



ENVIRONMENTAL ACCOUNTING AND FIRM VALUE OF LISTED OIL AND GAS COMPANIES IN NIGERIA

Bridget Ebikeseiye PINAOWEI¹, Ibrahim AMINU Ph.D.² & Josephine E. ENE Ph.D.³

¹Department of Accounting & Finance, Baze University Abuja, Nigeria: Bridget11975@bazeuniversity.edu.org

²Department of Accounting & Finance, Baze University Abuja, Nigeria: Ibrahim.aminu@bazeuniversity.edu.org

³Department of Accounting & Finance, Baze University Abuja, Nigeria: Josephine.ene@bazeuniversity.edu.org

Corresponding Author Email: Bridget11975@bazeuniversity.edu.org
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KEYWORDS

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Accounting; Disclosure
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ABSTRACT

This study examined the effect of environmental accounting practices on the firm value of listed oil and gas companies in Nigeria. Specifically, the study investigated the effect of Environmental Disclosure Index and Environmental Costs on firm value. An ex-post facto research design was adopted, while the population comprised eight oil and gas companies listed on the Nigerian Exchange Group as at December 31, 2024. Census sampling was employed, and secondary data were obtained from published annual reports, financial statements, sustainability reports, corporate websites, and Nigerian Exchange Group disclosures. The study covered a ten-year period from 2014 to 2023, generating 73 observations. Data were analyzed using descriptive statistics and multiple regression analysis with EViews 12. The findings revealed that Environmental Disclosure Index had a positive but statistically insignificant effect on firm value, while Environmental Costs had a negative and statistically insignificant effect. The study concludes that environmental accounting practices have limited influence on the firm value of listed oil and gas companies in Nigeria. It recommends stronger regulatory enforcement of environmental disclosures and improved strategic management of environmental costs to enhance transparency, sustainability, and corporate value.

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1.0 INTRODUCTION

The oil and gas industry occupies a strategic position in the global economy and plays a significant role in the development of financial and capital markets. Globally, the sector attracts substantial domestic and foreign investment and contributes considerably to economic activities, government revenues, and international trade (World Bank, 2023). Because oil and gas companies often constitute an important component of equity markets, their financial performance can influence market capitalization, liquidity, investor sentiment, and capital flows. The cyclical nature of crude oil prices also exposes companies in the sector to considerable market and operational risks, making investors increasingly concerned not only with financial performance but also with the long-term sustainability and environmental consequences of corporate activities (International Monetary Fund [IMF], 2022). Consequently, the ability of oil and gas companies to demonstrate responsible environmental management and provide credible information about their environmental activities has become increasingly relevant to investors and other stakeholders.

In Nigeria, the importance of the oil and gas industry is even more pronounced because the sector remains a major contributor to government revenue, foreign exchange earnings, employment, and economic activity. Oil and gas companies listed on the Nigerian Exchange Group (NGX), including major firms such as Seplat Energy and TotalEnergies, contribute substantially to the capitalization and activities of the Nigerian capital market (Nigerian Exchange Group, 2023). The performance and corporate practices of these companies therefore have implications for investor confidence and the broader development of the capital market. However, the sector also generates significant environmental consequences through exploration, drilling, transportation, refining, gas flaring, oil spills, and other related activities. These environmental effects have increased stakeholder concerns regarding the extent to which oil and gas companies recognize, manage, and disclose the environmental implications of their operations. As environmental concerns continue to attract public and regulatory attention, the traditional emphasis on financial information alone is increasingly insufficient for evaluating the overall sustainability and future prospects of firms

operating in environmentally sensitive industries.

One important indicator through which investors assess the performance and prospects of companies is firm value. Firm value reflects the market's overall assessment of a company's financial strength, growth opportunities, risk exposure, and future cash-generating capacity (Damodaran, 2021). For listed oil and gas companies, a high level of firm value may indicate investors' confidence in the company's ability to generate sustainable returns and manage the risks associated with its operations. However, contemporary investment decisions increasingly extend beyond conventional financial indicators to include non-financial information relating to environmental and social performance. Environmental accounting has consequently emerged as an important mechanism for expanding the information available to stakeholders concerning the environmental consequences and financial implications of corporate activities (Carnini-Pulino et al., 2022). It encompasses the identification, measurement, recording, and reporting of environmental-related financial and non-financial information, thereby enabling organizations to recognize the costs and impacts associated with their environmental

responsibilities (Islam, 2018). Environmental accounting has therefore become increasingly relevant to modern corporate reporting as firms seek to incorporate environmental sustainability into their business models and decision-making processes (Novovic et al., 2022).

