

# ***Carbon Information Disclosure Practice in Indonesia: A Comprehensive Study from Manufacturing and Mining Industry***

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**Abstract**—This research aims to provide an overview about the carbon information practice in Indonesia, particularly in manufacturing and mining industry. The sample of this research was the manufacturing companies and mining companies which listed in SRI-KEHATI Index and participated in SRA Award. This research examined the important factors to support the carbon information practice. Using the multiple analysis regression, this research has found the internal factors and the external factors to support the company's management disclose their carbon information. The variables in this research are environmental management system, the institutional ownership, stakeholder's pressure, the company's sustainability profile, and the company's size as the independent variables. This research found that the environmental management system and the company's size are the important factors that support the companies to disclose their carbon emissions disclosure. The result of this research can give the biggest contribution to develop the practice of carbon information disclosure for the companies in Indonesia.

**Keywords**—carbon information disclosure, company's sustainability profile, company's size, environmental management system, institutional ownership, stakeholder's pressure.

## I. INTRODUCTION

Carbon emission information disclosure from business activities is an important activity that should be done by the management of the company. Information regarding the carbon emissions which generated from business activities is one of the important information that should be disclosed by the company's management. Information about the level of carbon emissions which produced by the company is an important type of information and this information is very useful in the context of the decision-making by the company's stakeholders [1]. Previous research explained that the information reporting activity regarding carbon emissions has been on an upward

trend in recent decades and the effects of this trend has a high connection with the company's financial performance [2]. The research results from previous research proved that the level of disclosure of corporate carbon emissions is positively correlated with the level of corporate profitability (ROA) [3]. Previous research examined the company's carbon emissions reporting and its relationship with the financial value of the company, especially companies in South Africa [3]. When the information about carbon emissions has a direct implication on the financial condition of the company, then it implies that this kind of information would be a crucial concern for the company's stakeholders.

This research is focused on finding the factors that affect the disclosure of carbon emissions, particularly in companies that are included in the manufacturing industry and the mining industry in Indonesia. Determination of the independent variables in this research is based on previous research which examined the factors that affect the disclosure of carbon information on the company in Italy [4]. Previous research used the independent variables, namely (1) the company's environmental committee, (2) the level of institutional ownership, and (3) the presence of the independent board. This research tries to do the development of the previous research, where this research using independent variables, namely the applicable environmental management system in the company, the level of institutional ownership in the company, the pressure of the stakeholders of the company, the company's sustainability profile, and the size of the company. This research will also analyze the obstacles and challenges to the disclosure of carbon emissions in Indonesia. Previous research explained that in the context of the company's disclosure of carbon emissions, the company's management need a comprehensive audit process to ensure carbon emission information will be disclosed [5]. The result from previous research can be used as guidelines that those who are outside

the enterprise system, for instance, accountants and auditors, have an important role to establish carbon emission disclosure of a good company [5]. This research will develop the role of the parties which are outside the company to help improve the quality of information disclosure of carbon emissions which produced by the company's management. The implications of this study are expected to provide insight into trends disclosure of carbon emissions, especially in the manufacturing industry and the mining industry in Indonesia. Another implication of this research is expected to produce a conceptual framework to improve the quality of carbon emissions information which produced by the company's management.

Based on this research purpose, then there are several benefits from this research. Increasing understanding about the condition of the disclosure of carbon emissions, particularly in companies that are included in the manufacturing industry and the mining industry in Indonesia. The understanding in this context can be an understanding of the quality of the information disclosed, obstacles and challenges in the disclosure of information about carbon emissions, and the things that need to be improved in the context of disclosure of carbon emissions information for companies in Indonesia. This research helps to shape the quality of the information in carbon emissions to be better quality than before. Information regarding the carbon emissions which generated from business activities is a piece of essential information required by the company's stakeholders. The authors believe this research can be useful to establish a framework that can be used by the company's management to improve the quality of corporate carbon emissions information.

## II. LITERATURE REVIEW

### A. Carbon Accounting Concept

The concept of trading carbon emission rights is a relatively new concept that is used as an economic tool to make efforts to maintain environmental sustainability [6]. This concept set their pollution quotas or limits the number of carbon emissions that are allowed for each entity. Entities that receive emission rights can sell his rights if it can operate with the number of gas emissions under the allowed quota. Instead, entities are not capable of operating by the stipulated quota of carbon emissions can buy extra rights to emit carbon from entities that have excess quotas. Therefore, the mechanism of market forces will eventually prevail and this process will follow the basic principles of economics.

