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The Content and Determinants of
Greenhouse Gas Emission Disclosure:
Evidence from Indonesian Companies

by
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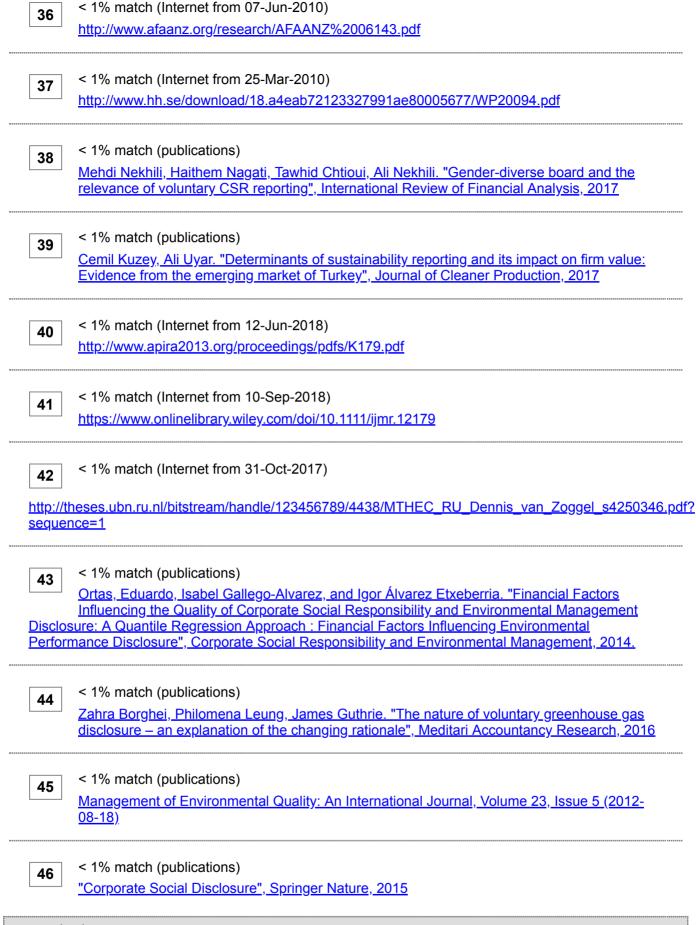
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33**The Content and Determinants of Greenhouse Gas** Emissions **Disclosure: Evidence from Indonesian Companies**

ABSTRACT This paper examined the content and determinants of greenhouse gas (GHG) emissions disclosure practices. This study found that number of firm disclosed is increased from 42.9% in 2011 to

48.1% in 2014. The assesment of risks and opportunities of climate change theme is the most item disclosed. Miscellaneous industries disclosed more GHG emissions information compared to any other industry. The results also show that profitability, leverage, company size and industry are significant determinants that can explain the extent of GHG emissions disclosure. The findings of this study indicated that GHG emissions disclosures are used as a mechanism to reduce pressures from stakeholders.This study contributes

> 44**to the GHG** emissions **disclosure literature by** providing patterns **and** determinants **of** companies' **GHG** emissions **disclosure**

in an emerging country. K e y w o r d s : greenhouse-gas, carbon disclosure, climate change, Indonesia Introduction Currently, companies worldwide have gradually started considering the substantial risk of climate change; both the direct physical impact on their businesses and climate change policies that change consumption patterns (Luo, Tang, and Lan, 2013). Several countries such as in the European Union, US, Canada, Japan, South Korea, New Zealand have committed to reducing greenhouse gas (GHG) emissions (including carbon emissions) by issuing mandatory regulations for

> 19**companies to disclose information related to GHG emissions**

(World Resources Institute, 2015). The Australian

> 29**government introduced** a **National Greenhouse and Energy Reporting (NGER) Act** as **a framework for**

reporting GHG emissions (Choi, Lee, and Psaros, 2013). Under the

> 14**companies Act 2006 (Strategic and Directors'** s **Reports) Regulations 2013, the** UK government **requires**

companies

> 14**to report their annual GHG emissions in their** directors's **report.**

In contrast to Indonesia, there has never been a specific regulation mandates to disclose GHG information. The government Regulation Number 47 (2012) only requires companies running their

> 2**business activities in the field and/or related to the natural resources to implement social and environmental responsibility**

(Article 74 paragraph 1). Also, the law number 17/2004, and presidential decree number 61/ 2011 only determine regulation regarding a national action plan for reducing the six GHGs as targeted by the Kyoto Protocol, namely