The growing relevance of environmental accounting is particularly evident in the oil and gas industry, where corporate activities can generate substantial environmental costs and risks. Increasing concerns about climate change, ecological degradation, pollution, oil spills, and resource depletion have intensified demands for greater corporate accountability and environmental transparency (Adebayo et al., 2024). Environmental accounting provides a framework through which companies can identify, measure, and communicate information about their environmental responsibilities and expenditures. Environmental Disclosure Index (EDI) is particularly important because it provides an indication of the extent to which companies communicate their environmental activities, policies, impacts, and responsibilities to stakeholders. Greater environmental disclosure can reduce information asymmetry, enhance corporate transparency, and potentially improve investors' confidence in the firm's ability to

manage environmental risks. Similarly, Environmental Costs (EC) capture the financial resources committed by companies to environmental protection, pollution control, remediation, waste management, compliance, and other environmental-related activities. Although environmental expenditure may impose additional costs on firms in the short term, effective management and transparent reporting of such costs may contribute to long-term sustainability, stakeholder trust, and corporate legitimacy (Almasyhari et al., 2025).

Despite the increasing recognition of environmental accounting as an important component of responsible corporate reporting, concerns remain regarding the extent and quality of environmental accounting practices among Nigerian oil and gas companies. Environmental disclosures in Nigeria are still characterized in some instances by inconsistencies in content, depth, and reporting practices, thereby limiting stakeholders' ability to make meaningful comparisons across companies. Egbunike and Tarilaye (2021) observed that environmental disclosure practices among Nigerian companies remain relatively weak, which may reduce the usefulness of environmental information for stakeholders. The problem is further compounded by the

treatment of environmental expenditures. Environmental-related costs are sometimes incorporated into broader operating or overhead expenses rather than being separately identified and reported, making it difficult for stakeholders to determine the actual financial resources committed to environmental management and the implications of such expenditures for corporate performance (Okoye & Ofoegbu, 2020). These practices may weaken transparency and limit the extent to which investors can incorporate environmental information into their valuation decisions.

The foregoing situation raises an important empirical question concerning whether environmental accounting practices actually translate into enhanced firm value in the Nigerian oil and gas sector. While existing studies provide evidence of a relationship between environmental accounting and corporate performance, their findings remain inconclusive. Giannopoulos et al. (2022) reported that environmental disclosure compliance significantly influenced the financial performance of pollution-sensitive firms, particularly under strong regulatory enforcement, while Emeke et al. (2021) found that green accounting practices significantly enhanced corporate performance. In Nigeria, Kurawa and

Shuaibu (2022) established a positive relationship between environmental accounting practices and return on equity, while Iliemena (2020) found a significant relationship between environmental accounting and firm performance in the Nigerian oil and gas sector, with environmental performance influencing both Tobin's Q and return on assets. Conversely, Jun et al. (2022) found that environmental indicators had a negative but insignificant effect on market share price and return on assets, while Igboke et al. (2021) attributed the limited performance implications of environmental disclosure partly to low compliance with environmental reporting standards. These divergent findings suggest that the relationship between environmental accounting and corporate value may vary according to the specific environmental accounting measure, industry characteristics, regulatory environment, and performance indicator employed.

More importantly, a gap remains in the literature concerning the specific effect of Environmental Disclosure Index and Environmental Costs on firm value, particularly when firm value is measured using Tobin's Q among listed oil and gas companies in Nigeria. Much of the existing Nigerian literature has focused broadly on

environmental accounting and conventional measures of financial performance such as return on assets and return on equity, while comparatively less attention has been devoted to decomposing environmental accounting into disclosure and cost dimensions and examining their individual implications for market-based firm value. This creates a need for further empirical evidence capable of establishing whether the extent of environmental information disclosed by oil and gas companies and the environmental costs incurred in the course of their operations influence how the market values these firms. Against this background, this study examines the impact of environmental accounting practices on the firm value of listed oil and gas companies in Nigeria, with specific emphasis on the Environmental Disclosure Index and Environmental Costs.

