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Article *in* International Journal of Economic Research · December 2017

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International Journal of Economic Research

ISSN : 0972-9380

available at http: www.serialsjournals.com

Volume 14 • Number 15 (Part-II) • 2017

Green Initiatives Adoption: Perspective of E&E Manufacturing SMEs Sustainability

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Abstract: In recent years, the importance of the environmental agenda for the industry has been rising exponentially at the international level. Additionally, increasing consumers' awareness on the environmental impact of their consumption choices and their willingness to reduce their ecological footprint has created new market opportunities for manufacturers. Sustainable green practices have become the conscientious imperative expected from all manufacturing industries due to rising environmental awareness among today's society. Therefore, the objectives of this research were to determine the extent of green initiatives implementation in Electrical and Electronics (E&E) manufacturing SMEs as well as to examine the relationship between those practices and sustainable green practices. The quantitative data was obtained through a survey of 260 E&E manufacturing SMEs located throughout Malaysia. Analysis of the findings showed that there is an encouraging level of sustainable green practice implementation among the SMEs, with optimization of water conservation initiative as being the top priority and followed by energy efficiency. The result also revealed that waste management initiative not significantly affected sustainable green practices. The findings of this research provide new directions for future research and key implications concern the importance for firms and policymakers to work with sustainability issues using both internal and external perspectives.

Keywords: E&E manufacturing SMEs, sustainable green practices, green initiatives, owner/managers, green technology

INTRODUCTION

Malaysia is known as one of the industrialized countries, whereby the economy mainly depends on the Small and Medium (SME) sector (Tehrani & Manap, 2014). In recent years, sustainability and green practices are among the vital management issues faced by SMEs generally, and E&E manufacturing SMEs specifically, due to the growing awareness in environmental matters among owners/managers, consumers, governments, social groups and employees. The greening practices of E&E manufacturing SMEs in Malaysia warrant investigation because this sector is predicted to have a collective impact on the environment and could outweigh the combined environmental impact of large companies (Hillary, 2000). Broadly, sustainable green practices and their outcomes have been addressed from various different perspectives, ranging from the application of green technologies as a mean to gain competitive advantage (Leonidou *et al.*, 2015), to the perception of environmental regulation as a driver for innovation (Hillary, 2000) and improvement of the competitive position (Porter & Van der Linde, 1995; Marchi *et al.*, 2013). In support, few studies have analyzed the development of green issues over time and they focused on specific industrial sectors (Bansal & Roth, 2002; Yol Lee & Rhee, 2007) or multi-sectorial large companies (Dahlmann & Brammer, 2011), addressing the advancement of environmental proactivity without its antecedents. Despite this, attention has normally been devoted to large firms and thus disregarding this development in E&E manufacturing SMEs, which, after all, constitute the "brick-and-mortar in many economies. On account of this, impact of E&E manufacturing SMEs on the natural environment remains significant and therefore, researchers and academicians should not overlook it. Therefore, this allows formulating the overall research question that has guided this empirical study: *"What are the extents of green initiatives implementation and correlation in building sustainable green practices in Electrical and Electronics (E&E) manufacturing SMEs?"*

In line with the above questions and in order to conduct a parsimonious exploration, framed in a rational perspective of planned and programmed nature of organizational change to pursue objectives (Favoreu *et al.*, 2015), the study focuses on the development of sustainable green practices in E&E manufacturing SMEs. Further, the paper follows the footsteps of Henriques and Sadorsky (2007) and others (Bansal & Roth, 2000; Dasgupta *et al.*, 2000; Banerjee, 2001; Gonzalez Benito & Gonzalez Benito, 2005 & 2006; Claver-Cortes *et al.*, 2007; Aragon-Correa *et al.*, 2008; Gadenne *et al.*, 2009) who investigated green initiatives in the determination of sustainable green practices. It also uses the work of Rice (2013), Chemers, (2014) and Walmsley and Lewis (2014) on discourse analysis to unveil the paradigms that help to explain why an individual or group of individuals (e.g. a firm) behave the way they do when being confronted with an environmental decision. The upcoming section discusses the different types of green initiatives of E&E manufacturing SMEs with reference to past literature and develops the hypotheses which form the basis of this study. This is followed by an account on the research methodology employed and then the analytical procedures and results. Lastly the paper concludes with a discussion of the key findings derived from analysis, the implications as well as suggestions for future research undertakings.

LITERATURE REVIEW

Green Initiatives

The processes and activities undertaken to reduce wastes and emissions are known as green initiatives (Sharma & Vredenburg, 1998; Epstein & Roy, 2001; Papagiannakis *et al.*, 2014). In order to improve productivity and reduce wastes, it started with remote incidents, such as turning off the lights or machines to systematic patterns of practices like automatic production lines. Complimentary to this, changes in business strategies can begin the green initiatives in business operations (Epstein & Buhovac, 2014), leading to innovations of product designs (Porter & Van der Linde, 1995; Nambisan, 2013), renovations of production processes (Pujari *et al,* 2003; Gomez & Abdulazeez, 2016) and modification of production technologies (Salvi & Panwar, 2012). This study seeks to examine the contexts and mitigating circumstances surrounding three green initiatives implementations in E&E manufacturing SMEs, namely energy management, water conservation and waste management.

Energy efficiency

Drawing on Kannan and Boie (2003) and Connolly *et al.* (2010), energy management roles have widely expanded in industries. However, there are restricted endeavors to introduce energy management in SMEs because of financial constraints, lack of initiation and the lack of expertise (Rizzo and Fulford 2012). As the cost of energy has become a growing element in the cost structure of SMEs over the past years, it is at the tipping point of survival to many SMEs owners/managers who are heavily dependent on the supply of electricity, and looking for ways to limit and manage the amount of money spent on electricity (Choong *et al.* 2012). With changing times, there is a need for SMEs owners/managers to consider their sustainable green practices, market image and market presence position, and this could be done with identifying and adopting the energy efficiency measures (Hirsig, Rogovsky, and Elkin 2014).

