

Profitability and Firm Size in ESG Disclosure: A Conceptual Review of Indonesia's Energy Sector

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Abstract: Environmental, Social, and Governance (ESG) disclosure has become increasingly important in Indonesia's energy sector as companies face growing expectations for transparency from investors, regulators, creditors, communities, and other stakeholders. Financial characteristics, particularly profitability and firm size, may influence a firm's ability and incentives to respond to these stakeholder expectations. Previous studies generally report positive relationships between profitability and firm size and ESG disclosure, although the strength of these relationships varies across industries and institutional contexts. This study aims to conceptually examine the relationship between profitability, firm size, and ESG disclosure in Indonesia's energy sector through the perspective of Stakeholder Theory. This study employs a conceptual literature review by synthesizing theoretical perspectives, previous empirical studies, sustainability reporting frameworks, and relevant developments in Indonesia's sustainability reporting environment. The conceptual synthesis indicates that profitability tends to support ESG disclosure through greater financial capacity and organizational resources, while firm size encourages broader disclosure through greater stakeholder visibility, external scrutiny, and reporting capacity. This study contributes an integrated conceptual framework that explains the relationship between financial characteristics and ESG disclosure through two stakeholder-related mechanisms: financial capacity and stakeholder visibility. The framework provides a conceptual basis for future empirical research on ESG disclosure among energy-sector companies in Indonesia.

Keywords: ESG Disclosure; Profitability; Firm Size; Stakeholder Theory; Conceptual Review; Energy Sector

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A. INTRODUCTION

Climate change has become one of the most pressing global challenges of the twenty-first century, with profound implications for environmental sustainability, economic resilience, and human well-being. The Intergovernmental Panel on Climate Change (IPCC) confirms that anthropogenic greenhouse gas (GHG) emissions have unequivocally driven global warming, leading to more frequent and intense extreme weather events, sea level rise, biodiversity loss, and increasing risks to food, water, and energy security (IPCC, 2023). These environmental changes highlight the urgency of integrating Earth system science into policy and corporate decision-making, particularly in sectors with high emissions intensity. Climate change is therefore no longer solely an environmental issue, but also a systemic economic and governance challenge requiring coordinated action across governments, industries, and financial institutions (IEA, 2024b; IPCC, 2023).

From an Earth Science perspective, the stability of natural systems is closely linked to the sustainability of global energy production and consumption patterns. The energy sector remains the largest contributor to global CO₂ emissions, primarily due to continued

dependence on fossil fuels in electricity generation, transportation, and industrial processes (IEA, 2024b). Although renewable energy deployment has expanded significantly in recent years, global energy demand continues to rise due to population growth, urbanization, industrial expansion, and digital transformation (IRENA, 2023). As a result, decarbonizing the energy sector has become a central pillar in achieving the Paris Agreement targets and the Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) (IRENA, 2023).

Recent projections from the International Energy Agency (IEA) indicate that Southeast Asia will be one of the fastest-growing energy demand regions globally over the coming decades (IEA, 2024b). Under current policy scenarios, energy demand in the region is expected to increase significantly, driven by economic development, industrialization, and population growth. Without accelerated deployment of renewable energy, energy efficiency improvements, and structural policy reforms, this growth trajectory may lead to higher fossil fuel dependency and increased greenhouse gas emissions, thereby complicating regional decarbonization efforts (IEA, 2024b). These findings reinforce the importance of accelerating sustainable energy transitions, particularly in emerging economies such as Indonesia, where economic growth and environmental sustainability must be pursued simultaneously.

Indonesia plays a strategic role in the global energy transition as both a major producer and consumer of fossil energy resources, while also committing to achieve Net Zero Emissions (NZE) by 2060 or earlier. The energy sector contributes significantly to national economic development through coal mining, oil and gas production, and electricity generation; however, it is also one of the largest contributors to national greenhouse gas emissions (IEA, 2023). In response, Indonesia has strengthened its climate commitments through its Nationally Determined Contribution (NDC), the Long-Term Strategy for Low Carbon and Climate Resilience 2050, and various energy transition policies aimed at reducing emissions intensity while maintaining economic growth (IEA, 2023).

The International Energy Agency (IEA) emphasizes that key pathways for achieving Indonesia's decarbonization targets include scaling up renewable electricity generation, improving energy efficiency, expanding electrification, and increasing investment in clean energy technologies (IEA, 2023). These structural transformations require not only technological advancement but also strong institutional frameworks, financial system alignment, and corporate participation in sustainability initiatives.

The transition toward sustainable energy extends beyond technological innovation and requires improvements in corporate governance, environmental accountability, and transparency. In this context, Environmental, Social, and Governance (ESG) disclosure has emerged as a critical mechanism for communicating corporate sustainability performance to stakeholders. ESG reporting is increasingly recognized as a strategic tool for managing climate-related risks, enhancing investor confidence, and supporting long-term value creation (Busch et al., 2022; Gillan et al., 2021). Rather than functioning solely as a compliance requirement, ESG disclosure has evolved into an essential component of corporate sustainability strategy and financial market transparency.

