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Exploring SDGs Disclosure among Public Listed Companies in Malaysia: A Case of Energy-related SDGs

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Abstract
Purpose: The objectives of this study are to examine energy-related SDGs disclosure in the corporate annual reports of Malaysian PLCs and to investigate the relationship between energy-related SDG disclosure and corporate characteristics (i.e., company size, corporate financial performance and industry).
Design/methodology/approach: Data were obtained using content analysis on the 2019 annual reports of public companies listed on the main board of Bursa Malaysia. Energy-related SDGs disclosure is the dependent variable and corporate characteristics (i.e., company size, corporate financial performance and industry) are independent variables.
Findings: This study revealed that more companies in energy-intensive industries disclosed energy-related information than those in non-energy-intensive industries. The most-reported energy-related goals were SDG 3, SDG 12 and SDG 13 for both energy-intensive and non-energy intensive industries. Energy-related SDGs disclosure is related to a company's size, larger firms were more likely to disclose SDGs.
Research limitations/implications: The study limited the investigation of energy-related SDGs to only corporate annual reports. It did not assess details of SDGs disclosure, for example, specific targets and key performance indicators (KPIs), to measure corporate performance in energy-related SDGs.
Practical implications: A better insight of the association between energy-related SDGs disclosure and corporate characteristics will contribute to the design of rules and regulations that enhance corporate accountability, on energy-related issues in particular.
Originality/value: This is among the first study to specifically explore energy-related SDGs and energy-intensive industry in the Malaysian context.
Paper type: Research paper

Keywords: SDG disclosure, Public listed companies, Malaysia, Energy-related SDGs, Energy-intensive industry

Introduction

The United Nations (UN) established the Sustainable Development Goals (SDGs) to provide a better understanding of global challenges and to emphasise the need for guidelines leading to a sustainable development agenda that includes social, economic and environmental elements (United Nations, 2015). One of the goals that directly focuses on energy is SDG 7 - Affordable and Clean Energy, which emphasises the need to ensure affordable, reliable, sustainable and modern energy. Achieving SDG 7 depends on making progress alongside other energy-related SDGs. All the goals could potentially interact with various other goals and actions and policies in these other domains could affect the energy-related SDGs (McCollum et al., 2018). Energy is a key factor in SDG-related issues and challenges in Malaysia (Ismail, 2015). Malaysian industrialisation and the improving living standards have significantly increased the country's energy consumption. Malaysian energy statistics reported that energy consumption increased by more than 100 per cent from 2008 to 2018 (Energy Commission, 2020).

In Malaysia, the transportation sector contributed 36.2% of the total energy consumption followed by the industrial (29.5%), residential and commercial (12%), agricultural (1.6%) sectors (Energy Commission, 2020). Previous research on energy consumption has only focused on a specific end-use sector, for example, the industrial sector (Tan & Tan, 2018), the transportation sector (Azam et al., 2016), the residential sector (Azlina et al., 2015) or the commercial sector (Chand et al., 2016). Although Malaysia is on track to utilise clean energy more widely (i.e., SDG 7), a downward trend on climate action has been reported (i.e., SDG 13) (Sachs et al., 2018). A major cause of climate change is greenhouse gas emissions, which are mainly due to the burning of fossil fuels to produce energy. Moreover, one impact of Malaysia's economic growth has been increased energy consumption (Xuan et al., 2018).. In spite of the extensive strategic planning devoted to energy efficiency practices, it has been found that the growth of Malaysia's energy consumption has been higher than the growth of its GDP (Energy Commission, 2020). As such, the efficient utilisation of energy warrants particular attention, not only from the government but also corporations, due to the direct involvement of the latter in business operations.

Therefore, working on SDG – 7 and energy-related SDGs is particularly important as meeting the goals poses challenges for government and corporations. The SDG Index and Dashboards Report 2018 revealed that none of the UN member states was on path to meet the SDGs by 2030 (Sachs et al., 2018). In relation to SDG 7, although good progress has been made, the pace of change remains too slow for energy-related SDGs to be met by 2030 (United Nations, 2015). Thus, these goals are considered necessary for limiting, for example, global warming. Hence, appropriate and immediate steps must be taken by all UN member states, including Malaysia. The SDGs might appear too broad to be relevant to a company; however, energy-related goals are relevant to everyday business decision making, such as the consumption of clean fuels. SDGs also allow more efficient technologies in business operations. Business operations have been found to cause substantial levels of energy consumption that produces pollutions and depletes natural resources, leading to global climate change and the greenhouse effect (Buhmann et al., 2019).

