

The Effect of Green Strategy and Green Investment Toward Carbon Emission Disclosure

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Abstract. This research aims to test the influence of the green strategy and green investment against disclosure of carbon emissions. Global warming leads to extreme climate change in various places around the world including in Indonesia. There is strong evidence that it is caused by human activity, mainly from burning fossil fuels so as to have an impact on the increasing greenhouse gases. One of the company's efforts in reducing the impact of carbon emissions is by disclosure of carbon emissions. Research on the relationship of the disclosure of carbon emissions by a factor of green strategy and green investments at private sector organization is still relatively limited and there are differences in the methods used. This research contributes to providing empirical evidence about the influence of the green strategy and green investment against disclosure of carbon emissions. Research on the relationship of the disclosure of carbon emissions by a factor of green strategy and green investments at private sector organization is still relatively limited and there are differences in the methods used. This research contributes to providing empirical evidence about the influence of the green strategy and green investment against disclosure of carbon emissions. This research using a sample of companies listed on stock exchanges in the country which is included in the rate of carbon emissions in the world, namely Indonesia and German. This study uses data from the 2014-2016 period in the annual report and the corporate sustainability report. The results showed that there is a significant influence of the green strategy and green investment against disclosure of carbon emissions

Keyword. green strategy; green investment; carbon emission disclosure

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INTRODUCTION

The increase in the temperature of the surface of the Earth, get significant attention as the issue of global warming, which climate change at various places in the world. Global warming is recognized as a problem that has a high priority throughout the world and the impact of global warming is getting worse (Borghei, Leung, & Guthrie, 2016; Luo, Tang, & Lan, 2013). Global warming caused by the activity of the humans and there is powerful new evidence that most of the observed global warming over the last 50 years due to human activities and 90% comes from fossil fuel combustion (IPCC, 2007). The economic development sector and industrial sector that are getting faster, which effect on climate change and the environment, encouraging the UN made efforts address the impacts of climate change by developing the concept of sustainable development aimed at Global. The effort began in the years 1972 through an environmental conference in Stockholm, Sweden. Then proceed with Our Common Future in Nairobi of the year 1982, the Earth Summit in

Rio De Janeiro years 1992 on the issue of climate change, the Kyoto Protocol on climate change 1997 and the year 2000 birth of the global goal of the MDGs (Millennium Development Goals) 2000-2015. Conference in Johannesburg South Africa and 2002 in Rio De Janeiro 2012, developed into a global goal SDGs (Sustainable Development Goals) 2015-2030 replace the MDGs. One purpose of SDG's is to take urgent action to combat the effects of climate change, and this deal is contained in the Paris Agreement is an international commitment in conducting mitigation efforts by way of reduction of greenhouse gas emissions to reach temperatures below 2 c. World Bank data show for the year 2013 total world CO₂ emissions amounted to 318 million metric tons. Years of the 1990 's, about two-thirds of CO₂ emissions come from developed countries. But this time, the developing countries also experienced a considerable increase in emissions. The top 10 countries the biggest contributors to carbon emissions are China, the U.S., the European Union (28 countries), India, Russia, Indonesia, Brazil, Japan, Canada, and Germany.

Carbon emissions mitigation efforts have been undertaken both at the country level as well as at the level of the company. At the country level, mitigation efforts made through the existence of regulations related to carbon emissions such as EU-ETS European Union Emissions Trading Scheme, including Indonesia and with the commitment to ratify the Kyoto Protocol with law No. 17/2004. However, after the enactment of ACT No. 17/2004 of Indonesia, only about 10% of manufacturing companies in Indonesia who have committed actions that are associated with the reduction of carbon emissions (Lindrianasari., 2014). At the corporate level, the impact of climate change mitigation efforts can be done by way of disclosure of carbon emissions. More and more scientific evidence suggests that carbon emissions are the main cause of global warming is a serious threat against the lives of both economically, socially and environmentally (Borghei et al., 2016; K. Li & Lin, 2016; Liao, Luo, & Tang, 2015; Luo Tang & 2014a; Luo et al., 2013). Carbon emissions disclosure largely not yet mandatory disclosure is in most of the countries in the world. However many companies prepare the disclosure of carbon emissions on a voluntary basis. This is done to avoid the risk of the company the existence of regulations on climate change in the future and a negative impact on the company's operations (Luo, Lan, Tang &, 2012).

