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## Factors Affecting Environmental Disclosure in Companies Listed on the Tokyo Stock Exchange

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### ABSTRACT

This study aims to examine the factors influence environmental disclosure such as company financial performance, company characteristics, corporate governance mechanism, and environmental management system. Environmental disclosure in this study used the content analysis method by calculating the number of sentences for each disclosure item based on GRI Standards 2016. The population of this study are 1st section companies listed in Tokyo Stock Exchange (TSE) during the period of 2016 to 2017 which consist of 2.062 companies. Sampling in this study used a purposive sampling technique. There are 47 companies as the research sample and 94 firms-year observations. This study used multiple linear regression analysis to determine the effect of independent variables on environmental disclosure. The result of the statistic analysis is firm size and firm age have a positive significant effect on environmental disclosure. ROE, corporate governance mechanism, and EMS have no significant effect on environmental disclosure, while NPM has a negative significant effect. The conclusion of this study is the environmental disclosure quantity positively influenced by firm age and firm size. The bigger and older companies proved disclose better environmental information by writing more narration or explanation of each environmental disclosure item.

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### INTRODUCTION

Environmental disclosure is the disclosure or reporting of information relating to the management and performance of corporate environment that is disclosed on corporate report or company website. Reporting on the information concerning corporate environment arises as a company effort in meeting the needs of stakeholders and also as a part of management effort in obtaining legitimacy from stakeholders. Environmental disclosure will indirectly require company to maintain and manage the environment in a responsible manner, so that the environmental information is essential for the company to be disclosed. Moreover, Environmental, Social, and Governance (ESG) investing is increasingly popular among investors, including in Japan. From 2016 to 2017, ESG investment in Japan increased more than 143% to reach ¥ 136.6 trillion.

Japan has become one of the countries that has interest to the environmental issue in the world. The government issues various environmental-related poli-

cies. In fact, the Japanese government also issues regulations relating to the disclosure of corporate environmental information called the Environmental Consideration Law. Based on the regulation, the large companies in Japan should work hard to provide information on its environment. In addition, there are also Environmental Reporting Guidelines that can be used by companies as a way to disclose their environmental information.

The percentage of Japanese companies listed on the stock exchange that discloses environmental information of their companies reaches more than 60%, so that is fairly high (Ministry of The Environment Japan, 2016). However, this does not guarantee that Japan does not have serious environmental problems. For example, Japan experienced environmental problems due to the explosion of a nuclear reactor in Fukushima in 2011. This event caused nuclear radiation and the spread of harmful chemical elements. Many industries in Japan also have negative impacts on the environment, one of which is CO<sub>2</sub> emissions. Based on Annual Report on The Environment in Japan 2017, in 2014 Japan produced 3.7% of CO<sub>2</sub> emissions from a total of 32.4 gigatons of CO<sub>2</sub> emissions all over the world. This value is greater than the few countries whose territory is much

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larger than Japan region such as Australia, Indonesia, and Saudi Arabia carbon emissions of less than 2% (Ministry of The Environment Japan, 2017).

Research that examines the factors that influence environmental disclosure has been widely carried out and there are still inconsistencies in testing results. For example, first, research which examines the effect of profitability on environmental disclosure. Dianto & Siregar (2018), Lu & Taylor (2018) proved that the level of profitability does not affect environmental disclosure, whereas Chandok & Singh (2017) and Yanto & Muzzammil (2016) found that profitability has a negative effect on environmental disclosure. On the other hand, research conducted by Ismail *et al.* (2018) found that profitability has a positive effect on environmental disclosure. This result is in line with the finding of Gianarakis (2014).

Second, research which examines the effect of firm size on environmental disclosure. Ismail *et al.* (2018), Ahmadi & Boji (2017), Ohidoa, *et al.*, (2016) proved that firm size has a positive effect on environmental disclosure. This result is in line with the finding of Yanto & Muzzammil (2016). On the contrary, Chandok & Singh (2017) found that firm size does not affect environmental disclosure. This finding is also in line with the finding of Budiman (2019).

Third, research which examines the effect of firm age on environmental disclosure. According to Welbeck *et al.* (2017), companies that have a longer age will perform environmental performance to influence perceptions about their business and to legitimize their existence. Finding of Welbeck *et al.* (2017), Yanto & Muzzammil (2016) find that firm age has a positive effect on environmental disclosure. However, finding of Elshabasy (2018) actually proves empirically that firm age has no significant effect on environmental disclosure.