Despite extensive research, there is relatively limited understanding of SDGs disclosure practices (Emma & Jennifer, 2021), particularly in developing countries including Malaysia. Limited evidence is available on the situations under which companies disclose SDG-related information and how stakeholders influence companies in this matter. Stakeholders have varying information needs, while corporate matters and practices should be conveyed to the

stakeholders. From an accounting perspective, the main communication approach with stakeholders is through annual reports, which include financial and non-financial information. Meanwhile, from the stakeholders' viewpoint, the communication between corporate and stakeholders generally occurs based on information in corporate reports (Crane & Glozer, 2016). This, in fact, may become the basis for the company-stakeholder relationship. Moreover, prior studies have illustrated that the information demanded by corporate stakeholders includes details about social and environmental matters (Islam & Deegan, 2008).

Hence, this study's aims are two-fold: firstly, to examine the extent of energy-related SDGs disclosure in the corporate annual reports of Malaysian PLCs; and secondly, to investigate the relationship between energy-related SDG disclosure and corporate characteristics (i.e., company size, corporate financial performance and industry). This study focuses on annual reports since they are the most valuable public papers produced by a firm and receive attention from a diverse stakeholders.

Literature Review

Energy Consumption

The essentiality of research into energy consumption is evident due to the urgency to integrate sustainability with economic growth, whereas global energy scarcity has become one of the main challenges. The high level of energy consumption can degrade the quality of the environment (Shaari et al., 2017). Sustainable energy consumption is the practice of reducing energy consumption and is related to efforts to increase the production of clean energy. Energy efficiency practices could help to reduce energy consumption and lead to cost savings and resource efficiency (Rahman et al., 2017). For instance, the use of renewable energy sources could help to prevent negative environmental and social effects while reducing air pollution and safety risk, increasing energy access and improving the security of the energy supply (Shahsavari & Akbari, 2018). The SDGs 2030 agenda outlines the UN's sustainable energy aims. The purpose of SDG 7 - Affordable and Clean Energy is to ensure access to affordable, reliable, sustainable and modern energy for all. This goal does not exist in isolation but interacts with other goals, such as poverty (SDG 1); health and well-being (SDG 3); education (SDG 4); gender (SDG 5); industry, innovation and infrastructure (SDG 9); sustainable cities and communities (SDG 11); responsible consumption and production (SDG 12); and climate action (SDG 13) (UNESCAP, 2018). The interactions are determined based on geography, time, governance, and technology (McCollum et al., 2018). SDG 7 is central to the achievement of other SDGs, so there is an urgent need for action. To achieve this, it is necessary to reduce, control and monitor energy consumption and improve energy efficiency (Rebelatto et al., 2019).

Promoting sustainable energy consumption will make a leading contribution to achieving SDGs. Since the SDGs were only introduced in 2015, the existing issues have long been identified. In general, all UN members, including Malaysia, have embraced the goals and are working towards them. Malaysia has aligned SDG principles with the 11th Malaysian Plan, which will establish SDGs in all facets of Malaysian development. Awareness of energy conservation remains poor in Malaysia because of low energy prices (Chong et al., 2015). Mhlanga et al. (2018) defined five categories linked to corporate engagement with SDGs they are; prioritisation, integration, ambitious action, human rights and gender equality, and reporting.

Previous research on energy consumption has only focused on a specific end-use sector, for example, on the industrial sector (Tan & Tan, 2018) or the commercial sector (Chand et al., 2016). This study includes a specific sector, energy-intensive industries, due to their direct linkages with energy-related SDGs. In general, the energy-intensive sector refers to businesses

whose energy usage comprises a major element of their production costs and businesses with high energy consumption, such as those in the electricity and heat; oil and gas; cement and ceramics (Li et al., 2014); iron and steel; and pulp and paper sectors (Song & Oh, 2015). Hence, it is crucial that energy-intensive industries reduce their energy consumption and that major efforts should be made to use energy efficiency resources, such as solar energy and renewable energy, so that meeting the energy-related SDGs is successful.