Hence, energy saving is deemed as one of the most prominent aspects as part of the green initiatives in manufacturing SMEs and it should be implemented, managed and controlled by a systematic method to achieve sustainable green practice. Energy efficiency improvement in manufacturing plants can lessen possible negative environmental impacts, and the same time, expanding the company's bottom line. In contrast, several studies have found that owners/managers intention towards green affects actual firm's growth (Parker, Redmond, and Simpson 2009) and therefore, SME owners/managers need to be more aware about their accomplishments on their markets and reach out for additional resources to enable further improvements of their energy management system. SMEs owners/managers need to empower themselves by improving their capacity to fulfill and comply with environmental demands, as well as identify direct and indirect benefits for SMEs by implementing energy efficiency measures. Thus we hypothesize:

H1: The implementation of energy efficiency initiative within E&E manufacturing SMEs has a positive impact on sustainable green practices.

Water conservation

Most manufacturing processes require water as part of their input depending on the manufacturing processes. Kenny *et al.* (2009) noticed that water conservation is a major issue in industrial activities and many SMEs do not pay much attention to water conservation in their manufacturing processes. Furthermore, Frost (2011) echoes Kenny *et al.*'s view that without careful water conservation, water wastage occurs in many SMEs. In addition, it is found that many SME owners/managers ignore the adoption of water minimization practices mainly due to the heavy financial commitment that may be required (Bay and Rasmussen 2011). However, what many businesses fail to realize is that in addressing water issues that are deemed financially burdensome, they stand to gain in terms of efficiency and profitability in the long run (Hoskinson 2010;

Mofokeng 2013). In fact, water conservation easily reduces the amount of water used, especially in SMEs (Vives 2010). In order to reduce the amount of water used, technologies and systems should be explored for water purification, recycling and reuse in SMEs (Andrade *et al.* 2012). SMEs shun the adoption of water minimization practices, as they have little understanding or appreciation of the potential benefits of water conservation (Vives 2010; Andrade *et al.* 2012). Awareness towards water conservation practices by SME's owners/managers to go green should be carried out. In order to achieve a widespread adoption of water conservation in SMEs, a fundamental change in owners/managers intention towards green is required and this involves a change in their mindset. This leads to the formation of following hypothesis:

H2: The implementation of water conservation initiatives within E&E manufacturing SMEs has a positive impact on sustainable green practices.

Waste management

The problem of waste management arises due to the unsustainable consumption in the operation processes (Tchobanoglous 2009) and many SMEs are facing difficulties in disposing the waste from their production process. Most of the SMEs have traditionally managed their waste products by discharging them into the environment without any preceding treatment, resulting in an increase of pollution and negative environmental impacts. Waste management performance of SMEs is neither recognized nor evaluated as most of the environmental research concentrates on large firms. In addition, Weerasiri and Zhengang (2012) reported that the level of recognition placed on the importance of waste management in SMEs is considerably low and more emphasis should be given to enhance the waste management agenda in SMEs. For SMEs to better manage waste, their existing problems need to be resolved and problematic areas improved towards more sustainable practices. In improving these problematic areas and promote green performance in waste management, a framework which enables step-by-step improvement of SMEs owners/managers intentions, perceptions and practices is necessary (Tchobanoglous 2009). The framework of waste management program in SMEs is a valuable tool to minimize the usage of natural resources, handle the wastes efficiently and to sustain green practices (Al-Maaded *et al.* 2012). Waste minimization, which is one aspect of sustainable green practices, leads to greater productivity in SMEs as well as environmental protection (Demirbas 2011). However, in building towards sustainable green practices in waste management, the willingness and intention of SMEs owners/managers to go green should facilitate sustainable green practices in the long-run for SMEs. Therefore, we hypothesize:

H3: The implementation of waste management initiative within E&E manufacturing SMEs has a positive impact on sustainable green practices.

RESEARCH METHODOLOGY

The following section discusses the research framework consist of respondents and data collection technique, questionnaire's measurement scales, questions adoption, validity and reliability of measurement.

Respondents and data collection

SMEs are acknowledged as the backbone to any economy due to their role as an important generator of employment and growth. Generally, SMEs accounts for the largest proportion of established businesses in most of the developing nations (Saleh & Ndubisi, 2006). In Malaysia, they account for about 97.3% of total business establishments, contributing to 35.9% of the nation's Gross Domestic Product (GDP), 21.7% to the country's total exports and 67.0% to total employment in the country (Department of Statistics, 2015a). SMEs' growth in the Malaysian manufacturing sector outperformed the overall sector since 2005, with SMEs' share to overall value added of the manufacturing sector rising from 29.3% in 2005 to 33.9% in 2014 (Department of Statistics, 2015b).

It is necessary to emphasize that the owners/managers who were chosen as the object of this study were in charge of E&E manufacturing SMEs whose activity causes significant environmental problems. The decision to study SMEs is mainly due to the importance that these types of businesses have in the economy. Before the crisis of the 1990's, production and job creation were concentrated in large firms (Tybout, 2000). However, from that decade on, a change in tendency was detected that produced an increase in the importance of SMEs to national economies, as Karlsson, and Karlsson (2002) and, Bridge and Wood (2005) confirmed in empirical studies. On the other hand, the competitiveness of these types of companies depends, fundamentally, on the capabilities of the owners/managers, on investments in intangible and technological equipment, and on their flexible innovation capacity (Sánchez-Medina *et al.*, 2014). Therefore, this paper focuses on the owners/managers, and, more specifically, on the intention and the constraints of environmental measures.

The target population for this study is 768 E&E manufacturing SMEs in Malaysia. Four hundred E&E manufacturing SMEs were contacted but only 272 E&E manufacturing SMEs returned the survey via conventional and electronic mail. The overall response rate was 68.0 percent. However, nine respondents indicated that their firm not adopting any green initiatives approach towards sustainable green practices based on the twenty four questions in the questionnaire form. In minimizing response bias that may disrupt the interest of this research, this study excluded thirteen responses, where nine responses were described above and three additional exclusion was of questionnaire which contained more than twenty percent missing data. Therefore, the usable rate of return is 65.0 percent and this value is equivalent to 260 sets of data. Based on Babbie (2007) and Zikmund *et al.* (2012) recommendation, this quantity is adequate for multivariate analyses and reporting as they advocated for a minimum of fifty percent response rate.

