

# THE LEVEL OF CARBON EMISSIONS AND CLIMATE CHANGE ENGAGEMENT THROUGH CORPORATE REPORTING: AN ANALYSIS OF MAIN POWER PRODUCER IN MALAYSIA

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**ABSTRACT** – Urbanization has extensively impacted the climate change issues as the ground level temperatures are dramatically increased from the greenhouse gas emissions (carbon emissions) caused by business operations globally. Consistently, the main contributor of climate change is from the power generation sector that emitted the highest carbon emissions from their coal burning activities. Amidst these circumstances, the growth of the development of policies and commitments in mitigating the issues had exponentially taken place globally. This research aims to observe the level of carbon emissions and climate change engagement through corporate reporting in Malaysia. Thus, this research analyses the main power producer in Malaysia, Tenaga Nasional Berhad for the year 2015 to year 2021. Based on the content analysis of annual reports, sustainability reports, and website's statements, the overall results indicate that the level of reporting had significantly increased in 2018 with the introduction of new mandatory guidelines from Bursa Malaysia as well as the adoption of Sustainable Development Goals (SDGs) in their corporate reporting. The findings suggest that the awareness on the company to mitigate the issues as a goal congruence with Malaysia's commitments internationally on climate change by communicating through corporate reporting.

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## INTRODUCTION

The Progressiveness of business environments with the rapid growth of industries has massively impacted the environment which brings a serious concern (Martinez, 2005; Nik Ahmad & Hossain, 2015). Climate change has become an impactful environmental concern of global warming (Akhiroh & Kiswanto, 2016). Business operations from the industries became the main sources of global warming (Ratnatunga & Balachandran, 2009). The increase of ground-level temperatures due to greenhouse gas emissions is the main reason for global warming that intensifies towards climate change (Altintas, 2013; Martinez, 2005). Commonly, carbon dioxide is used to describe greenhouse gas. Carbon emissions marked the highest contribution to climate change which resulted in lots of natural disasters (Romar, 2009). Among ASEAN countries, Malaysia is leading as the highest carbon emissions emitter that contributes towards climate change. Malaysia has envisioned reducing the carbon emissions level by 45% by 2030 (The Star, 19 September 2016). Amidst the global endeavours in achieving low carbon emissions, it is evidenced that the power sector, electricity, and heat generation are accountable for greater than 40% of the world's total carbon emissions. 63.10% of total carbon emissions globally are generated from the electricity sector (International Energy Agency (IEA), 2021). The charcoal-burning activities that emitted high density of carbon emissions bring negative impacts towards the atmosphere and increase the temperature of our earth (IEA, 2021). The global carbon emissions from fuel combustion from electricity and heat generation significantly increased from 1990 to 2019 as the demand for electricity increased in Malaysia (IEA, 2021). However, IEA (2021) evidenced that the total carbon emissions in Malaysia have slightly dropped from 2008 to 2019, thus it showed the commitments from the Malaysian government in mitigating the climate change issue and their commitments towards UNFCCC and other international commitments by Malaysia. Part of the challenge is that entities need to understand and communicate their contribution to global warming caused by carbon emissions (Choi, Lee & Psaros, 2013). Understanding concerning climate change has grown at an extraordinary rate during the last decade, increasing attempts to minimise greenhouse gas (GHG) emissions in order to counteract global warming (Grosbois & Fennell, 2022). As climate change became the main concern that needed vast attention, it has resulted in the introduction of new environmental rules in recent years and legal laws for GHG emissions reporting (Ghomi & Leung, 2013; Olson, 2010). Climate change is one of society's most pressing concerns, and during the last decade, an increasing number of businesses have been reporting extensively on their climate change performance. Hence, the demand for corporate information has steadily increased (Chariril, Januarti, & Yuyetta, 2018). In the relative study, greenhouse gas, carbon dioxide, global warming, and climate change are all used indiscriminately (Olson, 2010). Greenhouse gases are the main

contributors to climate change and global warming (Altintas, 2013) while carbon dioxide serves as the most prevalent greenhouse gas (IEA, 2021).

The demands for information related to climate change and global warming are increasingly overwhelming among stakeholders in assessing corporate performance specifically in climate change of the companies (Liesen, Hoepner, Patten, & Figge, 2015). As the current business environment had led towards diversified stakeholders, their goals are not only focusing on finances but also on the environment (Herzig & Schaltegger, 2006). This has resulted in the importance of satisfying their stakeholder needs with not only providing financial and economic information but ecological and social information (Schaltegger & Burritt, 2005). Corporate reporting alludes to the companies monitoring and communicating their environmental, economical, and societal risk from their businesses to their stakeholders (Jan, Marimuthu, Mat Isa, & Shad, 2019). This research will be using stakeholder theory in explaining the level of carbon emissions and climate change engagement through corporate disclosure. The main distinction is that stakeholder theory emphasizes the relationships between the company and its diverse stakeholders (Matsumura, Prakash, & Vera-Mun˜oz, 2014). One of the tenets of stakeholder theory is that everyone must be held responsible for the impacts of their actions upon others (Gray, Kouhy, and Lavers, 1995). The influence of the stakeholder will significantly impact the adaptation of reporting the environmental information in their corporate reporting. It is proven by the importance of corporate reporting as a medium of communication between companies and their stakeholders (Faisal, Adiningtyas, Achmad, Haryanto, & Meiranto, 2018).

