ATESTASI: JURNAL ILMIAH AKUNTANSI
Vol 7, Issue 2, (2024), 917 - 933

# The Influence of Industrial Type, Media Exposure and Institutional Ownership on Carbon Emission Disclosure

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**Received:** November 06, 2023, **Revised:** May 30, 2024, **Accepted:** July 07, 2024

## Abstract

The implementation of carbon emission disclosure is a solution that companies can use to reduce carbon emissions and ensure that they carry out business activities in a socially and environmentally responsible manner. The phenomenon that occurs in this study is that several companies in the basic materials sector have not fully carried out carbon emission disclosure every year because carbon emission disclosure in Indonesia is still voluntary. This study aims to simultaneously and partially determine the effect of industrial type, media exposure, and institutional ownership on carbon emission disclosure in basic materials sector companies listed on the Indonesia Stock Exchange (IDX) for the 2018-2022 period. This study uses a quantitative method with a sample selection method, namely purposive sampling. The analysis model used in this study is a multiple linear regression analysis model using SPSS 26 software. The results state that industrial type and media exposure have a positive and significant effect on carbon emission disclosure. Institutional ownership has a negative and significant effect on carbon emission disclosure.

**Keywords:** Industrial Type, Media Exposure, Institutional Ownership, Carbon Emission Disclosure.

**DOI: https://doi.org/10.57178/atestasi.v7i2.874**
**p-ISSN: 2621-1963**
**e-ISSN: 2621-1505**

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## Introduction

Climate change is an interesting issue and a global concern. Uncontrolled climate change globally can cause various problems in the environment. One of the problems that cause climate change is the increase in carbon emissions. Carbon emissions are one of the wastes generated from the company's business activities. Companies must make sustainability disclosures to ensure that they carry out sustainable and socially and environmentally responsible business activities. This is due to the increasing impact caused by the company's activities. One of the sustainability disclosures made by companies is *carbon emission disclosure. Carbon emission disclosure* is a disclosure of social and environmental responsibility carried out by the company as a form of corporate responsibility practice towards society

and the environment (Hapsari et al., 2021). *Carbon emission disclosure* is mandatory according to SEOJK Number 16 /SEOJK.04/2021, including total carbon, the amount and entity of emissions generated by type, emission reduction efforts made, achievement of emission reduction, amount and intensity of energy used, as well as efforts and achievements in energy efficiency and use of renewable energy. Other than these points, disclosure is still voluntary (Ladista et al., 2023).

The company's *carbon emission disclosure* not only shows the number of emissions produced but also the company's plan to reduce emissions. The quality of the company can be seen from the amount of carbon produced by its activities, which continues to decline every year (Fathia & Sulfitri, 2023).Based on published data from (databooks, 2023) Indonesia was ranked as the seventh-largest carbon emitter in the world in 2022. The amount of carbon emissions generated amounted to 1.24 GT CO2 for carbon dioxide (CO2) emissions. This figure increased from 2021, averaging 1.12 GT CO2. Based on data published by the *Global Reporting Index ASEAN* (GRI ASEAN) organization, of the 6 ASEAN countries, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, Indonesia ranks fourth in terms of the level of disclosure of carbon gas emissions, which is 44% (Ovina & Meiden, 2023). The legitimacy theory is the main foundation of this research. *Legitimacy* theory was first proposed by (Holland et al., 2021), which states that organizations build conformity between norms in the social system and social values related to the organization to adapt to its environment (Mellyanawati & Sasongko, 2023). Legitimacy theory is the basis of this study because by disclosing social and environmental responsibilities, such as carbon emission disclosure, companies can gain legitimacy from society. In addition to gaining legitimacy from the community, other stakeholders will certainly appreciate companies that care about the environment and conduct *carbon emission disclosure*. This can be seen from the information in the *annual report* and *sustainability* report of companies that conduct *carbon emission disclosure.* (Mellyanawati & Sasongko, 2023). The more information disclosed by the company will be a guide for stakeholders. In addition, companies carry out *carbon emission disclosure* to maintain better relationships with stakeholders so that they can generate more profits (Afnilia & Astuti, 2023).

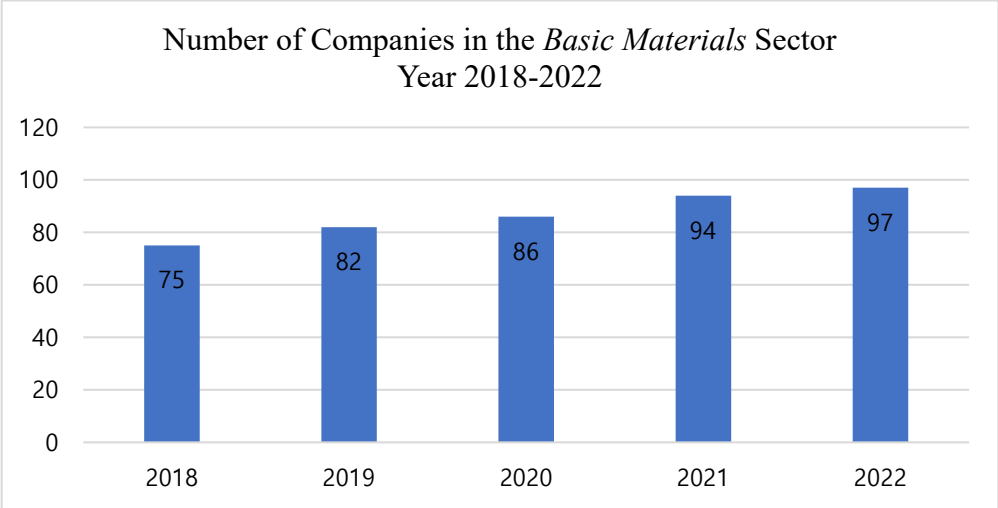


**Figure 1. Development of Basic Materials Sector Companies Year 2018-2022**

Based on Figure 1, it can be seen that every year, companies in the *basic materials* sector continue to experience a significant increase. In 2018-2019, the primary materials sector companies increased, with seven companies joining that year. From 2019 to 2020, as many as four companies joined the *primary materials* sector. From 2020 to 2021, the basic materials sector experienced a significant increase. Namely, eight companies joined. In 2021-2022, 3 companies joined the *primary materials sector.* The highest increase occurred in 2020-2021 when eight companies joined the primary materials

sector, and it can be seen that every year, the companies in the primary materials sector experienced a not-so-high but quite significant increase.

