Salford Business School

Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributor in Ghana.

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Executive Summary

Sustainability challenges confronting developing countries are numerous and substantial and appear to be exacerbating overtime. Sustainable Public Procurement could be of significant strategic importance to developing countries such as Ghana who spend substantial proportions of their Gross Domestic Product in public procurement. In the tapestry of Ghana's development, the electricity distribution organisation emerges as a vital thread, interweaving economic progress and societal welfare.

This case study research will assess the level of knowledge and appreciation by internal and external stakeholders in sustainable product procurement to identify relevant qualitative factors to achieve Best Value for Money procurement. The aim for this study is to investigate how sustainability factors are not considered as key factors of importance when procuring goods and include it within the Ghanaian electricity distribution organisation. Main objectives are therefore:

1. To find Sustainable Product key factors for tender evaluation in the electricity distribution organisation in Ghana.

2. To find a Model that will use factors obtained in objective 1 to evaluate tenders for goods procurement.

3. To test the aforementioned model on goods procurement tenders process for the electricity distribution organisation in Ghana.

The premise for choice of approach to this research was influenced by the search for alternatives to tackle industry problem through practical and hands-on solution.

The research philosophy in this qualitative study shaped the researcher's approach to understand and interpret social phenomena, influenced the choice of methods and data analysis techniques, and acknowledged the role of the researcher in the research process. It explained how the researcher gained meaningful insights into the complexities of human experiences and behaviour in the research process and discussed the specific research strategy employed, detailing the qualitative methods and techniques used to gather and analyse data.

From the identification of sustainability drivers to the exploration of barriers hindering seamless integration, the literature review aimed to unravel the multifaceted dimensional mix that defined sustainability within the public procurement processes and importance of infusing sustainability into tender evaluations.

The inductive approach to data collection was elaborated. A pilot study in the form of qualitative interviews was discussed. The use of Computer Assisted Qualitative Data Analysis Software e.g., NVivo 12 & 14, in analysing data from the pilot to the main study was discussed along with how rigor was ensured.

A reflective learning cycle approach, which was subjected to the ‘Gibbs’ reflective cycle, was used to navigate professional development in the 5-year doctoral journey to alter the underlying, governing variables and assumptions in the procurement strategy.

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List of Abbreviations

Corporate social responsibility	CSR	Entity Tender Committee	ETC
Chartered Institute of Procurement & Supply	CIPS	Small & Medium Scale Enterprise	SME
The Electricity Distributor of Ghana	EDG	Margin of Preference	MoP
Public Procurement Authority	PPA	Environmental, Social & Corporate Governance	ESG
Total acquisition cost of ownership	TACO	Internally Generated Fund	IGF
Political, economic, social, technological, and legal	PESTL	Health & Safety	H&S
Supply Chain	SC	Competitive Dialogue Procedure	CDP
Sustainable Public Procurement	SPP		
Computer Assisted Qualitative Data Analysis Software	CAQDAS	Most Economically Advantageous Tender	MEAT
Sustainability procurement	SP	Analytical Hierarchy Process	AHP
Sustainable Development Goals	SDG	Service Level Agreement	SLA
Enterprise Resource Product	ERP	Public Private Partnership	PPP
Higher National Diploma	HND	University of Salford Repository	USIR
United Nation	UN	Reflective Thematic Analysis	RTA
Fortune Institute of International Business	FIIB	International Standards Organisation	ISO
World Environment Day	WED	Value Added Tax	VAT
Best Value for Money	BVfM	Instructions to Tender	ITT
Key performance indicators	KPI	Tender Data Sheet	TDS
Gross Domestic Product	GDP	Commercial off-the-shelf	COTS
European Institute of Purchasing Management	EIPM	Hazard Identification and Risk Assessment	HIRA
Value for Money	VfM	Standard Operation Procedure	SOP
Green Supply Chain Management	GSCM	Environment and Social Performance	ESP
Supply Chain Management	SCM	Job Hazard Analysis	JHA
Green Public Procurement	GPP	Personal Protective Equipment	PPE
Resource Competence Capabilities	RCC	Sustainable Supply Chain Management	SSCM
Research & Development	R&D	Bulk Supply Point	BSP
State Owned Enterprises	SOE		
Health Safety & Environment	HSE		
Non-Governmental Organisation	NGO		
European Union	EU		
Safety Health & Environment	SHE		
World Health Organisation	WHO		
General Data Protection Regulation	GDPR		
External Stakeholder	ES		
Internal Stakeholder	IS		
Chief Executive Officer	CEO		
Information & Communication Technology	ICT		

Chapter 1:

Introduction

This chapter sets the stage to explore the nuances of sustainable procurement within Ghana's electricity distribution landscape, identifying a roadmap to infuse sustainability principles into the heart of evaluating procurement tenders in the quest for the best supplier of products. It examined the integration of sustainable procurement practices in developing countries, with particular emphasis on public procurement and specifically with electricity distribution in Ghana where procurement decisions significantly impact environmental and social outcomes. It highlighted the primary aim of this study which was to develop a model for evaluating tenders for sustainable products in the electricity distribution organisation in Ghana. Limitations and delimited of this study considered the potential subjectivity inherent in qualitative research and the challenges of generalising findings from a single critical case of public procurement practices within Ghana's electricity distribution sector. The chapter, therefore, introduced ways to bridge the gap in knowledge and practice concerning sustainable procurement in Ghana's electricity distribution organisation.

Foundation of the Study:

Procurement, according to the Chartered Institute of Procurement and Supply (CIPS.org, 2020), is the "buying of goods and services to enable organisations function in an ethical way while meeting bottom-line requirements". As a mainstream organisational function, buying has evolved from being considered as 'purchasing' to 'procurement' with purchasing being part of the defining process of manufacturing while procurement is used in government acquisitions (Murray, 2009: Stentoft Arlbjørn & Vagn Freytag, 2012: Arlbjørn & Freytag, 2012: Hafezi & Zolfagharinia, 2018). Abolbashari, Chang, Hussain and Saberi (2018) and Montalbán-Domingo, García-Segura, Sanz-Benlloch & Pellicer (2020) explained the importance and significance of procurement as not just being a support or a buying function but as a key strategic tool which is vital for the success of any firm. It is for this purpose that the role of procurement in ensuring that sustainability in the supply chain is adhered to becomes crucial.

Background of the Problem:

Recent procurement practices call for public procurement to be assessed beyond price considerations and include environmental and social factors. This was expressed by Gelderman, Semeijn and Bouma (2015), Keulemans and Van de Walle (2017), Adjei-Bamfo and Maloreh-Nyamekye (2019) and Baranovsky, Tkachenko, Glonti, Levchenko, Bogatyrova, Beridze and Zelenitsa (2020) that the impact of sustainability, using financial cost implications in the consumption and production behaviours of suppliers, has evolved to include entire life cycle of the goods, from production to disposal. Adjei-Bamfo and Maloreh-Nyamekye (2019) and Baranovsky et al. (2020) further evaluated procurement using total cost of ownership, including maintenance, energy efficiency, and potential long-term savings.

According to Salvia, Leal Filho, Brandli and Griebeler (2019) and Etse, McMurray and Muenjohn (2021) sustainability challenges including the economic, social and environmental issues confronting developing countries are numerous and substantial, and appear to be exacerbating with the passage of time, and to address these worsening situation, Sustainable Public Procurement (SPP) could be of significant strategic importance to these countries who spend substantial proportions of their Gross Domestic Product (GDP) in public procurement. Etse et al. (2021) reiterated that by procuring environmentally friendly products and demanding that suppliers reduce carbon footprints in their production and supply chain activities, public sector organisations would be in a position to contribute to environmental sustainability.

The existing procurement processes and regulations in Ghana does not adequately incorporate sustainability considerations. These legal processes prioritise value for money with little focus on incorporating economic, environmental, and social dimensions into purchasing of goods and services (Peprah, Brako & Akosah, 2018: Adzimah, Lei & Ishawu, 2020). The emphasis on lowest price or upfront costs, rather than life cycle costs, can discourage sustainable adoption or sustainable alternatives (Klingler, 2020). The inclusion of environmental and corporate social responsibility (CSR) issues in the procurement process becomes crucial because bottom-line requirement alone will only be concentrating on profit and loss at the expense of the social and environmental consequence of the procurement process (Qorri, Mujkić, &

Kraslawski, 2018: Ali, Kaur, & Khan, 2022). However, there have been few studies to examine the extent to which stakeholders in the procurement process or firms can influence the pursuit of sustainable procurement in Ghana (Kusi, Aggrey & Nyarku, 2014: Peprah et al., 2018: Adzimah, Lei & Ishawu, 2020).

The Electricity Distributor Ghana Limited (EDG)

The Electricity Distributor of Ghana (EDG-Not the actual name), the organisation of study, is a limited liability company and fully owned by the State. It is responsible for the downstream distribution of electricity to industry and for domestic use, after generation and transmission of electricity upstream by other state-owned organisations. Having been in existence since late 1940's as a department, EDG had evolved into a corporation and then incorporated as a limited liability company at the turn of the 20th century (Electricity Distributor of Ghana, 2022). As a state own enterprise, EDG's procurement is guided by a Public Procurement Authority (PPA) document provided by law, i.e., Act 663 of 2003 (914 as revised). The Act provides guidelines for all forms of procurement, be it goods, works, services, and indicates that these processes must be done in consideration with sustainability issues (Ampofo, 2021).

Sustainable Procurement in EDG

There is limited empirical literature on the effect of procurement practices on service provision, especially so, with the electricity sector in developing countries (Anane, Adoma & Awuah, 2019). The current evaluation of procurement process using EDG procurement guidelines (2020) does not include sustainability as a primary performance measurement or evaluation tool, despite sustainability forming part of defining responsibilities of the procurement directorate (EDG strategy document, 2022). This approach prevents the procurement process from achieving Value for Money (VFM) procurement which alongside price considers quality, reliability, durability etc. This approach is not inclusive, inconsistent with strategic goals of the organisation and do not consider the effects of uncertainty (Beamon, 1999: López-Vargas & Cárdenas-Aguirre, 2021) and not sustainable. According to Ghalayini and Noble (1996), Mohammed and Özdemir (2019) and, recently, Patil, Madaan, Chan and Charan (2022), traditional performance measurement based on financial data, i.e., return on investment, return on sales, price variances, sales per employee,

productivity etc., are no longer representative of the information needs of today's competitive global market and changing societal demands. Plaza-Úbeda et al. (2021) corroborates this by indicating that labour, which used to be a major cost component, rarely exceeds half of the manufacturing cost of today's organisations' cost buildup. Increasing environmental awareness, preferences of the society and legal framework have necessitated the need for a holistic view on environmental business practices (Plaza-Úbeda et al., 2021; Patil, Madaan, Chan & Charan, 2022).

Problem Statement

Current procurement models used by the electricity distributor in Ghana predominantly focus on cost, quality, and time, often overlooking critical sustainable development factors such as environmental impact, social responsibility, and economic benefits within the community. The lack of a comprehensive model that integrates these sustainability dimensions into the procurement decision-making process can hinder the sector's ability to contribute to Ghana's Sustainable Development Goals (SDGs). There is a need for an effective, scalable, and replicable model that can evaluate tenders not only based on traditional metrics but also on their ability to enhance sustainability (Berrone, Ricart, Duch, Bernardo, Salvador, Piedra Peña & Rodríguez Planas, 2019; Pellegrini, Locatelli, Meschini, Pattini, Seghezzi, Tagliabue & Di Giuda, 2021).

Purpose Statement

The purpose of this qualitative study is to investigate how sustainable products factors are not considered as key factors of importance when procuring goods and include them within the Ghanaian electricity distribution organisation procurement process. It will involve the evaluation of sustainable procurement practices in EDG with a view of creating evidence to influence policy review in the procurement of goods. This will include the researcher being self-critical, questioning assumptions based on philosophical orientation as against the organisational standpoint (Fromm, Radianti, Wehking, Stieglitz, Majchrzak & vom Brocke, 2021). Examples of common unethical procurement practices and their effect on the environment and employees would be considered. Practices that consider the nonfinancial long-term benefits associated with Total Acquisition Cost of Ownership (TACO) which is the life cycle

cost of buying, using, maintaining and disposal of a product (Moon & Lee, 2019: Roda, Macchi & Albanese, 2020) would be favoured.

The need to instil positive attitude in stakeholders toward the environment through the creation of awareness on sustainable development or sustainability issues, remained crucial in the study (Crotty & Hall, 2014: Iizuka, 2016: Żywiołek, Rosak-Szyrocka & Mrowiec, 2021). To this end investigating the level of awareness of the benefits obtained from sourcing sustainably by professionals or practitioners, internal end users and some key suppliers of EDG would be needed to enhance goods procurement in EDG.

Research Question

The research questions therefore were.

1. What is the specific sustainability needs and priorities within the Ghanaian electricity distribution sector?

2. What existing models of sustainable procurement are applicable to the Ghanaian electricity distribution organisation?

Aims and Objectives of Study

This research assessed the level of knowledge and appreciation by internal and external stakeholders in sustainable procurement to identify relevant qualitative variables or factors to be used to achieve Best Value for Money (BVfM) procurement. Key challenges bedevilling the introduction of sustainability procurement in EDG had been the creation of a clear and compelling case for change in the existing procurement process which give preference to price rather than value of goods, works and/or services bought (Delmonico et al., 2018: Ogunsanya, Aigbavboa, Thwala, & Edwards, 2022). EDG's current procurement activities can well be identified with the making of a case for "sustainability procurement" change and, therefore, the need to addressing systematic challenges and introducing a habit of receptiveness, and a policy that will adopt sustainability in the evaluation of suppliers during the tendering process (Klingenberg et al, 2020).

Key aim is to use research to find an existing model that will utilise sustainable product factors in evaluating procurement tenders by the electricity distributor in Ghana.

Main objectives were:

1. To find Sustainable Product key factors for tender evaluation in the electricity distribution organisation in Ghana.

2. To find a Model that will use factors obtained in objective 1 to evaluate tenders for goods procurement.

3. To test the aforementioned model on goods procurement tender process for electricity distribution organisation in Ghana.

The next stage discussed the research philosophy in this qualitative study that shaped the researcher's approach to understanding and interpreting social phenomena, with same influencing the choice of methods and data analysis techniques, acknowledging the role of the researcher in the research process. It explained how the researcher gained meaningful insights into the complexities of human experiences and behaviour in the research process. It discussed the methods and techniques used to gather and analyse data and, also, touched on the limitations, delimitations and assumptions employed in the research.

Research Philosophy

The philosophical approach to the research problem was based on a qualitative ontology that combined nature of reality and the existence of entities. From a relativist ontological point, it acknowledged the use of multiple perspectives and truths prevailing in an organisation that employs personnel from diverse disciplines, i.e., physical sciences to social sciences (Kamal, 2019: Al-Ababneh, 2020). The premise for choice of approach to this research was influenced by the search for alternatives to tackle industry problem through practical and hands-on solution rather than the overreliance on theory (Žukauskas, Vveinhardt, & Andriukaitienė, 2018: Hürlimann, 2019: Kirongo & Odoyo, 2020: Bowyer, Amos & Stevens, 2021). It further developed assumptions or preliminary statements of reasoning to give justifications for choice of approach, its knowledge, and insight obtained from intellectual and natural engagements (Hürlimann, 2019: Kirongo & Odoyo, 2020: Bowyer, Amos & Stevens,

2021). For Willig (2019), Hathcoat, Meixner and Nicholas (2019) and Al-Ababneh (2020), there had been various philosophical positions that defined reality and the role sustainable procurement play in contemporary society and, therefore, the study drew on the researcher's decision to adopt the ontological relativism with the belief that multiple truths exist, and experiences can be perceived differently depending on the viewpoint of the observer, and that the means by which data is collected can significantly determine the results. (Hinrichs & Wettlin, 2019: McGregor, Whitaker & Sritharan, 2020: Asokan, Yarime & Onuki, 2020: Walsh, Böhme & Wamsler, 2021).

There had also been some difficulty of implementation and practice of this reality in the electricity distribution organisation in Ghana even with sustainable procurement printed in black and white in policy document of EDG (EDG Strategy document, 2022). The focus for the research was, therefore, on understanding the subjective experiences, meanings, and interpretations of individuals or groups within the electricity distribution supply chain. This type will aim to explore complex social phenomena in their natural settings and gain in-depth insights into human behaviour and interactions. Therefore, the research strategy to this research relied, not only, upon the text but the context of the situation confronting an organisation, i.e., EDG.

The qualitative approach adopted in the research gained its inspiration from the view that non-random sampling which is associated, principally, with a range of non-positivist epistemologies and qualitative research, was based on judgement rather than statistical probability (Saunders, 2012: Jowett, 2020) and that organisational and management sciences prefer the use of the interpretivist approach to such research as opposed to earlier preference to the positivist approaches (Bercht, 2021: Kyngäs, 2020: Dyar, 2022). The constructivist epistemology emphasised researcher's interpretations as essential in shaping the understanding of reality. As suggested by Saunders, Lewis and Thornhill (2015), Voinea and Fratostiteanu (2018), Negi, Pérez-Pineda and Blankenbach, (2020) the epistemology of sustainable procurement in developing economies such as the Republic of Ghana could be found in answers to questions, such as, 'What is sustainable procurement?', 'How are sustainable goods procured?' and 'What do people know about sustainable procurement?' The positivist is of the view that truth is observed and described from the objective viewpoint, and that stakeholders on the receiving end cannot have any influence on sustainable manifestation (Cauvain, 2018: Pederneiras, Meckenstock, Carvalho & Barbosa-

Póvoa, 2022). For the purpose of this research, an induced and subjective interpretation (Tölkes, 2018: Ritch, 2021: Gowreesunkar, Mohanty & Maingi, 2022) was obtained by conducting interviews on procurement practitioners and professionals in EDG and some external stakeholders to identify the right drivers and factors for good sustainable practices for effective procurement. This corroborated the notion that practitioners who practice phenomena in their natural environment will align same to the right sustainability dimension (Silvestre & Ţîrcă, 2019: Ives, Freeth & Fischer, 2020) for BVfM procurement.

An interpretivist approach to data collection from participants who are mainly key stakeholders in the goods supply chain in EDG, as described by Pham (2018), Pulla and Carter (2018) and later, Curry (2020) as well as Alharahsheh and Pius (2020), would be used to find out why sustainable procurement had failed to see the light of day in EDG even when there was clear evidence of attempts to get it included in the procurement processes (EDG Procurement guidelines, 2020). Therefore, the purposive sampling method from internal and external stakeholders in the goods or product supply chain was fit for purpose.

This inductive approach, however, allowed for a further probe using secondary data from periodic Safety, Health and Environment reports or contracts awarded for the supply of products. This is because findings from a thematic analysis on a single phenomenon may have multiple interpretations instead of a process of measurement to establish truth (Pham, 2018: Obi-Ani, Anikwenze & Isiani, 2020). Therefore, the initial subjective approach to the search for sustainable procurement factors in the EDG will be subjected to deductive scrutiny after acceptance for implementation or use as a measurement tool.

Researcher acknowledged self in the instrumental role played during the research process by recognising own values, experiences and biases that shaped the study outcomes (Johnson, Adkins & Chauvin, 2020). This reflexive approach of self-awareness and reflection helped researcher to recognise and manage subjectivity to ensure that the research remains rigorous and credible. To gain trustworthiness and credibility to ensure that there is rigor, techniques such as triangulation, i.e., the use of multiple data sources or methods, seek participants' feedback on findings, and peer debriefing where colleagues join in discussing the research process, will be

employed to enhance the study (Mackieson, Shlonsky & Connolly, 2019; Johnson, Adkins & Chauvin, 2020).

Research Strategy

According to Creswell, (2013) and Gray, Wong-Wylie, Rempel and Cook (2020), in-person interviews were the traditional form of generating data in qualitative studies. However, this is no longer feasible due to geographically dispersed participants who are unable or unwilling to travel, or insufficient research funding does not allow. Online technologies such as emailing and virtual conferencing, therefore, provided researchers and participants with a cost effective and convenient alternative (Mason & Ide, 2014; James, 2015). This research, therefore, leveraged on video or audio-conferencing software such as “teams” or “zoom” because of their increasing accessibility to Internet services the world over (Fielding, 2010; Nehls, Smith, & Schneider, 2014; Gray et al., 2020).

The qualitative research relied on nuanced judgement that require researcher reflexivity (Olmos-Vega, Stalmeijer, Varpio & Kahlke, 2022). Therefore, to be aware of similarities and differences of researchers’ position as an insider or outsider, whether they have shared experiences with participants as stakeholders in EDG, the quality of the research was articulated to self and others for acceptance and authenticity (Berger, 2015; Teh & Lek, 2018; Dodgson, 2019). To further ensure that the qualitative research had rigor and quality, and that it had the standard for determining trustworthiness, the researcher used reflexivity to clearly describe the contextual intersecting relationships between stakeholders (Teh & Lek, 2018). E.g., professional status, work experience, end user, supplier etc., was distinctly used to distinguished between participants and researcher to increase the creditability of findings and to also deepen understanding of the study (Berger, 2015; Mitchell, Boettcher-Sheard, Duque & Lashewicz, 2018; Dodgson, 2019). The research used reflexivity to account for researcher’s ability to make and communicate nuanced and ethical decisions amid the complex work of generating real-world data that reflect the messiness of participants’ experiences and social practices (Finlay, 2002; Olmos-Vega et al., 2022). Reflexivity according to Berger (2015), means “turning of the researcher lens back onto oneself to recognise and take responsibility for one’s own situatedness within the research and the effect that it may have on the setting and

people being studied, questions being asked, data being collected and its interpretation" (Dodgson, 2019). Olmos-Vega et al. (2022) defined reflexivity as "a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes". This aspect of qualitative research that was understood through hands-on experience, effort and practice involved the process of continual and deep self-examination that extends across the entire duration of a research endeavour (Mitchell et al., 2018; Olmos-Vega et al., 2022). So, the whole doctoral journey, through to the overall conclusive stage was subjected to the "Gibbs' reflective cycle" to enhance the learning experience (Sekarwinahyu et al., 2019: Li et al., 2020). The researcher's influence, as suggested by Finlay (2002), Koopman et al. (2020) and Olmos-Vega et al. (2022) was, therefore, not neutralised, nor merely acknowledged, nor explained away but rather represented a productive result of all human interaction and asset to actively co-construct data and results. In this orientation, reflexivity was a means of capitalising on the researcher's knowledge, experience, and identities (Olmos-Vega et al., 2022).

While steps were taken to check against complacency and biases, the study leveraged researcher's familiarity of the organisational environment and adopted a participatory and collaborative approach in a social science research setting using qualitative data gathering approach. Qualitative interview questions were designed and administered to participants from the Procurement and Supply Chain (SC) departments in EDG, and supplier(s) as external stakeholder(s). Qualitative data collected also sought to explore reasons why actual sustainable procurement practices deviate from policy. Again, qualitative data collection approach helped the researcher to better understand the level of importance given to sustainable procurement, find out the appropriate factors to be used to evaluate bids or tenders to procure sustainable products. This formed the basis for future generalisability from a single case of the electricity distributor in Ghana that was central to scientific development and used as alternative to other methods (Flyvbjerg, 2006: Roth, Milbich, Sinha, Gupta, Ommer & Cohen, 2020: Lee, Kang & Kim, 2020: Maxwell, 2021).

The research took advantage of the time horizon that was needed to generate and experiment changes in the tender evaluation process (Eisner, Murray, Eisner &

Ribeaud, 2019: Orth, Clark, Donnellan & Robins, 2021: Hopwood, Bleidorn & Wright, 2022) that had the form of data collection, findings, analysis, conclusion and recommendations in the procurement process (Eisner et al., 2019). This time horizon was covered in a period of 3 to 6 months during which the tender evaluation model developed from the qualitative research was experimented using data from contract for the supply of products to the EDG. Recommendation for model review for standardisation as a procurement policy working document in the electricity distribution organisation of Ghana (EDG) was thereafter made. The author being a subject of research leveraged what Narushima, Liu and Diestelkamp (2018), Willems (2018) and Neubauer, Witkop and Varpio (2019) proposed as phenomenological studies of human learning for adults, as a leap in the learning process, where trends and patterns observed through experience and insight gained from on-the-job training over a long period formed the main bases for the academic exercise. Therefore, experience obtained, and familiarity of the work environment served as an advantage for the research.

Limitation:

CIPS.Org (2020) explained that Sustainability in procurement takes a wider view and incorporated the net benefits for both the buyer organisation and the wider world. The design which dealt with the physical network of cables and conductors, facilitating electricity energy distribution within Ghana through the “pipeline” energy supply chain, did not feature in this research since that was beyond the researcher’s control (Wang, Liang, Zheng, Yuan & Zhang, 2019: Yuan et al., 2020). While the review was conducted with extreme due diligence to ensure the highest level of comprehensiveness and accuracy, the number of participants was not representative for generalisability due to feasibility and practicality constraints with assignment timelines (Smith, 2018: Weise, Büchter, Pieper & Mathes, 2020: Hays & McKibben, 2021). With the possibility of multiple recommendations proposed in this qualitative study during the study period, the data collection stage was subjected to constant review based on introductions, such as technology, which affected research focus in the work environment.

Researcher’s understanding of sustainability in the electricity distribution organisation in Ghana also played a role in defining the parameters for consideration in the

research. Just as Tasdemir and Gazo (2018) and Dalkin, Forster, Hodgson, Lhussier and Carr (2021) indicated, the use of NVivo 12 in the qualitative analysis stage came with some unnoticed human errors associated with data coding and the interpretation of coded data. The use of publications within the last 10-years while synthesising articles restricted to peer-review journals was not adequate, although "references were made to evidence from other sources to reduce bias" (Adjei-Bamfo, Maloreh-Nyamekye & Ahenkan, 2019, p.199).

Delimitation

Sustainable procurement (SP) considers Goods, Works, and Services, such as, consultancy and non-consultancy, and their environmental, economic, and societal impact (CIPS.Org, 2020). But for the purposes of this research, SP was defined in the context of only "goods" or product procurement, while service was mentioned as an ancillary activity to facilitate sustainability in procurement. Works and Consultancy services procurement did not feature for similar purpose. While considering 'goods procurement,' attention was on items that were deemed to be strategic or critical to core business of electricity distribution. These were electricity distribution materials used for connecting the downstream end user or final consumer to the electricity grid. Materials that are categorised as 'bottle neck' were given less attention (Tsafouros & Roussos, 2020: Zhang, Jia, Liu, Wu, Zhang & Conibeer, 2021). Examples of materials considered for 'goods' sustainable procurement were, Cables and Conductors, Meters, ICT items, Fuel and Lubricants, etc.

Assumptions:

The assumptions about this research suggested that certain targeted persons within the case provided the needed answers to address the research objectives. The rich in-depth data collection method, through interviews was, therefore, the preferred means to the root cause of the absence of sustainable procurement in EDG.

Significance of Study

This research will contribute to the transformation of procurement practices in Ghana's electricity distribution organisation (EDG) by promoting sustainability. It is expected to guide policymakers and managers towards more responsible and sustainable decision-making processes. Additionally, the outcome model can serve

as a blueprint for other utility sector players within Ghana and similar economies seeking to incorporate sustainability into their procurement practices.

This chapter set the stage to explore the nuances of sustainable procurement within Ghana's electricity distribution landscape, identifying a roadmap to infuse sustainability principles into the heart of evaluating procurement tenders in the quest for the best supplier of products. It examined the integration of sustainable procurement practices in developing countries, with particular emphasis on public procurement and specifically with electricity distribution in Ghana where procurement decisions significantly impact environmental and social outcomes. It highlighted the primary aim of this study which was to develop a model for evaluating tenders for sustainable products in the electricity distribution organisation in Ghana. Limitations, delimitations, and significance of this study considered the potential subjectivity inherent in qualitative research and the challenges of generalising findings from a single critical case of public procurement practices within Ghana's electricity distribution organisation. The chapter, therefore, introduced ways to bridge the gap in knowledge and practice concerning sustainable procurement in Ghana's electricity distribution organisation.

The next chapter is a literature review that delved into an extensive collection of research and writings related to sustainable product procurement. By synthesising a diverse array of scholarly insights, the review sought to provide a comprehensive understanding of the complexities involved, illuminating pathways for informed decision-making and transformative action in the pursuit of a more resilient and sustainable product procurement for a greener global future.

Chapter 2:

Literature Review

The literature review delved into an extensive collection of research and writings related to sustainable product procurement. By synthesising a diverse array of scholarly insights, the review looked at providing a comprehensive understanding of the complexities involved, illuminating pathways for informed decision-making and transformative action in the pursuit of a more resilient and sustainable product procurement for a greener global future.

In the ever-evolving landscape of public procurement, the imperative to integrate sustainability has appeared as a pivotal change in basic assumptions to address the issue of climate change. This chapter on literature review looked at sustainable public procurement, delving into the key elements that shape its trajectory. From the identification of sustainability drivers to the exploration of barriers hindering its seamless integration, this review aimed to unravel the multifaceted dimensional mix that define the sustainability within the public procurement processes. Furthermore, it scrutinised the critical importance of infusing sustainability into tender evaluations, examining models that have proven effective in aligning procurement practices with broader sustainability goals. As we embarked on this theoretical exercise, the synthesis of existing knowledge looked to illuminate the path toward more effective, responsible, and sustainable public procurement practices.

Climate Change Impact on Developing Nations.

Climate change according to Shukla (2019), Fawzy, Osman, Doran, and Rooney (2020) and Pörtner et al. (2022) is defined as the shift in climate patterns caused by greenhouse gas emissions from natural systems and human activities that causes a threat to the planet and all life on it. For example, the effect of melting ice at the arctic sea could cause the extinction of polar bears which existence depends on the ice and are unable to survive on bare land. Sustainable consumer behaviour is behaviour which tries to satisfy present needs while simultaneously benefiting or limiting environmental impact (Trudel, 2019). Shukla (2019), and Eriksen et al. (2021) believed a greater burden of climate change impact is distributed to the developing world who are most exposed to stark new climatic challenges, while most greenhouse gas emissions arise from economic activities in the industrialised nations. For example, for a period of 105 years (1901-2005) data from the Nigerian Meteorological Agency and some Nigerian States' airports showed that while temperature increased by 1.1°C for the 105 years, rainfall decreased by 81 mm (Akpodiogaga & Odjugo, 2010). Developed and developing countries are both looking at the issues of climate change and carbon disclosure, and many proactive measures are being employed by countries around the world and in recent times goals such as environmental effects, including carbon dioxide emissions and energy consumption, and social welfare are added to literature in order to consider sustainable problems and solutions (Darus, Mohd Zuki, & Yusoff, 2020; Lotfi, Mehrjerdi, Pishvaee, Sadeghieh

& Weber, 2021; Pörtner et al., 2022). This calls for equity concerns and mitigation actions in assessing and remedying the consequences arising from climate change and which is worsened by equity problems for developing countries due to their poor information base, weak bargaining strength and inferior capacity to deal with climate change (Shukla, 2019; Trudel, 2019; Pörtner et al., 2022).

Global warming for the past decade has increased 1.0 °C above the pre-industrial level and this is likely to reach 1.5 °C between 2030 and 2052 if the current emission rates persist (Van Ruijven, De Cian, & Sue Wing, 2019; Shukla, 2019; Pörtner et al., 2022). The impact of an increase in temperature above 1.0 °C level, according to Leisner (2020) can challenge plant productivity in ways that impact the ability of the world to sustain adequate food production for a growing and increasingly affluent population with shifting access to affordable and nutritious food. Van Ruijven et al. (2019), estimated that 68.5 million people were affected, and economic losses amounted to $131.7 billion, of which storms, floods, wildfires, and droughts accounted for approximately 93% in 2018. Protecting intact ecosystems such as forests, wetlands, kelp forests and seagrass meadows limits CO_2 emissions; restoring native vegetation cover enhances CO_2 removal from the atmosphere; and improving the management of working lands can significantly reduce CO_2, methane, and nitrous oxide emissions, and sequester carbon (Busch et al., 2019; Friedlingstein, Allen et al., 2019; Seddon, Smith, Smith, Key, Chausson, Girardin & Turner, 2021).

Gifford (2011) and Wong-Parodi and Feygina (2020) suggested that there are seven key drivers or motivated roots of climate change denial including: limited cognition, ideologies, comparison with others, sunk costs, distrust (dismissing, or denying information about climate change and solutions to it), perceived risks, and limited behaviours (tendency to do easy but not effective actions). This entails knowing or having access to the facts about climate change and ways of counteracting it, but nevertheless denying them (Wong-Parodi & Feygina, 2020). This was corroborated by Hoogendoorn, Sütterlin and Siegrist (2020) that despite scientific agreement about the anthropogenic cause of climate change, the public still holds different beliefs about the causes of climate change. For example, while some people believe climate change is caused by natural processes, others believe it to be caused by human activities. Though no empirical establishment had been made if the consequences of

climate change is influenced by people's beliefs, about the causes of climate change, it drive both their risk feeling and their mitigation behaviour, and such beliefs are not easy to alter (Hoogendoorn et al., 2020).

Pro-environmental sustainability advocates such as Etse and Ingley (2015), Owusu-Manu et al. (2020) and Osei-Wusu (2022) argued that protecting the earth's resources is essential for the survival of humankind and other species and includes the preservation of biodiversity, ensuring clean air and water, and preventing pollution. For example, polar bears stand the risk of extinction due to the melting of the artic ice coursed by climate change. Owusu-Manu et al. (2020) and Osei-Wusu (2022) further argued that environmental sustainability can help the economy through investing in renewable energy that can create new jobs, reduce waste, save money by reducing to causes of climate change. It therefore stands to show from the foregone that Governments and organisations have a social responsibility to protect the environment for future generations including reducing our carbon footprint and taking steps to mitigate the effect of climate change.

Lately, Osei-Wusu (2022) emphasised the declaration by the United Nation (UN) Conference on Human Environment in Stockholm, Sweden in 1972, Fortune Institute of International Business (FIIB) 2019, (Chopra, 2019), and more recently COP 26 UN Climate Change Conference in Glasgow, UK (Zhongming et al., 2021) when countries agreed to make environmental issues a priority. More than 50 years on since the Sweden conference, Osei-Wusu (2022) reiterated the importance of the slogan, "Only One Earth" and adopted it for the World Environment Day (WED) celebration on the 5th of June 2022. Yogalakshmi and Singh (2020) and Kibria, Masuk, Safayet, Nguyen and Mourshed (2023) focused on environmental issues such as, climate change, plastic waste menace to the aquatic life and environment, and indiscriminate use of hazardous chemicals like lead, pesticides and weedicides, depletion of the green forest belt without any replanting strategies. Decisions made at these conferences can have a significant impact on global environmental policy and the actions taken by individual countries and organisations to address environmental sustainability. However, implementing these decisions requires the cooperation and commitment of all stakeholders involved, including governments, businesses, civil society, and individuals. The next stage is a review of some articles

considered to be related to sustainable procurement in Ghana's utility or energy sector.

