firm value. These findings suggest that, within the Nigerian oil and gas sector, integrating sustainability initiatives into operational strategies not only meets regulatory or ethical expectations but also delivers tangible financial benefits. However, Ebimobowei et al. (2025) diverge from this pattern, finding that while carbon accounting variables have positive effects on return on assets in manufacturing firms, these effects are not statistically significant, indicating that sector-specific factors and the maturity of environmental reporting frameworks may moderate outcomes.

In broader international contexts, studies such as Habibullah et al. (2025) in Indonesia and Nyahuna and Doorasamy (2023) in South Africa affirm a strong and significant positive relationship between carbon disclosure and corporate value, aligning with legitimacy and stakeholder theories. Conversely, findings from Vaicondam et al. (2025) in Malaysia and Ghosh et al. (2023) in India highlight more complex dynamics—wherein participation in disclosure initiatives or early stages of carbon performance improvement may incur costs that temporarily depress financial outcomes. Similarly, Loohuis (2022) provides evidence from a global sample that higher carbon emissions are associated with weaker financial performance, reinforcing the argument that unsustainable practices carry long-term financial risks. This international evidence underscores the idea that while transparency and sustainability investments can be profitable, the financial payoffs may depend on market expectations, industry structure, and cost management during implementation.

Other studies adopt more nuanced positions, noting that the relationship between carbon disclosure and performance is not universally strong or direct. For example, Mathebula (2023) finds insignificant correlations between carbon disclosure and various profitability measures in UK and South African firms, while Asif and Azad (2024) observe positive but non-significant effects in Pakistan. Such results suggest that disclosure alone may not guarantee enhanced performance unless accompanied by substantive emission reduction measures and complementary governance mechanisms, as observed in Issa (2024). Furthermore, evidence from Omaliko et al. (2021) indicates that in Nigeria, the sustainability impact of carbon disclosure is notable when supported by firm size and leverage, implying that organisational capacity shapes the extent to which environmental transparency translates into measurable business gains. Collectively, the synthesis of these findings points to a context-dependent but

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ISSN (Online): 1597–7641; ISSN (Print): 1597-8273
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increasingly recognised link between environmental disclosure and financial performance, with stronger effects in sectors where environmental risks are highly material.

MATERIALS AND METHOD

To assess the effect of hydrocarbon emissions disclosure on the return on investment (ROI) of listed energy firms in Nigeria, this study employed an ex-post facto research design. This design was considered appropriate because it enables the examination of possible relationships between variables using historical data, allowing for analysis without manipulating or influencing the data. The research focuses on the entire set of Oil and Gas companies that are publicly listed in Nigeria. As of December 31st, 2024, there are a total of eight (8) Oil and Gas companies listed in Nigeria. The 8 listed firms are shown in Table 1 below:

Table 1 Population of the Study

Company	**Sector**	**Date Listed**	**Date Incorporated**
1. Aradel Holdings Plc	Oil And Gas	October 14, 2024	March 25, 1992
2. Conoil Plc	Oil And Gas	1989	June 30, 1970
3. Eterna Plc.	Oil And Gas	1998	January 13, 1989
4. Japaul Gold & Ventures Plc	Oil And Gas	August 10, 2005	June 29, 1994
5. Oando Plc	Oil And Gas	February 24, 1992	August 25, 1969
6. Seplat Energy Plc	Oil And Gas	2014	June 17, 2009
7. Totalenergies Marketing Nigeria Plc	Oil And Gas	1978	June 1, 1956

Source: Nigerian Exchange Group (2024)

Purposive sampling was applied to determine the sample size. Since the study covers a ten-year period (2015–2024), only firms listed before 2015 were eligible. Aradel Holdings Plc, listed in 2024, was excluded, leaving a final sample of seven firms (Table 2).

