Does the COVID-19 Pandemic Affect the Transparency of Indonesian Industrial Companies in Managing Energy, Water, Carbon Emissions, and Wastes?

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Abstract. The COVID-19 pandemic affected Indonesia's economic growth which was marked by an economic growth of -2.1% in 2020. This economic contraction also affected the growth of industrial companies in Indonesia in the same year by -2.93%. These minus growths are also likely to reduce the transparency quality of industrial companies in managing their environmental impacts. This study aims to identify the effect of COVID-19 on the transparency of industrial companies in managing energy, water, carbon emissions, and waste. By analyzing the annual reports of 125 industrial companies operating in Indonesia, it was found that there was a significant decrease in the number of industrial companies reporting on energy, water, carbon emissions, and waste management in their annual reports. The number of companies reporting energy and water management decreased significantly during the pandemic, while the decline in the number of companies reporting carbon and waste emissions was not statistically significant. The Ministry of Forestry and Environment and the Indonesian Institute of Accountants need to facilitate industrial companies to disclose environmental reports in their annual reports.

Keywords: Environmental disclosure · industrial company · impacts of COVID-19 · Global Reporting Initiative

1 Introduction

The COVID-19 pandemic hitting all countries in the world has a negative impact on almost all sectors, including the economy and the environment. In 2018, 2019 Indonesia's economic growth was 4.97% and 5.02%, respectively [1]. In the following year, Indonesian economy contracted by 2.1% [2]. This negative economic growth also affected the growth of the industrial sector by -2.93% [3]. During the pandemic industries were experiencing financial and non-financial difficulties. Therefore, COVID-19 pandemic is likely to affect the transparency of industrial companies in managing energy, water, carbon emissions, and waste.

Energy plays an important role in industrial development. Until now, the use of energy from fossil fuels still dominates industrial growth [4]. Water is also pivotal in

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sustaining industrial growth. Therefore, it is necessary to carry out optimal management of energy and water resources so that the negative impact of industrial growth can be minimized.

Previous research found that industry growth has a negative impact on water resources and the government needs a lot of money to deal with this pollution [5]. Carbon emissions are closely related to the use of fossil fuels by industries. Indonesia's carbon emissions tend to increase every year [6]. Industrial waste is also a major concern for the Indonesian government, because the number of industries polluting water is already alarming [7].

This study aims to determine the impact of COVID-19 on the transparency of Indonesian industrial companies in managing energy, water, carbon emissions, and waste. The COVID-19 pandemic in Indonesia reached its peak in 2020 and 2021. Therefore, this research focuses on the disclosure of energy, water, carbon emissions, and waste in 2020 with disclosures in 2018 and 2019 as a comparison. The focuses of this study are energy, water, carbon emissions, and waste disclosure since these categories are important factors in environmental sustainability.

2 Research Method

This study uses the documentation method by scrutinizing the financial statements published by 125 industrial companies operating in Indonesia. This study conducts content analysis on financial reports and identifies the disclosures of information on energy, water, carbon emissions, and waste management by industrial companies operating in Indonesia. Content analysis is carried out on financial reports published in 2018, 2019, and 2020.

This research uses descriptive percentage analysis and one-way ANOVA analysis. Descriptive analysis is intended to find out the extent of companies disclose information about energy, water, carbon emissions, and waste. The one-way ANOVA analysis followed by post hoc LSD analysis aims to determine the differences in energy, water, carbon emissions, and waste disclosures in 2018, 2019, and 2020. Thus, the increase and decrease in disclosure analyzed by descriptive percentage will be strengthened by statistical analysis. Thus, this analysis can determine the level of significance of both decreasing and increasing disclosures.

3 Results and Discussion

3.1 Descriptive Analysis

The results of the descriptive analysis show that companies that disclose information on energy decreased in 2020 to 56.8% from 68.8% in 2019 and 66.4% in 2018. The number of industrial companies that convey information on water resources management fell to 12.8% in 2020 and 18.4% and 42.4% in 2019 and 2018. Likewise, reporting on carbon emissions in 2020 decreased to 71.2% from 80.0% in the previous year. The percentage of industrial companies that report waste management in their annual reports tends to be stable at around 80%. For clarity, the following Table 1 provides information on the percentage of Indonesian industrial companies reporting energy, water, carbon emissions and waste management in their annual reports.