Reporting or disclosure of carbon emissions through the company's annual report is one of the prevention efforts in carbon emissions that can be performed by the company. Previous research on disclosure of carbon emissions using the CDP questionnaire guide/Carbon Disclosure Project with the measurement does the company disclose or not ((Liao et al., 2015; Luo et al., 2012; Luo Tang & 2014a 2014b; Luo et al., 2013; Matsumura, Prakash, & Vera-Munoz, 2014; Tang & Luo, 2011). Other research develops components disclosure of carbon emissions based on the 2006 GRI-G3 (Borghei et al., 2016; Y. Li, Eddie, & Liu, 2014). Earlier research had yet to develop the components of the complete disclosure of carbon emissions, so it is not yet knowing the level of disclosure made by the company. Therefore this component develops the research disclosure of carbon emissions based on the CDP Guidelines and adapted to the G4-GRI and GHG Protocol.

Previous research identified a green strategy consists of hold-ups, step-up, and frontier (Hansen & Klewitz, 2012). Other studies adopting green strategy consists of three types, namely the prevention of pollution, products, services and clean technology (Masoumik, Abdul-Rashid, & Olugu, 2015). Research Duarte & Machado (2013) identifies the green strategy over lean & green. There have been no previous studies that tested the levels of green strategy firm based on the type of lean, defensive, shaded, and extreme green strategy (Ginsberg & Bloom, 2004). This grouping is required to find out if the companies take advantage of opportunities in the face of climate change's effect on the company's ability to manage emissions, expressed in the information disclosure of carbon emissions. Based on

the description above, this research to formulate the first problem: how to influence the level of green strategy against disclosure of corporate carbon emissions?

According to the International Monetary Fund (IMF), green investment is an investment that is required in adapting to climate change by reducing greenhouse gas emissions without reducing the production and consumption of non-energy significantly. Previous research gives an overview of energy efficiency to use green investment schemes on a case study of the housing sector accounts for 30% of carbon emissions. These studies provide evidence that investment green became a major force in the energy sector (Czako, 2012). However, it is still a little bit of research to provide evidence of the influence of the green investment towards adaptation to climate change to reduce greenhouse gas emissions through disclosure of carbon emissions. Previous research has yet to provide empirical evidence that tests the influence of green investment company against the disclosure of carbon emissions. Indonesia since the year 2004 has committed with the Act of the Republic of Indonesia No. 3 set about the green industry, but since the 2010-2014 the number of green investments reached 30% of the total investment. The year 2015 and then Indonesia is hosting Green Investment Conference international level with the theme of the tropical landscape: a global summit investment opportunity and are committed to improving the green investments of 20% per year. Based on the description above, this research to formulate the second problem: how to influence green investment against disclosure of carbon emissions.

This research aims to analyze the factors that affect the disclosure of carbon emissions that is green and green investment strategy. This research is expected to deliver benefits for the development of science, the Government as the regulator, and industry peers. For science is expected this research can add to the literature on disclosure of carbon emissions the firm views of the factors which affected green strategy and green investment. The study is also expected to contribute by providing empirical evidence of the existence of the influence of the green strategy and green investment against the disclosure of the company's carbon emissions.

THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

Stakeholder Theory

Stakeholder theory is a theory that gives an overview of the presence of the parties with regard to the interests of the company. Stakeholder groups or individuals who may be affected by the purpose of the company. Stakeholders are defined as those who have involvement in the company either by individuals, groups or organizations. The main stakeholders include employees, managers, shareholders, customers, and suppliers (Phillips, Freeman, & Wicks, 2003). Stakeholders include groups or individuals include shareholders, creditors, Governments, employees, community and social environment, and the other (Chairiri & Ghazali, 2007). On the point of view of the theory of stakeholder, the company not only is an economic entity only run operations for its own interests but should provide benefits for the parties the company responsible for their the stakeholders of the company. The company should be able to maintain good relations with stakeholders by understanding the desires of stakeholders, especially stakeholders that have an impact on the availability of the resources used for the operational activity of the company, such as employees, the company's top customers and others (Ghozali & Chairiri, 2007). Stakeholder theory also requires managers to be able to manage the expectations of the stakeholders and the value that they create and requires managers to understand what is wanted and what is created so that it corresponds to what is expected by stakeholders (Freedman & Jaggi, 2005).