2.0 Literature Review

2.1 Environmental Accounting Practices

Environmental accounting practices refer to the processes by which organizations identify, measure, record, and disclose environmental-related costs and performance indicators. In the oil and gas sector, these practices include strategies for controlling greenhouse gas emissions, reducing waste, conserving energy and natural resources, and

preventing land, water, and air pollution. They also encompass costs associated with implementing environmental policies, adhering to regulatory standards, and engaging in recycling and waste disposal initiatives (Okere et al., 2022; Simpson et al., 2021).

A key distinction exists between traditional accounting, which often treats environmental expenses as overhead, and environmental management accounting, which applies activity-based costing to allocate environmental costs to specific activities, products, or processes (Yaya et al., 2018).

Social accounting, a related concept, extends beyond environmental issues to include corporate investments in employee welfare, health and safety compliance, fair treatment, and community engagement. Such initiatives contribute to an organization's social legitimacy and long-term productivity (Yao & Liang, 2019).

2.2 Environmental Disclosure Index

The Environmental Disclosure Index (EDI) is a quantitative tool for assessing the extent and quality of environmental information disclosed by companies in their annual, sustainability, or integrated reports. Construction of the EDI typically involves a content analysis based on established reporting guidelines, such as the Global

Reporting Initiative (GRI), International Financial Reporting Standards (IFRS), or national regulatory frameworks (Clarkson et al., 2008).

EDI metrics often cover areas such as energy consumption, waste management, emissions control, water usage, environmental protection programmes', and compliance with environmental regulations. A higher EDI score generally signals greater transparency, which can enhance corporate reputation, attract sustainable investment, and potentially increase firm value (Egbunike & Tarilaye, 2021).

2.3 Environmental Costs

Environmental costs refer to the monetary expenditures incurred by organizations to prevent, control, or remediate environmental impacts resulting from their operations. These costs may include pollution prevention, waste treatment, environmental restoration, regulatory compliance, and investment in environmentally friendly technologies (Rounaghi, 2019)

In the oil and gas sector, environmental costs can be substantial due to the high environmental impact of extraction, processing, and distribution activities. These costs may be classified as:

Internal costs – Directly incurred by the company (e.g., installing pollution abatement equipment).

External costs – Borne by society (e.g., health risks, environmental degradation) (Okoye & Ofoegbu, 2020).

2.4 Firm Value

Firm value reflects the total worth of a business, incorporating both its tangible and intangible assets. It is often linked to management efficiency, brand reputation, corporate governance, and operational performance (Odoemelam & Okafor, 2018). From a market perspective, Tobin's Q, a ratio comparing a firm's market value to the replacement cost of its assets is frequently used to measure firm value (Martinico et al., 2018).

High levels of transparency, accountability, and corporate responsibility can strengthen stakeholder relationships, improve market perception, and ultimately enhance firm value. In contrast, poor disclosure and weak governance can erode trust and market competitiveness.

2.5 Empirical Review

A variety of studies have explored the relationship between environmental accounting practices and firm performance. Giannopoulos et al. (2022) found that environmental disclosure compliance

significantly affects the financial performance of pollution-sensitive firms, particularly in contexts with strong regulatory enforcement.

Jun et al. (2022) reported that environmental indicators had a negative but insignificant effect on market share price and return on assets, whereas economic and social environmental indicators significantly affected return on assets.

In Nigeria, Kurawa and Shuaibu (2022) found a positive relationship between environmental accounting practices and return on equity, while Emeke et al. (2021) concluded that green accounting practices significantly enhance firm performance. However, Igboke et al. (2021) observed low compliance with environmental disclosure standards, resulting in minimal performance impact.

Green accounting was examined by Emeke et al. (2021) from the perspectives of social, economic, and environmental accounting. In accordance with the Global Reporting Initiative index, the study investigated the usage of checklists and secondary data. The study took into account the reporting compliance implications for consumer products companies that were concerned about waste management and environmental damage. Using data from the yearly financial

reports of ten chosen organizations, the study employed pooled panel data and inferential statistics to conclude that green accounting practices are crucial for enhancing the companies' performance. Additionally, the study discovered that during the examined time, environmental accounting had a noteworthy impact on business performance. Iliemena (2020) found a significant relationship between environmental accounting and firm performance in Nigeria's oil and gas sector, with environmental performance influencing both Tobin's Q and return on assets. These mixed findings highlight the need for further research in the Nigerian context.