To solve the trading carbon problems, the International Financial Reporting Interpretations Committee (IFRIC) created the guideline and this guideline was based on the International Financial Reporting Standards (IFRS) that already exist by issuing an interpretation of the treatment of carbon emission rights trading mechanism. Based on IFRIC 3 guideline which issued at the end of 2004, the accounting treatment of carbon emission rights which allocated by the government and obtained through the acquisition are recognized as intangible assets following IAS 38 (Intangible

Assets). License/rights provided by the government is free of charge and this license would initially be recognized as an intangible asset at fair value and an account of his opponent is revenue deferred from government grants in accordance with IAS 20 (Accounting for Government Grants and Disclosure of Government Assistance). Companies may choose to record the intangible asset at cost or fair value (as long as the active market to trade these permits there).

On the other hand, previous research suggested there are four approaches to accounting systems compared in the calculation of GHG emissions (Green House Gases) [7]. First, using the ideal accounting system. In this system, the payment for carbon sequestration occurs when services are provided. The second approach is a tone-year method which does not require the exchange of carbon credit after harvest because the payment occurs only based on "equality" amount of emissions avoided permanently during a given year. Payments are made each year based on the current stock. Other accounting methods are discussed and consists of a carbon credit payment from the project begins until the current period [8].

### B. Carbon Emissions Reporting Concept

Reporting or disclosure of information on carbon emissions from business activities is a commitment of the company's management to provide comprehensive information to the company's stakeholders. Previous research found that the disclosure of carbon emissions and the value of the company has a good correlation and the results of this study have implications for shaping management commitment in the context of reducing carbon emissions [9]. From the previous research result, we can understand that the management should consider that the disclosure of information on carbon emissions will help to increase the company's value and reputation of the company's stakeholders. Previous research explained how or reframing that can be done by the company's management in the context of disclosure of information on carbon emissions [10]. Previous research explained that the company's management should not reveal obstacles and challenges in preparation of the disclosure of carbon emissions and report on the specific type of disclosure in carbon emissions [10]. Previous research from examined the carbon disclosure practices at companies in India and this study found that there are variations that vary conducted by the company's management in the context of the disclosure of carbon emission information [11]. Previous research suggested that to improve the quality of carbon emissions disclosure, the policy-maker should create the appropriate guideline for the reporting process [11].

### C. Research Framework and Hypothesis

This research framework is based on the concept that the level of disclosure of carbon emissions can be influenced by various factors. This study takes four independent variables, namely (1) the company's environmental management system, (2) the level of institutional ownership in the company, (3) the level of pressure from the company's stakeholders, (4) the

company's sustainability profile, and (5) the company's size. The disclosures of corporate carbon emissions are important information for the company's stakeholders. The company's management can build a reputation of an institution or a company's reputation on the quality of disclosure which provided to all stakeholders [12]. The framework of this study is based also on the legitimacy theory and stakeholder theory. Legitimacy theory and stakeholder theory considers that the company's management should always maintain good relations with all stakeholders of the company. Disclosure of information about carbon emissions is one way that can be used by the company's management to provide the information which required by the company's stakeholders.

Based on the research background, then this research suggests five hypotheses. These hypotheses are elaborated with some explanations. The environmental management system can be understood as a tool or technique which performed by the company's management in the context to control the company's business activities that may adversely affect the environment around the company. The implementation of an environmental management system in the operational activities of the company indicates that the company's management has a high commitment and permanent vision to reduce the adverse effects of corporate activity on the environment.

The level of institutional ownership can be defined as the percentage of the company's stocks which hold by the institutional investors. Current institutional investors are very concerned and very attentive to the kinds of financial information and non-financial information which disclosed by the company's management. The level of institutional ownership in the company also has the function of supervision and monitoring process. Oversight and monitoring function are crucial process to monitor the management's policy and to keep the interests of institutional investors. In the context of disclosure of carbon emissions, the institutional investors will support the company's management to disclose this information with good quality. The first reason is information on carbon emissions reflects the management's support on issues of environmental protection and this is kind of good news for the market information. The companies engaged in the manufacturing and mining industries are particularly vulnerable included in the issues of environmental degradation and carbon emissions disclosure will show that the company's management has a vision of a high order to the company's business activities under the regulations related to the environment. The second reason is institutional investors will tend to encourage management companies to disclose information on carbon emissions to reduce the monitoring and supervision by the other groups of stakeholders.