Sustainability

Sustainability is an increasingly vital concept that encompasses the responsible and balanced use of our planet's resources to meet the needs of both present and future generations. It acknowledges the interdependence between social, environmental, and economic factors, aiming to foster a harmonious coexistence between human activities and the natural world (Li, Lan & Zhang, 2019; Adzimah, Lei & Ishawu, 2020). Embracing sustainability involves implementing practices and policies that minimise ecological impact, promote social equity, and ensure long-term economic viability (Lăzăroiu, Ionescu, Andronie & Dijmărescu, 2020; Obal, Morgan, & Joseph, 2020). By adopting a sustainable mindset, we can strive for a more resilient and fair future, where the well-being of people and the health of our planet go hand in hand. Ogmundarson, Herrgard, Forster, Hauschild and Fantke (2020) and Ruggerio (2021) outlined several types of sustainability including Environmental Sustainability, Social Sustainability, Economic Sustainability, Cultural Sustainability and Sustainable Development. With the first three types of Environmental, Social, Economic Sustainability forming part of first definitions of sustainability, cultural sustainability and sustainable development were developed later to describe sustainability (Etse et al., 2020: Amoako, Zakuan, Okyere-Kwakye & Tetteh, 2023). Keulemans and Van de Walle, (2017) suggested that Environmental sustainability refers to the responsible and ethical management of natural resources and ecosystems to ensure their long-term viability. It involves practices that minimise pollution, preserve biodiversity, protect ecosystems, and reduce the consumption of non-renewable resources. The goal is to keep a balance between human activities and the natural environment, ensuring the well-being of both present and future generations (Bratt, Hallstedt, Robèrt, Broman, & Oldmark, 2013: Keulemans & Van de Walle, 2017: Adjei-Bamfo & Maloreh-Nyamekye, 2019).

According to Walker and Brammer (2012), Patil (2017) and Kong, Witmaier and Ko (2021) Social sustainability focuses on creating inclusive and fair societies that promote well-being, justice, and quality of life for all individuals. It encompasses fair access to resources, such as, right, and equal access to potable water, right to a

share in community resources, social cohesion, and community engagement on developmental endeavours. Socially sustainable practices aim to promote diversity, provide adequate healthcare and education, and foster a sense of belonging and participation within communities (Opoku & Guthrie, 2018; Daniel & Pasquire, 2019).

Wilhelm, Blome, Bhakoo, and Paulraj (2016) and later Adjei-Bamfo & Maloreh-Nyamekye, (2019) showed that Economic sustainability refers to the ability of an economic system to support long-term prosperity and development without depleting resources or causing significant negative impacts. It involves promoting economic growth while considering the well-being of communities, minimising waste, and inefficiency, and encouraging responsible production and consumption patterns. Economic sustainability also entails ensuring fair trade, promoting innovation, and creating opportunities for decent work and economic stability (Keulemans & Van de Walle, 2017: Adjei-Bamfo & Maloreh-Nyamekye, 2019).

Ruggerio (2021) said that Sustainable development is a comprehensive approach that integrates environmental, social, and economic considerations to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. Boar, Bastida and Marimon (2020) and Rajabi et al. (2022) further explained that the concept of sustainable development is often associated with the concept of sustainability and thus both terms are used as synonyms. It looked to achieve a balance between economic growth, social well-being, and environmental protection. Sustainable development aims to address global challenges such as poverty, inequality, climate change, and resource depletion, promoting a more sustainable and resilient future for all (Holmberg & Sandbrook, 2019; Khosla, Miranda, Trotter, Mazzone, Renaldi, McElroy & McCulloch, 2021).

Sustainable Procurement

Chartered Institute of Procurement and Supply UK (2020a) defined sustainable procurement, in addition to conventional price and quality considerations, as including the integrating of social, economic, and environmental issues in the buying processes and procedures. For this reason, procuring organisations must look out, not only for the price of the product being purchased, but the effect of the product life cycle on the environment and the user. The concept of considering only price in the procuring process addresses the immediate needs of end-users and not take into

consideration the future environmental hazards caused by supply chain activities. Difficulties often appear when trying to implement sustainability principles in the procurement process since the future is not considered when procuring and also due to the uncertainties of this concept (Billa, Gyamfi, & Adamu, 2021). The consumption of a sustainable or “green” product according to Chen, Ghosh, Liu, and Zhao (2019), simultaneously serves two purposes. Firstly, the consumption generates direct utility to the consumer and secondary, as a public good, consuming sustainable product provides important societal benefits, such as reduced energy consumption and reduced greenhouse gas emissions which goes on to mitigate the effect of climate change. Unfortunately, the societal benefits of green products are diffused, hard to quantify, and only obtained at an unknown future date (Chen et al., 2019). Plant-based feedstocks are very promising resources in achieving the goal of sustainable global carbon economy while avoiding adverse impacts on the climate (Li & Zheng, 2017; Usmani, Sharma, Awasthi, Sivakumar, Lukk, Pecoraro & Gupta, 2021).

Kumi (2017) and Billa et al. (2021) produced three dimensions that strengthens sustainability, which were environmental, social, and economic consideration, which when adhered to transforms into profitability, planet saving and environmental friendliness for all inhabitants. According to Walker and Brammer (2012), Chan, Darko, Olanipekun and Ameyaw (2018) sustainable procurement (SP) is procurement that is consistent with the principles of sustainable development, such as ensuring a strong, healthy, and just society, living within environmental limits, and promoting good governance. Sustainability is meeting the needs of the present without compromising the ability of the future generation to meet their own needs (World Commission on Environment and Development, 1987: Gidigah et al., 2021: Rajabi et al., 2022). Agbesi, Fugar and Adjei-Kumi (2018), Owusu-Manu, Debrah, Oduro-Ofori, Edwards and Antwi-Afari (2020) all agreed that there was a need for increased education and awareness in energy consumption and their prices, the knowledge of the science behind climate change and the business effect of environmental and social sustainability (Agbesi, Fugar & Adjei-Kumi, 2018: Owusu-Manu, Debrah, Oduro-Ofori, Edwards, & Antwi-Afari, 2020). Sustainable procurement practices enhance long term values of the supplies or products purchased, as they are more sustainable compared to products that are not environmentally friendly which tend to be also cheaper (Witjes & Lozano, 2012:

Igarashi, Boer & Michelsen, 2014: Uttam & Roos, 2015: Anane et al., 2019). Uttam and Roos (2015) and, Anane et al. (2019) further argued that by ensuring that companies procured from suppliers who use environmentally friendly means in their production activities defective goods and poor service will be eliminated enhancing customer satisfaction.

Unsustainable procurement processes in Ghana

In an era defined by increasing environmental concerns and social responsibility, the nexus between public procurement and sustainable procurement has gained significant prominence. According to Trionfetti (2000), Anane, Adoma and Awuah (2019) problems associated with public sector through a careful study becomes essential by recognising the significance of public organisations as body premeditated to assist the public, along with the imperious for culpability. Trionfetti (2000) and Anane et al. (2019) further reiterated that there is limited empirical literature on the effect of procurement practices on service provision especially with the electricity sector in developing countries. It therefore meant that elucidating the sustainability process and illuminating the barriers that often hinder the successful implementation of sustainable procurement practices within the public sector in Ghana was crucial.

Unsustainable procurement practices in Ghana can refer to various issues related to the procurement process that have negative environmental, social, or economic impacts such as nondisclosure of chemical components in products purchased and unverified source of cheap products which manufacturing inputs include the felling of trees from the prohibited rain forest (Opoku-Mensah, Maloreh-Nyamekye, Ahenkan & Temesgen, 2022). Sustainable procurement has for the past two decades been given critical consideration in most advanced economies, such as, the United Kingdom, United States of America etc, (Sánchez-Flores, Cruz-Sotelo, Ojeda-Benitez & Ramírez-Barreto, 2020: Karmaker, Ahmed, Ahmed, Ali, Moktadir & Kabir, 2021). Green supply chain management (GSCM) is not only considered a means of environmental protection but also a valuable and potential way to gain advancements and competitive advantages as well as bring performance improvements to an organisation (Yang, Lu, Haider & Marlow, 2013; Abbas & Tong, 2023).

Developing countries, like Ghana, are now giving the needed attention to sustainability as a key success factor in the procurement processes mainly due to central government support, but that has not yielded the needed result because stakeholders, such as manufacturers, consumers and society are left out in policy formulation (Lamoureux, Movassaghi and Kasiri, 2019: Adjei-Bamfo and Maloreh-Nyamekye, 2019). Examples of unsustainable procurement practices that have been used in Ghana as observed by Gidigah et al. (2021) and Opoku-Mensah et al. (2022), include: Lack of transparency; Limited consideration of environmental factors; Neglecting social responsibility; Overreliance on imports; Inadequate consideration of lifecycle costs. Gidigah et al. (2021) and Opoku-Mensah et al. (2022) opined that corruption and lack of transparency in the procurement process can result in unfair practices, favouritism, and the awarding of contracts to companies that do not meet the required criteria. limited emphasis on environmentally friendly procurement practices including the neglect of eco-friendly materials, inefficient energy usage, and inadequate waste management practices and where companies awarded contracts and do not adhere to fair labour practices, fail to provide safe working conditions, or do not respect human rights are prevalent in the Ghanaian context. This was corroborated by Etse and Ingley (2015) and Zhao and Li (2022) that significant dependence on imported goods and services which lead to unsustainable procurement practices, such as the neglect of local industries and the economy, increased carbon emissions from transportation contributes to trade imbalances leading to global events such as natural disasters, civil strife and its attendant humanitarian crisis, epidemics, worsening poverty and hunger are making it increasingly clear that passivity is not an option.

Sustainable procurement requires considering the full lifecycle costs of goods and services, including maintenance, operation, and disposal costs (Zhao & Li, 2022: Xue, Wang & Chen, 2022). However, in Ghana, there is a tendency to focus primarily on upfront costs, leading to inefficient and unsustainable procurement decisions eventually (Gidigah et al., 2021: Opoku-Mensah et al., 2022). Addressing unsustainable procurement practices in Ghana, therefore, requires a multi-faceted approach involving government regulations, enforcement of existing laws, increased transparency, and capacity-building initiatives. It is crucial to promote sustainable procurement practices that consider environmental, social, and economic factors to

ensure a more sustainable and responsible procurement process in Ghana and beyond. Green supply chain management (GSCM) is, therefore, a development of Supply Chain Management (SCM), which uses the same traditional concept of buying products at the “5” rights but adds an environmental component to increase the environmental performance of products and services as firms strive for sustainability (Abbas & Tong, 2023).

Sánchez-Flores et al. (2020) indicated that there is a strong need to research trends and pathways to achieving sustainability in emerging markets. At best, environmental concerns seem to be the most addressed of the sustainability dimensions of social, environmental, and economic in the emerging economy (Delmonico, Jabbour, Pereira, de Sousa Jabbour, Renwick & Thomé, 2018: Kazancoglu, Ozkan-Ozen & Ozbiltekin, 2018: Ulgen et al., 2019). Opoku-Mensah et al. (2022) corroborated this by saying that African countries, such as Ghana and Nigeria, are now embracing sustainable procurement (SP) such as in the precious minerals industry like gold and diamond to fight environmental degradation that has been hampered by illegal mining activities (Kpienbaareh et al., 2021). Investigating the interconnections between the social, environmental, and economic dimensions within a supply chain, to determine a sustainable balance in developing countries is becoming crucial in recent times (Sudusinghe & Seuring, 2020: Sánchez-Flores et al., 2020: Martinho, 2021).

Environmental issues in the supply chain process are now being regarded as a business opportunity rather than an economic burden if the right performance indicators and metrics are identified and made measurable (Ulgen et al., 2019). For example, plastic wastes from disposed packages are being collected and resold to industry for recycling. Again, Shirazi and Keivani (2019) and later, Popescu, Hitaj and Benetto (2021), indicated that the effects of social and environmental performances are measured to determine the economic dimension of sustainability. For example, Ghana’s President, Nana Addo Dankwa Akuffo Addo, said at the 27th United Nations Conference on Climate Change (COP27), that there had been a historic feat in reducing emissions in the forestry sector, through prudent reafforestation schemes and forest product supply chains management, generating a result-based carbon payment of about four Million Nine Hundred Thousand US Dollars to beneficiary local communities ("Akufo-Addo, UK PM Sunak Launch Forest and Climate Leaders Partnership”, 2022). The benefits from sustainability can mostly be achieved through

improved quality, increased flexibility, innovativeness, competitive advantages, green value creation, positive reputation, and ethical procurement, among others, in the long term (Ülgen et al., 2019).

Public Procurement in Ghana

According to Mor, Bhardwaj, Singh and Kharub (2019) and Klingler (2020), procurement the world over is now central to how organisations respond to issues of sustainability. This is because most governments often fail to apply due diligence in their procurement processes, which often results in negative environmental and socio-economic impacts, corruption, and legal losses on government coffers (Hope, 2017: Neupane, Soar, & Vaidya, 2014: Adjei-Bamfo and Maloreh-Nyamekye, 2019). This is corroborated by Ghana's Public Procurement Act 663 (2003, as amended in Act 914) that, procurement is to be executed in environmentally and socially sustainable manner (Billa, Gyamfi & Adamu, 2021). The promotion of diversity and inclusion of women and the marginalised in the bidding process, managing costs and risks in the complex global market, collaboration, and resilience are key in developing global supply chains with sustainability and innovation at its core (Montalbán-Domingo et al., 2019). There is conflicting evidence through research on the role that CSR plays in sustainable procurement decisions (Li, Lan & Zhang, 2019; Adzimah, Lei & Ishawu, 2020). Studies tend to focus on CSR influences on a firm's financial performance, performance in sales volume, market share, return on investment, firm image, and customer satisfaction but not its sustainable procurement practices (Muñoz, de Pablo & Peña, 2015; Tang, Walsh, Lerner, Fitza & Li, 2018; Asante Boadi, He, Boadi, Bosompem, & Avornyo, 2019). Different stakeholders might interpret the relationship between CSR and sustainable procurement differently in their supply chain (Chaudhary, 2018; El Akremi, Gond, Swaen, De Roeck, & Igalens, 2018; Adzimah, Lei & Ishawu, 2020) necessitating studies for a more complete understanding of the CSR and a firms' sustainable procurement practices (Chaudhary, 2018). Accordingly, organisations the world over are beginning to tie successful decision making to the outcome of sustainability and CSR initiatives on procurement and supply chain (Montalbán-Domingo et al., 2018: Montalbán-Domingo et al., 2020: Von Schönfeld & Ferreira, 2021). CIPS.Org (2020) further explains that "Sustainability in procurement takes a wider view and incorporates the net benefits for both the buyer organisation and the wider world" by considering the

impact of environmental, economic and social factors along with price and quality (Klingler, 2020: Lăzăroiu, Ionescu, Uță, Hurloiu, Andronie & Dijmărescu, 2020: Ali et al., 2022).

Public Procurement Act (663, 914 as Amended) Ghana

Indeed, Public Procurement Authority Ghana (2017), Sonnichsen and Clement (2020) and Gidigah et al. (2021), Ramadan (2022) placed responsibility on the shoulders of central government in Ghana to ensuring green and sustainable public procurement. It is an essential aspect of public governance and plays a significant role in the country's economic development. Key points related to public procurement in Ghana include Legal Framework; Public Procurement Authority (PPA); Procurement Methods; Thresholds; Public Procurement Processes; Electronic Procurement System and Compliance and Oversight. Efforts are continuously being made in Ghana to improve public procurement practices, enhance transparency, and reduce corruption. This has given rise to the amendment of the Public procurement Act 2003 (Act 663) Ghana, to incorporate sustainable issues such as Health and Safety, Security, Environment and Social in Public Procurement (Koranchie, 2015). Public procurement in Ghana is governed by the Public Procurement Act (PPA), 2003 (Act 663) and the Public Procurement (Amendment) Act, 2016 (Act 914) which laws provide the legal basis for public procurement processes, including procurement planning, tendering, evaluation, contract award, and contract management. In 2019, the Act was amended to incorporate new features and world best practices for public procurement. Section two (2) of the Act advanced the objectives of public procurement processes, which seek to harmonise the procurement processes in the public service to obtain a reasonable, economic and efficient use of state resources, intended to ensure public procurement was conducted in a fair, transparent and non-discriminatory manner, focusing on the environment and society (Gidigah et al., 2021: Ghana PPA (2003, Act 914 as amended). The PPA is the central regulatory body responsible for overseeing public procurement in Ghana and ensures compliance with procurement laws and regulations, develops procurement policies and guidelines, and provides training and capacity building for procurement practitioners (Chikwere, Dzandu & Dza, 2019: Ramadan, 2022). Tutu, Kissi, Osei-Tutu and Desmond (2019) indicated that Ghana’s PPA Act allows for various procurement methods, including open competitive tendering, restricted tendering, request for

quotations, and single-source procurement. Choice of procurement method depends on factors such as the value and nature of the procurement, emergency situations, or national security concerns, while thresholds determine the procurement method to be used, albeit high-value procurements e.g., international competitive bidding, or lower-value procurements which can be done through other methods. The procurement process typically involves procurement planning, preparation of bidding documents, advertisement, bid submission, bid evaluation, contract award, and contract management and aims to ensure transparency, competition, and fairness in the procurement process (Chikwere, Dzandu & Dza, 2019: Tutu et al., 2019).

Anane et al. (2019) and Billa et al. (2021) wrote that public procurement of Ghana was regulated by an Act of Parliament which was passed into law in December 2003, Act 663 and consequently revised and approved by the Legislative body of the Republic of Ghana and consented to by the Head of state on the 11th of May 2016, Act 914. The (Amended) Act 2016, (Act 914) is an act to; amend the Public Procurement Act, 2003 (Act. 663); make further public procurement provision; re-enact part two of the Act; provide for decentralised procurement and for connected purposes. The Public Procurement Act, as amended, was organised into sections and parts which relates to issues of different nature.

According to Anane et al. (2019) the Act has ninety-nine sections and divided into nine parts. Part one (I) established the Public Procurement Authority as a corporate body with a continuous progression and a common seal aim to reorganise and bring into line or synchronise public procurement processes to secure prudent, cost-effective, and efficient use of public funds and guarantee fair, transparent, and non-discriminatory, environmentally, and socially sustainable procurement practices. The Authority has a number of functions, the most important ones being regulations and policy formulation, employee training and capacity building; development of local industries; monitoring and evaluation and warranting that public procurement is mainstreamed into public fiscal management system.

The second part also related to Procurement structures and provides for administrative and established engagements for procurement. The scope and application of the Act involves procurement of goods, works and services funded either wholly or partly from public funds, functions that pertain to procurement of

goods, works and services including the description of requirement and source of supply, selection and award of contracts and the phases of contract administration. It also included the responsibilities of a procurement entity and institutes the Entity Tender Committee (ETC) and ensures compliance with Tender Review Committees whose duty is line with the provision of contemporaneous endorsements recommendations for award of contract.

Part three dealt with procurement rules, procurement plan, tenderers qualification and prequalification proceedings. It also indicated other issues like suspension of supplier or consultant, prequalification proceedings, decision on prequalification, participation in procurement proceedings, form of communication, records of procurement proceedings, cancelation of procurement records, denunciation of tenders, proposals and quotations and issues relating to the entry into force of procurement contract, notification of procurement contract award to the public, inducement and confidentiality.

The fourth part dealt with procurement methods such as competitive tendering, two-stage tendering, restricted tendering or single source tendering and request for price quotation and specifies the procedure and condition of use, including framework contracting.

Part five considered procedures for tendering. This section is subdivided into three namely, invitation of tenders and application to prequalify, submission, evaluation, and comparison of bids. The sixth dealt with techniques and procedures to employ the services of consultants. It spells out the notification of expression of interest invitation and preparation of shortlists, shortlisted candidates, illumination, and modification of request for proposals, selection procedure, and receipt and evaluation of proposals. Part seven contained complaints and administrative review. It also spelt out the review and complaint procedure, definite rules applicable to review proceedings and issues on deferment of procurement proceedings. Part eight dealt with the disposal of stores, vehicles, plant, and equipment. It indicates the authority to dispose, instruction and disposal of unserviceable stores procedures and guidelines. The last part (Nine of Section IX) dealt with conduct, modifications, information request and inquiry by the Board, procedure on investigation completion,

legislative reviews, and procurement related offenses, corrupt practices, threshold levels review, international obligation, use of procurement agent, interpretation.

According to Nsiah-Asare and Prempeh (2016), while the Government of Ghana is working towards building capacity, implementing electronic systems, and promoting best practices to achieve efficient and sustainable public procurement processes in the country, this has however not been achieved due to failures of State-owned enterprises in Ghana to apply due diligence in their procurement processes, often leading to negative environmental and socio-economic challenges and loss of revenue (Hafezi & Zolfagharinia, 2018: Lamoureux, Movassaghi & Kasiri, 2019: Adjei-Bamfo & Maloreh-Nyamekye, 2019). Indeed, this very issue was raised by Owusu-Manu et al. (2020) who argued that such governmental negligence generates tons of plastic waste and resultant pollution of rivers, the main sources of water supply, irrigation, and livestock watering, with its attendant excessive cost of treatment to make them potable.

Sustainability Perspectives Mix

Etse et al. (2020), Amoako, Zakuan, Okyere-Kwakye and Tetteh (2023) agreed that there have been several studies on sustainability with different dimensional focus. Multicriteria metrics for Sustainable Public Procurement (SPP) which seek to combine economic, social, and/or environmental sustainability measuring standards can span all the three dimensions of sustainable procurement (Adjei-Bamfo & Maloreh-Nyamekye, 2019). According to Koranchie (2015) and Gidigah et al. (2021) there must be a right balance between people, planet, and profit, the three elements that are represented by the social, environment and economic factors in sustainable procurement. With respect to the economic dimension, SPP practice emphasises best resource allocation and cost-effectiveness to avoid unnecessary procurement risks (Keulemans & Van de Walle, 2017: Adjei-Bamfo & Maloreh-Nyamekye, 2019). Geng and Doberstein, (2008), Wilhelm, Blome, Bhakoo, and Paulraj (2016) and later Adjei-Bamfo & Maloreh-Nyamekye, (2019) explained that price together with other cost variables aimed at Value for Money (VfM) Procurement and associated with product use, maintenance, and disposal are also assessed under economic sustainability.

With environmental dimension reference was made to green procurement which involves the environmentally responsive and management systems of suppliers (Geng & Doberstein, 2008; Adjei-Bamfo & Maloreh-Nyamekye, 2019). It was further presupposed that suppliers were assessed for the environmental impact they pose during the whole life cycle of their products and activities during the procurement process (Bratt, Hallstedt, Robèrt, Broman, & Oldmark, 2013: Keulemans & Van de Walle, 2017: Adjei-Bamfo & Maloreh-Nyamekye, 2019). Gidigah et al. (2021) and Rajabi, El-Sayegh and Romdhane (2022) were of the view that environmental sustainability perspective focuses on reducing the environmental impact of human activities and preserving natural resources for the future generation.

Walker & Brammer (2012) Patil (2017) explained that the social aspect of public procurement is the promotion of social justice and to elicit supplier activities that promote human rights, welfare, and favourable employee working conditions. Walker & Brammer (2012), Patil (2017) and later Chartered Institute of Procurement & Supply UK (2020b) added that social sustainability also contributed towards promoting the interest of vulnerable group such as women, children, migrant, disabled etc., and small and medium-scale enterprises (SMEs) who could be exploited during the manufacturing or supply chain process. Jain, Hazenberg, Seddon, and Denny (2019) and Gidigah et al. (2021) further explained that social sustainability perspective considers how human activities impacts society and aims to promote social justice and equity, and well-being of the community. Opoku and Guthrie (2018) and Daniel and Pasquire (2019) described social sustainability as the benefit a community and its inhabitants obtain in terms of social, economic, and environmental well-being from companies or organisations conducting business in and around the community. Some examples of social sustainability include improving access to education and healthcare, promoting diversity and social inclusion, and addressing social inequalities. Social sustainability may be aligned to cultural sustainability which recognises the importance of cultural diversity and heritage for sustainable development (Jain et al., 2019: Simm & Forslund, 2019: Agyabeng-Mensah et al., 2020).

The focus on sustainability in the supply chain has been more on economic and environmental aspects with little attention on social sustainability (Venkatesh Mani, Jabbour, & Mani, 2020: Amoako, Zakuan, Okyere-Kwakye & Tetteh, 2023). This was

emphasised by Jouzdani and Govindan (2021) that some writing on food supply chains mostly considered the environmental and economic aspects neglecting the social impact. According to Ashby et al. (2012) and Amoako, Zakuan, Okyere-Kwakye and Tetteh (2023) social sustainability, like non-economic aspect of sustainability, is the reaction given to social issues in the supply chain to establish an equal base of exchange or ensures price fairness among buyers and suppliers in a relationship (Strong, 1997: Amoako et al., 2023). Without social sustainability some organisations have ended up being negatively affected (Amoako et al., 2023). Some social sustainability variables such as, Corporate Social Responsibilities (CSR), Margin of Preference (MoP) to give local bidders an advantage over foreign competitors etc., are often difficult to enforce as they are mostly not standardised compared with those of environmental nature (McCrudden, 2004; Wilhelm et al., 2016). Economic sustainability on the other hand aims at creating a stable and resilient economy that can support long-term prosperity and well-being for all generations (Sánchez-Flores et al, 2020: Fischer, Brettel & Mauer, 2020). These strategies may enhance the promotion of sustainable business practices, investment in renewable infrastructure and support small and medium scale businesses in the local communities.

The difficulty of integration the best fit sustainability tool in the organisational decision-making process was corroborated by Jia et al. (2018), Datta and Diffee (2020) and more recently, Rajabi et al. (2022) who focused on the importance of the different sustainability dimensions. For Daneshpour (2016) and, Datta and Diffee (2020), Integration all dimensions of sustainability procurement, especially environmental and social elements, is a critical and challengeable task. This complexity in organisational decision making to integrate any or all the three-dimensional elements of environmental, economic, and social, sustainability need to be given prior attention (Hasselbalch et al., 2014: Yawar & Seuring, 2015: Ülgen, Björklund, Simm & Forslund, 2019). The need for “sustainability procurement mix” in the procurement process based on importance was corroborated by Gidigah et al. (2021), who said that “there is a shortfall of conceptual clarity in the field of study as to the level of analytic focus of sustainability dimension”.

Ülgen et al. (2019) and Sánchez-Flores et al. (2020), were of the view that the need to investigate interconnections between the social, environmental, and economic

dimensions within a supply chain to determine a sustainable balance in developing countries is becoming crucial in recent times because, “different industries face different sustainability challenges and, therefore, have different approaches towards sustainability in the same country” (Jia et al., 2018). This very point is also supported by Feng et al. (2016), Zaid et al. (2018), Çankaya and Sezen (2019), Agyabeng-Mensah et al. (2020) and recently Afum et al. (2021), who proved that investigations to show actual link between environmental management and financial performance yielded mixed and inconclusive results. For example, Agyabeng-Mensah et al. (2020) concluded that internal green supply chain management had an adverse effect on financial performance while Çankaya and Sezen (2019) found no relationship between internal environmental management and economic performance in their study. Feng et al. (2016) and Zaid et al. (2018) on the other hand, showed a link between environmental management systems and a positive financial outcome. This was collaborated by Mani Venkatesh, Jabbour and Mani (2020) who focused on sustainability in the supply chain to be more of economic and environmental with little attention on social sustainability. The concept of sustainability as a three-dimensional perspective or phenomenon has been widely accepted by writers, such as, Junior et al. (2018), Fischer et al. (2020) and Abdullahi et al. (2021) allowing for the integration of any two or three dimensions of environmental, economic, and social, during research study on sustainable procurement (Sánchez-Flores et al., 2020).

Authors such as Hasselbalch et al. (2014) and Ülgen et al. (2019) in their study focused on incorporating “sustainability”, as the “Triple Bottom Line” of social, environmental, and economic sustainability, making all sustainability dimensions worthy of inclusion when addressing the problem of sustainability procurement. This was corroborated by Ren, Kwaw and Yang (2012), Lu et al. (2021), Coupa (2021), Pernetti et al. (2021) and recently, Perčić et al. (2022) who stated that incorporating lifecycle costs of the initial investment, operation and maintenance as well as the end-of-life disposal value, in the procurement process will compel suppliers to include socially and environmentally innovative methods in their production processes while saving cost. For example, according to Coupa (2021) many organisations are actively investing in their operations to help them achieve their environmental, social, and corporate governance (ESG) goals to ensure compliance with new regulations, such as by buying or building new technology (61%), improving and expanding their legal

and compliance capabilities (60%) or acquiring new tools for measurement and analysis (53%). Coupa (2021) further advocated for a diverse supplier who can drive innovation, reduce supply chain disruption, lower operating costs, and support local communities at the same time. In a similar manner Walker and Brammer (2009), Wu et al. (2016) and Etse et al. (2021) explained that, to achieve successful sustainable procurement investigation, developed “scales” from previous studies, for example, transdisciplinary scale of project teams, organisations, networks and conversations (Aginako et al., 2021: Zeng et al., 2022) must be applied to facilitate best practices procurement, and encourage knowledge and experience transfer.

The importance of environmental sustainability was emphasised by Duane et al (2019), Wandosell, Parra-Meroño, Alcayde and Baños (2021) and more recently Ahmad, Yaqub and Lee (2024) as being the responsible and sensible use of natural resources in order to sustain and maintain an ecological balance to the neglect of the other dimensions. Loosemore and Barraket (2017) and Gidigah and Baiden (2021), in contrast, highlighted social drivers of sustainable procurement such as, employment, training and skills development, business setups, welfare enhancement, crime reduction, etc., in their studies over the environmental and economic dimensions and explained the need to integrate social values in public procurement policies and legislation. This, therefore, informed the legal bases for social inclusion in the procurement process. Barraket (2017), and Gidigah and Baiden (2021) further projected corporate social responsibility (CSR) and people centred sustainable procurement in the acquisition process highlighting resultant benefits such as employee satisfaction, positive corporate image, high share value and organisation of choice as some of the social values. Though Etse and Ingley (2015), Jia, Zuluaga-Cardona, Bailey, and Rueda (2018), Ali and Kaur (2021) defined sustainability to encapsulate environmental security, generational equity, economic enhancement as well as social and environmental justice, the social dimension of sustainability was, however, the focus of study. Etse and Ingley (2015), also stated that while, “Issues related to social well-being were the dominant sustainability issues present in the Higher National Diploma (HND-Ghana) course in Purchasing and Supply Management, issues of economic sustainability were the least addressed in the courses”, identifying the gap in the existing curriculum not focusing on economic sustainability.

Opoku, Ayarkwa and Agyekum (2019) and Owusu-Manu, Debrah, Oduro-Ofori, Edwards and Antwi-Afari (2020) all gave indication of the importance of environmental dimension of sustainable procurement in the wake of the devastating effects of climate change on the survival of the universe. Opoku et al (2019), for example, focused on guidelines development for the construction industry to enhance capacity and practices in environmental sustainability, and further suggested ways of reducing risks for successful implementation of environmentally sustainable policies in the industry. Etse and Ingley (2015) corroborated this when they suggested the importance of state involvement in the crafting and inclusion of environmental sustainability in the public procurement process. In fact, pro-environmentally sustainable procurement authors like Owusu-Manu et al (2020) agreed with this and said, “Development of green city principles that aid in enhancing air quality, improving water production and supply” among others must be encouraged. This, in effect, points to the need for state involvement in ensuring that organisations introduce their production policies to sustainability issues.

According to Kaur and Garg (2019), Sonnichsen and Clement (2020) and Samagaio and Diogo (2022), there are different tools and techniques used to obtain sustainable procurement products. Some of the sustainable procurement strategies, according to Rajabi et al. (2022) are aimed at implementing renewable energy sources, reducing pollution and wastes in the manufacturing and supply chain processes, and preserving biodiversity. Strategies may include supporting local traditions and knowledge, preserve cultural heritage sites, and promote cultural pluralism and dialogue.

Safety Health & Environment and Sustainable Development

The concept of occupational safety and health in sustainable development is not widely considered, according to Molamohamadi and Ismail (2014), Salguero-Caparrós, Pardo-Ferreira, Martínez-Rojas and Rubio-Romero (2020) and that there was a genuine desire of sustainable development and occupational safety, health, and environment in human welfare and satisfaction (Amponsah-Tawiah, 2013; Smith & Jacques, 2022). Ismail (2014) and Claxton, Hosie and Sharma (2022) also indicated that sustainable development had a general, holistic, point of view in sustaining the world as a habitable place for the next generation, while reaching the

satisfactory quality of life for the present communities through occupational safety, health, and environment (SHE).

Johnson (2020), Team (2020) and recently Okun, Guerin, Smith, Baker and DiMeo-Ediger (2024) referred to safety as the condition of being protected from harm, danger, or risk that can be associated with personal safety, occupational safety, or public safety. Safety measures are put in place to prevent accidents, injuries, and adverse incidents that could potentially harm people, property, or the environment. Safety constitutes one of the essential human needs, as postulated by Abraham Maslow in his theory of needs hierarchy (Sapiński, Mączka & Nastuła, 2020). Feeling safe at work ranks as an especially important factor in job satisfaction (Kreitner, 2007; Akpan, 2011; Team, 2020). In attempt to satisfy this need, certain organisations incorporate into their workplace safety policies, guaranteeing workers' safe work execution under a climate capable of enhancing the physical, mental, and emotional conditions (Akpan, 2011; Sui, Ding & Wang, 2020). Health refers to the state of physical, mental, and social well-being of individuals or populations and encompasses not just the absence of disease or infirmity but also factors that contribute to overall well-being, such as access to healthcare, nutrition, sanitation, and lifestyle choices (Umeokafor, Windapo & Evangelinos, 2019; Fiorino, 2023). Sui, Ding and Wang (2020) and Fiorino (2023) recently showed that Environmental policy consists of laws, regulations, and guidelines aimed at protecting the environment, natural resources, and ecosystems. These policies are put in place to address issues like pollution, climate change, biodiversity loss, deforestation, and waste management (Team, 2020; Fiorino, 2023). By integrating safety, health, environmental policy, and sustainable development, we can work towards a more resilient and prosperous world that benefits both current and future generations (Melnick & Darling-Hammond, 2020; Smith & Jacques, 2022). Governments, businesses, organisations, and individuals all play essential roles in advancing these goals (Fiorino, 2023).