Legitimacy Theory

Theory of legitimacy this provides an explanation of the social responsibility must be disclosed in order that the company gets the legitimacy of the social environment on the spot activities the company operates, and this will give the company financial strength the maximum for a long period of time. Theory of legitimacy is based there is the existence of a social contract between the company with the Community hosts a company running his business and use of economic resources. Legitimacy is a dynamic concept that changes in time and place (Ghozali & Chairiri, 2007). The company should be able to see between company goals with what became the hope of society against the company. If this is not the note will appear between the legitimacy gap expectations and how to behave and act in the organization. For it, organizations need to adopt a strategy to eliminate these disparities and change public perception through environmental and social disclosure of information (Gray, Kouhy, & Lavers, 1995). The legitimacy associated with the limitations of the company's values and norms in the conduct of business and is a strategic effort in the development of the company for the long term. The legitimacy of the community will encourage the sustainability of the company for the long term, but if the company cannot adapt to the prevailing norms and values in society, can threaten the very existence of sustainability the company in the future (Deegan & Soltys, 2007)

Institutional Theory

Initially, institutional theory focuses on how to explain the structure of the institution in the process affect organizations and behaviors that can be accepted as norms in the Organization (Tolbert & Zucker, 1996; Scott, 2001) in (Greenwood & Suddaby, 2006). Institutional theory or the theory of institutional formation that the Organization essentially because of the pressure on the environment of the institutions that led to a change in the organization. Changes in the form of ideas and ideas on environmental organizations that form the behavior in language and symbols which explain the existence of the Organization and accepted as norms in the concept of Organization (Donaldson & Preston, 1995). The Organization was formed because of the institutional environment that exists around the Organization and strength from outside the Organization through a process of mimicry and compliance. Ideas or ideas that influence was institutionalized and accepted as such organizations norms (DiMaggio & Powell, 1983). A change of institutional isomorphism can be identified into three mechanisms: first, coercive isomorphism that comes from political influence and legitimacy. Second, mimetic isomorphism, that is generated from a standard response to uncertainty. Third, normative isomorphism, associated with the demands of professionalism (DiMaggio & Powell, 1983). Isomorphism show result of the Coercive pressure of both formal and non-formal given on the Organization so that the organization took or committed some form of adoption against another organization due to pressure other countries, organizations and the public at large. Pressure on the organization can be felt as a force, or as a solicitation to join in a collision.

Mimetic isomorphism, there is uncertainty also provides a strong impetus for organizations to imitation or mimicking other organizations. When the purpose is still ambiguous, while creating an environment of uncertainty, organizations can model themselves on other organizations. Mimesis or model the behavior on other more successful organization is the dramatic response form is from the uncertainty. One of the most dramatic forms of modeling is the modernization of Japan in the late 19th century on the Western prototype is judged a success, and now American companies in Japan for resolve model applying problem productivity and personnel in their company. Companies that adopt modeling or other company innovation, aiming to enhance their legitimacy, at least try to

improve the working conditions of the company stepped better. Normative isomorphism is a source of organizational changes that are caused due to the demands of professionalism. To achieve success and legitimacy of the Organization's personnel, must have the commitment and can work in a professional, can compromise the internal organization, leadership, clients, regulators, professional organizations.

Green Strategy

The term green in major business activities is not a new phenomenon, but it has begun since the year 1980 's (Makower, 2009). This activity not only saves the Earth from climate changes due to the increase in the Earth's temperature caused by the greenhouse effect but can also increase the efficiency of business (Ginsberg & Bloom, 2004). Classification of the green strategy was developed from the green market strategy mix is divided into four parts, namely lean green, defensive green, shaded green, and extreme green. The strategy of lean Green, the appropriate company reduce product cost comparison of concern related to the environment, and there is no trend in producing environmentally friendly products. For example, the Coca-Cola Co., paying attention to the environment by recycling activities and modify packaging, though it is made to expand the market and establish the brand. The defensive strategy of the green is more appropriate to realize it is very important for the company will be an environmentally friendly industry segment but their very nature temporary. For example, a Huge Clothing Retailer Gap Inc., sponsoring activities and environment program on a small scale, if there is pressure from competitors, environmental activists, or regulators. The strategy of the green shaded more long-term oriented business processes environment-friendly, but not as a major factor, but only as a factor supporting the company's business. For example, the Toyota Prius, have products that are eco-friendly because the efficiency against fuel compared to Toyota Motor. The company chose the strategy of extreme green, on business process starting from the input, process, and output of the process is environmentally friendly and has a strong philosophy will concern the environment. For example the company Bodyshop and Honest Tea of Bethesda (Ginsberg & Bloom, 2004).