Stakeholders of the company are the group that is crucial for the company, particularly in the context of reporting information on carbon emissions. Business practices conducted by the company's management can produce negative impacts on the environment and the impact of these activities will generate negative externalities for the company's stakeholders. The stakeholder's pressure is one of the external

factors that could push the company's management to disclose carbon emissions information. The company's sustainability profile has a very large role in the context of disclosure of information about carbon emissions. The company's sustainability profile is a factor which derived from the internal sources that can improve the company's management commitment to disclose carbon emissions information. Previous research explained that the company's sustainability profile can be seen from the company's management report, CSR report, which is separate from the company's financial statements, the CSR committee or the environment committee on the organizational structure of the company, and the audit process for the CSR report or the sustainability report of the company [13]. Based on the concept of good corporate governance, management should practice good governance, in particular also concerns the business practices of companies that deal with environmental issues. Their CSR committee or the environmental committee in the organizational structure of the company indicated that information about the environment (including disclosure of carbon emissions) is crucial information for the company's stakeholders. Generally, the company which has released a sustainability report will try to convince the users of a sustainability report that the information in the sustainability report has been reliable and trustworthy. A process that can help ensure that the information in the sustainability report has been reliable and trustworthy is the auditing process for the corporate sustainability report. Other variables that are assumed to affect the disclosure of carbon information is the size of the company. Companies which have a large size (the size of the company can be reflected by market capitalization and total assets) will tend to provide comprehensive information to all stakeholders of the company. Based on the hypothesis explaining preparation which has been compiled, the hypotheses of this research are

- H<sub>1</sub>: The level of company's environmental management system has a positive connection with the level of carbon emissions disclosure.
- H<sub>2</sub>: The level of institutional ownership positively affects the level of carbon emission disclosure.
- H<sub>3</sub>: The level of stakeholder pressure has a positive connection with the level of carbon emissions disclosure.
- H<sub>4</sub>: The corporate sustainability profile has a positive connection with the level of carbon emissions disclosure.
- H<sub>5</sub>: The company's size has a positive connection with the level of carbon emissions disclosure.

### III. RESEARCH METHODS

The design of this study is a research that tries to gain a new understanding of the carbon emissions disclosure, particularly for companies in the manufacturing industry and the mining industry in Indonesia. This study used a quantitative paradigm to identify the first issue on the topic of this research. Quantitative paradigm is used to find the main factors that affect the disclosure of carbon emissions. The results from the

first part of this research will be used as a guide to developing concepts and strategies to improve the quality of disclosure of carbon emissions information. From the first stage of this research, will be known what factors that influence the quality of information disclosure of carbon emissions, particularly in the manufacturing and mining industries. The results of this research are expected to support the policymakers, especially policymakers and regulatory in the context of the disclosure of carbon emissions information. The reference [14], [2], [10], are the basic and main reference for this research. This research is expected to give the new perspective about the main factors that support the carbon emissions disclosure in Indonesia.

The object of this study is the reporting process on carbon emissions in the manufacturing industry and the mining industry in Indonesia. The sample used in this study was a sustainability report that have been published by companies incorporated in the manufacturing industry and the mining industry, particularly companies in the manufacturing industry and mining which competed in Indonesia Sustainability Reporting Award (ISRA) in 2014, 2015, 2016, 2017 and 2018 and companies in the manufacturing industry and mining industry which listed on the SRI-KEHATI index from 2014 until 2018. The ISRA competition is a corporate sustainability report assessment competition which conducted by the National Center for Sustainability reporting (NCSR). Basic reason why this research used sustainability report from manufacturing industry and the mining industry which participated the ISRA competition and listed on SRI-KEHATI index was the assumption that the reports more contain comprehensive information and the selection process in the competition have shown the quality of sustainability reports which produced by the company's management. Based on the data contained in the official website of ISRA, there are information about the company in the manufacturing industry and the mining industry which participated in ISRA competition. The list of companies listed in the SRI-KEHATI index can be obtained through the official website of SRI-KEHATI index. Based on the collecting data method, this research used 30 companies as a research sample. Therefore, this research has 150 observations from the 30 companies. The sustainability report from the 30 companies will be analyzed to be used as a database to determine the level of disclosure of carbon emissions. This study will also use other statements which published by the company's management throughout that report can reflect the level of carbon emissions disclosure.