2.6 Theoretical Framework

Stakeholder Theory

This theory was propounded by Freeman in 1983. It assumes that stakeholders play an indispensable role in the smooth functioning and effective growth of corporate organizations. According to Artene et al. (2020), stakeholder theory assumes that managers tend to protect the interest of the shareholders at the expense of the other stakeholders. Chen et al. (2019) noted that stakeholders possess the key to corporate effective performance and ensuring corporate competitiveness of companies. Underplaying the role of stakeholders could cause serious

damage to the image of the companies. Ayamba et al. (2020) reported that organizations require societal acceptance and on the other hand, the corporate acceptance of societal social norms and values is equally important in the success or failure of organizations. The stakeholder theory assumes that the role of peaceful coexistence between communities and the organization is significant in the going and corporate existence. Supporters of stakeholder theory suggested that the corporate structure can never be complete without the position of the stakeholders.

3.0 METHODOLOGY

This study applied an ex-post facto research design, which is considered appropriate when investigating cause and effect relationships using existing data. The design was chosen because the data used were pre-existing, unmanipulated, and obtained from the published financial statements of the selected companies. The population of this study comprises all eight (8) oil and gas companies listed on the Nigerian Exchange Group (NGX) as of December 31, 2024. Given the small population size, a census sampling technique was employed. Data were obtained solely from secondary sources, including: Published annual reports and financial statements of the sampled companies.

Sustainability and environmental responsibility reports published on corporate websites. Official disclosures on the NGX platform.

The study covered a 10-year period (2014–2023) to capture recent trends and ensure adequate observations for statistical analysis.

Measurement of variables

Variables	Type	Proxy/Measurement	Supporting studies
Firm value (FV)	Dependent	Tobin's Q (Market Capitalization/Total Assets)	Uwuigbe et al. (2020); Kurawa & Shuaibu (2022)
Environmental Disclosure Index (EDI)	Independent	EDI Score Content analysis using checklist (e.g., GRI indicators); scored as % disclosed	Egbunike & Tarilaye (2021);
Environmental Costs	Independent	Natural Log of Total environmental-related expenditure reported (in Naira)	Okoye & Ofoegbu (2020); Abdullahi & Muhammed (2023)

Source: Author's Compilation (2025)

Method of Data Analysis

Data were analyzed using multiple regression analysis to determine the effect of EDI and EC on firm value. Descriptive statistics also conducted to summarize the data. All analyses were period using EViews 12 statistical software.

3.1 Model Specification

The functional form of the model specified for this study and modified is given as:

$$FV = \beta_0 + \beta_1 EDI + \beta_2 EC + \mu$$

Where:

FV = Firm Value (proxied by Tobin's Q)

EDI = Environmental Disclosure Index

EC = Environmental Costs

β = Coefficients of the variables

μ = Error term

4.0 DATA ANALYSIS AND RESULT

4.1 Descriptive Statistic Result

	FV	EDI	EC
Mean	0.181507	0.168419	0.283014
Median	0.180000	0.157900	0.230000
Maximum	0.280000	0.294000	0.890000
Minimum	0.080000	0.021400	0.050000
Std. Dev.	0.044959	0.059314	0.171373
Skewness	0.262362	0.206561	1.777078
Kurtosis	2.714521	2.622094	6.356727
Jarque-Bera	1.085369	0.953510	72.69472
Probability	0.581186	0.620795	0.000000
Sum	13.25000	12.29460	20.66000
Sum Sq. Dev.	0.145534	0.253311	2.114537
Observations	73	73	73

The descriptive statistics in the table present the characteristics of Firm Value (FV), Environmental Disclosure Index (EDI), and Environmental Costs (EC) for 73 observations covering the sampled listed oil and gas companies in Nigeria. Firm Value has a mean of 0.1815 and a median of 0.1800, indicating that the average and central values are relatively close. The minimum and maximum values of 0.0800 and 0.2800, respectively, show that firm value varied moderately across the observations. The standard deviation of 0.0450 indicates a relatively low dispersion around the mean, suggesting that the firm-value levels of the sampled companies were fairly stable during the study period. The skewness value of 0.2624 indicates a slight positive skewness,

while the kurtosis value of 2.7145 is close to the normal benchmark of 3. The Jarque-Bera statistic of 1.0854 with a probability value of 0.5812, which is greater than 0.05, indicates that the distribution of Firm Value does not significantly depart from normality.