Measurement Scale

A five-point Likert scale from "strongly disagree" to "strongly agree" was used for the questionnaire. To meet the study objectives, Section A of the questionnaire titled as "Demographic Profile" and contains selected ten demographic questions of researcher. Section B titled as "Green Initiative Involvement", contain three green initiatives variables namely, "energy efficiency, water conservation and waste management" and make-up of eight questions each and all twenty four questions were adopted and translated from Kannan and Boie (2003), McKeiver and Gadenne (2005), Tchobanoglous (2009) and Cassells and Lewis (2011) studies. Finally, the dependent variable titled as "Sustainable Green Practices" in Section C and all six questions make-up in this variable were adopted and translated from Kerr (2006) and, Cassells and Lewis (2011) studies. Before proceeding with each questionnaire, it must be noted that a pretest was conducted on ten managers, which helped us to highlight the questions that would not be clearly understood or that could lead to confusion when responding. After the pretest was carried out, we made alterations in several questions in order to ensure that the respondents were able to fully understand them.

The Harman's single factor test was included during the single factor analyses of all the items measured, to test the probable common method bias which might be problematic. This is conducted as the data were obtained from a single respondent from a single company. As mentioned by Doty and Glick (1998) and Podsakoff and Organ (1986) common method bias will occur when all the variables load on one, or any factor explains a majority of variance. For this study, 5 different factors were found through the unrotated factor analysis which used the eigenvalue-greater-than-one criterion, these factors explain 20.82%, 16.43%, 14.35%, 13.82%, and 11.24% of the data variance, respectively. This study can safely conclude that the existence of common method variance in the data will not cause the results to be inflated. This is because the first factor accounted for the data fraction and a single factor did not emerge.

Analysis Technique

The descriptive analysis among the E&E manufacturing SMEs was analysed using SPSS version 22. On the other hand, the analysis of the research model, that is the hypothesis testing, was conducted using Partial Least Squares through the SmartPLS 3.0 software. The main reason behind the choice of PLS as the analysis technique for this study is because PLS allows the analysis of formative constructs. Unlike most covariance-based SEM analysis which requires items/indicators used to measure a latent variable to be reflective in nature (Chin, 2010), both reflective and formative measures can be included in PLS. Also, in contrast to covariance-based SEM which focuses on achieving the best fit for the research model, PLS focuses on maximizing the explained variance of the endogenous variables (Gefen *et al.* 2000). PLS recognizes the latent variable as weighted sums of their respective indicators (Chin & Newsted 1999; Fornell & Cha, 1994) and attempts to predict values for the latent variables using multiple regressions (Chin & Newsted, 1999; Fornell & Bookstein, 1982; Fornell & Cha, 1994).

DATA ANALYSIS

Descriptive analysis

The respondents to the survey consisted of 85.4% males and 14.6% females and most of the respondents were manager (37.7%), followed by owner (21.9%), director (17.7%), head of department (15.4%) and owner and manager (7.3%). Almost half of the respondents have six to ten years attachment in the organization (49.6%), followed by more than 10 years (25.8%), two to five years (23.8%) and less than two years (0.8%). Majority of the respondents have more than 10 year's attachment in the industry (80.4%), followed by six to ten years (16.2%) and two to five years (3.5%). Top three main activities in the company were manufacturer of consumer electronics (21.9%), manufacturer of electronic component and boards (20.4%) and manufacturer of electric domestic appliances (13.8%). Majority of the respondents were working in medium sized SME with 75 to 200 employees (75%), while another 25% working in small sized SME with 5 to 75 employees. Most of the company annual sales turnover was between RM41– RM50 million (66.5%), followed by between RM21–RM40 million (18.1%) and between RM10 – RM20 million (15.4%). Most of the company (75.8%) did not have accreditation from ISO 14000.

Table 1 shows the results extent of green initiatives implementation practices obtained from the descriptive analysis. Generally, all the green initiatives practices recorded mean values above 4.00 with the exception of 'Minimize the amount of emissions of contaminants to the land' and 'has waste storage facilities that meet environmental requirements'. Most of the standard deviation values, which were slightly over 1.00, if not close to 1.00, indicated a rather large dispersion from the mean. 'Minimize the amount of energy used' and 'monitors trends in energy consumption' in energy efficiency seemed to be the highly undertaken practices, judging by their mean values of 4.95 and 4.92 respectively. On the other hand, 'has waste storage facilities that meet environmental requirements' and 'minimize the amount of emissions of contaminants to the land' appeared to be the least popular practice compared to the other practices as observed from its low mean value of 3.82 and 3.91.

Table 1
Extent and differences in the green initiatives practices

Green Initiatives	*Mean*	*Std Deviation*	*Min*	*Max*
Energy Efficiency	4.82	1.214	1.00	6.00
Minimize the amount of energy used	4.95	1.065	1.00	6.00
Minimize the amount of emissions	4.89	1.053	1.00	6.00
Set measurable targets for reducing energy usage	4.81	1.084	1.00	6.00
Effective strategies for improving energy management	4.66	1.054	1.00	6.00
Utilizes sustainable energy sources	4.76	1.024	1.00	6.00
Uses energy efficient equipment	4.21	0.962	1.00	6.00
Uses high energy efficient lighting	4.49	1.214	1.00	6.00
Monitors trends in energy consumption	4.92	1.065	1.00	6.00
Water Conservation				
Minimize the amount of water used	4.85	1.072	1.00	6.00
Promotes the re-use of water in production process	4,46	0.990	1.00	6.00
Set measurable targets for reducing water usage	4.73	1.012	1.00	6.00
Effective strategies for improving water conservation	4.81	1.079	1.00	6.00
Recycling of water with re-circulating cooling system	4.62	0.974	1.00	6.00
Installs water-efficient devices and equipment	4.29	0.985	1.00	6.00
Monitors trends in water usage	4.35	0.959	1.00	6.00
Minimize the amount of effluent discharged	4.22	1.017	1.00	6.00
Waste Management				
Minimizes the amount of waste	4.17	1.084	1.00	6.00
Minimize the amount of emissions of contaminants	3.91	0.987	1.00	6.00
Promotes the recycling of waste	4.77	1.068	1.00	6.00
Sets measurable targets for waste reduction	4.89	1.053	1.00	6.00
Effective strategies for improving waste management	4.69	0.964	1.00	6.00
Ensures the disposal comply with legislation standards	4.36	0.931	1.00	6.00
Monitors and records on-site waste disposal	4.22	1.066	1.00	6.00
Waste storage facilities meets requirements	3.83	1.400	1.00	6.00

Measurement Model

The measurement model consists of relationships among the latent variables and the (item) indicators underlying each latent variable. Before proceeding to examine the research model for hypothesis testing, it is pertinent to first establish construct validity for the measurement model. Construct validity concerns the extent to which the indicators reflect their underlying constructs (latent variables). In order to establish construct validity, items in the measurement model need to demonstrate both convergent and discriminant validity.