Environmental management system variable was measured by indicators that contained in the earlier study or previous literature. Institutional ownership is the percentage of ownership of a company owned by another institution. In this research, institutional ownership was measured by the percentage of the value of shares which owned by institution divided by the total number of shares outstanding. The stakeholders pressure variable in this study was defined as the pressure from the government and pressure from the majority shareholders. Measurement of this variable is the combination from the total shares which owned by the government and the total stock from the majority shareholder. The corporate sustainability profile variable was based on two things, the company publishes a separate CSR information regarding the company's financial statements and the company's

organizational structure has a CSR committee or parts that have tasks related to issues of sustainability and the environment (including carbon emission information). The companies that perform publications about their CSR activity, has a CSR committee, and doing the audit process on the CSR report or sustainability report will be given a value of 1, and if it does not have to be given a value of 0. The measurement of corporate sustainability profile variable is based on previous research which used a variable of corporate sustainability profile in research on carbon emission disclosure on companies in South America [13]. The company's size variable was measured based on the company's total assets. The measurement criteria of carbon emissions disclosure variable are based on previous research that created the indicators for the disclosure of carbon emissions. Indicators from the carbon emissions disclosure will be examined in the corporate sustainability report using the content analysis method. Multiple regression equations were used in this research:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + e$$

or

$$CED = \alpha + \beta_1EMS + \beta_2IO + \beta_3PRESS + \beta_4CSP + \beta_5SIZE + e$$

with:

CED (Y)	= Carbon Emission Disclosure Level
$\alpha$	= Constanta
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$	= Regression Coefficients
EMS (X1)	= Environmental Management System
IO (X2)	= The Institutional Ownership Level
PRESS (X3)	= The Stakeholder's Pressure Level
CSP (X4)	= Company's Sustainability Profile
SIZE (X5)	= The Company's Size
e	= Residual Error

#### IV. RESULTS AND DISCUSSION

##### A. Hypotheses Testing Results

The descriptive statistics analysis purposes are to provide an overview of the characteristics or descriptions of data which used in this study. The descriptive statistics analysis of the data in this study is to find the range, the minimum value, the maximum value, the sum value, and the meaning of the data. Based on the test results of the descriptive statistics, it can be seen that the minimum value for the level of stakeholder's pressure is 0. It means that there are companies that not receive monitoring or supervision from the company's stakeholders. The mean of the data showed that the majority of companies in the sample had a great institutional ownership level (the value is 0.7108). It means that the average firm in the sample of this research has a great level of institutional ownership. Results from the classical assumptions testing explained that the research data was appropriate with the assumptions and the data had a normal distribution. Based on the K-S test results, it

can be seen that the value of Asymp. Sig. (2-tailed) was equal to 0.7. The regression model is perfect if the value of Asymp. Sig. (2-tailed) at the K-S test is greater than 0.05. It can be concluded that the regression model is appropriate with the assumptions of normality. The K-S test results have provided a more objective picture that the regression model in this study had to meet the assumptions of normality. The test results showed that the value of adjusted R<sup>2</sup> was equal to 0.529. It means that 52.9% from the all independent variables can use to explain the carbon emission disclosure level from the company. The further research can consider to use another independent variable to increase the value of adjusted R<sup>2</sup>.

The individual parameter significance test is to measure or indicate the effect of each independent variable on the dependent variable. The results of this test can also explain the research hypothesis. From the results of significance test of individual parameters can be concluded whether the research hypothesis is accepted or rejected.

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.851	.146		-5.824	.000
	EMS	.820	.355	.133	2.311	.022
	CSP	-.018	.014	-.074	-1.294	.198
	IO	-.082	.046	-.108	-1.783	.077
	PRESS	-.283	.067	-.262	-4.217	.000
	SIZE	.044	.004	.605	10.269	.000

a. Dependent Variable: CED

Fig. 1. The Hypothesis Testing Result

The results of hypothesis testing can be known based on the value of unstandardized coefficients and significant value. From the four independent variables which included in the regression model, it can be seen that the variable of CSP (corporate sustainability profile) and the IO variables (the level of institutional ownership) have a significance value respectively 0.198 and 0.077 (greater than  $\alpha = 0.05$ ). Based on the significant value, it can be concluded that the company's sustainability profile variable and the level of institutional ownership variable are insignificant or no effect on the disclosure of carbon emission information which conducted by the company.