Fourth, research which examines the effect of corporate governance on environmental disclosure by Rashid (2018), Rao *et al.* (2012), and Solikhah & Winarsih (2016). Rashid (2018) showed that corporate governance does not affect CSR disclosure. Rao *et al.* (2012) found that corporate governance has an effect on environmental disclosure. This result is different from Solikhah & Winarsih (2016) which empirically proves that the proportion of independent commissioners has a significant effect on environmental disclosure but with a negative effect.

The last inconsistency is related to environmental management system (EMS) variable. The EMS is a mechanism for defining environmental responsibilities for all employees, and helping them understand the environmental impact of individual activities and actions (WRAP, 2015). Rahmawati & Budiwati (2018) proved that the EMS has a significant and positive effect on the disclosure of environmental information. This finding is consistent with the finding of Bawono & Hayanto (2015) but different from Ismail *et al.* (2018) who revealed that EMS has no significant effect on environmental disclosure.

The purpose of this study is to examine the effect

of financial performance proxied by ROE and NPM, firm size, firm age, corporate governance mechanism, and environmental management system (EMS) on environmental disclosure. Besides that, control variable is presented, namely industry type. This research is expected to provide a reference related to environmental disclosure in companies in developed countries like Japan.

The originality of this research is that the object of research is companies in Japan where there is still few research related to environmental disclosure in Japan. Then, the content analysis method is used by calculating the quantity of disclosure sentences to measure environmental disclosure. The quantity of environmental disclosures reflects the number of explanations or narratives associated with each disclosure item. This study uses the natural logarithm of the total months to measure firm age which has never been done in the previous studies. The total months is used so that the difference in the age of the company is not too large.

Stakeholder theory reveals that a company is an entity that operates not only in the interests of its owners but also in the interests of all its stakeholders such as government, suppliers, society, creditors, consumers, and other parties. One of the forms of responsibility to stakeholders is to conduct environmental disclosure. Stakeholder theory underlies the effect of financial performance (ROE and NPM), corporate governance mechanism, and EMS on environmental disclosure.

Legitimacy theory assumes that companies operate according to the norms and expectations of the surrounding community so that their existence is legally accepted (Lu & Taylor, 2018). Elkington (1997) also revealed the triple bottom line concept which focuses on economic prosperity, environmental quality, and social justice which is often called 3P namely profit, planet, and people. One way to gain legitimacy while increasing transparency and corporate accountability is by reporting on social and environmental performance (Solikhah & Winarsih, 2016). Disclosure of information related to corporate environment is expected to help the company improve its reputation (Burgwal & Vieira, 2014). This legitimacy theory underlies the effect of company characteristics namely firm age and firm size on environmental disclosure.

Return on equity (ROE) is a financial ratio that is calculated to assess the ability of the company to generate profits using capital owned. Based on stakeholder theory, the company is obliged to prosper its owner and meet the interests of all stakeholders including the community, government, and investors. High profits motivate managers to disclose more environmental information (Aulia & Agustina, 2015). If profits are high, corporate financial capability will also be high. This increases the company's ability to disclose environmental information because environmental disclosure requires a large amount of money. Research results of Gianarakis (2014), Marwanti & Yulianti (2015) show that profitability positively influences CSR disclosure. Wahyuningrum & Budihardjo (2018) also proved that ROE positively influences environmental disclosure.



**H<sub>1</sub>: ROE has a significant positive effect on environmental disclosure**

A high net profit margin (NPM) indicates a high profit amount so that the company has more funds that can be used to meet the interests of stakeholders. In accordance with stakeholder theory, companies must meet the needs of all stakeholders, one of which is by disclosing information on the company's environment. A good financial performance will improve the financial capability of the company so that the company will be able to disclose better and detailed environmental information. This is since the environmental disclosure effort costs a lot. If the company is not in good financial condition, this effort to disclose the environment will actually worsen the company's financial condition. Research results of Ahmadi & Bouri (2017), Ismail *et al.* (2018) show that profitability positively influences environmental disclosure.