Establishing convergent validity involves satisfying the conditions imposed upon indicator loadings, reliabilities and average variance extracted (AVE). Table 2 lists the indicator loadings, reliabilities and AVE for all the reflective items listed in the model. The loadings of all reflective indicators surpassed the minimum required cut-off level of 0.60 except GR4 and GR8. Thus both GR4 and GR8 were dropped from the model. In terms of reliability, the composite reliability and Cronbach Alpha values for all reflective constructs exceeded the threshold value of 0.70 recommended by Hair *et al.* (2010) and Nunnally (1978) respectively.

Table 2
Convergent validity for reflective indicators

Latent Variable	*Green Initiatives*	*Items Loading*	*Composite Reliability*	*Cronbach Alpha*	*AVE*
Energy Efficiency	Minimize the amount of energy used (GR3)	0.871	0.879	0.873	0.639
	Minimize the amount of emissions (GR14)	0.799			
	Set measurable targets for reducing energy usage (GR7)	0.712			
	Effective strategies for improving energy management (GR 19)	0.742			
	Utilizes sustainable energy sources (GR11)	0.826			
	Uses energy efficient equipment (GR5)	0.662			
	Uses high energy efficient lighting (GR9)	0.837			
	Monitors trends in energy consumption (GR21)	0.855			
Water Conservation	Minimize the amount of water used (GR17)	0.841	0.914	0.897	0.651
	Promotes the re-use of water in production process (GR2)	0.788			
	Set measurable targets for reducing water usage (GR13)	0.850			
	Effective strategies for improving water conservation (GR20)	0.839			
	Promotes recycling of water with re-circulating cooling system (GR15)	0.647			
	Installs water-efficient devices and equipment to control water usage (GR22)	0.863			
	Monitors trends in water usage (GR1)	0.781			
	Minimize the amount of effluent discharged (GR6)	0.842			
Waste Management	Minimizes the amount of waste (GR12)	0.857	0.938	0.847	0.674
	Minimize the amount of emissions of contaminants to the land (GR18)	0.799			

contd. table 2

Latent Variable	*Green Initiatives*	*Items Loading*	*Composite Reliability*	*Cronbach Alpha*	*AVE*
	Promotes the recycling of waste (GR4)*	-			
	Sets measurable targets for waste reduction (GR24)	0.867			
	Effective strategies for improving waste management (GR16)	0.833			
	Ensures the disposal of hazardous waste by complying with legislation standards (GR8)*	-			
	Monitors and records on-site waste disposal (GR23)	0.752			
	Has waste storage facilities that meet environmental requirements (GR10)	0.749			

* Items dropped as their loadings did not exceed the cut-off requirement of 0.60.

The AVE for each construct were over the recommended value of 0.50 suggested by Fornell and Larcker (1981). In short, convergent validity was established. While indicator loadings, reliabilities and AVE are used to assess convergent validity for reflective constructs, they are not appropriate or meaningful for formative constructs (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). Thus, instead of convergent validity, indicator validity was used to assess formative constructs. Indicator validity refers to the importance of each individual indicator of the related formative construct (Andreev *et al.*, 2009; MacKenzie *et al.*, 2005) whereby its concern is on the strength and significance of the path from the indicator to the construct (MacKenzie *et al.* 2005). When interpreting a measurement model with formative constructs, the focus should be on the weights of each measure rather than the indicator loadings (Petter *et al.*, 2007).

In this study, sustainable green practices were deemed as a construct with formative indicators because each indicator exclusively defines and forms the characteristics of the sustainable green practices construct. To assess the indicator validity of this construct, a bootstrapping procedure was performed to calculate the t-values that determine the significance of the item weights. Table 3 shows the item weights and t-values of

Table 3
Indicator validity of the formative indicators

Latent Variable	*Items*	*Item Weights*	*t-values*
Sustainable Green Practices	Manufactures product in a way that minimize impacts on the environment (SG1)	0.462	3.892**
	Products are designed in a way that minimizes adverse impact on the environment (SG2)	0.441	2.173*
	Uses Life Cycle Analysis to assess the environmental impact of the product (SG3)	0.473	3.846**
	Carries out environmental audits at regular intervals (SG4)	0.459	4.619**
	Requires all suppliers meet certain environmental criteria before sourcing materials from them (SG5)	-0.052	0.284
	Has a clear vision of the importance of environmental policies (SG6)	0.397	3.492**

*$p<0.05$; **$p<0.01$

the formative items. Ideally, the t-values of each item weight should be significant in order to achieve indicator validity. All formative indicators except SG5 showed significant item weights.

However, although SG5 exhibited an insignificant item weight, it was still retained as its removal could result in failing to capture the full essence of the sustainable green practices construct. It has been said that the failure to include all facets of the conceptual domain of a construct leads to exclusion of the construct itself (Diamantopoulos & Winklhofer, 2001). Unlike convergent validity, discriminant validity can tested for both the reflective and formative constructs by testing for "whether the constructs are less than perfectly correlated" (MacKenzie *et al.* 2005). Discriminant validity concerns the degree to which the measures of different constructs are distinct from one another and is assessed by comparing the correlations between constructs with the square root of the AVE for a construct (Fornell & Larcker, 1981). Table 4 presents the discriminant validity of the measurement model. The elements in the matrix diagonals, representing the square root of the AVEs, are greater in all cases than the off-diagonal elements in their corresponding row and column, indicating discriminant validity has been achieved.

Table 4
Discriminant validity

Constructs	*EE*	*WC*	*WM*	*SGP*
Energy Efficiency (EE)	**0.799**			
Water Conservation (WC)	0.688	**0.807**		
Waste Management (WM)	0.762	0.784	**0.821**	
Sustainable Green Practices (SGP)	0.467	0.428	0.411	N/A

Note: 1) Diagonals represent the square root of the AVEs while the off-diagonal entries represent the correlations between constructs; 2) N/A – square root of the AVE is not available for formative constructs.

4.3. Structural Model

The structural model comprises of the hypothesized relationship between exogenous and endogenous variables in the model. It shows how well the theoretical model predicts the hypothesized paths. The bootstrapping procedure was applied to generate the path coefficients and their corresponding t-values which then enabled inferences to be made by determining the statistical significance of each path coefficient. Figure 1 shows all path coefficients and their corresponding t-values as well as the explanatory power of the estimated model. The explanatory power of the estimated model can be assessed by observing the R^2 of the endogenous constructs. Falk and Miller (1992) recommended that R^2 must be at least 0.10 in order for the latent construct to be deemed adequate.