*The basic materials* sector is one of the sectors that produces high carbon emissions compared to other sectors. Companies in the *basic materials* sector are the main contributors to the increase in carbon emissions, so companies need to pay attention to environmental aspects by conducting *carbon emission disclosures* to attract investors to invest. Companies in the *basic materials* sector drive economic turnover, which causes an increase in demand for raw materials, as in the case of PT Semen Indonesia Tbk (SMGR), which shows the attractiveness of exports and estimates that next year's exports will be even better as export agreements to the United States increase. Thus, in 2024, it has the potential to increase sales volume by 500,000 tons. Therefore, the *basic materials* sector is needed to reduce dependence on imports (Hamdhi, 2023). The basic materials sector also has several sectoral stock indices that have risen higher than the Jakarta Composite Index (JCI). *Carbon emission disclosure* in Indonesia is still voluntary, but the number of *basic materials* sector companies has increased every year. The following is the development of *basic materials* sector companies from 2018-2022.

One of the cases is about environmental pollution produced by PT Toba Pulp Lestari Tbk (INRU). PT Toba Pulp Lestari Tbk (INRU) took over the land in Parbulu Village, Toba Regency. Based on reports from the local community, the activities of PT Toba Pulp Lestari Tbk (INRU) have caused water pollution and air pollution due to the waste produced by the company. Problems regarding water pollution and air pollution have been occurring for 34 years. The impact of water pollution and air pollution is felt physically through health problems such as the emergence of skin diseases such as itching to release pus experienced by the local community. In addition, the resulting water pollution and air pollution also have an impact on the economy and the surrounding environment, such as damage to agricultural land where the ecosystem is the main livelihood of the local community. (Dirgantara, 2021).

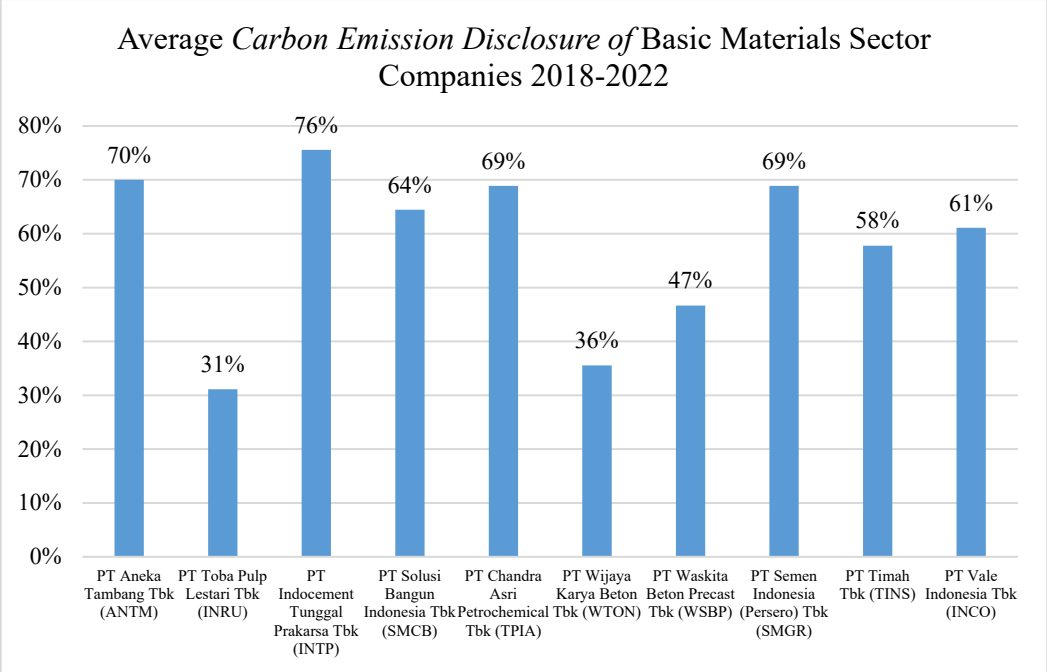


**Figure 2. Average Carbon Emission Disclosure of Basic Materials Sector Companies 2018-2022**

The problem related to *carbon emission disclosure* is that several companies in the primary materials sector have not thoroughly carried out *carbon emission disclosure* every year. Figure 2 explains the average level of *carbon emission disclosure* in *basic materials* sector companies for the period 2018-2022. *Carbon emission disclosure* is measured using the carbon *emission disclosure index checklist*

developed by (D. L. Choi & Psaros, 2013). Based on the data, it can be seen that from 2018 to 2022, the lowest level of carbon emission disclosure is at PT Toba Pulp Lestari Tbk (INRU), which has an average disclosure of 31%. Meanwhile, PT Indocement Tunggal Prakarsa Tbk (INTP) obtained the highest level of *carbon emission disclosure* during this period, which reached 76%. From the data, it can also be seen that there are two other *basic materials* sector companies, namely PT Wijaya Karya Beton Tbk (WTON) and PT Waskita Beton Precast Tbk (WSBP), which have an average level of *carbon emission disclosure* below 50% with each disclosure of 36% and 47%. The low average percentage of company *carbon emission disclosure* indicates that some *basic materials* sector companies have a low awareness of environmental responsibility, so they have not fully fulfilled the *carbon emission disclosure index* developed by (D. L. Choi & Psaros, 2013)Due to the low awareness of environmental responsibility, many companies in Indonesia are still reluctant to disclose their carbon emissions. *This* is because *carbon emission disclosure is still voluntary in the companies' annual and sustainability reports*.

