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Carbon emissions of manufacturing companies in Indonesia stock exchange: a sustainable business perspective

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Abstract Economic growth is followed by increasing carbon emissions today. Therefore, the issue of the green industry is a crucial need to be formulated by the government, academics, and companies. The lack of disclosure regarding carbon emissions in the Indonesia Stock Exchange company represents less awareness of the importance of reducing carbon emissions. The purpose of this study is to investigate carbon emissions in registered manufacturing company of Indonesia Stock Exchange. There are 40 manufacturing companies included in this study from 2012 - 2015. Data collection used content analysis which carbon emissions disclosure data measured by indexes. It divided into 5 fields which are Climate Change (CC), Greenhouse Gas (GHG), Energy Consumption (EC), Reduction and Cost (RC) of Greenhouse Gas and Accountability of Emission Carbon (AEC). The results of this study indicated that the level of disclosure of carbon emissions in manufacturing companies in Indonesia was low with an average value of 18.79%. It showed that company management awareness is an effort to reduce carbon emissions was still ineffective. Hence, it needs control from government, stakeholders, and related parties to issue the regulations for supporting companies to be aware of the environment especially carbon emission. Besides, it is essential to build sustainable business based-oriented in 3 things, economic, social, and environmental.

1. Introduction

Natural disasters, climate change, and environmental problems are important issues and are of concern to the public at this time. The problem is the impact of environmental pollution, one of which is caused by the development of industrial activities in each country. Although economic growth has increased due to industrial activities, on the other hand, the industry is also a cause of environmental pollution [1].

According to the social organization working on the field of the environment which is based on social and economic factors, the World Resources Institute (WRI) made a map of the countries which contributed the most carbon dioxide in the last 160 years. Then, the social organization examined it by making the world's first map of carbon dioxide emissions around the world, which was observed from 1850 to 2011. At that time, the world almost produced 46 billion tons of carbon dioxide. To be specific, Indonesia was placed in the sixth position by producing 2.053 billion tons of carbon dioxide [2].

Base on Carbon Disclosure Project Report [3], 50 of the 500 largest listed companies in the world are responsible for nearly three-quarters of the 3.6 billion metric tons of greenhouse gases (GHGs) [4]. Carbon is produced by these 50 companies which mainly operate in the energy, raw materials, and utility sectors. The carbon has increased by 1.65% to 2.54 billion metric tons in the past four years (cdp.net).

Observing from the various phenomena, it shows that there is a lack of awareness of the responsibility for environmental management of the company owner. Nowadays, the company is not only required to focus on increasing profitability but also to be more concerned about the environment. The phenomena occurred must be immediately solved not only from internal parties but also from external parties (government and society).

Several regulations made to focus on environmental pollution, such as the United States Environmental Protection Agency (US EPA) which releases Toxics Release Inventory (TRI) data, the International Organization for Standardization which sets ISO 1400 on systems financial management, and the Global Reporting Initiative (GRI) which issues guidelines for reporting environmental disclosures. Furthermore, the effort of the Indonesian government to reduce carbon emissions is statedin the Presidential Regulation No. 61 of 2011 about the National Action Plan for Reducing Greenhouse Gas Emissions and Presidential Regulation No. 71 of 2011 about the implementation of a national greenhouse gas inventory.

2. Literature Review

2.1 Legitimacy Theory

The legitimacy theory states that companies must be able to adjust to the system of values applied by society [5]. Legitimacy can be defined as company recognition by society. The recognition of the company by the society is the most important thing because that is how the company's survival will continue [6]. Legitimacy theory focuses on the interaction between companies and society. According to [7], the companies try to create harmony between the social values inherent in their activities with the norms that exist in the social system of society. It is because the company is part of the system. Legitimacy is essential for companies so that the boundaries emphasized by social norms and values encourage the importance of analysing organizational behaviour. Related to the theory where public perception and recognition are very important from a company as the main supportin making environmental disclosure in the company's annual report, the company must give high concern to the society about the environment [8].

2.2 Carbon emissions

Carbon emissions are substances, energy, or carbon components that are produced from an activity which has the potential of pollutant elements. Karl and Trenbeth [9] defines carbon gas emissions as gases emitted from the combustion of carbon-containing compounds, for example, CO^2 which is flue gas from burning gasoline, diesel, wood, leaves, LPG gas and many other fuels containing hydrocarbon (compounds containing hydrogen and carbon). Another opinion states that carbon gas emission is the release of carbon into the atmosphere from the process of burning fossil fuels which is directly related to the release of carbon dioxide levels into the atmosphere [10].