The analysis revealed that 23.7 percent of variance in sustainable green practices can be explained by the model ($R^2 = 0.237$), thereby satisfying the criteria suggested by Falk and Miller (1992). Out of the three path coefficients, only two were found to be significant. The energy efficiency (â=0.172, $p<0.10$) and water conservation (â=0.259, $p<0.01$) demonstrated an impact on sustainable green practices, thereby providing support for H_1 and H_2. It is interesting to note that while both the energy efficiency and water conservation had a positive effect on sustainable green practices, the waste management (H_3) exhibited a stronger impact on sustainable green practices.

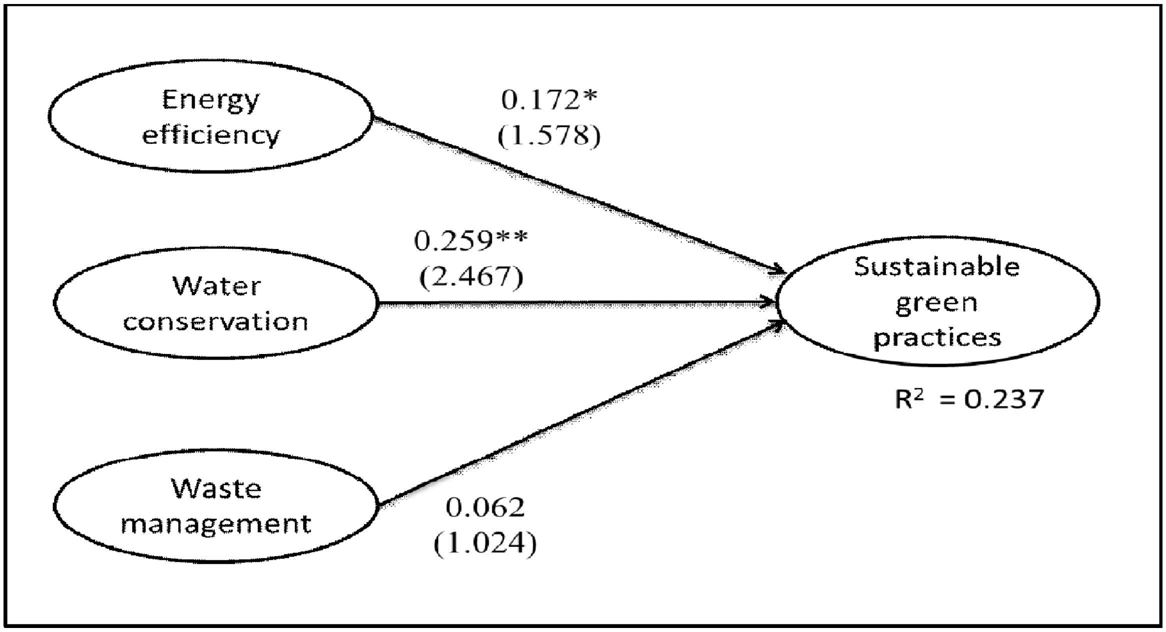

Figure 1: Structural model

Note. Significant levels: **p < 0.01; *p < 0.10

DISCUSSION AND IMPLICATION

The purpose of this study was to examine the extents of green initiatives implementation and correlation in building sustainable green practices in Electrical and Electronics (E&E) manufacturing SMEs. The results indicated that E&E manufacturing SMEs hold quite different views about green initiatives in regards to environmental sustainability. With reference to the positive influence exerted by energy management is anticipated as this dimension is strongly correlated with sustainable green practices. This could be attributed to the fact that access to capital is a crucial factor in adopting energy efficiency measures in E&E manufacturing SMEs, even if the measures are unexpected to be profitable. Furthermore, implementing energy saving practices tends to be largely influenced by the SME's resources availability and it is found that some energy management measures contribute return of investment through governments initiated programs. Past researches hold two different views on this construct. This finding agrees with Kannan and Boie (2003) and Choong *et al.* (2012) who found that energy management is significant in their studies and recognizes the economic and environmental benefits that energy efficiency can deliver to SMEs. However, some researchers (e.g. Painuly *et al.*, 2003; Sardianou, 2008) found that energy management does not significantly affect sustainable green practices. Furthermore, their findings substantiate the findings of Muthulingam *et al.* (2011) and Jenkin (2014) that cost savings alone are not a sufficient catalyst to action and other barriers limit the uptake of energy efficiency measures. The results of the current study also show that E&E manufacturing SMEs in Malaysia are convinced that energy management could elevate environmental performance among firms. In fact, various initiatives have been undertaken to promote energy efficiency improvements in SMEs, especially with the guidelines of New Energy Policy 2010 and Malaysia Energy Efficiency Action Plan. The outcome of the initiatives is quite clear among E&E manufacturing SMEs owners/managers. This situation is attributed to the fact that active environmental practices are widely adopted and most firms are acting to such requirements and comply with governments regulations.

Apart of energy efficiency, the significant result of water conservation is largely consistent with those reported by previous studies (e.g., Kenny *et al.*, 2009; Barrington *et al.*, 2013). Across the E&E manufacturing SMEs, water is used to cool machinery, dilute raw materials, washing PCB with diluted chemicals and to condense gases, as well as for several domestic purposes such as canteen and toilets. Côté *et al.* (2006) found that most manufacturing SMEs implement numerous ways to reduce water consumption ranging from simple housekeeping measures such as machine maintenance, no-cost and low cost methods such as adjusting flow rates or recycling water, as well as more complex solutions such as the installation of infrared-active faucets and water treatment plant. These findings substantiate the findings of Young *et al.* (2000) in which SMEs believe that reducing the amount of water used on site will generally reduce effluent production and associated costs, as well as lowering impact on the environment. Additionally, to meet the Department of Environments (DOE) water pollution control standard and to reduce their costs related to wastewater treatment, E&E manufacturing SMEs are increasingly move towards water conservation, re-use and separation technologies and techniques. Many E&E manufacturing SMEs have realized that low water consumption means lower wastewater discharges and lower costs of treatment. Conversely, failure to meet government standards can mean penalties to their operation and reduces their opportunities to sustain their business (King & Lenox, 2000). The occurrences of these situations reflect the shortcomings and negative repercussion of SMEs in implementing sustainable green practices.