Hypothesis Development

Effect of Green Strategy and Disclosure of Carbon Emissions

Companies that disclose information whether it's carbon emissions reporting mandatory or voluntary, knowing of the risks and opportunities that may arise in the face of climate change. Companies can integrate the risks and opportunities in corporate strategies that have an impact on the environment. Especially in companies that its business fields related to climate change such as forestry, energy and transportation, agriculture, industry, and waste, which disclose information on carbon emissions. IBM, Ricoh, and Chevron are examples of companies that have implemented a green strategy in their business processes. Companies that want to take advantage of climate change risks and opportunities by integrating it into the green strategy can emulate companies that have been successful implementing it (mimetic isomorphism).

Previous research to build the framework for the measurement of lean and green strategy (Duarte & Machado, 2013). The business model approach is used as awards, standards, and frameworks, to provide a comprehensive understanding of each model. GRI is one of the standards that govern certain aspects of green business that has been adopted by dozens of big companies as the standard reporting of environmental and social performance of the company by issuing sustainability reports (Sustainability Report) which includes three dimensions, namely environment, social and economic, in addition to other international

standards such as ISO14001 (Makower, 2009). The issue of sustainability is a systematic and efficient manner that delivers value to the business prospects. The benefits of sustainability help to determine the key factors that affect profits, dividends and stock prices of companies such as reputation brand strength, competitive products, supply chain (Blackburn, 2007).

Based on the explanation above, the disclosure of information is one of the forms of carbon emissions the company's ability to manage emissions, as a form of an effort to manage the risks and opportunities due to climate change. The risks and opportunities that can be integrated into the form of a corporate strategy that is a green strategy. Previous research has not been made on testing a level green strategy that is lean, defensive, shaded, and extreme green based on grouping of Ginsberg & Bloom (2004) against the disclosure of the company's carbon emissions. Researchers argue that companies that take advantage of opportunities from the impacts of climate change, by utilizing a competitive advantage through the green strategy, will demonstrate the company's ability to manage carbon emissions through information disclosure of carbon emissions. Based on the explanation above, then the first hypothesis in this study are:

H1: company adopting green strategy has a positive influence against the disclosure of the company's carbon emissions.

The influence of Green Investment and disclosure of carbon emissions

Green investment is an investment that is required in adapting to climate change by reducing greenhouse gas emissions without reducing the production and consumption of significantly (Eyraud et. Al. 2011). Green investment can come from investing in the country or from green FDI (Foreign Direct Investment) as a source of private sector financing and transfer of technology between countries. The industry uses raw materials and environmentally friendly technology, which produces no emissions but has added value, with the concept of reducing, reuse, recycle and recovery. Green industry criteria according to the Ministry of industry of Indonesia is a potential investment sectors group driven as the privately run green investment-friendly environment which includes agriculture, forestry, fisheries, concession geothermal power, processing industry, such as biomass, biofuels, an industry manufacturing and low cost green car components (LCGC), procurement of electricity from renewable sources, the procurement of electricity from renewable sources, biogas, and garbage or waste, waste management and recycling, as well as nature tourism.

UU RI No. 3/2014 about the industry (article 77-83) set about the green industry in Indonesia. Expansion of green investment relates to the progress of technology and innovation. This is related to the use of new technologies related to the cost of the R&D company (Eyraud, Clements, & Wane, 2013). In the financial sector, concern and responsibility towards the environment have increased investment opportunities in green mutual funds (Climent & Soriano, 2011; Czako, 2012). Economic growth leads to higher demand against energy resources, which then increases the level of emissions and potentially add to environmental degradation (Ahmed, 2014; Eyraud et al., 2013).

H2: Green investment has a positive influence on the disclosure of carbon emissions.