Table 2 Sample Size

Nigerian Firms

1. Conoil PLC
2. Eterna PLC
3. Japaul Oil and Ventures PLC

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4. MRS Oil Nigeria PLC
5. Oando Plc
6. Seplat Energy Plc
7. Totalenergies Nigeria PLC

Source: Researcher's Compilation (2025)

Secondary data were sourced from annual and sustainability reports of the sampled firms, which are mandatorily submitted to the Nigerian Exchange Group. The 2015 base year aligns with the adoption of the Sustainable Development Goals (SDGs), which spurred global and national emphasis on standardised sustainability disclosures, including hydrocarbon reporting in high-emission sectors. The regression model used in this study was adapted from the study by Aniefor, Onatuyeh, Aruobogha, and Orife (2023) which examined the effect of carbon emissions on the financial performance of oil and gas manufacturing firms in Nigeria.

$ROE_{(i,t)} = \alpha_{(1)} + EMD_{(1)} + EDI_{(2)} + FLev_{(3)} + \mu$ ..... Eqn 1.

Where:

ROE	=	Returns on equity
EMD	=	Emission disclosure
EDI	=	Environmental disclosure index
FLEV	=	Firm leverage
t	=	Time dimension of the variables
$\eta 0$	=	Constant or Intercept.
$\eta 1\text{-}2$	=	Coefficients to be estimated or the Coefficients of slope parameters.

There is need to modify the above model, so as to represent the effect of hydrocarbon disclosure on ROI. Hence the modified model is shown below in equation II.

$ROI_{it} = a_0 + b_1 HYD_{it} + \mu_{it}$. ..... Eqn 2.

Where,

ROI	=	Return on Investment
HYD	=	Hydrocarbon disclosure
a_0	=	constant
b_1	=	coefficient of the independent variable
μ	=	Disturbance
I	=	Firm of interest
t	=	Period of interest

Table 3 gives the operational measurement of the variables used in the study.

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Table 3 Operational Measurement of Variables

Variables	Type of Variable	Description and Measurement
1. Return on investment	Dependent	$\frac{Net\ Icome}{Invested\ Capital}$
2. Hydrocarbon disclosure	Independent	Score of "1" if hydrocarbon emission is disclosed in the firm annual or sustainability report or '0' if otherwise

Source: Researcher's Compilation, 2025

RESULT AND DISCUSSIONS

Descriptive Analysis

The data were analysed using descriptive test as shown in Table 4 below:

Table 4 Descriptive Analysis

	ROI	HYD
Mean	-0.026922	0.271429
Median	0.069219	0.000000
Maximum	2.653728	1.000000
Minimum	-3.227752	0.000000
Std. Dev.	0.683959	0.447907
Skewness	-1.595422	1.027988
Kurtosis	13.64690	2.056760
Jarque-Bera	360.3192	14.92383
Probability	0.000000	0.000575
Sum	-1.884550	19.00000
Sum Sq. Dev.	32.27822	13.84286
Observations	70	70

Source: Eviews 10 Output (2025)

As shown in Table 4 above, the mean ROI value of -0.026922 suggests that, on average, the sampled firms recorded a slight negative return over the study period, indicating instances where investments may not have yielded proportionate gains. The maximum ROI of 2.653728 reflects periods of substantial profitability for some firms, while the minimum value of -3.227752 indicates significant losses in other periods. The standard deviation of 0.683959 reveals moderate variability in returns, suggesting notable differences in performance across firms and years. The negative skewness value of -1.595422 implies that the distribution of ROI is left-skewed, meaning more observations fall below the mean, and extreme low returns are more frequent. The high kurtosis value of 13.64690 shows a leptokurtic distribution, indicating that extreme ROI values—both high and low—occurred more often than in a normal distribution. Furthermore, the Jarque-Bera probability of 0.000000 confirms that ROI

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is not normally distributed, which has implications for the choice of statistical models and the interpretation of financial performance trends in the sector.