Finally the results of waste management indicate that there is no significant relationship between waste management and sustainable green practices. This may have resulted from majority of E&E manufacturing SMEs aware of adopting waste management systems and procedures will allow flexibility, immediate feedback and long term decision-making chains. Concerning waste management initiatives, owners/managers also knows that disposition of scheduled wastes are given high priority in Malaysia through Environmental Act 1974 and penalties for illegal dumping are quite strictly enforced. Previous studies by different researchers have also found that waste management significantly affects green practices (e.g., Tchobanoglous, 2009; Slavik & Pavel, 2013). However, for certain SMEs owners/managers, lack of awareness towards the hazards of waste contributed to the insignificant relationship and this condition is accentuated by weak establishment of waste management system and infrastructure in Malaysia (Terazono *et al.*, 2005). The results of this study is best compared with a study by Eltayeb *et al.* (2010) due to similarities in environmental settings such as country of origin, type of industry, environmental certification, and traits of respondents particularly job designation of chosen representatives. Their study revealed that waste management, as one of the green initiatives does not contribute to firm's environmental outcome while the results of current study also show that E&E manufacturers in Malaysia are not convinced that waste management elevates environmental performance among firms. This situation is attributed to the fact that active environmental practices are widely adopted and most SMEs are responding to such requirements for the purpose of compliance and sustainability.

Implications and limitation

Practical implications are manifested in this study and it demonstrates that owners/managers only invest little attention on Green Technology adoption. Manufacturing SMEs are encouraged to integrate Green

Technology policy into their firm's policy as this aspect is highly beneficial to firms who consider the prospects of sustainability. On top of that, manufacturing SMEs are advised to increase their awareness of Green Technology, as awareness encourages owners/managers to develop a complementary set of environmental sustainability. This bundle of practices is valuable, rare, non-substitutable and is hard to imitate by competitors, which enhances the market competitiveness of the firm and enables it to have a sustainable competitive advantage. Implementing environmental sustainability competency is particularly important for the manufacturing SMEs aiming to improve their international reputation or to enhance their attractiveness as a partner in the supply chain of western firms. The performance outcomes of the collective environmental sustainability are sensitive to the contributions of employees, managers, internal departments as well as contributions from external supply chain partners in various environmental areas.

In view of managerial implications, the results are of interest to owners/managers faced with decisions regarding environmental sustainability. While some SMEs view environmental sustainability as a cost of doing business, findings from the study of McKeiver and Gadenne (2005), and Cordano *et al.* (2010) provide evidence of benefits such as cost reduction and quality improvement in the long-run. The results also help owners/managers understand what defines a well-developed green initiatives and what other firms are doing in regards to environmental sustainability. These study is a step forward in the right direction towards a resolution of the conflict between competing paradigms that drive the strategy of intention towards green and environmental sustainability. While the competing paradigms discuss either resource productivity (Porter & Van der Linde, 1995) or cost that exceed benefits (Litman, 2015), results of this study indicate that environmental sustainability can positively affect operational performance and produce benefits that exceed those costs.

On the other hand, there are relevant implications for practitioners and governments based on our findings. The importance of green initiatives has been demonstrated in this study while improving sustainability of manufacturing SMEs form a managerial point of view. Besides, it is crucial for manufacturing SMEs to incorporate environmental management monitoring, education, and training systems into their organizations. This is due to the fact that the business decision of environmental management required years of continuous organizational commitment and is not made at a single point in time. It is suggested that manufacturing SMEs appoint an environmental manager classified under green job category for green initiatives implementation and incorporate "four pillars" of Green Technology Policy into organization's corporate strategic agendas. From a government perspective, the level of perceived uncertainty should be reduced by government assistance to SMEs based on the results in order to ensure the successfulness of green initiatives. There are various programmes that may reduce the perceived uncertainty. For instance, training programmes such as green technology adoption for SMEs owners/managers. The understanding of green technology changes may be achieved and a clearer view of potential evolution on sustainability of development that will conserve the natural environment and resources can be provided.

CONCLUSION

Globalization has encouraged the emergence of customers who are environmentally conscious and supportive of environmental sustainability. The results of this study indicate the emergence of a valid and reliable environmental sustainability construct, and the impact of this construct on business performance. The environmental sustainability can be considered as a new, but overlooked capability of operations management. It is considered overlooked because typically little is known about these systems, despite several international standards and environmental systems concerning Environmental, Health and Safety which have been around for some time. The focus of this study is to define and bring about a better understanding of the impacts of green initiatives, owners/managers intention towards green as well as the Green Technology adoption in manufacturing SMEs.

REFERENCES

Al-Maaded, M., Madi, N. K., Kahraman, R., Hodzic, A., & Ozerkan, N. G. (2012). An overview of solid waste management and plastic recycling in Qatar. *Journal of Polymers and the Environment*, *20*(1), 186-194.

Andrade, L. C., Míguez, C. G., Gómez, M. C., & Bugallo, P. M. (2012). Management strategy for hazardous waste from atomised SME: Application to the printing industry. *Journal of Cleaner Production*, *35*, 214-229.

Andreev, P., Heart, T., Maoz, H., & Pliskin, N. (2009). Validating formative partial least squares (PLS) models: Methodological review and empirical illustration. *Proceedings of the Thirtieth International Conference on Information Systems*, Phoenix, Arizona.

Aragón-Correa, J. A., Hurtado-Torres, N., Sharma, S., & García-Morales, V. J. (2008). Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management*, *86*(1), 88-103.

Babbie, E. (2007), The Practice of Social Research (11th ed.). Belmont, CA Wadsworth.

Banerjee, S. B. (2001). Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. *Journal of Management Studies, 38*(4), 488-513.

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, *43*(4), 717-736.

Barrington, D. J., Prior, A., & Ho, G. (2013). The role of water auditing in achieving water conservation in the process industry. *Journal of Cleaner Production*, *52*, 356-361.

Bay, K., & Rasmussen, P. (2011). Youth entrepreneurship in Accra, Ghana, (Master Thesis, Copenhagen Business School). Retrieved from https://scholar.google.com/.

Bollen, K. A., & Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological Bulletin*, *110*, 305–314. doi:10.1037/0033-2909.110.2.305.

Bridge, G., & Wood, A. (2005). Geographies of knowledge, practices of globalization: learning from the oil exploration and production industry. *Area*, *37*(2), 199-208.