RESEARCH METHOD

In this study, the population is all of the companies listed on the Indonesia stock exchange and the Frankfurt Stock Exchange. The selection of the sample was based on these countries is producing the world's largest carbon emissions, a commitment to the international accord on emissions mitigation, and the EU is a country that started a pilot initiative in an effort

mitigation of carbon emissions. The criteria used is the sample of companies listed on the respective stock exchange each country sample, excluding the financial and banking sector, the company that issued the annual report, the Sustainability Report, and the Social Responsible Investment (SRI). The research period is the year 2014-2016. The research framework is as follows:

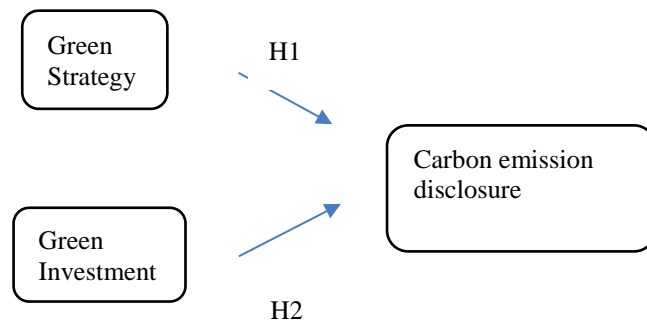


Figure 1: Research Framework

In this research, data processing for green strategy and disclosure of carbon emissions using a content analysis with the help of the NVIVO11 program, and testing these hypotheses using data panel with STATA program. Models used in testing the influence of green strategy and green investment against disclosure of carbon emissions are as follows:

$$EM_DISC_{it} = \alpha_1 + \alpha_2GS_{it} + \alpha_2GI_SRI_{it} + \alpha_3Size_{it} + \alpha_4IND_SECKd_Ind + \alpha_5KD_NEG + \epsilon_{it}$$

EM_DISC = Carbon Emission Disclosure

GS = Green Strategy

SRI = Green Investment

Table 1. Variable Summary

No	Variable	Indicator
1	Disclosure of carbon emission	Content analysis (Annual report)
2	Green Strategy	Content analysis (Sustainability Report)
3	Green Investment	Social Responsible investing Index

The proxy used for climate change strategy is the disclosure of carbon emissions (EM_DISC). Disclosure of the Carbon Emission (EM_DISC) is the disclosure of carbon emissions the firm (i) a year (t). Data used in this study are derived from the annual report and sustainability report. Carbon emissions disclosure components developed on the basis of the components of the disclosure that comes from the CDP's 2016 Climate Change

Information, GRI-G4, and GHG Protocol. Component outline disclosure is retrieved from the CDP's 2016 Climate Change Information that includes three sections; management, risks and opportunities, accounting of emissions, energy use and fuel, the trade component, but the disclosure of the CDP in the form of voluntary questioners, while in this study cannot be questioners. This research complements previous research (Borghei et al., 2016; Choi et al., 2013) using components disclosure of emission reduction targets, indirect emissions coverage, and coverage of other indirect emissions (according to the GHG Protocol).

Table 2. List of Disclosure of Carbon Emission

Category	Disclosure items	Max score	Score
Introduction	GHG01 Report Period	1	
	GHG02 General description of the organization	1	
Management	Governance		
	GHG03 Department/individual/highest level responsible for climate change	1	
	GHG04 Incentive for the management of climate change	1	
	Strategy		
	GHG05 Carbon emission reduction goals	1	
	GHG06 Emission reduction program/policy	1	
	GHG07 Climate change is integrated into business strategies	1	
	GHG08 Activities that could either directly or indirectly influence public policy on climate change.	1	
	GHG09 Management plan and strategies to reduce global warming	1	
	GHG10 GHG certifications	1	
	Target dan Initiative		
	a GHG11 Emissions reduction target	1	
	GHG12 Goods/services that low carbon	1	
	GHG13 Use of new technologies	1	
	GHG13 Energy conservation (reductions on energy consumption)	1	
	GHG14 Use of renewable energy	1	
GHG15 Implementation management plan/programs	1		
GHG16 Employee training/incentive to activities associated with global warning	1		
Risk and Opportunities	GHG17 Identify climate change risk	1	
	GHG18 Identify climate change opportunities	1	
	GHG19 Analysis of business risk and opportunity caused by climate change	1	
Methodology, Emissions Data, Emissions Performance	GHG20 Emission resources	1	
	GHG21 Measuring/calculating of carbon emission	1	
	GHG22 Total amount of carbon emission	1	
	GHG23 Carbon emissions limit	1	
	GHG24 Organizations documents on carbon emissions	1	
	GHG25 Scope emission sources more than one country	1	
GHG26 Intensity carbon emission	1		