Although there have been some mandatory regulations related to reporting GHG emissions in some developed countries, nonetheless, disclosure practices are still incomplete (Liesen, Hoepner, Patten, and Figge, 2015) and their comprehensibility is still questionable (Kolk, Levy, and Pinkse, 2008), especially in Indonesia, where the GHG reporting is still unregulated and voluntary. Most previous studies of GHG emissions disclosure have been conducted in developed and Western countries, such as Australia (see, Andrew and Cortese, 2011; Rankin, Windsor, and Wahyuni, 2011; Hrasky, 2012; Choi et al., 2013; Li, Eddie, and Liu, 2014; Wang, Li, and Gao, 2014); the UK (Chithambo and Tauringana, 2014; de Aguiar and Bebbington, 2014; Baboukardos, 2017); the US (see,

Stanny, 2013; Lewis, Walls, and Dowell, 2014) and Canada (see, Ben- Amar and McIlkenny, 2014). Choi et al. (2013) analysed the reactions of Australia's largest 100 companies during the period 2006–2008 when the Australian government announced a series of regulations regarding GHG emissions disclosure; they found that the level of disclosure was 46.0%. Using 210 firms listed on the UK Financial Times Stock Exchange, Chithambo and Tauringana (2014) showed that the extent of GHG emissions disclosure was 38.5%. In developing and Asian countries, most studies of GHG emissions disclosure were conducted in China (see, He, Tang, and Wang, 2013; Li, Yang, and Tang, 2015). Chu, Chatterjee, and Brown (2012) found that 61%

disclosed GHG emissions information with the mean of disclosure is 24.9%. Peng, Sun, and Luo (2015) examined 1,744 of China's non-financial A-share listed

proportion of firms reporting carbon- related information in their corporate social responsibility

GHG disclosure is only 5%. Based on these studies, it may indicate that the extent of GHG disclosure in developed countries is higher than in developing countries Some previous studies have also investigated determinants of GHG emissions disclosure. Borghei-Ghomi and Leung (2013)

in Australia. Using UK companies, Chithambo and Tauringana (2014) examined factors that affect the disclosure of GHG emissions; their results showed that corporate governance characteristics affected GHG emissions disclosure. In Asia, He et al. (2013) suggested that carbon performance and cost of capital have a significant influence on GHG emissions disclosure for companies listed on the Standard & Poor's 500

> 19**that participated in the Carbon Disclosure Project (CDP).**

Although previous studies have investigated factors influencing GHG emissions, few studies have detailed content of GHG emissions disclosure and focused on internal contextual factors such as firm size, profitability, leverage, industry and ownership in developing countries (Ali, Frynas, and Mahmood, 2017), especially in Indonesia. This study is the first to explore the content and determinants of GHG emissions disclosures in Indonesia. Indonesia presents an interesting case in which to explore the pattern and determinants of GHG emissions disclosures. Indonesian companies, for some time now, have been facing a number of factors exposing them to

> 31**corporate social responsibility (CSR)** practices. These include **the** issues **of**

poverty alleviation,

> 31**health and safety of the environment,**

pollution, deforestation, social and political insecurity, and the high needs for direct foreign investment (Djajadikerta and Trireksani, 2012, p.22). In spite of these problems, since 2013, the Indonesian government has continuously released GHG regulations as a commitment to reducing GHG emissions, improved sustainable development and a contribution towards overcoming global warming. The findings of the study offer both theoretical and practical insights into the extent and pattern of GHG emissions disclosures and what factors determine disclosure. The

> 26**research questions** addressed **in this study are** (1) **what is the extent and** pattern **of** GHG emissions **disclosure**

and (2) whether firm's factors influence the extent of GHG emissions disclosure. The remaining parts of

> 28**the paper** proceed **as follows: The next section** reviews **the theoretical** framework. **Section** 3 explains **the** GHG emissions regulation **in**

Indonesia. Section 4 presents the hypothesis development. Research method is provided in Section 5. Section 6 discussion the results of the analysis. Finally, Section 7 presents the conclusion and limitations of the research. Theoretical Framework

> 23**Freeman (1984, p. 46) defines stakeholders as** groups **or individual** in company that **can** influence **or** be influenced **by the** activity **of the**

company. One of the principles of stakeholder theory is that everyone should take responsibility for the impact of their respective deeds towards others (Gray, 2001). A company's existence is affected by

stakeholders' support; the viability of an enterprise relies on the support of its stakeholders. The more powerful the stakeholders, the greater a company's effort to adapt to the corporate environment (Parmar, Freeman, Harrison, Wicks, Purnell, and Colle, 2010). Gray, Kouhy, and Lavers (1995) argued that the stakeholder theory can be tested through content analysis of a company's annual reports; this is the most efficient way for organisations to communicate with stakeholders. Therefore, GHG disclosure is considered a part of the dialogue between companies and stakeholders.

