

The Impact of Institutional Pressures of Climate Change Concerns on Corporate Environmental Reporting Practices: A Descriptive Study of Malaysia's Environmentally Sensitive Public Listed Companies

SAGE Open
April-June 2018: 1–10
© The Author(s) 2018
DOI: 10.1177/2158244018774839
journals.sagepub.com/home/sgo


Amar Hisham Jaaffar¹, Azlan Amran², and Jegatheesan Rajadurai¹

Abstract

Malaysian companies have dramatically increased their corporate environmental reporting (CER) practices in response to institutional pressures related to concerns about climate change. Based on a content analysis of annual reports, sustainability reports, and websites of 209 Malaysian environmentally sensitive public listed companies (ESPLCs), we describe CER practices with respect to various environmental strategies implemented by companies over a 5-year period. The results show that environmental strategies include pursuing sequential progression from noncompliance to compliance, and beyond in response to external factors such as institutional pressures and climate change concerns. This progression is manifested by the extent and quality of CER practices as pursued by Malaysian ESPLCs.

Keywords

corporate environmental reporting practices, neoinstitutional theory, corporate environmental strategy, content analysis

Introduction

Issues related to climate change, such as the rise in the earth's average surface temperature, expanding deserts, melting Arctic sea ice, ocean acidification, extreme weather events, and unpredictable plant and animal disease patterns, already provide what scientists all over the world believe to be unequivocal evidence that human activities, especially those related to business, are fundamentally altering the earth's climate (Intergovernmental Panel on Climate Change, 2015). Malaysia and other ASEAN (Association of Southeast Asian Nations) economies are particularly vulnerable to the impact of climate change, including extreme weather conditions, increased risk of floods and landslides, air pollution, rises in sea level, and storm surges (Amran, Ooi, Wong, & Hashim, 2016). A study by the Asian Development Bank (2013) indicated that disasters and losses, due to the effect of climate change, have outpaced the region's economic growth and will continue to hamper development gains in these emerging markets.

Given the emergence of climate change issues and their massive impact on the local economy, there has been

growing pressure on Malaysian publicly listed companies over the past decade to be more transparent in disclosing their businesses in relation to environmental impacts (PwC, 2013) and to increase their performance in terms of Environmental and Social Governance (ESG; Kweh, Alrazi, Chan, Abdullah, & Lee, 2017). In responding to climate change concerns, a firm can use Corporate Environmental Reporting (CER) practices to inform shareholders, regulators, and other stakeholders of the environmental impacts of firm activities and of any initiatives to mitigate these impacts, as well as to create and maintain a socially responsible image (Alrazi, De Villiers, & Van Staden, 2016). CER practice refers to the set of means used by companies to reveal their environmental practices to their stakeholders, which also

¹Universiti Tenaga Nasional, Muadzam Shah, Pahang, Malaysia

²Universiti Sains Malaysia, Pulau Pinang, Malaysia

Corresponding Author:

Amar Hisham Jaaffar, Department of Management and Human Resource, College of Business Management and Accounting, Universiti Tenaga Nasional, 26700 Muadzam Shah, Pahang, Malaysia.
Email: Ahisham@uniten.edu.my



serves as a decision-making tool for interested stakeholders (Rosa, Guesser, Hein, Pfitscher, & Lunkes, 2015, p. 250). CER can also be regarded as one of the components of environmental accountability (Alrazi, de Villiers, & van Staden, 2015) and corporate environmental management (Albertini, 2013). One of the reasons that firms publish CERs is to indicate to their stakeholders that they are good environmental performers who take sustainable development seriously. However, some firms with inferior environmental performance records have used CER practices as a management tool to gain legitimacy (Braam, de Weerd, Hauck, & Huijbregts, 2016). This suggests that CER is driven by a firm's less altruistic strategies and motives.

CER practices consist of information regarding environmental management practices, environmental performance, and the legal and financial aspects of environmental practices (Rosa et al., 2015). In fact, CER practices are considered a vital aspect of the measurement of corporate environmental management, along with environmental performance (Albertini, 2013). However, in some instances, CER practices have been measured by word count, sentence count or (summed) page proportions, frequency of disclosure, and/or high or low disclosure ratings (Chaklader & Gulati, 2015), instead of measurements relating to a firm's environmental strategies (Albertini, 2014).

Studies have shown that the CER's measurement approach, in relation to a firm's environmental strategies, is important in guiding a firm's CER practices (Alrazi et al., 2015). Therefore, this study measures CER practices of Malaysian environmentally sensitive public listed companies (ESPLCs) based on their disclosure of environmental strategies related to 15 indicators of corporate environmental management practices. These include (a) material used in the production process, (b) energy used in operations, (c) water usage, (d) atmospheric emissions, (e) waste, (f) environmental management of biodiversity, (g) environmental management of business products, (h) environmental management practices of the business process, (i) environmental expenditures, (j) environmental accounting and green balanced scorecard, (k) environmental training for employees, (l) environmental certification, (m) environmental management related to stakeholders, (n) environmental policy and environmental governance, and (o) environmental reporting practices based on established standards such as the Global Reporting Initiative (GRI) Framework (Rupley, Brown, & Marshall, 2012). Levels of environmental strategies for responding to institutional pressures related to climate change concern are (a) noncompliance environmental strategy (e.g., noncompliance strategic behavior to institutional pressures related to climate change concern), (b) compliance environmental strategy (e.g., compliance to institutional pressures related to climate change concerns), and (c) beyond-compliance environmental strategy (e.g., voluntarily going beyond institutional pressures related to climate change concern) (Albertini, 2014).