Tang and Luo (2011) also agreed that stakeholders influenced the decision of the management in achieving their objectives. Budiharta and Kacaribu (2020) stated that management is most likely to be influenced by stakeholders that have wider control within the company. The information provided by the stakeholder is the core growth of a company and the need to satisfy their demand would ensure the company's going concern (Deegan & Bloomquist, 2006). Due to the rising public awareness of climate change issues, it is crucial for a company to maintain the balance between financial, social, and environmental performance by satisfying the stakeholders' desire for a company mitigation plan on climate issues (Zhang & Liu, 2020). Luo, Lan, and Tang (2012) also agreed that companies that are under immense pressure from their stakeholders tend to provide more carbon emissions information in their corporate reporting. This is also supported by Liesen et al. (2015) who mentioned that pressure arises from stakeholder results in carbon emissions reporting. In conjunction with the pressure from stakeholders, companies tend to improve their environmental planning in meeting such demand for their corporate reputation (Kilic & Kuzey, 2019). These researches have proven that stakeholders portrayed an extremely important role in the social and environmental reporting of a company (Barako & Brown, 2008). It is also evident that companies are environmentally and socially responsible by communicating with their stakeholders through corporate reporting and it is no longer becoming a liability for a company to devote to this area as it will also enhance the company's value (Hardiyansah, Augustini, & Purnamawati, 2021).

Hence, this research aims to investigate the level of carbon emissions and climate change engagements through corporate reporting in the main power producer company in Malaysia. This research would significantly expand the academic literature for the area and would significantly contribute to the improvement of existing regulations and policies. Apart from that, this research would increase company recognition of the need to reduce their carbon emissions for reducing climate change by communicating the data in their reporting publicly. In addition, this research would help the policy formulation in terms of having many comprehensive guidelines/frameworks on carbon emissions reporting as Malaysia transitioned from voluntary to mandatory reporting.

## LITERATURE REVIEW

### Climate change engagements and reporting regulation in Malaysia

Malaysia became the party that participated in the United Nations Framework Convention on Climate Change (UNFCCC) on 13 July 1994 (UNFCCC, 2022). UNFCCC is designed primarily to initiate and facilitate a strategy for the future in responding towards climate change issues. UNFCCC will play a role to gather data and information related to climate change from their respective parties ratified. These parties will be needed to provide detailed information on their mitigation, contingency plans for climate change reductions and the impact towards the implementation of their policies (Kuh, 2018). Kyoto Protocol is the first guideline designed by the UNFCCC to realise its climate change objectives. It is named after the place of the negotiation initiated in the Japanese city, Kyoto. Later, the name is used in referring to the first protocol by UNFCCC. Malaysia ratified the Kyoto Protocol on 4 September 2002 (UNFCCC, 2022). In line with the objective of UNFCCC, Kyoto Protocol did not set vivid guidelines for developing countries in their reduction targets as it is supposed to be initiated by the country themselves in mitigating the impacts within their countries. In contrast, the protocol specifies a reduction target of 5% lower than the 1990 level (Lee, 2011). The protocol offered opportunities for Malaysia to thrive in a sustainable manner. The UNFCCC established the Paris Agreement in 2015 to dictate the emission reductions beginning in 2020 and notify of the mitigation plans the parties took to show their reduction commitments under the Agreement. The Paris Agreement recognises the vital need to significantly increase the concerted efforts for climate change which urges countries to be more audacious (Stephenson, 2018). This Agreement would recognise their parties' commitments. Malaysia ratified the Paris Agreement on 16 November 2016 (UNFCCC, 2022). In conclusion, Malaysia had significantly committed and obliged to UNFCCC by providing detailed data and information in their mitigation response in lowering carbon emissions that would help to reduce climate change and global warming (Malaysia Third National Communication (TNC), 2018). The UN had initiated a new goal that comprises all vital aspects to show commitment within participating parties. In September 2015, Sustainable Development Goals (SDGs) were launched and

it comprises 17 goals. These goals promote greater and more in-depth information on various aspects. Focusing on environmental aspects specifically relating to climate change issues, SDG stated that Goal 13 is for Climate action. Goal 13 fosters awareness among entities in the countries for togetherness in being reliable on the negative impacts of their operations towards environments (United Nations, 2022). Carrot and Stick (2016) stated that Bursa Malaysia had introduced the mandatory sustainability framework for all publicly listed companies in their corporate reporting.

