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Barriers to the involvement in green public procurement among small and medium enterprises (SMEs) government suppliers

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Abstract

Purpose – The objectives of this study are twofold. Firstly, this study aims to examine the challenges of green public procurement (GPP) involvement among small- and medium-sized enterprises (SMEs) government suppliers. Secondly, it investigates the differences in the perceived challenges between the small- and medium-sized groups of companies.

Design/methodology/approach – The study draws on the quantitative method. The questionnaire was distributed to SMEs that supply green goods or services to the government and which are listed in the MyHijau directory. Using convenience sampling, a total of 394 questionnaires were distributed and 126 usable questionnaires were received, representing a response rate of 31.98%. A descriptive analysis of the mean score, standard deviation and mean score ranking was used to analyse the overall results. The *t*-test analysis was carried out to examine the differences between the small- and medium-sized groups of companies.

Findings – All five categories of the barriers, i.e. financial, legal, people, knowledge and organizational challenges, are perceived as the important challenges for SMEs' involvement in GPP. Of the five categories, "having lack of knowledgeable staff on GPP" under the category of "people" challenge is ranked as the most major barrier. In relation to the differences between the two groups of enterprises (small- and medium-sized), medium enterprises are more affected by two items under the "organization" challenge, i.e. "The company has not targeted suppliers that promote environmentally-friendly products/services" and "The company has not established a clear objective on purchase of green products and services", as compared to the small-sized enterprises through their GPP involvement.

Social implications – By understanding the difficulties faced by SMEs in engaging with GPP, various practical measures can be formulated to support the SME businesses in mitigating the challenges faced for their involvement with GPP, which subsequently will lead to the country's target to reach the sustainable development goals.

Originality/value – This study extends empirical evidence on barriers or challenges that may hinder the involvement in government green procurement, with a specific focus on SME government suppliers.

Keywords Barriers, Small and medium enterprises (SMEs), Green public procurement (GPP), Sustainable procurement, MyHIJAU

Paper type Research paper

1. Introduction

Governments and corporations across the globe are dedicated to implementing environmentally-friendly products and practices in response to an urgent need for the conservation of resources and sustainable environments (Salam, 2008). Hawkins *et al.* (2011) emphasized that the government procurement market is the world's largest business sector.

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This activity amounted to 12% of the global gross domestic product (GDP) in 2018, making it a significant part of the global economy. In Malaysia, government procurement represented about 24%–33% of GDP over the past decade (Adham and Siwar, 2012). The 10th Malaysia Plan recognizes the activity as one of the most important movements in developing innovation and encouraging SMEs to create products of national value. As the largest purchaser, the governments of many countries have encouraged the use of environmentally-friendly products and services in both the public and private sectors, as a way to sustain the environment by shifting to green public procurement (GPP).

According to the Ministry of Energy, Green Technology and Water Malaysia (KeTTHA) (2010), GPP refers to:

> The acquisition of products, services, and work in the public sector that takes into account environmental criteria to conserve natural environment and resources, and minimizes and reduces negative impacts of human activities (Ministry of Energy, Green Technology and Water Malaysia (KeTTHA), 2010).

Generally, GPP is promoted under various other names, such as "environmentally-preferable purchasing (EPP)", "sustainable public procurement (SPP)" and government green procurement (GGP) (International Green Purchasing Network (IGPN), 2010). In Malaysia, the term "GGP" has been used in official documents of the government, including in the 11th and 12th Malaysia Plans (Economic Planning Unit [EPU], 2015, 2021). However, this article uses the term, "GPP", as it is widely recognized and used in the industry as well as in the extant literature.

The demand for green procurement activity can enable the public sector to create a market for sustainable products and services (Cheng *et al.*, 2018; Michelsen and de Boer, 2009). In Malaysia and other Southeast Asian countries, green procurement is viewed as a developing concept due to their policies of accepting green procurement in their nation's practices, although the activity has been recognized in developed countries (Bohari *et al.*, 2017). Under the 12th Malaysia Plan, a target of 25% GPP implementation for government procurement by 2025 (EPU, 2021) has been set, a clear manifestation of the government's commitment to protecting the environment.

Prior studies have evinced that engagement with GPP can benefit companies in terms of environmental improvement and diffusion of green technologies (Bogran and Džaja, 2015; Aldenius and Khan, 2017). Moreover, while increasing resource efficiency, green procurement can minimize costs and waste, which can affect manufacturing businesses, prices, available services and company attitude (Bogran and Džaja, 2015; NyachombaMachira and Juma, 2016; Masudin *et al.*, 2020). Despite the various benefits of GPP as evinced, the participation in GPP by SMEs is lower compared to larger companies (Ahmad and Buniamin, 2020). This has raised concerns as to whether or not the SMEs can receive the same benefits as the larger companies for their involvement in GPP. Moreover, there could be barriers or challenges that hinder the SMEs' participation in GPP as discovered by Bogran and Džaja (2015) and Da Costa and da Motta (2019) in the context GPP participation in developed countries, i.e. Scotland and Brazil, respectively. Hence, the present study further contributes to the GPP literature by examining the barriers or challenges faced to be involved in GPP with a specific focus on SMEs in a developing economy (i.e. Malaysia). The study also investigates whether or not there are differences in the perceived challenges between the small- and medium-sized groups of companies.

This study is essential for exploring SMEs' engagement with GPP as they are a significant contributor to the economy and their participation in GPP can lead to the development of a more sustainable industrial ecosystem. There is also a need to move towards sustainability as a result of environmental depletion. Second, while larger corporations often have the resources to implement green procurement practices, SMEs may

face significant challenges due to their limited financial and technical capacity. Therefore, understanding the challenges of GPP for SMEs can help identify strategies to support their engagement with green practices.

The remainder of this paper is structured as follows. Sections 2 and 3 present the development of GPP in Malaysia and literature review, respectively. Section 4 describes the research methodology applied in the study. Findings and discussions are presented in Section 5. Implications and limitations of the study, suggestions for future research, as well as a conclusion are presented in Section 6.

2. Development of green public procurement in Malaysia and small and medium enterprises participation

GPP in Malaysia was first introduced in 2012, where some government agencies participated in a pilot project to overview and give information regarding sustainability activities, as well as the current state of the environment. The National Green Technology and Climate Change Council (NGTCCC) was formed by KeTTHA in 2009 in line with the National Climate Change Policy introduced under the 9th Malaysia Plan (Ministry of Natural Resources and Environment Malaysia [MNRE], 2009). Generally, the establishment of the NGTCCC is significant for GPP and is the basis for how GPP was first introduced in the country.

The Government of Malaysia is committed to improving its procurement process and GPP is part of the transformation agenda (Adham *et al.*, 2012). Malaysia aimed for GPP to contribute at least 20% of government procurement (EPU, 2015) by 2020 initially, and the government managed to gain 20.7% between 2016 and 2019, exceeding this set target (EPU, 2021). As proposed in the 12th Malaysia Plan, in 2025, Malaysia aims for GPP to contribute at least 25% of government procurement (EPU, 2021). It is believed that GGP could create a domino effect to enable the economy to flourish. The 12th Malaysia Plan aspires that micro, small and medium enterprises can contribute to Malaysia's GDP by 45% of the total GDP, a 3.6% increment in labour productivity growth and a 4% reduction in the unemployment rate (EPU, 2021). One of the initiatives to reach these targets is to generate 230,000 green jobs by 2030, as proposed by the Malaysian Green Technology and Climate Change Corporation (MGTC), (MGTC, 2022).

Concerning the emergence of green activities in the country, the Malaysian Government has established a national green recognition, i.e. the MyHIJAU recognition. MyHIJAU is an initiative by the MGTC to promote the use of environmentally-friendly products and services throughout Malaysia. The programme was launched in 2012 to support the implementation of GPP (MGTC, 2017). The goal of the programme is to encourage the adoption of sustainable practices in the country, while stimulating the growth of Malaysia's green economy.

In line with the establishment of MyHIJAU, the government also endorsed the establishment of the MyHIJAU mark, Malaysia's official green recognition (Ahmad and Buniamin, 2020). This recognition under one single mark, certifies green products and services that comply with local and international environmental standards, indicating compliance with global environmental standards. The acknowledgment received from the MyHIJAU mark allows the products or services to contribute to GPP activity, while receiving incentives from the government, i.e. the Green Investment Tax Allowance, for companies that procure the MyHIJAU mark products, and the Green Income Tax Exemption, for the providers of green services (MGTC, 2021).