Theoretical and Hypothesis Development

Stakeholder Theory

Stakeholder theory concentrates on generating value for stakeholders as an vital element of ensuring the realisation of a company (Freeman, 1984; Freeman et al., 2010). SDGs disclosure is a recent trend involving corporate reactions to the global demand to address sustainability issues. This practice needs a dedication on behalf of the companies' management to offer to social and environmental progress (Lopez, 2020) and to incorporate this commitment in their corporate reports. Stakeholder theory has been employed to non-financial reporting, such as sustainability reporting, to provide sufficient information to the stakeholders so they can make decisions (Mitchell et al., 2016). In this context, corporates are liable for creating SDGs information reporting standards and reporting important details to the stakeholders. Integrating SDGs into non- financial reports could be an instrument to participate more efficiently with stakeholders (Pizzi et al., 2021). Stakeholder theory also refers to ethical ways for businesses to consider the interests of its stakeholders. According to the idea, all stakeholders have rights that should be effectively managed for the benefit of all stakeholders, requiring leading businesses to participate in specific social activities (Garriga & Melé, 2004). Therefore, SDG disclosure can be considered a suitable way of promoting to society and creating positive opinions among stakeholders (Emma & Jeniffer, 2021).

Corporate Characteristics and Energy-related SDGs Disclosure

Various literature has focused on corporate characteristics that impact companies to include and report sustainable development matters. Among the corporate characteristics identified by previous studies are company size, financial performance, corporate governance elements and the industry (Chiu et al.,2020; Cohen et al., 2011; Alrazi et al. 2016). The concept of corporate sustainability SDG reporting, CSR and sustainable development are closely related (Izzo et al., 2020). SDGs can be used as an effective mechanism of moving towards new business models and integrated reporting that assists the achievement of sustainable growth. The overall aim is to reduce the risk and increase the benefit to the economy and the organisation (Izzo et al., 2020). The rising impact of organisations' activities and the continuous demand from investors for more transparent and accountable reporting have raised the awareness of the need for better sustainability disclosure that reflects a fair assessment of corporate performance (Modogu, 2020). Thus, based on past literature, the authors have identified three important corporate characteristics – firm size, industry and financial performance – that might influence energy-related SDGs disclosure.

Company Size

Company size is constantly observed to relate to the extent of disclosure (Cormier et al., 2011). Previous studies have showed that major companies tend to disclose more information and provide more quality disclosure (Buniamin et al., 2011; Gallo & Christensen, 2011). van der Waal & Thijssens (2020) found evidence of a positive relationship between corporate size and SDGs among companies in the 2000 largest public listed companies in the world. Consistent with this result, Van Zanten and Van Tulder (2018) found that European and North American

multinational companies engaged extensively with SDGs. Furthermore, Das (2017) found that company size has a significant positive relationship with voluntary disclosure, which indicates that larger companies disclose more information than small companies. Similarly, Lucia & Panggabean (2018) found that variations in company size significantly affect the disclosure of sustainability reports. Larger companies tend to issue more sustainability reports as they are more impactful, visible, and exposed to stakeholder attention than smaller companies. This implies that larger companies tend to involve more in SDGs practices. Therefore, the first hypothesis is developed:

H_1 There is a significant relationship between company size and energy-related SDGs disclosure.

Industry

Corporate websites, mandatory filing and press releases are some popular platforms used by all industries to disseminate information. It is essential for stakeholders to review information for comparison with competitors so as to gain insights into a company's standing within an industry (Cohen et al., 2011). The energy industry is considered one of the best-performing industries in producing broad, high-quality coverage of sustainability disclosures. This might link to the climate risk to which this industry is exposed and the continuous pressure from investors, stakeholder and the public (Emma & Jennifer, 2021). According to Zhao (2011), the energy-intensive industry plays an important role in terms of industrial value added and the quantities of leading products, with a 75% total energy demand for this type of sector. The discernible industry-based trends in disclosure are consistent with the strategic aim and competitive condition of different industries (Cohen et al., 2011). In addition, Li et al. (2019) stated that different industries have different strategies for CSR disclosure, which affects their environmental practices. According to Reverte (2009), companies in the manufacturing sector publish more environmental information than those in the non-manufacturing sector. The manager in controversial industries like energy industry can be more concerned about their harmful activities and place a higher importance on SDG commitment reflecting in their SDG disclosure (Emma & Jennifer, 2021). According to Dusterhöft et al. (2020), firms disclose details about environmental risk to reduce the impact of this risk, which is specifically the case for energy utilities. Hence, the second hypothesis is formulated as follows:

H_2 There is a significant relationship between industry and energy-related SDGs disclosure.