## Literature Review

*Legitimacy Theory*

Legitimacy theory was first proposed by (Holland et al., 2021) Which states that legitimacy theory discusses the interaction between companies and society. Legitimacy theory states that companies try to ensure that their operations remain within the boundaries of the bonds and norms of society in their environment. Based on legitimacy theory, large companies experience more significant pressure from society regarding environmental issues. Therefore, companies must be more responsible for the environment. This will encourage large companies to disclose more information related to the company's activities in environmental conservation. *Carbon emission disclosure* can be one way for companies to build a good reputation in the community (Astiti & Wirama, 2020).

*Carbon Emissions*

Carbon emissions are gases formed when compounds are burned in materials containing carbon compounds. All production and consumption activities that produce emissions are called carbon footprints. (Madiya & Yasa, 2023). The Ministry of Environment and Forestry (MoEF) launched Ministerial Regulation No. P. 73 regarding Guidelines for Implementing and Reporting the National Greenhouse Gas Inventory. This is because *carbon emission disclosure* currently has an optional nature, so that only a few companies declare the amount of carbon emissions they produce (Ratmono et al., 2021).

*Carbon Emission Disclosure*

*Carbon* emission disclosure is a voluntary environmental disclosure and can be found in the company's annual report or sustainability report.(Rusdi & Helmayunita, 2023). The implementation of carbon emission disclosure is a solution that companies can use to reduce the amount of carbon emissions they produce (Iratiwi & Sulfitri, 2023). Carbon emission disclosure can be proof that a company has fulfilled its responsibilities (Yuliandhari et al., 2023). Voluntary disclosure of the company's plans to reduce carbon emissions can provide investors with a better understanding of the company's ability to reduce carbon emissions. (Iratiwi & Sulfitri, 2023). Information on carbon emission disclosure can be found in companies' annual reports and sustainability reports (Iratiwi & Sulfitri, 2023).

*Industrial Type*

According to the Global Industry Classification Standard (GICS), industries are divided into two broad categories: high-profile and low-profile. (Mulya & Rohman, 2020). Carbon-intensive industries (high profile) are referred to as emission-intensive industries, while non-carbon-intensive industries (low profile) are referred to as non-emission-intensive industries. Emission-intensive industries are more

sensitive to environmental damage, so companies must take greater social responsibility than non-emission-intensive industries(Rusdi & Helmayunita, 2023). Companies with a significant influence on the environment will be required to make environmental disclosures, compared to companies with less influence (Dewi & Aldhani, 2021).

*Media Exposure*

Media exposure is one of the risks described as a media attack that includes the company's media activities on various platforms at different times (Ferdiani & Mulyani, 2023). Companies usually use the media to attract investors indirectly and communicate information about activities related to carbon emissions. Companies may be required to provide information about social responsibility and other related opinions to their stakeholders through the media. The media helps stakeholders learn and respond to news about environmental performance and conditions, including carbon emissions generated by the company (Nurjanah & Herawaty, 2022). Media such as websites are one effective means of encouraging companies to make voluntary disclosures to gain public legitimacy and get positive responses from stakeholders. Basically, the company operates to provide benefits to stakeholders but not for personal gain (Septriyawati & Anisah, 2019).

*Institutional Ownership*

Institutional ownership is the percentage of shares owned by institutions that can be used to monitor and control company performance. A high level of institutional ownership will cause institutional investors to supervise the company more closely to prevent unethical behavior by company management (Afnilia et al., 2023). Institutional ownership can act to oversee the company. With institutional ownership, it is hoped that the management supervision carried out will be more optimal. The higher the institutional ownership, the greater the pressure received by company management (Almuaromah et al., 2022). Good institutional ownership will be able to increase company supervision to disclose all activities carried out by the company in order to improve the positive image of company stakeholders, one of which is *carbon emission* disclosure (Mellyanawati & Sasongko, 2023).

*The Effect of Industrial Type on Carbon Emission Disclosure*

Industrial type is considered a factor associated with carbon emission disclosure practices. (Mulya & Rohman, 2020). Industrial type is divided into two types, namely carbon-intensive industries (high profile) and non-carbon-intensive industries (low profile). Carbon-intensive industries (high profile) are referred to as emission-intensive industries, while non-carbon-intensive industries are referred to as non-emission-intensive industries (low profile). High-emission industries will be under greater scrutiny from the government and are often the subject of sensitive politics in the country (Asmeri et al., 2023). Carbon-intensive industries (high profile) are more sensitive to environmental damage, so companies must take greater social responsibility than non-carbon-intensive industries (low profile). Companies engaged in carbon-intensive industries (high profile) do more carbon emission disclosure than companies engaged in non-carbon-intensive industries (low profile) (Rusdi & Helmayunita, 2023). Therefore, the more intensive the industry is in producing carbon, the greater the pressure on the industry to conduct carbon emission disclosure. Based on this, it can be concluded that industrial type has a positive impact on carbon emission disclosure. This has been supported by previous research conducted by (Rusdi & Helmayunita, 2023) and (Asmeri et al., 2023) That industrial type has a positive and significant effect on carbon emission disclosure.

$H_1$: *Industrial Type* Positively Affects *Carbon Emission Disclosure*

*The Effect of Media Exposure on Carbon Emission Disclosure*

Media exposure is an activity carried out by the company to explain information about social responsibility and other relevant opinions to its stakeholders (Afnilia et al., 2023). The media plays an important role in social mobilization movements, such as groups interested in the environment. It also conveys information to the public, including information about the company's activities (Loru, 2023).The media can influence companies' incentives to voluntarily disclose carbon emissions in annual reports and sustainability reports to get favorable feedback from stakeholders (Afnilia et al., 2023).Therefore, the more media exposure the company has, the more motivated the company will be to conduct carbon emission disclosure. Based on this, it can be concluded that media exposure has a positive impact on carbon emission disclosure. This has been supported by previous research conducted (Afnilia et al., 2023). Moreover (Ulfa & Ermaya, 2019) That media exposure has a positive and significant effect on carbon emission disclosure.