The Hydrocarbon Disclosure (HYD) variable records an average value of 0.2714, indicating that approximately 27.14% of the sampled observations reported hydrocarbon emissions, making it the most frequently disclosed pollutant in the dataset. The median value of 0 reveals that the majority of firms did not provide this type of disclosure during the study period. With a maximum of 1, the variable reflects cases of full disclosure, while the standard deviation of 0.4479 suggests a moderate level of variation across firms and years. The skewness value of 1.0280 shows a positive skew, meaning higher disclosure values occurred less frequently but were present. The kurtosis figure of 2.0568 is relatively close to the value for a normal distribution, indicating that extreme values are not overly concentrated. Nonetheless, the Jarque-Bera test yields a p-value of 0.000575, confirming that the distribution of hydrocarbon disclosure does not conform to normality.

Test of Hypothesis

H_0: Hydrocarbon emission disclosure does not significantly affect the return on investment of listed energy firms in Nigeria.

Table 5 Test of Hypothesis

Dependent Variable: ROI
Method: Panel EGLS (Cross-section SUR)
Date: 08/14/25 Time: 23:48
Sample: 2015 2024
Periods included: 10
Cross-sections included: 7
Total panel (balanced) observations: 70
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HYD	0.073859	0.025836	2.858789	0.0056
C	-0.017483	0.026702	-0.654769	0.5148
	Weighted Statistics			
R-squared	0.107290	Mean dependent var		0.312587
Adjusted R-squared	0.094162	S.D. dependent var		1.086554
S.E. of regression	1.000006	Sum squared resid		68.00087
F-statistic	8.172572	Durbin-Watson stat		1.908941
Prob(F-statistic)	0.005641			

Source: Eviews 10 Output (2025)

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The model validity results presented in Table 5 indicate that the estimated regression equation is statistically significant. The Prob(F-statistic) = 0.005641 is well below the 5% significance threshold, which confirms that the explanatory variable—Hydrocarbon Disclosure (HYD)—collectively contributes to explaining variations in Return on Investment (ROI) for the sampled energy firms. The R-squared value of 0.107290 suggests that about 10.73% of the variation in ROI can be explained by changes in HYD, while the remaining variation is attributable to other factors not captured in the model. This is not unusual for firm-level financial performance models, which often involve many unobserved influences. The Durbin-Watson statistic of 1.908941 is close to the ideal value of 2, indicating that there is no serious concern of autocorrelation in the residuals, and thus, the model is statistically reliable.

The constant term (C = -0.017483, p = 0.5148) represents the estimated average ROI when Hydrocarbon Disclosure (HYD) is equal to zero. This coefficient is negative, suggesting that in the absence of any hydrocarbon disclosure, firms would, on average, record a slightly negative ROI. However, this effect is not statistically significant at the 5% level (p-value > 0.05), implying that this baseline ROI cannot be distinguished from zero in a statistical sense. Therefore, the constant does not provide strong evidence of a meaningful return when no disclosure is made.

The coefficient for Hydrocarbon Disclosure is 0.073859. This means that a one-unit increase in HYD—interpreted as moving from non-disclosure (0) to full disclosure (1)—is associated with an average 7.39% increase in ROI, holding other factors constant. The positive sign indicates that greater transparency in hydrocarbon emissions tends to improve firms' return on investment. The effect is statistically significant at the 5% level (p = 0.0056), meaning that the likelihood of this result occurring by chance is less than 1%. In practical terms, this suggests that firms engaging in full hydrocarbon disclosure are more likely to achieve better investment returns than those that do not disclose. The null hypothesis stated that Hydrocarbon emission disclosure does not significantly affect the return on investment of listed energy firms in Nigeria. Given the coefficient of 0.073859 with a p-value of 0.0056, the null hypothesis is rejected at the 5% significance level. This provides strong statistical evidence that hydrocarbon disclosure has a positive and significant effect on ROI for listed energy firms in Nigeria. Thus, Hydrocarbon disclosure has a positive effect on ROI (β = 0.073859, p = 0.0056).