Malaysia developed a series of policies and plans to show their high commitments which are National Energy Policy 1979, Fuel Diversification Policy 1981, Eighth Malaysia Plan (2001 to 2005), and Third Outline Perspective Plan (OPP-3)(2001-2010). Currently, Malaysia is adopting Vision 2020 (Sustainable Development Plan). Recent policies by the Malaysian government are National Policy on Climate Change and National Green Technology Policy. These policies are intended to provide guidance and encourage corporate pledges to address climate change holistically, assuring climate-resilient development, building a low-carbon economy, and supporting green technologies. Malaysia had exponentially engaged in ensuring their commitments objectives to be achieved with all the policies and guidelines governing the country relating to climate change and global warming. The impact of the deferred action on mitigating climate change would bring greater financial and economic competitiveness and it complicated the planning as global environmental circumstances had plummeted precipitously with increasing ground-level temperature that increased global warming (The Edge Malaysia, 26 April 2022). This will result in adverse opportunity costs involved. Thus, the Malaysian government urged all entities in various sectors to mitigate the issues together in lowering carbon emissions.

### Prior Literature on Carbon Emissions Reporting

Rising knowledge of climate change concerns has increased demand for GHG emissions monitoring and carbon reporting. As numerous policies and international commitments grow rapidly, there has been an increase in the amount of academic research on carbon reporting practices, factors, and impacts (Grosbois et al., 2022). This is evident in the expanding levels of carbon emissions or climate change information in their corporate reporting. The Carbon Disclosure Project (CDP) is the database that provides reports on carbon emissions of greenhouse gas emissions which participating companies will submit their report to the database (CDP,2022). Most of the studies had focused on the factors and impacts of carbon emissions disclosure in corporate reporting. Prado-Lorenzo, Dominguez, Ivarez, and Sánchez (2009) viewed only the engagement towards Kyoto Protocol as the factor towards carbon emission reporting. This is also supported by Tang et al. (2011) and Luo et al. (2013) in which engagement towards Kyoto Protocol positively affected the decision on carbon emissions reporting. Whereas, Rankin, Windsor and Wahyuni (2011) generally mentioned that there are positive influences on international engagement towards carbon emission reporting. In contrast, other studies such as Gu, Guo, and Jian (2013), Halimah and Yanto (2018), and Córdova, Zorio-Grima, and Merello (2018) focused on the internal factors that contribute towards carbon emissions reporting. Mahapatra, Schoenherr, and Jayaram (2021) suggested that companies that have a high market capitalization that reported their carbon footprint information did not affect the financial performance of the companies as the researchers investigated the factors that lead towards carbon footprint reporting. Consistent with Desai, Raval, Baser, and Desai (2021), they found that there is no relationship between reporting carbon emissions and financial performances among the top 200 companies in India.

Miklosik and Evans (2021) stated that the amount of carbon information provided by the companies in the reporting varies according to the size of the company. This is evident among the top 100 mining companies in Australia. The data imply that carbon emissions have a considerable negative influence on both financial performance indicators. In contrast, Busch, Bassen, Lewandowski, and Sump (2022) stated that companies that disclose higher amounts of carbon emissions information are linked to better long-term financial success. Alsaifi (2021) summarised that carbon-intensive industries are having more enhanced carbon performance. However, all these studies are not focusing on the sensitive sectors which are the power sector, electricity, and heat generation. Due to the importance of the climate change issue globally and the contribution of Malaysia among leading countries in ASEAN towards climate change, there is a need to conduct research using a wider sample of ASEAN countries, especially in the power sector, electricity, and heat generation area. The research that focused on the electricity companies to determine the impacts towards carbon emissions reporting is Freedman and Jaggi (2004) which was investigating the impacts of carbon emissions reporting among electricity generating companies in the United States (US). This is similar to Silva-Gao (2012) which was focusing on the US electricity companies but only on general environmental performance. However, Alrazi, De Viliers, and Van Staden (2016) widely used electricity-generating companies from 35 countries as samples but not specifically ASEAN countries. Based on the review above, despite climate change being a very crucial issue, it contradicts the low number of research in this sector. Thus, this is proven that the research area is still nebulous.