The objective of this study is to describe CER practices concerning environmental strategy in a sample of Malaysian

ESPLCs. More specifically, this study analyses the content of CER practices in annual reports, sustainability reports, and other disclosures by company websites between 2010 and 2014 to determine the characteristics and evolution of CER practices with respect to different environmental strategies over a 5-year span. This article contributes to the literature on CER practices in two different ways: (a) It presents the recent evolution of the CER practice with respect to the different levels of corporate environmental strategies implemented by ESPLCs and (b) provides an explanation of how Malaysian ESPLCs respond to the institutional pressures of climate change concerns. The Malaysian ESPLCs' responses are manifested in their CER practices. The remainder of this article is organized as follows. The subsequent section contains an overview of studies that analyzed the two subjects that serve as a foundation for our research into environmental strategies and CER practices. In the "Research Method" section, the method of analysis is described. In the "Result and Discussion" sections, interpretations of the results are presented, adding to the discussion on the subject. Conclusions, limitations, and suggestions for further studies are presented in the final section.

Literature on Environmental Strategy and CER Practices

Table 1 shows the levels of environmental strategies that have usually been reported by firms through environmental management practice indicators, classified according to the environmental commitment they represent (Albertini, 2014). As seen in Table 1, there are three levels of environmental strategy: (1) noncompliance, (b) compliance, and (c) beyond compliance. A "noncompliance" environmental strategy refers to the failure of a firm to meet environmental sustainability requirements (Pedersen, Neergaard, Pedersen, & Gwozdz, 2013). A "compliant" environmental strategy means that the efforts of a firm are minimal in terms of meeting the regulatory standards of environmental sustainability practices (Delmas & Montes-Sancho, 2011). A "beyond compliance" environmental strategy (e.g., pollution prevention, product stewardship, and sustainable development) refers to a firm's efforts to go beyond what is required by environmentally sustainability practice regulations (Jaaffar & Amran, 2017). These levels of environmental strategies have been proven to have a significant influence on environmental performance and CER practices (Alrazi et al., 2015).

Theoretical Perspectives: Firms' Responses to Institutional Pressures of Climate Change Concerns

Climate change is considered an environmental sustainability "mega force" which affects firms worldwide and Malaysia in particular (Klynveld Peat Marwick Goerdeler [KPMG], 2013). Because Malaysia and other ASEAN members have committed to addressing climate change by reducing greenhouse gas (GHG) emissions, the ASEAN member country

Table 1. The Level of Environmental Strategy.

No.	Level of environmental strategy	Description	Sources
1	Noncompliance	<ul style="list-style-type: none"> A firm has not developed any environmental policies and fails intentionally or by default to address the requirements of environmental regulation and social pressure. Environmental performance is often measured by the number of environmental accidents, penalties, or lawsuits. 	Nadler (1999) Thomas (2001)
2	Compliance	<ul style="list-style-type: none"> A firm usually carries out environmental strategies to a minimum level to avoid legal penalties or loss market share or just to meet environmental regulatory requirements. To satisfy government or stakeholder requirements, the firm implements CER practices which address climate change, biodiversity, and so on, resulting from their industry activities. Environmental performance is commonly measured by pollution control indexes such as greenhouse gas emission; toxic chemical release in the water, in the air, and on land; or waste management. 	Hunt and Auster (1990) Delmas and Montes-Sancho (2011) Freedman and Patten (2004)
3	Beyond compliance		
	Pollution prevention	<ul style="list-style-type: none"> A firm undertakes environmental strategies to minimize emissions, effluent, and waste (e.g., reduces waste, recycling solid waste, toxic emissions, business impact on ecosystems, and conserves energy and other natural resources). Environmental performance is often measured by pollution prevention programs, the level of environmental investments or participation in voluntary environmental initiatives, rather than an “end of pipe” control measure. 	Christmann and Taylor (2002) Roome (1992)
	Product stewardship	<ul style="list-style-type: none"> Firms focus on minimizing the life cycle cost of products, making their product more sustainable throughout its life cycle to attain a balance among environmental sustainability aspects while not compromising the cost, quality, function, and technical issues of the products. Firm initiatives may reduce nonrenewable resource requirements and hazardous material which have a severe impact on the environment, and facilitate reuse or reuse or recycling of components at the end of product’s life cycle. 	Gunasekaran and Spalanzani (2012) Maxwell and van der Vorst (2003)
	Sustainable development	<ul style="list-style-type: none"> A firm executes this strategy to minimize the environmental sustainability burden of firm growth by using the design of an integrated approach capable of dealing with environmental sustainability and waste while ensuring economic and social prosperity (e.g., emission reduction policy implementation and improvement, product innovation related policies and improvement and resource reduction related policies, implementation, and improvement). 	Khalili, Duecker, Ashton, and Chavez (2015) Escrig-Ormedo, Muñoz-Torres, Fernández-Izquierdo, and Rivera-Lirio (2017)

governments have applied institutional pressure to integrate climate change into their strategies (Amran et al., 2016). Neoinstitutional theory offers the potential to explain the difference in the organizations’ strategic responses to institutional pressures of climate change concerns (Levy & Kolk, 2002). The Neoinstitutional theory, which is the new version of institutionalism, provides an explanation of the transformation and change in institutions as well as the heterogeneity of participants and practices in the field (DiMaggio & Powell, 1991; Greenwood, Oliver, Sahlin, & Suddaby, 2008, 2012; Scott, 2008). From the perspective of Neoinstitutional theory, the institutional environment can be characterized by coercive, normative, and cognitive elements, which reflect

how an organization understands, interprets, and perceives its environment (Scott, 2013).