Table 1. Industry Reporting Environmental Management

Disclosure Category	2018	2019	2020
Energy	66.4%	68.8%	56.8%
Water	42.4%	18.4%	12.8%
Carbon Emission	73.6%	80.0%	71.2%
Waste	80.8%	83.2%	80.0%

Source: Data Analysis

Table 2. Comparison of Energy Disclosure

Year Comparison	Mean Difference	Sig.	F
2018–2019	-0.024	0.692	2.116 ($p = 0.113$)
2018–2020	0.096	0.114	
2019–2020	0.120	0.061	

Source: Data Analysis

3.2 Energy Disclosure

The results of one-way ANOVA analysis show that the number of industrial companies that disclose their energy is no different from 2018 to 2020 with an indication of the F value of 2,116 ($p > 0.05$). The results of the post hoc analysis with LSD also show that there is no significant difference in the number of companies reporting energy. The most notable difference is the energy disclosure in 2018 and 2020 with a mean difference of 0.120 ($p = 0.061$). The following Table 2 presents the results of a comparative analysis of energy disclosure by industrial companies in Indonesia.

3.3 Water Disclosure

The number of companies that disclose water management from 2018 to 2020 is statistically different with the F value of 18,178 ($p < 0.05$). However, the post hoc test showed that the number of companies that disclosed water management in 2018 and 2019 was significantly different with a mean difference of 0.240 ($p < 0.05$). Likewise, the comparison between 2018 and 2020 is significantly different with a mean difference value of 0.296 ($p < 0.05$). However, the comparison between 2019 and 2020 does not show a significant coefficient with a mean difference of 0.056 ($p > 0.05$) (Table 3).

3.4 Carbon Emission Disclosure

The carbon emission disclosures of industrial companies in Indonesia did not significantly changes from 2018 to 2020. The F value shows 1.376 ($p > 0.05$). The results of the post-hoc analysis also show that there is no significant difference in emission disclosures

Table 3. Comparison of Water Disclosure

Year Comparison	Mean Difference	Sig.	F
2018–2019	0.240	0.000	18.178 ($p < 0.05$)
2018–2020	0.296	0.000	
2019–2020	0.056	0.284	

Source: Data Analysis

Table 4. Comparison of Carbon Emission Disclosure

Year Comparison	Mean Difference	Sig.	F
2018–2019	-0.064	0.244	1.376 ($p > 0.05$)
2018–2020	0.024	0.662	
2019–2020	0.088	0.109	

Source: Data Analysis

Table 5. Comparison of Waste Disclosure

Year Comparison	Mean Difference	Sig.	F
2018–2019	-0.024	0.628	0.227 ($p > 0.05$)
2018–2020	0.008	0.872	
2019–2020	0.032	0.518	

Source: Data Analysis

between 2018 and 2019 and 2020. All mean difference values have a significant level above 0.05. For more details, the following Table 4 depicts the results of the one-way ANOVA analysis with the post hoc test.

3.5 Waste Disclosure

The results of the analysis show that there is no significant difference in the number of companies that disclose water management from 2018 to 2020. The F value of the ANOVA analysis is 0.227 ($p > 0.05$). The LSD post hoc test also showed a very small mean difference with a significant value above 0.05. Table 5 provides more complete information on the ANOVA test and post hoc test on waste disclosure.