The EMS variable (environmental management system), the PRESS variable (stakeholders' pressure) and the SIZE variable (the size of the company) have a significance value 0.022, 0, and 0 (smaller than  $\alpha = 0.05$ ). Based on this result, it can be concluded that the environmental management system variable, the variable size of the company, and the stakeholders pressure variables are significant with the level of carbon disclosure. To see the relationship between variables is positive or negative is based on the value of unstandardized coefficients. The SIZE variable (the size of the company) has a value of unstandardized coefficients of 0.044 which means that the company's size has a positive effect on the carbon emission disclosure level. It means the "big" company will have a high capability to report their carbon emissions information. The PRESS variable (the stakeholder's pressure) has the unstandardized coefficients value of -0.283. It can be defined

that the variable pressure of stakeholders has a negative correlation with the ability of firms reporting their carbon information. It means if the pressure of the stakeholders of the company increases, the companies tend to not disclose the carbon emissions from its activities (the company's ability to perform carbon emissions reporting into a low level). The EMS variable (environmental management system) has a value of 0.820. This value can be defined that variable of environmental management system has a positive influence on the disclosure of carbon emissions which produced by the company. It means that if the company's management has a strong commitment to implementing a good quality of environmental management system, this process will increase the the quality of their carbon emission disclosure.

**B. Results Discussion**

Based on the hypothesis testing that has been done, it can be concluded that the hypothesis test results indicate that the first hypothesis is accepted. It means that the environmental management system has a positive connection on carbon emissions disclosure which made by the company. This research result supports the previous research which states that the environmental management system has a positive correlation with the level of carbon emission disclosure [15]. The perfect environmental management system indicates that the company's management had a high commitment to increase the company's concern for the environment and to improve the quality of the company's environmental performance. Directly, the environmental management system will be the basis for the company's management in the context to improve the environmental performance of the company. Factors that come from internal sources is one of the biggest factors that can encourage management to undertake disclosure of carbon emissions. The environmental management system is example of factors that come from the internal company and when the company's management is committed to build a perfect environmental management system, the company's management will disclose this environmental performance in corporate report (including in the corporate sustainability report).

Based on the hypothesis testing that has been done, it can be concluded that the second hypothesis is rejected. It means that the level of institutional ownership has no effect on carbon emissions disclosure which made by the company. Previous research said that environmental problems were also the forerunner of the presence of social and environmental accounting [16]. This is important because the company needs to deliver relevant information about social activities and its role in preserving the environment not only to shareholders but also to the other stakeholders, such as government, non-governmental organizations, as well as society in general. Companies that perform carbon disclosure will allow stakeholders to make informed decisions about the state of corporate carbon emissions performance, force companies to reduce carbon emissions, and contribute to the public debate on climate change policies and regulations [17]. The good institutional ownership will improve the monitoring of

companies to disclose all activities undertaken by the company to enhance the positive image of the stakeholders.

Unfortunately, in Indonesia, the disclosure of carbon emissions is still a voluntary disclosure, therefore there is no obligation and uniformity of corporate responsibility disclosure towards the environment condition. Previous research stated that the carbon information disclosure is presented as a form of voluntary disclosure and this information can be used for internal and external decision-making process [18]. In practice, information on GHG emissions does not always contain positive statements. However, with such disclosure, the company is considered more transparent in providing information to the public [19]. Previous research said that sometimes the information on the emissions of greenhouse gases (GHG) are revealed through the process of cosmetics [20]. The company's management provides information about their efforts to combat global warming, but they do not have the real action to reflect the company's commitment. The condition is often referred to as the phenomenon of "green-washing." Therefore, the accurate and reliable information is very important for the public to assess the sustainability of the company.

Based on this research result, the institutional ownership is not able to make the company revealed their responsibilities to the effects of carbon emissions. This is because the disclosure of carbon emissions is still a voluntary disclosure and the possibility of the company to build a good reputation for investors to make disclosures that do not reflect the actual company's efforts in overcoming the effects of carbon emissions. These results do not support the results from previous studies which suggest that the level of institutional ownership positively connected with the carbon emissions disclosure level. This research identified that the characteristics of the institutional investors will determine the process of monitoring the company's carbon disclosure. The monitoring which carried out by the institutional investors in the countries that require the disclosure of carbon information went very well. It means, the characteristics of the economic system in the specific country will determine the support for the carbon information disclosure process. In these conditions, carbon information which disclosed by the company is the type of material information for the company's stakeholders.

Based on the hypothesis testing that has been done, it can be concluded that the hypothesis test results show that hypothesis 3 was rejected. Based on the value of the coefficient, the conclusion said that the level of stakeholder pressure is inversely proportional to the level of carbon emission disclosure which made by the company.