Corporate Financial Performance

Firms with good financial performance tend to reveal more information through sustainability reporting to show the public and stakeholders their level of profitability compared with their peers in the same industry (Ghozali & Chariri, 2007). In addition, companies tend to disclose such information voluntarily to differentiate themselves from companies with financial problems (Das, 2017). According to Tasrip et al. (2017), a company with high profitability tends to increase the quality of its environmental reporting since they have more opportunities to do so, compared to companies with lower profitability. Numerous studies have attempted to determine the relationship between financial performance and energy-related disclosure. As stated earlier, firms might disclose environmental risks to reduce the impact of those risks, especially on investors. In relation to oil and gas companies, Rajgopal (1999) reported a significant relationship between stock return and share prices on one hand and risk disclosure on the other. Hopeet al. (2016) found similar results, in that a positive market reaction is significantly related to more specific risk factor disclosures. This is supported by a recent study

by Dusterhöft et al. (2020), who observed that risk-information disclosure is positively influenced by firm value. This indicates that the higher the firm value, the more transparent an energy utility is, compared to its peers. On the contrary, a recent study by Lu et al. (2021) conducted on the carbon-intensive industry, found that financial performance and carbon disclosure is not significantly related. This shows that improvements in financial performance will not affect energy disclosure. Thus, the third hypothesis is developed as follows:

H_3 There is a significant relationship between corporate financial performance and energy-related SDGs disclosure.

Research Method

The sample of 320 enterprises was randomly drawn from the 788 PLCs on the main board of Bursa Malaysia as of June 2020, using Excel's random number generator. The data were obtained through a content analysis of corporate annual reports for 2019. It was found that only 87 of the sample companies disclosed SDGs information in their corporate annual reports. The dependent variable of this study is the disclosure of energy-related SDGs, indicating whether the company disclosed any energy-related SDG or not. The energy-related SDGs included in this study are SDG 1, SDG 3, SDG 6, SDG7, SDG9, SDG 11, SDG12 and SDG13. The selection of these SDGs is based on the high level of interaction between other SDGs and SDG 7, which directly focuses on energy (McCollum et al., 2018; Nilsson et al., 2018). Meanwhile, the independent variables of the study are company size, corporate financial performance (CFP) and industry. Company size was measured using a natural logarithm of total assets (Dang et al., 2018). The industry variable was categorised into energy-intensive and non-energy-intensive industries. The term energy-intensive refers to the high energy consumption by businesses in the sector, such as transport, industry, commerce, fishing and agriculture (Energy Commission, 2020). This study selected energy-intensive companies following the Energy Commission outline, which matched the Bursa Malaysia sectors classification. The overall sector includes the transportation and logistics; industrial products and services; construction; property and plantation sectors. For financial performance, the accounting-based measure return on equity (ROE) was used. ROE is widely used as a proxy of CFP in the literature (Galant & Cadez, 2017; Endrikat et al., 2014). Moreover, this accounting-based measure captures various company attributes responsible for corporate social reporting (Laan et al., 2008) that relate to the SDGs.

Findings

Table 1 shows that only 27%, or 87 companies from a total of 320 sample companies, disclosed SDGs initiatives in their corporate annual reports. Although this suggests that SDGs disclosure practices among Malaysian PLCs remain low, the focus was on specific SDGs, implying that businesses have sought, at least on certain level, to select the SDGs most pertinent to their business and social value.

Table 1: Corporate SDGs Disclosure

SDGs Disclosure		Frequency	Percentage
Disclosure in Annual Report	Yes	87	27
	No	233	73
	Total	320	100
Disclosure by Industry	Non-energy-intensive industry	40	46
	Energy-intensive industry	47	54
	Total	87	100

In terms of disclosure by industry, more companies in the energy-intensive industry disclosed at least one SDG than companies in the non-energy-intensive industry.
Table 2 presents the extent of disclosure of eight energy-related SDGs among Malaysian PLCs. The first column lists the eight energy-related SDGs, followed by the number of companies that disclosed each SDG, along with the percentage; the last column shows the order of the SDGs in terms of frequency.