> 8**Legitimacy theory asserts that organisations continually seek to ensure that they are perceived as operating within the bounds and norms of their respective societies**

(Suchman, 1995, p. 573). According to Deegan (2002), legitimacy and status are conditions that occur when a company's

> 22**value system is congruent with the value system of the larger social system** in **which the company**

operates. The legitimacy of the company is threatened when there is a real or potential difference between these two value systems. A theoretical construct known as the 'social contract' is central to legitimacy, which relies on the notion

> 11**that the legitimacy of a business entity to operate in society depends on an implicit social contract between** a **business entity and society**

(Lindblom, 1994, p. 2). Therefore,

> 17**an organisation's survival** might **be threatened if society perceives that the organisation has breached its social contract**

(Guthrie and Parker, 1989). Qian and Schaltegger (2017) argue that companies are regarded as adaptive entities reacting to social and environmental pressures, such as GHG emissions. GHG disclosures thus may be used as a powerful medium to influence the perceptions of stakeholders, and thereby contribute towards the maximisation of earning potential (Gray, Javad, Power, and Sinclair, 2001, p. 329). Institutional theory is a branch of legitimacy theory that describes the institutional pressures faced by organisations. As a result of these pressures, organisations tend to be similar in shape and practices (DiMaggio and Powell, 1983; Islam and Deegan, 2008). According to Cahaya, Porter, Tower, and Brown (2012, p. 115), institutional theory has two dimensions: isomorphism and decoupling. In the context of this study, isomorphism relates to the ways in which institutional setting affects GHG disclosures. Deegan (2009) suggests that decoupling occurs when the practice of GHG disclosure creates a different image of environmental responsibility activities, programmes and policies among stakeholders. Moreover, Deegan (2009) states that isomorphism comprises three processes:

> 32**coercive, mimetic and normative.** According to **DiMaggio and Powell (1983), coercive isomorphism refers to**

situations where institutional practices, such as GHG disclosures, arise from stakeholder pressure. Mimetic isomorphism refers to situations where an organisation mimics the practices of other institutional organisations, which often happens for competitive advantage. Finally, normative isomorphism refers to pressures arising from the norms of groups, for example a manager is pressured to implement a certain institutional practice (DiMaggio and Powell, 1983). Indonesian Regulation of GHG Emissions In Indonesia, regulation related to social and environmental issues started in 2007 when the government released the company law number 40/2007 and the NAPACC programme. The company law number 40/2007 stipulated that companies running their

> 2business activities in the field and/or related to natural resources implement social and environmental responsibility

(Article 74, paragraph 1). Any company that does not perform this obligation

> 2will be sanctioned in accordance with the provisions of the legislation

(Article 74, paragraph 3). In 2008, the National Council on Climate Change (NCCC) was formed as a forum to communicate climate change issues to stakeholders. Complementing this commitment, the presidential regulation number 11/2011 and number 71/2011 were released. According to this regulation (number 11/2011), the national action plan consists of three actions for emissions reduction targets and industry sector targets: strategies, programmes and activities contributing to emissions reduction and authorities responsible for programmes and activities. Meanwhile, the implementation of a GHG inventory aimed to provide information periodically about the level, status and trends of changes in emissions and GHG absorption, including carbon deposits at the national level, provinces and counties. However, such these regulations only set policies regarding the commitment to reduce the GHG emissions, not for reporting. There is no a specific government regulation that govern the GHG emissions reporting. Research Hypothesis Profitability Profitability is a company's ability to earn income or profit within a specific period using all capital owned (Pahuja, 2009). Companies with high profitability will be considered good prospects for the future, because high levels of profitability demonstrate a company's efficiency and the survival of a company. Many previous studies from multi-theoretical perspectives have suggested that profitability

> 45is positively related to the extent of environmental disclosure (Adams and Hardwick, 1998; Cormier, Magnan, and

Van Velthoven, 2005; Tagesson, Blank, Broberg, and Collin, 2009; Ben-Amar and McIlkenny, 2014; Calza, Profumo, and Tutore, 2014; Liesen

> 30et al., 2015). Liu and Anbumozhi (2009)

suggest that companies in a good financial position

> 30tend to disclose more environmental information.

> 6Stanny and Ely (2008) argue that firms that are more profitable

34**would be likely to want to disclose** GHG emissions **more** to convey **positive outlook to investors.**

Moreover, the better the financial performance of a company, the greater a company's financial ability to include carbon emission reduction strategies into their business strategies (Cormier and Magnan, 1999). Firms that are more profitable have more resources to engage in GHG emissions reduction and disclosure. Good companies in their financial performance, will be able to avoid losses due to their involvement in the GHG emissions activities and, at the same time it can give a positive signal to stakeholders.