The Environmental Disclosure Index (EDI) recorded a mean value of 0.1684 and a median of 0.1579, indicating that the typical level of environmental disclosure among the sampled companies was relatively low. The EDI values ranged from a minimum of 0.0214 to a maximum of 0.2940, revealing considerable differences in the extent of environmental information disclosed by the companies. The standard deviation of 0.0593 indicates a moderate degree of variation in

environmental disclosure practices across the observations. The skewness value of 0.2066 shows a slight positive skewness, while the kurtosis value of 2.6221 suggests a distribution that is reasonably close to normal. Furthermore, the Jarque-Bera statistic of 0.9535 and probability value of 0.6208 indicate that EDI is normally distributed at the 5% significance level. This suggests that although companies differ in their environmental disclosure levels, the distribution does not exhibit a statistically significant departure from normality.

Environmental Costs (EC) have a mean of 0.2830, compared with a median of 0.2300, indicating some difference between the average and middle observation and

suggesting the presence of relatively higher environmental-cost values in some observations. The variable recorded a minimum of 0.0500 and a maximum of 0.8900, demonstrating substantial variation in environmental costs among the sampled companies. This is further reflected in the standard deviation of 0.1714, which is considerably higher than those of FV and EDI. The skewness value of 1.7771 indicates substantial positive skewness, while the kurtosis value of 6.3567 indicates a leptokurtic distribution with heavier tails and possible extreme observations. The Jarque-Bera statistic of 72.6947 with a probability value of 0.0000 confirms that Environmental Costs are not normally distributed at the 5% significance level.

4.2 Regression Analysis Result

Dependent Variable: FV
Method: Least Squares
Date: 09/02/26 Time: 22:49
Sample: 1 73
Included observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDI	0.168056	0.089803	1.871387	0.0655
EC	-0.019488	0.031082	-0.626996	0.5327
	0.158718	0.016902	9.390512	0.0000
R-squared	0.048791	Mean dependent var		0.181507
Adjusted R-squared	0.021613	S.D. dependent var		0.044959
S.E. of regression	0.044470	Akaike info criterion		-3.347756
Sum squared resid	0.138434	Schwarz criterion		-3.253627
Log likelihood	125.1931	Hannan-Quinn criter.		-3.310244
F-statistic	1.795267	Durbin-Watson stat		1.006593
Prob(F-statistic)	0.173645			

The regression results indicate that the Environmental Disclosure Index (EDI) has a positive coefficient of 0.168056, with a standard error of 0.089803 and a t-statistic of 1.871387. The associated probability value of 0.0655 is greater than the 5% significance level but less than the 10% level. This implies that EDI has a positive but statistically insignificant effect on firm value at the 5% level. Specifically, a one-unit increase in the Environmental Disclosure Index is associated with an estimated 0.168056 increase in firm value, holding Environmental Costs constant. Therefore, the null hypothesis that Environmental Disclosure Index has no significant effect on firm value is not rejected at the 5% significance level. However, the result becomes significant if a 10% significance threshold is adopted, suggesting weak evidence of a positive relationship between environmental disclosure and firm value.

Environmental Costs (EC) have a coefficient of -0.019488, with a standard error of 0.031082 and a t-statistic of -0.626996. The probability value of 0.5327 is substantially greater than 0.05, indicating that Environmental Costs have a negative but statistically insignificant effect on firm value. The coefficient suggests that, holding environmental disclosure constant, a one-unit

increase in Environmental Costs is associated with an estimated 0.019488 reduction in firm value. However, the high probability value indicates that this observed negative relationship is not statistically meaningful within the sample. Consequently, the null hypothesis that Environmental Costs have no significant effect on the firm value of listed oil and gas companies in Nigeria is not rejected.