The coercive pressures suggest that increasing regulatory enforcement and policy guidelines for climate change concerns provides a direct incentive and pressure on the firms implementing environmental strategies (Bui & De Villiers, 2017). The normative element refers to a firm’s perception of the community’s expectations and the public’s opinions of climate change issues as raised in the 2015 Paris Climate Conference involving the cooperation of over 190 countries. The issues highlighted at the conference were extreme weather events and widespread flooding, which can influence a firm’s environmental strategy (Demska, Capstick, Pidgeon,

Sposato, & Spence, 2017). The cognitive element relates to the business's key decision maker's cognitive schemas, mindsets, or experiences pertaining to cleaner production to mitigate the effect of climate change and their license to operate (Li et al., 2017). The explanation of cognitive elements is consistent with the view of Hambrick (2007) and Starbuck and Milliken (1988) who believe that past experience can be regarded as a key cognitive filter through which information is processed and understood. These coercive (i.e., regulations and laws), normative (i.e., social and cultural norms to which firms are expected to adhere), and cognitive (i.e., business leader's experience derived from their external and internal social capital) elements influence a firm's environmental strategies, including their CER practices (Amran et al., 2016).

In Malaysia, several recent initiatives have been implemented by the Malaysian government to address climate change issues. These include (a) the National Policy on the Environment, (b) the National Energy Policy, (c) the National Forest Policy, (d) the Biodiversity Policy, and (e) the National Policy in Climate Change Issues (Al-Amin, Jaafar, Azam, Kari, & Agil, 2013). In Malaysia, Bursa Malaysia, an exchange holding company, has required all Malaysian publicly listed companies (PLCs) to report on their corporate social responsibility (CSR) practices relating to the community, workplace, environment, and marketplace in their annual reports as a part of the listing requirement effective from 2007 onward. This was implemented due to concerns about climate change (Bursa Malaysia, 2014). In addition to the mandatory requirements, Bursa Malaysia has also offered sustainability guidance and training programs for key governance decision makers from 2009. These programs include the Bursa Malaysia's Business Sustainability Program, the Portal of Powering Business Sustainability—A Guide for Directors in 2010, the Corporate Disclosure Guide in 2011, and the Corporate Governance Guide: Toward Boardroom Excellence in 2013 (Bursa Malaysia, 2014).

In addition to guidance and training programs, the Malaysian government has collaborated with the United Nations Development Program (UNDP) Malaysia by launching My Carbon Reporting Programs in December 2013 (Economic Planning Unit, 2015). The program is a voluntary reporting mechanism which aims to encourage and facilitate private entities, particularly Malaysian firms, to measure and report their GHG emissions. Interestingly, the environmental sustainability concept has progressively gained importance for the Malaysian government because it is in line with global initiatives for sustainable development. The term sustainable development is used here as it is believed to be the most appropriate term in line with the definition provided by the Brundtland Commission (1987). These institutional pressures on climate change concerns have increased the quantity of CER practices in Malaysia dramatically, but with huge variations in the level and quality of the disclosures (Alazzani, Hassanein, & Aljanadi, 2017; Jaffar, Adinezhadeh, & Rahman, 2015; KPMG,

2015; Ong, Tho, Goh, Thai, & Teh, 2016). These institutional pressures affecting climate change concerns have increased the strategic behavior of Malaysian ESPLC from the oil and gas industry which has moved from noncompliance to compliance (Alazzani & Wan-Hussin, 2013), increased the sustainable manufacturing of Malaysian manufacturing companies (Abdul-Rashid et al., 2017), and improved the environmental performance of the Malaysian power plant sector (Wong, Abdullah, Baini, & Tan, 2017). Therefore, this study hypothesizes the following:

Hypothesis 1: The institutional pressures of climate change concerns will increase the level of a firm's environmental strategy gradually in CER practices.

Hypothesis 2: The institutional pressures of climate change concerns will lead the level of a firm's environmental strategy differ for each environmental management practice indicator.

Research Method

Database

The sample is composed of firms listed in Bursa Malaysia, categorized as ESPLCs based on the definition of the North American Industry Classification System (NAICS) codes for environmental sensitive industries and a report issued by the Department of Environment of Malaysia. The period of the study from 2010 to 2014 was chosen because 2014 revealed significant normative and cognitive factors that influenced Malaysian firms to participate in CER practices, particularly those initiated by Malaysian government and the local stock exchange. This study initially considered 458 firms listed on the Bursa Malaysia in 2014, but selected only 209 firms because, of the original 458, many were either not listed in the 2010 report or had none of their details published in the 2014 annual report when the study began collecting data in June 2015. The final sample represents 46% of the total population of 458 Malaysian publicly listed firms associated with environmentally hazardous industries. Data were collected from reports published annually, sustainability reports, and other disclosures on company websites. The company type was determined by the Standard Industrial Classification (SIC). The code is described in Table 2.