Category	Disclosure items	Max score	Score
	GHG27 Emission trading	1	
	Total	27	

Companies that disclose information of each item is given a value of 1 (one) and who did not reveal the value of 0 (zero). The total number of items of disclosure of aggregated, divided by the total number of disclosure, in order to obtain the overall score for each company. The higher the index value of the disclosure of a company, means of information disclosure of carbon emissions are higher the company disclosed.

Green Strategy

This research uses the standards of the Global Reporting Initiative GRI/(GRI, 2013). GRI standards used are based on G4 sustainability guidelines that contain common standards and standards of disclosure. Aspects related to sustainable development GRI that contains the three dimensions of sustainability i.e. environmental, social and economic.

Table 3. Category ECONOMIC

No	G3 & G4	Indicator	Skor
	Aspect: Economic Performance		
1	EC1, G4-EC1	Direct economic value generated and distributed	
2	EC2, G4-EC2	Financial implications	
3	EC3, G4-EC3	Coverage of organization's defined benefit plan obligations	
4	EC4, G4-EC4	Financial assistance received from government	
	Aspect: Market Presence		
5	EC5, G4-EC5	Ratios of standard entry-level wage	
6	EC7, G4-EC6	A proportion of senior management hired from the local community	
	Aspect: Indirect Economy impacts		
7	EC8, G4-EC7	Development and impact of infrastructure investment	
8	EC9, G4-EC8	Significan indirect economic impacts	
9	G4-EC9	A proportion of spending on the local supplier	

Table 4. Category ENVIRONMENT

No	G3 & G4	Indicator	Skor
	Aspect: Material		
10	EN1, G4-EN1	Materials used by weight or volume	
11	EN2, G4-EN2	Percentage of materials used that are recycled input materials	
	Aspect: Energy		
12	EN3, G4-EN3	Energy consumption within the organization	
13	EN4, G4-EN4	Energy consumption outside the organization	
14	EN5, G4-EN5	Energy intensity	
15	EN6, G4-EN6	Reduction of energy consumption	
16	EN7, G4-EN7	Reduction in energy requirement of the product	
	Aspect: Water		
17	EN8, G4-EN8	Total water withdrawal by source	
18	EN9, G4-EN9	Water source significantly affected by the withdrawal of water	

No	G3 & G4	Indicator	Skor
19	EN10, G4-EN10	Percentage and a total volume of water recycled and reused	
	Aspect: Biodiversity		
20	EN11, G4-EN11	Operational sited owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	
21	EN12, G4-EN12	Description of significant impacts of activities products and services on biodiversity in protected areas	
22	EN13, G4-EN13	Habitat protected or restored	
23	EN14, G4-EN14	Total number of IUCN red list species with habitat in areas affected by operations, by a level of extinction risk	
	Aspect: Emission		
24	EN16, G4-EN15	Direct GHG Emission scope 1	
25	EN17, G4-EN16	Indirect GHG emission scope 2	
26	G4-EN17	Another GHG emission scope 3	
27	G4-EN18	GHG emission intensity	
28	EN18, G4-EN19	Reduction GHG emission	
29	EN19, G4-EN20	Emission of ozone-depleting substances	
30	EN20, G4-EN21	NOx, Sox, and another significant air emission	
	Aspect: Effects and Waste		
31	EN21, G4-EN22	Total water discharge by quality and destination	
32	EN22, G4-EN23	Total weight of waste by type and disposal method	
33	EN23, G4-EN24	Total number and volume of significant spills	
34	EN24, G4-EN25	A weight of transported, imported, or treated waste deemed hazardous	
35	EN25, G4-EN26	Identity, size, protected status and biodiversity value of water bodies	
	Aspect: Product and Service		
36	EN26, G4-EN27	the extent of impact mitigation of environmental impacts of products and services	
37	EN27, G4-EN28	Percentage of product sold and their packaging materials that are reclaimed by category	
	Aspect: Compliance		
38	EN28, G4-EN29	The monetary value of significant fines and a total number of non-monetary sanction for non-compliance with the environmental law	
	Aspect: Transport		
39	EN29, G4-EN30	Significant of the environmental impact of transporting product and other goods	
	Aspect: Overall		
40	EN30, G4-EN31	Total environment protection expenditures and investments by type.	
	Aspect: Supplier Environment assessment		