The theory of legitimacy encourages the companies to ensure that the activities and their performance can be accepted by the public. The company uses its annual report to describe the impression of environmental responsibility, therefore the company's business activities will be accepted by the society [21]. Under the theory of legitimacy, the organization will continue to strive to ensure that they are considered to be operating under the restrictions and norms of society. They are trying to ensure that stakeholders consider

their activities as "legitimizing" [22]. On the other hand, based on the theory of stakeholders, the different groups of stakeholders have different views on how an organization should perform its operations, various social contract would be "negotiated" with different stakeholder groups, and it is not a contract with society in general as the theory of legitimacy [22]. Based on the managerial achievement concept, the interpretation of corporate social responsibility by managers is to focus on their ultimate goal to maximize the shareholder value. However, in practice, the company's management tends to promote the "perfect image" of the company, rather than being transparent and accountable to the communities they serve. The previous research revealed that the company's stakeholders group has a main role to support the carbon emissions disclosure [23].

In other words, the social contract which undertaken by the different stakeholder groups not to describe environmental responsibility which can be accepted by the public. Therefore, the stakeholders pressure variable is not an important factor to support the disclosure of carbon emissions. This research identifies the stakeholder pressure from the governments and the organizations that are majority shareholders. In other words, this research found that the pressure from the government and other organizations have not been the deciding factor which can "force" the company's management to disclose their carbon emissions information.

Based on the hypothesis testing that has been done, it can be concluded that the hypothesis 4 was rejected. It means that the company's sustainability profile does not affect the disclosure of carbon emissions which made by the company. The companies that have a strong commitment to developing corporate sustainability report is not positively correlated with the company's commitment to present information in carbon emissions. This is understandable considering that in the corporate sustainability report, the company's management may disclose information that focuses on economic performance, social performance and environmental performance. The companies that have a low level of environmental performance will tend to present information on other performance with a high level to cover the weaknesses of the company's environmental performance.

This research did not find evidence that the audit report disclosures management prevent the environmental sustainability. Thus, the external audit was not able to reduce environmental disclosure issues [5]. The results of the study have implications for the audit profession, which should revise its practice that only provides a limited level of services assurance the CSR report and should start to switch from simply labelling to be a thorough audit process. The audit process should cover the comprehensive information, including the social information and the environmental information. The previous research revealed that there are significant gaps in the report audited by a third party and concluded that the actual usefulness of the process can be questioned [24].

Based on the hypothesis testing that has been done, it can be concluded that the hypothesis test results indicate that the

hypotheses 5 was accepted. It means that the size of the company has a positive effect on carbon emissions disclosure which made by the company. These results support the results of previous research showing that the size of the company has a positive relationship with the disclosure of carbon emissions. Previous research stated that companies disclose its carbon emissions information to receive legitimacy from the stakeholders, avoiding the threat of the company resulting from greenhouse gas advantages such as increased operating costs, reduce demand, reputation risk, legal proceedings, fines and penalties [25]. Large enterprises are more likely to become the subject of public scrutiny because the company's business activities cause the environmental pollution. The larger companies have the big resource to disclose all information from the internal source. Based on this fact, the company's management may be interested in the social activities of the company and use the disclosures to communicate the results of the company's social efforts to gain public support. This is in line with the results from the previous research which revealed that company size affects the quality of environmental disclosure [26]. Previous research also suggests that company size affect environmental disclosure [27].

The further research can use other variables to develop this research result. The variables can be divided from the internal companies or from the external companies. The various variable in the further research can give the new perspectives in the context of develop the research in carbon emissions disclosure area. The next research also create the new research about the carbon emissions disclosure in the public sector organization, particularly in higher education institution. Reference [28] was the previous research that examine the carbon emissions in the higher education ecosystem. In the future, the higher education institution (including public university) will become the role model to implement the concept of carbon emissions disclosure.

### C. Conclusion

This research has produced some conclusions based on the research results which have been obtained. This research has identified factors that affect the disclosure of carbon information on mining and manufacturing industries in Indonesia. This research has concluded that the environmental management system and the size of the company are variables that affect the company's carbon disclosure in the mining and manufacturing industries. Other variables are the level of institutional ownership, stakeholder pressures, and the sustainability profile of companies do not provide any significant support to the disclosure of carbon emissions information.

This research focuses on identifying the factors that influence the carbon disclosure in the mining and manufacturing industries in Indonesia. The implication of this research is the company's management and the stakeholders have a new perspective on the biggest factors that contributing in the context of the carbon information disclosure. The results of this study concluded that the environmental management

system is a major contributing factor to the disclosure of carbon emissions information. From these results, the company's management can improve the quality of environmental management system to further positively correlated with the quality of carbon emissions disclosure.

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