WHO (1994) defined sustainable development as a strategy to meet the needs of the present world population without causing any negative effect on health and the environment, and without endangering the global resource base nor compromising the ability of future generations to meet their needs (Molamohamadi & Ismail, 2014). WHO (1994) further declared that "human beings are at the centre of concern for

sustainable development". Jeronen (2020) and Ruggerio (2021) defined Sustainable development as a concept that promotes the attainment of the needs of the present without compromising the ability of future generations to meet their own needs. It involves balancing economic, social, and environmental considerations to achieve long-term prosperity and well-being for all. Sustainable development recognises that economic growth should be inclusive, environmentally responsible, and socially fair (Team, 2020; Fiorino, 2023). Sustainable development addresses humanity's aspiration for a better life while observing the limitations imposed by nature. The United Nations General Assembly in 2015 approved the 17 Sustainable Development Goals (SDGs) with the aim to foster the organisational operation and integration of sustainability to address the current and future stakeholder needs and, therefore, ensuring a better and sustainable future for all (Jeronen, 2020; Fonseca, Domingues, & Dima, 2020). Included is the SDG 12 which concerns responsible consumption and production. This is to ensure that individuals, organisation, communities, governments etc., consume and produce sustainably.

Sustainable Public Procurement

Adjei-Bamfo and Maloreh-Nyamekye (2019) defined Sustainable Public Procurement (SPP) as the considerations for long-term social and environmental impacts of products while meeting the fundamental principles of public procurement. SPP refers to purchase of goods and services while taking economic, social, and environmental concerns into consideration and ensuring that there is value for money with no damage to environment (Walker, & Brammer, 2012: Roman, 2017: Zaidi, Mirza, Hou & Ashraf, 2019: Karikari et al., 2022). SPP brings innovation in the product-service system and ensures value for money by controlling the environmental impact of goods and services across their whole life cycle (Bratt, Hallstedt, Robèrt, Broman & Oldmark, 2013; Zhu, Geng & Sarkis, 2013; Zaidi et al., 2019). According to Billa, Gyamfi and Adamu (2021) this concept addresses the immediate needs of end-users and not compromising with the future to destroy the environment. Billa et al. (2021) further explained that due to the uncertainties and ambiguity of this concept, difficulties often appear when trying to implement sustainability principles since the future is taken into consideration in its present value basis. The concept entails considering the economic, environmental, and social consequences of corporate operations at the same time (Gelderman, Semeijn & Bouma, 2015: Billa et al., 2021).

European Commission defined SPP as, “a process by which public authorities seek to achieve the appropriate balance between the three pillars of sustainable development - economic, social and environmental - when procuring goods, services or works at all stages of the project” (Grandia & Kruyen, 2020; Halonen, 2021). This was to be done on the premise that transparency and equal treatment are met when awarding a contract. SPP has the potential to stimulate demand for sustainable products and services, creating incentives for businesses to innovate, develop more sustainable practices and by creating a market for sustainable goods and services, SPP can contribute to the growth of green industries, job creation, and economic development (Fregonara, Ferrando & Tulliani, 2022: Karikari, Tettevi, Amaning, Opoku Ware & Kwarteng, 2022). SSP Stakeholder engagement, including suppliers, civil society organisations, and communities, ensure their input and participation in the procurement process promotes transparency, accountability, and inclusiveness.

According to Braulio-Gonzalo and Bovea (2020b) Green Public Procurement (GPP) is one of the most effective policy instruments used to reduce the environmental impact of products, services and works, and to create environmental and innovative value for society. Uttam and Roos (2015) and Braulio-Gonzalo and Bovea (2020b) further defined GPP as, “a process whereby Public Authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured”. Emerging public procurement literature contends that there is the need to assess tenders beyond price criteria to also consider other environmental and social criteria that control the production and consumption behaviours of suppliers (Gelderman, Semeijn, & Bouma, 2015; Keulemans & Van de Walle, 2017). In 2002, a European Union (EU) Court of Justice gave a landmark ruling with Case reference, C-513/99 Concordia Bus, which started a new era for Green Public Procurement (GPP), thereby, opening possibilities to recognise non-financial elements in tender evaluation alongside financial and conventional qualitative parameters (Halonen, 2021). State Governments in developing countries such as Ghana are placed in a prime position to ensuring that sustainability in the public procurement process is achieved through regulating manufacturer activities, to avoid major environmental incidents like flooding, draught, global warming etc., the effect of which can damage an organisation’s corporate reputation (Jia, Zuluaga-Cardona

& Rueda, 2018; Lamoureux et al., 2019). For example, due to unethical procurement practices such as deforestation or felling timber within the green (tropical) belt reserve needed to absolve carbon emission a firm can barred from operating legally (Lamoureux et al., 2019: Lăzăroiu et al., 2020; Sönnichsen & Clement, 2020; Ramadan, 2022).

Zaidi et al. (2019) showed the need for development of necessary tools to help sustainable procurement practices become a part of public policy by including environmental considerations in procurement criteria. SPP, therefore, aims to achieve sustainable development goals by using the purchasing power of Governments to drive positive change **(**Mak et al., 2016; Heard, Kerxhalli-Kleinfield & Holmes, 2022). Governments can set up legal and policy frameworks that promote sustainable public procurement using guidelines, criteria, and performance indicators to support the integration of sustainability considerations into procurement processes (Karikari et al., 2022: Agyemang & Baah, 2023). The implementation of SPP, therefore, requires collaboration between government agencies, procurement officials, stakeholders, capacity building, training programs, and awareness campaigns to ensure understanding and effective implementation of sustainable procurement practices. According to Murutu (2016) sustainable procurement strategies on supply chain performance bears a positive relationship between sustainable procurement techniques and distribution chain performance. SPP is a powerful tool for governments to drive positive change, contribute to sustainable development goals, and create a more environmentally, socially, and economically responsible society (Etse, McMurray & Muenjohn, 2022).

Sustainable Public Procurement (SPP), as enshrined in the Public Procurement Act (Act 663, 2003 as revised) of Ghana seeks to emphasis the important role of central government at addressing societal, environmental and economic challenges through public procurement activities (PPA Ghana, 2017: Liu, Liu & Yang, 2019) and to push suppliers, through regulatory framework, to produce goods and services sustainably, by ensuring that the objectives of Sustainable Development Goals (SDG) are achieved (Duane et al., 2019). At a United Nations World Summit on Sustainable Development (WSSD) launched by the Johannesburg implementation plan in 2002, a global 10-year development plan framework for action on sustainable consumption and production generated calls to consider long-term economic, social, and

environmental impact of public procurement practices (Seyfang, 2003; Walker & Brammer, 2012: Adjei-Bamfo, Maloreh-Nyamekye & Ahenkan, 2019). These calls according to Adjei-Bamfo et al. (2019) seek to promote sustainable public procurement practices and emphasises the world's effort to achieving the Sustainable Development Goals (SDGs) of encouraging SPP practices that are consistent with national priorities. These, Walker & Brammer (2012) and Adjei-Bamfo et al. (2019) explained promote innovation and the development of sustainable industrial practices creating a resilient infrastructure and support the transition to more sustainable production and consumption patterns. Walker and Brammer (2012) and Adjei-Bamfo et al. (2019) further supported that sustainable products embody the principles of responsible consumption and production and used in ways that minimise their environmental impact, conserve resources, and promote sustainable lifestyles. Sustainable products help address climate change by reducing greenhouse gas emissions, minimising energy, and resource consumption, and promoting renewable energy sources. Duane et al. (2019) indicated that sustainable products contribute to building a low-carbon economy, mitigating the impacts of climate change and support the conservation of marine and terrestrial ecosystems.

Sustainability Drivers

According to De Medeiros, Ribeiro and Cortimiglia (2014), Díaz-García, González-Moreno and Sáez-Martínez (2014), Del Río, Peñasco and Romero-Jordán (2016) and later Kiefer, Del Río González and Carrillo-Hermosilla (2019) substantial research on the drivers to sustainability has been carried out since the year 2000. Del Río González and Carrillo-Hermosilla (2019) further suggested that firms are influenced by internal and external factors when taking the decision towards sustainability with the role of Resources, Competences, and dynamic Capabilities (RCCs) serving as important internal drivers of business strategies and innovation performance, while public policy, stakeholder impacts, and environmental regulation mostly drive sustainability externally. Critical success factors for environmentally sustainable product innovation include market, law, and regulation knowledge; collaboration; innovation-oriented learning; and Research and Development (R&D) investments (De Medeiros et al., 2014). The drive towards circular economy is progressively promoted as a way of separating economic growth and environmental consequences with low-carbon use and production mechanisms enabling circularity

and bolster the implementation of sustainable development goals (Marrucci, Daddi & Iraldo, 2019; Lăzăroiu et al., 2020; Wiprächtiger, Haupt, Heeren, Waser & Hellweg, 2020). Drivers such as renewable energy, stakeholder (social) satisfaction, efficiency improvement and innovation (Daneshpour, 2016; Lăzăroiu et al., 2020; Wiprächtiger et al., 2020) and, from the economic aspect of sustainability, waste as a valuable resource because of its value resource in recycling (Mwanza & Mbohwa, 2017; Marrucci, Daddi & Iraldo, 2019) have been considered in recent times by developing economies such as Ghana. Customer expectation, top management commitment, moral and ethical values of managers, reputation management, and economic and operational benefits (Sajjad, Eweje & Tappin, 2020) are some of the key sustainability drivers. Mwanza & Mbohwa (2017) further explained that household and individuals should be aware or educated on the value of plastic waste as a resource. According to Daneshpour (2016) and Del Río González and Carrillo-Hermosilla (2019) environmental protection, climate change and global warming are drivers in sustainability from the environmental aspect. For example, wastes, whether solid (plastics) or liquid (acidic gases) have detrimental effect on the environment and, therefore, educating the community and households on, for example, the effects of plastic wastes on the environment is a cardinal aspect in sustainable development of systems (Daneshpour, 2016: Sajjad, Eweje & Tappin, 2020). Daneshpour (2016) and Sajjad et al. (2020) further stated that human population, public awareness, and education are social drivers that have driven sustainability management.

Barriers to sustainability

Though Ghana's Public Procurement Act 663, (2003) has been amended by Act 914 (2016) to provide a legal basis for Sustainable Public Procurement (SPP) and make room for certain socio-economic policies (environmental, social, economic and other policies which are intended to promote social and economic impact), there is no explicit definition and provision for social value as an evaluation criterion (Gidigah, Agyekum & Baiden, 2022). Ghana's Public Procurement Amendment Act 2016 (Act 914) was made to respond to the contemporary sustainability orientation of public procurement and to correct existing snags in the practice (Adjei-Bamfo & Maloreh-Nyamekye, 2019). However, effort by procurement entities to achieve an ideal sustainable procurement process has been fraught with many challenges including the difficulty in showing a powerful bidding preference that has the capability to

effectively encourage every construction-oriented party toward sustainability (Somboonpisan & Limsawasd, 2021). Ayee (2000) and Adjei-Bamfo and Maloreh-Nyamekye (2019) were of the view that the absence of a clear legal framework to regulate, and to supply a guide for SPP practice has been challenging. Ayee (2000), Hasselbalch, Costa and Blecken (2014) and Somboonpisan and Limsawasd (2021) corroborated that these barriers (absence of legal framework, a guide for SPP practice) can hinder the adoption and implementation of sustainable procurement practices and, further stated that these barriers include; limited availability of sustainable products in the Ghanaian market; local suppliers may have limited ability or awareness of sustainable options; and, lack of incentives for businesses to produce or import sustainable products. Raymond (2008), Anane et al. (2019) and Gidigah et al. (2022) also traced the lack of professional and qualified procurement staffs in public procurement entities to unsustainable practices such as the sourcing or buying from unregistered manufacturers who source of raw materials remained questionable and avoid compliance. Procurement staff could feel pressured to make decisions that do not align with sustainable procurement strategy which could suggest a conflict between the pressures on staff and the greater driving them towards supporting the status quo (Brammer & Walker, 2011; Ogunsanya et al., 2022). According to Nigeria's Sustainable Development Commission (2004) and Ogunsanya et al. (2022) there is a belief that sustainability increases cost, lack of awareness of the need for sustainable procurement and the processes entailed, lack of knowledge needed, risk averseness on the part of clients, legal constraints, leadership challenges and inertia.

Effective training, therefore, will enhance knowledge skills and behaviours of the personnel and improve performance and productivity (Tukamuhabwa, 2012: Anane et al., 2019). The absence of training, therefore, makes it difficult for procurement entities to find and obtain sustainable product alternative. Absence of clear standards and certifications for sustainable products in Ghana can make it difficult for procurement entities to find and verify the sustainability claims of suppliers. The lack of recognised standards may lead to confusion and uncertainty on the credibility and performance of sustainable products in the market. State Owned Enterprises (SOE) such as EDG have had to seek legal guidance and redress on whether the PPA Act 663 (2003) covers procurement using internally generated funding (IGF).

Entities responsible for enforcing SPP standards lack the requisite capacity to design SPP criteria and to evaluate suppliers (Ayee, 2000: Kauppi & Van Raaij, 2014: Patil, 2017) and the lack of coordination among relevant stakeholders such as enforcing agencies, suppliers etc., can lead to duplication of efforts, inefficiencies, and delays in decision implementation. According to Crespin-Mazet and Dontenwill (2012), Adjei-Bamfo and Maloreh-Nyamekye (2019) these considerations present purchasers with complex decision-making processes, such as, developing new performance indicators for assessing the environmental and social impact of products and production behaviours of suppliers which often puts added strain on the budget of the purchaser. However, ignoring the performance indicators may stimulate exploitation and unfairness due to the information gaps created (Kauppi & Van Raaij, 2014). A major problem in adoption of sustainable public procurement is the lack of information available to people on the impact of the goods on the environment and that purchase officials lack information and face difficulty in the preparation of tender documents for purchasing (Walker & Brammer, 2012: Zaidi et al., 2019).

The absence of clear definition and lack of evaluation standards for green procurement are other hindrances to sustainable public procurement implementation. According to Ayee (2000), Kauppi and Van Raaij (2014) and Ibrahim, Bawole, Obuobisa-Darko, Abubakar and Kumasey (2017), poor SPP monitoring hinders control mechanism which allows procurement bureaucrats and professionals act within the dictates of politicians rather than procurement guidelines. Sustainable procurement requires monitoring and enforcement decisions which can be difficult to achieve due to inadequate resources, corruption, or lack of political will (Liu, Liu & Yang, 2019; Owusu-Manu et al, 2020). Although the will and commitment of relevant stakeholders, including procurement bureaucrats and heads of entities, to enforce the SPP policy cannot be overemphasised, that of the political executives is more crucial to the success of the SPP policy (Ayee, 2000: Ameyaw, Mensah & Osei-Tutu, 2012: Liu, Liu & Yang, 2019). Adjei-Bamfo and Maloreh-Nyamekye (2019) and Vejaratnam, Mohamad and Chenayah (2020) further opined that cost of green products is another form of a financial barrier explaining that sustainable products often came with a higher price tag compared to conventional products. Examples of high-cost sustainable options are energy-efficient appliances or eco-friendly materials, such as, electrical vehicles which initial price compared with fuel

dependent vehicles appears to be high but eventually tend to be cost effective**.** This deterred procurement entities from choosing sustainable products because of limited budgets and the pressure to achieve cost savings in the short term. This, therefore, made it challenging to prioritise sustainability over immediate financial considerations because sustainable products were seen to be expensive as compared with goods that were manufactured without regard to their impact on the environment (Vejaratnam et al, 2020). Leni, Victoria, Maia, and Dan (2012) and Anane et al. (2019) asserted that despite the increase in resources, delivery of service in the public sector is still decreasing in many developing nations due to inadequate procurement practices such as, lack of procurement policy, poor sustainable procurement practices and absence of procurement planning. However, Brammer and Walker (2011), Keulemans and Van de Walle (2017) and Adjei-Bamfo and Maloreh-Nyamekye (2019) believed citizens of the advanced economies such as the European Union (EU) more often accept expensive tender offers, provided the price variations are explained by environmental and social considerations.

Measuring Procurement Performance

On March 2, 2004, the European Institute of Purchasing Management (EIPM) organised a conference titled, “Measuring Purchasing Performance” to discuss, among others, issues that bothered on measurements of intangibles as opposed to tangibles, financial measurements as opposed to other indicators in the procurement process (Kakwezi & Nyeko, 2019). The need to measure procurement performance has since caused numerous studies in performance measurement to formulate appropriate models including the determination of the six indicators of Value for Money (VfM) procurement. This relates to number of bidders for a contract, open advertising of contracts, aggregation of demand, type of award criteria used, decision speed, and reporting of information about contract awards (European Commission, 2015: Flynn, 2018). For example, weights are given to each of the six indicators according to their threshold or importance to the item being procured, and scores awarded to same and summed up to determine the lowest evaluated bid. The result being that the supplier or bidder with the highest score would have best satisfied all the requirement needed to supply the item or goods. Abolbashari, Chang, Hussain and Saberi (2018) projected the Smart Buyer framework using Bayesian Network theory (Chen et al., 2018) to capture the different Key Performance Indicators (KPIs)

that come under the organisation effective and efficient procurement process and quantified on the Smart Buyer scale to determine procurement performance. Abolbashari et al. (2018) further explained that such a model can either predict or diagnose reasons and identify the areas for improvement to increase overall procurement performance. In the performance measurement using the six indicators of VfM procurement or Smart Buyer scale the price of the item is an absent performance indicator or factor.

The key problems and issues faced here can be detailed as: the need to include environmental and corporate social responsibility (CSR) issues in the procurement process since bottom-line requirement alone will be concentrating on profit and loss at the expense of the social and environmental consequence: promotion of diversity and inclusion of women and the marginalised in the bidding process in developing supply chains with sustainability and innovation at its core: need to measure procurement performance using appropriate models to determine of VfM procurement. The next stage will critically analyse and synthesise the existing scholarly writings on procuring sustainable products in developing countries with Ghana being the focus. It will seek to identify the gaps, inconsistencies, and emerging trends in the field of sustainable public procurement, with the goal of generating new insights and directions for future practice.

Sustainability for Effective Tendering

Contemporary public procurement literature contends that there is the need to assess tenders beyond price criteria to also consider other environmental and social criteria that control the production and consumption behaviours of suppliers and buyers (Gelderman, Semeijn, & Bouma, 2015: Keulemans & Van de Walle, 2017: Adjei-Bamfo & Maloreh-Nyamekye, 2019). A tender is a formal offer or bid from a potential supplier looking to win a contract for goods, works or services and, usually submitted in writing, outlining the work or goods or services to be delivered, at a stated price and under stated conditions (Baiden et al., 2015: Mapulanga, 2015: CIPS.Org, 2022). There is an increasing call for the inclusion of sustainability considerations in tender procedures (Bernal et al., 2019).

Evaluation of tenders refers to the process of assessing and deciding which bidders are qualified to perform the contract with the aim of ensuring the ‘best fit’ supplier is

selected to supply goods or works or services while legalities are observed (Matto, Ame, & Nsimbila, 2021: CIPS.Org, 2022). The selection process used by public institutions in tendering has a great deal to do with the performance of the product or service purchased as they handle setting up the basis and guidelines for companies' willing to take part in the tender (Braulio-Gonzalo & Bovea, 2020a). Therefore, the requirements set in tender documents will decide what kinds of companies will be able to take part. To help find which supplier is offering the best value for money, tenders should be examined based on trust, fairness, and quality (Marcarelli & Nappi, 2019: CIPS.Org, 2022).

Effectiveness of sustainability efforts is influenced by a variety of internal and external stakeholders, including suppliers, which parties may have opposing objectives (Billa et al., 2021). For example, in assessing the commitment of the suppliers to sustainability, one has to lookout for suppliers who have robust sustainability policies, initiatives and goals in place. This enhances collaboration between the buying party and seller when sustainability issues are to be considered since stakeholder members' values and morality draw them closer to firms with similar values (Adzimah, Lei & Ishawu, 2020). These inherent varieties of aims and beliefs held by stakeholders in the procurement process can feed into the tendering process for a transparent, fair, and acceptable outcome. In an attempt to achieve an ideal outcome for all stakeholders in the procurement process Fukui and Kobayashi (2010), Hardwick, Akram and Markantonakis (2018) and Jain, Chauhan, Singh and Thakur (2018) agreed on the use of multiple attribute of quality, price, completion time, technical merit, aesthetic and functional characteristics, environmental characteristics, running costs, cost-effectiveness, etc. in the selection of bidders to a contract. This tends to achieve Government aims of achieving socially efficient levels of quality that maximise social surplus and simultaneously improve the expected providing source through competitive bidding (Deshpande, Gowda, Dixit, Khubbar, Jayasri & Lokesh, 2020).

Regarding the contractor or supplier selection criteria, project owners or buyers traditionally favour the contractor with the lowest bid price, which, in most cases, leads to poor quality, delays, and added costs because of rework, claims, and disputes in the contractual period (Cheaitou, Larbi & Al Housani, 2018: Chen, Zhang, Rodríguez, Pedrycz & Martínez, 2021). This is more so where the criteria include

technical aspects such as quality of work or products, contract completion or delivery period, tender price, management and personnel capacity and the health, safety & environment (HSE) system (Nasab & Ghamsarian, 2015: Chen et al., 2021). Bergman and Lundberg (2013) and Chen et al. (2021) further reiterated that earlier practice and experience have proved that the method of prioritising lowest bid price is undesirable in many ways because it is likely to lead to unsatisfactory quality of work and even serious safety accidents, which usually cause significant loss to the employer. Instead, a practical paradigm based on the best value has been widely used to select suitable contractors in which experts score bidders according to a set of conflicting quantitative and qualitative criteria. Abdollahi, Arvan and Razmi (2015) and Nair, Jayaram and Das (2015) confirmed this by saying that the strategic impact of buying in terms of cost, quality, delivery, flexibility, and innovation is increasingly clear with Nair et al. (2015) associating cost of procurement with a range from 30% to as high as 70%.

To ensure that procurement sustainability is given the importance it deserves in shaping the relationship between parties of the supply chain, the key requirement is first to measure how it is currently being done and then, depending on this, to make plans for improvement (Abolbashari et al., 2018). In other words, to be sure that sustainable products are given its due importance as a strategic activity, it first needs to be measured to decide how well it impacts across all the organisation's contributing departments (Abolbashari et al., 2018: Montalbán-Domingo et al., 2020) and to find out if this measurement matches with the organisation's strategic requirements. For example, the concept of social value, as proposed by Halloran (2017), as a soft non-financial benefit, such as the construction of borehole to provide potable water for communities through an organisation's corporate social responsibility (CSR) including the effect an activity has on the wider community and the environment (Gidigah & Baiden, 2021). This provides the platform for the social perspective of sustainability to be measured. In other words, evaluating tender under social perspective, one has to lookout for goods produced under fair labour conditions, support local communities, or promote social equality. This is concurrent to the notion that you cannot improve what you cannot measure (Abolbashari et al., 2018).

Liu, Huo, Wang, Shen, and Chen (2013), Liu, Yang, Huo, Shen, and Wang (2017) and Oguntona and Aigbavboa (2017) wrote about a decision-based bid evaluation

model for urban infrastructure projects that considered social costs and agreed that sustainability criteria, such as, reduced carbon dioxide emissions were an essential factor for contractor selection. The selection criteria used in the studies were either wholly or partially qualitative. One of the ways to reduce risk outcomes on public procurement is by integrating sustainable and safety issues into the tender evaluation process to figure out who to supply a product that will cause less or no harm to the people and the environment (Loosemore & Higgon, 2015: Boadu, Sunindijo, Wang & Frimpong, 2021: Boadu et al., 2022). Boadu et al. (2021) further, supplied an evidence-based assessment of the extent of Health and Safety (H&S) consideration in the procurement process for public projects in Ghana. This shown that H&S and sustainability matters are not adequately integrated into decision-making and practices in public procurement, resulting in high rates of industrial accidents and exposure to hazardous products by employees.

There are rules on scoring and weighting during evaluation to choose the most economically advantageous tender (Bergman & Lundberg, 2013: Stilger et al., 2017) and if not properly managed, considering whole life costs, including the removal or disposals of a product, the tender evaluation process can be extremely costly and entities may automatically fail to achieve economy and efficiency (Asare & Prempeh, 2016: Matto, Ame & Nsimbila, 2021: CIPS.Org, 2022). This was corroborated by Cheng et al. (2018) and Braulio-Gonzalo and Bovea (2020a), showing that scoring rules for award criteria and the weighting of requirements are barely discussed in literature, and that allocating the weight for environmental considerations included into scoring rules, and knowing to what extent environmental significance is compared to the product price, and other indicators are necessary to enable Green Public Procurement (GPP) to become a more viable environmental tool.

In assessing or evaluating environmental impact of the goods being procured, one may have to lookout for products that are; energy-efficient, have a low carbon footprint, use environmentally friendly materials, or have a minimal impact on natural resources. According to Dotoli, Epicoco and Falagario (2020), tenders can be evaluated based on the price and the overall quality, and the latter subdivided into ‘‘Technical’’ value, ‘‘Certifications’’, and ‘‘Conditions’’. Each sub-criterion is further characterised by some risk factors such as injuries, environmental impact, and supply chain disruption. Hatush and Skitmore (1998), used multi-criterion utility theory to

assess different contractor capabilities, of which the utility curve was determined by decision maker risk type and each contractor criterion specified by using a weighting that incorporated the risk due to the decision maker.

Falagario, Sciancalepore, Costantino and Pietroforte (2012) adopted a cross-efficiency approach to public procurement tenders' evaluation, in which the weights of criteria were determined objectively after bid opening by using, a specific algorithm defined a priori, to guarantee fair and equal evaluation after which vendors were finally ranked according to their cross-efficiency values. According to Chen, et al. (2021) as qualitative tender evaluation analyses were developed, many researchers, such as, Ko, Cheng, and Wu(2007), Juan, Perng, Castro-Lacouture and Lu (2009) and, Vahdani, Mousavi, Hashemi, Mousakhani and Tavakkoli-Moghaddam (2013) investigated the bid-evaluation problem in a fuzzy environment where decision is made based on goals and/or the constraints, but not necessarily the system under control. Subsequently, Ko et al. (2007) used the evolutionary model to evaluate the performance of sub-contractors and the effect of their activities on the environment. Vahdani et al. (2013) studied bid evaluation by using the method to obtain a compromised solution that considers both conflicting quantitative and qualitative evaluation criteria, while Juan et al. (2009) proposed a hybrid approach combining fuzzy set theory and quality function deployment, which took customer requirements into account to establish a housing refurbishment contractor-selection model.

According to Braulio-Gonzalo and Bovea (2020a) public tender documents for the evaluation process which include a mixture of technical, economic, work condition-related, social, ethical, environmental and innovation specifications, distribute discretionary percentage weights to each of the categories, since European Union (EU) Green Public Procurement (GPP) proposed a set of criteria but not a weighting system. Although, environmental considerations are increasingly considered during procurement processes in the European context, they only represent around 10% of the overall weight, with economic specifications still being the most relevant ones (Uttam & Roos, 2015: Braulio-Gonzalo & Bovea, 2020a).

Sustainability Gaps

Cheng, Appolloni, D'Amato and Zhu (2018) named missing gaps, associated with sustainable procurement and supply chain management, such as, over concentration

of research on limited impacts and that green public procurement, in its infancy stages, needs to be looked at in future trends. Indeed, leadership, as De Giacomo et al. (2019) and Sönnichsen and Clement (2020) argued, is a crucial factor in the implementation of circular public procurement in public sector organisations. Therefore, support from senior management incorporating circular public procurement into organisational planning, strategies and goal setting will serve as a catalyst to enforce the rules of engagement. Liu, Liu, and Yang (2020) and Sánchez-Flores et al. (2020) corroborated this that top management and government support are critical elements if sustainable supply chain management in emerging economies is to achieve what it is set to achieve. For Loosemore and Barraket (2017), and recently, Nimsai, Yoopetch and Lai (2020), practitioners and scholars, such as those in supply chain management, are now inquiring into how integrating social values into policies and legislations could contribute to waste reduction through efficient resource use, energy conservation, and less environmental effects by manufacturing activities. Integrating social values into policies and legislations is to provide a solid legal foundation for public procurement process. Monica, Ridwan and Hediyanto (2021) has taken it to another level by advocating for the use of Enterprise Resource Product (ERP) to identify responsible and sustainable sources of materials through manufacturers who implement objectives to enhance the selection of vendors that meet defined social and environment standards. The Public Procurement Act 663 of Ghana (2003, 914 as amended) which was legislated to help conduct public procurement in a fair, transparent, and non-discriminatory manner, focusing on the environment and society, has had its fair share of implementation challenges, with organisations such as EDG still struggling to implement the dictates of the Act to the letter. In fact, Donkoh, Adinyirah and Aboagye-Nimo (2015) corroborated this by showing that H&S does not form part of the criteria for evaluating tenders, and that the public procurement act of Ghana (Act 663) has no clause that addresses this. This was further corroborated by Gidigah et al. (2021) that despite the benefit that social sustainability comes with, an evaluation of public procurement act of Ghana (Act 663, 914 as amended) shows no explicit definition of social value in the public procurement process and that even when the Act alludes to consideration for specific social criteria in evaluating tenders, these provisions are silent on social value as an evaluation criterion in the public procurement processes. Relevant literature, industry reports, and guidelines from organisations such as the United Nations or

sustainability-focused Non-Governmental Organisations (NGOs) provide further insights into evaluating tenders for sustainable goods.

Models for Tender Evaluation

According to Cheaitou et al. (2018) considering the price as the only selection criterion is not the best approach but rather a multi-criteria contractor selection, based on quantitative and qualitative criteria, is necessary otherwise the tendering process will result in serious repercussions in terms of poor quality, delays and additional costs due to rework, preponderance of claims and disputes. The main concept of the Multi Attributes Bidding System is that the selection process of the contractors will be based on more attributes than just the price, and the successful bidder will be the one who has the highest combined bidding value of the multiple attributes (Huang, 2011; Cheaitou et al., 2018). To decide which tender is the most economically advantageous involves the use of an aggregation method like the weighted sum which is also an intuitive evaluation criterion to show relative importance of tenders (Mateus, Ferreira & Carreira, 2010; Cheng, Wang & Sun, 2012; Agyekum, Adinyira & Amudjie, 2021). According to Igarashi, de Boer and Fet (2013) and Baranovsky et al. (2020) selecting a supplier can be regarded as a major decision, not only in the sense of providing the purchasing organisation with the right materials, products, or solutions at a competitive cost level, but also to improving its environmental performance. E.g., evaluation of tender to select a supplier could be done with the view to avoiding hazardous materials or considering alternative solutions that require less materials and/or energy. Igarashi et al. (2013) and Uttam and Roos (2015) further showed that contracting authority should assess the received tenders since the award criteria specified in the contract documents and select the Most Economically Advantageous Tender (MEAT). To effectively develop the right criteria for selecting the MEAT, various aspects of a product or service that provide value to the purchasing organisation, such as, economy, quality, environmental, social etc., need to be considered (Uttam & Roos, 2015; Dotoli, et. al., 2020).

There are several existing models for evaluating procurement tenders which considers product or service impact on economy, quality, environmental, social, and non-price criteria such as payment terms, date for implementation, warranty service, etc. Some known models include.

(i) “Competitive Dialogue Procedure (CDP)” (Uttam & Roos, 2015) allows authorities to hold discussions with shortlisted candidates on the authority's requirements before the authority invites final written tenders. The European Union (2014) explained CDP as a procedure in which a supplier or vendor may request to participate in a tender while the contracting authority conducts a dialogue with the candidate admitted to that procedure, with the aim of developing one or more suitable alternatives capable of meeting its requirements and based on which the candidates chosen are invited to a tender. Also referred to as MEAT (Uttam & Roos, 2015; Dotoli et al., 2020) the preferred tender is decided by the weighted sum of various aspects of a product or service that supplies value to the procurer in terms of economy, quality, environmental considerations, and social aspects.

(ii) A two-step tendering process that resonates with CDP with the first step enabling interaction and dialogue between the contracting authority and potential bidders on the needs and options, and the second step being the actual tendering process (Džupka, Kubák, & Nemec, 2020). The tendering process will score each bid under the given criterion and the weight adopted for that criterion by the organisation under study (E.g., EDG) and same used for rating the alternative. Ratings will be calculated using value function in which the overall value of the alternative x is used.

(iii) According to Lehtonen and Virtanen (2022) a common way to assess the relative attractiveness of performance levels is through a scoring formula and using a weighted average to combine scores into an overall tender score. An analytical hierarchy process (AHP) based tender evaluation models was introduced, by Ishizaka et al. (2012), Marcarelli and Nappi (2019) and Marcarelli and Squillante (2019) who, for instance, applied AHP to rank tenders using the Most Economically Advantageous Tender (MEAT) criteria.

(iv) Iso-utility curve: According to Stilger, Siderius and Raaij (2017), and Corradin and Sartore (2018) when the iso-utility curve is used to select a winning tender. The lowest price bid gets the maximum price score; others get fewer points pro rata; the quality score is the sum of the scores on the individual quality criteria times the total weight of quality; the total score is the sum of the price score and the quality score.

The ranking is based on the sum with the highest sum ranked first. Besides price, Technical Capacity; SLA (Service Level Agreement); CSR (Corporate Social Responsibility) are three quality criteria used to differentiate offers. These minimum requirements are covered in the qualification stage. In the selection stage, the buyer ranks all qualified bidders on discriminating criteria. This allows the buyer to choose for a 70% weight on price and 30% on quality and assigns weights to the three non-price qualities criteria (Stilger et al., 2017).

(v) The Prequalification Method: To ensure the quality of suppliers or contractors, the valuation can be done beforehand with a prequalification method. Facing the owner's scrutiny regarding its competency to handle the business aspects of the operation during prequalification allows the contractor to focus on the specifics of the construction project once it has passed through prequalification and been short-listed. This also allows the owner's bid evaluation team to focus only on the specific elements of the project, without being distracted by the other business considerations. In the simplest meaning prequalification is a before tendering procedure which allows to choose the most appropriate candidates from amongst those declaring willingness to participate in the tendering (Huang, 2011).

(vi) According to Berrone, Ricart, Duch, Bernardo, Salvador, Piedra Peña and Rodríguez Planas (2019) the EASIER model accounts for six different dimensions which is an acronym for: Engagement of Stakeholders, in reference to the scope that the Public, Private, Partnership (PPP) involved in multiple constituencies; Access, which refers to the extent to which the PPP is oriented toward increasing access to social interest services to the population; Scalability and Replicability, regarding the degree to which a

PPP can achieve profitable growth and be copied to other geographies; Inclusiveness, which refers to level of coverage that a PPP offer on a non-discriminatory ground; Economic Impact, which refers to the impact of the PPP on the economy and its contribution to economic growth; Resilience and Environment, which refers to the ability of the PPP to build resilient and ecological communities. EASIER is an evaluation method based on a questionnaire, tapping into the six dimensions of the EASIER conceptual model. In order to ensure validity, two different evaluators participated in the evaluation process and applied the EASIER questionnaire independently (Berrone et al., 2019).