Table 2: Energy-related SDGs Disclosure

SDGs	Frequency	Percentage	Rank Order
SDG 1 – No Poverty	26	30	8
SDG 3 – Good Health & Well-Being	68	78	1
SDG 6 – Clean Water & Sanitation	33	38	6
SDG 7 – Affordable & Clean Energy	35	40	5
SDG 9 – Industry, Innovation & Infrastructures	48	55	4
SDG 11 – Sustainable Cities & Communities	32	37	7
SDG 12 – Responsible Consumption & Production	61	70	2
SDG 13 – Climate Action	57	66	3

As shown in Table 2, the most-reported energy-related SDG is SDG 3 - Good Health and Well Being, on which about 78% (68 companies) disclosed details in their annual reports. Next, SDG 12 – Responsible Consumption and Production and SDG 13 - Climate Action immediately followed, on which 70% (61 companies) and 66% (57 companies) disclosed, respectively. Meanwhile, SDG 9 – Industry, Innovation and Infrastructures, was ranked fourth, with 55% (48 companies) revealing these particular goals. SDG 7 - Affordable and Clean Energy was ranked fifth, with 40% of companies (35 companies) reporting on the goal in their annual reports. Meanwhile, SDG 1 – No Poverty had the fewest energy-related SDGs, with just 30% (26 companies) of companies disclosing it in their annual reports.
Table 3 presents energy-related SDG disclosure provided by energy-intensive and non-energy-intensive companies.

Table 3: Energy-related SDGs Disclosure According to Industries

Industry	Energy-intensive		Non-energy-intensive	
SDG	Frequency	Percentage	Frequency	Percentage
SDG 1	12	14	14	16
SDG 3	39	45	29	33
SDG 6	21	24	12	14
SDG 7	21	24	14	16
SDG 9	26	30	22	25
SDG 11	21	24	11	13
SDG 12	32	37	29	33
SDG 13	31	36	26	30

As shown in Table 3, more companies in energy-intensive industries than in non-energy-intensive industries disclosed information on all energy-related SDGs, except for SDG 1, for which the situation was reversed. This is consistent with the PwC SDG Challenge Report (2019), which found that, except from the energy industry, most other businesses have yet to develop a strategy centred on Affordable and Clean Energy (SDG7). The findings also revealed that the leading SDGs for more than 30% of companies in both the energy-intensive and non-energy-intensive industries were SDG 3, SDG 12 and SDG 13. The t-test was conducted to

establish that there was no significant difference in SDG disclosure between the energy- and non-energy-intensive industries (results not presented here). According to PwC (2019, 2018), SDG 13, SDG 8, SDG 7, SDG 9 and SDG 12 were among the SDGs for which firms in the energy industry revealed the greatest level of information. Moreover, Izzo et al. (2020) reported that the SDGs most mentioned by companies in the energy sector were SDG 8, SDG 9 and SDG 13.

Table 4 presents the results of regression analysis to test all the hypotheses. The analysis tested the relationship between corporate characteristics and corporate disclosure on one hand and all energy-related SDGs on the other. It also tested the individual relationship with each energy-related SDG (i.e. SDG 1, SDG 3, SDG 6, SDG 7, SDG 9, SDG 11, SDG 12 and SDG 13).

Table 4: SDGs Disclosure and Corporate Characteristics

Variables	**All energy -SDGs**	**SDG 1**	**SDG 3**	**SDG 6**	**SDG 7**	**SDG 9**	**SDG 11**	**SDG 12**	**SDG 13**
CFP	-0.084	-0.106	-0.190	-0.041	-0.019	0.004	-0.016	0.007	-0.046
	-0.786	*-0.960*	*-1.742*	*-0.370*	*-0.169*	*0.033*	*-0.149*	*0.060*	*-0.416*
CoSize	0.288*	0.106	0.089	0.162	0.145	0.261*	0.319*	0.064	0.150
	2.761	*0.979*	*0.836*	*1.517*	*1.341*	*2.461*	*3.125*	*0.582*	*1.382*
Industry	0.080	-0.124	0.086	0.146	0.098	0.011	0.182	-0.045	0.003
	0.745	*-1.122*	*0.783*	*1.327*	*0.882*	*0.098*	*1.737*	*-0.400*	*0.031*
R^2	0.313	0.181	0.242	0.225	0.031	0.068	0.366	0.006	0.025
Adjusted R^2	0.098	0.033	0.059	0.051	-0.004	0.034	0.134	-0.030	-0.011
F-statistic	3.013	0.935	1.721	1.478	0.886	2.019	4.272	0.178	0.700