The MyHIJAU programme is the initiative taken by the Government of Malaysia to push local industries, especially SMEs, to participate in government programmes, thus

benefitting them at the international level (Ministry of Energy, Green Technology and Water [KeTTHA], 2014). SMEs play a crucial role in a country's economic growth, and in Malaysia, they are considered the backbone of the economy (Ghazilla *et al.*, 2015). SMEs facilitate the development of the Malaysian economy since the early 1970s (Che-Ha and Mahmood, 2012). SMEs create a significant number of jobs, employing about 7.3 million people, or approximately 65% of Malaysia's total workforce, according to the SME Annual Report 2020 (SME Corp, 2021). This demonstrates the government's reliance on the SME sector to maintain economic stability.

Participation in GPP requires SMEs to produce goods and services with a lesser negative impact on the environment, such as energy-efficient, eco-labelled and sustainable products, as compared to the traditional industry standards. According to Salam (2008), GPP can be encouraged if organizations can easily obtain eco-friendly products and services that perform as well as conventional products. The availability of suppliers, products and services can significantly affect the implementation of green procurement (Brammer and Walker, 2011), as a green market cannot exist without the supplier's offer and the buyer's demand. As government suppliers, SMEs must meet government and public demands by offering green products and services.

3. Literature review

Prior studies on GPP have focused on several aspects, including differences in practices among countries (Brammer and Walker, 2011); enablers or benefits of GPP (Bogran and Džaja, 2015; NyachombaMachira and Juma, 2016; Masudin *et al.*, 2020); as well as challenges or barriers to GPP participation (Bogran and Džaja, 2015; Aldenius and Khan, 2017; Da Costa and Da Motta, 2019; Vejaratnam *et al.*, 2020). In relation to benefits of GPP, prior studies have claimed that GPP significantly contributes towards achieving environmental and socio-economy policy goals (Marron, 1997; Barr *et al.*, 2005; Chen, 2005; Ho *et al.*, 2010; McCrudden, 2004; Parikka-Alhola, 2008; United Nations Development Programme [UNDP], 2008; Lewis *et al.*, 2023). In relation to the environmental aspect, GPP assists public authorities to achieve the environmental policy by reducing GHG emission and air pollution, enhancing energy and water efficiency and encouraging the utilization of renewable resources and other cleaner technologies (Marron, 1997, Hassanbeigi *et al.*, 2021; Lewis *et al.*, 2023). However, Lundberg *et al.* (2015) revealed limited evidence to support the claim that GPP is an effective environmental policy. In terms of the socio-economy, GPP encourages innovation that leads to cost saving, creates a market for green products, services and work, as well as creates job opportunities which subsequently reduce poverty, improve work conditions and gender and ethnicity equality (Walker and Phillips, 2009; Brammer and Walker, 2011; Testa *et al.*, 2012; Adham and Siwar, 2012; Da Costa and Da Motta, 2019; Rizzi *et al.*, 2014).

On the challenges and barriers to GPP involvement, Aldenius and Khan (2017) reported that cost is the main barrier to GPP engagement. The high cost of designing green technologies, products or services, and lack of GPP legislations, can discourage SMEs from entering the green market. In addition to costs, Bogran and Džaja (2015) highlighted that time constraints, size of contract and conflict of experiences with GPP goals as key barriers to GPP participation. Likewise, Ahsan and Rahman (2017) and Da Costa and Da Motta (2019) identified lack of long-term planning, methods to measure sustainability, training and education, organizational culture, government incentives and top management support, as important barriers to GPP participation.

A systematic review of literature on challenges to GPP implementation by Vejaratnam *et al.* (2020) has identified five categories of challenges, i.e. financial, legal, people, knowledge

and organizational challenges. Lack of knowledge has been claimed to be the most important barrier, whereas financial constraint is the least important barrier. Moreover, the study has reported different degrees of importance of the barriers between developed and developing countries. In a more recent study, Bilan (2023) examined the challenges in the context of Romania, and identified lack of training and knowledge, absence of GPP strategic direction, and limited leadership support, as the fundamental challenges.

Although there are a few prior studies that have analysed the GPP challenges, those studies have been in the context of developed countries (Thomson and Jackson, 2007; Walker *et al.*, 2008; Walker and Brammer, 2009; Flynn *et al.*, 2013; Simcoe and Toffel, 2014; Ahsan and Rahman, 2017). Moreover, prior studies in Malaysia have focused on customer perspectives (Ramayah *et al.*, 2010; Ramakrishnan *et al.*, 2015; Lasuin and Ng, 2014) and neglected the viewpoints of suppliers (Shaharudin *et al.*, 2018; Cheng *et al.*, 2018), in their systematic review paper on GPP, specifically called for more research on barriers to GPP implementation among SME suppliers. Furthermore, Ghazilla *et al.* (2015) stated that there are differences in the factors that trigger and restrain green practices among SMEs as compared to those in large corporations due to SMEs' lacking in necessary data, technical expertise, resources and knowledge, to perform green practices. In addition, the intention of SME owners and the criteria of SMEs vary significantly across various geographical regions. As there is still limited research on SMEs' involvement in GPP activities, particularly in developing countries, such as Malaysia, and it has also been acknowledged that company size and geographical location may lead to the facing of different main challenges, therefore, the present study is essential as it empirically identifies the challenges that affect SMEs' participation in GPP in Malaysia.

4. Methodology

4.1 Research instrument

In achieving the objectives, a questionnaire survey method was used. The questionnaire items were adopted from Vejaratnam *et al.* (2020) and Adham and Siwar (2017), with the addition of several new items based on reviews of prior studies. The questionnaire explores the challenges faced by SME suppliers in engaging with GPP. There are 17 statements in total, divided into five different types of challenges based on Vejaratnam *et al.* (2020): financial, legal, people, knowledge and organizational challenges. A five-point Likert scale, in which "1" is strongly disagree and "5" is strongly agree, is used to indicate respondents' level of agreement with each challenge. A higher score implies a higher level of challenges faced by the supplier, whereas a lower score means vice versa.

4.2 Respondents and data collection procedures

The sampling frame for the survey comprised SMEs known to have been suppliers to the government and listed in the MyHIJAU directory. The MyHIJAU directory provides contact details of at least two representatives from each company. Convenience sampling was chosen for this research as the entire population of the SMEs involved in GPP could not be identified, and only the SMEs willing to participate in the study were given a questionnaire for them to answer. Initially, phone calls were used to contact the respondents. However, the researchers found that the respondents resisted answering the calls, and even if they did answer, they were engaged with their work, and thus, the call had to be abruptly ended.

As a result, the researchers had to restrategize the questionnaire distribution method. Based on the suggestion by several respondents who earlier had answered the phone call, WhatsApp and email methods were then used to get in touch with the potential respondents and to distribute the questionnaire. The WhatsApp method was used to engage with the

potential respondents, to notify them on the questionnaire that was emailed and to invite them to participate in the study. The respondents seemed to be more comfortable to reply to WhatsApp messages as they could instantaneously ask any further question or seek clarification. Moreover, to ease the respondents to answer the questionnaire items, they were given the options to either respond via the Google Form link or via the Word document questionnaire. Moreover, the researchers' contact number and Google Meet link were also included in the email should they need further help. Two rounds of follow-up were carried out, with a gap of seven days for every session, and the entire data collection process took approximately 10 weeks. As a result, 145 completed questionnaires were received via email and WhatsApp.

4.3 Data analysis

The data collected from the questionnaires were analysed using Statistical Package for the Social Sciences software. The information on the respondents' background and demographic profile was analysed using descriptive analysis. The descriptive data gives the average value, calculated from the five-point Likert scale. As for the second objective, *t*-test analysis was used to identify any significant mean differences between small- and medium-sized enterprises (SMEs).

5. Findings and discussion

5.1 Demographic information of respondents

Of the 394, 145 responses received and 126 were usable for analysis because 19 of the questionnaires were responded to by non-GPP suppliers or non-SMEs, whereas others were not completed properly, as identified by the respondents themselves, who admitted to not fully understanding the terms used in the questionnaire. This resulted in an overall response rate of 31.98%, which is considered adequate, as suggested by Sekaran (2003), who stated that a response rate of 30% is acceptable in most social science research. As the unit of analysis in this study is the SME, the demographic information of the companies, such as the type of industry the entrepreneurs belong to, and the type of public procurement activities they have been involved in is presented in Table 1. The respondents were also asked about their experiences related to the GPP process to ensure the credibility of the person representing the company as a respondent.