**H<sub>2</sub>: NPM has a significant positive effect on environmental disclosure**

Firm size is a measure of the size of the company. Large companies tend to have a greater impact, especially if the company is a multinational company with many subsidiaries in the world so that the impact will be felt globally. The environmental impact of large companies will be more felt by the public and easy to be exposed by the media, so large companies tend to really maintain the performance and disclosure of their environment to avoid problems that can interfere with corporate operations. This is done in line with legitimacy theory in which the company seeks to gain stakeholder legitimacy so that it can operate even longer. Several studies show empirical evidence that firm size has a positive effect on environmental disclosure such as Ohidoa, *et al.* (2016), Ahmadi & Bouri (2017); Ismail *et al.* (2018); and Wahyuningrum & Budihardjo (2018).

**H<sub>3</sub>: Firm size has a significant positive effect on environmental disclosure**

Firm age shows how long the company has been established or has been listed on the stock exchange. The longer the company is established, the more diverse and having many experiences. In accordance with legitimacy theory, the company will make efforts so that the business can be accepted by the community so that it can operate for much longer. Older companies tend to know more about the needs of stakeholders, so they will better understand the importance of disclosing environmental information for companies in obtaining investment from investors, especially investors who are interested in ESG investing. Environmental disclosure will also help companies gain legitimacy as well as gain stakeholder trust towards the company. Ahmadi & Bouri (2017); Frendy & Kusuma, (2011); Solikhah & Winarsih (2023); and Welbeck *et al.* (2017) proved that firm age has a positive effect on environmental disclosure.

**H<sub>4</sub>: Firm age has a significant positive effect on environmental disclosure**

Corporate governance is the structure of decision making by companies by paying attention to the needs and perspectives of stakeholders. In accordance with stakeholder theory, companies must disclose their environmental information in order to meet the needs of stakeholders. One of the internal mechanisms of corporate governance is the existence of committees or board of commissioners in charge of overseeing the company on the activities carried out. Board of independent commissioners does not come from within the organization or company concerned so that it will oversee the activities of the company by taking into account all stakeholders, not only the interests of the company owner alone. This will indirectly encourage companies to pay attention to the needs of stakeholders such as the need for environmental information. A high proportion of independent commissioners will add encouragement to companies to conduct environmental performance and disclose environmental information to stakeholders because the board of independent commissioners is not the only party that prioritizes financial performance as well as corporate management. Research result by Rao *et al.* (2018) shows that the proportion of independent directors has a significant positive effect on environmental reporting. This finding is in line with the result of the study conducted by Sari & Marsono (2013).

**H<sub>5</sub>: Corporate governance mechanism has a significant positive effect on environmental disclosure**

Environmental management system (EMS) is a structured framework used to manage significant environmental impacts of an organization which is very important for companies and stakeholders, especially the society. EMS is very essential because the disclosure of environmental information also includes information on corporate environmental management. Companies that implement EMS will follow a clear environmental management framework so that it will help companies in disclosing their environmental information better. Corporate environmental information is useful to meet the interests of stakeholders and gain legitimacy from the community. This is in line with stakeholder theory which reveals that an entity must meet the interests of stakeholders including the community. EMS in this case ISO 14001 is very important in environmental management and corporate sustainable development (Hannouche, *et al.*, 2014). Research result of Rahmawati & Budiwati (2018) proves that EMS has a significant positive effect on environmental disclosure. This finding is consistent with the finding of Bawono & Hayanto (2015).

**H<sub>6</sub>: EMS has a significant positive effect on environmental disclosure**

## RESEARCH METHODS

This study was a quantitative study using secondary data. The study population was 2,062 Japanese companies listed on the TSE and included in the main market 1<sup>st</sup> section period 2016-2017. Purposive sampling

technique was used for sampling so 47 companies were obtained 94 units of analysis. Details of the selection criteria for this study sample are presented in Table 1.

Environmental disclosure was used in this study as the dependent variable with independent variables of ROE and NPM for profitability, firm size, firm age, corporate governance mechanism, EMS and one control variable, namely industry type. Environmental disclosure was measured by the content analysis method by calculating the quantity of sentences for each item of

environmental disclosure based on GRI Standards 2016 (30 specific items). The scoring is: score 0 if there is not a single sentence of disclosure; score 1 if there are one to two sentences; score 2 if there is one paragraph (minimum of three sentences); score 3 if there are sentences of half a A4 page; score 4 if there is one A4 page; and score 5 if more than one A4 page (Raar, 2002). The operational definitions of the variables in this study can be seen in Table 2.