$H_2$: *Media Exposure* Positively Affects *Carbon Emission Disclosure*.

*The Effect of Institutional Ownership on Carbon Emission Disclosure*

Institutional ownership is the percentage of share ownership owned by institutional parties, which can be used to monitor company performance (Mellyanawati & Sasongko, 2023).Institutional ownership significantly influences companies' disclosure of carbon emissions, as evidenced by research findings. While institutional ownership can strengthen the impact of regulators on increasing carbon emissions disclosure (Ding, 2023), it also shows a negative effect on carbon emissions disclosure itself. Foreign institutional ownership, on the other hand, has been associated with better quality climate change disclosures, particularly in firms domiciled in stakeholder-orientated countries, those with emission trading schemes, and those with higher information asymmetry levels (Wicaksono et al., 2023).These insights underscore the intricate relationship between institutional ownership and carbon emission disclosure, emphasizing the importance of further research and regulatory attention to enhance transparency and accountability in environmental reporting practices. The higher the institutional ownership in the company, the higher the power, pressure and voting rights allowed by company management to carry out *carbon emission disclosure*. Based on this, it can be concluded that institutional ownership has a positive impact on *carbon emission disclosure.* This has been supported by previous research conducted by (Wang & Scheinbaum, 2017) that institutional ownership has a positive and significant effect on *carbon emission disclosure*.

$H_3$: *Institutional Ownership* Has a Positive Effect on *Carbon Emission Disclosure*

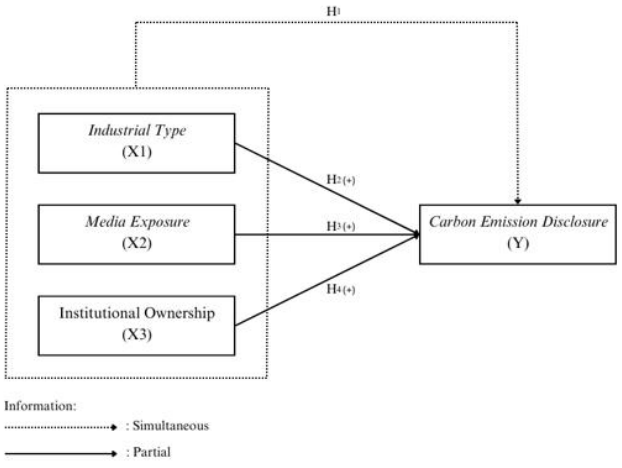


**Figure 3. Conceptual Framework**

## Research Method

This research uses a quantitative approach and descriptive research type. According to (Ardyan et al., 2023), the quantitative approach is a research approach that utilizes quantitative data that can be measured and summed up. The purpose of this study is to determine the effect of *industrial type, media exposure* and institutional ownership on *carbon emission disclosure.* Then, this research includes descriptive research. This research seeks to describe the situation or event, and the data collected is descriptive. Based on the development of the theory used, this research is included in deductive research. Deductive research is research that has a general nature and then becomes specific, the stages of which start from using a clear theoretical basis, formulating hypotheses, making observations, analyzing data and confirming the theory built (Tohardi, 2023). The strategy used in this research is a case study, namely research that studies the background, final status and environmental interactions that occur in a social unit such as individuals, groups, institutions or communities (Almuaromah et al., 2022). The unit of analysis in this study is a group analysis unit, namely *basic materials* sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022. Based on the research setting, this research includes a *non-contrived setting* because the researcher does not intervene in the data on the research results. *Non-Contrivied Setting* is research conducted in a normal environment (actual environment) or natural environment so that researchers cannot manipulate data (Almuaromah et al., 2022).Researchers are not involved in the data presentation process and cannot manipulate data obtained from *annual reports* and *sustainability* reports, so research involvement is minimal. Based on the research time, the data used in this study are *time series* data and *cross-section* data. *The data* collection technique in this research is the observation technique. Researchers made observations by looking for information related to the research title. Information is obtained from books, the Internet and previous studies. In this study, data collection was carried out on *basic materials* sector companies that published *annual* reports and *sustainability* reports and were listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022.

*Population and Sample*

The population in this study is 103 basic materials sector companies listed on the Indonesia Stock Exchange for the period 2018-2022. The sample selection method used in this study is purposive sampling.

**Table 1. Research Sample Selection**

| No | Sample Selection Criteria | Total |
|---|---|---|
| 1 | *Basic materials* sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022. | 103 |
| 2 | *Basic materials* sector companies that do not consistently publish *annual* reports and *sustainability* reports for the 2018-2022 period. | 93 |
| Total Research Sample | | 10 |
| Total Research Observations 2018-2022 Period (10x5) | | 50 |

*Source: Data Processed by the Author (2024)*

Based on the sample selection criteria above, the samples used in this study were ten basic materials sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022. So, the total number of observations in this study was 50. The dependent variable in this study is carbon emission disclosure. The independent variables used in this study are industrial type, media exposure and institutional ownership.