Table 1 shows that the majority of the respondents are male, accounting for 69% of the total respondents, whereas the remaining 31% are female. Regarding the current work position of the SME representatives, the majority of the respondents are managers and directors of their respective companies, accounting for 42.9% and 31.7%, respectively. The remaining respondents are executives, assistant managers and other related positions.

The SMEs that responded are from various types of industries. The highest number of SMEs belongs to the technology industry, representing 32.5% of the respondents. The second highest industry is construction, accounting for 29.4%, followed by the industrial sector, representing 23% of the respondents. The trading services industry accounted for 10.3% of the respondents, followed by the consumer industry at 4.0%, and the properties industry at 0.8%. Most of the respondents answering the questionnaire on behalf of the SMEs, are involved in supply-based procurement activities, accounting for 42%, followed by services-based procurement activities at 41%, as well as work-based procurement activities at 17% of the total procurement activities.

Category	Frequency	%
Gender		
Male	87	69.0
Female	39	31.0
Total	*126*	*100.0*
Position in the company		
Director/CEO	40	31.7
Manager	54	42.9
Assistant manager	6	4.8
Executive	19	15.1
Other	7	5.6
Total	*126*	*100.0*
Working experiences with GGP		
None	60	47.6
Less than 1 year	8	6.3
1 to less than 3 years	20	15.9
3–5 years	14	11.1
More than 5 years	24	19.0
Total	*126*	*100.0*
Types of industry		
Construction	37	29.4
Consumer	5	4.0
Industrial	29	23.0
Properties	1	0.8
Technology	41	32.5
Trading-services	13	10.3
Total	*126*	*100.0*
Types of procurement		
Works	31	17
Supplies	75	42
Services	74	41
Total procurement activity engagement	*180*	*100.0*

Source: Created by authors

Table 1. Demographic information of the respondents

5.2 Challenges of green public procurement involvement to small and medium enterprise suppliers

Table 2 presents the findings on the objective, which concerns the challenges of GPP to SME suppliers, with an average mean score for the challenges being 3.27. This indicates a moderate level of agreement among the respondents regarding the five challenges: financial, legal, people, knowledge and organizational challenges. The findings reveal that the challenge of people ($M = 3.54$) has the highest mean score, followed by legal ($M = 3.42$), knowledge ($M = 3.30$) and financial ($M = 3.28$). Organizational challenge ($M = 2.83$) has the lowest level of agreement among the challenges and is ranked fifth.

Based on the overall mean results of the challenges faced by SMEs in GPP participation, the biggest obstacle is found to be related to people in terms of awareness, motivation and competence. This is consistent with previous research by Testa *et al.* (2016) and Vejaratnam *et al.* (2020), that lack of awareness about GGP is a more significant barrier than the financial challenge.

However, to provide a more comprehensive overview of the results, a detailed discussion of each challenge is presented in the next section, starting with the financial challenge, followed by legal, people, knowledge and organizational challenges.

5.2.1 Financial challenge. In Table 3, the mean scores range from 2.98 to 3.52, implying a low to moderate agreeableness of the GPP participation challenges. Overall, the findings reveal that SME suppliers agree with the existence of the financial challenge throughout their engagement with GPP.

Based on the overall mean scores presented in Table 3, the biggest financial challenge item for GPP is "The company incurred higher production cost in producing green goods or services" ($M = 3.52$, SD $= 0.94$). This result is consistent with prior studies that financial constraint is a major barrier to sustainable procurement worldwide (Khan *et al.*, 2018). The Korea Environmental Industry and Technology Institute (2017) has also reported that the price of green products and services may increase due to international financial instability and fluctuating oil prices, which make green products less desirable in terms of price.

The second biggest challenge item is, "The cost of procedures to engage with GPP is expensive" ($M = 3.34$, SD $= 0.85$). Ma *et al.* (2021) suggested that GPP market pressure triggers companies to incur a series of environmental investments to satisfy the requirements of green contracts. Wang *et al.* (2020) confirmed that the private and government sectors prefer to cooperate with responsible and sustainable suppliers. It is undeniable that GPP procedures are costly, as Vejaratnam *et al.* (2020) found that in China, operating in an environmentally-friendly manner is far more expensive than paying the penalty for destroying the environment. Therefore, it can be confirmed that every GPP

No.	Challenges of GPP	Overall mean	Mean score ranking
1	People	3.54	1
2	Legal	3.42	2
3	Knowledge	3.30	3
4	Financial	3.28	4
5	Organization	2.83	5
	Overall level of challenges	*3.27*	–

Source: Created by authors

Table 2. Overall results for the challenges of GPP involvement to SME suppliers

		Overall			Small			Medium		
No.	Financial challenge of GPP	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
1	The company incurred higher production cost in producing green goods/services	3.52	0.94	1	3.52	0.93	1	3.52	0.97	2
2	The cost of procedures to engage with GPP is expensive	3.34	0.85	2	3.26	0.78	2	3.58	1.00	1
3	The company faced difficulties in terms of financial resources due to engagement with GPP	2.98	0.94	3	2.96	0.97	3	3.06	0.86	3

Source: Created by authors

Table 3. The financial challenges of GPP participation to SME suppliers

supplier is required to bear additional expenses compared to non-GPP suppliers, and this is also faced by SMEs in Malaysia.

The third ranked item is, "The company faced difficulties in terms of financial resources due to engagement with GPP" ($M = 2.98$, SD $= 0.94$). Gimenez-Pujol and Castano (2013) mentioned that a lack of financial resources is one of the barriers to GPP activity. This is also consistent with Ma *et al.* (2021) and Gerstenfeld and Roberts (2000), that the government should facilitate SMEs due to their limited financial resources to tackle new pressures, such as environmental regulations, to engage with GPP.

In general, medium-sized companies have higher mean scores than small-sized companies, indicating that they perceive themselves as more affected by the financial challenge of GPP participation than their smaller counterparts.

As illustrated in Table 3, both groups (SMEs) rated all three financial challenge items as either "agree" or "neutral", with mean scores ranging from 2.96 to 3.58. According to the mean score ranking, medium-sized companies are more concerned with the challenge item of "The cost of procedures to engage with GPP is expensive", which is ranked first, whereas small companies rank it second. On the other hand, small-sized companies rank, "The company incurred higher production cost in producing green goods or services" as first, whereas medium-sized companies rank it as second.

For a more in-depth overview, the differences in the perceptions between the SMEs regarding the financial challenge of GPP participation were analysed using an independent *t*-test. The results are presented in Table 4.

Based on the results as tabulated in Table 4, the differences in terms of the financial challenge of GPP participation as perceived by the two groups of respondents are not statistically significant for any statement as the result of claimed variances for the two groups (small and medium) is equal at Sig. (two-tailed) > 0.05.

5.2.2 Legal challenge. The results (Table 5) of the mean scores range from 3.34 to 3.54, which imply a moderate agreeableness with the GPP participation challenges.

The top-ranked legal challenge item is, "There are inadequate policies and regulations on green procurement activities" ($M = 3.54$, SD $= 0.87$). This finding is consistent with Gimenez-Pujol and Castano (2013), who identified the lack of a legal framework as a barrier to GPP. Brammer and Walker (2011) also noted that GPP implementation is problematic in unregulated nations. Thus, the respondents' agreement on inadequate GPP policies as the major legal barrier is not surprising.

Table 4. Summary of independent *t*-test results for the financial challenges of GPP to SME suppliers

No	Financial challenge of GPP Participation	Levene's test for equality of variances		*t*-test for equality of means		
		F	Sig	*t*	df	Sig. (two-tailed)
1	The company incurred higher production cost in producing green goods/services	0.108	0.742	0.005	124	0.996
2	The company faced difficulties in terms of financial resources due to engagement with GPP	0.517	0.473	−0.544	124	0.588
3	The cost of procedures to engage with GPP is expensive	3.746	0.055	−1.863	124	0.065

Source: Created by authors

The second-ranked challenge item is, "There are grey areas in the current GPP policy" ($M = 3.39$, SD = 0.87). According to the IGPN (2010), the complex bidding procedures have made it difficult for suppliers to understand the grey areas. Vejaratnam *et al.* (2020) emphasized the insufficient and unclear guidelines, which have caused difficulties for procurers. Brammer and Walker (2011) agreed that excessive information in the regulations could cause confusion among implementers and act as a barrier to GPP participation. This suggests that grey areas in the regulations, whether due to too much or too little information provided, pose a challenge to GPP involvement.