**Table 1.** Sampling Criteria

No.	Criteria	Beyond Criteria	Included Criteria
1.	Companies listed on the TSE and are included in the main market for the 1st section of the period 2016-2017		2,062
2.	Top 50 companies with the largest market capitalization in the 1st section of the TSE as of March 2016	(2,012)	50
3.	Consistently listed on TSE for the period of 2016-2017	(1)	49
4.	Companies make environmental disclosures in accordance with GRI Standards	(2)	47
Total sample companies			47
Year of Observation			2
Total analysis units (47 companies × 2 years)			94

**Table 2.** Operational Definition of Variable

Variables	Definition	Indicators
Environmental Disclosure (ED)	Disclosure of environmental information items carried out by companies (Solikhah & Winarsih, 2016)	Content analysis (Raar, 2002; Wahyuningrum & Budihardjo, 2018)
Return on Equity (ROE)	Indicators of corporate financial performance in generating profits using its own capital (Lampe, 2013)	$\frac{\text{net income}}{\text{shareholders' equity}} \times 100\%$ (Buallay, 2019; Lampe, 2013)
Net Profit Margin (NPM)	Profitability ratio to calculate net profit margin of a company (Liu et al., 2013)	$\frac{\text{net income}}{\text{net sales}} \times 100\%$ (Liu et al., 2013) $\frac{\text{net income}}{\text{revenue}} \times 100\%$ (Lampe, 2013)
Firm Size (SIZE)	Large or small size of a company (Irawati, 2012)	LN(Total Asset) (Dang et al., 2018)
Firm Age (AGE)	The duration of company listed on the stock exchange (Yanto & Muzzammil, 2016)	LN(Total Month)
Corporate Governance Mechanism (CG)	Governance mechanism in companies (Damak, 2013)	$\frac{\text{Independent Commissioners}}{\text{Board of Commissioners}} \times 100\%$ (Solikhah & Winarsih, 2016)
Environmental Management System (EMS)	An environmental management system for managing an organization's environmental impact (WRAP, 2015)	1 = if having EMS 0 = if not having EMS (Ismail et al., 2018)
Industry Type (TYPE)	Industry type based on its sensitivity to the environment (Djajadikerta & Trireksani, 2012)	1 = high profile 0 = low profile (Wahyuningrum & Budihardjo, 2018)

Source: Various references, 2019



Industry type was used to see differences in environmental disclosure in types of industries that are sensitive and not sensitive to the environment. Industry type classification refers to the previous research (Djajadikerta & Trireksani, 2012; Raar, 2002; Hackston & Milne, 1996). Industries included in the high profile are: agriculture; plantation; livestock; fisheries; forestry; mining; basic and chemical industries; ceramics; cement; glass; metal products; porcelain; plastic and wrapping; animal food; wood industry; pulp and paper; miscellaneous industry; machine; heavy equipment; automotive; textiles; footwear; cable; consumer goods industry; manufacture; tobacco; pharmacy; cosmetics; home furnishings; building construction; real estate; property; infrastructure; transportation; utility; and trade. The types of industries that are categorized as low profiles are financial companies; advertising; printing; media; computers and services; investment company; provider; and broadcasting.

The research data was obtained by using the documentation method using sustainability reports, environmental reports, integrated reports, financial statements, and annual reports published on the related company pages or sites. Multiple linear regression analysis (significance  $\alpha$  5%) was used for data analysis by conducting a classical assumption test with the regression equation in equation 1.

$$ED = \beta_0 + \beta_1ROE + \beta_2NPM + \beta_3SIZE + \beta_4AGE + \beta_5CG + \beta_6EMS + \beta_7TYPE + \epsilon \dots (1)$$