The chapter engaged a comprehensive literature review that provided a nuanced understanding of sustainable public procurement, shedding light on its fundamental components and complexities. By examining sustainability drivers and barriers, insights into the forces propelling change and the challenges that must be navigated in the quest for more responsible procurement practices was gained. The exploration of sustainability within the context of effective tendering underscored its pivotal role in shaping the procurement landscape. Moreover, the scrutiny of diverse models for tender evaluation illustrated the diversity of approaches available to align procurement processes with sustainability goals in EDG. As we consolidated this knowledge review, it became clear that the journey towards sustainable public procurement is dynamic, requiring a thoughtful integration of diverse perspectives and methodologies. This chapter served as a foundation for the next sections, guiding us toward a deeper exploration of practical applications and potential avenues for further research in this vital field.

The next chapter will discuss the methodology that was employed in collecting and analysing the primary data. It will discuss the rationale for choice of approach, access and tools used in gathering data, sampling method and coding. The inductive approach to data collection and the selection of participants to be interviewed were elaborated. The use of Computer Assisted Qualitative Data Analysis Software (CAQDAS) (Dalkin, Forster, Hodgson, Lhussier & Carr, 2021) in analysing data was also discussed along with how to ensure rigor of findings. A pilot study in the form of qualitative interview with four stakeholders, two of whom were staff of EDG with the other two being Suppliers of products to EDG was conducted and analysed using

NVivo 12. The chapter concluded with a post pilot study meant to revise interview protocol and the several important steps to be taken to, further, refine the research and prepare for the main data collection and analysis.

Chapter 3:

Methodology

This chapter discussed the methodology that was employed in collecting and analysing the primary data. It discussed the rationale for choice of approach, access, and tools to be used in gathering data, sampling method and coding. The inductive approach to data collection including a 'data informing' theoretically framed data collection approach which identified the right model for sustainable product tender evaluation in EDG, and the selection of participants to be interviewed was elaborated. The use of Computer Assisted Qualitative Data Analysis Software (CAQDAS), i.e., NVivo 12 and 14 (Dalkin, Forster, Hodgson, Lhussier & Carr, 2021) in analysing data was also discussed along with how to ensure rigor of findings. A pilot study in the form of qualitative interview with four stakeholders, two of whom were staff of EDG with the other two being Suppliers of products to EDG, was conducted. The chapter concluded with a post pilot study meant to revise interview protocol and the several important steps to be taken to, further, refine the research and prepare for the main data collection and analysis.

Rationale for choice of Approach

The choice of a qualitative approach to data collection was informed by the view that non-probability sampling that is associated, principally, with the range of non-positivist epistemologies and qualitative research is based on judgement rather than statistical probability (Saunders, 2012: Jowett, 2020) and that most organisational and management sciences are beginning to make use of the interpretivist approach to such research as opposed to earlier preference to positivist approaches (Bercht, 2021: Kyngäs, 2020: Dyar, 2022).

This study, however, avoided the "methodological monism" (Filip, 2020) which is the use of one approach to data collection with the believe that all approaches could yield valuable results if applied prudently. The inclusion of a theoretically framed data collection approach to obtain the right model for sustainable product tender evaluation in EDG (Walliman, 2010: Willig, 2013: Dow, 2018: Filip, 2020: Varpio,

Paradis, Uijtdehaage & Young, 2020) will call for constant review of literature alongside data collection, analysis, and conclusion. Therefore, the qualitative approach will guide the development of the theoretical framework, including practical decisions of research design, e.g., the design of interview questions, study participant selection etc., while the researcher will wait until data analysis is underway to decide which models or theories can be used to inform data interpretations (Varpio, Paradis, Uijtdehaage & Young, 2020). By resorting to a theory-informing inductive data analysis study design and a theoretically framed data collection approach will guide the qualitative interview questions and analysis, inform the discussion of the findings, and reveal the subjectivities of the research (Talbot et al., 2016: Varpio et al, 2020). The subjective approach will also obtain data from published safety, health and environment report or surveys from the Safety, Health, and Environment (SHE) department of EDG to augment the main qualitative interview (Jeevan, Bandara, Mohd Salleh, Ngah & Hanafiah, 2019: Strijker, Bosworth & Bouter, 2020: Lall, 2021). The search and application of the tender evaluation model, with weight allocated to sustainability factors, will be subjectively flexible during trial and implementation stages to get a best fit metrics. The ultimate concern for the study is to ensure that it is relevant to all the research aim and key objectives. As suggested by Thorpe and Holt (2008), Ivanov, Seyitoğlu and Markova (2020), Lall (2021) and Lee-Cultura, Sharma, and Giannakos (2022), the study will employ a flexible technique by drawing on multiple data gathering approaches to understand complex phenomena.

Access

An ‘opportunist approach’ according to Ritchie, Lewis, and Elam (2003) and Kravariti, Oruh, Dibia, Tasoulis, Scullion and Mamman (2021) of gaining access and choosing research participants, will be adopted. Therefore, access to departmental gatekeepers will be brokered through known colleagues in EDG operational areas (Okumus et al., 2007). For example, colleagues in the supply chain profession, working in departments of choice for the research sites, will be used as ‘snowballing’ medium to reach targets.

Tool

This research will adopt a data driven, single critical case, due to significance to the industry in a participatory and collaborative social science environment (Saunders,

2012: Banks & Brydon-Miller, 2018: Kythreotis, Mantyka-Pringle, Mercer, Whitmarsh, Corner, Paavola, & Castree, 2019: Vaughn, & Jacquez, 2020). The focus will be on the people in decision making positions, e.g., Managers, Professionals. The integrative approach using designed in-depth, qualitative open-ended interview questions (Rosskam, 2018: Altrichter, 2020) supported by data from theoretical framework will be administered to participants who are both internal and external stakeholders in the electricity distribution organisation in Ghana.

Virtual meeting in the form of “Teams” meeting will be used to save costs (Deakin & Wakefield, 2013; Winiarska, 2017), gain access to larger and more diverse populations, interview more participants in a shorter amount of time by eliminating travel and to reduce unpredictable circumstances, such as poor weather conditions, that would deter participants meeting face to face (Deakin & Wakefield, 2013; Winiarska, 2017; Gray et al., 2020). Indeed, participants using video conferencing enjoy the flexibility and convenience of participating online (Deakin & Wakefield, 2013).

According to Gray et al. (2020) virtual communication programs, such as Teams, may have different requirements, but will require access to specific software, hardware, and high-speed Internet access. Researcher and participants will connect to their chosen platform using their computer, mobile telephone, or tablet and have the choice of using wireless Internet or hardwiring their computer to the Internet. The use of technology to aid communication has been discussed by Sah, Singh and Sah (2020), Morrison-Smith and Ruiz (2020) and Gupta, Mathur and Narang (2023) who advocates that virtual communication act as an enabler for effective working and dissemination of information in an effective manner and, therefore, has now become as important as traditional communications. For an effective qualitative interview, the following 10 recommendations by Smith (2014), Hai-Jew (2015) and Gray, et al. (2020) will apply:

(1) Test Teams ahead of interview. This will be done with a colleague to solve common technical difficulties that may arise. For example, participants downloading the application to their phone if they are not using the computer version of Teams may need some technical guidance. The researcher will also need to test the audio

volume before and during each interview to ensure clarity. This is best practice for any audio-recorded research interview, regardless of method.

(2) Provide participant with technical information, such as, specific information that is important for them to know about participating in a Teams interview in the study information letter. For example, provide options regarding what type of device they can use teams on, any required audio and/or visual capabilities, and the option of using a headset with a microphone.

(3) Have an alternative plan. Have a prearranged backup plan with participants in case of technical difficulties or other disturbances. If there is an unreliable Internet connection, technical difficulties such as loss of Internet connection, freezing, or other audio and video disturbances can occur. For example, at the start of the Zoom interview, remind participants that the researcher will phone them if problems arise. In addition, researchers are encouraged to allow additional interview time to accommodate for unexpected delays.

(4) Plan for distractions. Account for interview time taken up by distractions when designing your interview guide. Participants may be in their home, car, or a public setting for their interview and will have distractions and noises, such as family members, pets, and doorbells. For example, another phone may ring.

(5) Provide a direct link to meeting. When a Teams meeting is scheduled, a meeting invitation is generated with live link to the meeting. Paste this link into the email invitation to interviewee. Participants will enter the online interview with one click of this link.

(6) Consider storage needs. Researchers will benefit from budgeting time for the interviews based on how much computer data or cloud storage they have available. Depending on the video or audio resolution, storage needs for a one-hour interview range from 23 megabytes to 623 megabytes.

(7) Hardwire computer to Internet. If possible, hardwire the researcher's computer to the Internet instead of using a Wi-Fi connection to secure a stronger and more stable Internet connection.

(8) Uninterrupted Internet connection. Unhook other devices connected to the researcher's Internet provider during the interview, including Wi-Fi on mobile phones

and tablets, and Internet-based phones. A house phone, using the same Internet connection, can cause an audio and video disturbance.

(9) Create a visual reminder. The researcher will use a visual cue as a reminder to press record when they start the interview. While Teams offers the option to automatically record a meeting, the ethically correct strategy will seek consent to record from the participant.

(10) Manage consent processes. Before starting the interview, researcher will review the information letter and consent form to invite questions and ensure participants understand the research processes. Consider recording the participant's verbal consent and interview in two separate recordings.

Computer Assisted Qualitative Data Analysis Software (CAQDAS)

According to Rodrigues, Costa, and Moreira (2019) by "allowing the introduction of new interpretive elements that enrich the analysis and understanding of their object of study", in the form of Computer Assisted Qualitative Data Analysis Software (CAQDAS), an enhanced understanding into the objectives of a study can be achieved. With the aid of NVivo 12 software, the approach to the qualitative data analysis will aim at data reduction by summarising and simplifying data (Jackson & Bazeley, 2019: Dalkin et al., 2021), displaying data by organising them into diagrams, and drawing conclusions by exploring relationships, key themes, patterns, and trends (Saunders, 2015: O'Kane, Smith, & Lerman, 2021: Smit & Scherman, 2021). Interview questions was designed to aid the narrative analysis of the various categories of participants and products. Examples are Procurement professionals and practitioners, procurement practitioners who happened to be Engineers, suppliers of electrical products (cables & conductors), suppliers of non-electrical products (computers). These could be senior managers and/or Senior Staff in the organisation.

Sampling Method

The non-random sampling of participants will be purposive and based on convenience, targeting homogenous groups such as procurement professional, supply chain practitioners and some staff of user departments numbering over 100, as well as over 20 external suppliers of critical products (Berndt, 2020; Stratton,

2021). The sample units will be chosen for having particular features or characteristics which will enable detailed understanding of the central theme of the study (Ritchie et al., 2003; Stratton, 2021). It will include a means of accessing participants by asking for their consent to participate, justifying and reporting on choice of respondents (Gruber, Eberl, Lind & Boomgaarden, 2021: Cheron, Salvagni & Colomby, 2022).

To ensure transparency in the selection process, ethical consideration will be needed to accord respect for the rights of participants (Cheron et al., 2022). While gaining access is crucial to the collection of data, it is of little value unless it is established, precisely, from whom we need to collect data and how these participants will be chosen (Saunders, 2012). Saunders (2012) and Gill (2020) agreed that to answer the research question and meet its aim there will be the need to ensure that the sample enables the collection of data that are appropriate. This means specific sampling technique should be used, and the appropriate number of participants selected. Therefore, a volunteer, non-random sampling method will be used to select participants from a population of EDG Managers or Seniors staff, professionals, some internal users of products procured, and external suppliers, where choice will be based on the researcher's judgement regarding those of the population's characteristics that are important to addressing the research aim (Saunders, 2012: Shaheen & Pradhan, 2019: Gill, 2020: Jowett, 2020). This means that the researcher, together with gatekeepers, will actively choose right cases to be in the sample while reviewing published secondary sources, such as, safety reports as data sources.

The first step in a four-point approach in selecting participants to be interviewed, as indicated by Campbell, Greenwood, Prior, Shearer, Walkem, Young and Walker (2020) and May and Perry (2022), is defining the sample universe, also known as "study population" or "target population". This according to, Vasileiou, Barnett, Thorpe and Young (2018) and Campbell, et. al, (2020) is the totality of persons from which cases may legitimately be sampled in an interview study. It will involve an inclusion criterion that should specify an attribute that participants must possess to qualify for the study, and an exclusion criterion which on the other hand must stipulate attributes that disqualify a case from the study. For example, the research will look out for direct users of products bought for ECG and/or who design specifications of products. If at any time during data collection researcher judges that "theoretical saturation" has

been reached and it is assumed that further data collection will not bring incremental benefit to the theory-development process (Strauss & Corbin, 1998; Vasileiou et al., 2018; May & Perry, 2022) data collection will be halted.

A convenience sampling strategy that is purposive in nature from a population of procurement professional, supply chain practitioners, managers or heads of departments, some staff of user departments and external suppliers of critical products, as a second step in the selection process, will be used to locate any homogeneous groups that meet the required criteria and respond on a first-come-first-served basis until theoretical saturation is reached (Tomaszewski, Zarestky & Gonzalez, 2020; May & Perry, 2022). As a third step researcher will then need to ensure that all potential interviewees are informed of the study's aims, of what participation entails, of its voluntary nature, of how anonymity is protected and any other information that will help them reach an informed, consensual decision to participate (Saunders & Townsend, 2016; Vasileiou et al., 2018; Dwyer et al, 2020). In all these the Yardley (2000) criteria for evaluating qualitative research to ensure validity of a study will be adhered to as the final step. These are sensitivity to context, rigour, transparency, coherence, impact, and importance (Saunders & Townsend, 2016; Guest, Namey, & Chen, 2020).

As proposed by Saunders et al. (2009), Barglowski (2018), Gill (2020), and recently Suleiman et al. (2022), this purposive sampling method, where participants are chosen based on researcher’s judgement will also look out for volunteering participants or self-selection samples included for snowballing purposes, to reach participants that are easily identifiable but difficult to access, such as, EDG Managing director or Procurement director. Therefore, the convenience sampling method involving the use of participants from homogenous groups from Supply chain and procurement professional or practitioners, of which researcher belongs, will be leveraging approach since such participants allow one to address a research aim of an in-depth focus (Saunders, 2012: Gill, 2020; May & Perry, 2022). In effect, participants with knowledge or experience in sustainable product procurement, and are willing to spare time to share, will be selected. Sampling method will, however, change to suit the iterative nature of research and approach refined as data collection and analysis proceed (Farrugia, 2019: Suleiman et al., 2022).

An approximately one-month period will be used to set up the suitable candidates to be interviewed by identifying, contacting, introducing them to the purpose of research and scheduling date for interview etc. Interview will be based on participant's perceptions of public sector tendering, sustainable products, and what activities they engaged in when obtaining, evaluating, and responding to tenders (Kelly, Marshall, Walker & Israilidis, 2021). During the one-month period effort will be made to reassure respondents of the researcher's trust and intentions and seek consent before the interview. This will include assuring participants of the interview taking a limited portion of their time, upholding the confidentiality of information gathered and the anonymity of respondent.

Ethics

Ethical agreements with participants, in the form of participant information sheet (PIS) and consent form, to authenticate the significance of research, issues of participant confidentiality and negotiated consent at the original and/or subsequent engagements during the research period, will be critically looked at to preserve quality of research (Wan, 2019: McLeod & O'Connor, 2020: Hennell, Limmer, & Piacentini, 2020). This includes published secondary sources (Bowler, Julien & Haddon, 2018: Chatfield, 2020) on employee health and safety, in relation to sustainable products which could be obtained from EDG SHE department. Therefore, any suspicions for gaining access to organisation data will be allayed since secondary data will be assessed on published website and by formally communicating the purpose of the research to EDG and the respondents ahead of actual interview (Swayamsiddha & Mohanty, 2020: Liu, Hu & Pascarella, 2021). Evidence of approval to conduct research will, therefore, be sought and provided before actual interview of participants commences. Since the researcher will be in the organisation of study, access to data will include physical presence and phone or video conversation. The research would be expected to, in the long run, be able to verify the impact of recommendations on the tender processed and, therefore, access to data must be a continuing process or iterative and not just one single event (Saunders, 2012: Clark ,2021: Kolawole, Mishra and Hussain, 2021). This will introduce the researcher to an

interactive and incremental access to data for further investigation into the tender evaluation process to select suppliers or vendors of sustainable products.

While assuring participants that their personal data will be handled in a safe and confidential way, it will be done through an informed consent with a statement, to allow respondent some level of control over and usage of data while exercising liberty to exit at any time (Regulation, 2018: McLennan, Celi, & Buyx, 2020). The UK principle of data protection and management on personal data collection will be applied in full to address the issue of a fair and lawful, adequate and relevant, accurate and up-to-date, secure process of data handling, storage period, and disposal (van Dijk, Tanas, Rommetveit & Raab, 2018: Truong, Sun, Lee & Guo, 2019: Sudarwanto & Kharisma, 2021). That will include sensitive personal data on race or ethnic, political and religious opinion, sexual orientation etc. and the fact that participants must be of the required age of 18 years and above, can withdraw from participating in the research at any time as enshrined in UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018. Safe secure data storage network via the University of Salford Repository (USIR) cloud (i.e., https://salford-repository.worktribe.com/) will be utilised. Further, the research will include a participant information sheet stating the nature of the research, data analysis, a safe data storage and disposal process for formal agreement to be signed by both parties (Chosen, 2019: Dwyer et al., 2020: Humphries, Willoughby & Clarke, 2022).

Coding

Transcripts from qualitative interviews will be read repeatedly to, according to Elliott (2018), Linneberg and Korsgaard (2019), identify codes or themes that will be grounded in the story told and relate directly or indirectly to research questions. However, a´priori themes drawn from a conceptual framework will also be used. Themes or codes will then be reflexively analysed to identify and report on patterns or themes to make sense out of any ambiguities (Braun & Clarke, 2019). A narrative analysis in the form of content and, where applicable, visual will be used to make the story telling meaningful. Transcribed interviews from all participants will be the main source of data for the research. The thematic analysis will be fine-tuned by making sense of data through identified patterns and their importance, and why you think they are, using the skill of storytelling to describe and processing analysis (Hayfield,

Clarke & Braun, 2017: Braun, Clarke & Hayfield, 2022). Transcripts will, thereafter, be discussed with participants for mutual understanding, agreement, and acceptance. This inductive process will be expected to develop patterns from key categories of participants (Nguyen et al., 2022: Heller, Webb, Bestelmeyer, Brungard, & Davidson, 2022) for example, Managers or Seniors staff, professionals, and internal users of products procured, through their responses to interview questions on procurement practices and their effect on the environment, social, health, and safety issues.

Saturation

The level of data needed will be in accordance with Dworkin (2012), Saunders (2015), Lowe, Norris, Farris and Babbage (2018), Guest, Namey and Chen (2020) and recently Hennink and Kaiser (2021) which indicates that the number of participants needed will be a function of the relationship between the research aim, and dependent upon data collected, until no new themes are observed and the data collection process no longer offers any new or relevant data. The right level of data needed was corroborated by Leese, Nimmon, Townsend and Backman (2021) and Aguboshim (2021), that saturation in data collection is the working sampling size beyond which no relevant additions may be found. Saturation according to Guest, Namey and Chen (2020) refers to the point during data analysis at which incoming data produce little or no new useful information relative to the study objectives.

Like the approach by Guest et al. (2020) to operationalise the definition of saturation, the study will use three distinct elements, i.e., the base size, the run length, and the relative amount of incoming added information, or the new information threshold to reach same. Information gathered will be weighed against the information already obtained from previous interviews. Base size which Guest et al. (2020) refers to as the body of information already identified in a dataset to be subsequently used as a denominator, will be identified by the key themes from two (2) interviewees. The run length which is the set of two (2) consecutive interviews or observations within which we look for, and calculate, new information defines the numerator in the saturation ratio (Francis, Johnston, Robertson, Glidewell, Entwistle, Eccles & Grimshaw, 2012; Hagaman & Wutich, 2017; Guest et al., 2020). Just as Francis et al. (2012) and

Hagaman and Wutich (2017) suggested, runs of two data collection events each, to assess the number of new themes for the numerator, will be used.

The next level according to Guest et al. (2020) will be a paucity of added information that will be subjected to the researcher's judgment as indicative of saturation and this will be, initially, one level of new information (from 2 set of qualitative interviews). This will represent the proportion of new information or evidence that saturation has been reached at a given point in data collection, e.g., ≤5% new information or no (0%) new information. Percentage weight allocated to the NVivo 14 generated Nodes, Child Nodes and Grand Child Nodes was 60:30:10, respectively. The narrative analysis on experiences of the procurement professionals, practitioners, and the external stakeholders was reviewed repeatedly to preserve coherence of stories told.

Ensuring Rigor

The research will look out for and avoid biases alongside ethical considerations in order not to compromise on the quality of research and achieve what it set out to do. This was be done in reference to Peterson (2019), Mackieson et al. (2019) and later, Johnson et al. (2020) approaches to minimise bias through rigor and preserve quality, using best practices for qualitative research designing, conducting, and reporting, while focusing on the research question. To further ensure reliability and validity, as suggested by Rezapour (2018), FitzPatrick (2019), Gani, Imtiaz, Rathakrishnan and Krishnasamy (2020) and Coleman (2022), the research established trust in the inferences made on the purpose, context and its conclusions, based on the method used to address validity threats by giving back or reading back transcript to ensure accuracy of interview data collected. With reference to proposals from Lincoln and Guba (1985), Abdalla et al. (2018), Kühberger and Bernhard (2019) and later, Hays and McKibben (2021) the data avoided manipulation of research outcomes to ensure rigor with a complementary investigation which will be achieved through triangulation analysis that relied on multiple qualitative data set with NVivo 14 (Denzin, 2009; Merriam & Tisdell, 2016; Lemon & Hayes, 2020). Again, results will be run alongside previous tender evaluation outcome to observe any or no variances and to explain research contributions to practice.

To acknowledge the possibility of any bias and mitigate its effect the research will use reflexivity to account for researcher's ability to make and communicate nuanced and ethical decisions amid the complex work of generating real-world data that reflect the messiness of participants' experiences and social practices (Finlay, 2002; Olmos-Vega et al., 2022). Again, this qualitative research will rely on nuanced judgements that require researcher reflexivity (Olmos-Vega et al., 2022), to be aware of similarities and differences of researchers' position as an insider, whether it has shared experiences with the participants. The quality of this research will be articulated to self and others for acceptance and authenticity (Berger, 2015; Teh & Lek, 2018; Dodgson, 2019). To further ensure that the qualitative research has rigor and quality and that it has the standard for determining trustworthiness (Teh & Lek, 2018) reflexivity will be used by the researcher to clearly describe the relationships between the participants and self and clear or explain any ambiguities or conflicting situations e.g., professional status, work experience, end user, supplier, colleague participants etc., to increase the creditability of findings and to also deepen understanding of the study (Berger, 2015; Mitchell, Boettcher-Sheard, Duque & Lashewicz, 2018; Dodgson, 2019).

The researcher's influence, as suggested by Finlay (2002), Koopman et al. (2020) and Olmos-Vega et al. (2022) will not be merely acknowledged, neither will it be explained away but will represent a productive result of all human interaction and an asset to actively co-construct data and results. This is explained by the term "Use-of-Self" in Jamieson, Auron and Shechtman (2010) and Jamieson and Davidson (2019) among a variety of definitions as "(. . .) the conscious use of one's whole being in the intentional execution of one's role for effectiveness in whatever the current situation is presenting". Jamieson and Davidson (2019) further explained that use-of-self is a deliberate use of one's being and what one knows about it to, positively, impact the situations at hand and enables the engagement of emotional, physical, psychological, and spiritual factors in the moment and in a diversity of situations (Jamieson et al., 2010; Shufutinsky & Long, 2017; Shufutinsky, 2020). This includes various aspects of self and behavior, including self-awareness, situational awareness, mindfulness, self-knowledge, self-monitoring, identity, and agency (Huebner, 2019; Shufutinsky, 2020). Use-of-self serves as a link between our internal, individual potential and the world of change, and it is a connecting fabric of the concepts of self-awareness,

choices, and actions (Shufutinsky, 2020). In this orientation, reflexivity will be a means of capitalising on the researcher's knowledge, experience, and identities (Olmos-Vega et al., 2022) for a positive impact on the research. Thus, the qualitative study will rely on the reflexivity of the researcher and emphasis that experiences and data exist in multiple realities, including those of the researcher, and that data interpretation and theory development, therefore, exists partially with the researcher's perspectives in the embedded situations (Charmaz, 2014; Bryman, 2016; Shufutinsky, 2019; Shufutinsky, 2020). This will further ensure that the qualitative research has rigor and quality for determining trustworthiness (Teh & Lek, 2018).

Model Adaptation and Development

Based on the findings from the literature review, case studies, and stakeholder interviews, the study developed a hybrid model that addressed the identified needs and priorities. The concept model, which provided the underlying theory for this study was obtained through a theoretically framed data collection approach which identified the right model for sustainable product tender evaluation in EDG (Walliman, 2010: Willig, 2013: Dow, 2018: Filip, 2020: Varpio, Paradis, Uijtdehaage & Young, 2020). The theoretical framework approach helped to make the case for the purpose of study and shaped the literature review, justifying the study design and methods and guided in the reporting, interpretation, and discussion of results and their implications (Harding & Gantley, 1998; Cai, Morris, Hohensee, Hwang, Robison, Cirillo & Hiebert, 2019; Varpio et al., 2020). This approach was corroborated by Luft, Jeong, Idsardi and Gardner (2022) that the aim of theoretical framework is to show the assumptions and orientations of the researcher regarding the topic of study and a reflection of the work the researcher engages in.

According to Varpio et al. (2020) the search for patterns and prominent key words from data gathered from the main interview will align to theory that is logically developed to connect to the procurement tender evaluation concept. Therefore, the bottom-up approach review of data to determine key literature or models on evaluating procurement tenders evolved a new insight into phenomenon. The theory-informing inductive data analysis study design which was iterative was, also, the result of deep exploration of data that revealed the particular model on evaluating

procurement tenders to be relevant to the study findings and came as the end result of the research (Varpio et al., 2020; Thielmann, Spadaro & Balliet, 2020).

Pilot Study

A pilot study was conducted by the researcher during in year 3 and 4 of the academic journey. These were in the form of an applied research project and qualitative interview with four stakeholders respectively, two of whom were staff of EDG Ghana with the other two being suppliers of products to EDG. The main aims for the pilot study according to Malmqvist, Hellberg, Möllås, Rose and Shevlin (2019) were: (1) to gather data to provide guidance for a substantive study, (2) to critically interrogate how researcher could most effectively conduct a pilot study utilising virtual 'Teams' and audio-recorded data. Malmqvist et al. (2019) further explained that a researcher having conducted a pilot study, is well informed and prepared to face the challenges that are likely to arise in the substantive study and more confident in the instruments to be used for data collection. Motivation for this pilot study was further enhanced through Malmqvist et al. (2019) and Pearson, Naylor, Ashe, Fernandez, Yoong, and Wolfenden (2020) who indicated that a proper analyses of the procedures and results from a pilot study facilitates the identification of weaknesses and has the potential to increase the quality of the research. As suggested by Lowe (2019), the primary purpose of this pilot study was not to answer specific research questions but to prevent researcher from launching a large-scale study without adequate knowledge of the methods proposed. This pilot study was conducted to prevent the occurrence of a fatal flaw such as questions not focused and seeking the desired information in the study (Polit & Beck, 2017). Just as will be done in the large-scale study, transcript from the pilot was given back the interviewee for clarification and confirmation of responses.

Findings for Pilot Study

The first question (Refer to Appendix: Y&Z) for both external and internal stakeholders that sought to know the level of experience of interviewee on EDG procurement activities and determine if participant was in the position to answer the questions, showed that both stakeholders had immense experience in terms of years gained in office. For example, having supplied goods to EDG for 12 and 14 years respectively showed that both interviewees (referenced: ES-1G & ES-2G), both of

whom happen to be external stakeholders, are familiar with the procurement process in EDG. Respondents must have had their companies registered with the Registrar General department in Ghana, under the Ghana company code. This is because firms or organisations cannot operate in Ghana without being registered with the Registrar General's department. Key themes to emerge from interview were: EDG procurement process; Registrar General department in Ghana.

In the similar case of the internal stakeholder (referenced: IS-2P), in response to the first interview question demonstrated that he was a procurement professional with 20 years' work experience. Respondent must, therefore, be very conversant with the procurement processes and policies in the EDG organisation. With the other internal stakeholder (referenced: IS-1E) the respondent had been working with EDG for a minimum of 20 years. As a Senior manager in the procurement department and an Electrical Engineer by profession put respondent in a category of a procurement practitioner. Key themes to emerge from interview were Procurement Professional, Familiar, and experienced with EDG procurement process, Senior manager, Electrical Engineer, procurement practitioner, 20 years.

Question 2 (Refer to Appendix: Y&Z): Just as the previous question, the second question was to gauge level and work experience of respondents and to find out if they were the right people to give the answers sought for the study. The external stakeholders' indication that they occupied the positions of "chief executive officer of the organisation" (CEO) which made it clear that they were in decision-making and policy formulation positions with their various organisations. Key themes to emerge from interview were Policy formulation; decision-making, CEO, 90% Shareholding.

From the responses given by the internal respondents on question 2 it was clear that interviewees had a split working life with IS- 2P having worked in 2 departments, i.e., Customer Service and Procurement. Respondent could, therefore, be answering questions from a professional viewpoint as well as an end user of products bought by the organisation. IS-1E had had working experience in 3 department in EDG, i.e., engineering department, Research & Development (R&D), System planning, Procurement, "I've also worked in procurement where I am now with their works and services division". That puts the interviewee in a Practitioner position. Key themes to emerge from interview were Customer Service department, Procurement

department, professional viewpoint, end user of products, engineering department, Research & Development (R&D), System planning, Procurement Practitioner.

The interview question 3 (Refer to Appendix: Y&Z), for the external participants was meant to categorise the product supplied by interviewee's organisation and answer objective 1. From the answers given it was obvious that the respondent ES-G1 supplied information, communication and technological (ICT) products with accessories to EDG. Such products need licensing such as manufactures certificate from the manufacturer to enable a person or firm to deal or distribute products in Ghana. This was clearly captured in interviewee response as:

> We've been supplying computing and accessories, and we've been supplying electronics. So let me break the two down. So, with computing we have normal computers, laptops, mouse, keyboards and when we come to electronics within the electronics sector. We have two divisions, so we have the main electronics, which is the TV's and tabletop fridges, and we have also the other side of the electronics, the protection electronics.

For ES-G2 it was clear that they dealt in office consumables. ES-G2 had also diversified from the earlier printing business into other areas equally needed by the client EDG. Key themes to emerge from interview were products licensing, manufactures certificate, Printing, diversify, office supplies, office stationery.

Question 3 (Refer to Appendix: Y&Z) for the internal stakeholder was to seek expectations in relation to a product bought and answer objective 1. Interviewee IS-2P expressly indicated efficiency and quality standards as what to look out for in a product bought for use, e.g., "[product] should be used to do what I want to do with it efficiently, so that, it should do what I expect from it. So quality, yes, you meet quality standards to do what I expect to use it for, yes." IS-1E, on the other hand, opined that products bought should be able to meets the expectation, quality requirements and be durable, i.e., have a "particular shelf life" as "long [as] we are expecting to use the item". Key themes to emerge from interview were Efficiency, quality standards, meets expectation, quality requirements, durable.

Question 4 (Refer to Appendix: Y&Z) was meant to find out level of knowledge of EDG procurement policy on sustainable products and answer objectives 1 and 2. Response by the external stakeholder detailed how EDG for the past decade had been adopting sustainable practices in the procurement process. Mention was made of product recycling, product disposal, product safety, sustainable goods etc. interviewee was, however, optimistic that ECG could do better with procuring sustainable products. It was obvious that interviewee ES-G2 was not aware of any sustainable products strategy put in place by EDG. Such policy should be shared or captured in all contract documents with suppliers. Interviewee uncertainty was captured in the statement, “And I'm sure this sustainable product is something that, they take very much into consideration when doing their things.” However, respondent was clear on quality product standards required by EDG when he said, “But they're very particular and they set a very high standard, that we need to follow in [*sic*], as it were, meeting the sort of demands that they want.”

Key themes to emerge from interview were sustainable practices, procurement process, product recycling, product disposal, product safety, sustainable goods, meet those standards, extremely high standard, unawareness of sustainable product policy by EDG, substandard within the sustainable chain.

In a similar vein when the fourth question was posed to the internal stakeholder IS-2P, he expressed doubt about EDG buying sustainable products when he said “It's not that good enough” yet he was quite optimistic of it being considered in the near future, saying, “ . . . but it's still ongoing. I wouldn't say it's up to scratch.” With IS-1E it was obvious that he had knowledge about sustainable products and their impact, though admitting that sustainability was in the early stages of consideration for inclusion in the procurement process. This was evident in the statement, “though it is still an area that is continuing to develop and receive attention.” Examples of environmentally safe transformer oil, highly efficient transformers to safeguard the environment. Mention was also made about procurement of vehicles with high efficiency at competitive pricing. Wood poles treatments meet specifications to ensure no toxic leakages into the environment will harm the community around. Key themes to emerge from interview were: “doubt about EDG buying sustainable products,” “optimistic of sustainability,” continuing to develop, environmentally safe transformer oil, safeguard the environment, vehicles with high efficiency, competitive

pricing, Wood poles treatments, toxic leakages into the environment will harm the community around.

Question 5 (Refer to Appendix: Y&Z) to the external respondents (ES-G1 & ES-G2) was to find out opinion on how buying sustainable products would benefit EDG in the context of improving employee health and safety and answer objectives 2. In his response the interviewee ES-G1 was of the view that while sustainable products impacted positively on employee health & safety, highly rated and green products are also less hazardous to human health. This was clearly captured in the statement, “You have a television or a fridge, and that fridge is a four-star fridge. It means that energy consumption wise is very good” and “when he uses the right gas, the right gas available, you don't get bad fumes coming out of the fridge, affecting the lungs”. ES-G2 was certain, “health issues or staff health should be of prime concern to” EDG. This, he believes, would increase organisational cost if not attended to. In the same vein sources of supply are investigated to avoid the supply of harmful products which in the “long run” will have negative health consequences on the EDG staff. Key themes to emerge from interview were highly rated green products, hazardous products, prime concern, increase organisational cost, harmful products, negative health consequences.