20**Based on this** evidence, the **following hypothesis is proposed: H1:**

13**Firms with higher levels of** profitability will **disclose more** GHG emissions information **than firms with** lower **levels of**

profitability. Leverage Leverage is a ratio intended to measure how a company's assets are financed by both long-term and short-term debt (Pahuja, 2009). Previous studies have reported that the relationship between leverage and environmental disclosure is negative (Belkaoui and Karpik, 1989; Adams and Hardwick, 1998; Brammer and Millington, 2004; Liu and Anbumozhi, 2009; Giannarakis, 2014). Andrikopoulos and Kriklani (2013) found that companies with higher leverage tend to decrease the GHG emissions disclosure as preparation to provide disclosure is costly. Consistent with Andrikopoulos and Kriklani (2013), Luo et al. (2013) argue that firms with high leverage and interest payments will be more cautious in revealing expenses related to GHG emission precautions, and therefore, will limit their ability to execute strategic GHG emission reduction and disclosure. Chithambo and Tauringana (2014) suggest that companies that have lower debt tend to disclose GHG emission information because of motivation to send a signal to the market and to attract investors to invest in socially responsible companies. Firms that are higher leverage associated with an increase in the risk of bankruptcy. Therefore, managers may act to reduce the discreationary costs that are not related to main business activities such as GHG emissions disclosure. By reducing the discreationary expenditures, company can avoid the risk of bankruptcy, thus it can reduce pressures from stakeholders. The

43**following hypothesis is proposed: H2:** Firms **with higher** levels of **leverage will disclose**

less GHG emissions information than firms with lower levels of leverage. Firm Size According to stakeholder and legitimacy theories, larger companies are under more public attention (Dowling and Pfeffer, 1975; Brammer and Millington, 2004). The

42**larger the size of** a **company, the** greater **the** number **of** stakeholders involved **in the**

activities of the company, and they also have higher expectations regarding GHG emissions practices

16**(Hackston and Milne, 1996; Cormier and** Gordon, 2001; **Cormier et al., 2005).**

As a result, pressure from stakeholders is also higher (Brammer and Pavelin, 2004; Cho and Patten, 2007). Under such conditions, meeting stakeholders' demands is mandatory (Patten, 2002). GHG emissions disclosure is a mechanism that can be performed by a company to reduce this pressure (Rankin et al., 2011). Therefore, large companies will be more responsive to this demand of GHG emissions disclosure in order to avoid conflict (Cormier et al., 2005; Kuo and Chen, 2013). Results of

> 36**previous studies** show **a positive relationship between** firm **size and** voluntary **environmental disclosure** (Neu, Warsame, **and**

Pedwell, 1998; Cormier and Magnan, 1999;

> 6**Stanny and Ely, 2008; Kim and Lyon, 2011;** Ben-Amar **and**

McIlkenny, 2014; Kuzey and Uyar, 2017). It is assumed that large companies have enough resources to meet the costs related to GHG emissions disclosure. Assumptions have underlined that larger companies will disclose more information than smaller firms (Chithambo and Tauringana, 2014). The following hypothesis is proposed: H3: Larger firms will disclose more GHG emissions information than smaller sized firms. Industry Type Dye and Sridhar (1995) state

> 15**that companies are more likely to disclose information** in accordance with **the** characteristics **of**

their industry. Previous studies suggested that companies belonging to high-profile industries tend to have a greater risk because they receive more attention from the wider community (consumer visibility), they engage in higher levels of competition (Roberts, 1992) and the companies' activities tend to have a negative influence on the environment (Reverte, 2009). Alternatively, low- profile industries have lower consumer visibility, so the companies' risks tend to be lower (Roberts, 1992). Some industries that generate high emission levels may face greater pressure from stakeholders and regulators compared to other industries. For example,

> 3**a study conducted by** Rankin **et al. (2011) showed**

that companies belonging to the mining and energy industry provide more credible and consistent GHG emissions information. H4: Firms in sensitive industries will disclose more GHG emissions information than firms within non-sensitive industries. Government Ownership Ownership structure is considered as a factor that affects disclosure of GHG emissions, as it represents the status of a company's capital. Previous studies suggest that companies that are majority owned by government are expected

> 41**to be more concerned with social and** environmental **issues, such as**

GHG emissions reduction (Amran and Devi,

> 3**2008; Tagesson et al., 2009; Haji, 2013).** Calza et al. **(2014)**

argue that pressures from government can influence managers on environmental issues. Their finding shows

> 35that there is a positive relationship between state ownership and environmental performance for European companies. The