**RESULTS AND DISCUSSIONS**

The results of descriptive statistics show the average value of environmental disclosure of 46.17 with a standard deviation of 21.58. ROE and NPM variables have pretty low average values of 0.11 and 0.12 with standard deviations of 0.05 and 0.13. The average firm size, firm age, and corporate governance mechanism values successively are 29.53, 6.07, and 0.58 with standard deviations of 1.44, 0.79, and 0.13. As many as 87.2% of the sample companies are ISO 14001 certified. ISO 14001 is used as an EMS indicator since the certification is an international standard that serves to help companies improve environmental performance through efficient use of resources and waste reduction in order to gain stakeholder trust (ISO, 2015). Industry type is dominated by high profile at 76.6%. The variables of environmental disclosure, ROE, firm age, firm size, corporate governance mechanism have average values higher than the standard deviation values. These values indicate that the data distribution of these variables

is homogeneous because the data deviation is relatively small. The variable of NPM has a standard deviation that exceeds the average value, thus indicating that the NPM data is heterogeneous because the deviation of the data is quite large compared to the average.

One sample Kolmogorov Smirnov test is used to test for normality with the result of the Kolmogorov Smirnov value of 0.698 (0.698 < 0.05) and significant at 0.714. This value indicates that the residual data is normally distributed. The multicollinearity test shows that all variables have a VIF value <10 and tolerance > 0 so there is no multicollinearity between variables in the regression model of this study. Furthermore, the heteroscedasticity test is performed with the glejser test. Based on the glejser test result, the significance values of all variables are more than 5% (0.05) so that in this regression model there is no heteroscedasticity. The autocorrelation test uses the Durbin-Watson test which produces a DW value of 2.10 (n=94, k=7, significance of 5%) which exceeds the upper limit (dU) 1.8268 and less than 4 - 1.8268 (4-dU) so it can be concluded that there is no autocorrelation in the regression model.

The result of the coefficient of determination shows the Adjusted R<sup>2</sup> value of 0.426. This value means that 42.6% of ED variation can be explained by variations of this research variable then the rest is explained by other causes outside the research model. Based on the test results, the variable of industry type has a  $\beta$  value of 14.166 with a significance value of 0.025 so that it can be interpreted that high profile companies have ED scores greater than 14.166% than low profile companies. The multiple linear regression equation in this study is in equation 2 and the results of hypothesis testing can be seen in Table 3.

$$ED = -163.502 - 32.86ROE - 38.046NPM + 5.051SIZE + 13.14AGE - 22.1CG - 9.921EMS + 14.166TYPE \dots \dots \dots (2)$$

**The Effect of ROE on Environmental Disclosure**

The result of the study proves that ROE has no significant effect on environmental disclosure. This condition can occur because the awareness of Japanese companies to disclose environmental information is quite high. This can be seen from the number of companies that disclose environmental information according to GRI Standards, which is 47 out of 50 companies even though corporate profitability is low. According to Yanto & Muzzammil (2016), companies with high profitability tend to disclose less environmental information

**Table 3.** Results of Hypothesis Testing

Hypothesis	Statement	B	Sig.	Decisions
H <sub>1</sub>	ROE has a significant positive effect on ED	-32.860	0.366	Rejected
H <sub>2</sub>	NPM has a significant positive effect on ED	-38.046	0.031	Rejected
H <sub>3</sub>	Firm size has a significant positive effect on ED	5.5051	0.002	Accepted
H <sub>4</sub>	Firm age has a significant positive effect on ED	13.140	0.000	Accepted
H <sub>5</sub>	Corporate governance mechanism has a significant positive effect on ED	-22.100	0.127	Rejected
H <sub>6</sub>	EMS has a significant positive effect on ED	-9.921	0.144	Rejected

Source: Data processed, 2019

because it can interfere with information about the company's financial success. ROE has an average value of 11.29% which is categorized as low. Even so, companies with low ROE actually have ED scores above the average such as one of the sample companies that has a ROE of 2% but an ED score of 76. These findings are consistent with studies conducted by Chandok & Singh (2017) and Deswanto & Siregar (2018).

#### **The Effect of NPM on Environmental Disclosure**

The test result shows that NPM has a significant negative effect on environmental disclosure. NPM has an average value of 12.66% which is categorized as low. Information about the low profitability of the company will reduce the interest of investors to invest, so the companies will make other efforts to attract these investors by highlighting their environmental information better. Moreover, the popularity of ESG investing is increasing in Japan, so that more companies are making environmental disclosures to attract potential investors. When the companies have a high level of profit, the companies actually does not disclose environmental information in more detail (Yanto & Muzzammil, 2016) because high profitability information is quite attractive to investors. The result of this study is in accordance with the findings of the studies conducted by Chandok & Singh (2017) and Yanto & Muzzammil (2016).