The final rank is occupied by, "There are loopholes in the current GPP policy" ($M = 3.34$, SD = 0.88). This finding is consistent with Vluggen *et al.* (2019), that existing loopholes in the GPP system and policy are barriers to GPP involvement. It also confirms the findings of McMurray *et al.* (2014) and Vejaratnam *et al.* (2020) that procurement policies in Malaysia emphasize social aspects more than environmental ones. This indicates that the respondents perceive that the loopholes in the GPP policy are related to environmental aspects.

The findings suggest that SME suppliers recognize the existence of the legal challenge in their engagement with GPP. The medium-sized group has higher mean scores than the small-sized group for most of the legal challenge items, indicating that the medium-sized group seems to perceive that it is more affected by the legal challenge from GPP participation than their small-sized counterparts.

As illustrated in Table 5, both groups (SMEs) rate all three items of the legal challenge as "agree" with the mean score ranging from 3.28 to 3.55. However, based on the mean score ranking, all the proposed items are similar for both groups, as well as for the overall respondents. A detailed overview of the differences in perceptions between SMEs regarding the items of the legal challenge of GPP participation was identified through an independent *t*-test analysis, and the results are presented in Table 6.

Based on the results as tabulated in Table 6, the differences in terms of the legal challenge of GPP involvement as perceived by the two groups of respondents are not statistically significant for any statement as the result of claimed variances for the two groups (small and medium) is equal at Sig. (two-tailed) > 0.05.

5.2.3 People challenge. The results (Table 7) of the mean scores range from 3.40 to 3.65, which implies a moderate agreeableness of the GPP participation challenges.

The top-ranked challenge item in terms of people is "The, lack of knowledgeable staff on GPP" ($M = 3.65$, SD = 0.97). Al Nuaimi *et al.* (2020) and Blomea *et al.* (2015) mentioned that one of the main issues in implementing GPP is the low supplier knowledge of GPP. In addition, Bidin *et al.* (2018) emphasized that the lack of awareness and knowledge regarding GPP and the green concept is a constraint for practitioners or suppliers to engage with the green area. The lack of knowledgeable staff on GPP has been acknowledged by SME suppliers as the main challenge in terms of the people challenge.

No.	Legal challenge of GPP participation	Overall			Small			Medium		
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
1	There are inadequate policies and regulations on green procurement activities	3.54	0.87	1	3.54	0.88	1	3.55	0.87	1
2	There are grey areas in the current GPP policy	3.39	0.87	2	3.33	0.91	2	3.55	0.71	2
3	There are loopholes in the current GPP policy	3.34	0.88	3	3.28	0.93	3	3.52	0.71	3

Source: Created by authors

Table 5. Legal challenges of GPP participation to SME suppliers

The second-ranked challenge item is, "The lack of competent staff in handling green procurement in the company" ($M = 3.56$, SD = 1.02). Competence is related to the skills and actions of the SME staff. Apart from being not knowledgeable, the staff of the SMEs could be a barrier in terms of people for the SMEs if the level of competence to deal with GPP is low. From the obtained result, this challenge does affect the SMEs throughout their participation in GPP. According to McMurray *et al.* (2014), a major barrier to engaging with GPP is incompetence, which may result from a lack of guidance and awareness. Vejaratnam *et al.* (2020) also confirmed that know-how skills to execute GPP is an additional sort of knowledge and is essential for surviving in the GPP market. As proposed in the GPP guidelines, suppliers who want to participate in GPP need to provide additional information regarding their products or services, which can affect the environment. McMurray *et al.* (2014) indicated that the lack of competent experts is a hindrance to GPP implementation in Malaysia to accomplish tasks requiring technical skills, such as designing and incorporating green criteria.

The final challenge item is, "The lack of motivated staff to engage with GPP" ($M = 3.40$, SD = 0.96). This statement might trigger the respondents as most of them are in the top management team. Delmonico *et al.* (2018) proposed that organizational culture or attitude is needed to promote and strengthen the implementation of GPP.

Good organizational practices, such as green human resource management, training and GPP procedures, could motivate GPP implementation in organizations (Al Nuaimi *et al.*, 2020). Staff motivation is related to a company's or management's well-being. With regards to the respondents' backgrounds, where most of them are among the owners and managers, the challenge item on lack of motivated staff might reflect the respondents' practices and support in the company, through their company's engagement with GPP.

Table 6. Summary of independent *t*-test results for the legal challenges of GPP to SME suppliers

No.	Legal challenge of GPP participation	Levene's test for equality of variances		*t*-test for equality of means		
		F	Sig	*t*	df	Sig. (two-tailed)
1	There are inadequate policies and regulations on green procurement activities	0.005	0.942	−0.044	124	0.965
2	There are loopholes in the current GPP policy	0.609	0.437	−1.329	124	0.186
3	There are gray areas in the current GPP policy	0.832	0.364	−1.210	124	0.229

Source: Created by authors

Table 7. People challenge of GPP participation to SME

No.	People challenge of GPP participation	Overall			Small			Medium		
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
1	Lack of knowledgeable staff on GPP	3.65	0.97	1	3.62	1.03	1	3.73	0.76	1
2	Lack of competent staff in handling green procurement in the company	3.56	1.02	2	3.56	1.06	2	3.58	0.90	2
3	Lack of motivated staff to engage in GPP	3.40	0.96	3	3.40	1.02	3	3.42	0.75	3

Source: Created by authors

The findings of this section reveal that SME respondents agree with the existence of the people challenge throughout their engagement with GPP. In most cases, the medium-sized group score higher mean scores than the small-sized group, suggesting that medium-sized companies are more affected by the people challenge from GPP participation than their smaller counterparts.

As illustrated in Table 7, both groups (SMEs) rate all three people challenge items as "agree", with the mean scores ranging from 3.40 to 3.73. Based on the mean score ranking, the items are similar for both groups as well as for the overall respondents. A detailed overview of the differences in perceptions between SMEs regarding the people challenge of GPP participation was identified through an independent *t*-test analysis, and the results are presented in Table 8.

Based on the results presented in Table 8, the differences in terms of people challenge of GPP participation as perceived by the two groups of respondents are not statistically significant for any statement as the result of claimed variances for the two groups (small and medium) is equal at Sig. (two-tailed) > 0.05.

5.2.4 Knowledge challenge. The results (Table 9) of the mean scores range from 3.10 to 3.51, which imply a moderate agreeableness to the GPP participation challenges.

The top-ranked knowledge challenge item is, "There is insufficient information on green criteria in the GPP guidelines" ($M = 3.51$, SD = 1.03). Bohari *et al.* (2017) indicated that the current green procurement guidelines in Malaysia are fragmented, whereas Gimenez-Pujol and Castano (2013) confirmed that there are usually insufficient tools, such as databases, to disseminate environmental criteria for products and services. This suggests that the respondents are not well-informed on GPP and the accompanying green criteria.

The second-ranked challenge item is, "The company is unaware of the GPP policy direction" ($M = 3.29$, SD = 1.15). Gimenez-Pujol and Castano (2013) also supported this

Table 8. Summary of independent *t*-test results for the people challenges of GPP to SME suppliers

No.	People challenge of GPP participation	Levene's test for equality of variances		*t*-test for equality of means		
		F	Sig	*t*	df	Sig. (two-tailed)
1	Lack of knowledgeable staff on GPP	4.620	0.034	−0.609	76	0.545
2	Lack of competent staff in handling green procurement in the company	1.462	0.229	−0.080	124	0.936
3	Lack of motivated staff to engage in GPP	5.136	0.025	−0.157	76	0.876

Source: Created by authors

Table 9. Knowledge challenges of GPP participation to SME suppliers

No.	Knowledge challenge of GPP participation	Overall			Small			Medium		
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
1	There is insufficient information on green criteria in the GPP guidelines	3.51	1.03	1	3.47	1.09	1	3.61	0.83	1
2	The company is unaware of the GPP policy direction	3.29	1.15	2	3.25	1.21	2	3.39	0.97	2
3	The company is unaware of the green tax incentives provided by the government	3.10	1.23	3	3.04	1.24	3	3.24	1.20	3

Source: Created by authors

challenge, mentioning that it occurs because the GPP policy and benefits are not well-communicated to public officers, companies or suppliers. Previous research has found that ineffective communication of financial and environmental benefits is one of the most often cited obstacles by respondents (Gimenez-Pujol and Castano, 2013). This suggests that the lack of communication between the government and suppliers has led suppliers to be less sensitive towards GPP policies.