This study uses content analysis techniques based on a measurement index related to a firm's environmental strategies (Rupley et al., 2012). Based on the literature and content analysis, techniques can be divided into two types: (a) mechanistic technique (measurement of environmental reporting practices by the number of total words, sentences, summed page proportion, frequency of disclosure and high/low disclosure ratings) and (b) interpretative technique (measurement of environmental reporting practices by qualitative character of the narrative, which focuses on interpretation of

Table 2. Sample Distribution Based on Type of Industry.

Types of industry	Frequency	Percentage of total sample
Miscellaneous manufacturing	30	14.4
Heavy & civil engineering construction	29	13.9
All other miscellaneous crop farming	16	7.7
Fabricated metal product manufacturing	14	6.7
Plastics & rubber products manufacturing	14	6.7
Wood product manufacturing	14	6.7
Furniture & related	8	3.8
Machinery manufacturing	8	3.8
Beverage & tobacco product manufacturing	7	3.3
Chemical manufacturing	7	3.3
Paper manufacturing	7	3.3
Food manufacturing	6	2.9
Automobile & other motor vehicle merchant wholesalers	5	2.4
Electrical equipment, appliance, & component	5	2.4
Petroleum & coal products manufacturing	5	2.4
Primary metal manufacturing	5	2.4
Oil & gas extraction	5	2.4
Transportation equipment manufacturing	4	1.9
Construction, transportation, mining, & forestry machinery & equipment rental & leasing	3	1.4
Mining (except oil & gas)	3	1.4
Printing & related support activities	3	1.4
Chemical & allied products merchant wholesalers	2	1
Metal & mineral merchant wholesaler	2	1
Motor vehicle and parts dealers	2	1
Petroleum & petroleum products merchant wholesalers	2	1
Computer & electronic product manufacturing	1	0.5
Marinas	1	0.5
Support activities for mining	1	0.5
Total	209	100

text) (Beck, Campbell, & Shrives, 2010). The interpretative approach of content analysis captures the meaning of CER practices by disaggregating narrative into its constituent parts and then describing the contents of each disaggregated component, thereby gaining a greater understanding of the environmental strategies (Albertini, 2014). The interpretative technique of content analysis is used to describe the CER practices with respect to a firm's environmental strategies in responding to various institutional pressures (Rupley et al., 2012). In addition, this study also used paired *t* test to

compare the two samples from 2010 and 2014 to obtain the mean score and total score of CER practices based on the level of environmental strategies. The results from the paired *t* test are used to determine whether there are significant differences in the total score of CER practices in 2014 compared with 2010.

Measurement of CER Practices Based on the Level of Environmental Strategy

The environmental management practice indicators in this study were adopted from the environmental indicators of GRI (Rupley et al., 2012). There are 15 environmental management practice indicators as presented in Table 3. The measurement of CER practices in this study can be considered a proxy for the level of the environmental strategies where the value of -1 is given for a "noncompliance" level environmental strategy (e.g., related to noncompliance or a "denial" aspect which means that the firms have not developed any environmental policies and have failed intentionally, or by default, to address the requirements of environmental regulation or social pressure in environmental sustainability practices). The value of 0 is given for "compliance" level of environmental strategies (e.g., complied with environmental regulations or have implemented the "end-of-pipe" environmental solution that is corrective to minimize risks, liabilities and costs in environmental sustainability practices) and the value of 1 for "beyond-compliance" environmental strategies (e.g., a firm's effort to minimize the emissions and waste related to its operating activities [pollution prevention], minimized life cycle costs of the product [product stewardship], and minimized the environmental burden of the firm's growth [sustainable development] in environmental sustainability practices) (Albertini, 2014).

Results

Table 4 shows the comparison of the total scores of CER practices in 2010 and 2014 based on the level of environmental strategy according to the 15 environmental management practices indicators. Table 4 shows the results of the statistical *t* test ($p < .01$) where there is a significant difference in the averages of CER scores in 2010 and 2014. The mean score of CER in 2010 was -0.2494 , which increased by 42.2% to -0.637 in 2014. This result shows that for all the 15 management practices indicators, the average level of a firm's environmental strategies is moving toward a "compliance" environmental strategy. This result supports our first hypothesis that the institutional pressure of climate change concerns increases the level of a firm's environmental strategy gradually in CER practices.

Table 5 shows the distribution of environmental management practice indicators based on the level of environmental strategies. According to Table 5, the environmental

Table 3. The Environmental Management Practices Indicators.

No.	Environmental management practices indicators
1	Material—Materials input into the production process from internally or externally supplied recycled materials/sales of materials formerly discarded.
2	Energy—Consumption of energy (joules, BTUs, or similar measures)/renewable resources.
3	Water—Use of water/rehabilitation of water, put back into watershed/reused water, for additional processes
4	Atmospheric emissions—(a) Total waste created and/or disposed, disposal sink not specified or all sinks aggregated; (b) emission of ozone-depleting substances; (c) emission of other significant gasses; and (d) carbon offsets
5	Total waste (Include: Hazardous, toxic, radioactive)—Total waste created and/or disposed, disposal sink not specified, or all sinks aggregated, treated, recycled, and/or reused.
6	Biodiversity—(a) Sensitive lands impacted by activities and operations and (b) impacts on endangered species due to activities and operations
7	Products—Take back or reclaimed products or components/"green" products/environmental impacts due to use of green products made by a company
8	Process—Life cycle analysis (LCA)/design for environment (DfE)/environmental management system (EMS)
9	Environmental expenditures—Environmental expenditures, total/by type
10	Other accounting/scoring systems—Environmental accounting/Green Balanced Score Card
11	Employee training—Environmental training, hours; environmental training, monetary value (\$); percentage of employees receiving environmental training
12	Certification—Environmental process and product certifications
13	Stakeholder engagement—Communities/NGOs/government/consumers/employees/suppliers/shareholders.
14	Environmental policy—Environmental policy or program audit/structure of environmental responsibility
15	Reporting—Published CER according to established standards (GRI standard)/report verification

Note. NGO = nongovernmental organization; CER = Corporate Environmental Reporting; GRI = Global Reporting Initiative.