**Significant at p < 0.05, CFP = Corporate Financial Performance, CoSize = Company Size*

The results show that the relationship between company size (CoSize) and all energy-related SDGs is positive and significant (coefficient = 0.288; t = 2.761; *p<0.05)*. The value of adjusted R^2 is 0.098, which indicates that 9.8% of the variability in SDGs can be explained by all the variables in the research equation. Similarly, a positive significant relationship was demonstrated between company size (CoSize) and SDG 9 - Industry, Innovation and Infrastructures at $p < 0.05$ (coefficient = 0.261; t = 2.461), as well as SDG 11 – Sustainable Cities & Communities at $p < 0.05$ (coefficient = 0.319; t = 3.125). However, similar results were not found for the relationship between energy-related SDGs and CFP, as well as industry. Therefore, only H_1, which predicts a positive relationship between company size and energy-related SDGs disclosure, was supported. This finding is consistent with Izzo et al. (2020), who found a positive significant association between SDG reporting and firm size.

Discussion and Conclusion

This study concentrates specifically on energy-related SDG disclosure practices among Malaysian PLCs. The main aims of this study were to determine the energy-related SDG disclosure practices and to investigate the influence of corporate characteristics on energy-related SDG disclosure. This study revealed that more companies in the energy-intensive industry disclosed details on energy-related SDGs than those in the non-energy-intensive industry. However, in general, the findings show that in Malaysia, corporate SDGs disclosure remains very low, as only 27% of the sample companies (87 out of 320 companies) disclosed at least one specific SDG in their annual report. This is consistent with the findings of Tasrip et al. (2017), who reported that the extent of energy disclosure among the top 100 energy-intensive Malaysian companies was low. However, the trend illustrates an increasing tendency for Malaysian companies to report such information, which is good progress. In the latest

Sustainable Development Goals Report 2020, Malaysia's ranking for SDG disclosure moved to 60th in 2020 from 66th in 2019 (PwC, 2020).

Further analysis was conducted to focus on the energy-related goals disclosed by companies in both the energy-intensive and non-energy-intensive industries. In total, more companies in energy-intensive industries disclosed energy-related goals than companies in non-energy-intensive industries. Similarly, for each energy-related SDG, except for SDG 1, companies in the energy-intensive industry lead the disclosure practices in their corporate annual reports. This is consistent with the SDG Challenge Report by PwC (2019), which revealed that other than the energy sector, companies in most other industries have not develop a strategy around SDG7. In addition, Hacking (2019) suggested that companies that operate in sensitive industries are more concerned in disclosing information on their contribution to the SDGs, possibly because they need to demonstrate their corporate social responsibility. Likewise, the presence of common regulations about non-financial information has required energy-intensive companies to disclose information more fully than other companies.

The findings revealed that the most-reported energy-related goals were SDG 3, 12 and 13 for both the energy-intensive and non-energy-intensive industries. Accordingly, past literature has identified significant interactions between direct energy goals (SDG 7) and other goals, including SDG 3, 12 and 13 (McCollum et al., 2018). Interactions can occur in a variety of ways, such as energy policy; natural resource demands for sustainable development; access to affordable and clean energy for economic, environmental and social performance; energy efficiency; clean and renewable energies, as well as sustainable consumption (Fonseca et al., 2020). The energy-related SDGs are determined by their context, which includes the time horizon, location, governance, technology and directionality (Nilsson et al., 2018; McCollum et al., 2018).