The least-ranked challenge item is, "The company is unaware of the green tax incentives provided by the government" ($M = 3.10$, SD = 1.23). According to Gerstenfeld and Roberts (2000), as well as Hutchinson and Hutchinson (1995), SMEs' awareness of environmental legislations and regulations is often low. SMEs are also unable to integrate the relevant environmental legislations into their business practices (Gerstenfeld and Roberts, 2000). This suggests that SME suppliers still have issues with awareness of environmental legislations despite being engaged with GPP. Geng and Doberstein (2008) and Erridge and Hennigan (2012) found that suppliers are not motivated to participate in GPP due to a lack of incentives received. This reason is also a barrier for SME suppliers to participate in GPP as the respondents in the current study are unaware of the incentives provided by the government.

The findings and discussions of this section reveal that SMEs agree on the existence of the knowledge challenge throughout their engagement with GPP. The medium-sized group has higher means for most of the challenges compared to the small-sized group, indicating that medium-sized companies perceive that they are more affected by the knowledge challenge in GPP participation than their smaller counterparts.

As illustrated in Table 9, both groups (SMEs) rate all three knowledge challenge items as "agree" with the mean scores ranging from 3.04 to 3.61. The mean score ranking shows that the items are similar for both groups and the overall respondents. A detailed discussion using the independent *t*-test analysis on the perspectives of both SMEs is presented in Table 10.

According to the results in Table 10, the differences in terms of the knowledge challenge of GPP participation as perceived by the two groups of respondents are not statistically significant for any statement as the result of claimed variances for the two groups (small and medium) is equal at Sig. (two-tailed) > 0.05.

5.2.5 Organizational challenge. The results (Table 11) of the mean scores range from 3.06 to 2.61, which imply a low agreeableness with the GPP participation challenges.

The top-ranked organizational challenge item is, "The size of the company hinders its innovation for green solutions" ($M = 3.06$, SD = 1.09). This item is ranked first and is in

Table 10. Summary of independent *t*-test results for the knowledge challenges of GPP to SME suppliers

No.	Knowledge challenge of GPP participation	Levene's test for equality of variances		*t*-test for equality of means		
		F	Sig	*t*	df	Sig. (two-tailed)
1	There is insufficient information on green criteria in the GPP guideline	2.437	0.121	−0.638	124	0.525
2	The company is unaware of the GPP policy direction	4.197	0.043	−0.698	70.147	0.487
3	The company is unaware of the green tax incentives provided by the government	0.283	0.596	−0.800	124	0.426

Source: Created by authors

tandem with Gerstenfeld and Roberts (2000) that smaller businesses, like SMEs, lack the internal expertise to respond to new demands for green solutions, which proves that the size of a company influences its outcomes. Meehan and Bryde (2011) and de Souza Dutra *et al.* (2017) also agreed that failure to implement GPP could be the result of insufficient ability, such as technology and management skills, because a company must adapt to a changing, more sustainable environment and develop innovative capabilities. This challenge item is more relevant to smaller organizations, like SMEs, because of their limited resources due to their size.

The second-ranked challenge item is, "The company has not targeted suppliers that promote environmentally-friendly products/services" ($M = 2.90$, SD $= 1.13$). Since GPP is not mandatory in the country, it is expected that this item would be among the top three of the organizational challenge items. According to Gimenez-Pujol and Castano (2013), almost 45% of Asia-Pacific Economic Cooperation (APEC) economies have reported that the shortage of product suppliers that meet environmental criteria is one of the barriers to GPP development.

The third-ranked challenge item is, "The company has not established a clear objective on purchase of green products and services" ($M = 2.82$, SD $= 1.09$). The respondents' agreement with this statement shows the reason why SMEs face difficulties in engaging with GPP because engaging with GPP requires the integration of core organizational business values into the lifecycle of the organization's products or services over time to succeed (Ochoa *et al.*, 2017). Prior studies have also shown that organizations have an important role in implementing and engaging with GPP by gaining organizational commitment to this change (Prasad *et al.*, 2018; Meehan and Bryde, 2015; Bhatty, 2012). In addition, linking sustainability values with organizational values has been found to have a favourable correlation with GPP engagement (Pedersen *et al.*, 2018).

The findings of this section reveal that SMEs agree with the existence of the organizational challenge in their engagement with GPP. The medium-sized group generally give higher scores than the small-sized group for most of the organizational challenge statements, indicating that medium-sized companies perceive they are more affected by the organizational challenge of GPP participation than their smaller counterparts.

No.	Organization challenge of GPP participation	Overall			Small			Medium		
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
1	The size of the company hinders its innovation for green solutions	3.06	1.09	1	3.03	1.10	1	3.15	1.09	3
2	The company has not targeted suppliers that promote environmentally-friendly products/services	2.90	1.13	2	2.69	1.05	2	3.48	1.15	1
3	The company has not established a clear objective on purchase of green products and services	2.82	1.09	3	2.66	1.10	3	3.27	0.94	2
4	The company has no specific green practices policy	2.75	1.07	4	2.65	1.05	4	3.03	1.07	4
5	There is lack of support from company's top management for green procurement practices	2.61	1.16	5	2.57	1.16	5	2.73	1.15	5

Source: Created by authors

Table 11. Organization challenges of GPP participation to SME suppliers

As illustrated in Table 11, both groups (SMEs) rate all five organizational challenge items as "moderately agree" with the mean scores ranging from 2.57 to 3.03. In terms of mean score ranking, all proposed challenge items are similar for both groups, as well as for the overall respondents. However, among the five items, "The size of the company hinders its innovation for green solutions", is ranked first by the small-sized group but third by the medium-sized group. In addition, "The company has not targeted suppliers that promote environmentally-friendly products or services", is ranked second by the small-sized enterprises and first by the medium-sized group.

A detailed overview of the differences in perceptions between SMEs regarding the organizational challenge of GPP participation was identified through the independent *t*-test analysis and the results are presented in Table 12.

According to the results in Table 12, two statements of the organizational challenge are significantly different between the small and medium groups, where $t\ (126) = -3.646$ and p-value $= 0.000$ and $t\ (126) = -2.870$ and p-value $= 0.005$, whereby the recognized items are highlighted in Tables 11 and 12, respectively. Specifically, the result of the statement, "The company has not targeted suppliers that promote environmentally-friendly products/services", is significantly different between small enterprises ($M = 2.69$, SD $= 1.05$) and medium enterprises ($M = 3.48$, SD $= 1.15$). Also, "The company has not established a clear objective on purchase of green products and services", is significantly different between small enterprises ($M = 2.66$, SD $= 1.10$) and medium enterprises ($M = 3.27$, SD $= 0.94$). The "Not targeted supplier that promotes environmentally-friendly product/services" and "Not established a clear objective on purchase of green products and services" items are significantly more prevalent in medium enterprises than in small enterprises.

The possible explanation for this is the bigger size of medium enterprises compared to small enterprises, leads to higher costs due to their larger operations and higher production volume. Targeting suppliers that promote environmentally-friendly products or services for their operational businesses might be challenging due to the high costs to bear and the lack of availability of suppliers to support their production size as compared to small enterprises. Other than that, medium enterprises have a larger team, which means that each person has

Table 12. Summary of independent *t*-test results for the organization challenges of GPP to SME suppliers

No.	Organization challenge of GPP participation	Levene's test for equality of variances		*t*-test for equality of means		
		F	Sig	*t*	df	Sig. (two-tailed)
1	The size of the company hinders its innovation for green solutions	0.132	0.717	−0.537	124	0.592
2	The company has not targeted suppliers that promote environmentally-friendly products/services	0.428	0.514	−3.646	124	0.000
3	The company has not established a clear objective on purchase of green products and services	1.900	0.171	−2.870	124	0.005
4	The company has no specific green practices policy	0.231	0.632	−1.800	124	0.074
5	There is lack of support from company's top management for green procurement practices	0.139	0.710	−0.669	124	0.505

Source: Created by authors

fewer responsibilities, and there are more people to do the jobs compared to small enterprises. This is a challenge for medium enterprises to focus on a specific area and to establish a clear objective towards the purchase of green products and services. On the other hand, small enterprises have fewer workers, making it easier for them to communicate and ensure the fulfilment of the objective to purchase green products. As for medium enterprises, it is difficult to ensure that all workers have the same information and knowledge (Lighthouse, 2022), especially regarding the company's objective to purchase green products or services.