Indonesian government has released several laws and regulations related to environmental disclosure, such as law number 40/2007, for limited liability companies, law number 32/2009 for the protection and management of the environment and the Minister of Environment number/2011 regulation for a corporate performance- rating programme for environmental management. As the owner of a company, the government will more concern with how the legislation released can directly affect a company (Habbash, 2016). Reid and Toffel (2009) argue that government may act as change agents in setting a new legislation regarding GHG disclosure.Therefore, the propensity of managers to reduce pressure from government may be mitigated by communicating GHG emissions via disclosures. H5: State-owned enterprises (SoEs) will disclose more GHG emissions information than other firms. Methods Sample and Data Collection GHG emissions data were sourced from publicly listed companies' 2011 to 2014

> 38annual reports, and financial and accounting data were collected from the Bloomberg database. A baseline year of

2011 was selected because government regulation number 61/2011 was released in this year. In 2011, 37 firms that disclosed GHG information met the criteria for sampling. Table 1 presents the sample selection. Table 1 Table 2 lists the study's samples based on nine industry sectors according to the Indonesian stock exchange's (IDX) classifications: (1) agriculture, including plantations, animal husbandry, fisheries and forestry; (2)

> 27mining, including coal mining, crude petroleum and natural gas production, metal and mineral mining and

land/stone quarrying; (3) basic industry and chemicals, including

> 1cement, ceramics, glass, porcelain, metal and allied products, chemicals, plastics and packaging, animal feed, wood industries and pulp and paper;

(4) miscellaneous industries, including

> 1machinery and heavy equipment, automotive and components, textile and garments, footwear

and cables; (5) consumer goods industries, including

> 1food and beverages, tobacco manufacturers, pharmaceuticals, cosmetics and houseware; (6) property, real-estate and building construction;

(7) infrastructure, utilities and transportation, including energy, toll roads and airports; (8) financial; and (9) trade, services and investment, including wholesale, retail trade, restaurants, hotels and tourism. For the current study, the financial sector was excluded. The financial sector was excluded as this study has an independent variable namely, leverage. The high leverage in non-financial sector may indicate that the company has financial distress problems. However, in financial sector, high leverage is common and it doesn't indicate a problem. Therefore, the conclusion of the finding of this study may be bias

> 16regarding the negative relationship between leverage and the extent of GHG emissions disclosure

if the financial sector was included as the sample. Table 2 As shown in Table 2, basic industry and chemicals represent the largest sample with 44 firms (29.7%). This is followed by the mining industry, 36 firms (24.3%), and the smallest group is miscellaneous industries, 4 companies (2.7%). Variable measurement and analysis Consistent with previous studies of GHG emissions disclosure, a content analysis method was used to extract the GHG emissions information from the annual reports. Measurements of GHG emissions disclosure refers to items developed by Choi et al. (2013) and used by (Kalu, Buang, and Aliagha, 2016). The use of a checklist item is based on the consideration that those items represent the Carbon Disclosure Project questionnaires and are appropriate for GHG emissions regulations in Indonesia. The dependent variable is measured using the unweighting disclosure index approach.

> 10In an unweighted index, each disclosure item is deemed equally important and therefore each item is awarded the same score when it is

disclosed;

> 18this technique is considered far less subjective than a weighted index and is more relevant to all

companies (Cooke, 1989, 1993). The score was 1 if the company disclosed information as determined by the checklist items and 0 was assigned if it was not disclosed. Table 3 provides the disclosure checklist items. Table 3 This study employed multivariate regression analysis, which is used

> 25to examine the influence of independent variables on a dependent variable. This analysis also measures the strength of

a relationship between these variables, and it shows the direction of the relationship. The regression equation is: GHGDisc = β_0 + β_1PROF + β_2LEV + β_3SIZE+ β_4INDUSTRY + β_5GOVOWN + ε where, profitability (PROF) is

> 12measured as the ratio of earnings after tax divided by total assets; leverage (LEV) is measured as the ratio of total debt divided by total assets;

firm size (SIZE) is measured by a logarithm of the total assets; industry membership (INDUSTRY) is measured by

previous studies, in this study, agriculture, mining, basic industry and chemicals were categorised as sensitive industries (Moroney, Windsor, and Aw, 2012) since their activities modify the environment (resources), and they are more closely monitored for environmental performance, while miscellaneous industries,

non- sensitive industries; and government ownership (GOVOWN) was measured by

for other firms. Results and Discussion Extent of GHG Emissions Disclosure Table 4 presents the percentage firm disclosed GHG emission items. Financial implications are the most disclosed items (86.5%, 94.6%, 97.2%, 91.9%), followed by assessment of risks and opportunities (89.1%, 94.6%, 89.1%, 86.5%) and the least disclosed item is the

