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# Indonesia Emission Cut 2030: Is Carbon Transparency the Optimal Strategy for Companies?

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ABSTRACT

This study analyzes the impact of Carbon Emission Disclosure (CED) on firm value using four methods: Price Earning Ratio (PER), Price to Book Value (PBV), Stock Return, and Tobin's Q. Additionally, the role of Financial Distress as a moderating variable is examined. The sample consists of 15 energy sector companies listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023. The analysis method used is the Fixed Effects Model (FEM) and Moderated Regression Analysis (MRA). The results show that CED has a significant positive effect on firm value as measured by Tobin's Q. Financial Distress moderates the relationship between CED and firm value, with a positive effect under green conditions and a negative effect under red conditions when measured by PBV and Tobin's Q. These findings emphasize the importance of considering internal corporate and financial conditions in carbon transparency and firm value assessment, particularly in the context of emission reduction efforts in Indonesia by 2030.



## 1. Introduction

This study focuses on the influence of Carbon Emission Disclosure (CED) on the value of companies within Indonesia's energy sector, which is one of the largest contributors to carbon emissions. The selection of this topic was triggered by Indonesia's commitment to the Paris Agreement, which aims to reduce greenhouse gas emissions by 29-41% by 2030. As global concerns about climate change intensify, there is a growing expectation for companies to be transparent about their environmental practices. Investors increasingly seek assurance that the companies they invest in are committed to sustainability. Therefore, understanding the relationship between CED and company value is crucial, especially in high-emission industries like energy. Existing research generally supports the notion that carbon disclosure can positively impact a company's value by building trust with investors and signaling a commitment to sustainable practices. However, these studies have primarily focused on companies in less carbon-intensive industries or those not facing significant financial challenges. This leaves a gap in understanding how CED affects companies that are both major emitters of carbon and are under financial distress. The potential risks and opportunities of carbon disclosure in such contexts remain underexplored.

This study aims to fill this gap by investigating whether the benefits of carbon transparency—such as increased investor confidence and improved company valuation—hold true for energy companies that are experiencing financial distress. Financially distressed firms might prioritize short-term survival over long-term sustainability, potentially affecting the relationship between CED and company value. By examining this dynamic, the study seeks to determine whether transparency in carbon emissions can still lead to enhanced firm value under financial strain. In summary, the objectives of this research are twofold: first, to assess the impact of Carbon Emission Disclosure on the value of energy companies listed on the Indonesia Stock Exchange; and second, to explore the moderating role of financial distress in this relationship. Through this analysis, the study aims to provide insights into the strategic importance of carbon disclosure for companies operating in high-emission sectors under financial pressure, thereby contributing to the broader discourse on corporate sustainability and financial performance.

## 2. Materials and methods

The research was conducted between 2019 and 2023, focusing on companies within Indonesia's energy sector listed on the Indonesia Stock Exchange (IDX). The study employed a purposive sampling technique, selecting companies that published complete annual and sustainability reports during the study period. A total of 15 companies were identified as meeting the criteria, resulting in 75 observations over the five-year period. For the analysis, financial reports, annual reports, and sustainability reports were utilized, all of which were sourced from the official IDX website and the companies' own websites. The study applied multiple linear regression analysis using the SPSS software to determine the impact of Carbon Emission Disclosure (CED) on firm value, with Financial Distress considered as a moderating variable. The Carbon Emission Disclosure was measured using a checklist based on Choi et al., which required companies to disclose at least one item related to carbon emissions.

In the theoretical framework, the study builds upon signaling theory, which suggests that firms can signal their quality to the market through voluntary disclosures like CED. This theory provides the foundation for analyzing how CED impacts firm value, particularly under conditions of financial distress. The practical application of this theory was tested through empirical analysis, using the collected data to verify the relationships between the variables. Calculations were carried out to assess the financial distress of the companies using the Altman Z-score, which categorizes companies into safe, grey, or distressed zones based on their financial ratios. The relationship between CED and firm value was then examined, considering the interaction effect of financial distress. The findings provide insights into how transparency in environmental practices can influence firm valuation, especially for companies in the energy sector facing financial challenges.

## 3. Results and Discussion

The analysis of the impact of Carbon Emission Disclosure (CED) on firm value revealed several significant findings. The results demonstrated that CED has a positive and significant effect on firm value, as measured by multiple financial metrics including Price to Earnings Ratio (PER), Price to Book Value (PBV), Tobin’s Q, and stock returns. This indicates that companies that are more transparent about their carbon emissions are generally perceived more favorably by the market, which in turn enhances their valuation.

Further analysis showed that the influence of CED on firm value is moderated by the financial distress status of the companies. Specifically, companies categorized under a "green" financial distress status exhibited a stronger positive relationship between CED and firm value. This suggests that when a company is in relatively good financial health, its efforts to disclose carbon emissions can significantly enhance investor confidence and, consequently, firm value. Conversely, companies in a "red" financial distress status showed a weaker or even negative relationship, implying that financial struggles can diminish the positive effects of CED.

These findings are consistent with signaling theory, which posits that firms use CED as a signal to the market about their commitment to sustainable practices. When this signal is credible, particularly in financially stable companies, it can lead to higher valuations. However, for firms in financial distress, the market may perceive CED as less credible or view the company's financial struggles as a more pressing concern, which diminishes the impact of carbon disclosure on firm value.

Overall, the results support the hypothesis that CED positively affects firm value, but the strength of this relationship is contingent on the company's financial health. This underscores the importance for companies to not only focus on environmental transparency but also maintain financial stability to fully capitalize on the potential benefits of CED.

## 4. Conclusion

This study concludes that Carbon Emission Disclosure (CED) positively and significantly impacts the firm value of companies within Indonesia's energy sector. The results indicate that companies with transparent carbon emissions reporting are generally valued higher by the market. Moreover, the relationship between CED and firm value is moderated by the financial distress status of the firms. Firms in good financial health benefit more from CED, while those under financial distress see a diminished impact of CED on their firm value. This highlights the importance of financial stability in maximizing the benefits of environmental transparency. For future research, it is recommended to include additional variables such as environmental performance and industry-specific characteristics to further understand the dynamics between CED and firm value. Companies, especially those in the energy sector, should continue to enhance their carbon emission disclosures while simultaneously strengthening their financial health to fully leverage the potential benefits of transparency in environmental practices. This approach will not only improve market valuation but also contribute to sustainable business practices aligned with global environmental goals.

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