6. Implications, limitations, suggestions for future research and conclusion

The present study examines the barriers faced by SMEs for their involvement in GPP. Generally, the results reveal that the people challenge is ranked first by the SMEs, which marks it as the most agreeable major obstacle faced by them in GPP engagement. For financial challenge, the first ranked item is, "The company incurred higher production cost in producing green goods or services", whereas for the legal challenge, "There are inadequate policies and regulations on green procurement activities" is ranked highest. People and knowledge challenges both have "Lack of knowledgeable staff on GPP" and "There is insufficient information on green criteria in the GPP guidelines", respectively, in the first rank. Organizational challenge item, "The size of the company hinders its innovation for green solutions", is in the first place. In terms of differences in perceptions between the medium and small groups, medium enterprises are more affected by two items under the organizational challenge, i.e. "The company has not targeted suppliers that promote environmentally-friendly products/services" and "The company has not established a clear objective on purchase of green products and services".

The findings of the current study lead to important implications to both knowledge and practice. In terms of contribution to knowledge, the current study offers insightful information on the key challenges or barriers to GPP involvement among SMEs, and also contributes to the literature in the field of public sector accounting, where GPP is under one of the sustainability goals of governments in many countries. The present study may inspire academics and researchers to pursue further work in this area, which is crucially needed in line with the global sustainability agenda.

There are at least four implications to practice. Firstly, as the current results reveal that SMEs are having difficulties in terms of costs to produce green goods and services, therefore, the government may want to enhance financial incentives to eco-friendly SMEs, such as in the form subsidies or engagement with banks to offer more attractive and flexible financing terms and conditions. Secondly, in relation to the people challenge, relevant agencies, such as SME Corp., may want to offer regular workshops and training courses to procurement officers of SMEs to enhance their understanding of the concept of GPP, as well as on the procedures and guidelines related to GPP practices. Having better understanding of the concepts and green procurement procedures may further encourage SMEs to meet the green criteria, and subsequently, can ensure the successful implementation of the GPP agenda in the country. Thirdly, as the study also reveals that SMEs perceive that there is insufficient information in the current GGP guidelines, therefore, the relevant authorities, including the MGTC, may want to review and revise the existing GGP guidelines to include more relevant information which will be useful to the SMEs in applying and practicing green procurement. Furthermore, creative ways to disseminate important information and procedures can be made via various digital platforms, such as websites and social media, to enhance the effectiveness of the guidelines. Finally, as the present study also reveals that company size has a crucial influence on the extent of challenges faced, hence, the relevant

government authority or the SME Corp. may want to further investigate the specific challenges in an attempt to mitigate the challenges based on company size.

Despite the importance of the current findings, this study carries several limitations. For future research, the findings can be improved by taking a larger sample of all SMEs as the suppliers of GPP, including non-MyHIJAU mark recipients. This is because current respondents do not represent the whole population of SMEs involved in GPP, and a larger sample would help analyse the benefits of gaining national green recognition, i.e. the MyHIJAU mark, as it is not compulsory for the companies to engage with GPP to apply for the national mark.

Other than that, it is suggested that all sizes of companies that engage with GPP in Malaysia, and not just SMEs, be considered. This is because GPP has been introduced in the country to ensure participation in green practices, targeting the private sector, without specifying the size of the company. Large companies are also engaging with GPP; hence, taking their views into account would help in better understanding challenges from their perception.

In conclusion, the present study acknowledges the struggle faced by SMEs during their involvement in GPP despite their potential to steer the economy due to their large numbers. Hence, the formulation of relevant measures to mitigate the challenges and to protect SMEs will not only be beneficial for the economy, but also for the environment and future generations. This study provides a basis for future research to further explore the topic of GPP and its impact on SMEs as GPP suppliers in Malaysia.

References

Adham, K.N. and Siwar, C. (2012), "An empirical investigation of government green procurement (GGP) practices in Malaysia", *OIDA International Journal of Sustainable Development*, Vol. 4 No. 4, pp. 77-87, available at: SSRN: https://ssrn.com/abstract=2073517

Adham, K.N. and Siwar, C. (2017), "Factors influencing government green procurement practices: structural equation modelling analysis", *Middle East Journal of Entrepreneurship, Leadership and Sustainable Development*, Vol. 1 No. 1, pp. 61-89, available at: www.researchgate.net/publication/340547046

Adham, K.N., Siwar, C. and Aziz, S.A.A.G. (2012), "Pertimbangan alam sekitar dalam peraturan perolehan kerajaan di Malaysia: analisis arahan perbendaharaan", *Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke*, Vol. VII, p. 809, available at: www.researchgate.net/publication/283352949

Ahmad, N. and Buniamin, S. (2020), "Managers' awareness on green public procurement (GPP): a case of Malaysian public enterprises. Global business and management research", *An International Journal*, Vol. 12 No. 4, pp. 1-9, available at: http://gbmrjournal.com/pdf/v12n4/V12N4-21.pdf

Ahsan, K. and Rahman, S. (2017), "Green public procurement implementation challenges in Australian public healthcare sector", *Journal of Cleaner Production*, Vol. 152, pp. 181-197, doi: 10.1016/j.jclepro.2017.03.055.

Al Nuaimi, B.K., Khan, M. and Ajmal, M. (2020), "Implementing sustainable procurement in the United Arab Emirates public sector", *Journal of Public Procurement*, Vol. 20 No. 2, pp. 97-117, doi: 10.1108/JOPP-07-2019-0044.

Aldenius, M. and Khan, J. (2017), "Strategic use of green public procurement in the bus sector: challenges and opportunities", *Journal of Cleaner Production*, Vol. 164, pp. 250-257, doi: 10.1016/j.jclepro.2017.06.196.

Barr, S., Gilg, A. and Ford, N. (2005), "Defining the multi-dimensional aspects of household waste management: a study of reported behavior in Devon", *Resources, Conservation and Recycling*, Vol. 45 No. 2, pp. 172-192, doi: 10.1016/j.resconrec.2004.12.007.

Bhatty, S. (2012), "Drivers of incorporating sustainability in procurement organizations – E-sourcing forum", eSourcing Forum, available at: www.esourcingforum.com/archives/2012/04/10/driversof-incorporating-sustainability-in-procurement-organizations/

Bidin, Z.A., Bohari, A.A.M., Rais, S.L.A. and Saferi, M.M. (2018), April). "Green related practices for construction procurement", *In IOP Conference Series: Earth and Environmental Science*, Vol. 140 No. 1, doi: 10.1088/1755-1315/140/1/012099.

Bilan, A. (2023), "Challenges for upscaling green public procurement in Romania", *Perspective Politice*, Vol. 16 No. Special Issue, pp. 7-15, doi: 10.25019/perspol/23.16.0.1.

Blomea, C., Hollos, D., Paulraj, A. and Henke, M. (2015), "Erratum: green procurement and green supplier development: antecedents and effects on supplier performance", *International Journal of Production Research*, Vol. 52 No. 1, pp. 680-688, doi: 10.1080/00207543.2013.825748.

Bogran, A.P. and Džaja, D. (2015), "How do SMEs engage in green public procurement? An exploratory study of SMEs' barriers and enablers for green public procurement in Scotland", available at: http://umu.diva-portal.org/smash/get/diva2:781007/FULLTEXT01.pdf

Bohari, A.A.M., Skitmore, M., Xia, B. and Teo, M. (2017), "Green oriented procurement for building projects: preliminary findings from Malaysia", *Journal of Cleaner Production*, Vol. 148, pp. 690-700, doi: 10.1016/j.jclepro.2017.01.141.

Brammer, S. and Walker, H. (2011), "Sustainable procurement in the public sector: an international comparative study", *International Journal of Operations and Production Management*, Vol. 31 No. 4, pp. 452-476, doi: 10.1108/01443571111119551.

Che-Ha, N. and Mahmood, A. (2012), "Malaysian SMEs in the new economy", available at: http://handle.westernsydney.edu.au:8081/1959.7/uws:51283

Chen, C.C. (2005), "Incorporating green purchasing into the frame of ISO 14000", *Journal of Cleaner Production*, Vol. 13 No. 9, pp. 927-933, doi: 10.1016/j.jclepro.2004.04.005.