#### **The Effect of Firm Size on Environmental Disclosure**

Based on the results of tests that have been done, firm size has a significant positive effect on ED. Larger companies tend to have greater impacts as well, especially multinational companies with many subsidiaries in the world which impacts are felt globally. The impact of a large corporate environment will be more felt by the public and easily exposed by the media. Thus, large companies tend to maintain extremely the performance and disclosure of their environment to avoid problems that can interfere with company operations. This is in accordance with the theory of legitimacy. The disclosure of environmental information is also useful to maintain or enhance company's reputation (Burgwal & Vieira, 2014). The result of this study is in line with the theory of legitimacy and in line with the findings of Ohidoa, *et al.*, (2016), Ahmadi & Bouri (2017); Ismail *et al.* (2018); and Wahyuningrum & Budihardjo (2018).

#### **The Effect of Firm Age on Environmental Disclosure**

The result of this study indicates that the variable of firm age has a significant positive effect on environmental disclosure. Companies that have stood longer tend to more understand market desires and know the needs of stakeholders, so they will be more aware of the importance of disclosing environmental information for the companies to gain stakeholder trust and also obtain investments, especially from investors interested in ESG investing. Longer age encourages the companies to perform better

environmental performance to influence perceptions about their business and legitimize their existence (Welbeck *et al.*, 2017). This result is also in line with legitimacy theory which states that companies want recognition for its business activities. The finding of this study is consistent with the findings of the studies conducted by Welbeck *et al.* (2017) and Elshabasy (2018) which prove that firm size has a positive effect on environmental disclosure.

#### **The Effect of Corporate Governance Mechanism on Environmental Disclosure**

The result of this study indicates that the corporate governance mechanism is not proven to affect environmental disclosure. Based on the Japan Corporate Governance Code, the proportion of corporate independent commissioners in Japan has been determined to be at least one third of the total number of commissioners, so the proportion of independent commissioners is not much different in each company even though the ED scores of each company tend to vary. The absence of significant effect of the proportion of independent commissioners on environmental disclosure can occur because the encouragement to disclose corporate environmental information does not only come from independent commissioners, but also the entire board of commissioners or even the company's management. This shows that the company's awareness in disclosing the environment is high because of the high commitment of various parties from within and outside the company. This finding is in line with the studies conducted by Frendy & Kusuma (2011); Rashid (2018); and Solikhah & Winarsih (2016).

#### **The Effect of EMS on Environmental Disclosure**

The result of this study shows that EMS does not significantly affect environmental disclosure. This condition can occur because EMS is just a system or framework used by the companies to manage environmental impacts, not a system used to disclose information on the company's environmental impacts. There are 41 of the 47 sample companies that have ISO 14001 certificates, but that does not mean they have high ED scores. The use of EMS will improve the corporate environmental performance, but not increase the quantity of environmental disclosure. This is due to environmental disclosure must follow the provisions governing what information must be disclosed, whereas EMS only contains ways to manage environmental impacts not ways to disclose environmental information. This findings is in line with Ismail *et al.* (2018) who proved that EMS has no significant effect on environmental disclosure.

#### **CONCLUSIONS**

The result of this study indicates that firm size and firm age positively affect environ-



61]ntal disclosure. Larger companies and older companies are proven to disclose their environmental information better by writing more narratives or explanations for each item of environmental disclosure. ROE, corporate governance mechanism, and EMS in this study are proved not to affect environmental disclosure. Then, NPM has a significant negative effect on environmental disclosure. Industry type has a  $\beta$  value = 14.166 so it can be concluded that high profile companies display higher environmental information of 14.166% than low profile type companies.

The quantity of environmental disclosure for companies in Japan is quite high due to high commitment of the companies in managing and environmental impacts and disclosing corporate environmental information. This is proven in the number of the companies that are ISO 14001 certified and conduct environmental disclosure by referring to the GRI Standards regardless of the type of industry. Future studies are expected to refer to the GRI Standards which have been updated with a list of disclosure items to be more suitable with corporate environmental disclosures in the period after 2017.

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