Carbon emission disclosure is a voluntary environmental disclosure and can be found in the company's annual report or sustainability report. Carbon emission disclosure can be measured using a checklist index developed by the Carbon Emission Disclosure Checklist, which consists of 18 items and five categories related to climate change, carbon emissions and energy consumption. Furthermore, after

obtaining the overall score of each company, the score is summed up and then divided by the total maximum carbon emission disclosure items using the formula carbon emission disclosure. (D. L. Choi & Psaros, 2013) As follows:

$$Carbon\ Emission\ Disclosure = \frac{\Sigma di}{M}$$

Description:
Σdi = Total Items disclosed
M = Total Maximum Items (18 Items)

The following is a *carbon emission disclosure checklist* table used as a measurement of the dependent variable in this study:

**Table 2. Research Sample Selection**

| No. | Category | Index | Disclosure Items |
|---|---|---|---|
| 1. | Climate Change: Risks and Opportunities (CC/Climate Change) | CC1 | Assessment/description relating to climate change and actions to be taken to manage the risk |
| | | CC2 | Assessment/description of financial implications, business implications and opportunities of climate change |
| 2. | Accounting for Greenhouse Gas (GHG) Emissions | GHG1 | Description of the methodology used to calculate Greenhouse Gas Emissions (e.g., GHG Protocol or ISO) |
| | | GHG2 | External verification of the quantity of Greenhouse Gas Emissions (if any, by whom and on what basis) |
| | | GHG3 | Total Greenhouse Gas Emissions (metric tons CO2-e generated) |
| | | GHG4 | Disclosure of Scope 1, scope 2 or scope three direct Greenhouse Gas Emissions. |
| | | GHG5 | Disclosure of Greenhouse Gas Emissions by source (e.g., coal, electricity, etc.) |
| | | GHG6 | Greenhouse Gas Emissions Disclosure by facility or segment level |
| | | GHG7 | Comparison of Greenhouse Gas Emissions with previous years |
| 3. | Energy Consumption Accounting (EC) | EC1 | Total energy consumed (such as tera-joules or petajoules) |
| | | EC2 | Quantification of energy used from renewable energy sources |
| | | EC3 | Disclosure by type, facility or segment |
| 4. | Greenhouse Gas Reduction and Cost (RC/Reduction and Cost) | RC1 | Detailed plan or strategy to reduce Greenhouse Gas Emissions |
| | | RC2 | Specification of level and year targets for Greenhouse Gas Emission reductions |
| | | RC3 | Emission reductions and associated costs or costs achieved to date as a result of the emission reduction plan. |
| | | RC4 | Future emission costs required in capital expenditure planning |
| 5. | Carbon Emissions Accountability (ACC/Accountability) | ACC1 | An indication that the board (or other executive body) has responsibility for actions related to climate change. |

| No. | Category | Index | Disclosure Items |
|---|---|---|---|
| | | ACC2 | Description of the mechanism by which the board (or other executive body) reviews the company's progress on climate change |

*Source:* (D. Choi et al., 2019)

According to the Global Industry Classification Standard (GICS), industries are divided into two broad categories: high-profile and low-profile. Industrial types are divided into two types: carbon-intensive industries and non-carbon-intensive industries. Carbon-intensive industries are referred to as emission-intensive industries, while non-carbon-intensive industries are referred to as non-emission-intensive industries. Emission-intensive industries are more sensitive to environmental damage, so companies must take greater social responsibility than non-emission-intensive industries (Rusdi & Helmayunita, 2023). Companies that have a significant influence on the environment will be required to make environmental disclosures compared to companies that have less influence on the environment. Firms in emission-intensive industries are given a value of 1, which includes types of industries engaged in energy, transportation, materials, chemicals and utilities. Meanwhile, non-intensive companies that produce emission gases are given a value of 0, such as industries engaged in service providers, trade, finance and so on (Mulya & Rohman, 2020).

Media exposure is one of the risks described as a media attack that includes the company's media activities on various platforms at different times. (Ferdiani & Mulyani, 2023). Companies usually use the media to attract investors indirectly and communicate information about activities related to carbon emissions. Companies may be required to provide information about social responsibility and other related opinions to their stakeholders through the media. The media helps stakeholders learn and respond to news about environmental performance and conditions, including carbon emissions generated by the company. (Nurjanah & Herawaty, 2022) Media such as websites are one effective means of encouraging companies to make voluntary disclosures to gain public legitimacy and get positive responses from stakeholders. Basically, the company operates to provide benefits to stakeholders but not for personal gain. (Septriyawati & Anisah, 2019). The media exposure used in this study is the company's official website. (Mellyanawati & Sasongko, 2023). Media exposure in this study is measured using dummy variables. Namely, companies that disclose more information related to carbon emissions through the company's website are given a value of 1. Meanwhile, a value of 0 for companies that do not conduct carbon emission disclosure through the company's website (Ulfa & Ermaya, 2019).

Institutional ownership is the percentage of share ownership owned by institutional parties and is used to oversee company performance (Almuaromah et al., 2022). A high level of institutional ownership will cause institutional investors to conduct greater supervision of the company so as to prevent unethical behavior by company management. Institutional ownership can act to oversee the company. With institutional ownership, it is hoped that the management supervision carried out will be more optimal. The higher the institutional ownership, the greater the pressure received by company management. Good institutional ownership will be able to increase company supervision to disclose all activities carried out by the company in order to improve the positive image of company stakeholders, one of which is carbon emission disclosure. Institutional supervision of the company will make the company more transparent in conducting carbon emission disclosure to maintain the company's image and reputation so that it will build shareholder trust. Therefore, the company's share ownership will be maintained. (Putri et al., 2022). Institutional ownership can be measured by comparing the number of institutional shareholdings with the number of shares outstanding at the end of the year. The following is a measurement of institutional ownership (Amaliyah & Solikhah, 2019).

$$\text{Institutional ownership} = \frac{Number\ of\ Institutional\ Share\ Ownership}{Number\ of\ Outstanding\ Shares\ End\ of\ Year}\ x\ 100\%$$

In this study, quantitative analysis was applied by utilizing descriptive statistics. The analysis method used is multiple linear regression analysis. This research uses SPSS 26 *software* to process data. The multiple linear regression analysis equation used in this study is as follows:

$$Y = \alpha + \beta_1 X_1 it + \beta_2 X_2 it + \beta_3 X_3 it + e$$

Description:

| | |
|---|---|
| Y | = *Carbon Emission Disclosure* |
| $X_1$ | = *Industrial Type* |
| $X_2$ | = *Media Exposure* |
| $X_3$ | = Institutional Ownership |
| $\beta_1, \beta_2, \beta_3$ | = Regression Coefficient of Each Independent Variable |
| $e$ | = *Error* Term |
| $i$ | = Time |
| $t$ | = Company |