No	G3 & G4	Indicator	Skor
41	G4-EN32	Persentase new supplier	
42	G4-EN33	Significant actual and potential negative environmental impact in the supply chain	
	Aspect : Environment grievance mechanism		
43	G4-EN34	Number of grievances about environmental impacts field	

Table 5. Category SOCIAL

G3 & G4	Indicator	Skor
Aspect: Employment		
LA1, G4-LA1	Total number and rate of new employee hires and employee turnover by age group, gender, and region	
LA2, G4-LA2	A benefit provided to full-time employees	
LA3, G4-LA3	Return to work and retention rates after parental leave	
Aspect: Labor Management		
LA4, G4-LA4	Minimum notice period regarding operational changes	
Aspect: Occupational health and safety		
LA6, G4-LA5	Percentage of total workforce represented in formal joint management	
LA7, G4-LA6	Type of injury and rate of injury	
G4-LA7	A worker with a high incident or high risk	
LA9, G4-LA8	Health and safety topics	
Aspect: Training and Education		
LA10, G4-LA9	Average hours of training per year per employee by gender	
LA11, G4-LA10	Program for skill management	
LA12, G4-LA11	Percentage of employees for receiving regular performance and career development	
Aspect: Diversity and equal opportunity		
LA13, G4-LA12	Composition of governance bodies	
Aspect: Equal remuneration for man and woman		
LA14, G4-LA13	Ratio of basic salaries and remuneration	
Society		
Aspect: Local community		
SO1, G4-SO1	Percentage of operations with implemented local community engagement	
SO9, G4-SO2	Operations with significant actual and potential negative impact on local communities	
Aspect: Corruption		
SO2, G4-SO3	Total number and percentage of operations assessed for risk related to corruption	
SO3, G4-SO4	Communication and training for anti-corruption	
SO4, G4-SO5	Confirm incident of corruption	

G3 & G4	Indicator	Skor
Aspect: Public policy		
SO5, G4-SO6	A total value of political contribution by country and recipient	
Aspect: Anticompetitive		
SO7, G4-SO7	Total number of legal action for anti-competitive behavior, antitrust and monopoly	
Aspect: Compliance		
SO8, G4-SO8	The monetary value of significant fines and a total number of non-monetary sanctions	
Aspect : Supplier assessment for impact on society		
G4-SO9	Percentage of a new supplier	
G4-SO10	Significant actual and potential negative impact on society in the supply chain	
Aspect: Grievance mechanism for impact on society		
G4-SO11	Number of grievance about the impact on society filed	
Aspect: Product responsibility		
PR1, G4-PR1	Percentage of significant product and service categories for which health and safety impact are assessed for improvement	
PR2, G4-PR2	Total number of incident of non-compliance with regulation	
PR3, G4-PR3	Type of product and service information required by the organization procedure	
PR4, G4-PR4	Total number of incident of non-compliance with regulation	
PR5, G4-PR5	A result of surveys measuring customer satisfaction	
PR6, G4-PR6	Sale of banned or disputed product	
PR7, G4-PR7	Total number of incident of non-compliance with regulation	
PR8, G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy	
PR9, G4-PR9	The monetary value of significant fines for non-compliance with law and regulation	

Based on the table above, the indicator used is largely derived from the standard G4-GRI indicators specifically used each having a value of 1 (one) if such information is disclosed in the sustainability report and the value 0 (zero) if such information is not disclosed.

Green Investment

Index of SRI (Sustainable and Responsible Investing or Socially Responsible Investment). SRI is an investment strategy that seeks to consider both financial and social returns. The SRI indices give exposure on the level of the company drawn upon the basis of three categories of fundamental aspects of requirements environmental, social and governance (ESG) in accordance with the principle of sustainable who care about the environment and surrounding communities, will concern human rights, employment, and good governance.

In addition to the three fundamental aspects, the aspect of climate change become the focus of a specific area.