Recent empirical studies in Scopus Q1/Q2 journals further demonstrate that high-quality ESG disclosure is associated with improved corporate legitimacy, reduced cost of capital, and stronger resilience to environmental and regulatory risks (Wang et al., 2024). In the energy industry, the importance of ESG disclosure is even more pronounced because operational activities directly affect carbon emissions, ecosystem integrity, and natural resource utilization. Consequently, energy companies face increasing pressure from regulators, investors, and society to improve sustainability performance and reporting quality.

To standardize sustainability reporting practices, the Global Reporting Initiative (GRI) has developed Universal Standards that are widely adopted as global benchmarks for ESG disclosure (GRI, 2021). These frameworks enable comparability, transparency, and accountability in corporate sustainability reporting, thereby supporting green investment decisions and sustainable finance development. In parallel, financial regulators and institutional investors increasingly require ESG-aligned disclosures to assess climate-related financial risks and long-term corporate sustainability performance.

Indonesia has responded proactively to these global developments through the implementation of the Sustainable Finance Roadmap Phase II (2021–2025), the development of the Indonesia Taxonomy for Sustainable Finance, and the issuance of climate-related financial risk management guidelines by the Financial Services Authority (OJK) (OJK, 2021, 2023). These initiatives aim to integrate environmental, social, and governance principles into financial markets and corporate strategies, thereby accelerating the transition toward a low-carbon economy. The increasing regulatory emphasis on sustainability disclosure reflects the recognition that ESG reporting is no longer voluntary but an integral component of national climate governance and sustainable economic development.

Against this global and national background, understanding the determinants of ESG disclosure has become increasingly important, particularly for companies operating in the energy sector. Financial characteristics such as profitability and firm size may influence a firm's capacity and willingness to invest in sustainability initiatives and disclose environmental performance transparently. Therefore, examining these determinants contributes not only to accounting and corporate governance literature but also to broader discussions on sustainable energy transition, climate governance, and environmental accountability. In this context, ESG disclosure serves as a strategic instrument that supports Indonesia's commitment to sustainable development and the achievement of the Sustainable Development Goals through enhanced transparency, responsible corporate behavior, and improved climate change mitigation outcomes.

1. ESG Disclosure in the Energy Sector

The increasing urgency of climate change mitigation has fundamentally transformed the role of Environmental, Social, and Governance (ESG) disclosure from a voluntary sustainability initiative into a strategic instrument of corporate accountability. In recent years, governments, investors, financial institutions, and civil society have demanded greater transparency regarding how corporations manage environmental risks, social responsibilities, and governance practices (Friede et al., 2015; KPMG, 2024). This transformation reflects a broader shift from shareholder-oriented business models toward

stakeholder-oriented governance, in which corporate success is evaluated not only through financial performance but also through contributions to sustainable development and long-term environmental resilience. Consequently, ESG disclosure has become an important mechanism for reducing information asymmetry, strengthening stakeholder trust, and improving the credibility of sustainability-related decision-making across global capital markets (Gillan et al., 2021).

Within the global energy industry, ESG disclosure has gained particular importance because the sector directly influences greenhouse gas emissions, biodiversity conservation, resource depletion, and energy security. Energy companies operate in industries that are highly exposed to climate-related risks, environmental regulations, and increasing public scrutiny. Consequently, investors increasingly incorporate ESG information into investment decisions to evaluate corporate resilience against transition risks associated with decarbonization policies, carbon pricing mechanisms, and technological changes (IEA, 2024a). Simultaneously, governments have strengthened sustainability reporting requirements to improve market transparency and encourage corporate contributions toward achieving national and international climate targets. These developments indicate that ESG disclosure has evolved beyond regulatory compliance and now functions as a strategic component of corporate risk management and sustainable value creation (KPMG, 2024).

The International Energy Agency emphasizes that achieving global net-zero emissions requires not only large-scale investments in renewable energy and low-carbon technologies but also improvements in corporate governance, sustainability reporting, and investment transparency (IEA, 2024b). Although global investment in clean energy has increased substantially and now exceeds investment in fossil fuels, significant financing gaps remain in many emerging economies, including Southeast Asia. These conditions highlight the importance of transparent ESG reporting in attracting sustainable investment and strengthening investor confidence, particularly within capital-intensive sectors such as energy. Consequently, sustainability disclosure increasingly functions as an essential bridge connecting corporate financial performance with long-term environmental and climate objectives (World Bank, 2023).

From a theoretical perspective, ESG disclosure is closely associated with Stakeholder Theory, which argues that corporate sustainability depends upon an organization's ability to respond to the expectations of multiple stakeholder groups, including investors, regulators, creditors, employees, customers, and local communities. Companies operating in environmentally sensitive industries generally experience greater stakeholder pressure to disclose comprehensive sustainability information because their operational activities directly affect ecological systems and social welfare (Freeman et al., 2021). Therefore, ESG reporting serves not only as a communication mechanism but also as a governance instrument that enhances corporate legitimacy, demonstrates accountability, and reduces uncertainty regarding environmental and social risks.