## Result and Discussion

In this study, descriptive statistical analysis used a ratio scale and a nominal scale. Descriptive statistical analysis on a ratio scale is measured using the mean value, maximum value, minimum value and standard deviation. The ratio scale measurements contained in this study are the *carbon emission disclosure* variable and institutional ownership. The following are the results of ratio-scale descriptive statistical testing:

**Table 3. Descriptive Statistical Analysis**

| | Carbon Emission Disclosure (Y) | Institutional Ownership (X3) |
|---|---|---|
| Mean | 0.607 | 0.718 |
| Maximum | 0.833 | 0.986 |
| Minimum | 0.111 | 0.510 |
| Standard Deviation | 0.207 | 0.162 |
| Observation | 50 | 50 |

*Source: Data Processed by the Author (2024)*

Based on Table 3, the results of descriptive statistics are presented, which show the average value *(mean), the* largest data value (maximum), the smallest data value (minimum) and the standard deviation on each ratio-scale variable. The dependent variable in this study is *carbon emission disclosure* as measured by giving a score for each indicator *disclosed* on the *carbon emission disclosure checklist* index, which shows an average value (*mean*) of 0.607 and a standard deviation value of 0.207. The *carbon emission disclosure* variable obtained a maximum value of 0.833 owned by PT Aneka Tambang Tbk, PT Toba Pulp Lestari Tbk, PT Indocement Tunggal Pakarsa Tbk, PT Chandra Asri Pacific Tbk, PT Semen Indonesia (Persero) Tbk and PT Vale Indonesia Tbk because they disclosed 15 items on the *carbon emission disclosure checklist,* namely in the category of climate change risks and opportunities disclosing two items, in the category of greenhouse gas emissions disclosing six items, in the category of energy consumption disclosing three items, in the category of greenhouse gas reduction and costs disclosing two items and in the category of carbon emission accountability disclosing two items. In addition, the *carbon emission disclosure* variable obtained a minimum value of 0.111, which PT Toba Pulp Lestari Tbk owns, because it only disclosed two items on the *carbon emission disclosure checklist.* The items disclosed by PT Toba Pulp Lestari Tbk, namely in the carbon emission accountability category,

disclose two items.

The independent variable of institutional ownership is measured by comparing the number of institutional shareholdings with the number of shares outstanding at the end of the year, showing an average value (*mean*) of 0.718 and a standard deviation value of 0.162. The institutional ownership variable obtained a maximum value of 0.986 owned by PT Solusi Bangun Indonesia Tbk in 2020-2022. In 2020, the percentage of institutional share ownership was 99% or IDR 7,553,148,888 of the total shares of IDR 7,662,900,000. In 2021, the percentage of share ownership by institutional was 99% or IDR 8,889,548,179 of the total shares of IDR 9,019,381,973. In 2021, the percentage of share ownership by institutional was 99% or IDR 8,889,548,179 of the total shares of IDR 9,019,381,973. Meanwhile, the minimum value of the institutional ownership variable is 0.510, which was owned by PT Indocement Tunggal Prakarsa Tbk and PT Semen Indonesia (Persero) Tbk from 2018 to 2022. In 2018-2022 PT Indocement Tunggal Prakarsa Tbk, the percentage of institutional share ownership was 51% or Rp 1,877,480,863 of the total shares of Rp 3,681,231,699. In 2018-2022, PT Semen Indonesia (Persero) Tbk institutional share ownership amounted to 51% or Rp 3,025,406,000 of the total shares of Rp 5,931,520,000.

Nominal scale descriptive statistical analysis is carried out to determine subjects based on the dimensions of certain groups or categories. The results of descriptive statistical testing on nominal scale variables, namely *industrial type* and *media exposure, were* measured using *dummy* variables. In the *industrial type* variable, the measurement of the *dummy* variable is that the value of 1 is given to companies that are included in the carbon-intensive industry (high profile), and the value of 0 is given to companies that are included in the non-carbon intensive industry *(low profile). The* following are the results of testing nominal scale descriptive statistics on *industrial-type* variables:

**Table 4. Nominal Scale Descriptive Statistical Analysis**

| No. | Criteria | Percentage |
|---|---|---|
| 1 | Carbon Intensive Company (High Profile) | 90% |
| 2 | Non-Carbon Intensive Company (Low Profile) | 10% |
| Total | | 100% |

*Source: Data Processed by the Author (2024)*

Based on Table 4, the results of descriptive statistics are presented, which show the percentage of industrial-type variables on a nominal scale. Based on the results of these descriptive statistics, it is known that 90% of the total research observations in basic materials sector companies listed on the Indonesia Stock Exchange (IDX) for the 2018-2022 period are worth one or have a carbon-intensive industry type (high profile). Meanwhile, 10% of the total research observations in basic materials sector companies listed on the Indonesia Stock Exchange (IDX) for the 2018-2022 period are worth 0 or have a non-carbon-intensive industry type (low profile). So, in this study, the amount of observation data on companies that have a carbon-intensive industry type (high profile) is higher than the amount of observation data on companies that have a non-carbon-intensive industry type (low profile).

In the media exposure variable, the measurement of the dummy variable is value 1 for companies that conduct carbon emission disclosure through the company's website. The value of 0 is for companies that do not carry out carbon emission disclosure through the company's website. (Ulfa & Ermaya, 2019). The following are the results of nominal scale descriptive statistical testing on the media exposure variable:

**Table 5. Nominal Scale Descriptive Statistical Analysis**

| Value | Total | Percentage |
|---|---|---|
| 0 | 27 | 54% |
| 1 | 23 | 46% |
| Total | 50 | 100% |

*Source: Data Processed by the Author (2024)*

Table 5 presents the results of descriptive statistics showing the percentage of *media exposure* on variables that have a nominal scale. The 50 observations data show that 46% of companies disclose *carbon emission disclosures through their websites, and 54% do not*.