Table 4. Comparison of Total Score of CER Practices in 2010 and 2014.

Comparison for CER score 2010 and 2014	N	CER mean score	Mean standard error	CER score difference	Significance (one-tailed) of t test for the equality of two mean
CER score 2010	209	-.2494	.04388	-.18573 (42.2%)	***
CER score 2014	209	-.0637	.04302		

Note. Total CER Practice Score—Aggregate Score of 15 Environmental Management Practices Indicators (noncompliance = -1; compliance = 0; and beyond compliance = +1). CER = Corporate Environmental Reporting.

* $p < .1$. ** $p < .05$. *** $p < .01$.

management practice indicators that have the highest numbers of a "noncompliance" environmental strategy, based on the comparison of 2010 and 2014 figures, are the environmental management of energy used in the operation such as consumption of energy (joules, BTUs, or similar measures)/renewable resources (28 firms) and environmental management practices related to environmental expenditures (28 firms). Environmental management practice indicators that have the highest number of improvements in terms of "compliance" of the environmental strategy based on the comparison of 2010 and 2014 figures are environmental management practices related to environmental expenditure (30 firms). Environmental management practice indicators that have the highest numbers of improvements in terms of "beyond compliance" of the environmental strategy, based on the comparison of 2010 and 2014 figures, are environmental management practice indicators related to environmental policy or program audits or the structure of environmental responsibility (44 firms).

With respect to the mean difference of the level of environmental strategy, environmental management practice indicators such as environmental policy or program audits or the structure of environmental responsibility, the mean of the level of a firm's environmental strategy had already reached a positive value in 2010 (mean 2010 = 0.22). This value increased by 2014 (mean 2014 = 5.31). These kinds of environmental management practice indicators also recorded the highest increment from 2010 to 2014 (mean difference = 5.09). Environmental management and the acquisition of environmental certification (e.g., environmental process and product certification; mean difference = 3.09) recorded the second highest increment, followed by environmental management practices related to stakeholders (e.g., communities/NGOs/government/consumers/employees/suppliers/shareholders; mean difference = 3.08) and the environmental management of material used in the production process (e.g., materials input into the production process from internally or externally supplied recycled materials/sales of materials

Table 5. The Distribution of Environmental Management Practices Indicators Based on the Level of Environmental Strategy.

No.	Environmental management practice indicator	Level of environmental strategy	Score difference (2010 and 2014) (per firm)	Mean in 2010	Mean in 2014	Mean difference (2010 and 2014)
1	Material	Noncompliance	25,000	-3.45	-0.43	3.02
		Compliance	8.000			
		Beyond compliance	17.000			
2	Energy	Noncompliance	28,000	-4.02	-1.22	2.8
		Compliance	17.000			
		Beyond compliance	11.000			
3	Water	Noncompliance	25,000	-3.8	-1.36	2.44
		Compliance	16.000			
		Beyond compliance	9.000			
4	Atmospheric emissions	Noncompliance	27,000	-4.67	-2.01	2.66
		Compliance	17.000			
		Beyond Compliance	10.000			
5	Total waste	Noncompliance	27,000	-3.8	-1.29	2.51
		Compliance	19.000			
		Beyond compliance	8.000			
6	Biodiversity	Noncompliance	26,000	-4.67	-2.3	2.37
		Compliance	19.000			
		Beyond compliance	7.000			
7	Products	Noncompliance	27,600	-3.73	-1.29	2.44
		Compliance	20.000			
		Beyond compliance	7.000			
8	Process	Noncompliance	21,000	-1.08	1.51	2.59
		Compliance	6.000			
		Beyond Compliance	15.000			
9	Environmental expenditure	Noncompliance	28,000	-5.45	-3.59	1.86
		Compliance	30.000			
		Beyond compliance	-2.000			
10	Other accounting or scoring system	Noncompliance	28,000	-6.17	-3.73	2.44
		Compliance	22.000			
		Beyond compliance	6.000			
11	Employee training	Noncompliance	27,000	-5.17	-3.09	2.08
		Compliance	25.000			
		Beyond compliance	2.000			
12	Certification	Noncompliance	22,000	-1.51	1.58	3.09
		Compliance	5.000			
		Beyond compliance	19.000			
13	Stakeholder engagement	Noncompliance	27,000	-3.3	-0.22	3.08
		Compliance	11.000			
		Beyond compliance	16.000			
14	Environmental policy	Noncompliance	27,000	0.22	5.31	5.09
		Compliance	17.000			
		Beyond compliance	44.000			
15	Reporting	Noncompliance	26,000	-4.38	-2.15	2.23
		Compliance	21.000			
		Beyond compliance	5.000			

formerly discarded; mean difference = 2.59). Conversely, the lowest improvement of the mean differences noted in this study are environmental management of environmental expenditures (e.g., environmental expenditures, total/by type; mean difference = 1.86), environmental training of

employees (e.g., environmental training, hours; environmental training, monetary value; percentage of employees receiving environmental training; mean difference = 2.08) and environmental reporting practices based on established standards such as the GRI framework or report verification

(mean difference = 2.23). These results support our second hypothesis, which holds that the institutional pressures of climate change concerns will lead to heterogeneity in the level of environmental strategy for each type of environmental management practice indicator.