The finding that hydrocarbon disclosure exerts a positive and statistically significant effect on return on investment ($\beta = 0.073859$, $p = 0.0056$) implies that greater transparency in reporting hydrocarbon emissions is associated with improved financial returns for listed energy firms in Nigeria. This outcome may be explained by the fact that proactive disclosure fosters stakeholder trust, mitigates reputational risk, and enhances access to capital from environmentally conscious investors. In the Nigerian oil and gas sector, such disclosures may also be interpreted as indicators of robust environmental governance and long-term risk management, which can, in turn, translate into higher operational efficiency and better investment appeal. This finding aligns with several prior studies in similar contexts. For example, Nwokeogu et al. (2024) observed that carbon management and emission transparency significantly enhanced profitability among Nigerian energy firms, while Obafemi and Oyedepo (2024) reported that integrating environmental disclosure into operational strategies yielded measurable financial benefits. Similarly, Okike et al. (2024) and Aniefor et al. (2023) confirmed that sustainability-oriented reporting frameworks positively influence firm value in the Nigerian oil and gas industry, supporting the notion that transparency in environmental performance aligns with market expectations and can be financially rewarding.

Beyond Nigeria, international evidence also reinforces this positive association. Habibullah et al. (2025) demonstrated a strong and significant link between environmental disclosures and corporate value in Indonesia, while Nyahuna and Doorasamy (2023) found that carbon transparency improved investor perception and firm valuation in South Africa. These results are consistent with legitimacy and stakeholder theories, suggesting that firms operating in environmentally sensitive sectors derive tangible returns from disclosure practices by maintaining their social licence to operate. Conversely, studies such as Ebimobowei et al. (2025) in Nigeria's manufacturing sector, and Mathebula (2023) in the UK and South Africa, did not find significant effects, implying that sector-specific factors—such as regulatory enforcement intensity, investor awareness, and environmental risk exposure—can shape the magnitude of the observed benefits. Similarly, Ghosh et al. (2023) in India and Vaicondam et al. (2025) in Malaysia note that initial adoption of disclosure frameworks may involve substantial compliance costs, potentially moderating early financial gains. However, in the context of Nigerian listed energy firms, where environmental risks are high and investor sensitivity to sustainability issues is growing, the present study's finding corroborates the bulk of empirical evidence suggesting that hydrocarbon emission disclosure is an economically valuable practice.

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CONCLUSION AND RECOMMENDATIONS

The finding that hydrocarbon emission disclosure exerts a positive and significant effect on the return on investment of listed energy firms in Nigeria carries notable implications for the evolving relationship between environmental transparency and financial performance in high-emission industries. This result suggests that in the Nigerian context, greater openness regarding hydrocarbon-related environmental impacts is associated with improved investor returns, indicating that disclosure is not merely a regulatory compliance measure but a financially material activity capable of influencing capital allocation and operational efficiencies. Such a relationship may reflect a growing alignment between the expectations of capital market participants and corporate environmental accountability, where transparent firms are perceived as better managed, more trustworthy, and potentially more resilient to environmental and regulatory risks.

The positive association also implies that environmental disclosure can serve as a strategic lever within corporate governance frameworks, enhancing not only public trust but also market valuation and the efficiency of resource utilization. This could stem from increased stakeholder confidence, reduced informational asymmetry, and the operational benefits of internal monitoring mechanisms necessitated by disclosure processes. Furthermore, the Nigerian oil and gas industry—traditionally characterized by opacity and environmental controversy—appears to be experiencing a structural shift where sustainability-related reporting plays a contributory role in value creation. The significance of this association, especially over a ten-year horizon, indicates that environmental accountability is gaining economic weight in the investment calculus, suggesting a broader market recognition that sustainability and profitability are not mutually exclusive but potentially reinforcing dimensions of firm performance in resource-dependent economies.

It is recommended that the management boards of listed energy firms in Nigeria institutionalize standardized hydrocarbon emission disclosure frameworks within their annual reporting processes to strengthen market confidence, enhance investor trust, and leverage transparency as a driver of sustained financial returns.

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