Cassells, S., & Lewis, K. (2011). SMEs and environmental responsibility: Do actions reflect attitudes?.*Corporate Social Responsibility and Environmental Management*, *18*(3), 186-199.

Chemers, M. (2014). *An integrative theory of leadership*. Psychology Press.

Chin, W. W. (2010). How to write up and report PLS analyses. In Esposito Vinzi, V., Chin, W. W., Henseler, J., & Wang, H. (Eds.), *Handbook of partial least squares: Concepts, methods and applications*. Berlin, Germany: Springer-Verlag.

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling: analysis with small samples using partial least squares. In Hoyle, R. H. (Ed.), *Statistical strategies for small sample research*. Thousand Oaks, CA: Sage.

Choong, W. W., Chong, Y. F., Low, S. T., & Mohammed, A. H. B. (2012). Implementation of energy management key practices in Malaysian universities. *International Journal of Emerging Sciences*, *2*(3), 455-477.

Claver-Cortés, E., Molina-Azorín, J. F., Pereira-Moliner, J., & López-Gamero, M. D. (2007). Environmental strategies and their impact on hotel performance. *Journal of Sustainable Tourism*, *15*(6), 663-679.

Connolly, D., Lund, H., Mathiesen, B. V., & Leahy, M. (2010). A review of computer tools for analysing the integration of renewable energy into various energy systems. *Applied Energy*, *87*(4), 1059-1082.

Côté, R., Booth, A., & Louis, B. (2006). Eco-efficiency and SMEs in Nova Scotia, Canada. *Journal of Cleaner Production, 14*(6), 542-550.

Dahlmann, F., & Brammer, S. (2011). Exploring and explaining patterns of adaptation and selection in corporate environmental strategy in the USA. *Organization Studies*, *32*(4), 527-553.

Dasgupta, S., Hettige, H., & Wheeler, D. (2000). What improves environmental compliance? Evidence from Mexican industry. *Journal of Environmental Economics and Management*, *39*(1), 39-66.

Demirbas, A. (2011). Waste management, waste resource facilities and waste conversion processes. *Energy Conversion and Management*, *52*(2), 1280-1287.

Department of Statistics. (2015a). *Monthly manufacturing statistics* . November 2014.

Department of Statistics. (2015b). *Malaysia external trade statistics* . December 2014.

Department of Statistics. (2015c). *Index of industrial production, Malaysia* . November 2014.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *JMR, Journal of Marketing Research*, *38*, 269–277. doi:10.1509/ jmkr.38.2.269.18845.

Doty, D. H., & Glick, W. H. (1998). Common methods bias: Does common methods variance really bias results? Organizational Research Methods, 1, 374-406.

Epstein, M. J., & Buhovac, A. R. (2014). *Making sustainability work: Best practices in managing and measuring corporate social, environmental, and economic impacts*. Berrett-Koehler Publishers.

Eltayeb, T. K., Zailani, S., & Jayaraman, K. (2010). The examination on the drivers for green purchasing adoption among EMS 14001 certified companies in Malaysia. *Journal of Manufacturing Technology Management*, *21*(2), 206-225.

Epstein, M. J., & Roy, M. J. (2001). Sustainability in action: Identifying and measuring the key performance drivers. *Long range planning*, *34*(5), 585-604.

Falk, R. F., & Miller, N. B. (1992). *A primer soft modeling*. Akron, OH: University of Akron Press.

Favoreu, C., Carassus, D., & Maurel, C. (2015). Strategic management in the public sector: a rational, political or collaborative approach? *International Review of Administrative Sciences*, 1-19.

Fornell, C., & Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *JMR, Journal of Marketing Research*, *19*(4), 440–452. doi:10.2307/3151718.

Fornell, C., & Cha, J. (1994). Partial least squares. In Bagozzi, R. P. (Ed.), *Advanced methods of marketing research* (pp. 52–78). Oxford, UK: Blackwell.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *JMR, Journal of Marketing Research*, *18*(1), 39–50. doi:10.2307/3151312.

Frost, A. (2011). *Going green: prospects for SME's to attain ISO 14001 and the challenges they face in the process* (Doctoral dissertation, Aston University). Retrieved from https://scholar.google.com/

Gadenne, D. L., Kennedy, J., & McKeiver, C. (2009). An empirical study of environmental awareness and practices in SMEs. *Journal of Business Ethics*, *84*(1), 45-63.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural equation modeling and regression: guidelines for research practice. *Communications of the AIS*, *4*(7), 1–79.

Gomez, C. P., & Abdulazeez, U. R. (2016). Benefits Optimization through Ill-Informed Client Competency Acquisition and Engagement in Renovation Works Flow. *Mediterranean Journal of Social Sciences*, *7*(5), 335-342.

González-Benito, J. C., & González-Benito, Ó. C (2005). Environmental proactivity and business performance: an empirical analysis. *Omega*, *33*(1), 1-15.

Gonzalenz-Benito J. C., & Gonzalenz-Benito O. C. (2006). A review of determinant factors of environmental proactivity. *Business Strategy and the Environment, 15*(2), 87-102.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*. Upper Saddle River, NJ: Prentice-Hall.

Henriques, I., & Sadorsky, P. (2007). The determinants of an environmentally responsive firm: an empirical approach. *Journal of Environmental Economics and Management*, *30*(3), 381-395.

Hillary, R. (Ed.). (2000). *Small and medium-sized enterprises and the environment: business imperatives*. Greenleaf Publishing.

Hirsig, N., Rogovsky, N., & Elkin, M. (2014). Enterprise Sustainability and HRM in Small and Medium-Sized Enterprises. In *Sustainability and Human Resource Management* (pp. 127-152). Springer Berlin Heidelberg.

Hoskinson, B. (2010). *Microfinance sustainability versus development objectives: an assessment of the South African environment* (Doctoral dissertation, Rhodes University). Retrieved from *https://scholar.google.com/*.

Jenkin M., (2014) The rewards for small businesses that save energy are undeniably great Available at: http://energyindemand.com/2014/01/24/the-rewards-for-small-businesses-thatsave-energy-are-undeniably-great/.

Kannan, R., & Boie, W. (2003). Energy management practices in SME - case study of a bakery in Germany. *Energy Conversion and Management*, *44*(6), 945-959.

Karlsson, C., & Karlsson, M. (2002). Economic policy, institutions and entrepreneurship. *Small Business Economics*, *19*(2), 163-171.