(2013) results are different; they found that the risk and opportunity of GHG emission item was the most disclosed. This finding may indicate different motivations for disclosing GHG emissions between companies in developed countries, such as Australia, and in an emerging country: Indonesia. Table 4 In terms of the percentage of items disclosed per theme by industry (Table 5), companies from the miscellaneous industries (75.0%), lead in disclose of GHG emissions, followed by mining industry (68.2%),

(40.3%), basic industry and chemicals (39.9%), consumer goods industries (36.6%), agriculture (28.6%) and property, real estate and building constructions (11.1%). This finding is surprising. As explained above that government regulation have released the limited liability company law number 40/2007 and government regulation number 47/2012. These regulations mandated that any company that operates in a natural resource area be obligated to report related corporate social environmental responsibility; this obligation was effective from April 2012. However, the finding of this study suggested that companies from non-sensitive industry (such as, miscellaneous industries,

lead in providing GHG emissions information. Table 5

mean of GHG emissions disclosure is 50.0%, with a minimum of 6.0% and a maximum of 100%. The results show that there is a large gap in the mean of disclosures, which indicates that GHG emissions disclosure exhibits extreme values and is heavily skewed. Overall, the mean disclosure is relatively high. The mean profitability suggests that the companies have relatively low financial performance: the minimum value is -19.0% and the overall mean is 12.0%. The low profitability ratio may be a reflection of Indonesian economic financial hardship during the global financial crisis. The leverage ratio of the sampled firms is 88.0% indicating that the sampled firms' leverages are relatively high; this may indicate that creditors represent key stakeholders. For the categorical variables of industry type, 96 (64.9%) of the total 148 sampled companies were categorised as sensitive industries and 52 (35.1%) as non-sensitive industries. The results indicate that sensitive industries tend to provide more GHG emissions disclosure than non-sensitive industries. Table 6 also shows that 28 (18.9%) of the sampled companies are owned by the Indonesian government and 120 (81.9%) are non-SoEs. Table 6 Table 7 shows the correlations between the variables; the directional correlations

0.80, and it is suggested that there is no multicollinearity problem between predictor variables. Table 7 A heteroscedasticity test suggests that a regression model does not contain heteroscedascity if

current study, the level of significance for all independent variables was greater than 0.05. The result of the multicollinearity tests, consistent with Table 7, are shown in Table 8; the tolerance values for all variables are greater than 0.10 and all the VIF values are below 10. It was concluded that there was no multicollinearity problem in the regression model. Determinants of GHG Emissions Table 8 details

shows that the model fits and is statistically significant: F-statistic = 14.956 and p-value = 0.000. The regression has an adjusted R^2 of 32.2%. The details of the hypotheses testing's results are as follows: first, profitability is positively associated with GHG emissions disclosure with a coefficient (p- value) of 0.415 (0.017). Thus, H1 is supported. This finding suggests that a company's economic performance is the most important factor when they are making decisions to engage in environmental responsibility, such as GHG reduction activities. Given the high numbers for environmental expenditure, companies that have low economic performance certainly will give top priority to improving their economic performance compared with environmental responsibility activities. The result implies that companies with greater profitability might have an incentive to reveal their good news to stakeholders; they are not only pursuing high profit but also showing they are responsible and compliant with regulations. By producing a higher volume of GHG emissions information, companies can make themselves more attractive to various stakeholders, receive less pressure and complaints from communities and may enhance the relationship with their stakeholders. Table 8 Second, the relationship between leverage and GHG emissions disclosure is negative and significant (coefficient = -0.074; p-value = 0.017). Hence, H2 is supported. This result suggests that

companies with low leverage tend to reveal more GHG emissions information. This is likely motivated by trying to improve the credibility of the company with investors, debtholders and customers. By providing more relevant information, such as environmental expenditure incurred for GHG reduction activities, it will reduce pressure from stakeholders. In contrast, companies with high leverage tend to reduce GHG emissions information. This is because if a company with high environmental liabilities disclosed more GHG emissions information, it would reduce its cash flow that would in turn impact on its ability to pay debt (Cormier and Magnan, 1999). Third, H3 predicted

> 4**that there is a positive relationship between firm size and** GHG emissions **disclosure**

(coefficient = 0.107; p-value = 0.000) is also supported. Companies that have high visibility have incentives and greater resources to reduce the risks of environmental damage arising from their activities. Companies that are large also have large capacities to shape the positive perceptions of the public and key stakeholders; their initiatives to disclose GHG emissions information is a form of environmental corporate responsibility. By doing so, a company can maintain their legitimacy. Fourth, Table 8 indicates that

> 39**there is a positive and statistically significant association between industry** type **and**