The overall regression model produced an R-squared of 0.048791, indicating that EDI and EC jointly explain approximately 4.88% of the variation in firm value, while the remaining 95.12% is attributable to other factors not captured by the model. The adjusted R-squared of 0.021613 further indicates the relatively limited explanatory power of the model. The F-statistic of 1.795267 with a probability value of 0.173645 shows that the model is not statistically significant at the 5% level, implying that EDI and EC jointly do not have a significant effect on firm value. The Durbin-Watson statistic of 1.006593 is below the conventional benchmark of 2, which may indicate the possibility of positive serial correlation in the residuals.

4.3 Discussion of Findings

The findings of this study indicate that Environmental Disclosure Index (EDI) has a positive but statistically insignificant effect on firm value, while Environmental Costs (EC) have a negative and statistically insignificant effect on firm value of listed oil and gas companies in Nigeria. The positive coefficient of EDI suggests that greater environmental disclosure may improve investors' perception of firms and potentially enhance firm value, although the evidence is insufficient to establish a significant relationship at the 5% level. This finding contrasts with Giannopoulos et al. (2022), who found that environmental disclosure compliance significantly influenced the financial performance of pollution-sensitive firms, particularly where regulatory enforcement was strong. It also differs from Iliemena (2020), who reported a significant relationship between environmental accounting and firm performance in Nigeria's oil and gas sector, with environmental performance influencing both Tobin's Q and return on assets. Similarly, Kurawa and Shuaibu (2022) and Emeke et al. (2021) found positive and significant effects of environmental or green accounting practices on firm performance. However, the present finding is consistent with Jun et al.

(2022), who reported that environmental indicators had a negative but insignificant effect on market share price and return on assets. It is also compatible with Igboke et al. (2021), who observed that low compliance with environmental disclosure standards could limit the extent to which environmental reporting translates into improved corporate performance. The relatively weak effect observed in the present study may therefore suggest that environmental information disclosed by Nigerian oil and gas companies is not yet sufficiently comprehensive, credible, or valued by investors to produce a significant market-value response.

The negative and insignificant effect of Environmental Costs further suggests that environmental-related expenditures may impose financial burdens on firms without necessarily generating an immediate improvement in market valuation. This finding has important implications for corporate managers, investors, regulators, and other stakeholders. For managers, environmental spending should not be viewed merely as a cost but should be strategically integrated with environmental risk management, operational efficiency, and transparent reporting so that stakeholders can recognize its long-term value. For investors, the findings imply that environmental

disclosure and expenditure, by themselves, may currently provide limited information for assessing the value of Nigerian oil and gas companies. For regulators, the results reinforce the need to strengthen environmental reporting requirements, improve compliance monitoring, and encourage standardized and verifiable environmental disclosures. The divergence between this study and the significant findings of Iliemena (2020), Emeke et al. (2021), Kurawa and Shuaibu (2022), and Giannopoulos et al. (2022) also suggests that the financial benefits of environmental accounting may depend on factors such as regulatory enforcement, disclosure quality, industry characteristics, and stakeholder awareness.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study concludes that environmental accounting practices have limited influence on the firm value of listed oil and gas companies in Nigeria. Specifically, Environmental Disclosure Index demonstrated a positive but statistically insignificant effect on firm value, while Environmental Costs exerted a negative and statistically insignificant effect. This suggests

that, despite the potential of environmental accounting to improve corporate transparency, stakeholder confidence, and market perception, its value-enhancing benefits have not been sufficiently realized within the Nigerian oil and gas sector. The study therefore concludes that stronger regulatory enforcement, improved environmental disclosure practices, greater transparency, and more effective management of environmental costs are necessary to enhance the contribution of environmental accounting practices to firm value.

5.2 Recommendations

Based on the findings of the study:

- 1 Strengthen environmental disclosure: Regulatory authorities should strengthen and enforce environmental reporting requirements for listed oil and gas companies. Companies should provide comprehensive, standardized, and verifiable environmental information to improve transparency and enable investors to properly assess environmental performance.

- 2 Improve environmental cost management: Management of listed oil and gas companies should adopt more efficient strategies for managing environmental costs by integrating environmental expenditure with pollution prevention, resource efficiency, and sustainable operational practices. This can help reduce unnecessary environmental costs while improving the potential long-term value of such investments.

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