Discussion and Conclusion

The purpose of this research is to describe trends in CER practices among 209 Malaysian ESPLCs across time (2010 and 2014) in relation to their environmental strategies due to their growing concerns about climate change. Results provide evidence to suggest that CER practices of Malaysian ESPLCs are moving toward conformity due to institutional pressures related to climate change concerns. These institutional pressures such as regulative, normative, and cognitive pressures may increase the overall level of environmental strategies of the sample firms in this study manifested by their compliance level score in CER practices. Furthermore, the most common noncompliance environmental strategies adopted by the sample firms based on the content analysis of CER practices are in environmental management of energy used in operations and environmental management practices related to environmental expenditure. This result is not surprising, because renewable energy technology in Malaysia remains at the developing stage. Investment in environmental sustainability practices is very costly and is thus more suitable for Malaysian ESPLCs with larger market size (Salleh, Alhayali, Chew, & Hamid, 2017). The highest increment of compliance levels of environmental strategies is in environmental expenditure. This is in line with a report by the Department of Statistics Malaysia in 2014, which shows an outstanding increase in the amount Malaysian firms are spending to comply with the environmental regulations. The highest increment, or the “beyond compliance” level of environmental strategy, relates to environmental management practice indicators involved in environmental policy or program audits or the structure of environmental responsibility. This suggests that the Malaysian ESPLCs in our sample have established beyond compliance environmental strategies in environmental policy to satisfy the requirements of stakeholders such as government, stockholders, and community groups (Amran, Periasamy, & Zulkafli, 2014).

Besides the most exercised level of environmental strategy, environmental management practices related to environmental policy include program audits and the structure of environmental responsibility, environmental management related to the acquisition of environmental certification (e.g., environmental process and product certification), and environmental management practices related to stakeholders. These recorded the highest improvement in terms of level of environmental strategy. The International Organization for Standardization (ISO) 14001 has become a popular standard for Malaysian ESPLCs in our sample. It is a standard recognized worldwide and provides a systematic approach

for an environmental management system. Firms qualified to ISO14001 standards must commit to continual improvement and comply with applicable environmental legislation and regulations.

On the contrary, environmental management in environmental expenditures (e.g., environmental expenditures, total/by type), environmental training of employees (e.g., environmental training hours; environmental training, monetary value; percentage of employees receiving environmental training), and environmental reporting practices based on established standards such as the GRI Framework or report verification recorded the lowest improvement on the level of environmental strategy. This suggests that although the Malaysian ESPLCs respond to concern on climate change, they may not want to utilize extensive financial resources to implement costly practices such as environmental training and advance environmental reporting (Albertini, 2014).

This study contributes to the existing literature by expanding the knowledge of environmental strategies and CER practices on two points. First, the findings show the evolution of the noncompliance environmental strategies to compliance strategies from 2010 to 2014 have improved substantially for all the sample companies. In addition, the evolution of the compliance strategy to beyond compliance environmental strategies from 2010 to 2014 has progressed marginally and gradually. We can therefore assume that the environmental strategies implemented by Malaysian ESPLCs represent a stepwise progression, because they have improved the level of environmental strategy step by step from noncompliance to compliance and gradually to beyond compliance. Second, this study shows that Malaysian ESPLCs' environmental strategies include the pursuit of a sequential progression with respect to coercive, normative, and cognitive forces perhaps spurred on by climate change concerns are at the heart of new pressures on firms to change their behaviors. The indirect effect of climate change is the modifying of priorities of the Malaysian government and stock exchange to mandate firms to report on their progress in environmental strategies (cognitive pressure) and increase the awareness and exposure of key governance decision makers to environmental sustainability practices (normative and cognitive pressure). This progression is manifested by the extent and quality of CER practices produced by Malaysian ESPLCs. Based on the perspective of neoinstitutional theory, this study provides evidence of the indirect effect of climate change on stimulating the regulative, normative, and cognitive pressures on CER practices. Therefore, CER practice is becoming an important mechanism for Malaysian ESPLCs in communicating the environmental strategies to tackle climate change issues.

One limitation of this study is that it has relied on information disclosed by companies in their annual reports, sustainability reports, and websites without verifying that they are legitimate and accurate. For this reason, future research should contrast these sources with CER practices in reality via case studies.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Special thanks to Universiti Tenaga Nasional for funding this research under the Bold 2025 Start-Up Grant Scheme No. RJO10289176/B/1/2017/2