RESULTS AND DISCUSSION

Sample

This research was conducted in companies listed on stock exchanges in their respective countries. But not all companies in Indonesia and Germany has the completeness of the required data. All types of industrial companies listed on the stock market is a sample research unless the company banking and other services. The period of the data used in this study are for 3 years, 2014, 2015 and 2016. The availability of sample data for the study can be seen in table 6:

Table 6. Sample Selection

Sample selection	No of companies	Firm-year
Companies listed on Indonesia Stock Exchange and Frankfurt Stock Exchange that issue sustainability report	69	207
Data isn't in accordance with GRI Guideline	(12)	(36)
Data incomplete	(10)	(30)
Final Sample	47	141

In table 6 above is the number of samples used in the study. Initial samples used is a company that published a report on sustainability. But not all companies listed on the stock market the sustainability reports published in accordance with the instructions of GRI. In the period of 3 years of research, there are 69 companies (207 firm-year) that make sustainability report. The data obtained showed a company that makes sustainability report in accordance with GRI as much as 47 companies (141 firm-year).

Descriptive Statistic

Table 7. Statistic Descriptive

No	Variables	Mean	Std Dev	Min	Max
1	Em_Disc	0,59	0.29	0	1,07
2	GS (Green Strategy)	0,53	0,27	0,06	1,02
3	SRI	0,55	0,49	0	1
4	Ln_TA	32,19	1,87	27,6	35,7
5	Kd_Ind	7,5	4,7	1	16
6	Kd_Neg	0,7	0,45	0	1
	N	141			

Source: Statistic result data

In table 7, the variable disclosure of carbon emissions showed on average (59%) of companies disclose information on activities related to emissions. For variable green strategy shows that the average (53%) of the company strives to increase corporate strategy by increasing the dimensions of the economic, social and environmental. SRI (Socially Responsible Investing) by an average of more than 50% of the companies do an investment strategy that seeks to consider both financial and social returns.

Hypothesis Testing

The first hypothesis suggested that green strategy has an impact on disclosure of carbon emissions. The test results indicate that there is a significant positive influence of green strategy and disclosure of carbon emissions. Companies that disclose information whether it's carbon emissions reporting mandatory or voluntary, knowing of the risks and opportunities that may arise in the face of climate change. Companies can integrate the risks and opportunities in corporate strategies that have an impact on the environment. The second hypothesis is guessed that there was an influence of SRI (Socially Responsible Investing) against disclosure of carbon emissions. The results of showed there is a significant positive influence on green investments and disclosure of carbon emissions. Green investment is an investment that is required in adapting to climate change by reducing greenhouse gas emissions without reducing the production and consumption of significantly.

Table 8. Regression Result

Model-based regression				
$EM_DISC_{it} = \alpha_1 + \alpha_2GS_{it} + \alpha_2GI_SRI_{it} + \alpha_3Size_{it} + \alpha_4IND_SECKd_Ind + \alpha_5KD_NEG + \varepsilon_{it}$				
Variable	Prediksi Arah	Koof	T stat	Sig
Independent variables :				
GS	+	0.834	8.55	0.000***
SRI	+	0.0.18	2.91	0.005***
Control variables :				
Size	+	0.064	1.21	0.229
Industri_sec				
Kd_Neg				
R2	0.463			
N	141			

CONCLUSION

This research generally aims to analyze the influence of the green strategy, green investment, against disclosure of carbon emissions. Global warming leads to extreme climate change in various places around the world including in Indonesia. There is strong evidence that it is caused by human activity, mainly from burning fossil fuels so as to have an impact on the increasing greenhouse gases. One of the company's efforts in reducing the impact of carbon emissions is by disclosure of carbon emissions. The results showed that there was a

significant influence on green investment strategy and have an impact on the disclosure of the company's carbon emissions.

Implication this study gives evidence of the influence of the green strategy and green investment against disclosure of carbon emissions. However, it should be noted also that each country has different regulations. For example, Indonesia has yet to require issuers to publish sustainability reports, whereas in Europe the company public has been obliged to publish reports on sustainability.

Limitations this study has limitations time span which is used only during the three (3) years, and the sample used is limited to companies in Indonesia and the German, which includes countries that are the biggest producers of carbon emissions in the world. There are still many countries in Europe, USA, China which is the largest emissions-producing country in the world. For the study, expected to be more exploration other factors that have an influence on disclosure of carbon emissions and do a comparison with other countries that do carbon emissions disclosure and use different research methods.

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