3.6 Combined Disclosures

This study attempts to test the combination of disclosures from Energy, Water, Carbon Emission, and Waste. The results of the analysis show that there is a significant difference in combined disclosure in 2018, 2019, and 2020. The F value of the one-way ANOVA

Table 6. Comparison of Combined Disclosure

Year Comparison	Mean Difference	Sig.	F
2018–2019	0.128	0.393	4.222 ($p < 0.05$)
2018–2020	0.424	0.005	
2019–2020	0.296	0.049	

Source: Data Analysis

shows a figure of 4.222 ($p < 0.05$). The results of the post hoc test with LSD show that there is no difference in the combination of disclosures between 2018 and 2019's disclosures with a mean difference of 0.128 ($p > 0.05$). However, this analysis shows that there is a significant difference between the combined disclosures in 2018 and 2020 with a mean difference of 0.424 ($p < 0.05$). Likewise, the difference in the mean difference in 2019 and 2020 with a mean difference of 0.296 ($p < 0.05$). Thus, the hypothesis proposed by this study that there is a negative impact of COVID-19 on environmental disclosure is partially accepted. For more details, Table 6 provides a summary of the results of the analysis.

3.7 Discussion

Environmental disclosure by industrial companies operating in Indonesia is mandatory through OJK regulations [9] as a form of the company's commitment to implementing transparent environmental management. Environmental disclosure has become mandatory for companies, in fact environmental disclosure is still not satisfactory.

The results of the analysis show that during the pandemic there was a decrease in the number of industrial companies reporting on their energy disclosure. The results of statistical analysis showed no significant decrease in the number of companies reporting their energy use. However, the number of industrial companies reporting their energy management is only 56.8%. The number of fossil energy sources is depleting significantly, but on the other hand the energy demand for industry is increasing [10]. Therefore, transparency in energy management by industrial companies is very necessary.

The transparency of water management by industry fell drastically during the pandemic. Only 12% of industrial companies disclose water management in their annual reports. The results of statistical analysis also show that there is a decrease in the number of companies disclosing water management during the pandemic. Given the high demand for clean water for industry [11], the government, Institute of Indonesia Chartered Accountant (IAI), and other parties need to appeal to companies to improve the quality of water management in a more sustainable manner. Uncontrolled exploitation of groundwater will cause various environmental problems [12–14].

Along with the increasing use of fossil energy by industrial companies, the carbon emissions released into the atmosphere also increase. However, the disclosure of carbon emissions during the pandemic period is still considerably low, only 71.2%. The percentage change from 2018, 2019, and 2020 is not statistically significant. If it is related to the government's target to reduce carbon emissions by 29% in 2030 [18], then law

enforcement needs to be carried out by the government so that industrial companies implement carbon emission management properly. Affirmation and strict monitoring of PROPER implementation [19] should be carried out immediately. In addition, the use of green energy [20] and carbon taxes [21] can be an alternative for reducing carbon emissions in Indonesia.

Disclosure of waste by Indonesian industrial companies has been good with an achievement of around 80%. Although there has been a decrease in the number of industrial companies disclosing waste in their annual reports during the pandemic, this decline in percentage is not significant. However, river water pollution from industry still occurs in various regions in Indonesia [22–24].

Overall, it can be concluded that the disclosure of energy, water, carbon emissions, and waste by industrial companies decreased significantly during the pandemic. Besides that, the development of disclosure of this category every year is still low even though environmental disclosure is mandatory for every company. Therefore, the government, OJK, Ministry of Forestry and Environment, and IAI need to continue to facilitate and enforce law to increase transparency in the management of energy, water, carbon emissions, and waste by industrial companies. In addition, this facilitation and law enforcement can also support the government in reducing carbon emissions by 29% in 2030 [18].

4 Conclusion

In general, during the COVID-19 pandemic there was a decrease in the number of industrial companies disclosing energy, water, carbon emissions, and water in their annual reports. Water disclosure dropped significantly during the COVID-19 pandemic followed by waste disclosure. The decrease in the number of industrial companies that disclose carbon emissions and waste can be considered insignificant.

The number of companies disclosing energy, water, carbon emissions, and waste over the last three years is still considered unsatisfactory. During the COVID-19 pandemic, the disclosure of the four GRI Indicators was still below 80% except for waste disclosure. To increase corporate accountability to the environment and society, the Ministry of Forestry, and the Environment together with the Indonesian Institute of Accountants needs to require companies to disclose environmental management in the company's annual reports. By disclosing energy, water, carbon emission, and waste, industrial companies would provide information enabling stakeholders to monitor companies' activities. In addition, the companies also would improve their commitment to the environment and community.

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