References

- Abdul-Rashid, S. H., Sakundarini, N., Raja Ghazilla, R. A., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance: Empirical evidence from Malaysia. *International Journal of Operations & Production Management*, 37, 182-204.
- Al-Amin, A. Q., Jaafar, A. H., Azam, M. N., Kari, F., & Agil, S. O. S. (2013). *Climate change issues and Malaysian initiatives climate change governance*. Berlin, Heidelberg: Springer.
- Alazzani, A., Hassanein, A., & Aljanadi, Y. (2017). Impact of gender diversity on social and environmental performance: Evidence from Malaysia. *Corporate Governance: The International Journal of Business in Society*, 17, 266-283.
- Alazzani, A., & Wan-Hussin, W. N. (2013). Global Reporting Initiative's environmental reporting: A study of oil and gas companies. *Ecological Indicators*, 32, 19-24.
- Albertini, E. (2013). Does environmental management improve financial performance? A meta-analytical review. *Organization & Environment*, 26, 431-457.
- Albertini, E. (2014). A descriptive analysis of environmental disclosure: A longitudinal study of French companies. *Journal of Business Ethics*, 121, 233-254. doi:10.1007/s10551-013-1698-y
- Alrazi, B., de Villiers, C., & van Staden, C. J. (2015). A comprehensive literature review on, and the construction of a framework for, environmental legitimacy, accountability and proactivity. *Journal of Cleaner Production*, 102, 44-57. doi:10.1016/j.jclepro.2015.05.022
- Alrazi, B., De Villiers, C., & Van Staden, C. J. (2016). The environmental disclosures of the electricity generation industry: A global perspective. *Accounting and Business Research*, 1-37.
- Amran, A., Ooi, S. K., Wong, C. Y., & Hashim, F. (2016). Business strategy for climate change: An ASEAN perspective. *Corporate Social Responsibility and Environmental Management*, 23, 213-227.
- Amran, A., Periasamy, V., & Zulkafli, A. H. (2014). Determinants of climate change disclosure by developed and emerging countries in Asia pacific. *Sustainable Development*, 22, 188-204. doi:10.1002/sd.539
- Asian Development Bank. (2013). *Investing in resilience: Ensuring a disaster-resistant future*. Manila: Asian Development Bank.
- Beck, A. C., Campbell, D., & Shrives, P. J. (2010). Content analysis in environmental reporting research: Enrichment and rehearsal of the method in a British-German context. *The British Accounting Review*, 42, 207-222.
- Braam, G., de Weerd, L. U., Hauck, M., & Huijbregts, M. (2016). Determinants of corporate environmental reporting: The importance of environmental performance and assurance. *Journal of Cleaner Production*, 129, 724-734.
- Brundtland, G. H. (1987). *Our common future, world commission on environment and development*. Oxford: Oxford University Press.
- Bui, B., & De Villiers, C. (2017). Business strategies and management accounting in response to climate change risk exposure and regulatory uncertainty. *The British Accounting Review*, 49, 4-24.
- Bursa Malaysia. (2014). *Environmental management & reporting, key environmental issues*. Retrieved from http://bursa.listed-company.com/misc/ar2014/Bursa_AR14_html/corporate-governance-statement.html
- Chaklader, B., & Gulati, P. A. (2015). A study of corporate environmental disclosure practices of companies doing business in India. *Global Business Review*, 16, 321-335.
- Christmann, P., & Taylor, G. (2002). Globalization and the environment: Strategies for international voluntary environmental initiatives. *The Academy of Management Executive*, 16, 121-135.
- Delmas, M. A., & Montes-Sancho, I. M. J. (2011). An institutional perspective on the diffusion of international management system standards: The case of the environmental management standard ISO 14001. *Business Ethics Quarterly*, 21, 103-132.
- Demski, C., Capstick, S., Pidgeon, N., Sposato, R. G., & Spence, A. (2017). Experience of extreme weather affects climate change mitigation and adaptation responses. *Climatic Change*, 140, 149-164.
- DiMaggio, P. J., & Powell, W. W. (1991). *The new institutionalism in organizational analysis* (Vol. 17). Chicago, IL: The University of Chicago Press.
- Economic Planning Unit. (2015). *Eleventh Malaysia Plan (2016-2020)*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Escrig-Olmedo, E., Muñoz-Torres, M. J., Fernández-Izquierdo, M. A., & Rivera-Lirio, J. M. (2017). Measuring corporate environmental performance: A methodology for sustainable development. *Business Strategy and the Environment*, 26, 142-162. doi:10.1002/bse.1904
- Freedman, M., & Patten, D. M. (2004). Evidence on the pernicious effect of financial report environmental disclosure. *Accounting Forum*, 28, 27-41.
- Greenwood, R., Oliver, C., Sahlin, K., & Suddaby, R. (2008). *The SAGE handbook of organizational institutionalism*. Thousand Oaks, CA: Sage.
- Greenwood, R., Oliver, C., Sahlin, K., & Suddaby, R. (2012). *Institutional theory in organization studies*. London, England: Sage.
- Gunasekaran, A., & Spalanzani, A. (2012). Sustainability of manufacturing and services: Investigations for research and applications. *International Journal of Production Economics*, 140, 35-47.
- Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32, 334-343.
- Hunt, C. B., & Auster, E. R. (1990, January). Proactive environmental management: Avoiding the toxic trap. *MIT Sloan Management Review*, 31(2), 7-18.