2.3 Carbon Emission Disclosure

Disclosure of Carbon Emissions is the extent disclosure of carbon emissions [11]. In Indonesia disclosure of carbon emissions is voluntary disclosure undertaken by the companies. Choi et. al. [11] classifies emissions reporting categories in three scopes namely scope 1, scope 2 and scope 3. Scope 1 and 2 are emissions that must be reported, while scope 3 isoptional.

First, scope 1 is direct greenhouse gas emissions which come from companies. The examples are emissions from burning boilers, furnaces, vehicles owned by companies; emissions from chemical production on equipment controlled by the company. Scope 2 is indirect greenhouse gas emissions which come from electricity. It includes GHG emissions from power plants consumed by companies. Scope 2 physically occurs in some facilities where electricity is generated. Scope 3 is the other indirect greenhouse gas emissions. Moreover, scope 3 is an optional reporting category that allows all other indirect emissions. Indeed, scope 3 is a consequence of company activities but it occurs from sources that are not owned or controlled by the company.

Literature may argue that legitimacy theory as a logical reasoning for the company to take a role in managing carbon emissions as a form social and environmental responsibility. Deegan [12] suggests that corporate motivation for environmental disclosure may include a desire to comply with legal requirements. Based on the literature [12-14] there are some motivations from the company to report their environments performance, such as: to create a good image or reputation; to maintain their legitimacy in the eyes of society; to gain marketing benefits; and to response the government regulation.

3. Method

The population in this study is a manufacturing company listed in Indonesia Stock Exchange (IDX) from the period 2012 until 2015. Meanwhile, the samples in this study were determined using purposive sampling with criteria and sample acquisition as describe in Table 1.

Table 1. Sample Determining Criteria in this Study

No	Criteria	Not In Criteria	In Criteria
1	Manufacturing companies listed in Indonesia Stock Exchange (IDX) in the period 2012-2015		143
2	Manufacturing companies that do not issue financial statements	(24)	119
3	Manufacturing companies that do not issue annual reports and sustainability reports	(39)	80
4	Companies that do not disclose carbon emissions	(40)	40
	Number of samples		40
	Total unit of data analysis (40 x 4 years)		160

Carbon Emission Disclosure in this study is measured with a disclosure checklist index developed by Choi, et al. [11]. Five broad categories in the checklist index are climate change, greenhouse gas emissions, energy consumption, greenhouse gas reduction and carbon emissions with a total of 18 items. The researcher gives a score on each disclosure item with a dichotomous scale. 0 score is given if it does not reveal information and 1 is given if it discloses. Furthermore, the data collected is analyzed by using qualitative descriptive method to determine trends in carbon emissions disclosure practices in manufacturing companies listed on the Indonesia Stock Exchange.

4. Result and Discussion

In this study, the disclosure of carbon emissions was measured by using a Carbon Emission Disclosure Checklist. The assessment process of *Carbon Emission Checklist* provides a score with dichotomous scale of 18 disclosure items. The descriptive statistical result indicates that the average carbon emissions disclosure was 18.79% which means that the level of carbon emissions disclosure in manufacturing companies in Indonesia is relatively low. The low level of carbon emissions disclosure indicates that companies have not fully implemented carbon emissions disclosures. Not all companies disclose carbon emission because it requires a lot of funds. Furthermore, it can be seen that the level of carbon emissions disclosure is relatively small. Disclosure of the highest carbon emissions of 66.67% owned by PT Holcim Indonesia Tbk in 2015.

Table 2. Descriptive Statistic Test

Description	N	Maximum	Minimum	Median	Average	Standard Deviation
Carbon Emission Disclosure (CED)	160	0.667	0.056	0.167	0.188	0.124
Valid N (listwise)	160					

There are several samples that only reveal the disclosure of carbon emissions of 5.6% owned by PT Budi Acid Jaya Tbk in 2012-2013, PT Yana Prima Hasta Persada Tbk in 2012-2015, PT Mayora Indah Tbk in 2012-2013, PT Selamat Sempurna Tbk in 2012-2013, PT Supreme Cable Manufacturing and Commerce Tbk in 2012-2015, and PT Cahaya Kalbar Tbk in 2012-2105. The low level of carbon emissions disclosure indicates that companies have not fully cared about carbon emissions disclosures. Another reason for disclosing carbon emissions because they require more resources (funds and expert labor). As a result, most companies can not disclose their carbon emissions. Figure 1 shows the growth of carbon emission disclosure from 2012 until 2015.