The development of international sustainability reporting frameworks has significantly improved the comparability and credibility of ESG disclosure across industries. Among these frameworks, the Global Reporting Initiative (GRI) Standards remain the most widely

adopted sustainability reporting standards worldwide because they provide comprehensive guidance covering economic, environmental, and social dimensions of corporate performance. The GRI Universal Standards 2021 establish the fundamental principles for sustainability reporting, while sector-specific standards further strengthen disclosure quality by recognizing that environmental impacts differ substantially across industries (GRI, 2021). For the energy industry, GRI has introduced dedicated sector guidance addressing issues such as climate change mitigation, greenhouse gas emissions, biodiversity protection, energy management, environmental compliance, and community engagement. These standards enable companies to present sustainability information in a manner that is transparent, comparable, and relevant for investors and other stakeholders.

Recent empirical studies similarly indicate that the quality of ESG disclosure has become an important determinant of corporate competitiveness and sustainable business performance. Studies in the post-pandemic period show that ESG reporting is increasingly linked to firm resilience, cost of capital reduction, and long-term value creation (Borghesi et al., 2025; Xia et al., 2025). Borghesi et al. (2025) argue that the evolution of ESG reporting should move beyond symbolic disclosure toward measurable sustainability outcomes that support environmental governance and sustainable economic development. Likewise, Xia et al. (2025) demonstrate that ESG reporting has evolved into a strategic knowledge management system through which corporations continuously improve sustainability communication and respond to rapidly changing stakeholder expectations. Rather than functioning solely as compliance documentation, ESG reports increasingly provide decision-useful information for investors evaluating climate-related risks, environmental performance, and long-term corporate resilience.

Within the Indonesian context, ESG disclosure has experienced significant development following the implementation of sustainable finance policies introduced by the Financial Services Authority (Otoritas Jasa Keuangan/OJK). The Sustainable Finance Roadmap Phase II (2021–2025), together with sustainability reporting requirements for publicly listed companies, reflects Indonesia's commitment to integrating environmental, social, and governance principles into the national financial system (OJK, 2021). Furthermore, the establishment of the Indonesia Carbon Exchange (IDXCarbon) and the continued development of the Indonesia Taxonomy for Sustainable Finance illustrate the government's strategy to accelerate low-carbon economic transformation while improving environmental accountability across strategic sectors (IDX, 2023). These regulatory developments have substantially increased stakeholder expectations regarding the quality, consistency, and transparency of ESG disclosure among publicly listed companies, particularly those operating in environmentally intensive industries.

The Indonesian energy sector represents one of the most critical sectors for evaluating ESG disclosure because it simultaneously contributes significantly to national economic growth and greenhouse gas emissions. Companies engaged in coal mining, oil and gas exploration, electricity generation, and other energy-related activities face increasing regulatory pressure to improve environmental performance while maintaining financial sustainability. Consequently, sustainability reporting has become an important mechanism for demonstrating corporate commitment toward responsible resource management, climate

mitigation, environmental protection, and sustainable energy transition. Recent evidence from Indonesian energy-sector studies also indicates that the implementation of GRI-based sustainability reporting remains heterogeneous, with considerable variation in disclosure quality among companies despite the increasing adoption of GRI Standards (Wijaya & Herwiyanti, 2024). These findings suggest that differences in firm characteristics may influence the extent of ESG disclosure and therefore warrant further empirical investigation.

Against this background, identifying the financial determinants of ESG disclosure has become increasingly relevant for both academic research and public policy. Financial resources generated through profitability may enable firms to invest more extensively in sustainability initiatives and reporting systems. Larger companies generally possess stronger organizational capacity, greater public visibility, and higher stakeholder pressure, encouraging broader ESG disclosure. Understanding how these financial characteristics influence ESG disclosure within Indonesia's energy sector therefore contributes not only to accounting and corporate governance literature but also to broader discussions concerning climate governance, sustainable energy transition, green finance, and the achievement of the Sustainable Development Goals (SDGs).

2. Indonesia's Energy Sector and Regulatory Framework

Indonesia plays a strategic role in the global energy landscape because it possesses abundant fossil energy resources while simultaneously committing to accelerate the transition toward a low-carbon economy (IEA, 2023, 2024b). As one of the world's largest producers of coal, natural gas, and geothermal energy, Indonesia's energy sector contributes significantly to national economic growth through exports, electricity generation, industrial development, and employment. However, the sector is also one of the largest contributors to greenhouse gas (GHG) emissions, making it central to Indonesia's climate mitigation strategy and long-term sustainable development agenda. Consequently, balancing energy security, economic growth, and environmental sustainability has become one of the government's primary policy priorities in achieving the Nationally Determined Contribution (NDC) targets and the Net Zero Emissions (NZE) target by 2060 or earlier (IEA, 2023). The International Energy Agency (IEA) emphasizes that Indonesia's decarbonization pathway requires accelerated renewable energy deployment, improvements in energy efficiency, electrification of end-use sectors, and increased investment in low-carbon technologies (IEA, 2024b). These measures are expected to reduce emissions while maintaining energy affordability and economic competitiveness.