**Table 6. Classical Assumption Test Normality Test**

| One-Sample Kolmogorov-Smirnov Test | | |
|---|---|---|
| | | Unstandardized Residual |
| N | | 50 |
| Normal Parametersa,b | Mean | .0000000 |
| | Std. Deviation | .11766688 |
| Most Extreme Differences | Absolute | .097 |
| | Positive | .097 |
| | Negative | -.077 |
| Test Statistic | | .097 |
| Asymp. Sig. (2-tailed) | | .200c,d |

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
*Source: Data Processed by the Author (2024)*

Table 6 shows the results of the normality test, with a significance value of 0.200, which is greater than 0.05. Thus, the data in this study's regression model are normally distributed.

**Table 7. Multicollinearity Test**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .640 | .129 | | 4.944 | .000 | | |
| | Industrial Type (X1) | .258 | .082 | .378 | 3.146 | .003 | .968 | 1.033 |
| | Media Exposure (X2) | .155 | .052 | .379 | 2.993 | .004 | .874 | 1.144 |
| | Institutional Ownership (X3) | -.469 | .159 | -.369 | -2.942 | .005 | .893 | 1.120 |

a. Dependent Variable: Carbon Emission Disclosure (Y)
*Source: Data Processed by the Author (2024)*

Based on Table 7, the multicollinearity test results are presented with the *Variance Inflation Factors* (VIF) value for each independent variable, namely *industrial type of* 1,033, *media exposure of* 1,144 and institutional ownership of 1,120. These independent variables each have a *Variance Inflation Factors* (VIF) value <10, so these results indicate that in this study, there is no multicollinearity between the independent variables.

**Table 8. Heteroscedasticity Test**

| Mode | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .375a | .141 | .043 | .05007 |

a. Predictors: (Constant), X1_X2_X3, U2_X1, U2_X3, U2_X2, X3
*Source: Data Processed by the Author (2024)*

Based on Table 8, the results of the heteroscedasticity test using the *white* test with SPSS 26 are presented. It can be seen from the table above that the test criteria use a significance level of 0.05 for the *chi-square* table value to be at a value of 14.06714. The *chi-square* value is calculated by the formula,

namely *R square* x n (number of samples). The *R square* value of 0.141 is multiplied by n = 50 (number of samples). So, the calculated *R square* value is 7.05. This means that the calculated *chi-square value of 7.05 < the chi-square* table value of 14.06714. So, there is no heteroscedasticity in this research data.

**Table 9. Autocorrelation Test**

| Model Summary | | | | | |
|---|---|---|---|---|---|
| **Mode** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **Durbin-Watson** |
| 1 | .490a | .240 | .189 | .15645 | 1.861 |

a. Predictors: (Constant), LAG_X3, LAG_X1, LAG_X2

b. Dependent Variable: LAG_Y

*Source: Data Processed by the Author (2024)*

Based on Table 9, the autocorrelation results are presented with a *Durbin-Watson* value of 1,861. In this study, 50 samples were collected using three independent variables, industrial type, media exposure, and institutional ownership. Based on the *Durbin-Watson* table with an *alpha* value of 0.05, the dL value is 1.673, and the dU value is 2.139. So, it can be seen that 1.673 < 1.861 < 2.139 (dL < DW < 4-dU), which indicates that there is no autocorrelation in this study.

**Table 10. Multiple Linear Regression Analysis**

| Coefficients a | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .640 | .129 | | 4.944 | .000 |
| | Industrial Type (X1) | .258 | .082 | .378 | 3.146 | .003 |
| | Media Exposure (X2) | .155 | .052 | .379 | 2.993 | .004 |
| | Institutional Ownership (X3) | -.469 | .159 | -.369 | -2.942 | .005 |

a. Dependent Variable: Carbon Emission Disclosure (Y)

*Source: Data Processed by the Author (2024)*

Based on Table 10, the results of multiple linear regression analysis are presented, which explains the effect of *industrial type, media exposure* and institutional ownership on *carbon emission disclosure* in *basic materials* sector companies listed on the Indonesia Stock Exchange for the 2018-2022 period. So, the multiple linear regression model equation in this study is as follows:

$$CED = 0.640 + 0.258\ IT + 0.155\ ME - 0.469\ KI$$

**Table 11. Coefficient of Determination ($R^2$)**

| Model Summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| 1 | .596a | .355 | .313 | .171165 |

a. Predictors: (Constant), Institutional Ownership (X3), Industrial Type (X1), Media Exposure (X2)

b. Dependent Variable: Carbon Emission Disclosure (Y)

*Source: Data Processed by the Author (2024)*

Based on Table 11, the results of the coefficient of determination test are presented ($R^2$) with an *Adjusted R-squared* value of 0.313 or 31.3%. So, it can be seen that the independent variable *industrial type, media exposure* and institutional ownership can explain the dependent variable, namely *carbon emission disclosure* in *basic materials* sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022 by 31.3%. Meanwhile, 68.7% can be explained by other factors outside the

independent variables in this study.