GHG emissions disclosure (coefficient = 0.122; p-value = 0.005). Hence, H4 is supported. This finding is in line with prior studies that reported that industry type, specifically sensitive industries, are more likely to generate GHG emissions disclosure. This finding suggests that a key reason that sensitive industries make more GHG emissions disclosures is to improve their accountability and visibility. Sensitive industries have a greater

> 37**effect on** their **community, and therefore,** they **normally have a** broader **group of stakeholders**

to satisfy. Fifth,

> 4**there is a** positive **relationship between government ownership and** GHG emissions **disclosure;**

however, the relationship is not statistically significant (coefficient = 0.013; p-value = 0.239). Thus, H6 is not supported. In Indonesia, all companies whose shares are majority owned by the government are mandated by legislation and the minister of state-owned enterprise's regulations to engage in CSR activities. Because a company is owned by the state, the company may not need to report the activity of GHG emissions reductions to key stakeholders such as the government, because SoEs are protected by the state (Chu et al., 2012). In other words, environmental responsibility activities, such as GHG emissions reduction, are aimed not at legitimacy and reducing pressure from the government, but as a form of compliance with government regulation. Conclusions and Limitations This study examined the determinants of greenhouse gas (GHG) emissions disclosure of Indonesian publicly listed companies. The findings provide evidence that the company characteristics of profitability, leverage, size and industry type are factors that determine companies' disclosures of GHG emissions. However, this study failed to provide empirical evidence

enhancing public companies to disclose GHG emissions. Thus, the results of this research are consistent with previous studies that demonstrated that disclosure of GHG emissions is a company's way of responding to stakeholder pressure and public visibility while providing legitimacy for their existence. This result implies that the application of stakeholder, legitimacy and institutional theories can provide more insight into disclosure than the motivation of public Indonesian companies based solely on the consideration of costs and benefits, i.e. the increased legitimacy and reduced pressures, of the activity disclosed. This study has limitations. Although the implementation of GHG emissions reduction has been mandated by the Indonesian government, this study only found about 10% of publicly listed Indonesian companies consistently disclosed information of GHG emissions during the research period (2011– 2014). This is a challenge for the Indonesian government to continue pushing companies to provide GHG emissions information in their annual reports. The use of a larger sample in future studies would provide more details of this finding. In addition, this study cannot determine the

Although the average disclosure levels were high, future studies need to assess the quality of the disclosure: whether it is merely symbolic or substantive. Overall, these results support the conclusion of Cormier et al. (2005); the disclosure of environmental information is driven by multidimensional factors. References

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Criteria Year (2011-2014) 2011 2012 2013 2014 Total Number of firm listed on Indonesia Stock Exchange Number of financial firms Firm consistently provides GHG information in annual reports since 2011 Percentage sample to total listed firm 442 (81) 37 10.24 463 486 509 (81) (81) (81) 37 37 9.68 9.13 1,900 (324) 37 148 8.64 9.39 T a b l e 1 . Sample selection Sector Industry classifcation 2011-2014 N % 1 2 3 4 5 Agriculture Mining Basic industry and chemicals Miscellaneous industries Consumer goods industries 20 36 44 4 12 13.5 24.3 29.7 2.70 8.10 6 Property, real estate, and building constructions 7 Infrastructure, utilities, and transportation 8 Trade, services, and investment Total 8 5.40 12 8.05 12 8.05 148 100 T a b l e 2 . Sample by industry GHG emissions category Coding GHG emissions details Climate change: risks and opportunities GHG emissions (CC) GHG emissions (GH) Energy consumption (EC) GHG reduction and cost (RC) GHG emission accountability (AC) CC1 CC2 (1) assessment of risks and opportunities (2) financial implications GH1 (3) methodology for calculation GH2 (4) external verification