- Intergovernmental Panel on Climate Change. (2015). *Climate change 2014: Mitigation of climate change* (Vol. 3). Cambridge University Press.
- Jaaffar, A. H., & Amran, A. (2017). The influence of leaders' past environmental-related experiences and positive deviance behaviour in green management practices. *Jurnal Pengurusan (UKM Journal of Management)*, 51, 1-18.
- Jaffar, R., Adinezhadeh, R., & Rahman, M. R. C. A. (2015). Environmental performance and disclosure: Impression management theory.
- Khalili, N. R., Duecker, S., Ashton, W., & Chavez, F. (2015). From cleaner production to sustainable development: The role of academia. *Journal of Cleaner Production*, 96, 30-43.
- Klynveld Peat Marwick Goerdeler. (2013). *The KPMG Survey of Corporate Responsibility Reporting 2013*. Retrieved from <https://assets.kpmg.com/content/dam/kpmg/pdf/2015/08/kpmg-survey-of-corporate-responsibility-reporting-2013.pdf>
- Klynveld Peat Marwick Goerdeler. (2015). *The KPMG Survey of Corporate Responsibility Reporting 2015*. London, England: KPMG International. Retrieved from <https://home.kpmg.com/xx/en/home/insights/2015/11/kpmg-international-survey-of-corporate-responsibility-reporting-2015.html>
- Kweh, Q. L., Alrazi, B., Chan, Y. C., Abdullah, W. M. T. W., & Lee, R. M. A. (2017). Environmental, social and governance and the efficiency of government-linked companies in Malaysia. *Institutions and Economies*, 9(2), 55-74.
- Levy, D. L., & Kolk, A. (2002). Strategic responses to global climate change: Conflicting pressures on multinationals in the oil industry. *Business and Politics*, 4, 275-300.
- Li, D., Zheng, M., Cao, C., Chen, X., Ren, S., & Huang, M. (2017). The impact of legitimacy pressure and corporate profitability on green innovation: Evidence from China top 100. *Journal of Cleaner Production*, 141, 41-49.
- Maxwell, D., & van der Vorst, R. (2003). Developing sustainable products and services. *Journal of Cleaner Production*, 11, 883-895.
- Nadler, S. (1999). The green stairway: Surviving and flourishing in environmental management. *Corporate Environmental Strategy*, 5(2), 14-21.
- Ong, T. S., Tho, H. S., Goh, H. H., Thai, S. B., & Teh, B. H. (2016). The relationship between environmental disclosures and financial performance of public listed companies in Malaysia. *International Business Management*, 10, 461-467.
- Pedersen, E. R. G., Neergaard, P., Pedersen, J. T., & Gwozdz, W. (2013). Conformance and deviance: Company responses to institutional pressures for corporate social responsibility reporting. *Business Strategy and the Environment*, 22, 357-373.
- PwC. (2013). *Putting a price on value*. Retrieved from <http://preview.thenewsmarket.com/Previews/PWC/DocumentAssets/302536.pdf>
- Roome, N. (1992). Developing environmental management strategies. *Business Strategy and the Environment*, 1(1), 11-24.
- Rosa, F. S., Guesser, T., Hein, N., Pfitscher, E. D., & Lunkes, R. (2015). Environmental impact management of Brazilian companies: Analyzing factors that influence disclosure of waste, emissions, effluents, and other impacts. *Journal of Cleaner Production*, 96, 148-160.
- Rupley, K. H., Brown, D., & Marshall, R. S. (2012). Governance, media and the quality of environmental disclosure. *Journal of Accounting and Public Policy*, 31, 610-640.
- Salleh, N., Alhayali, Z. A. B. M., Chew, B. C., & Hamid, M. S. R. b. A. (2017). Implementation of renewable energy concept in the automotive industry in Malaysia: An exploratory study. *Journal of Technology Management and Business*, 4(1), 96-115.
- Scott, W. R. (2008). *Institutions and organizations*. Thousand Oaks, CA: Sage.
- Scott, W. R. (2013). *Institutions and organizations: Ideas, interests, and identities*. Los Angeles, CA: Sage.
- Starbuck, W. H., & Milliken, F. J. (1988). Executives' perceptual filters: What they notice and how they make sense. In D. C. Hambrick (Ed.), *The executive effect: Concepts and methods for studying top managers* (pp. 35-65). Greenwich, CT: JAI Press.
- Thomas, A. (2001). Corporate environmental policy and abnormal stock price returns: An empirical investigation. *Business Strategy and the Environment*, 10, 125-134.
- Wong, J. J., Abdullah, M. O., Baini, R., & Tan, Y. H. (2017). Performance monitoring: A study on ISO 14001 certified power plant in Malaysia. *Journal of Cleaner Production*, 147, 165-174.

Author Biographies

Amar Hisham Jaaffar (PhD in organizational behavior-related study) is the senior lecture of Department of Management and human resource of Universiti Tenaga Nasional, Malaysia. His research interests are in environmental sustainability and management education. He has published in journals index by SCOPUS such as *Pertanika Journal of Social Sciences & Humanities*, *International Journal of Business & Society*, and *The Social Sciences Journal*.

Azlan Amran (PhD in accounting) is the professor in Corporate Sustainability of Graduate School of Business of Universiti Sains Malaysia and associate fellow for Centre for Global Sustainability Studies in Malaysia. He has published a significant number of articles in the area of corporate sustainability in high-impact journals such as *Corporate Social Responsibility and Environmental Management*, *Business Strategy and Environment*, and *Sustainable Development*.

Jegatheesan Rajadurai (DBA in marketing) is the senior lecture of Department of Marketing & Entrepreneur Development of Universiti Tenaga Nasional, Malaysia. His research interests are in environmental sustainability and management education. He is currently supervising PhD and master's candidates in environmental sustainability.