Cheng, W., Appolloni, A., D'Amato, A. and Zhu, Q. (2018), "Green public procurement, missing concepts and future trends–a critical review", *Journal of Cleaner Production*, Vol. 176, pp. 770-784, doi: 10.1016/j.jclepro.2017.12.027.

Da Costa, B.B. and Da Motta, A.L.T. (2019), "Key factors hindering sustainable procurement in the Brazilian public sector: a Delphi study", *International Journal of Sustainable Development and Planning*, Vol. 14 No. 2, pp. 152-171, doi: 10.2495/SDP-V14-N2-152-171.

De Souza Dutra, C.T., Rohan, U., Branco, R.R., Chinelli, C.K., De Araujo, A.J. and Soares, C.A. (2017), "Barriers and challenges to the sustainability requirements implementation in public procurement of engineering works and services", *Open Journal of Civil Engineering*, Vol. 07 No. 1, pp. 1-13, available at: www.scirp.org/journal/doi.aspx?DOI=10.4236/ojce.2017.71001

Delmonico, D., Jabbour, C.J.C., Pereira, S.C.F., de Sousa Jabbour, A.B.L., Renwick, D.W.S. and Thomé, A. M.T. (2018), "Unveiling barriers to sustainable public procurement in emerging economies: Evidence from a leading sustainable supply chain initiative in Latin America", *Resources, Conservation and Recycling*, Vol. 134, pp. 70-79, doi: 10.1016/j.resconrec.2018.02.033.

Economic Planning Unit (EPU) (2015), *Eleventh Malaysia Plan, 2016-2020: Anchoring Growth on People*, Prime Minister's Department, Putrajaya.

Economic Planning Unit (EPU) (2021), *Twelfth Malaysia Plan 2021–2025: A Prosperous, Inclusive, Sustainable Malaysia*, Malaysia, Putrajaya.

Erridge, A. and Hennigan, S. (2012), "Sustainable procurement in health and social care in Northern Ireland", *Public Money and Management*, Vol. 32 No. 5, pp. 363-370, doi: 10.1080/09540962.2012.703422.

Flynn, A., Davis, P., McKevitt, D. and McEvoy, E. (2013), "Sustainable public procurement in practice: case study evidence from Ireland", available at: https://orca.cardiff.ac.uk/id/eprint/94463

Geng, Y. and Doberstein, B. (2008), "Greening government procurement in developing countries: building capacity in China", *Journal of Environmental Management*, Vol. 88 No. 4, pp. 932-938, doi: 10.1016/j.jenvman.2007.04.016.

Gerstenfeld, A. and Roberts, H. (2000), "Size matters: barriers and prospects for environmental management in small and medium sized enterprises", *Small and Medium-Sized Enterprises and the Environment: business Imperatives*, Vol. 1 No. 80, pp. 106-118.

Ghazilla, R.A.R., Sakundarini, N., Abdul-Rashid, S.H., Ayub, N.S., Olugu, E.U. and Musa, S.N. (2015), "Drivers and barriers analysis for green manufacturing practices in Malaysian SMEs: a preliminary findings", *Procedia CIRP*, Vol. 26, pp. 658-663, doi: 10.1016/j.procir.2015.02.085.

Gimenez-Pujol, A. and Castano, L. (2013), "Green public procurement in the Asia Pacific Region: challenges and opportunities for green growth and trade", *Asia-Pacific Economic Cooperation Secretariat*, Singapore (Singapore).

Hawkins, T.G., Gravier, M.J. and Powley, E.H. (2011), "Public versus private sector procurement ethics and strategy: what each sector can learn from the other", *Journal of Business Ethics*, Vol. 103 No. 4, pp. 567-586, doi: 10.1007/s10551-011-0881-2.

Ho, L.W.P., Dickinson, N.M. and Chan, G.Y.S. (2010), "Green procurement in the Asian public sector and the Hong Kong private sector", *Natural Resources Forum*, Vol. 34 No. 1, pp. 24-38, doi: 10.1111/j.1477-8947.2010.01274.x.

Hutchinson, A. and Hutchinson, C. (1995), "Sustainable regeneration of the UK's small and medium-scale enterprise sector: some implications of SME response to BS 7750", *Greener Management International*, Vol. 9, pp. 74-84.

International Green Purchasing Network (IGPN) (2010). *Green Purchasing: The New Growth Frontier – Policies and Programmes to Enhance Green Business Growth in Asia, Europe and the United States*, International Green Purchasing Network (IGPN), Japan.

Khan, M.W.A., Ting, N.H., Kuang, L.C., Darun, M.R., Mehfooz, U. and Khamidi, M.F. (2018), "Green procurement in construction industry: a theoretical perspective of enablers and barriers", *MATEC Web of Conferences*, Vol. 203, p. 2012, doi: 10.1051/matecconf/201820302012.

Korea Environmental Industry and Technology Institute (KEITI) (2017), *Current Status of Green Public Procurement and Eco-Labelling in Four Asian Countries*, Korea Environmental Industry and Technology Institute (KEITI).

Lasuin, C.A. and Ng, Y.C. (2014), "Factors influencing green purchase intention among university students", *Malaysian Journal of Business and Economics (MJBE)*, Vol. 1 No. 2, doi: 10.51200/mjbe.v1i2.116.

Lighthouse (2022), "Why everything breaks when you reach 25 employees", Retrieved February 12, 2022, available at: https://getlighthouse.com/blog/company-growth-25-employees/#communication

Lundberg, S., Marklund, P.O., Strömbäck, E. and Sundström, D. (2015), "Using public procurement to implement environmental policy: an empirical analysis", *Environmental Economics and Policy Studies*, Vol. 17 No. 4, pp. 487-520, doi: 10.1007/s10018-015-0102-9.

McCrudden, C. (2004), "Using public procurement to achieve social outcomes", *Natural Resources Forum*, Vol. 28 No. 4, pp. 257-267, doi: 10.1111/j.1477-8947.2004.00099.x.

McMurray, A.J., Islam, M.M., Siwar, C. and Fien, J. (2014), "Sustainable procurement in Malaysian organizations: practices, barriers and opportunities", *Journal of Purchasing and Supply Management*, Vol. 20 No. 3, pp. 195-207, doi: 10.1016/j.pursup.2014.02.005.

Ma, Y., Liu, Y., Appolloni, A. and Liu, J. (2021), "Does green public procurement encourage firm's environmental certification practice? The mediation role of top management support", *Corporate Social Responsibility and Environmental Management*, Vol. 28 No. 3, pp. 1002-1017, doi: 10.1002/csr.2101.

Malaysian Green Technology and Climate Change Corporation (MGTC) (2017), "MyHIJAU mark branding guideline", available at: www.myhijau.my/using-the-mark/

Malaysian Green Technology and Climate Change Corporation (MGTC) (2021), "guidelines for green technology tax incentive (gita/gite)", available at: www.mgtc.gov.my/what-we-do/green-incentives/green-investment-tax-incentives-gita-gite/

Malaysian Green Technology and Climate Change Corporation (MGTC) (2022), "Annual report 2021", available at: https://ar2021.mgtc.gov.my/pdf/mgtc-annual-report-2021.pdf

Masudin, I., Summah, B., Zulfikarijah, F. and Restuputri, D.P. (2020), "Factors affecting the implementation of green procurement: empirical evidence from Indonesian educational institution", *Jurnal Ilmiah Teknik Industri*, Vol. 19 No. 2, pp. 186-197, doi: 10.23917/jiti.v19i2.10718.

Meehan, J. and Bryde, D. (2011), "Sustainable procurement practice", *Business Strategy and the Environment*, Vol. 20 No. 2, pp. 94-106, available at: www.scopus.com/inward/record.uri?eid=2-s2.0-79251568005&doi=10.1002%2fbse.678&partnerID=40&md5=b89c5cec2a2ef62dfe982212f75cc009

Meehan, J. and Bryde, D.J. (2015), "A field-level examination of the adoption of sustainable procurement in the social housing sector", *International Journal of Operations and Production Management*, Vol. 35 No. 7, pp. 982-1004, doi: 10.1108/IJOPM-07-2014-0359.

Michelsen, O. and de Boer, L. (2009), "Green procurement in Norway; a survey of practices at the municipal and county level", *Journal of Environmental Management*, Vol. 91 No. 1, pp. 160-167, doi: 10.1016/j.jenvman.2009.08.001.

Ministry of Energy, Green Technology and Water (KeTTHA) (2014), "Government green procurement (GGP); guidelines for government procurers", Version July 2014.