**Table 12. Simultaneous Test (F Test)**

| ANOVAa | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | .743 | 3 | .248 | 8.453 | .000b |
| | Residuals | 1.348 | 46 | .029 | | |
| | Total | 2.091 | 49 | | | |

a. Dependent Variable: Carbon Emission Disclosure (Y)

b. Predictors: (Constant), Institutional Ownership (X3), Industrial Type (X1), Media Exposure (X2)

*Source: Data Processed by the Author (2024)*

Based on Table 12, the results of the F test are presented with a probability (*F-statistic*) of 0.000. These results indicate that the probability value (*F-statistic*) is smaller than the significance level, namely 0.000 <0.05, so there is a simultaneous influence between the independent variables and the dependent variable in this study. So, it can be concluded that the variables of *industrial type, media exposure* and institutional ownership simultaneously have a significant effect on *carbon emission disclosure.*

**Table 13. Partial Test (t-Test)**

| Coefficients a | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .640 | .129 | | 4.944 | .000 |
| | Industrial Type (X1) | .258 | .082 | .378 | 3.146 | .003 |
| | Media Exposure (X2) | .155 | .052 | .379 | 2.993 | .004 |
| | Institutional Ownership (X3) | -.469 | .159 | -.369 | -2.942 | .005 |

a. Dependent Variable: Carbon Emission Disclosure (Y)

*Source: Data Processed by the Author (2024)*

Based on Table 13, the partial test results (t-test) are presented with the following explanation:

a. *Industrial type* variable $(X_1)$Ch is measured using a *dummy* variable that has a probability value of 0.003, which is smaller than the significance level of 0.003 <0.05. So, it can be concluded that *industrial type has a* significant effect on *carbon emission disclosure.*
b. *Media exposure* variable $(X_2)$Hich is measured using a *dummy* variable has a probability value of 0.004 which is smaller than the significance level, namely 0.004 <0.05. So it can be concluded that *media exposure has a* significant effect on *carbon emission disclosure.*
c. *Institutional* ownership variable $(X_3)$ which is measured using the percentage of shares by comparing the number of institutional share ownership with the number of shares outstanding at the end of the year has a probability value of 0.005 which is greater than the significance level, namely 0.005> 0.05. So it can be concluded that institutional ownership has a significant effect on *carbon emission disclosure.*

## Discussion

*The Effect of Industrial Type on Carbon Emission Disclosure*

Based on the research results, the *industrial type* variable $(X_1)$ h a probability value of 0.003 < 0.05 significance level and a regression coefficient value of 0.258. Then $H_0$ ris rejected and H sub accepted which means that *industrial type has a* positive and significant effect on *carbon emission disclosure.* This indicates that companies engaged in carbon-intensive industries (high profile) do more carbon emission disclosure than companies engaged in non-carbon-intensive industries *(low profile)*. The results of this study are in line with research conducted by (Rusdi & Helmayunita, 2023) and (Asmeri et al., 2023), which states that *industrial type has a* positive and significant effect on *carbon emission disclosure*. Therefore, the more intensive the industry is in producing carbon, the greater the

pressure obtained by the industry to carry out *carbon emission disclosure.*

*The Effect of Media Exposure on Carbon Emission Disclosure*

Based on the research results, the media exposure variable $(X_2)$ has a probability value of 0.004 < 0.05 significance level and a regression coefficient value of 0.155. Then $H_0$ rejected and $H_a I\ was$ accepted, which means that media exposure has a positive and significant effect on carbon emission disclosure. This indicates that the media can influence the company's incentive to voluntarily disclose carbon emissions in the annual report and sustainability report to get good feedback from stakeholders. The results of this study are in line with research by (Sari & Sulfitri, 2023) Therefore, the more media exposure a company receives, the more motivated it will be to carry out carbon emission disclosure.

*The Effect of Institutional Ownership on Carbon Emission Disclosure*

Based on the research results, the *institutional* ownership variable $(X_3)$ has a probability value of 0.005 <0.05 significance level and a regression coefficient value of -0.469. So $H_0$ rejected and $H_a$ cannot be accepted, which means that institutional ownership has a negative and significant effect on *carbon emission disclosure.* The results of this study are not in line with the research built by researchers, namely that institutional ownership has a positive and significant effect on carbon emission disclosure. This indicates that the company's high and low institutional ownership will affect its low carbon emission disclosure.

## Conclusion

This study has successfully addressed the research question regarding the influence of industrial type, media exposure, and institutional ownership on carbon emission disclosure in basic materials sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2018-2022. The analysis reveals that the type of industry has a positive and significant effect on carbon emission disclosure. This indicates that the nature of the industry in which a company operates plays a crucial role in driving transparency about carbon emissions. Furthermore, media exposure is found to have a positive and significant impact on carbon emission disclosure. Companies that receive frequent media attention tend to be more open in reporting their carbon emissions, likely due to public pressure or the desire to maintain a favorable corporate image. Conversely, institutional ownership exhibits a negative and significant effect on carbon emission disclosure. This suggests that institutional shareholders may have motivations to limit the transparency regarding carbon emissions, possibly to protect investment performance or to avoid stricter regulatory scrutiny.

This research provides significant contributions both in the context of academic knowledge and practical application. Theoretically, the study enriches the literature on the factors influencing carbon emission disclosure by providing robust empirical evidence on the roles of industrial type, media exposure, and institutional ownership. These findings enhance the understanding of how these elements can affect corporate behavior in disclosing carbon emissions, which is highly relevant in an era where environmental transparency and accountability are increasingly scrutinized. From a practical perspective, the results are valuable for stakeholders in basic materials sector companies. Investors and financial analysts can leverage this information to make more informed investment decisions, considering how factors like industrial type and media exposure might influence a company's transparency about carbon emissions. Moreover, companies can utilize these findings to develop more effective communication and reporting strategies, not only to meet public expectations but also to build a reputation for environmental responsibility.

However, this study is not without limitations. One primary limitation is that the study period, which only covers the years 2018 to 2022, is potentially insufficient to capture long-term trends in

carbon emission disclosure. Additionally, the study uses specific indicators for institutional ownership, which may not fully represent the complexity of institutional ownership in various corporate contexts. Future research should consider extending the study period to gain a more comprehensive understanding of carbon emission disclosure and consider employing a broader range of indicators to measure institutional ownership. Furthermore, future studies could explore the influence of other factors, such as government regulations or internal company policies, which might also play a significant role in carbon emission disclosure. Thus, this study not only provides in-depth insights into the current factors influencing carbon emission disclosure but also paves the way for further research that can enrich the understanding of these dynamics in the future.

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