When asked the same question (i.e. question 5- Refer to Appendix: Y&Z) the internal stakeholders IS-2P responded by advocating consciousness about our health needs while buying products for use as an organisation. He admonished that side effects from consuming or using chemical Products should not have negative consequences on staff health. Interviewee had preference for natural products when he said, “side effect of chemicals and other things used that may not be natural.” According to internal respondent IS-1E, products that are bought for construction related areas are considered in relation with employee safety. Therefore:

> Safety requirements that go with the procurement of these items are very much part of our evaluation criteria to make sure that even in our construction, the kind of gear that is used to climb up our poles or to install our Transformers, the people who are involved in this are given adequate protection against injury and safety from the use of the electrical items.

“Strong policies back this”, interviewee indicated. Key themes to emerge from interview were Side effects from consuming or using chemical Products, negative consequences on staff health, advocate for natural products, construction related procurement consider employee safety, evaluation criteria, safety gear, protection against injury and safety from the use of the electrical items, Strong policies.

Question 6 (Refer to Appendix: Y&Z) for both internal and external respondents was to seek opinion on how buying sustainable products address environmental concerns in your work environment and answer objectives 2. The answer given by the external stakeholder (ES-G1) bothered on cost savings and durability (longevity) so that sustainable products last longer and, therefore, takes longer replenishment lead time, e.g., “(. . .) It saves a lot of money too. So, it (organisation) does not repeat buying the same product over within the shortest possible time” and that they (sustainable products) are environmentally friendly and does not pollute the atmosphere, meaning the “(…) environment itself [is] also a safe place to work in as well.” The answer by ES-G2 was that environmental issues have a “chain” effect in the procurement process. particular attention must be taken not to dent organisation image with environmentally harmful products that also affect staff health with complications. Key themes to emerge from interview were saves cost, durable(durability), environmentally friendly, pollute the atmosphere, “chain” effect, organisation image, environmentally harmful products, affect staff health with complications.

In an answer to question 6, the internal stakeholder IS-2P explained that the environment could be polluted with organisms that could affect life if we do not buy sustainable products. Therefore, buying sustainable products could be a hygienic form of life preservation. This was succinctly captured in the statement, “if we don’t consider sustainability issues, we will also be leaving organisms in the environment. It will have some effects, positive effect on us, so, we should focus on that [buying sustainable products].” Key themes to emerge from interview were polluted with organisms, hygienic form of life preservation.

Question 7 (Refer to Appendix: Y&Z) sought to answer objectives 2 and find out some of the challenges in supplying sustainable products to EDG. It was skipped for the external stakeholder ES-G1 since interviewer believed it had been answered in the previous answer (i.e., for question 6). However, according to the interviewee ES-G2

sustainability issues were now “creeping” into the Ghana’s procurement processes. Looking for sustainable products could cause some delays since supplier may have to look for them beyond the local market. Interviewee ES-G2 was of a further opinion that communicating the cause of delay and benefit of diligently sourcing for sustainable products to the client or buyer is the best. He advised the buyer to be initiative-taking, so they do not run out of stock of sustainable product. Mention was made about the UN’s effort in championing the sustainability course.

In an answer to the 7th question the internal stakeholder IS-P1 response indicated that sustainable products tend to be expensive when compared with “unsustainable” products when he said, “Costs! And because other things that may not be sustainable will be a little bit on the affordable side, so probably, is the reason EDG would want to be going to [buy them] and not going more into the sustainable issues.” This could be the reason for EDG not buying sustainable products. However, interviewee hinted of efforts being made on the part of EDG to buy sustainable products in the statement, “I will say also that its ongoing, so we are catching up somehow.” Interviewee IS-1E was of the opinion that sustainable products “tend to have an upfront higher cost”. Explaining that to management or top management to “considered sustainability in determining the best value” and getting support has been the challenge. To the interviewee, “we are looking at value and not price” because the cost of value “looks higher” than cost of “price.” IS-1E made an indirect linkage between statutory requirement, such as, environmental protection certification fee, social security contribution certification, insurance fee and price, to best practice procurement, such statutory payments, under the labour and environmental protection Acts of Ghana (Attuaquayefio & Folib, 2005: Dickson, 2017) when he said, “I think there are so many laws in the country that will support that argument or focusing on those areas” and further indicated that these requirements add to cost of production which then end up increasing prices of sustainable products. Key themes to emerge from interview were: Sustainable products tend to be expensive, “unsustainable” products, efforts on the part of EDG to buy sustainable products, critical and high value items, high risk to the environment, sustainability impact, the community, and the country at large, management buy-in, laws in the country.

Question 8 (Refer to Appendix: Y&Z) was to find how EDG could improve its process for obtaining sustainable products and answer objectives 2 and 3. In a response the

external stakeholder ES-G1 opined that buyer/seller collaboration could be a vital approach to introducing sustainable products to EDG. Interviewee further indicated that existing sustainable policies of companies and the United Nations could be a starting point to introducing sustainable products to EDG. Again, EDG can set up a sustainability unit to exclusively research and make recommendations for the introduction of sustainable products. This was clearly captured in the statement that EDG could collaborate with distributors and research to get the right sustainable product for its environment:

> It can collaborate [to get] much information online, companies and United Nations have its own sustainable policies. So, [EDG] can collaborate with distributors [to get] positive feedback and (…) can just [communicate to] their suppliers [that] this is exactly what we want, and then by doing that, they can have the right sustainable product.

ES-G2, on the other hand, believes that processes to implement sustainability issues are long overdue and that developing nations should, “catch up with the rest of the world”. Key themes to emerge from interview were buyer/seller collaboration, sustainable policies, sustainability research unit, Implementation of sustainability issues, developing nations should, “catch up with the rest of the world.”

The internal respondent (IS-2P) explained that by engaging with its suppliers EDG could be in a position to corroborate and educate them (suppliers) on its sustainable policy directions. This will improve on the working relation between EDG and its suppliers. Interviewee, therefore, advocated that EDG begin by educating stakeholders on sustainability issues and start implementing them. E.g.:

> I think by the companies we engage [*sic*] If we send a word out there, what our intention and our policy directions are, then we'll select companies and make them aware. … to a large extent it will improve the companies that approach us, because (…) the companies we have available is what we will use [*sic*]. So, if from the start we put some education out there as to where the world is going now on

sustainability issues and they also are aware and start towards that line, I'm sure as a company [we] will improve in that direction.

According to the interviewee IS-1E the journey to introducing sustainability into EDG procurement process should start with focusing “on the critical and high value items that may contribute to sustainability”. Such products which are deemed to be high risk to the environment must be considered in relation to sustainability impact on “the community and the country at large.” Interviewee advocated for management buy-in on this while “laws in the country will support that argument or focusing on those areas.” Key themes to emerge from interview were: Engaging with its suppliers, corroborate, sustainable policy directions, working relation between EDG and its suppliers, educating stakeholders on sustainability issues, implementing them. Collaboration or partnership in the supply chain process (Ramanathan & Gunasekaran, 2014: Mofokeng & Chinomona, 2019: Boddy, Macbeth & Wagner, 2000) was revealed in the pilot findings to be important in the procurement process in EDG.

Question 9 (Refer to Appendix: Y&Z) was to find out from both internal and external stakeholders the extent of compliance with environmental protection, policies, laws, and regulations applicable in Ghana as well as policies for the promotion of sustainable development during the tender evaluation process. This was to answer objectives 2 and 3. The external respondents ES-G1 and ES-G2 appeared to have a fair knowledge of all five policies of: Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy and the cost and benefits accruing from them. It was realised, however, from ES-G1 that Green Footprint policy is not used in Ghana as in other advanced countries. This could be found from the statement, “Green footprint policy, normally because it's mostly within the advanced country, where you are paid, or you are giving points for how best to use sustainable product.” Interviewee ES-G1, therefore, recommended its introduction in EDG where companies are given points or rebates for using such policy. Key themes to emerge from interview were: (apriori codes): Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy. Other themes: “not used in Ghana as in other advanced countries,” points or rebates for using such policy.

In a response to question 9 (Refer to Appendix: Y&Z), the internal stakeholder while agreeing on the need for the introduction of all five policies, i.e., Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy, demonstrated little knowledge of all policies being practiced in EDG, except Waste disposal where respondent pointed to a deteriorating situation in the organisation of study. This was evident in the statement, “our environment has been engulfed with waste”. Interviewee, however, believes that such policies should be prioritised when initiating any transactions for preventive purposes. IS-1E seemed not to be familiar with Green Footprint policy, saying, “it's not very obvious for us to use the green policy”. Key themes to emerge from interview were: (apriori codes): Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy. Other themes: deteriorating situation, prioritised when initiating any transactions, consumers safety, complies with our environmental policy, Recycling be looked at in the future.

Question 10 (Refer to Appendix: Y&Z), the last of series of qualitative interview questions, was to answer objectives 2 and 3 and to find out how weights, in respect to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products, could be applied. In their responses both external stakeholders ES-G1 and ES-G2 were of a strong opinion that a weight of 60% should be given to sustainable technical specification with the remaining 40% going to other technical requirements of a product. Respondent ES-G1 opined, for example, that if a product can be upgraded to last longer than usual it could be considered as sustainable. He agreed that sustainable product must be part of the technical specification. ES-G2 thought that to achieve sustainable development goals (SDG’s) emphasis must be placed on procurement sustainably. Key themes to emerge from interview were: 60% technical specifications for sustainable products, upgradable. E.g., “I would give 60% (. . .) there, it's a combination of the technical with a sustainable, it needs to be part (. . .)”.

In response to interview question 10 the internal stakeholder (IS-P1) was emphatic in the percentage weight choice, as evident in the caption:

> I will estimate some 40% for now. Like I mentioned earlier, we are heading there, but it appears we are not [there]. As a country we are not, that's, on that speed

level. So, we need to encourage our suppliers ourselves, our all-other stakeholders to come along and in that encouragement, I think 40% will play it safe. So that we'll encourage one another and come along in the sustainability drive.

Interviewee believed 40% weight of technical factor should go to sustainable product when evaluating bids or tenders. He advocated for an all stakeholder concerted efforts in making it a reality. IS-1E preferred a weight range of between 10-30% to be given to sustainable products. He thinks that "environmental or sustainable considerations may be higher for some products than for others" so weight must be commensurate with "critical items or high value items" level. Key themes to emerge from interview were: 40% technical specifications for sustainable products, stakeholder concerted efforts, 10-30% technical specifications for sustainable products, weight must be commensurate with "critical items or high value items" level.

Transcripts were run through NVivo 12 software with key themes further reviewed into codes. In all cases coded manual was created to give a brief description of codes. Coding of responses by participants were assigned meaning through to identify trends and patterns that was used to achieve research purpose. Axial nodes were then created in the form of 'tree' nodes. The resultant themes or codes from NVivo 12 were:

i. 'Experience and Career' as the mother node with 'Products' being a child node.
ii. 'Regulations and Laws'
iii. 'Research and Innovation'
iv. 'Stakeholder Expectation'
v. 'Sustainability Policy' with child nodes including.
    a. Disposal
    b. Environmental
    c. Green footprint
    d. Health and Safety
    e. Recycle, all being apriori nodes.
vi. Sustainable Procurement
vii. Sustainable Strategy.

Themes or codes from the pilot will further be reviewed to refine, discard, collapse, and/or merge codes to make meaningful themes and sub-themes in the form of axial nodes, child, or grandchild nodes. Figures 1 and 2 show a screen shot of the NVivo 12 pilot codes and interview files, respectively.

Figure 1: NVivo 12 Pilot Codes

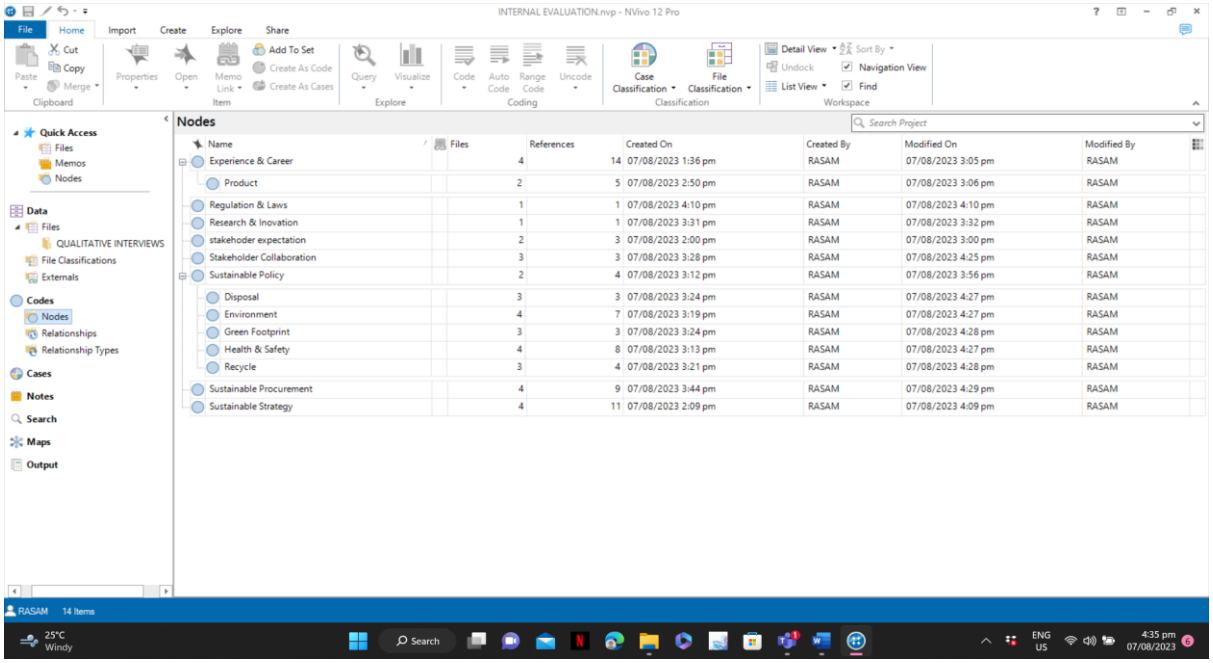
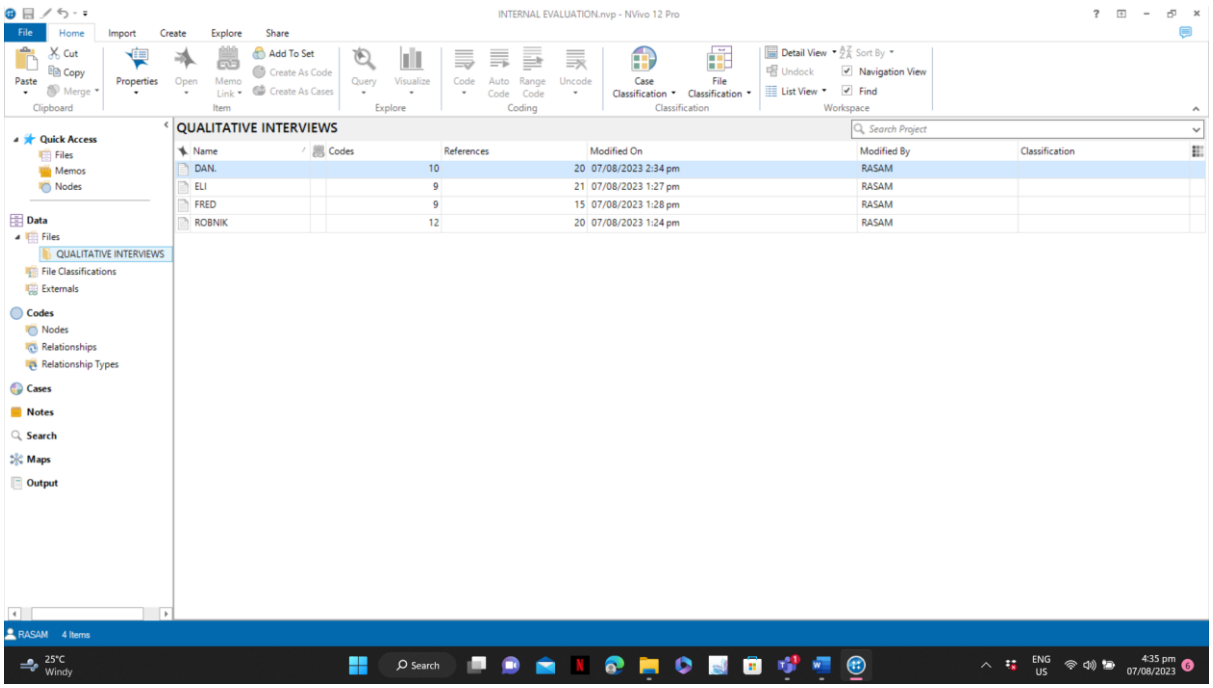


Figure 2: NVivo 12 Pilot Interviews Files



Analysis of findings from the pilot revealed the need for changes to interview questioning as suggested by Weller et al (2018), Roberts (2020), Roulston (2021) and Turner III and Hagstrom-Schmidt (2022), by ensuring that open-ended questions led to the right probing and follow-up questions with separate set of questions, designed for both external and internal participants.

According to Charmaz and Belgrave (2012) the use of theoretically framework should lead to the avoidance of leading questions or suggested answers with interviewer in mind, such as, “which of the following (…)”. Other examples are the replacement of words such as “can” and “would” with “has.” Therefore, interviewee must express their own experiences and actual understanding of the situation (Charmaz & Belgrave, 2012; Staller, 2022). This has been shown in appendices “w, x, y, z,” with pilot interview questions ‘w’ and ‘x’ corrected and replaced by ‘y’ and ‘z’ respectively.

Transcripts were run through NVivo 12 software with key themes further reviewed into codes. In all cases coded manual was created to give a brief description of codes. Coding of responses by participants were assigned meaning through to identify trends and patterns that was used to achieve research purpose. The pilot was, therefore, a pre-test version of the research instrument before conducting the actual study (Gani, Imtiaz, Rathakrishnan, & Krishnasamy, 2020). The following roadmap was followed before and after the actual study.

- Evaluate the Pilot Interview: a second look was be taken at the pilot interview process to further assess its effectiveness. For example, questions such as were there no ambiguities in the questions? Were the questions understandable? What were the challenges encountered by the researcher? Notes were be taken of any modifications needed for the full study. This was done in conjunction with Wilson, Roe and Wright (1998) proposal to evaluate pilot studies on response rates against the nature of the topic and the sample used, the length of the instrument knowing that, just as in telephone interview, the length of instruments is not critical in Teams virtual interviews and can feasibly last up to 29 minutes. The skill of the interviewers, instruments and the nature of the sample, quality of response through authentic attitudes by interviewee which cannot be obtained by face-to-face interview (de Vaus, 1991: Wilson, et al.,1998) was verified and confirmed.

- Review Interview Protocol: Necessary adjustments were be made to the interview protocol based on the insights gained from the pilot to ensure that the questions were focused and sought the desired information. Here, the research instrument was assessed for validity and reliability, and time allowed for opportunity for refinements and modifications. This served as a pre-test version of a research instrument before conducting the actual study (Gani, Imtiaz, Rathakrishnan, & Krishnasamy, 2020).
- Test run Revised Protocol: Before conducting the full-scale interviews, a second pilot with revised interview protocol was conducted to ensure effectiveness and identify any potential issues likely to pop up (Hilari, Behn, Marshall, Simpson, Thomas, Northcott & Goldsmith, 2019: Spriggs, Douglass, Park, Read, Danby, de Magalhães & Carhart-Harris, 2021).
- Identify Participants: Based on the objectives of the research and the refined interview protocol, further selection of participants who fit the criteria for the study was made. A new, diverse, and representative sample was aimed for (Gani, et al., 2020).
- Conduct Full-scale Interviews: Carried out the full set of qualitative interviews based on the outcome of steps 1 to 4. Interviewer ensured attentiveness, asked follow-up questions, and encouraged participants to elaborate on their responses (Hilari et al., 2019: Gani, et al., 2020).
- Write your Transcript and Manage the Data collected: Transcripts for the interview recordings and data were organised in a systematic manner to facilitate the analysis process (Spriggs, et al., 2021).
- Perform Thematic Analysis using NVivo 12: Conducted a thematic analysis of the interview data (Rodrigues, Costa & Moreira, 2019). This involved identifying recurring themes (codes), patterns, and concepts within the data. Coding and categorising the data helped derive meaningful insights into the study (Jackson & Bazeley, 2019: Dalkin et al, 2021).
- Cross-Validation, rigor, and Reliability: ensured rigor and reliability by independently analysing a subset of the data. Compared and discussed the results to ensure inter-rater reliability, strengthen the credibility of research

findings and minimise bias (Peterson, 2019; Mackieson, et al., 2019; Johnson, et al., 2020)

- Triangulation: Considered using multiple data sources, including previous contracts awarded to EDG suppliers, and methods to cross-validate research findings. Triangulation using “Leximancer” enhanced the validity of the study by approaching the research question from different angles (Lincoln & Guba, 1985; Abdalla et al., 2018; Kühberger & Bernhard, 2019; Hays & McKibben, 2021).
- Analyse and Interpret the Data: Analysed the data in-depth and interpreted the findings considering the research objectives. Looked out for connections and explanations between themes to draw conclusions based on the evidence (Spriggs, et al., 2021).
- Report Writing: As suggested by Smith and Felix (2019) and Hunt, Ryan, hAodha and Rezaei-Zadeh (2022) findings were compiled into a coherent and well-structured research report that included an introduction, enhanced methodology, literature review, results, discussion, and conclusion sections. Conclusions, supported with quotes or excerpts from interviews, were made to add credibility.
- Discussion and Implications: Reflection on the significance of the findings and its implications for theory, practice in the electricity distribution organisation in Ghana, or future research was made. Research also addressed any limitations of the study and suggest potential areas for further investigation (Smith & Felix, 2019; Starks & Robertson, 2023).
- Dissemination: Research is expected to be shared with relevant audiences through organisation periodic newsletters, academic publications, conferences, training programs or presentations (Tincani & Travers, 2019; Misra, 2021). These steps are expected to contribute to the advancement of knowledge in the field of sustainable product procurement.

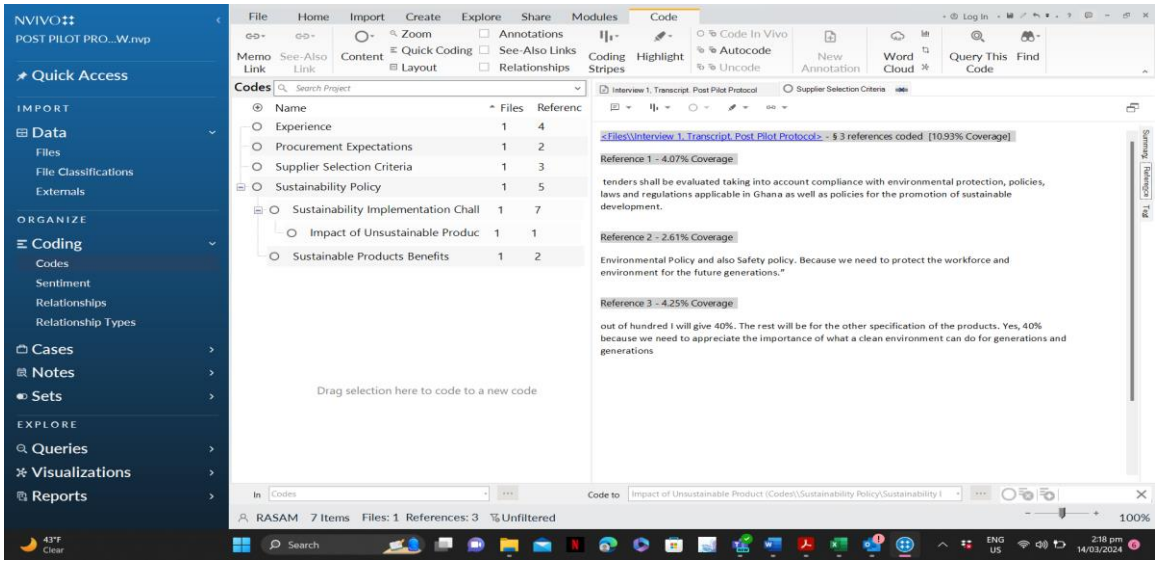
Findings from the pilot revealed the need for changes to interview questioning as suggested by Weller et al (2018), Roberts (2020), Roulston (2021) and Turner III and Hagstrom-Schmidt (2022), by ensuring that open-ended questions led to the right

probing and follow-up questions with separate set of questions, designed for both external and internal participants. A pilot was conducted to further revise interview protocol to ensure effectiveness and identify any potential issues likely to pop up (Hilari, et al, 2019)

Post Pilot Study

Transcript from a post pilot protocol review interview was run through the improved version, NVivo 14 software, with key themes further reviewed into codes (Spriggs et al., 2021). The NVivo 14 can ask complex questions of your data to identify themes and draw conclusions, employ advanced data management and visualisation tools to uncover richer insights and, therefore, producing clearer articulation with rigorous evidence to back findings (Mehta & Chawla, 2024). In all cases (pilot and post pilot) coded manual was created to give a brief description of codes. Trends and patterns of responses by participants were assigned meaning to identify themes that was used to achieve research purpose (Jackson & Bazeley, 2019). Themes from the post pilot interview transcript, with the aid of NVivo 14, yielded “codes” such as, “Experience”, “Procurement Expectation”, “Supplier Selection Criteria” and “Sustainable Policy”. “Sustainable Policy” further yielded child nodes such as, “Sustainable Implementation Challenges” and “Sustainable Product Benefits,” while “Sustainable Implementation Challenges” further generated grandchild nodes such as, “Impact of Unsustainable Product.” This is shown in figure 3**.**

Figure 3: NVivo 12 Post Pilot Study Codes.



The post pilot study, therefore, considered the several important steps to be taken to, further, refine the research and prepare for the main data collection and analysis. Focus was on the qualitative research as iterative, as each step informs the next. There was a look out for unexpected or emerging themes that required the revisiting of previous steps. By these guidelines, it was expected that a thorough and rigorous qualitative study will, eventually, be conducted.

The chapter discussed the methodology that was employed in collecting and analysing the primary data. It discussed the rationale for choice of approach, access and tools used in gathering data, sampling method and coding. The inductive approach to data collection that included a 'data informing' theoretically framed data collection, and the mode of selection of participants interviewed were elaborated. A pilot study in the form of qualitative interviews for four stakeholders, two of whom are staff of EDG with the other two being suppliers of products to EDG was conducted and discussed. The use of CAQDAS (i.e., NVivo 12 & 14) in analysing data from the pilot and main study was also discussed along with how to ensure rigor of findings. The chapter concluded with a post pilot study meant to revise interview protocol and the several important steps to be taken to, further, refine the research and prepare for the main data collection and analysis.

The next chapter will consider the full-scale interviews that will discuss the qualitative research as iterative, as each step informed the next. Transcript from qualitative interview was run through the Computer Assisted Qualitative Data Analysis Software (CAQDAS) called NVivo 14 software, to find key themes or codes (Spriggs et al., 2021). Themes or patterns within data were identified in an inductive or 'bottom up' way (Clarke & Braun, 2013). While conducting a Reflexive Thematic Analysis there was a look out for unexpected or emerging themes which formed the bases for sustainability factors for tender evaluation while determining saturation level. The iterative process of the Reflexive Thematic Analysis was expected to ensure a thorough and rigorous qualitative study conducted.

Chapter 4:

The Project

The chapter dealt with the full-scale interviews that discussed the qualitative research as iterative, as each step informed the next. Transcript from qualitative interview was run through the Computer Assisted Qualitative Data Analysis Software (CAQDAS) called NVivo 14 software, to find key themes or codes (Spriggs et al., 2021). Themes or patterns within data were identified in an inductive or 'bottom up' way (Clarke & Braun, 2013). There was a look out for unexpected or emerging themes which formed the bases for sustainability factors for tender evaluation while determining saturation level. The iterative process of the Reflexive Thematic Analysis was expected to ensure a thorough and rigorous qualitative study conducted. However, based on research findings 30% of the 70% weight allocated to technical factor was assigned to sustainable product factors and scores obtained aggregated together to determine the total score for each tenderer and tested for rigor on a previously awarded contract at EDG.

Reflexive Thematic Analysis.

Themes or patterns within data were identified in an inductive or 'bottom up' way (Clarke & Braun, 2013). The inductive or bottoms-up approach yielded grounded codes or themes that emerged (e.g., Product Category, Framework Agreement) from data gathered while a 'theoretical' thematic analysis provided themes driven by the researcher's theoretical or analytic interest in the area of tender evaluation and therefore more explicit themes, such as, "Tender Evaluation" (Clarke & Braun, 2017). These were as a result of the initial process of Reflexive thematic analysis (RTA). Reflexive thematic analysis (RTA) is an easily accessible and theoretically flexible interpretative approach to qualitative data analysis that facilitates the identification and analysis of patterns or themes in each data set (Braun & Clarke, 2012: Terry & Hayfield, 2020). RTA was used to ensure rigorous prototyping, testing and refining processes that led to meaningful, conceptually driven themes (Braun & Clarke, 2006: Terry & Hayfield, 2020).

The 6 Phases of thematic analysis which according to Braun and Clarke (2006) included.

1. Familiarising yourself with your data: Self transcribed data (if necessary), reading and re-reading the data, noting down initial ideas. The qualitative interviews were read repeatedly to, according to Elliott (2018), Linneberg and Korsgaard (2019), identify codes or themes that were grounded in the story told and relate directly or indirectly to research question(s). Transcripts were, thereafter, discussed with participants for mutual understanding, agreement, and acceptance.

2. Generating initial codes: Coded interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code. Themes or codes were subjected to reflexive analysis to identify and report on patterns or themes to make sense out of any ambiguities (Braun & Clarke, 2019).

3. Searched for themes: Codes were collated into potential themes, while gathering all data relevant to each potential theme.

4. Reviewed themes: Checking if the themes work in relation to the coded extracts and the entire data set, generating a thematic ‘map’ of the analysis.

5. Defined and named themes: through reflexive thematic analysis (RTA) refined the specifics of each theme, and the overall story the analysis told, generating clear definitions and names for each theme. The themes were fine-tuned by making sense of data through identified patterns and their importance, and why you think they are, using the skill of storytelling to describe and processing analysis (Hayfield, Clarke & Braun, 2017: Braun, Clarke & Hayfield, 2022).

6. Production of report: The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating the analysis to the research question and literature, producing a scholarly report of the analysis, were adopted in the thematic analysis process. However, the 4th to 6th phases were the main focus of the reflexive thematic analysis (RTA).

The review of the themes suggested that there was the need for parent nodes such as “Procurement Experience” to be replaced with “Experience” to make way for the inclusion of varied workplace experiences. This further generated child nodes i.e.,

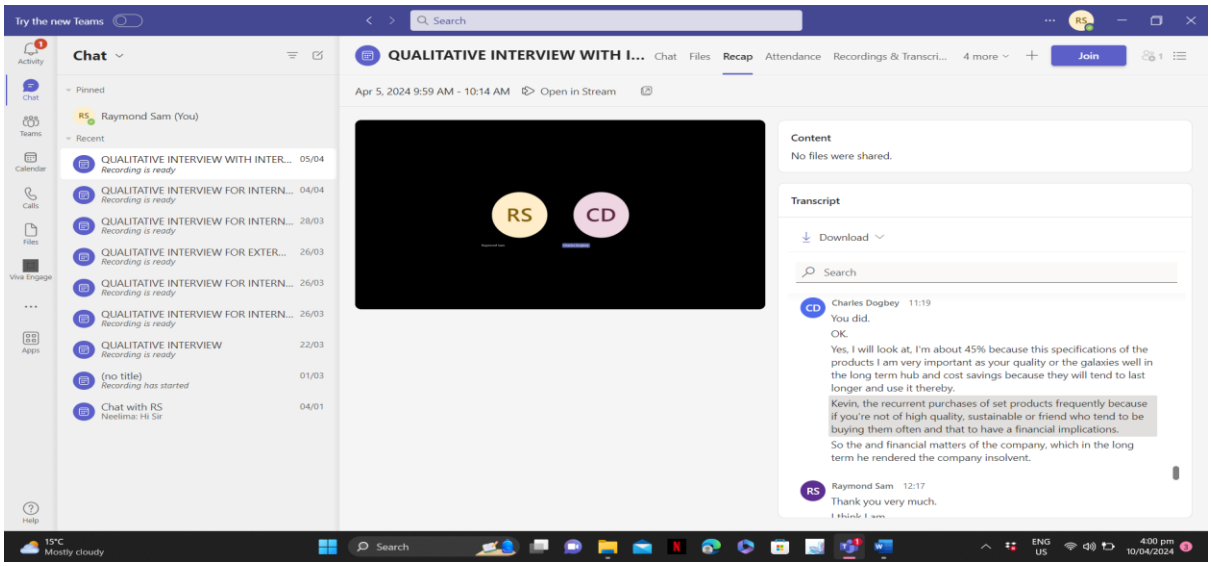
“Procurement experience,” “Managerial,” “Production” with “decision making” as grandchild node.

Data Saturation

Like the approach by Guest, et al. (2020) to operationalise the definition of saturation, the study used three distinct elements, i.e., the base size, the run length, and the relative amount of incoming new information, or the new information threshold to reach saturation. Information gathered was weighted against the information already obtained from previous interviews. Base size which Guest et al. (2020) refers to as the body of information was identified by key themes from two (2) interviewees in a dataset and subsequently used as a denominator. The run length which was the set of two (2) consecutive interviews or observations within which we looked for, and calculated new themes (codes), defined the numerator in the saturation ratio (Francis, Johnston, Robertson, Glidewell, Entwistle, Eccles & Grimshaw, 2012; Hagaman & Wutich, 2017; Guest et al., 2020). Just as Francis et al. (2012) and Hagaman and Wutich (2017) suggested, runs of two data collection set each, to assess the number of new themes for the numerator, was used.

Saturation, according to Guest et al. (2020) was a paucity of new information in the form of themes or codes (from NVivo 14) that was subjected to the researcher’s judgment. Initially, information from 2 set of qualitative interviews using audio recorded “Teams” virtual meeting as evident in the figure 4 below was used.