The transition toward sustainable energy has encouraged significant changes in Indonesia's regulatory environment, particularly regarding sustainable finance and corporate sustainability reporting. Recognizing that climate-related risks affect financial system stability and long-term economic resilience, the Financial Services Authority (Otoritas Jasa Keuangan/OJK) has positioned Environmental, Social, and Governance (ESG) principles as an integral component of Indonesia's sustainable finance ecosystem (OJK, 2021). Through the Sustainable Finance Roadmap Phase II (2021–2025), OJK established a comprehensive framework consisting of seven strategic pillars covering policy development, financial products, market infrastructure, inter-agency coordination, non-government

support, human resource development, and public awareness (OJK, 2021). This framework aims to accelerate the integration of ESG principles into the financial services industry while supporting the transition toward a sustainable and low-carbon economy. The roadmap also identifies several strategic priorities, including the development of a green taxonomy, ESG implementation, sustainable financial product innovation, and the strengthening of sustainable finance market infrastructure (OJK, 2021).

To further strengthen sustainable investment practices, OJK introduced the Taxonomy for Indonesian Sustainable Finance (TKBI), which serves as a scientific classification system for economic activities based on environmental, social, and economic sustainability criteria (OJK, 2025). The first edition primarily focused on the energy sector, while the second edition expanded its scope to include transportation, construction, forestry, and agriculture. The taxonomy aligns national sustainable finance policies with the ASEAN Taxonomy for Sustainable Finance and Indonesia's Net Zero Emissions commitment, providing clearer guidance for investors, financial institutions, and corporations in identifying sustainable economic activities (OJK, 2025). The TKBI also supports the implementation of green investment strategies by improving consistency between sustainability reporting, financing decisions, and national climate policies (OJK, 2025).

Beyond financial sector reforms, Indonesia has strengthened sustainability governance through the establishment of the Indonesia Carbon Exchange (IDXCarbon), the implementation of carbon pricing mechanisms, and the continuous enhancement of sustainability disclosure requirements for publicly listed companies (OJK, 2025). These initiatives demonstrate the government's commitment to encouraging corporations to internalize environmental externalities, improve climate-related risk management, and increase transparency regarding sustainability performance. Together with the Sustainable Finance Roadmap and the Indonesian Sustainable Finance Taxonomy, these policy instruments create an integrated regulatory ecosystem that encourages companies to adopt ESG principles not only for regulatory compliance but also as part of long-term corporate strategy (OJK, 2021; OJK, 2025).

Within this regulatory environment, companies operating in the energy sector experience stronger stakeholder pressure than firms in many other industries because their operational activities directly influence carbon emissions, environmental degradation, natural resource utilization, and biodiversity conservation. Investors increasingly evaluate energy companies based not only on their financial performance but also on their environmental responsibility, governance quality, and capacity to manage transition risks associated with climate policies. Likewise, creditors and financial institutions increasingly integrate ESG considerations into lending decisions, while regulators expect greater consistency between sustainability commitments and corporate disclosure practices. Consequently, high-quality ESG disclosure has become an essential instrument for reducing information asymmetry, strengthening corporate legitimacy, and improving investor confidence in Indonesia's capital market (GRI, 2021).

Internationally recognized sustainability reporting standards have also contributed to improving ESG disclosure practices among Indonesian companies. The Global Reporting Initiative (GRI) Universal Standards 2021 provide a globally accepted framework for

reporting environmental, social, and governance performance through standardized disclosure principles (GRI, 2021). For environmentally intensive industries such as energy, GRI complements its Universal Standards with sector-specific guidance addressing greenhouse gas emissions, biodiversity, climate adaptation, energy management, occupational health and safety, and community engagement (GRI, 2021). The adoption of GRI Standards enables companies to produce sustainability reports that are more transparent, comparable, and decision-useful for investors and regulators, while simultaneously supporting sustainable finance initiatives and international capital market expectations (GRI, 2021).

Although Indonesia has made substantial progress in developing its sustainable finance ecosystem, empirical evidence indicates that the quality and comprehensiveness of ESG disclosure remain heterogeneous across publicly listed companies. Differences in organizational resources, financial capacity, governance quality, and stakeholder pressure often result in varying levels of sustainability disclosure, particularly within the energy sector. Some companies have adopted comprehensive ESG reporting aligned with GRI Standards, whereas others continue to provide relatively limited environmental disclosure despite operating in environmentally sensitive industries. This variation suggests that firm-specific characteristics continue to play an important role in determining the extent of ESG disclosure.

Among these characteristics, profitability and firm size are frequently identified in the sustainability literature as important determinants of corporate disclosure decisions. Financially stronger firms generally possess greater resources to invest in environmental management systems, sustainability initiatives, and ESG reporting processes. Larger companies typically face higher public visibility and greater stakeholder expectations, encouraging broader sustainability disclosure. Consequently, investigating the influence of these financial characteristics on ESG disclosure within Indonesia's energy sector is both theoretically and practically relevant. Such analysis contributes not only to corporate governance and accounting research but also to broader discussions concerning climate governance, sustainable finance, energy transition, and the achievement of the Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action).