The study also investigated the relationship between energy-related SDG disclosure and corporate characteristics. It was revealed that energy-related SDG disclosure is related to firm size, with larger companies demonstrating more corporate disclosure of SDGs. Similarly, past studies stated that company size plays an significant role in SDGs disclosure (Hummel & Szekely, 2020; Rosati & Faria, 2019; van der Waal & Thijssens, 2020). A possible reason is that larger companies disclose information more frequently because they are more visible, more impactful and deal with larger stakeholder groups (Gallo & Christensen, 2011). They are also more likely to attract media and public attention (Ma et al., 2019). Moreover, major companies are generally more worried with their public image, affected by stakeholders' prospects and engaged in emerging sustainability discussions than smaller companies (Rosati & Faria, 2019). In addition, Alhayali et al. (2017) indicated that sustainability practices were very costly, so smaller companies, which generally encountered cost constraints and limited resources, would limit their corporate disclosure (Baumann-Pauly et al., 2013; Hahn & Kühnen, 2013). Furthermore, large companies would perceive SDG disclosure differently from small companies due to the different impacts they have on society. This could be connected to their different approaches to corporate activities, including SDG involvement.

The corporate financial performance and industry variables demonstrated no relationship with energy-related SDGs disclosure. Corporate characteristics of corporate disclosure that have generally been examined in the literature include company size, corporate performance and industry classification. Although some determinants have been repeatedly examined, the findings from prior studies vary. For instance, past literature has highlighted that companies with good financial performance are naturally interested in disclosing their sustainability information (Qiu et al., 2016) to engage with their stakeholders. Similarly, Rosati & Faria (2019) suggested that financial performance represents a possible determinant of SDG reporting. Meanwhile, Pizzi et al. (2020) found an insignificant relationship between corporate

performance and SDG reporting among Italian companies. Likewise, several studies have found that industry affects corporate disclosure (Lu & Abeysekera, 2014). Different industries have different characteristics, which are formed by the strength of competition, consumer visibility and regulations. These varying characteristics can influence corporate, social and environmental disclosure, so disclosure is industry-specific. For example, Hummel and Szekely (2020) revealed that environmentally sensitive industries are positively associated with SDG disclosure. They also reported evidence that companies in the business-to-customer industry provide more SDG disclosure than companies in other industries, which aligns with the current authors' expectations and earlier proof. This mixed finding may be due to the different contexts in which the investigations occurred.

Theoretical Implications

This study aims to provide to the body of literature on stakeholder theory by providing novel research that identifies energy-related SDGs. The study contributes to the current argument on SDG reporting practices about the interlinkages between goals and which corporate characteristics are more likely to influence companies' disclosure on energy-related SDGs. Through its findings, this study is among the first to provide evidence of energy-related SDG disclosure among Malaysian companies, a practice which is becoming the new business model.

Practical and Social Implications

The study's findings are likely to have practical implications for corporations and other business organisations seeking to actively involve the energy-related SDGs in their business models and successfully communicate these efforts to stakeholders. A better understanding of the relationship between energy-related SDGs disclosure and corporate characteristics will contribute to the design of policies that can enhance corporate accountability. This study also suggests that SDGs provide the opportunity for academic research to develop and further improve corporate disclosure practices related to SDGs as the latter will represent a way to signal the orientation toward sustainable development and are becoming increasingly prevalent in the global agenda.

Limitations and Suggestions for Future Research

While this study adds to the body of knowledge on SDGs, it also has a number of limitations that must be taken into account when interpreting its findings. Only annual reports were examined in order to look at the energy-related SDGs. Thus, future studies need to examine more extensive corporate reporting, such as sustainability reports, corporate social responsibility reports or integrated reports. This study was limited to an investigation of the energy-related SDGs mentioned in corporate annual reports but did not assess other SDGs disclosure details, such as specific targets and key performance indicators (KPIs) to measure corporate performance in terms of meeting energy-related SDGs. Thus, future research might benefit from measuring actual corporate performance in terms of SDGs engagement and describing corporate disclosure in more meaningful terms. This might include corporate intentions, strategic plans and opportunities and lead to a better understanding of the actual absence or presence of SDGs in disclosure practices. The focus and context of the study was only Malaysia, while a limited sample size was used and only at one point in time. Having country-specific attributes certainly affected the results and thus affects their generalisation. Future studies could extend the investigation to different countries, thereby providing a cross-country evaluation. Alternatively, a longitudinal basis would enable the development of corporate disclosure to be monitored over several years and to find evolutionary forms on how companies report their contribution to related to the SDGs. SDGs disclosure should be aligned

with a company's business model, which would result in more sustainable practices, specifically in achieving energy-related SDGs. This practice may offer a corporate competitive advantage, generate more revenue, build corporate reputations, attract investor interest and reduce risks. Hence, the SDGs should be really embedded in corporate strategies, business models and performance valuation practices.

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