Figure 4: Virtual Qualitative Interview



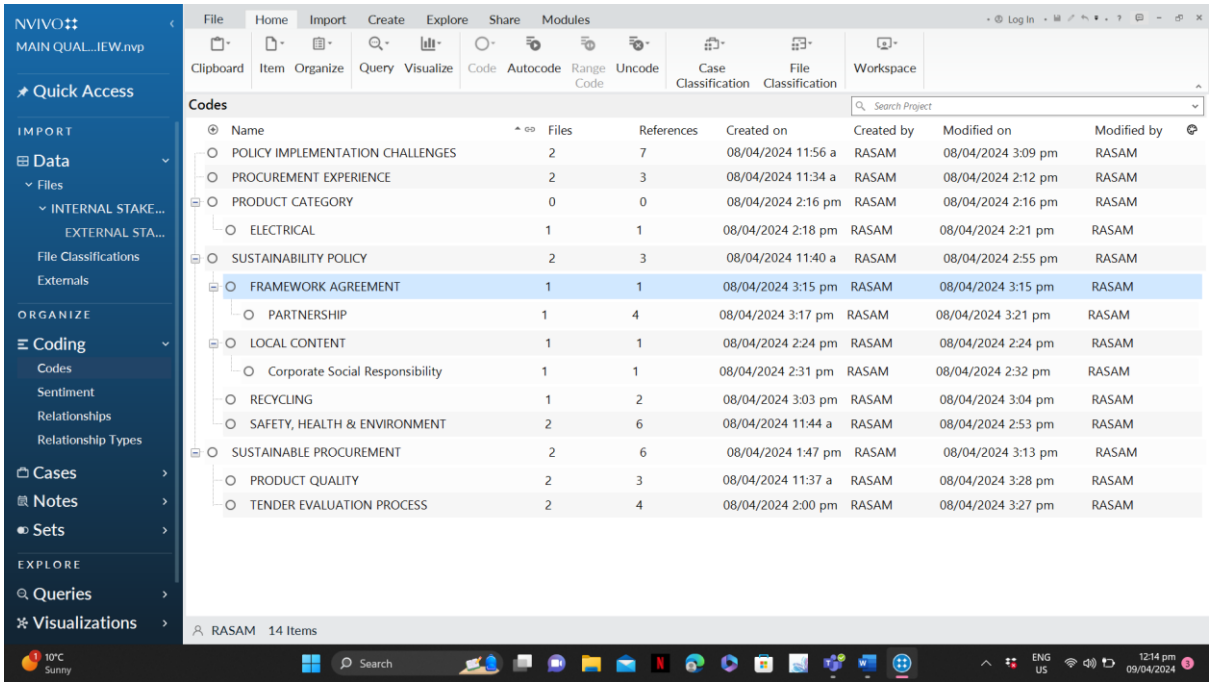
Guest et al. (2020) further suggested that the proportion of new information as evidenced that saturation had been reached at a given point in data collection was identified by a range, e.g., between 0% ≤ 5% new information. With percentage weight allocated to the NVivo 14 generated Parent Nodes, Child Nodes and Grandchild Nodes as 60:30:10 respectively the narrative analysis on experiences of the procurement professionals, practitioners, and the external stakeholders was reviewed repeatedly to preserve coherence of stories told.

Emerged themes or codes that were realised using a base size of two (2) interviewee (i.e., one internal stakeholder and one external stakeholder), included the following,

- Policy Implementation Challenges
- Procurement Experience
- Product Category (with “Electrical” as Child Node)
- Sustainability Policy (with “Framework Agreement,” “Local Content,” “Recycling” and “Safety, Health & Environment” as Child Nodes, and “Partnership,” “Corporate Social Responsibility”-CSR as Grand Child Node)
- Sustainable Procurement (with “Product Quality” and “Tender Evaluation Process” as Child Nodes).

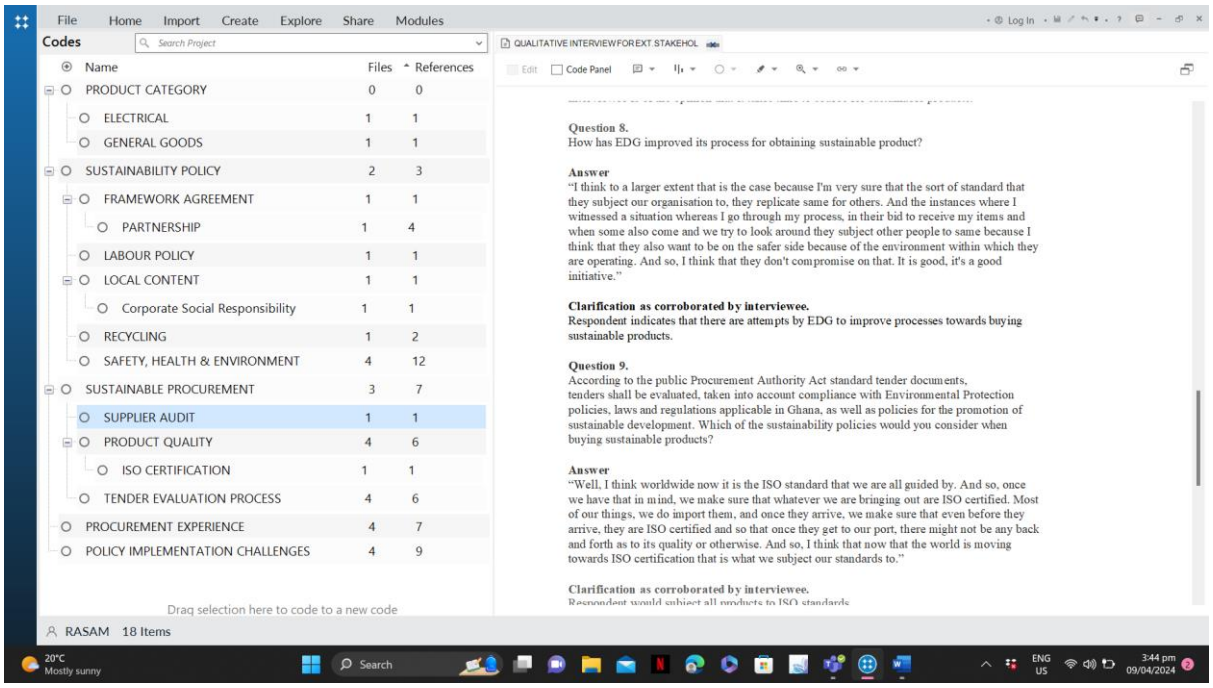
This is shown in figure 5.

Figure 5. NVivo Theme Review 1



The NVivo 14 assisted review of the 2 set of qualitative interviews at the run length stage produced two child nodes and one grandchild node. These were “General Goods” for the main theme or code “Product Category,” “Supplier Audit” for the theme “Sustainable Procurement” and “ISO Certification” for child node “Product Quality.” This is shown in Figure 6 below.

Figure 6: NVivo Theme Review 2



With percentage weight allocated to the NVivo 14 generated Parent Nodes, Child Nodes and Grandchild Nodes being 60:30:10 respectively, it was found out that no new information was gained for the main themes represented by a 60% weight. Child node generated 2 new themes (i.e., “General Goods” and “Supplier Audit”) while grandchild node gained only 1 new theme (ISO Certification). This showed an overall increase of 2.6% of new information obtained at the run length stage as indicated in the saturation Table 1 below.

Table 1: Saturation Level 1

Level	**Parent Node**	**Child Node**	**Grandchild Node**	**Total**
Base Size	5	7	2	14
% Weight	60	30	10	100

Run Length increase	0	2	1	3
% Change	-	+2.55	+0.05	+2.6

The final stage according to Guest et al. (2020) approach, to operationalise the definition of saturation, which is, the relative amount of incoming new information, or the new information threshold to reach saturation was applied using NVivo 14 to review two (2) additional set of qualitative interviews (i.e., one internal, one external stakeholder each). This, again, produced two child nodes and one grandchild node which were “Computerisation” for the main theme “Sustainability Policy,” “Mitigation” for the theme “Policy Implementation Challenges” and “Diversification” for child node “General Goods.” Again, referring to percentage weight allocated to the NVivo 14 generated Nodes or Themes, Child Nodes and Grandchild Nodes being 60:30:10 respectively, it was found out that no new information was gained for the main themes represented by a 60% weight. Again, the 2 new themes generated for Child node (i.e., “Computerisation” and “Mitigation”) and the new theme (Diversification) for grandchild was not significant enough to call for further interviews. This time round the numerator in the saturation ratio which Guest et al. (2020) referred to as “the body of information already identified in a dataset to be subsequently used as a denominator” was the total number of base size and run length increase for Node, Child node and Grandchild Node, which were, 5, 9 and 3 respectively. Applying the percentage weight increase for each category to find the level of new information realised we obtained an overall increase of 0.1 percent (%). This is shown in the Table 2 below.

Table 2: Saturation Level 2

Level	**Node**	**Child Node**	**Grandchild Node**	**Total**
Base Size	5	9	3	17
% Weight	60	30	10	100

Run Length increase	0	2	1	3
% Change	-	+0.07	+0.03	+0.1

At this point, the level of new information (i.e., +0.1) corroborated Leese, Nimmon, Townsend and Backman (2021) and Aguboshim (2021), definition for saturation in data collection as, “the working sampling size beyond which no relevant additions may be found”.

Research Findings

The first and second questions (Refer to Appendix: Y&Z) were to answer research objectives 1 (i.e., To find Sustainable Product key factors for tender evaluation in the electricity distribution organisation in Ghana) and meant for both external and internal stakeholders. It sought to know the level of work experience of interviewee on EDG procurement activities and to determine if participant has knowledge of sustainable procurement. Answers obtained showed that both external and internal stakeholders had immense experience in terms of years gained in office. For example, all stakeholders, both internal and external demonstrated that they had an appreciable level of experience in supply chain management. This was expressed in statements such as, “I've had experience throughout the company in sales and procurement, in quality control and some parts of fulfilling orders to do with customer service provision. So, I've had basically a cross section of experiences in the organisation” and “So I worked in the accounts section for about 10 years. Then I decided to pursue a course in procurement and supply chain management and later on moved to join the Materials management division.”

Some respondents also showed some level of experience at the management level representing the decision-making category. Such management respondents were captured in statements such as, “I am the Chief Executive Officer (CEO) of Tripple “X” Limited,” “I'm now working with the materials management division as the planning and stock control manager Materials section” and “I'm the MD of my organisation.” Some external stakeholders indicated a level of experience in the production or

manufacturing process with captions such as, “Our core product is electrical cables and conductors” and “My firm is in the printing business, so we produce all kinds of printing works and consumables for many organisations.”

The third question (Refer to Appendix: Y&Z) to the internal respondent was to answer research objectives 1 and to assess interviewee definition of “quality” in the product procured. This saw varied user expectations in the products bought with some respondents indicating that, “a product that can meet the purpose for which it is procured. That the products must meet my expectation, can perform their function for which it is procured. That is my main objective for buying a product.” Another also included the environmental dimension in what to expect from a product by saying that “the product must best fit for purpose, (. . .) must be of high quality and (. . .) must be environmentally friendly so as not to damage the ecosystem.” Therefore, expectation from a product bought, according to the respondent, will not only be quality but bear environmentally friendly features.

The fourth question to both external and internal stakeholders was, again, to answer research objectives 1 by finding out whether strategies to procure sustainable products are pursued by EDG. Some external stakeholders expressed knowledge and pursuit of such policy on sustainability in statements such as,

> their particular standard stated within the provisions that make sure that those woods that are sourced are from sustainable sources and certain companies that have been a standardised or given approval to provide wood that is from sustainable forest where people replant seeds, etc.

“Particular suppliers that we have to go to who are particularly certified under ISO and other criteria to provide that kind of wood to our process” and “EDG has come up with a policy framework, on sustainable procurements, and also by ensuring that the policy is followed by all stakeholders”. Some of the sustainability strategies in place at EDG were mentioned in statements such as “When it comes to the use of paper for their activities, like I said, they are moving away from the use of paper to computerisation which means less trees being felled.”

On how buying sustainable product benefited EDG in the context of improving employee health and safety (i.e., question 5 -Refer to Appendix: Y&Z) which was to answer objective 1) all stakeholders expressed positive outcomes on the health and safety of employees as a result of buying sustainable products. These can be found in answers such as,

> Buying EDG projects has seriously improved the environmental issues, because the company tries to buy products that can withstand the weather condition, especially in terms of safety apparel. We normally buy products that can withstand the weather. That even when the staff uses it, they will not have a (skin) reaction due to the harsh weather conditions in the company, in that country. So, we look at all that and also in disposing of the products, we make sure that the product is appropriate or when we are disposing off, we'll be able to do that safely. We don't just buy any products.

Interviewee gave an example of some electrical cable drums that are sustainably produces, “we made sure that we use biodegradable materials like wood and not plastic”. These are very protective to the staff handling them and keeps waste at the minimum so that the “(. . .) drum itself doesn't affect us and the environment negatively, thereby, does not affect the staff and also other”. Some of the cables come with a grease and oils so we make sure that they are not hazardous.” Another internal respondent explained that explained that non sustainable product is of risk to staff and environment and the fact that EDG has a manager in charge of Safety, Health and Environment suggests the level of importance it puts on sustainability. This was captured in the answer “Once the product is not environmentally sustainable or it's not sustainable product, the safety of the users or the staff is at risk and EDG takes safety very seriously. As such, has a general manager solely in charge of safety and environment which give credence to the fact that it (EDG) considers safety and the working of the environment very seriously.”

The external respondents were also optimistic about EDG effort to ensuring that the health and safety of employees are paramount. This was found in responses such as,

> EDG buys their products from companies that demonstrate that measures are put in place to protect the wellbeing of their workforce. I am saying this because at times they will visit your company to see the sort of safety measures being practiced by their suppliers and even ask for some policy documents to show if the company is actually practicing safety measures. For instance, in a contract it is clearly stated how packaging should be done in order to make materials handling at the point of delivering goods easy and safe for the people who offload the product at the receiving end.

With regards to question 6 (Refer to Appendix: Y&Z) on the environment, asked to strengthen objective 1, all internal stakeholder respondents dealt with the Health and Safety, together with environmental issues, by referring to answers given to question 5 on health and safety as captured as “I believe that I alluded to that at my previous answer (. . .)”. This seemed to suggest that all three issues, i.e., Health, Safety and environmental, were considered together in EDG.

On the flip side it appeared that the external stakeholders dealt with environmental issues distinctly from employee health and safety as was expressed by one who demonstrated the organisation’s conscious effort to preserve the forest by buying wood from sustainable sources and adopting a recycling policy to reduce the rate of wood disposal in statements like, “(…) make sure that those woods that are sourced are from sustainable sources and certain companies that have been a standardised or given approval to provide wood that is from sustainable forest where people replant seeds, etc”. So, to the participant particular suppliers that are particularly certified under ISO are those that they engage to provide the kind of wood required in the manufacturing process and also, their less reliance on wood product in order to sustainably preserve the environment. For example, the lagging provided is “supposed to protect the material in the drums. But what we've seen over time is the transition from using that lagging to using more durable materials that are multi use materials to cover the products as opposed to using wood so that we can lessen the burden on the environment”. This, according to the participant is adopted alongside packaging in the

whole supply chain, which is different from or change from what they used to do previously.

Another external respondent in an answer to question 6 (Refer to Appendix: Y&Z) corroborated the organisation's effort to preserve the environment by showing compliance to the laws and regulations regarding same. This was indicated in statements like "my organisation deals not only with EDG but supply to some firms in other countries apart from Ghana". Interviewee respondent that their organisation was ISO certified to produce quality goods and also conform with regulations regarding sustainable development goals. For example, in a response it was stated that, "the registrar general (Ghana) require us to provide all those supporting documents before our registration certificate is renewed every year, so we make every effort to keep within the laws on the environmental protection agency (Ghana) and others."

In answering question 7 (Refer to Appendix: Y&Z), that was also meant for objectives 1 and 2 (i.e., To find a Model that will use factors obtained in objective 1 to evaluate tenders for goods procurement) some internal stakeholders identified; change, limited time and resources, high products price, getting to the right source, lack of support from suppliers because of product development as main challenges. This was seen in captions such as, "Change is not easy", "Change is not welcome" and "We have challenges with employees accepting the change, it's not easy". Other indicative statements include, "we also have issues with limited time and resources to buy such products. Sometimes some of these products are expensive" and "(. . .) getting to that source where these products are is sometimes a problem and it also comes with high cost, sustainable product comes with high costs and it sometimes a challenge". Some indicated that there was lack of support from suppliers for product development. This is evident in responses such as, "Sometimes you have to engage them (suppliers) and ensure that they produce their item to suit your requirements and sometimes changes in some of these products creates some challenges for the suppliers" and "the main challenge, if I can mention, is because we are in a new area where venturing into (sustainability) is [just] started [and] for some time change is difficult to accept, so the drive is on and you know dealing with suppliers who don't have this in mind, it becomes new to them".

On the other hand, some external stakeholders indicated that standardisation of raw materials and technology used in the manufacturing of the end products is a hinderance to sustainability since those components are hard to degrade. For example, one such respondent said,

> I think the challenges are really about, you know, technology from our point of view because some of the products that we supply in general, they are products that have been developed by the industry over time and some of them, for example, the things that we use in our products because they are industrially recognised and from an engineering point of view, they are standardised, they are very few deviations around that. So, unless there is a real watershed moment in which there's a new type of more biodegradable material being used, for example, we use PE and PVC and those materials. By design, they are not biodegradable and fully biodegradable, so they either have to be recycled, or we'll just have to use less of it. And this is what has been in use for many, many years.

Another external stakeholder respondent appeared to understand the need for education on the benefits of sustainable products and conscious effort by authorities and Governments to demonstrate preference for such products by lowering taxes on sustainable products and encouraging its use. This can be found in responses such as “everything that comes with quality is expensive and if your offer (. . .) is expensive while a competitor offers a relative cheaper product the most likely choice will be the cheap one. The sustainable products usually are not cheap and not easily available”. Respondent gave an example of electric cars which are not easily available on the market but which before they are brought to Ghana attracts huge taxes that eventually makes it more expensive than the petrol and diesel ones in use. “I think there need to be more education on the use of sustainable products and also some deliberate effort by government to give some preference to sustainable products. Or else, people will still go for the products that are not sustainable simply because of the low price which will also further worsen the environmental challenges that we face”, according to one external respondent.

For question 8 (Refer to Appendix: Y&Z) that sought to address objective 2 and to find out how EDG had improved its processes for obtaining sustainable products, the EDG respondents corroborated their knowledge about existing sustainable policy and application through continuous supplier engagement, research into environmentally friendly products by the Research and Development (R&D) department and, effort to get suppliers to abide by the sustainability policies. This could be found in captions such as,

> we try to engage the suppliers continuously. And we also try to continuously audit and evaluate our product performance. The product that we use, we engage the R&D, which is the research and design section, for them to sometimes evaluate some of the products for us to know their performance and how best they can get us better items that can also sustain or help the environment. And we also try to include in our policies some of these sustainable product policies, so that suppliers will abide by them and ensure that we get the right materials.

Other supporting statements indicated that stakeholders put in some measure suppliers engage in sustainable practices, e.g., not employing child labour and not using harmful materials. “We look out for signs of awareness first of all. And furthermore, has to show some effort towards sustainability”. Furthermore, EDG ensured that specification designed is focused on sustainability. This is captured as, “Our technical (Research & Development) people look in that direction to make sure that the materials we are buying meets our specification and are sustainable” and “I believe it does that through vendor education and assessment system where they are assessed or educated on the need for environmentally friendly products and then the company's policy or safety and health”.

When the same question (i.e., 8) was asked the external stakeholders they showed appreciation for the introduction of the Enterprise Resource Planning (ERP) software or computerisation of the procurement processes in EDG with less reliance on paperwork by same, and even suggested some form of preferential treatment for companies willing to offer sustainable products and services against those who provide unsustainable products. This could be seen in a caption such as,

> what I've seen over the time that we've worked, EDG in some of the documentation processes within the organisation, we used to see a lot of heavy reliance on paperwork. That is the use of more paper as opposed to the computer. But now, I've seen a transition to an ERP system that seems as being able to track, for example, our documentation without a heavier reliance on the transfer of physical paper.

The external respondent shared an observation that EDG practiced “plugging-in” of suppliers and stakeholders into their computerised system to allow stakeholders to plan better. This also allowed EDG to reduce waste and to generally save time in the processing and movement of information and coordination of demand related items. The respondent also showed knowledge of EDG having put in place health and safety measures in the workplace. The use of less paper by “are moving away from the use of paper to computerisation” meant less trees being felled. The responded recommended some kind of discount to be given to companies that supply sustainable products to EDG so that they can compete well with the others.

When asked about the sustainability policies the respondent would consider when buying sustainable products in question 9 (Refer to Appendix: Y&Z), in the bid to answer both objectives 1 and 2, the internal EDG respondents suggested policies such as, Waste Disposal policy, Labour policy, Health, Safety & Environment policy. This was captured in responses such as, “I believe the enforcement of the Environmental Protection policies as well as the strict enforcement of the laws and regulations in that regard. Because if the law says a particular product should not be imported or produce, it should be enforced to the letter so as not to give room for the harmful gas released into the environment,” “Disposal is and serious issue. Not only the acquisition, but also disposal (. . .)” and,

> Specifically, I'll say Labour's policy, to make sure that the companies and the suppliers and manufacturers who we are dealing with employs in ways that is consistent with the laws. For instance, children which the law frowns upon. I'll consider that materials we buy and the components of the materials, like our cables,

> use certain chemicals to preserve them to make sure the weather doesn't have effect on them. We also have to make sure that the chemicals and other substances used are not harmful to the people using them. Health and safety policy, so that we make sure we preserve the lives of our workers going forward.

With the EDG suppliers (external stakeholders) some were of the view that introducing framework agreement is a sustainable way of maintaining work relationships and dealing with fluctuating or unstable trading currencies. Others believed in subjecting all products to ISO standards and that the choice of a recycling policy would also address waste management challenges. The following statements corroborates that; “The policy that I think is most relevant to us is, for example, the policy around the guidelines for framework agreements because of our amount of time that we spend”. To the respondent the framework agreement guidelines are more applicable to them (suppliers) because they create a certain standard and principle of work that governs relationship between stakeholders in the contract. This, to the respondent, is very essential in creating sustainable partnerships because when “behaviours are predictable it also allows closer and closer cooperation in terms of needs, in terms of standards, in terms of safety, in terms of even being able to make adjustments into the production processes of your partners or stakeholders in their value chain”. The external stakeholder believed that framework agreements are able to give a certain “predictability that allows for stakeholders to feel more comfortable to work with EDG” so framework agreements put to ease agitated minds in terms of being able to function in a predictable and I the long-term. “In our part of the world (...) the impact of the exchange rate” affects raw material prices so that predictability around the framework agreement is always useful and allows one to plan long term to mitigate loss and to generate a better value adding in our decision-making process. Responded also advocated for a recycling policy by stating thay,

> I will call for some kind of recycling policy that will take care of the waste that is produced in our production process. Ones such a policy is put in place all the waste we generate will be useful in one way or the other. Most of the paper we use can be recycled to produce things like toilet paper, and other consumables. Even the

plastic waste can be used for other things instead of leaving them to litter everywhere.

and “Most of our things, we do import them, [*sic*] and once they arrive, we make sure that (. . .), they are ISO certified and so that (. . .) there might not be any back and forth as to its quality or otherwise. And so, I think that now that the world is moving towards ISO certification that is what we subject our standards to.”

In answering research objectives 2 and 3, question 10 (Refer to Appendix: Y&Z) sought to find out the percentage weight to be given any sustainable procurement policy in place during the tender evaluation process. Some of the suggested figures by EDG participants included, 20%, 70% and 45% mainly for, Waste disposal policy, labour policy as captioned from “Because the people matter for us as a going concern” and Waste disposal policy respectively.

The three external stakeholders chose to allocate 70% to the quality of materials against going for a low-priced product which in the long run increase the organisation energy losses and cost. 50% was allocated to sustainable products against going for a low-priced product which are not sustainable while 90% was given to sustainable product policy. “Price” was not considered as the main determinant to selecting supplier to a product. This is evidenced in statements like, “I feel that I will give it about 70% rating when it comes to sustainable procurement because I feel that every company has a standard in terms of how it wants to approach the customer”. But “because of (. . .) volume of investment that is going in and the likelihood of the cost that (electricity/energy) losses could bring, I think it's very important to adhere to the technical standards so that the product by itself is speaking to the quality that it is supposed to manifest”. According to the respondent EDG in the long term saves money because it doesn't have do much repair works or reinstall certain components that have been procured, which over time could cost it more if it considered only the price component when procuring. EDG’s program to cut losses within the organisation in terms of distribution of power, according to respondent, is influenced by the quality of material being used which determines the level of losses within the transmission lines. For example, “if you use lesser quality material, you have more waste. So, this actually impacts the revenue ability or generation capacity of EDG in terms of being able to recuperate revenue if the distribution lines are not of quality”. So, for me, “(. .

.) I think quality is much more important than price. And I think when you approach that in all materials, you actually cause your stakeholders to force them to give you more value". So, "if you go towards quality, you then make the customer do give you more value on top of the standard product that are supposed to be supplied. So, they compete on giving you more value through other means instead of the actual product itself. You know, so they don't reduce the quality of the product". The respondent further explained that suppliers give more value through other aspects of the value chain if tenders are evaluated with quality and sustainability being prioritised and thinks that it will benefit organisations like EDG if price is rated after the former. So, "for me 70% is what I will look at and even for our organisation", other external stakeholders said, "50%, yes, because we need to be made aware of the implications of what the products that are not sustainable causes to the environment and climate change. Dealing with climate change alone could be more expensive than the 50% allocated to sustainable products" and "I realise that lowest bidder might not exactly be the consideration moving forward. Anything between 80 to 90%". It was, however, interesting to note how all the external stakeholders preferred higher sustainability weights in the tender evaluation process.

NVivo 14 Aided Analysis and Discussion

The NVivo 14 aided findings pointed to various percentage weights allocated to sustainable policy in the tender evaluation process by the respondents. While the EDG respondents (i.e., IS-1P, IS-2P and IS-3P) indicated specific sustainable policies, for example, waste, labour, and waste, those of the external stakeholders were broad in nature, for example "sustainability". **Table 3** shows stakeholders' sustainable policy choice and percentage (%) weight allocated.

Table 3: Stakeholder Sustainable Policy Percentage Weight

Stakeholder	**IS-1P**	**IS-2P**	**IS-3P**	**ES-1G**	**ES-2E**	**ES-3G**
Policy type	Waste	Labour	Waste	Sustainability	Sustainability	Sustainability
Weight allocated (%)	20	70	45	90	70	50

From the data gathered the average percentage weight allocated to sustainable procurement by the internal (EDG) stakeholders (e.g., Av. % WIS) was 45% (i.e., [20+70+45]/3) while that allocated to sustainable procurement by the external stakeholders (e.g., Av. % WES) was 70% (i.e., [90+70+50]/3).

Calculating an overall average percentage weight (OAv. % Weight) for the internal (EDG) stakeholders and external stakeholders we obtain.

$$\textbf{OAv. \% Weight} = \frac{\textbf{(Av. \% WIS) + (Av. \% WES)}}{\textbf{2}} = \frac{\textbf{45\% + 70\%}}{\textbf{2}} = \textbf{57.5\% ---------- 1}$$

Where: Av. % WIS is average percentage weight allocated to sustainable procurement by the internal (EDG) stakeholders.

Av. % WES is sustainable procurement weight allocated by the external stakeholders,

OAv. % Weight is the overall average percentage weight.

This implied, according to the above analysis, that approximately 58% of the 30% allocated to technical factor was given to sustainable factors in the tender evaluation process to determine the lowest bidder.

It also became obvious that the overreliance on price as the main determining factor for selecting suppliers for the award of a contract was a reason all the external stakeholders recommended a higher percentage weight for non-price evaluation factors. This is evidenced in a caption from answers given by the external stakeholders such as, “So, for me, from the material that we produce, I think quality is much more important than price” and “Dealing with climate change alone could be more expensive than the 50% allocated to sustainable products”. The overreliance on price in the supplier selection process was also evidenced in answers given by the internal stakeholders including statements such as “I think, and I believe one of the major challenges is the noncompliance by vendors introducing environmentally friendly and sustainable products because maybe they feel cost of producing them are higher compared to the non-environmentally friendly ones”. Such remarks were made to emphasise the believe that to cut down costs of production the supplier will have to avoid complying with the environmentally friendly productions process.

In analysing the Sustainable policies generated in NVivo 14 which included.

- Computerisation
- Framework Agreement

- Labour
- Local content
- Recycling
- Safety & Health
- Environment,

it was realised that Safety and Health had 51 references appearing in 6 files with 4.04%-word coverage (see also figure 7: Word tree for Safety & Health Policy) while environmentally related policy obtained 36 references, appearing in 6 files and a percentage word coverage of 4.6%. Waste related issues followed with 13 references in 5 files and 0.67%-word coverage.

Figure 7: Word Tree for Safety & Health Policy

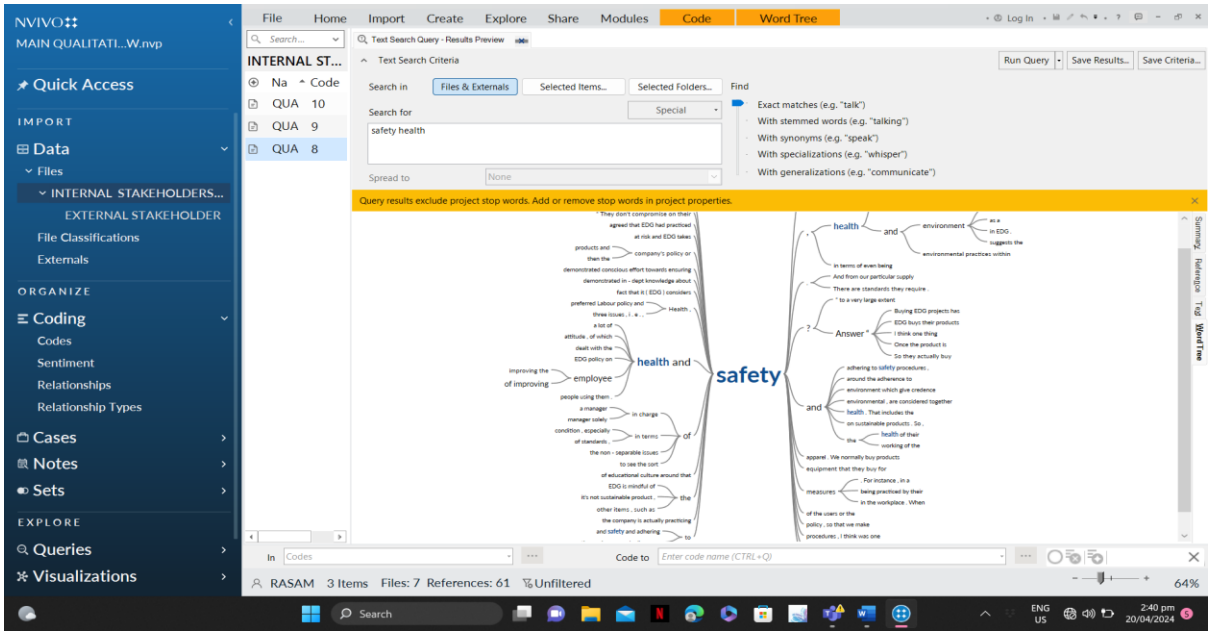


Figure 7: Word tree for Safety & Health Policy

Then came framework agreement getting 12 references in 3 files and 0.89%-word coverage. Computerisation, recycling, and labour followed closely in that order with 3 references each, appearing in 2, 2 and 1 files with a word coverage of 0.29%, 0.25% and 0.24%, respectively. Appearing in just 1 file, Local content was the least scored with 2 references and a 0.06%-word coverage. The **table 4** below shows the Sustainability Policy Ranking 1.

Table 4: Sustainability Policy Ranking 1

Sustainable policy (NVivo 14)	**References**	**% word coverage**	**Ranking**
Waste	13	0.67	4th
Computerisation/Paperless	3	0.29	5th
Framework agreement	12	0.89	3rd
Labour	3	0.24	7th
Local content	2	0.06	8th
Recycling	3	0.25	6th
Safety & Health	51	4.04	2nd
Environment	36	4.60	1st
Total	**123**	**11.04**	

The reflexive analysis further detected that “Framework Agreement” was a procurement method and not a “Sustainability” Policy and, therefore, had to align with the “Sustainable Procurement” process. “Local Content” was also seen to be a “Corporate Social Responsibility” (CSR) issue and so was replaced by the later, i.e., CSR while “Local Content” served as a child node to CSR. “Waste” management was identified as a “Recycling” agenda and so was collapsed under same. “Health, Safety & Environment” (SHE) was considered together all the time so was merged as one sustainability policy. The Sustainability Policy Ranking 1 was, therefore, further revised (i.e., Figure 5: Sustainability Policy Ranking 2) as indicated below.

Table 5: Sustainability Policy Ranking 2

Sustainable policy (NVivo 14)	**References**	**% word coverage**	**Ranking**	**% Coded Ref Coverage**
Computerisation/Paperless	3	0.33	3rd	1.80
Labour	3	0.24	4th	3.13

Corporate Social Responsibility	4	0.17	5th	2.69
Recycling	16	0.92	2nd	6.56
Safety, Health & Environment	82	8.63	1st	56.62
Total	**108**	**10.29**		**70.80**

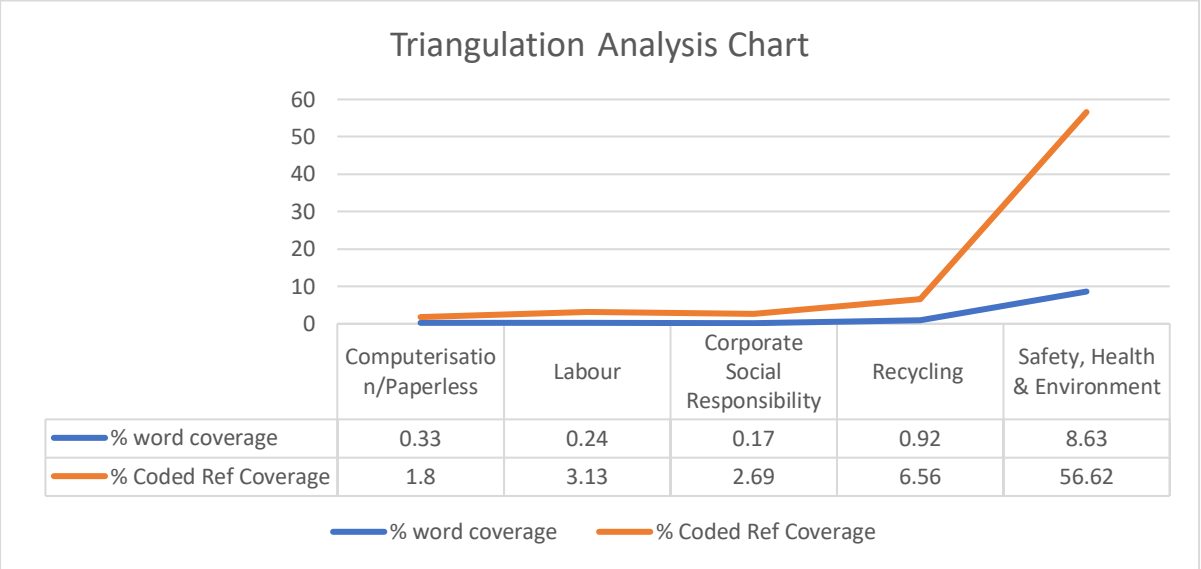
It was observed from the revised Sustainability Policy Ranking-2 that Safety, Health & Environment (SHE) policy was the highest ranked sustainability policy, followed by Recycling, Computerisation, Labour, and Corporate Social Responsibility (CSR), in that order.