The growing importance of Environmental, Social, and Governance (ESG) disclosure has encouraged extensive empirical research examining the factors that influence corporate sustainability reporting. Previous studies have identified financial characteristics—particularly profitability and firm size—as important determinants of ESG disclosure because they reflect a firm's financial capacity, organizational resources, and relationships with external stakeholders. Nevertheless, despite the increasing volume of research, the empirical evidence remains inconclusive, indicating that the relationship between financial characteristics and ESG disclosure is highly context-dependent and may vary across countries, industries, regulatory environments, and sustainability reporting frameworks.

Profitability is frequently associated with broader ESG disclosure because financially successful companies generally possess greater resources to invest in environmental

management systems, sustainability programs, and disclosure activities. Stakeholder Theory suggests that profitable firms have stronger incentives to demonstrate accountability to investors, regulators, and society through transparent sustainability reporting. Several recent studies reported a positive relationship between profitability and ESG disclosure, arguing that stronger financial performance enables firms to allocate more resources toward sustainability initiatives and long-term environmental commitments (Abdi et al., 2022; Zahid et al., 2023). However, other studies indicate that profitability does not always translate into higher disclosure quality because corporate sustainability reporting may also be influenced by institutional pressure, governance mechanisms, or strategic managerial decisions rather than financial capacity alone (Velte, 2019; García-Sánchez et al., 2020). These contrasting findings suggest that profitability alone cannot consistently explain variations in ESG disclosure across different institutional settings.

Similar inconsistencies are observed regarding firm size. Large corporations generally experience greater public visibility, stronger regulatory oversight, and higher stakeholder expectations, encouraging broader ESG disclosure. Previous research demonstrates that larger firms tend to disclose more comprehensive sustainability information because they possess more sophisticated reporting systems and greater organizational resources (Khan, Serafeim, & Yoon, 2016; Rahman & Alsayegh, 2021). Nevertheless, several studies argue that organizational size is not always a sufficient predictor of disclosure quality, particularly in countries where ESG reporting remains largely voluntary or where sustainability practices are still developing (Cormier & Magnan, 2015). Consequently, differences in regulatory enforcement and industry characteristics may weaken the influence of firm size on sustainability disclosure.

Although previous studies have significantly contributed to understanding ESG disclosure, several research gaps remain. First, most existing studies focus on developed economies or cross-country comparisons, while evidence from emerging economies, particularly Indonesia, remains relatively limited despite the country's strategic role in the global energy transition (Laskar & Maji, 2018). Second, many previous studies employ broad industrial samples, making it difficult to capture the unique sustainability characteristics of environmentally intensive sectors such as energy. Third, recent regulatory developments—including Indonesia's Sustainable Finance Roadmap Phase II (2021–2025), the Indonesia Sustainable Finance Taxonomy, and the strengthening of GRI-based sustainability reporting—have substantially transformed the national ESG landscape, yet empirical evidence evaluating corporate responses under these evolving regulations remains scarce. Finally, the majority of previous studies measure sustainability performance using ESG ratings obtained from commercial databases, whereas relatively few studies evaluate actual ESG disclosure quality through comprehensive content analysis based on the Global Reporting Initiative (GRI) Universal Standards 2021 (GRI, 2021). These limitations provide strong justification for conducting further research within Indonesia's energy sector.

This study offers several contributions that distinguish it from previous research. First, it focuses specifically on energy sector companies listed on the Indonesia Stock Exchange (IDX), an industry that plays a pivotal role in climate change mitigation because of its substantial contribution to greenhouse gas emissions, energy production, and national economic

development. The energy sector has become one of the primary targets of sustainable finance policies, carbon reduction strategies, and environmental governance reforms; therefore, understanding ESG disclosure practices within this sector is highly relevant to achieving Indonesia's sustainable energy transition and climate commitments.

Second, this study evaluates ESG disclosure using the Environmental, Social, and Governance Disclosure Index (ESGDI) constructed through content analysis based on the Global Reporting Initiative (GRI) Universal Standards 2021 (GRI, 2021). Unlike many previous studies that rely primarily on ESG ratings provided by commercial agencies, the GRI-based disclosure index enables a more comprehensive and transparent assessment of sustainability reporting by examining the actual disclosure of environmental, social, and governance information contained in corporate sustainability reports. This approach provides a richer understanding of corporate sustainability transparency while improving the comparability of disclosure practices across companies.

Third, this research is conducted during the period 2021–2025, which represents a significant phase in Indonesia's sustainability governance. During this period, the implementation of the Sustainable Finance Roadmap Phase II, the development of the Indonesia Sustainable Finance Taxonomy, the establishment of the Indonesia Carbon Exchange (IDXCarbon), and the strengthening of ESG-related regulations have collectively accelerated the integration of sustainability principles into corporate governance and financial markets (GRI, 2021). Examining ESG disclosure during this transition period provides contemporary empirical evidence regarding corporate responses to evolving sustainability policies and environmental governance reforms.

Finally, this study contributes to the growing literature by integrating financial characteristics—profitability and firm size—with the broader discourse on sustainable energy transition, climate governance, and environmental accountability. Rather than viewing ESG disclosure solely as a corporate reporting mechanism, this research positions sustainability disclosure as a strategic instrument supporting green finance, climate risk management, stakeholder accountability, and the achievement of the Sustainable Development Goals (United Nations, 2015), particularly SDG 7, SDG 12, and SDG 13.