### METHODOLOGY

This research analyses the main electricity company in Malaysia which is Tenaga Nasional Berhad. Nor, Selamat, Rashid, Ahmad, Jasmian, Kiong, Hassan, Mohamad, and Yokoyama (2016) stated that the highest contributors to carbon emissions are electricity and heat production. According to the UNFCCC Biennial Report (2020), the highest emissions provider is from the energy sector. The main electricity provider in Malaysia is Tenaga Nasional Berhad (TNB) as electricity generated in the country are monopolies by TNB. This is also supported by IEA (2022) in which the highest contributors of carbon emissions are coming from electricity generation. Hence, this study to analyse TNB to see the trends of reporting and the engagements towards climate change mitigation. Given that it is assumed that disclosure will not vary considerably over a short time, such a long interval would allow any relevant trend to be seen (e.g., from one

year to another). This study examined the carbon emissions disclosure made by the company from the Year 2015 to 2021. The year 2015 is chosen as the basis year of the analysis as during this year, United Nations (UN) launched its SDGs and Bursa Malaysia introduced the new sustainability guideline that is mandatory to be abided by all publicly listed companies in Malaysia. In addition to that, the research will see the trend in the disclosures amidst the development of the policies and regulations throughout the period analysed. This research employed content analysis involving secondary data. Annual reports and sustainability reports were downloaded from the company's website. Apart from that, the company website is also being used for content analysis. This research is using the Carbon Emissions Index adopted by Choi et al. (2013) for the detailed disclosure items regarding the emissions information. However, the checklists are being revised to fit the electricity industry by incorporating disclosure information from CDP electricity utilities (2013), Alrazi et al. (2016), Clarkson, Li, Richardson, and Vasvari (2008), and Van Staden and Hooks (2007). The final Carbon Emissions Index comprises 25 disclosure items which cover 5 categories which are 1: climate change risk and opportunity, 2: GHG emissions accounting, 3: energy consumption accounting, 4: GHG reduction and cost, and 5: carbon emission accountability. The disclosure information is captured using dichotomous variables with which 1 for presence information and 0 for non-disclosure information. The total maximum number of the disclosure will be 25.

## RESULTS AND DISCUSSIONS

The results show that there is an increasing trend of carbon emissions disclosure in the main power producer in Malaysia which is Tenaga Nasional Berhad. The company proved their engagement in the mitigation of climate change issues in the disclosure of its corporate reporting. The result is presented from the year 2015 to the year 2021. It showed that the development of the regulations is positively being adopted by the company. Table 1 shows, in the year 2015, a low number of disclosure as sustainability reporting is yet to be mandatory. Consistent with the launch of SDG by the UN and Malaysia's engagement towards mitigating climate change, an increasing trend in the year 2016 can be seen which is 32% of disclosure (8 items) compared to the previous year 2015 with only 16% (4 items). The trend massively increased in the year 2017 with 80% (20 items) as compared to the previous year. It is evident that it is because the company had abided by the Bursa Malaysia mandatory sustainability reporting. Hence, the positive trends prove that the information being disclosed is more in detail than the sustainability reporting published. This also indicates that awareness and engagement of the company towards the importance to mitigate the climate change issue are taken into massive steps. It supported the stakeholder theory in which carbon emissions disclosure is being used as a tool to satisfy the needs of the stakeholder regarding social pressures (Guenther, Guenther, Schiemann, & Weber, 2015). In 2018, the disclosure by the company is still increasing by 88% (22 items). However, the trend shows consistency for the next 3 years until the year 2021.

**Table 1.** The Number of Carbon Information

Company	2015	2016	2017	2018	2019	2020	2021
TNB	4	8	20	22	22	22	22

## CONCLUSION AND LIMITATIONS

In conclusion, the research proved that stakeholder expectations and awareness of environmental information enhanced corporate reporting. Corporate reporting has become an important tool for communication between companies and stakeholders (Gonzalez & Ramirez, 2016). Apart from that, it shows that the environment has publicly become a crucial area in corporations. Business operations have significantly brought negative impacts towards the environment. These impacts gradually increased the climate change and the ground level temperature that resulted from carbon emissions emitted. The commitments by the governments also would enhance the engagements among companies. Making mandatory reporting among large companies would also enhance small and medium enterprises to voluntarily incorporate climate change as one of their objectives. This would most likely amplify the companies being socially and environmentally responsible in their business operations. International commitments played an important role in the country's governance. There are limitations that need to be considered for future research as this research only analysed the main power producer in Malaysia, thus the results may not be favourable to measure the competitive trends among companies in the same sector. Apart from this, this research only focused on the level of reporting and the extent of reporting that should be used for content analysis by measuring the strength of each of the pieces of information in the reporting. Furthermore, this research also did not measure any other external and internal factors contributing to corporate reporting. Hence, future studies should analyse the content by measuring the strength of information instead of only focusing on the dichotomous analysis to have a more in-depth understanding of the information. It would also be recommended for future research to focus on more companies internationally.

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