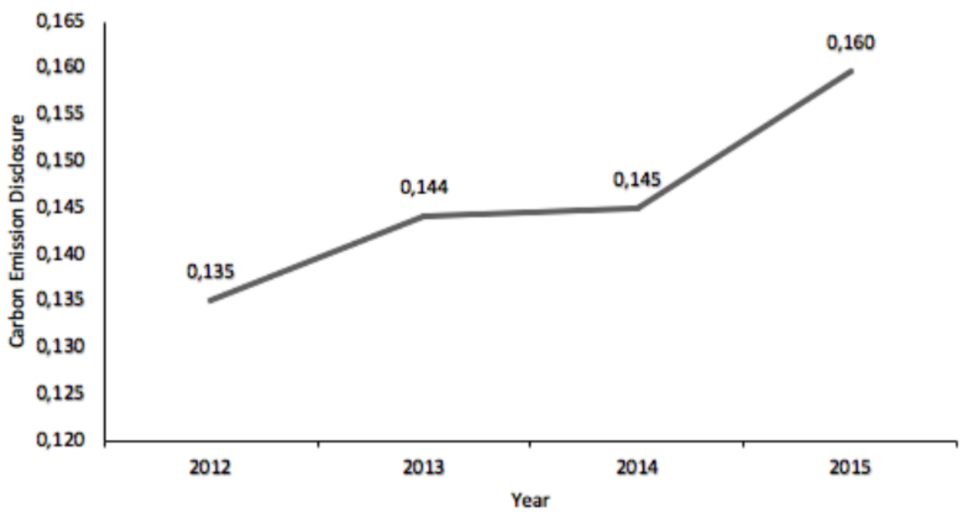

Figure 1. Carbon Emission Disclosure of Manufacturing Companies 2012 - 2015

Companies are expected to be more open by disclosing carbon emissions and all activities carried out by the company as a form of accountability [15]. Transparency and accountability are established by companies by disclosing information in their annual reports. Disclosure of carbon emissions in Indonesia is still a voluntary disclosure and the practice is rarely done by the business entities. Companies that disclose carbon emissions have several considerations such as getting legitimacy from stakeholders, avoiding threats especially for companies that produce greenhouse gases such as increasing operating costs, reduced demand, reputation risk, legal proceedings, and fines and penalties

[16,17]. Another consideration is that companies begin to disclose carbon emissions for the benefit of stakeholders to increase transparency and accountability of the company [18]. Unfortunately, not a few companies that hold disclosure of carbon emissions because the information may require large costs and are considered to be detrimental to the company [18].

Disclosure of carbon emissions is a part of environmental disclosure. Disclosure of carbon emissions is a voluntary disclosure made by the company and it is also one of the activities of Corporate Social Responsibility. Corporate social responsibility for environmental can impact operational activities, such as global warming [19,20]. Accordingly, disclosure of carbon emissions is one of the ways companies take to legitimize their activities. Therefore, the disclosure of carbon emissions is the company's commitment to take responsibility for the environmental impacts caused in the social, economic, and environmental dimensions.

The International Accounting Standards Board (IASB) has not decided the standards yet for reporting environmental issues and the disclosures which may be manifested in the form of annual reports and/or sustainability reports and still voluntary. However, the preparation of the current sustainability report can be in the same position as the financial statements. This is due to the sustainability report as a media for companies to be able to dialogue with stakeholders. The dialogue aims to inform what activities have been carried out in connection with social and environmental activities. Moreover, companies can get feedback about sustainability reporting from stakeholders so it can be an improvement in the future [21].

5. Conclusion and Suggestions

This study reveals the level of carbon emission disclosure at manufacturing companies in Indonesia is very low with an average value 18.8%. A good finding from this study is that there has been an increase in the quality of the disclosure of carbon emissions during the four years of observation, namely 2012-2015. Although the increase was relatively small at 7% in 2013, 1% in 2014 and 10% in 2015. Besides, the efforts to reduce carbon emissions needs to be encouraged by all stakeholders, mainly from the government and society. For the purpose of sustaining business and keep the earth, companies are encouraged to be concerned about environmental issues and climate change. Further the company responsibility can be demonstrated through more active disclosure of carbon emissions.

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