Based on these considerations, this study aims to examine the influence of profitability and firm size on ESG disclosure among energy sector companies listed on the Indonesia Stock Exchange during the 2021–2025 period.

B. METHOD

1. Research Design

This study employs a conceptual, literature-based research design built on a narrative synthesis of theory and prior empirical findings to examine how financial characteristics are theorised to influence Environmental, Social, and Governance (ESG) disclosure among energy sector companies listed on the Indonesia Stock Exchange (IDX). A conceptual review approach is appropriate because the study seeks to synthesise and integrate theoretical perspectives and prior empirical evidence on the relationship between profitability, firm size, and ESG disclosure, rather than to test these relationships statistically using primary data.

The study is grounded in Stakeholder Theory, which views ESG disclosure as a corporate response to the information needs and expectations of stakeholders regarding environmental responsibility, social accountability, and governance transparency. In this perspective, companies are encouraged to provide relevant sustainability information to demonstrate accountability and maintain stakeholder trust, particularly in sectors with substantial environmental and social impacts such as the energy sector. Recent studies emphasize that ESG reporting has become an important mechanism for communicating corporate sustainability practices and responding to increasing stakeholder demands for greater transparency and accountability (Borghesi et al., 2025; Gati et al., 2024; Xia et al., 2025). Accordingly, ESG disclosure can be viewed as a strategic form of corporate communication through which companies demonstrate their commitment to sustainable business practices and address stakeholder expectations.

The study focuses on Indonesia's energy sector because it represents one of the country's most environmentally intensive industries and plays a strategic role in supporting sustainable energy transition and national climate commitments. The observation period covers 2021–2025, representing a critical phase in the implementation of Indonesia's Sustainable Finance Roadmap Phase II, the adoption of the Global Reporting Initiative (GRI) Universal Standards 2021 (GRI, 2021), and the strengthening of ESG-related regulations by the Financial Services Authority (OJK, 2021).

2. Data Source

As a conceptual paper, this study does not collect or analyze primary financial or sustainability data. Instead, it draws on secondary literature and publicly available institutional information to build the conceptual argument. Descriptive contextual information on the financial and sustainability profile of energy sector companies listed on the Indonesia Stock Exchange (IDX)—drawn from publicly available annual reports, corporate sustainability reports, and integrated annual reports published during the 2021–2025 period—is used only to illustrate the propositions developed in this paper, not to statistically test them.

Additional supporting information regarding sustainability regulations and ESG reporting practices is obtained from official publications issued by the Indonesia Stock Exchange (IDX), the Financial Services Authority (OJK), the Global Reporting Initiative (GRI), and other internationally recognized institutions. These sources ensure that the research is based on reliable, transparent, and publicly verifiable information (GRI, 2021; OJK, 2021).

The literature reviewed in this paper is delimited using the following inclusion criteria, applied through a purposive approach to source selection:

- a. Studies, reports, or regulatory publications addressing companies classified under the Energy Sector according to the IDX-IC classification, or comparable energy-sector classifications in other markets.
- b. Sources published, updated, or otherwise relevant to the 2021–2025 period, corresponding to the implementation window of Indonesia's Sustainable Finance Roadmap Phase II.

- c. Peer-reviewed journal articles, institutional reports, and regulatory publications that provide sufficient theoretical or empirical detail on profitability, firm size, or ESG disclosure to be meaningfully synthesised.
- d. Studies explicitly examining sustainability, ESG, or GRI-based disclosure practices, whether in energy-sector or other environmentally intensive industries, that inform the conceptual synthesis.
- e. Sources accessible through recognised academic databases and institutional repositories, ensuring the reliability and traceability of the literature synthesised (Sekaran & Bougie, 2020)(Sekaran & Bougie, 2016).

3. Variables and Measurement

The central construct examined in this conceptual review is Environmental, Social, and Governance (ESG) Disclosure. Drawing on prior literature, ESG disclosure is conventionally operationalised using the Environmental, Social, and Governance Disclosure Index (ESGDI) based on the Global Reporting Initiative (GRI) Universal Standards 2021, assessed through content analysis—a systematic research technique used to identify, classify, and quantify sustainability information presented in corporate reports. Under this approach, the extent of ESG disclosure is evaluated by comparing the number of ESG indicators disclosed by a company with the total number of applicable disclosure indicators contained in the GRI Universal Standards 2021. This paper presents the corresponding index formula below as the conceptual measurement basis that future empirical studies on Indonesia's energy sector could adopt:

$$ESGDI = \frac{\sum X_i}{N} \quad (1)$$

where:

ESGDI = Environmental, Social, and Governance Disclosure Index;

X_i = disclosure score for each GRI indicator (1 = disclosed; 0 = not disclosed);

N = total number of disclosure indicators assessed.