Ministry of Energy, Green Technology and Water Malaysia (KeTTHA) (2010), *National Green Technology Policy, Ministry of Energy, Green Technology and Water Malaysia*, Putrajaya.

Ministry of Natural Resources and Environment Malaysia (MNRE) (2009), *National Policy on Climate Change*, Ministry of Natural Resources and Environment Malaysia, Putrajaya.

Nyachombamachira, T. and Juma, D. (2016), "Factors affecting implementation of green procurement Kenya: a case study of Coca-Cola bottling limited Nairobi".

Ochoa, A., Führ, V. and Günther, D. (2017), "Green purchasing in practice: experiences, opportunities and potentia for eco-procurement", in Erdmenger, C. (Ed.), *Buying into the Environment*, Routledge, New York, NY, doi: 10.1108/JOPP-07-2019-0044.

Parikka-Alhola, K. (2008), "Promoting environmentally sound furniture by green public procurement", *Ecological Economics*, Vol. 68 Nos 1/2, pp. 472-485, doi: 10.1016/j.ecolecon.2008.05.004.

Pedersen, E.R.G., Gwozdz, W. and Hvass, K.K. (2018), "Exploring the relationship between business model innovation, corporate sustainability, and organisational values within the fashion industry", *Journal of Business Ethics*, Vol. 149 No. 2, pp. 267-284, doi: 10.1007/s10551-016-3044-7.

Prasad, D.S., Pradhan, R.P., Gaurav, K., Chatterjee, P.P., Kaur, I., Dash, S. and Nayak, S. (2018), "Analysing the critical success factors for implementation of sustainable supply chain management: an Indian case study", *Decision*, Vol. 45 No. 1, pp. 3-25, available at: www.scopus.com/inward/record.uri?eid=2-s2.0-85044389039&doi=10.1007%2fs40622-017-0171-7&partnerID=40&md5=a8f1e19441ddf0ef4579edeb5614b2cb

Ramakrishnan, P., Haron, H. and Goh, Y.N. (2015), "Factors influencing green purchasing adoption for small and medium enterprises (SMEs) in Malaysia", *International Journal of Business and Society*, Vol. 16 No. 1, doi: 10.33736/ijbs.552.2015.

Ramayah, T., Lee, J.W.C. and Mohamad, O. (2010), "Green product purchase intention: some insights from a developing country", *Resources, Conservation and Recycling*, Vol. 54 No. 12, pp. 1419-1427, doi: 10.1016/j.resconrec.2010.06.007.

Rizzi, F., Frey, M., Testa, F. and Appolloni, A. (2014), "Environmental value chain in green SME networks: the threat of the Abilene paradox", *Journal of Cleaner Production*, Vol. 85, pp. 265-275, doi: 10.1016/j.jclepro.2014.09.001.

Salam, M.A. (2008), "An empirical investigation of the determinants of adoption of green procurement for successful green supply chain management", *2008 4th IEEE International Conference on Management of Innovation and Technology*, pp. 1038-1043, IEEE, doi: 10.1109/ICMIT.2008.4654511.

Sekaran, U. (2003), *Research Methods for Business*, John Willey and Son.

Shaharudin, M.R., Zainoddin, A.I., Abdullah, D., Hotrawaisaya, C., Soonthornpipit, H. and Norddin, N. (2018), "Factors that influence the green purchasing practices among suppliers of electrical components", *AIP Conference Proceedings, 2020 (October 2018)*, doi: 10.1063/1.5062692.

Simcoe, T. and Toffel, M.W. (2014), "Government green procurement spillovers: evidence from municipal building policies in California", *Journal of Environmental Economics and Management*, Vol. 68 No. 3, pp. 411-434, doi: 10.1016/j.jeem.2014.09.001.

SME Corp (2021), "SME insights 2019/20", Retrieved February 15, 2023, available at: www.smecorp.gov.my/index.php/en/component/content/article/191-laporan-tahunan/4323-sme-insights-2019-20?layout=edit

Testa, F., Annunziata, E., Iraldo, F. and Frey, M. (2016), "Drawbacks and opportunities of green public procurement: an effective tool for sustainable production", *Journal of Cleaner Production*, Vol. 112, pp. 1893-1900, doi: 10.1016/j.jclepro.2014.09.092.

Testa, F., Iraldo, F., Frey, M. and Daddi, T. (2012), "What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey", *Ecological Economics*, Vol. 82, pp. 88-96, doi: 10.1016/j.ecolecon.2012.07.011.

Thomson, J. and Jackson, T. (2007), "Sustainable procurement in practice: lessons from local government", *Journal of Environmental Planning and Management*, Vol. 50 No. 3, pp. 421-444, doi: 10.1080/09640560701261695.

United Nations Development Programme (UNDP) (2008), "Environmental procurement, UNDP procurement support office", available at: www.undp.org/procurement

Vejaratnam, N., Mohamad, Z.F. and Chenayah, S. (2020), "A systematic review of barriers impeding the implementation of government green procurement", *Journal of Public Procurement*, Vol. 20 No. 4, pp. 451-471, doi: 10.1108/JOPP-02-2020-0013.

Vluggen, R., Gelderman, C.J., Semeijn, J. and van Pelt, M. (2019), "Sustainable public procurement-external forces and accountability", *Sustainability (Switzerland)*, Vol. 11 No. 20, pp. 9-17, doi: 10.3390/su1120569.

Walker, H. and Brammer, S. (2009), "Sustainable procurement in the United Kingdom public sector", *Supply Chain Management: An International Journal*, Vol. 14 No. 2, pp. 128-137, doi: 10.1108/13598540910941993.

Walker, H. and Phillips, W. (2009), "Sustainable procurement: emerging issues", *International Journal of Procurement Management*, Vol. 2 No. 1, pp. 41-61, doi: 10.1504/IJPM.2009.021729.

Walker, H., Di Sisto, L. and McBain, D. (2008), "Drivers and barriers to environmental supply chain management practices: lessons from the public and private sectors", *Journal of Purchasing and Supply Management*, Vol. 14 No. 1, pp. 69-85, doi: 10.1016/j.pursup.2008.01.007.

Wang, Q., Zhang, R. and Liu, J. (2020), "Price/time/intellectual efficiency of procurement: Uncovering the related factors in Chinese public authorities", *Journal of Purchasing and Supply Management*, Vol. 26 No. 3, p. 100622, doi: 10.1016/j.pursup.2020.100622.

Further reading

Faith-Ell, C., Balfors, B. and Folkeson, L. (2006), "The application of environmental requirements in Swedish road maintenance contracts", *Journal of Cleaner Production*, Vol. 14 No. 2, pp. 163-171.

Islam, M.M. and Siwar, C. (2013), "A comparative study of public sector sustainable procurement practices, opportunities and barriers", *International Review of Business Research Papers*, Vol. 9 No. 3, pp. 62-84, available at: http://hdl.handle.net/1959.3/369233

McMurray, A.J., Islam, M., Siwar, C. and Fien, J. (2009), "Sustainable procurement in the public and private sector–a case study in Malaysia", *23rd Australian and New Zealand Academy of Management Conference (ANZAM 2009). held at RMIT University, Australia Melbourne*, pp. 2-4.

Ribeiro, C.G.E.I., Jr, Rauen, A.T. and Li, Y. (2018), "Unveiling the public procurement market in Brazil: a methodological tool to measure its size and potential", *Development Policy Review*, Vol. 36 No. S1, pp. O360-O377, doi: 10.1111/dpr.12301.

Svensson, G. (2007), "Aspects of sustainable supply chain management (SSCM): conceptual framework and empirical example", *Supply Chain Management: An International Journal*, Vol. 12 No. 4, pp. 262-266, doi: 10.1108/13598540710759781.

Thai, K.V. (2001), "Public procurement re-examined", *Journal of Public Procurement*, Vol. 1 No. 1, pp. 9-50, doi: 10.1108/JOPP-01-01-2001-B001.

Tucker, M. (1995), "Carbon dioxide emissions and global GDP", *Ecological Economics*, Vol. 15 No. 3, pp. 215-223, doi: 10.1016/0921-8009(95)00045-3.

United Nations Environment Programme (UNEP) (2011), "Buying for a better world-a g uide on sustainable procurement for the UN system", available at: www.oneplanetnetwork.org/sites/default/files/bfabw_final_web_1.pdfdefault/files/bfabw_final_web_1.pdf

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