Juxtaposing the overall average percentage weight (O. Av %Weight) of 58% for Sustainable products with references in the Sustainability Policy Ranking 2 and finding the correspondent percentage (%) ratio we obtain % weights for the 5-sustainability factor as shown in Figure 6.

Table 6: Sustainable Product Percentage (%) Weight Allocated

Sustainable policy (NVivo 14)	**References**	**% Weight Allocated (a)**	**(a) X 1.724**
Computerisation/Paperless	3	1.60	2.82
Labour	3	1.60	2.82
Corporate Social Responsibility	4	2.10	3.75
Recycling	16	8.50	14.65
Safety, Health & Environment	82	44.0	75.86
Total	**108**	**58%**	**100%**

To avoid manipulation of research outcomes to ensure rigor a complementary investigation through triangulation analysis using multiple qualitative data set with NVivo 14 was conducted (Denzin, 2009; Merriam & Tisdell, 2016; Lemon & Hayes, 2020), i.e., percentage (%) word coverage and percentage (%) coded reference coverage. The result is as shown in Figure 8: Triangulation Analysis Chart.



The results from the Triangulation Analysis Chart showed that both word coverage and coded reference coverage followed a similar linear pattern increasing in percentage from the least sustainability policy i.e., computerisation to the highest policy i.e., safety, health, and environment.

Tender Evaluation Model for EDG

The theoretical framework was used to identify the tender evaluation model and to answer objective questions 2 (i.e., To find a Model that will use factors obtained in objective 1 to evaluate tenders for goods procurement) and 3 (i.e., To test the aforementioned model on goods procurement tenders process for electricity distribution organisation in Ghana). The theoretically framed approach was also used to shape the literature review, justifying the study design and methods and guide the reporting, interpretation, and discussion of results (Harding & Gantley, 1998; Cai, Morris, Hohensee, Hwang, Robison, Cirillo & Hiebert, 2019; Varpio, et. al., 2020). According to Varpio et. al. (2020) the search for patterns and prominent key words from data gathered from the main interview aligned to theory that was logically developed to connect to the procurement tender evaluation concept. Therefore, the

bottom-up approach review of data to determine key literature or models on evaluating procurement tenders evolved a new insight into phenomenon. The theory-informing inductive data analysis study design which was iterative was as a result of deep exploration of data that revealed the particular model on evaluating procurement tenders to be relevant to the study findings and came as the result of the research (Varpio et. al., 2020; Thielmann, Spadaro & Balliet, 2020).

The two-step tendering process that resonated with Competitive Dialogue Procedure (Uttam & Roos, 2015; Džupka, Kubák & Nemec, 2020) emerged as the preferred model for the research. The first step enabled interaction and dialogue between the contracting authority and potential bidders on the needs and options for the tender. During the first step bidders were also informed and educated on the need for the inclusion of sustainable factors in the evaluation criteria. The second step being the actual tendering process was when bids or tenders were invited with instruction to comply with sustainability requirements. The tendering process will, therefore, score each bid under the given criterion and the weight adopted for sustainable products by the research and same used to triangulate existing contracts. Ratings were calculated using value function or weights realised in the Reflexive Thematic Analysis in answering objective question 3.

Application to Professional Development and Practice

EDG Procurement Manual and Policy

The EDG procurement process is regulated by a manual that was approved by the Board of Directors of the organisation. it was crafted out of the Public Procurement Authority (PPA) Ghana standard tender document. The Procurement Manual has been compiled to provide guidance to all EDG staff in their everyday work schedule related to procurement. It was intended as a reference tool for guiding the practice of procurement and application of international best procurement practices. It also facilitates the standardisation of procurement practices across all units and departments within the EDG with a view to ensure a transparent procurement system that, is central to good financial management and offers equal opportunities for all eligible competitors. The Manual is available on the EDG website so that suppliers, contractors, and consultants may better understand EDG procurement systems and processes to facilitate their effective participation in best procurement practices.

The scope of the Manual covered the procurement of all goods, works and services undertaken by the EDG including regional and district offices when expending internally generated funds (IGF). One of the underlying principles of the manual is to seek through the adherence, where possible, to the local content Legislative Instrument (L.I.) 2354 of Ghana to push for the systematic development of national capacity and capability for the enhancement of the Ghanaian economy through. The manual specifically covers procedural guidance and instructions on the main aspects of procurement and contracting, including standard forms and model documentation.

The Manual is designed so that it allows a user, whether as a procurement specialist or Practitioner to easily find practical information and guidance through the sequential stages of best practice procurement process. It contains step by step guide for developing tender documentation for the procurement of goods, works or services. The Manual describes procurement processes and procedures, and is divided into Parts, each of which is broken down into Sections.

The Procurement Directorate of EDG, as stated in the manual, is responsible for the planning, executing, advising, monitoring, and managing all procurement activities on behalf of EDG in accordance with approved policies/procedures and regulatory requirements to optimise the procurement of goods, works and services. The mandate of the Procurement Directorate shall include.

a) To Procure materials for the operations of EDG and for specialised projects of ECG from the right source, at the right price, at the right time and of the right quality

b) To prepare tender documents from the specifications provided by user directorates and assist the Tender Committee in evaluation and award of contracts

c) Be responsible for all aspects of contract administration and contract management in liaison with all relevant directorates.

Ethical behaviour in procurement in EDG is of particular importance because it affects the integrity of both individual staff and the company. The expenditure of public funds is always subject to scrutiny. Therefore, all staff concerned with procurement of goods, works and services must endeavour to maintain their integrity and that of the company through ethical behaviour. The guiding principles of ethical behaviour in

procurement can be summarised as the “Three I’s” – Impartiality, Independence, and Integrity. The main guiding principles are as follows:

• The conduct of individual buyers should not foster the suspicion of any conflict between their official duty and their private interest.

• The action of individual buyers in an official capacity should not give the impression to any member of the public, to any organisation with whom they deal, or to their colleagues that they have been, or may have been, influenced by a gift or consideration to show favour or disfavour to any person or organisation.

• Dealings with suppliers must at all times be honest, fair, and even handed

• Ethical behavior must be promoted and supported by appropriate systems and procedures.

EDG requires that a firm participating in any procurement process shall not have a conflict of interest. Any firm found to have a conflict of interest shall be ineligible for award of contract. A tenderer shall be considered to have conflict of Interest under the following circumstances.

i. If the Firm submits more than one tender, either individually or as a joint venture partner in another tender, except for permitted alternative tenders. This will result in the disqualification of all tenders in which the Tenderer is involved.
ii. Similarly, staff who handle any aspect of the procurement process and have direct or indirect business/family links with any tenderer must disclose and ask to be excused.

Fraud and Corruptions EDG requires tenderers, suppliers, contractors, and their agents, sub-contractors, consultants, service providers and any personnel thereof to observe the highest standard of ethics during the procurement of goods, works and services. For the purposes of these guidelines, the following definitions are given.

Corrupt Practice: Corrupt practice is the offering, giving, receiving, or soliciting, directly or indirectly of anything of value to influence improperly the actions of another party.

Fraudulent Practice: Is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, a party to obtain a financial or other benefit or to avoid an obligation.

Collusive Practice: Is any arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.

Coercive Practice: Is impairing, harming, or threatening to impair or harm directly or indirectly any party or the property of the party to influence improperly the actions of a party.

Obstructive Practice: Is deliberately destroying, falsifying altering, or concealing of evidence material to the investigation or making false statements in order to materially impede investigation into allegation of corrupt, fraudulent, coercive, or collusive practice.

The Procurement Directorate EDG is guided by the ethics of the Chartered Institute of Purchasing and Supply (CIPS), which is reproduced.

*The CIPS Ethical Code Staff responsible procurement shall never use their authority or office for personal gain and shall seek to uphold and enhance the standing of the Company by:

• Maintaining an impeccable standard of integrity in all their business relationships both inside and outside the organisation.

• Fostering the highest possible standards of professional competence amongst those for whom they are responsible.

• Optimising the use of resources for which they are responsible for providing maximum benefit to their employing organisation.

• Complying both with the letter and spirit of: - The Laws of Ghana (Act 663 -914 as Revised). Such guidance on professional matters as may be issued by the Institute from time-to-time Contractual obligations.

• Rejecting any business practice which might be deemed improper.

In applying these precepts, personnel shall follow the guidance outlined below:

▪ Declaration of Interest – Any personal interest which may impinge or might be deemed by others to impinge on a staff's impartiality in any matter relevant to his or her duties should be declared.

▪ Confidentiality and Accuracy of Information – The confidentiality of information received in the course of duty should be respected and should never be used for personal gain. Information given in the course of duty should be true, fair, and designed never to mislead.

▪ Competition- Whilst bearing in mind the advantages of his or her employing organisation of maintaining a continuing relationship with a supplier any arrangement that may eventually prevent the effective operation of fair competition should be avoided.

▪ Business Gifts – Business gifts other than items of small intrinsic value should not be accepted.

▪ Hospitality – Modest hospitality is an accepted courtesy of any business relationship. However, the recipient should not allow him or herself to reach a position whereby he or she might be deemed by others to have been influenced in making a business decision because of accepting such hospitality. The frequency and scale of the hospitality accepted should not be significantly greater than that which the recipient's employer would be likely to provide in return. When it is not easy to decide between what is and is not acceptable in terms of gifts or hospitality, the offer should be declined, or advice sought from the staff's superior.

A supplier's performance shall be appraised, and point rated during an evaluation process based on a pre-set criterion. The Supplier is initially asked to complete a Supplier Information Form. The following factors should be considered:

• Supplier's location, experience, any change of business name. The location should always be business premises. A residential house will denote a brief case merchant with little capital, stock, or knowledge of the goods and quality required.

• The Supplier's status is an important factor when considering supply sourcing Manufacturers, Authorised Importers, and Main Agents will generally supply to known quality and price levels. Stockists and general merchants of good quality can be useful particularly for one-off urgent or small value requirements. The so-called

'Agent' who is not authorised and is really a commission merchant should be avoided and deleted from the Suppliers database. Details of products, certificate of registration as agents and where appropriate, Value-Added Tax (VAT) Registration Number or Tax Clearance Certificate are also important considerations.

• The available workforce and storage facilities are often a good indicator of the status of the potential supplier. A single office with a receptionist and a telephone often denotes the bazaar trader who is an opportunistic buyer to meet a known requirement. He will often provide poor quality and sometimes not deliver at all if he cannot buy cheaply enough.

• Ownership, time in business, product knowledge and previous relationships should all be considered together with the financial status of the supplier.

• Recommendation for inclusion in the Suppliers List should be based on a point count assessment as shown below to be awarded as follows:

➢ Supplier status (Points 0-10) based on standing of the Company, e.g. known international or local manufacturing company would rate 10,

➢ Facilities (Point 0-10) based on office, warehouse, workforce facilities and delivery capacity

➢ Knowledge of supply of Product (Points 0-10) based on qualification, experience, corporate achievements.

➢ Finance (Points 0-10) score 0-5 for Banker's reference and 0-5 for pricing policy based on discounts, quotation validity, terms of business.

➢ Contract Arrangements (Points 0-10) Score 10 if supplier is prepared to enter term contract at agreed price. Deduct from 10 as validity of term to be agreed is reduced.
➢ Total points scored should be divided by 5 to give a score out of 10. In evaluating supplier's potential, consideration should also be given to the range of goods available. A wide range may lead to the award of a term contract for many items – thus easing the buying task. Conditions of contract should also be considered. What is the suppliers' attitude to the return of goods found defective in use? Settlement terms are also a factor as are communications and stock availability.

Certain factors should automatically lead to a “not recommended” assessment. The main ones are: No Bankers reference; No. stock held; False information supplied; and No business premises.

Evaluation of EDG Tenders

The relevant Tender Committee shall constitute and appoint an evaluation Committee for the evaluation of tenders. Tender evaluation shall be conducted by a Tender Evaluation Committee consisting of a minimum of three (3) members for low value procurements and up to 5 for high value procurements. The Evaluation Committee shall evaluate Tenders solely based on the information provided in the respective Tenders and no changes in the Tender price or substance of a Tender will be permitted. No circumstances shall justify meetings or consultations between the Evaluation Committee (or its Consultants) and tenderers during the Tender evaluation process. The Evaluation Committee shall first conduct a preliminary examination to determine whether the tenders are complete, whether the required sureties have been furnished, whether the documents have been properly signed and whether the tenders are in order. Prior to the technical evaluation, the Evaluation Committee shall determine the substantial responsiveness of each tender to the Tender enquiry documents. The Tender Evaluation Committee should examine the tenders to determine whether any issues arising from the preliminary examination affect the responsiveness of an individual tender, and whether each tender is responsive to the technical specifications and contract conditions stated in the Tender Document.

A substantially responsive tender is one that conforms to all the instructions, requirement, terms, and conditions of the Tender Document without material deviation, reservation, or omission. A material deviation, reservation or omission is one that:

• Affect in any substantial way the scope, quality or performance of the goods, works or services specified in the tender document.

• would limit in any substantial way, inconsistent with the Tender Documents, the rights of the Procurement Directorate or the Tenderer’s obligations under any resulting contract; or

• if corrected would unfairly affect the competitive position of other Tenderers presenting substantially responsive and compliant Tenders. Any tender containing a material deviation, reservation, or omission, is therefore not substantially responsive, shall be rejected and may not subsequently be made responsive by the Tenderer or the Procurement Entity. The classification of a deviation, reservation, or omission as material or non-material shall be determined by the objectives and requirements of the individual procurement requirement, as stated in the Tender Document, and shall consider the impact on key factors, such as cost, risk, time, and quality. Non-material deviations may include minor deviations in the payment terms required; tenders offering goods to alternative, but equal or superior specifications and performance; The classification of deviations, reservations, and omissions as material or nonmaterial must be consistently applied to all Tenders. Where a Tender is determined to be substantially responsive, the Evaluation Committee may waive, clarify, or correct any non-conformity, error, or omission, which does not constitute a material deviation. Such nonconformity, error or omission should be quantified in monetary terms to the extent possible and considered in the financial evaluation and comparison of Tenders.

The Evaluation Committee may.

• Reject and exclude from further evaluation any Tender that is incomplete, unsigned, not accompanied by a Tender Security, not accompanied by essential supporting documents, or not substantially responsive to the technical specifications, contract conditions or other critical requirements stated in the Tender Document.

• Reject and exclude from further evaluation any Tender which contains material deviations, reservations, or omissions, and is therefore not substantially responsive.

Tenders that are determined to be substantially responsive to the requirements of the Tender Document shall be subjected to financial evaluation to determine the evaluated price of each Tender, and the lowest evaluated tender. The evaluated price for each Tender shall be determined by taking the Tender price, as read out at the tender opening; Correcting any purely arithmetical errors in tenders in accordance with the procedure stated in the Tender Document.

EDG shall grant a margin of preference in the evaluation of tenders offering certain materials/goods manufactured in Ghana, when compared to tenders offering such

goods manufactured abroad. In such cases, tendering documents shall clearly indicate any preference to be granted to domestic manufactured goods and the information required to establish the eligibility of tender for such preference. The nationality of the manufacturer or supplier is not a condition for such eligibility. For evaluation purpose the tenders are separated into foreign and local tenders. If the local tender is the lowest evaluated tender, there is no need to apply preference. However, if a tender with foreign origin is the lowest evaluated tender, a predetermined percentage (15% maximum) will be added for comparison with any local tenders, to increase the competitiveness of local tenders. Details of the domestic preference shall be contained in the Tendering Documents.

Life Cycle Cost or Total Cost Tender A Life Cycle Cost or Total Cost Tender may be used when it is desirable to award on the basis of the cost to acquire and use the goods or services over a period of time. For example, an invitation to Tender would require tenderers to supply the price of the copier, its electric usage, the cost of maintenance, and the cost of supplies for five years usage, or for making a specific number of copies. The lowest cost is determined by adding together the costs of each of these components.

Multi-step tendering is a two-phase process consisting of a technical first phase composed of one or more steps in which tenderers submit un-priced technical offers to be evaluated; and a second phase in which those tenderers whose technical offers are determined to be acceptable during the first phase have their price tenders considered. It is designed to obtain the benefits of competitive sealed tendering by award of a contract to the lowest responsive tenderer, and at the same time obtain the benefits of the competitive sealed proposals procedure through the solicitation of technical offers and the conduct of evaluation and to determine the acceptability of technical offers. When it is not possible to write specifications with a description sufficient to award based on price, an Invitation to Tender may be issued requesting the submission of un-priced offers, followed by the second step of issuing an Invitation to Tender to only those tenderers whose offers have been qualified under the criteria set forth in the first step. The specifications may, instead, require submittal of a second sealed envelope within the main sealed tender envelope. The second sealed envelope shall contain the prices, and only those tenders of the tenderers whose offers have been qualified will be opened. Pre-Tender Conferences A pre-

tender conference may be held at the discretion of the Procurement Directorate to explain any part of the specifications, and to allow the prospective tenderers to ask questions. It shall be held long enough after the specifications are issued to allow the tenderers to become familiar with them, but sufficiently before tender opening to allow consideration of the conference results in preparing the tender. Nothing said in the pre-tender conference shall change the specifications unless a written amendment to the specifications is issued. A summary of the conference shall be supplied to all those prospective tenderers known to have received the specifications.

Applied Tender Evaluation Model for EDG

Similar to the two-step tendering process that resonated with Competitive Dialogue Procedure (Uttam & Roos, 2015; Džupka, Kubák & Nemec, 2020) that emerged as the preferred model for the research, the application for professional development used multi-step tendering in a two-phase process consisting of a technical first phase in which tenderers submit un-priced technical offers to be evaluated; and a second phase in which those tenderers whose technical offers are determined to be acceptable during the first phase have their price tenders considered. The EDG procurement case considered involved implementation of an industry-standard Employee Time and Attendance (ETA) system under a Supply and Installation of Fingerprint based Employee Time and Attendance Management System. EDG intended to use its internally generated funds (IGF) to pay for the Supply and delivery of the Fingerprint-based Time & Attendance System, installation, configuration, integration of the system with ECG'S HR & Payroll system, deployment of the system throughout the organisation for use, and provide training to selected users/administrators on the system under the supply and installation contract. In view of the above, EDG invited sealed bids from three selected Tenderers for the supply and installation of a companywide ETA system. The three Nos. selected Tenderers for this bid were (for purposes of anonymity):

a) “A” Consult Limited

b) “B” Services Limited and

c) “C” Consultants Limited

The bidding documents were prepared as selective tendering document following the Public Procurement Authority (PPA) and ECG procurement guidelines. Invitation letters were issued out to the above three selected companies for their offers. A pre-tender virtual meeting was held enabled interaction and dialogue between the contracting authority and potential bidders on the needs and options for the tender. During the pre-tender virtual meeting bidders were informed and educated on the need for the inclusion of sustainable factors in the evaluation criteria. Then followed the actual tendering process when bids or tenders were invited with instruction to comply with sustainability requirements. The tendering process, thereafter, scored each bid under the given criterion and the weight adopted for technical, including sustainable products factors.

The technical evaluation of bids was carried out by a five (5) member committee put together by the Managing Director of EDG. The technical evaluation followed the standard guidelines set out in the EDG procurement manual for goods, works and services. The methodology used was to first conduct a preliminary check on the bids to identify and reject bids that were incomplete, invalid, or substantially nonresponsive to the bidding documents and, therefore, were not to be considered for further evaluation. Major deviations, reservations, and/or omissions to the Instructions to Tender (ITT), which if accepted, would not fulfil the purposes for which the bid was requested or would prevent a fair comparison with bids that are properly compliant with the bidding documents, were the basis for rejection of bids. Bids surviving the preliminary examinations were examined further on the technical requirements called for in the bidding document *(see appendix for Sample EDG Tender Document Extracts***).** Based on all the above preliminary checks, bids from all three (3) Tenderers, i.e., “A” Consult Limited, “B” Services Limited and “C” Consultants Limited, were accepted for further examination on technical responsiveness.

Technical Responsiveness

As part of the determination and comparison of Evaluated Tender Prices, the responsive tender was evaluated against technical and qualifications criteria using the procedures specified in ITT Clause 32. The Technical Score (St) for successful tender was calculated as the sum of scores given by the Technical Evaluation Team

to a Percentage Weight for Technical Merit Factor of 70% stated in the TDS (see appendices: Sample EDG Tender Document Extract). The following baseline requirement was used as a guide to the allocation of weighted scores:

Architecture Principles and Drivers for the design, development and implementation of the time and attendance solution including:

i. Use of interpretable and standards-based technologies: The technology/solution must be standards-based systems that permit easier integration of data across ECG'S enterprise systems. All technologies deployed by EDG must conform to the interoperability architecture.

ii. Commercial off-the-shelf (COTS) solutions: EDG is adopting a strategy of designing systems to use COTS software components with minimum customisation.

iii. Web based: Software Applications must be Web-based deployed across all business functions.

iv. Technology Independence: Applications are independent of specific technology choices and are not dependent on specific hardware and software platforms. Independence of applications from the underlying technology allows applications to be developed, upgraded, and operated in the most cost-effective and timely way.

v. Ease of use: All applications must be easy to use. The underlying technology must be transparent to users, so they can concentrate on performing business tasks. Applications will have a common "look and feel" and support ergonomic requirements. Hence, the common look and feel standard must be complimented by user friendliness.

The Technical Components of the Time & Attendance System include:

1. Server Hardware

2. Server software

3. Fingerprint Units (an initial quantity of 100 units)

4. Reporting Infrastructure (reports & tools)

5. Integration and Interfaces.

The proposed solution **MUST** meet the following key system requirements:

1. The system must be hosted on premise at EDG offices.

2. System must allow for periodic backups.

3. The system must have the ability to integrate with other current/future systems at EDG.

4. The system must have the ability to set access and user permissions.

5. The system must have the ability to import/export data in formats such as xlsx, csv, pdf, docx, etc.

EDG Safety, Health, and Environment policy

The EDG Safety, Health, and Safety (SHE) manual available on the EDG website was developed to ensure all major risks and hazards to people, the environment or EDG assets have been identified and that suitable mitigations or controls are implemented to assure that the risks associated with EDG operations and activities are eliminated. The manual provides criteria and approach for monitoring, evaluation and overall continuous improvement of the program and organizational performance of EDG. To ensure safe work practices; operations procedures, code of practices, EDG Safety, Health, and Environment (SHE) has approved plan and other procedures that must be adhered to. These are a set of requirements designed to manage risks and impacts within the Business operations of EDG. The effective implementation of these procedures will steer EDG's commitment to eliminating harm to all employees, contractors, and the public. These procedures are expected to guide all employees and contractors. The following are SHE policy guidelines.

Hazard Identification and Risk Assessment (HIRA): Identification of risks and impacts arising from EDG operations and activities. Risks shall be evaluated, and the suitable control measures put in place to reduce harm to workers, contractors, visitors, public and environment. Risk management will form an integral part of daily work operations and practices.

- An up-to-date risk assessment register/form shall be maintained within EDG and its operations**.** This document shall detail all risks associated with work activities with ECG operations and infrastructure activities. The Risk

assessment template shall be shared with contractors for works or projects. This document shall be reviewed quarterly, updated, and shared.

- Supervising engineers, supervisors and contractors shall ensure hazards pertaining to their areas of responsibilities are captured and assessed and reported to the SHE Division. These assessments shall be reviewed whether new or old tasks to ensure that prior to commencement or continuation works and activities, the right mitigation measures have been put in place by contractors and authorized person to minimize risks to employees, general public and environment.
- Risks identified and registered in the template shall be revisited and reviewed quarterly. For instance, High, medium, and low risks identified, and timelines indicated to mitigate risks.
- All corrective actions or interventions identified to manage risks shall be communicated to all relevant stakeholders, contractors, and employees, implemented, and verified prior to commencement and/or continuation of operations and activities.
- Method statement and specific Standard operating procedures (SOPs) with the input of contractors shall be developed after reviewing risks. SOPs must be reviewed should accident or any incident occur. Risk assessment shall be reviewed periodically and reproduced should work activities and processes change.
- The SHE Division will oversee that any corrective action identified based on risk assessment will be implemented so as to reduce risks.

Training and Induction. Training has a key role to ensure employees acquire appropriate skills and competencies to manage work related hazards and risks. This procedure is to ensure all employees, contractors and consultants are provided with the appropriate training to complement their experience, with respect to hazards and working conditions associated with EDG operation and activities. SHE induction and training programs shall be incorporated in EDG operations and infrastructure activities. All employees and contractors shall be provided with SHE induction and other training programs.

- Training and competency building in H&S will be undertaken by all employees and contractors.
- A training matrix shall be developed by EDG SHE Division in collaboration with Human Resource (HR). This will detail all training needs of employees and directorates. EDG SHE Division shall provide targeted training programs in H&S for contractors and subcontractors and their employees.
- The Environment and Social Performance (ESP) team will ensure all training needs and delivery meets required standards and incorporate gender and social inclusion perspectives. The Human Resource Directorate will keep record of training database and assist in facilitation of the programs.
- Directors, managers, and Supervisors are required to communicate to the SHE Division upon completion of training courses of all employees under their responsibility.
- All EDG employees shall undertake H&S induction programs and orientation relevant to the tasks to which they are assigned**.** Induction training programs shall be delivered to workers in a language and form understood and acceptable to target group. This induction shall be prior to commencement of work supervised by the SHE Division of EDG. The SHE Division shall ensure that all new employees are advised on SHE practices and procedures and given copies of the SHE policy and procedures. This will be done in a timely manner before work commences.
- Contractors and associates contracted by EDG with the support of the SHE Division shall conduct SHE induction for contractors, subcontractors and their employees appropriate to their expected duties.
- The SHE Division led by the General Manager (GM) shall design a EDG specific H&S induction program for all visitors, employees, contractors before they are allowed to work on EDG premises. This induction must explain Emergency procedures, risk management, SOPs and identify sections of the manual which must be read and understood prior to start of work.

Accident, Incident Reporting, and Investigation. This outlines the reporting protocols for all types of incidents in order to ensure that incidents are investigated in a

consistent manner to determine the immediate and root causes and to recommend actions for correction and prevention of such incidents and accidents. It is a requirement for EDG staff as well as persons working within and on behalf of EDG to cooperate with accident, incident and near-miss investigation processes and reporting. The objective of the H&S investigation process is to identify potential hazards and risks and identify control measures to prevent recurrence.

- All employees & Contractors are responsible for immediate reporting of all accidents, incidents and near misses.
- Supervising engineer, authorized persons and contractors are responsible for ensuring that all accidents, incidents, and near-misses are recorded and investigated. A standard accidents and incident template and tools shall be developed for recording**.** All parties shall comply with this reporting system.
- The SHE Division shall ensure that all supervisory employees are trained in incident investigation and given adequate support to carry out their responsibilities in this regard.
- Directors, managers, contractors, and supervisors shall be responsible for handing over all incident and accident reports with comments and recommendations to the SHE Divisions and for ensuring that mitigation measures are implemented accordingly.
- Employees shall be responsible for reporting all injuries and incidents, however minor to their immediate supervisor.
- Supervisors, Managers, Contractors and Engineer shall report all incident/accident to the SHE Division and copy to the Director of Operations within 24 hours of the incident or accident occurring by the GM. Staff or contractors who sustain injuries in the course of work should report to the supervisor immediately and the EDG Emergency personnel to attend to such persons.
- Supervisors, Managers, Contractors, and Engineer shall forward accident/incident report to EDG SHE Division not later than 21 days after the occurrence of the accident or incident through the GM.

- Complete incident/ accident investigation and submit the report within 21 days of incident/accident occurrence.
- Where there is property damage, the supervisor, contractor, or supervising engineer in charge shall inform the SHE Division as soon as they become aware of it.
- All employees or contractors shall report in writing cases of near misses.
- The SHE Division shall carry out independent investigation of all accidents, near-misses and property damage and the head of SHE shall review all investigation reports within 21 days of occurrence.

Workplace Hazard Control. Workplace hazard control ensures that all work is undertaken safely and that risks are identified and managed. All project activities and tasks shall only proceed when all personnel involved are confident, they understand their roles and responsibilities and are well trained, knowledgeable and have the requisite practical experience to undertake them.

- All work routine and processes shall be assessed, and industry's best practice shall be involved.
- Non-routine works shall be assessed for risks and will not take place until Job hazard analysis (JHA)/risk assessment has been conducted and scope of work clearly identified with corresponding responsible persons and dates of completion stated.
- The SHE Division must ensure all hazard lists; Risk assessments and risk register are up to date and reviewed for update should there be any changes. Risk assessment must be reviewed; after accidents, incidents/near-misses, after 12 months, after audit findings, when work circumstances or processes change or when the procedure is no longer valid.
- Risk assessment shall also be conducted in the work environment which include vulnerable groups such as pregnant women, persons with disability etc.

Personal Protective Equipment (PPE). PPE is the last line of defence in controlling hazards. Issuance and training on use of PPE must be made available to all employees and visitors on every infrastructure site, EDG offices.

- Contractors and employees shall be made aware of policy requirements regarding PPE usage on every project site and work area.
- Training on benefits and correct usage of PPEs will also be conducted by the SHE Division.
- Signs shall be posted at sites and work areas where PPE is required.
- Appropriate PPE provisions shall be available and must be fitted to the specific user, stored in a clean area, maintained, and inspected on a regular basis.
- All employees shall use PPE in the correct manner and report all problems encountered with usage to their supervisors.
- Supervisors must ensure that there is adequate PPE for their workers, and they are being kept in good conditions. They must ensure that the right PPE is being used for the right job.
- Personal Protection Equipment (PPE) depends on the risks as defined by a risk assessment. A staff visiting active project site or work area, PPE requirement may be different from a worker performing a specific task during the construction of a Primary/BSP or performing electrical operation on the network. PPEs must be worn as detailed in the risk assessment and minimum site requirements. All employees must wear the appropriate PPE for specific task and when working or visiting active project sites or work areas.

Examples of PPE's

- Safety Helmet.
- Safety Shoes/ Boots (E.g. Wellington boots, insulator boots, chukka shoes).
- Coveralls such as reflective vest, robe, or apron for special tasks.
- Prescribed eye safety goggles, glasses, or shield.

- Task Specific Gloves (Example, Leather, auto electrical gloves, insulation gloves or rubber gloves).
- Safety Belts (Example for working at height).
- Fall arrest harnesses.
- Dust & filter masks.
- Visor
- Choice of appropriate Respirator (Disposable). This will consider fit testing and training. A doctor must first medically clear all users of respiratory protection.
- Hearing protection such as hearing plugs.
- Code of Practice.

First Aid. This procedure shall provide a standard for the management of injuries and illnesses associated with work operations and activities.

- All injuries or illness however minor must be reported to the SHE Division and must be disaggregated by age, sex.
- On infrastructure site and EDG offices, all staff must be aware of who the nominated emergency personnel are prior to the commencement of work. All EDG emergency personnel shall undertake first aid training courses provided by EDG and consultant to assist in their line of work.
- SHE officers and working group must assess situations in the event of an accident as well as ensure their own safety and to determine the necessary basic treatment and whether an ambulance is needed to transport injured persons to the nearest medical centre.
- A vehicle must always be on standby to transport personnel in case of an emergency on every EDG infrastructure site and EDG Office.
- First Aid and Material Provision must be adequate and in place for initiating any potential hazard material spills. First aid kit shall contain the following; Gauze pads (at least 4 x 4 inches), Two large gauze pads (at least 8 x 10 inches), Box adhesive bandages (Band-Aids), Elastic roll adhesive,

Hypoallergenic tape, Two triangular and Roller bandages, Wound cleaning agent such as sealed moistened towelettes, Scissors, at least one blanket, Tweezers, Adhesive tape, Disposable gloves, Resuscitation mask, Two elastic wraps, Splint, Eye pad, Eye shield.

- First Aid Kits shall be inspected weekly and always stocked.
- EDG Management shall provide standard first aid kits at work areas and train selected employees to administer first aid assistance to EDG personnel.
- Contractors/Authorized person/Supervisor shall ensure project site first aid facilities exists at all times and emergency personnel are trained to manage any emergency in EDG office and infrastructure sites.
- All EDG vehicles shall have First Aid Kits available.
- EDG staff travelling to project site/work area shall have a first aid kit or bag at their disposal.

Well-Being and Hygiene Procedures. The SHE safe work procedures implemented shall manage potential health and hygiene risks and protect the welfare of employees.

- Health and hygiene risks associated with physical, chemical, and ergonomic exposures must be identified, risk assessed and fully understood by employers and contractors.
- All incidents that have the potential to impact the health/well-being and hygiene of individuals must be immediately reported in accordance with EDG's incident reporting process.
- Medical assessments such as chest x-ray, blood and glucose test, hearing, eye tests and other medical examinations shall be undertaken for all employees prior to commencement of EDG official duties and execution of specific activities.
- Allocate sufficient resources to support emergency medical facilities and screening programs and train individuals on the risk associated with the work being performed and safe work procedures to mitigate such risks.

- Supervisors, contractors, and engineers in charge of designing and implementing work schedules must review and adjust schedules to ensure that individuals do not work excessive hours without providing sufficient rest periods.
- Fatigue management must be considered when extended working hours are anticipated. An individual must not work more than 16hrs within a 24hr period without sufficient rest.
- Malaria risk must be assessed for every operation and management plans must be in place where there is significant risk to mitigate them.
- Enclosed structure offices, workshops and sub-stations shall have the capacity to allow free flow of natural air.
- All offices, workshops and sub-stations shall be fitted with well maintained, appropriate lighting fixtures to provide standard illuminations wherever necessary.
- Dustbins shall be provided at vantage points/locations and emptied daily.
- All waste materials in offices, garages, workshops shall be segregated (Solid/liquid) and deposited in the appropriate bins.
- Offices, workshops, substations, and garages shall be assessed and repainted annually.
- All personnel or employees performing work on behalf of EDG must not do so while under the influence of drugs and alcohol and all personnel must comply with the EDG Alcohol, Drug Use and Smoking Policy.
- If you are on any prescribed medication that may affect work performance, the employee must disclose this to Supervisor, Engineer, Director, Manager or Contractor.
- Employees who by the nature of work may be exposed to health hazards must undergo periodic medical examinations such as chest x-ray etc.