Kenny, J. F., Barber, N. L., Hutson, S. S., Linsey, K. S., Lovelace, J. K., & Maupin, M. A., (2009). Estimated use of water in the United States in 2005: US Geological Survey Circular 1344, 52.

Kerr, I. R. (2006). Leadership strategies for sustainable SME operation.*Business Strategy and the Environment*, *15*(1), 30-39.

King, A. A., & Lenox, M. J. (2000). Industry self-regulation without sanctions: The chemical industry's responsible care program. *Academy of Management Journal, 43*(4), 698-716.

Leonidou, L. C., Fotiadis, T. A., Christodoulides, P., Spyropoulou, S., & Katsikeas, C. S. (2015). Environmentally friendly export business strategy: Its determinants and effects on competitive advantage and performance. *International Business Review*, *24*(5), 798-811.

Litman, T. 2015. Evaluating public transit benefits and costs. Victoria Transport Policy Institute.

Mackenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *The Journal of Applied Psychology*, *90*, 710–730. doi:10.1037/0021-9010.90.4.710.

Marchi, V. D., Maria, E. D., & Micelli, S. (2013). Environmental strategies, upgrading and competitive advantage in global value chains. *Business strategy and the environment*, *22*(1), 62-72.

McKeiver, C., & Gadenne, D. (2005). Environmental management systems in small and medium businesses. *International Small Business Journal*, *23*(5), 513-537.

Muthulingam S., Corbett C. J., Benartzi S., & Oppenheim B., (2011) Investment in Energy Efficiency by Small and Medium-Sized Firms: An Empirical Analysis of the Adoption of Process Improvement Recommendations, Working Paper, Anderson Graduate School of Management [pdf] Available at: http://www.escholarship.org/uc/item/6545t5bf.pdf.

Mofokeng, T. G. (2013). *Assessment of the causes of failure among small and medium sized construction companies in the Free State Province* (Doctoral dissertation, University of Johannesburg). Retrieved from https://scholar.google.com/

Nambisan, S. (2013). Information technology and product/service innovation: A brief assessment and some suggestions for future research. *Journal of the Association for Information Systems*, *14*(4), 215-413.

Nunnally, J. (1978). *Psychometric theory* (2^{nd} ed.). New York, NY: McGraw Hill.

Painuly, J. P., Park, H., Lee, M. K., & Noh, J. (2003). Promoting energy efficiency financing and ESCOs in developing countries: mechanisms and barriers. *Journal of Cleaner Production*, *11*(6), 659-665.

Papagiannakis, G., Voudouris, I., & Lioukas, S. (2014). The road to sustainability: exploring the process of corporate environmental strategy over time. *Business Strategy and the Environment*, *23*(4), 254-271.

Parker, C.M., Redmond, J. & Simpson, M. (2009). A review of interventions to encourage SMEs to make environmental improvements. *Environment and Planning C: Government and Policy*. *27*(2), 279-301.

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *Management Information Systems Quarterly*, *31*(4), 623–656.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of management*, *12*(4), 531-544.

Porter, M. E., & Van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *The journal of economic perspectives*, *9*(4), 97-118.

Pujari, D., Wright, G., & Peattie, K. (2003). Green and competitive: influences on environmental new product development performance. *Journal of Business Research*, *56*(8), 657-671.

Rice, A. L. (2013). *The enterprise and its environment: A system theory of management organization* (Vol. 10). Routledge.

Rizzo, A., & Fulford, H. (2012). Understanding Small Business Strategy: A Grounded Theory Study On Small Firms In The EU State Of Malta. *Journal of Enterprising Culture*, *20*(03), 287-332.

Saleh, A. S., & Ndubisi, N. O. (2006). An evaluation of SME development in Malaysia. *International Review of Business Research Papers*, *2*(1), 1-14.

Salvi, B. L., & Panwar, N. L. (2012). Biodiesel resources and production technologies–A review. *Renewable and sustainable energy reviews*, *16*(6), 3680-3689.

Sánchez-Medina AJ, Romero-Quintero L, Sosa-Cabrera S (2014) Environmental Management in Small and Medium-Sized Companies: An Analysis from the Perspective of the Theory of Planned Behavior. PLoS ONE 9(2), 1-12.

Sardianou, E. (2008). Barriers to industrial energy efficiency investments in Greece. *Journal of Cleaner Production*, *16*(13), 1416-1423.

Sharma, S., & Vredenburg, H. (1998). Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 729-753.

Slavik, J., & Pavel, J. (2013). Do the variable charges really increase the effectiveness and economy of waste management? A case study of the Czech Republic. *Resources, Conservation and Recycling*, *70*, 68-77.

Tchobanoglous, G. (2009). Solid waste management. *Environmental engineering: environmental health and safety for municipal infrastructure, land use and planning, and industry. Wiley, New Jersey*, 177-307.

Tehrani, P. M., & Manap, N. A. (2014). Contractual issues of transformation technology in SME industry in Malaysia. *International Business Management*, *8*(1), 39-48.

Terazono, A., Moriguchi, Y., Yamamoto, Y. S., Sakai, S.-i., Inanc, B., Yang, J., Mungcharoen, T. (2005). Waste management and recycling in Asia. *International Review for Environmental Strategies, 5*(2), 477-498.

Tybout, J. R. (2000). Manufacturing firms in developing countries: How well do they do, and why?. *Journal of Economic literature*, *38*(1), 11-44.

Vives, A. (2010). Responsible Practices in Small and Medium Enterprises. *A Handbook of Corporate Governance and Social Responsibility, Farnham*, 107-130.

Walmsley, D. J., & Lewis, G. J. (2014). *People and environment: Behavioural approaches in human geography*. Routledge.

Weerasiri, S., & Zhengang, Z. (2012). Attitudes and Awareness towards Environmental Management and its Impact on Environmental Management Practices (EMPs) of SMEs in Sri Lanka. *Journal of Social & Development Sciences*, *3*(1), 16-23.

Yol Lee, S., & Rhee, S. K. (2007). The change in corporate environmental strategies: a longitudinal empirical study. *Management Decision*, *45*(2), 196-216.

Young, D., Scharp, R., & Cabezas, H. (2000). The waste reduction (WAR) algorithm: environmental impacts, energy consumption, and engineering economics. *Waste Management, 20*(8), 605-615.

Zikmund, W. G., Carr, J. C., & Griffin, M. (2012). *Business research methods*. Australia: CengageBrain.com.