GH3 (5) total emissions GH4 (6) disclosure by scope GH5 (7) disclosure by source GH6 (8) disclosure by facility or segment GH7 (9) historical comparison of emissions EC1 (10) total consumed EC2 (11) disclosure consumption from renewable EC3 source (12) disclosure by type, facility or segment RC1 (13) plans to reduce GHG emissions RC2 (14) targets for GHG emissions RC3 (15) reductions achieved to date RC4 (16) costs of future emissions factored in capital expenditure planning AC1 (17) explanation of where responsibility lies for climate change policy and action AC2 (18) mechanism by which board reviews company progress on climate change actions 1 = if item disclosed; 0 = otherwise; GHG disclosure index (GHGDisc) = number of items disclosed by firm divided by total items (18 items). Source: Choi et al. (2013) T a b l e 3 . GHG emissions's disclosure check list Coding GHG checklist items Percentage firm disclosed 2011 2012 2013 2014 CC Climate change: risks and opportunities GHG emissions - - - - CC1 Assessment of risks and opportunities 89.1 94.6 89.1 86.5 CC2 Financial implications 86.5 94.6 97.2 91.9 GH GHG emissions - - - - GH1 Methodology for calculation 16.2 18.9 18.9 24.3 GH2 External verification 45.9 54.0 54.0 54.0 GH3 Total emissions 32.4 35.1 37.8 37.8 GH4 Disclosure by scope 43.2 51.3 48.6 51.3 GH5 Disclosure by source 43.2 GH6 Disclosure by facility or segment 13.5 GH7 Historical comparison of emissions 24.3 EC Energy consumption - EC1 Total consumed 43.2 EC2 Disclosure consumption from renewable source 16.2 EC3 Disclosure by type, facility or segment 37.8 RC GHG reduction and cost - RC1 Plans to reduce GHG emissions 67.6 RC2 Targets for GHG emissions 32.4 RC3 Reductions achieved to date 43.2 RC4 Costs of future emissions factored in capital expenditure planning 0.0 AC GHG emission accountability - AC1 Explanation of where responsibility lies for climate change policy and action 81.0 AC2 Mechanism by which Board reviews company progress on climate change actions 56.8 Mean 42.9 51.3 48.6 16.2 16.2 32.4 32.4 - - 51.3 51.3 21.6 21.6 51.3 51.3 - - 75.7 67.6 37.8 35.1 43.2 43.2 0.0 0.0 - - 86.5 91.9 64.9 59.5 48.9 48.0 48.6 16.2 35.1 - 48.6 27.0 48.6 - 67.6 37.8 40.5 0.0 - 89.9 59.5 48.1 Table 4. Percentage firm disclosed each item Industry classification Percentage item disclosed per theme CC GH EC RC AC Mean Agriculture Mining Basic industry and chemicals Miscellaneous industries Consumer goods industries Property, real estate, and building constructions Infrastructure, utilities, and transportation Trade, services, and investment 60.0 12.1 18.3 25.0 77.5 97.2 57.5 73.1 56.9 91.7 94.3 25.0 31.1 31.3 68.2 100.0 64.3 66.7 75.0 100.0 83.3 23.8 19.4 39.6 54.2 50.0 .00 .00 .00 50.0 100.0 51.2 44.4 45.8 83.3 100.0 31.0 22.2 33.3 54.2 28.6 68.2 39.9 75.0 36.6 11.1 57.9 40.3 Mean of total sample 85.6 33.1 34.4 38.4 72.4 52.8 CC = climate change: risks and opportunities GHG emissions (2 items); GH = GHG emissions (7 items) ; EC = energy consumption (3 items); RC = GHG reduction and cost; (4 items) AC= GHG emission accountability (2 items). Total items = 18; N = 148 T a b l e 5 . Number of items disclosed per theme by industry Panel A: Continous variables Variables N Minimum Maximum Mean SD GHG disclosure 148 .06 1.00 .52 .29 Profitability 148 -.19 .54 .12 .12 Leverage 148 .01 3.20 .88 .71 Firm size (Ln) 148 20.25 26.19 23.31 1.23 Panel B: Categorical variables Industry: 1 = Sensitive industry 0 = Other industry Government ownership: 1 = SoEs 0 = Other N 148 96 52 148 28 120 % 100.00 64.86 35.14 100.00 18.91 81.09 T a b l e 6 . Descriptive statistics 1 2 1. GHG disclosure 1 .254** 2. Profitability .254** 1 3. Leverage -.226** -.358** 4. Firm size .475** .059 5. Industry .215** -.078 6. Government ownership .237** .155 **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). 3 -.226** -.358** 1 .021 .052 -.192* 4 .475 ** .059 .021 1 .079 .259 ** 5 .215** -.078 .052 .079 1 .211* 6 .237** .155 -.192* .259** .211* 1 T a b l e 7 . Pearson's correlations Variables Prediction Coefficient sign regression t p-value Tolerance Multicollinearity VIF Heterocedasticity t p-value Constant -2.049 -5.261 .000 - - .832 .407 Profitability + .415 2.407 .017 .939 1.065 -2.033 .454 Leverage - -.074 -2.418 .017 .855 1.170 .470 .639 Firm size + .107 6.346 .000 .843 1.186 1.763 .639 Industry + .122 2.834 .005 .925 1.081 .261 .080 Gov.Own + .013 .239 .812 .846 1.183 1.474 .143 R^2 = .345; Adjusted R^2 = .322; F = 14.956; p-value = .000; N = 148 Note: Dependent variable = GHG emissions disclosure; Gov.Own = government ownership T a b l e 8 . Regression results 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19