In the literature synthesised for this paper, the independent constructs associated with ESG disclosure typically consist of profitability and firm size. Profitability is conventionally proxied using Return on Assets (ROA) because it reflects management's effectiveness in generating earnings from total assets (Brigham & Houston, 2022). Firm size is conventionally proxied using the natural logarithm of total assets (Ln Total Assets), which represents the scale of corporate operations and organizational resources (Hery, 2023).

Table 1. Variable Measurement and Operational Definitions Reported in Prior Literature

Variable	Proxy	Formula	Reference
ESG Disclosure	ESG Disclosure Index (ESGDI)	$ESGDI = \sum \frac{X_i}{N}$	GRI (2021); Krippendorff (2018)

Profitability	Return on Assets (ROA)	$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\%$	Brigham & Houston (2022)
Firm Size	Firm Size (SIZE)	$SIZE = \ln(\text{Total Assets})$	Hery (2023)

4. Conceptual Synthesis Approach and Proposed Empirical Model

As this paper is conceptual in nature, no statistical software or primary dataset is analyzed. Instead, the literature identified through the criteria above is synthesised using a narrative, theory-driven approach: theoretical perspectives, prior empirical findings, sustainability reporting frameworks, and relevant regulatory developments in Indonesia are compared, contrasted, and integrated around the two financial characteristics of interest—profitability and firm size—through the lens of Stakeholder Theory. This synthesis is used to develop propositions regarding the expected relationship between each financial characteristic and ESG disclosure, culminating in an integrated conceptual framework.

To make the propositions developed in this conceptual review empirically testable, the relationships can be expressed as a multiple linear regression model, which is proposed here as a basis for future empirical validation rather than an equation estimated within this paper. The proposed model is formulated as follows

$$ESGDI_i = \alpha + \beta_1 ROA_i + \beta_2 SIZE_i + \varepsilon_i \quad (2)$$

where:

ESGDI = Environmental, Social, and Governance Disclosure Index;

α = constant;

β_1 – β_2 = regression coefficients;

ROA = profitability;

SIZE = firm size;

ε = error term.

Future empirical estimation of this model would allow the direction and magnitude of the relationship between financial characteristics and ESG disclosure to be evaluated statistically. Within the scope of this conceptual paper, however, the propositions are instead evaluated through narrative synthesis of theoretical arguments and prior empirical findings, discussed in relation to Stakeholder Theory, sustainable energy transition, climate governance, and previous empirical studies concerning corporate sustainability reporting (Itan et al., 2025; OJK, 2021).

C. CONCEPTUAL SYNTHESIS AND DISCUSSION

Stakeholder Theory holds that a firm's continuity depends on its ability to satisfy the informational and normative expectations of the various parties affected by its operations, including investors, creditors, employees, regulators, and the surrounding community (Itan et al., 2025). Under this framework, ESG disclosure functions as a communication channel through which a firm demonstrates accountability and reduces information asymmetry with its stakeholders (Aulia et al., 2025). For energy companies, whose operations are closely tied

to resource extraction and greenhouse gas emissions, this communication channel carries particular weight because the intensity of stakeholder scrutiny is inherently higher than in less resource-intensive industries.

1. Profitability and the Capacity to Disclose

Profitability, commonly proxied by Return on Assets, reflects a firm's capacity to generate earnings from its asset base. From a resource-based perspective consistent with Stakeholder Theory, firms that generate higher profits possess greater financial slack to fund sustainability programmes, hire dedicated ESG reporting personnel, and pursue independent assurance of their disclosures. Table 1 shows that this logic is empirically supported in several Indonesian studies (Aulia et al., 2025; Rahmah et al., 2024), yet Machmuddah et al. (2025) find no significant effect in a broader cross-sector sample. A plausible explanation for this divergence is that the relationship may be sector-dependent: in capital-intensive, high-scrutiny industries such as energy, profitable firms may feel a stronger obligation to convert financial capacity into visible sustainability communication, whereas in less scrutinised sectors the link between earnings and disclosure incentives is weaker. This reasoning supports the expectation that profitability is positively associated with the extent of ESG disclosure among Indonesian energy companies.

2. Firm Size and Stakeholder Visibility

Firm size, typically measured as the natural logarithm of total assets, captures the scale of a company's operations and, by extension, its visibility to external stakeholders. Larger firms tend to attract broader media attention, more extensive analyst coverage, and closer regulatory oversight, all of which increase the political and reputational cost of non-disclosure (Gati et al., 2024). The evidence summarised in Table 1 is comparatively consistent: both Gati et al. (2024) and Risal et al. (2024) report a positive relationship between firm size and disclosure, and Abdi et al. (2022) find that size strengthens the value-relevance of ESG disclosure in the airline industry. In the Indonesian energy sector, where the largest listed firms such as Adaro Energy Indonesia, Bukit Asam, and Medco Energi Internasional command substantial market capitalisation and public attention, this pressure is amplified by the sector's direct link to national carbon reduction targets. It is therefore reasonable to expect firm size to exert a consistently positive influence on the extent of ESG disclosure.

Table 2. Synthesis of Prior Studies on Financial Determinants of ESG/Sustainability Disclosure

Variable	Study	Sector / Context	Reported Effect on ESG/Sustainability Disclosure
Profitability (ROA)	Rahmah, Purwohedi, & Handarini (2024)	IDX-listed firms, Indonesia	Positive and significant
Profitability (ROA)	Aulia, Lastari, & Dillak (2025)	Banking, Indonesia & Malaysia	Positive and significant
Profitability (ROA)	Machmuddah, Winarsih, & Yuesti	Cross-sector	Not significant

	(2025)		
Firm Size (Ln Assets)	Gati, Harymawan, & Nasih (2024)	ISSI-listed firms, Indonesia	Positive and significant
Firm Size (Ln Assets)	Risal, Mustaruddin, & Afifah (2024)	Public companies, Indonesia	Positive and significant
Firm Size (Ln Assets)	Abdi, Li, & Càmara-Turull (2022)	Global airline industry	Positive moderating role

Table 3. Average Annual Brent Crude Price and Reference Coal Price, 2023-2025 (USD)

Indicator	2023	2024	2025
Brent crude oil (USD/barrel, annual average)	82.00	80.52	69.14
Reference coal price / HBA (USD/ton, sample months)	-	114.06 (May) / 130.44 (Jul)	107.35 (Jul)

3. The Indonesian Energy Sector in Context

The empirical backdrop against which these two relationships should be interpreted has shifted markedly over the 2021-2025 period. Data compiled from the Indonesia Stock Exchange, as cited in Validnews (2025), show that the number of listed issuers publishing a Sustainability Report rose from 20 percent in 2020 to 94 percent (882 issuers) by 2023, a trajectory driven substantially by SEOJK No. 16/SEOJK.04/2021 on the form and content of annual reports. At the same time, the energy sector experienced considerable commodity price volatility, as illustrated in Table/Figure 1: the Brent crude benchmark declined from an average of USD 82.00 per barrel in 2023 to USD 69.14 in 2025, while the government's reference coal price fluctuated between roughly USD 107 and USD 130 per tonne across sampled months in 2024-2025 (EIA, 2025; Statista, 2026).

This price volatility is analytically important because it directly affects the profitability channel discussed above. A period of declining commodity prices compresses profit margins for coal and oil-linked firms, which, if the profitability hypothesis holds, should be accompanied by a corresponding moderation in the pace of ESG disclosure improvement, even as regulatory pressure through the Sustainable Finance Roadmap and IDXCarbon continues to intensify. This creates an empirically interesting tension: regulatory and stakeholder pressure push disclosure upward regardless of earnings performance, while the profitability channel would predict disclosure to move together with earnings. Testing which of these forces dominates in the energy sector specifically, rather than assuming the cross-sector pattern applies uniformly, is precisely the contribution that a focused quantitative study on IDX-listed energy firms can offer.

Taken together, the literature synthesis and contextual data support two interconnected propositions consistent with Stakeholder Theory: profitability and firm size are both expected to be positively associated with the extent of ESG disclosure, since profitability reflects the financial capacity to fund sustainability initiatives while firm size reflects the organisational capacity and stakeholder visibility that heighten pressure to disclose. Nevertheless, the strength of these associations may still vary across firms depending on commodity price cycles and firm-specific governance quality, warranting direct empirical

testing within the energy sector rather than reliance on findings from manufacturing or banking samples.

D. CONCLUSIONS AND SUGGESTIONS

This paper has examined, through a conceptual review of Stakeholder Theory and prior empirical literature, how profitability and firm size are theorised to shape the extent of ESG disclosure among energy companies listed on the Indonesia Stock Exchange during the 2021-2025 period. The discussion concludes that profitability and firm size are consistently supported determinants, since both proxy a firm's capacity and exposure to stakeholder scrutiny, though the magnitude of their effect may still vary with commodity price cycles and firm-specific governance quality. The Indonesian regulatory trajectory, from POJK No. 51/POJK.03/2017 to the establishment of IDXCarbon in 2023, together with the sharp rise in Sustainability Report adoption nationally, indicates that disclosure pressure in this sector will likely continue to intensify irrespective of short-term commodity price cycles.

Several practical implications follow. For energy company management, the analysis suggests that maintaining profitability is not merely a shareholder concern but also a lever that can be used to expand sustainability transparency and satisfy stakeholder expectations. For investors and creditors, understanding the differentiated roles of profitability and firm size can sharpen the assessment of which financial characteristics genuinely signal governance quality rather than mere compliance. For regulators, the consistency of these two determinants suggests that disclosure mandates can reasonably build on market-based incentives tied to firm profitability and scale, while still monitoring smaller or lower-profitability firms that may otherwise face weaker pressure to disclose.

This paper is limited by its conceptual and literature-based nature; it does not present primary statistical evidence specific to Indonesian energy firms. Future research, including the author's ongoing undergraduate thesis, should therefore test these propositions empirically using panel data from the 32 IDX-listed energy companies that meet data-completeness criteria over 2021-2025, applying multiple linear regression with ROA and firm size as independent variables and a GRI-based ESG Disclosure Index as the dependent variable. Such a study would provide the first sector-specific empirical evidence needed to confirm or refine the propositions developed here.

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