Intimidation, Harassment and Abuse. Harassment, Intimidation, and abuse must be entertained since it has an impact on productivity and impact an individual mentally/psychologically.

- Employees must report incidences or cases of intimidation, harassment and abuse to Supervisors, Contractors, Managers and Directors for appropriate action to be taken. It should be noted that, workplace intimidation, harassment and abuse affect work productivity and output.
- EDG Management must encourage mutual respect at the workplace and on infrastructure site. Teamwork is key and enhances productivity and effectiveness of employee's skills and potential.
- Education on workplace intimidation, abuse and harassment must be done for all workers. Management shall prepare policies and disciplinary sanction for such behaviours. Such issues must be addressed fairly and properly.
- Intimidation, Harassment, and abuse codes shall be posted at EDG Offices and all infrastructure sites to inform workers of these rules.

Forced Labor and Child Trafficking. Ghana is mandated to eliminate the issues surrounding Trafficking in persons. EDG has the responsibility to eliminate this practice from its operations.

- EDG management, supervisors and contractors shall not employ personnel underage for economic exploitation as defined by the WHO/ILO standards and other international and national laws and regulations.
- Engineers, Supervisors, and contractors shall not employ trafficked persons for infrastructure works or any other activities. This includes work or service not voluntarily performed or under threat of force or penalty.

Welfare Facilities. This shall be applicable, if necessary, on project sites/work areas.

- Manned substations, offices, workshops, garages shall be provided with adequate washroom and toilet facilities for both males and females. Facilities shall be kept clean and in a hygienic condition by cleaning daily with sanitary detergents.

- Food consumption in offices and workshop shall be discouraged and restricted to specific areas reserved for such services.
- Eating areas and clean drinking water shall be provided to all staff. Staff shall not drink from a common drinking cup. Staff shall be entitled to disposable cups which are disposed immediately after use.
- Toilet facilities shall be provided for employees. It is the responsibility of everyone to ensure that these facilities are kept to a high standard of cleanliness.
- It is the responsibility of the Contractor to ensure these facilities are provided for both males and females at project sites. Dressing areas shall be provided for males and females separately.
- Contractors shall designate entry and exit areas for the delivery of materials and supplies. And designate walkways for pedestrians and employees.
- As appropriate, Contractors may be required by EDG as part of their site-specific health and safety plans to provide an infirmary on site and make any necessary arrangements for ambulance service.

Housekeeping.

- It is the duty of all employees, supervisors, and contractors to ensure a clean and tidy workplace on infrastructure sites, storage areas, sub-stations and EDG offices. When work areas are tidy and clean, there is reduction in risk of injury.
- All fire escape route and fire exits must be always kept free from obstruction. EDG offices areas and workstation should be spacious, and walkways must be free from any obstruction.
- Liquid spills such as oils for transformers, petroleum, diesel, are to be cleaned immediately to prevent falls, slips and trips and other health concerns.
- The contactor should have a management plan for handling liquid spills.
- Debris or waste of any description must be carefully disposed.

- Maintain a clean environment to protect the health and welfare of all employees.
- Workshops, offices, furniture, equipment, sub-stations, and its environs shall be kept clean always.
- Growth of weeds, shrubs and climbers in sub-stations shall be controlled by regular weeding and use of weedicide.

Employee Safety Guide. This is a brief guide for EDG employees (This include EDG gangs) when going into the field to inspect and visit active infrastructure site. This instruction applies to EDG employees and contractors contracted by EDG to manage and oversee EDG infrastructure projects.

- Employees shall wear the minimum PPEs on project site and when performing certain task which require use of PPEs from the risk assessment.
- EDG employees shall inform the EDG Emergency Response team of all planned field visits to infrastructure sites and other off-site official assignment for effective emergency response coordination.
- Incidents and accidents at the workplace and on the field shall be recorded and reported to EDG Emergency Response team, SHE Division and Supervisor within 24 hours and for investigation and corrective actions to be implemented.
- Employees shall adhere to the safe driving and vehicle use procedures.
- Employees and visitors shall register their names in the employees and visitor's logbook both at the office and at infrastructure sites. Employees and visitors shall sign-in and sign-out in the logbook.
- Badges shall be provided by EDG for all staff and visitors for identification purposes. These badges shall be always worn at the Office and when visiting infrastructure site. Visitors visiting EDG office shall be issued with a visitor's tag by EDG for easy identification. EDG shall require of works contractors to provide badges for staff and visitors who may visit infrastructure site at any given time.

- Employees shall participate in all health and safety induction and training programs.
- Emergency Contact details shall be provided by EDG to all EDG staff embarking on a field trip and official EDG engagement. In case of any emergency out on the field, EDG staff will be required to contact the emergency service emergency response team at EDG. Emergency Contact details shall be made available to staff (including drivers) prior to any planned field visit.
- All employees embarking on field trips shall participate in a health and safety orientation and training.
- Regular SHE briefs shall be provided (Toolbox talks).
- At the beginning of every meeting at EDG office or on infrastructure site, a health and safety orientation shall be provided.
- Employees shall comply with approved SHE policies and procedures as well as instructions.
- Safety rule violations by contractor or employees noted shall be addressed immediately and sanctions implemented.
- In the event of a health and safety emergency, employees will first report to the emergency response team at EDG head, district, and regional offices. The team will then communicate and coordinate with the relevant emergency service provider to provide relief to affected staff. Employees may use the following means or methods of communication. This includes Phone calls, SMS messaging, WhatsApp or Viber, email etc.

Threats and Dispute. To foster business integrity and manage continuity, the security of employees and property is critical. Action must be taken against group or individuals acting illegally and such actions must be taken within the confines of national and international human rights practice and legislation and without infringing the rights of the individuals or group concerned.

- Assess and manage threats so that employees and assets are protected.
- Take account of security issues in all aspects of EDG operations and planning.

- Engage effectively with public security providers to protect employees and assets from threats. Security personnel shall be stationed at the EDG offices and infrastructure sites to respond to potential threats and vandalism and are appropriately trained in crowd control practices to manage conflict situations.
- Use skilled and equipped security personnel to provide security training for EDG employees.

Ensure all employees and visitors log-in and log-out at the EDG office and infrastructure sites (e.g. LV Bifurcation, Substation and Bulk Supply Point (BSP) construction). For communities and public, signage and access control checks shall be put in place by contractors to prevent injuries or fatalities.

- EDG shall develop a security management plan to adhere to during an emergency.
- At the EDG premises, all vehicles entering and exiting the premises shall undergo security checks. Personal belongings and People entering and exiting the building are all scanned for security purposes.

SHE Management Review and Audit. This outlines guidance for conducting audits for SHE Management.

- The GM for SHE in EDG is responsible for ensuring that SHE policy and procedures reviewed and updated periodically. Periodic audits either done in-house or by external experts shall be conducted annually.
- The SHE Division shall maintain an audit schedule for internal audit of the entire ESHSMP together with all other plans and procedures for SHE annually.
- There shall be adequate preparation for such audits and reviews and all parties duly informed in good time. All other parties that play roles in the management of SHE shall prepare for audits and reviews and play their part in ensuring successful programs.
- SHE performance indicators shall be identified for effective monitoring and evaluation of the SHE management system.

Documentation and Data Control Management.

- The SHE Division shall collaborate with other directorates to ensure that documents or templates to control activities are readily available to personnel performing any assigned task that may affect safety, health and wellbeing employees and environment.
- The SHE Division is responsible for the development, maintenance and revision of SHE manuals and documents. These documents/manuals are to ensure that the SHE management and activities are reviewed, approved and mitigation measures put in place to control risks.
- Records must be kept and reviewed periodically to demonstrate effectiveness of the SHE management system.
- Keep reliable sex and age disaggregated statistical data of all accidents to ensure safety effectiveness.
- Set up an SHE data management system.

Confined Space Entry. An enclosed or partially enclosed space not intended or designated primarily as a place of work.

- Confined space entry must only be conducted after alternatives which avoid confined space entry have been considered, evaluated, and discounted.
- Identify and suitably mark all confined spaces to prevent unauthorized access to unauthorized personnel.
- Risk assessment must be conducted for all confined space entries with all personnel involved or impacted by the work.
- A rescue plan and associated equipment must be in place and communicated to personnel prior to the commencement and/or continuation of a confined space entry.
- Trained and competent individuals/authorized persons must only perform confined space entries.
- Adequate ventilation (Gas air monitoring requirement – 02, CO, LEL & H2S) must be provided to always ensure a safe atmosphere, from initial entry until the work is completed and the space is evacuated.

- A dedicated stand-by person must be continually stationed at the entrance to the space to prevent unauthorized entry and initiate any rescue response.
- There must be a reliable means of communication established with individual(s) in the confined space.

Working at Height. Ladders can be used when risk assessment has shown that using equipment offering a higher level of fall protection is not justified due to low risk and short duration of use.

- Ladders must be used by a competent person who has had training and understanding of how to use the equipment safely. Appropriate training shall be provided and the persons working with ladders shall be supervised.
- Ladders shall be used in a safe environment. Example, where the ladder will be level and stable and where reasonably practicable to do so.
- Check ladders before use. A pre-check shall be carried out before starting a task. Example, check the feet, any locking mechanisms, steps, or treads on stepladders.
- Floors and other areas where ladders shall be used must be free from any obstruction and clean.
- Ladder used to access another level should be tied and extend at least 1m above the landing point to provide secure hand hold. A self-closing gate may be provided where necessary.
- Contractors must ensure that ladders or stepladders are suitable for the specific task and in safe condition before use.

The Summary of Technical Responsiveness for the Tenderers showed the evaluation of all non-price factors including Experience, Approach to system delivery, Project team qualifications, Capacity and project schedule and all sustainable product factors. However, based on research findings 30% of the 70% weight allocated to technical factor was assigned to sustainable product factors and scores obtained aggregated together to determine the total score for each tenderer and tested for rigor on a previously awarded contract at EDG (see sample EDG Tender document extracts in appendices). This is shown in Tables 7, 8 and 9 below.

Table 7 – Summary of Technical Responsiveness (Section IV pg.37 of ITT)

Bidder: “A” Consult Limited

Item	Evaluation Factor	Weighted Factor (Others) (%)	Weighted Score (%)	Evaluation Factor (Sustainability Policy)	Weighted Factor (Sustainability) (%)	Weighted Score (Sustainability) (%)
1	Experience and references	20	16	Computerisation	2.82	.2.60
2	Approach to system delivery	55	55	Labour	2.82	2.68
3	Project team qualifications	15	15	Corporate Social Responsibility	3.75	1.21
4	Capacity and project schedule	10	10	Recycling	14.65	5.00
5	-	-	-	Safety, Health & Environment	75.86	75.86
	Total	**100**	**96**		**100**	**87.35**

Table 8: Bidder: “B” Services Limited

Item	Evaluation Factor	Weighted Factor (Others) (%)	Weighted Score (%)	Evaluation Factor (Sustainability Policy)	Weighted Factor (Sustainability) (%)	Weighted Score (Sustainability) (%)
1	Experience and references	20	10	Computerisation	2.82	.0.00
2	Approach to system delivery	55	50	Labour	2.82	2.69
3	Project team qualifications	15	15	Corporate Social Responsibility	3.75	3.75
4	Capacity and project schedule	10	5	Recycling	14.65	0.00

5	-	-	-	Safety, Health & Environment	75.86	70.00
	Total	**100**	**80**		**100**	**76.44**

Table 9: Bidder: "C" Consultants Limited

Item	Evaluation Factor	Weighted Factor (Others) (%)	Weighted Score (%)	Evaluation Factor (Sustainability Policy)	Weighted Factor (Sustainability) (%)	Weighted Score (Sustainability) (%)
1	Experience and references	20	5	Computerisation	2.82	0.00
2	Approach to system delivery	55	40	Labour	2.82	2.68
3	Project team qualifications	15	5	Corporate Social Responsibility	3.75	0.00
4	Capacity and project schedule	10	5	Recycling	14.65	0.00
5	-	-	-	Safety, Health & Environment	75.86	60.00
	Total	**100**	**55**		**100**	**62.68**

Scoring Criteria

Technical scoring for Experience and references were obtained based on the minimum requirements for the following.

- Last three (3) years financial statement showing average net positive results (10 Marks).
- Ideally, 5 years history in Ghanaian or other relevant market(s) (5 Marks).

• Additional Minimum 2 projects of relevant scope and ideally also of size (including participation as subcontractor or lead contractor) in Ghana or other relevant market(s) (5 Marks).

For Approach to system delivery the minimum requirement was.

•Approach to fulfilment of hardware and software requirements of the Time & Attendance Management System as required by the specifications (20 Marks).

• Approach to overall Project Management including installation and deployment strategy (10 Marks).

• Approach to Integration with existing systems (15 Marks).

• Approach to fulfilment of Support and Network Security requirements (5 Marks)

• Approach to Training of administrators and key users (5 Marks)

That for Project team qualifications were.

•Minimum 5 years of relevant experience of each key personnel (5 Marks).

• Detailed knowledge and experience of Time and Attendance Management Systems (5 Marks).

• Relevant IT work experience (5 Marks).

For Capacity and project schedule the minimum requirements for scoring included.

•Experienced Human resource availability in line with project scale/geography (5 Marks).

• Project time schedules proposed and their alignment with the estimated duration to complete the project as defined in the Data Sheet (5 Marks).

Scores obtained by the tenderers were aggregated together to determine the total score for each tenderer and compared to determine the most responsive technical tenderer. This can be found in the Table 10 below:

Table 10: Most Responsive Technical Tenderer

Tenderer	Total (%) weighted score- Others. (a)	(a)X40%=Y (%)	Total (%) weighted score- Sustainability. (b)	(b) X 30%= Z (%)	(Y)+(Z)= Total technical score (St) (%)
"A" Consult Ltd	96	38.4	87.35	26.62	65.02
"B" Services Ltd	80	32.0	76.44	22.93	54.93
"C" Consultants	55	22.0	62.68	18.80	40.80

Financial Cost Responsiveness

The Summary of Financial Cost Responsiveness for the Tenderers showed the evaluation of all quoted prices from the 3 (three) tenderers. However, based on evaluation and qualification criteria of the instruction to tender (ITT) 30% weight was allocated to financial factor **(see sample EDG Tender document extracts in appendices).** The following are prices quoted for industry-standard Employee Time and Attendance (ETA) system under a Supply and Installation of Fingerprint based Employee Time and Attendance Management System:

a) "A" Consult Limited - Ghana Cedis (GHs) 2,663,388.00

b) "B" Services Limited - Ghana Cedis (GHs) 2,594,629.00

c) "C" Consultants Limited - Ghana Cedis (GHs) 2,609,340.00

It was obvious that "B" Services Limited quoted the lowest price of GHs 2,594,629.00. However, to determine the weighted score for the financial factor the lowest tenterer ("B" Services Limited) was presumed to have scored one hundred percent (100%) of the 30% weight allocated to financial factor (i.e., 30% weighted score) while the second ("C" Consultants Limited) and third ("A" Consult Limited) lowest priced tenderers scored 99.43% and 97.35% respectively. Calculating the percentage scores using the 30% financial factor we obtained 29.8% and 29.2% respectively for the second and third tenderers. By adding the technically responsive and financially responsive scores and ranking the results we can obtain the Most Economically

Advantageous Tender (MEAT). This can be seen in table 11: Most Economically Advantageous Tender (MEAT).

Table 11: Most Economically Advantageous Tender (MEAT)

Tenderer	**Price Quoted (GHs)**	**Total technical score (St) (%)**	**Financial score (Fin) (%)**	**Total Tech. & Fin. Score (St. + Fin)**	**Ranking**
"A" Consult Limited	2,663,388.00	65.02	29.2	94.44	1st
"B" Services Limited	2,594,629.00	54.93	30.0	84.93	2nd
"C" Consultants Limited	2,609,340.00	40.80	29.8	70.60	3rd

It was realised that "B" Services Limited quoted the lowest price among the three tenderers. However, the supplier ("B" Services Limited) was ranked second (second) when both technical factor and financial factors were summed up to determine the MEAT.

The chapter dealt with the full-scale interviews that discussed the qualitative research as iterative, as each step informed the next. Transcript from qualitative interview was run through the Computer Assisted Qualitative Data Analysis Software (CAQDAS) called NVivo 14 software, to find key themes or codes (Spriggs, et. al., 2021). Themes or patterns within data were identified in an inductive or 'bottom up' way (Clarke & Braun, 2013). There was a look out for unexpected or emerging themes which formed the bases for sustainability factors for tender evaluation while determining saturation level. The iterative process of the Reflexive Thematic Analysis was expected to ensure a thorough and rigorous qualitative study conducted. However, based on research findings 30% of the 70% weight allocated to technical factor was assigned to sustainable product factors and scores obtained aggregated together to determine the total score for each tenderer and tested for rigor on a previously awarded contract at EDG.

The next chapter considered Reflective Professional Development that used reflective learning cycle approach to alter the underlying, governing variables and assumptions in the procurement strategy. During the doctoral journey, through to the overall conclusive stage, the research was subjected to the 'Gibbs' reflective cycle

that was iterative in nature. Recommendation resulting from the study and suggested further studies on same or similar area of research was discussed with the chapter ending with a conclusion section of all the areas in the study.

Chapter 5:

Reflective Professional Development

This chapter considered Reflective Professional Development that used reflective learning cycle approach to alter the underlying, governing variables and assumptions in the procurement strategy. It looked at the doctoral journey, through to the overall conclusive stage, which was subjected to the Gibbs' reflective cycle (Adeani, Febriani & Syafryadin, 2020). Recommendations resulting from the study and suggested further studies on same or similar area of research was discussed with the chapter ending with a conclusion section of all the areas in the study.

As part of the research there was a reflective learning cycle that was adopted during the 5-year doctoral journey. The research which was necessitated by the existing shortfalls in procurement practices in EDG as a public entity was designed to fit into a corporate objective (Jia et al., 2019). Such practices fuelled routine behaviour and culture which paid little or no attention to sustainability practices in the procurement process. A reflective learning cycle, according to Widiastuti and Budiyanto (2018), Chiu (2019) and with the recently emerging "virtual world" proposed by Fromm et al. (2021), sought to alter the underlying, governing variables and assumptions in the procurement strategy, by obtaining feedback from a theoretically framed approach that shaped the literature review to reinforce governing values and action strategy. The emphasis was on how to illustrate one's claims, encourage inquiries into them, and test them as robustly as possible (Argyris, 1980: Cartwright, Hayes, Yang & Shires, 2021: Tovey & Skolits, 2022).

During the doctoral journey, through to the overall conclusive stage, the research was subjected to the Gibbs' reflective cycle (Sekarwinahyu et al., 2019: Li et al., 2020; Adeani et. al., 2020) to enhance the learning experience, thus, making the research longitudinal (Schoch, 2021). Therefore, the determination of final evaluation model resulted from the "Gibbs' reflective cycle" (Li et al., 2020) throughout the research period (Brown, 2022). This is represented in the figure 9.

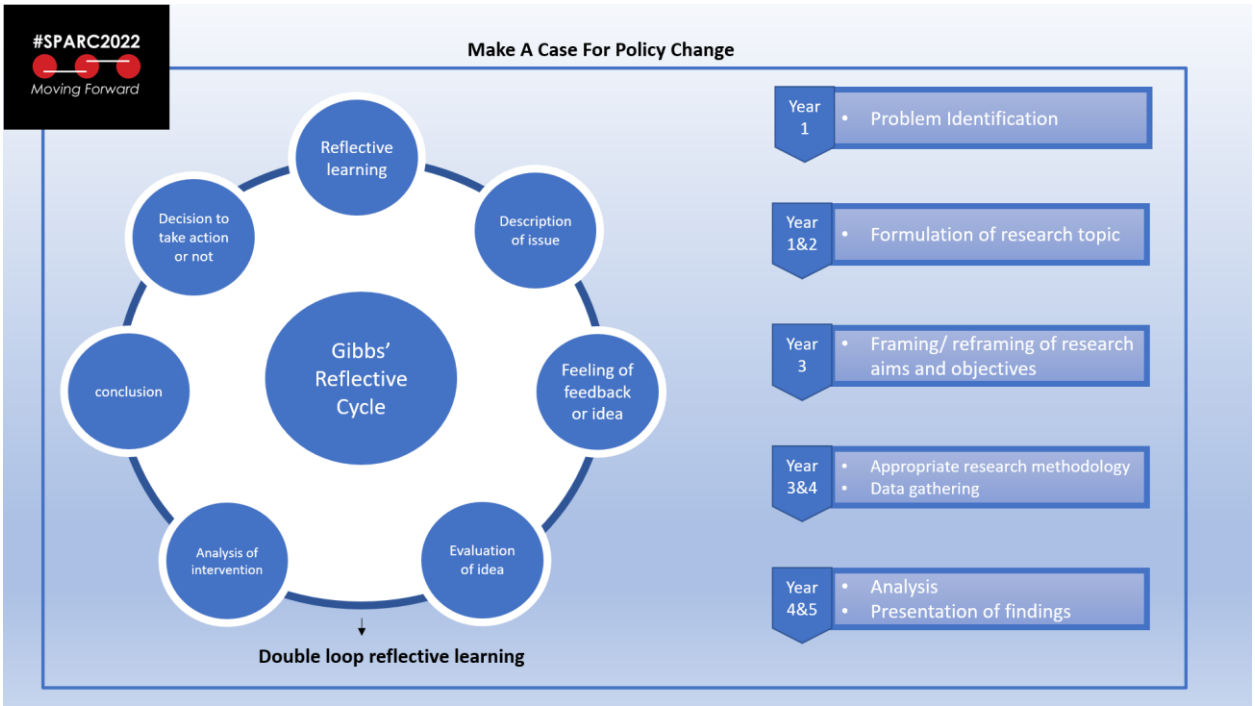


***Figure 9**: Continuous Reflective Practice (Source: Authors' Own Construct, 2020)*

Organisation policies, programs, and processes, in most situations, are meant to make things work efficiently. The "single-loop" learning was not efficient in the research process and therefore paved way for the "double-loop" learning that sought to alter underlying governing variables of strategy, and to change underlying assumptions and values that fuel policy (Clark ,2021: Kolawole, Mishra and Hussain, 2021). The research continuously focused on the design and fine tune the tender evaluation model for adoption into the electricity distribution organisation's (EDG) procurement processes to get Best Value for Money (BVfM) procurement or Most Economically Advantageous Tender (MEAT) resulting from the "double loop" process.

Conceptual Framework

Aided by NVivo as suggested by Swygart-Hobaugh (2019), Dalkin, Forster, Hodgson, Lhussier & Carr (2021) and recently Niedbalski and Ślęzak (2022) a research project map which showed the connections between codes was developed to link responsible procurement. A conceptual framework (Purwanto & Budiman, 2020: Zhang, Leung & Bai, 2021) was designed to link EDG Vision and Mission to corporate and procurement objectives. Sustainable product policies drew inspiration from recommendations to make a case for change. It was further recommended that

sustainable procurement model (Kaur & Singh, 2019: Gholizadeh, Fazlollahtabar & Khalilzadeh, 2020) affected all known types of procurement, be it works, good and/or services as they relate to sustainability. However, for the context of this research, sustainability procurement in EDG focused on goods or tangible product procurement, and as suggested by Al Dakheel, Del Pero, Aste and Leonforte (2020) and Bortoluzzi, de Souza and Furlan (2021), identified variables were used as key performance indicators (KPI's) or tender evaluation factors. Multiple runs of the model (Castruccio, Hu, Sanderson, Karspeck & Hammerling, 2019: Lee, 2021) is expected to identify appropriate sustainability metrics for further effectiveness in the procurement process. This is shown as a concept map in Figure 10.

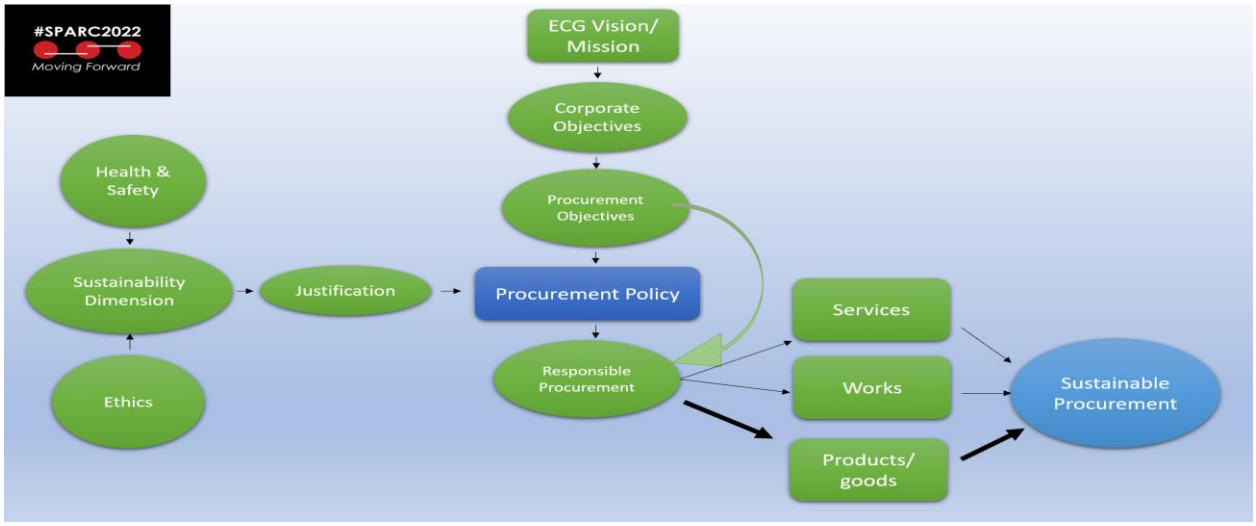


Figure 10: Concept Framework (*Source: Authors' Own Construct, 2020)*

Recommendations

This paper presented come with limitations. The restriction of database access availability limited the research and thus articles from other sources of primary importance in Sustainable supply chain management (SSCM) could have been excluded from processing. The keywords used may not be all inclusive; expanding the search to include the names of more developing countries and emerging markets that could provide a more comprehensive review of the topic. Future research could, therefore.

1. consider expanding its boundary of inclusiveness. It is further recommended that EDG adopt and integrate technology into their operations to promote transparency in the delivery of their mandate.
2. Framework Agreement could also enhance partnership in procurement contracts.
3. Exploration of more articles could broaden the conceptualisation and knowledge of empirical research, and issues currently addressed regarding procuring sustainable products in emerging economies.

There are functions in sustainable product procurement that have not been studied in the same magnitude as others, including.

1. logistics activities regarding sustainable product distribution and transport.
2. Another function needing research development is works procurement, which can provide opportunities and advantages of improvement in sustainable performance due to its direct involvement in the requirements and demands throughout the management of the supply chain in emerging economies (Sánchez-Flores et al., 2020).

Future studies may examine other public utility organisations in emerging markets to address the issue of generalisability.

Industry specific empirical studies, other than case study, are required within the context of Sustainable supply chain management (SSCM) and procurement management in emerging markets as confirmed by Rajeev, Pati, Padhi and Govindan (2017).

Model review for standardisation as a procurement policy working document in the electricity distribution organisation of Ghana (EDG) will be necessary for full operation.

Model can be designed into a software for ease of computation and time management. This will prevent the occurrence of any errors and instil confidence in the use of the software.

Conclusion

The study identified that sustainability is an increasingly vital concept that encompasses the responsible and balanced use of our planet's resources to meet the needs of both present and future generations. It acknowledged the interdependence between social, environmental, and economic factors, aimed at fostering a harmonious coexistence between human activities and the natural world (Li, Lan & Zhang, 2019; Adzimah, Lei & Ishawu, 2020). Embracing sustainability involves implementing practices and policies that minimise ecological impact, promote social equity, and ensure long-term economic viability. The study further acknowledged that by adopting a sustainable mindset, we can strive for a more resilient and equitable future, where the well-being of people and the health of our planet go hand in hand.

The research was able to corroborate that emphasis on lowest price or upfront costs, rather than life cycle costs, can discourage the adoption of sustainable alternative (Klingler, 2020). The study agreed that the inclusion of environmental and corporate social responsibility (CSR) issues in the procurement process becomes crucial since bottom-line requirement alone will only be concentrating on profit and loss at the expense of the social and environmental consequence of the procurement process (Qorri, Mujkić, & Kraslawski, 2018: Ali, Kaur, & Khan, 2022).

Using a comprehensive literature review to provide a nuanced understanding of sustainable public procurement, shedding light on its fundamental components and complexities and examining sustainability drivers and barriers, the case study research gained insights into the forces propelling change and challenges that must be navigated in the quest for more responsible procurement practices by the Electricity Distribution Ghana (EDG). The exploration of sustainability within the context of effective tendering underscored its pivotal role in shaping the procurement landscape in EDG. Moreover, the scrutiny of diverse models for tender evaluation illustrated the diversity of approaches available to align procurement processes with sustainability goals in EDG.

Using an inductive approach to data collection that included theoretically framed data collection the study qualitative interviews were run through the Computer Assisted Qualitative Data Analysis Software (CAQDAS) called NVivo 14 software, to find key

themes or codes (Spriggs et. al., 2021). Themes or patterns within data were identified in an inductive or 'bottom up' way (Clarke & Braun, 2013). The bottoms-up approach yielded grounded codes or themes that emerged from data gathered while a 'theoretical' thematic analysis provided themes driven by the researcher's theoretical or analytic interest in tender evaluation.

In fulfilling research objective(s) results from the thematic analysis were applied, using data from EDG procurement contracts, for professional development and practice. This was subjected to a multi-step tendering in a two-phase process consisting of a technical first phase in which tenderers submit an un-priced technical offer to be evaluated and scored; and a second phase in which those tenderers whose technical offers are determined to be acceptable for meeting minimum requirement during the first phase have their price tenders considered. The EDG procurement sample considered for the case involved a contract for the implementation of an industry-standard Employee Time and Attendance (ETA) system under a Supply and Installation of Fingerprint based Employee Time and Attendance Management System procurement contract.

The result from the applied project showed that even though a Tenderer, "B" Services Limited, quoted the lowest price among three (3) tenderers the supplier ("B" Services Limited) was ranked second (2nd) when both technical factor and financial factors were summed up to determine the Most Economically Advantageous Tender (MEAT). This provided evidence of how sustainability factors, when employed effectively in the evaluation of procurement tenders, would lead to the selection of the Most Economically Advantageous Tender for the supply of sustainable products.

This chapter considered Reflective Professional Development that used reflective learning cycle approach to alter the underlying, governing variables and assumptions in the procurement strategy. It looked at the doctoral journey, through to the overall conclusive stage, which was subjected to the 'Gibbs' reflective cycle. Recommendations resulting from the study and suggested further studies on same or similar area of research was discussed with the chapter ending with a conclusion section of all the areas in the study.

Referencing

Abbas, H. & Tong, S. (2023). Green Supply Chain Management Practices of Firms with Competitive Strategic Alliances—A Study of the Automobile Industry. *Sustainability*, *15*, 2156. https://doi.org/10.3390/su15032156

Abdalla, M. M., Oliveira, L. G. L., Azevedo, C. E. F., & Gonzalez, R. K. (2018). Quality in qualitative organisational research: Types of triangulations as a methodological alternative. *Administração: ensino e pesquisa*, *19*(1).

Abdollahi, M. Arvan, M., Razmi, J. (2015). An integrated approach for supplier portfolio selection: lean or agile? *Expert Syst. Appl*. *42*(1), 679-690.

Abdullahi, H., Reyes-Rubiano, L., Ouelhadj, D., Faulin, J., & Juan, A. A. (2021). Modelling and multi-criteria analysis of the sustainability dimensions for the green vehicle routing problem. *European journal of operational research*, *292*(1), 143-154.

Abolbashari, M. H., Chang, E., Hussain, O. K., & Saberi, M. (2018). Smart buyer: a Bayesian network modelling approach for measuring and improving procurement performance in organisations. *Knowledge-Based Systems*, (*142)*, 127-148.

Adeani, I. S., Febriani, R. B., & Syafryadin, S. (2020). Using GIBBS'reflective cycle in making reflections of literary analysis. *Indonesian EFL Journal*, *6*(2), 139-148.

Adjei-Bamfo, P., & Maloreh-Nyamekye, T. (2019). The "baby steps" in mainstreaming sustainable public procurement in Ghana: A "double agency" perspective. *Journal of Public Affairs*, *19*(1), e1902.

Adjei-Bamfo, P., Maloreh-Nyamekye, T., & Ahenkan, A. (2019). The role of e-government in sustainable public procurement in developing countries: A systematic literature review. *Resources, Conservation and Recycling*, *142*, 189-203.

Adzimah, E. D., Lei, L. & Ishawu, M. (2020). Organisational culture influences on corporate social responsibility and sustainable procurement in a service sector industry. *Journal of Psychology in Africa, 30*(5), 390-396, DOI: 10.1080/14330237.2020.1821309

Agbesi, K., Fugar, F. D., & Adjei-Kumi, T. (2018). Modelling the adoption of sustainable procurement in construction organisations. *Built environment project and asset management,8* (5), p. 461-476. https://doi.org/10.1108/BEPAM-10-2017-0108.

Aginako, Z., Peña-Lang, M. B., Bedialauneta, M. T., & Guraya, T. (2021). Analysis of the validity and reliability of a questionnaire to measure students' perception of inclusion of sustainability in engineering degrees. *International Journal of Sustainability in Higher Education, 22*(6), 1402-1420. Retrieved from: https://doi.org/10.1108/IJSHE-09-2020-0355.

Agyabeng-Mensah, Y., Afum, E. and Ahenkorah, E. (2020), "Exploring financial performance and green logistics management practices: examining the mediating influences of market, environmental and social performances". *Journal of Cleaner Production, 258*, p. 120613.

Agyekum, K., Adinyira, E., & Amudjie, J. (2021). Ethical misconducts within the invitation to tender and tender evaluation and award stages of construction

contracts in Ghana. *Journal of Engineering, Design and Technology*, *19*(5), 1101-1123.

Agyemang, S. K., & Baah, B. (2023). Identifying Social Sustainability Considerations at the Design Stage of Public Procurement of Works in Ghana. *Asian Journal of Management, Entrepreneurship and Social Science*, *3*(01), 1-24.

Ahmad, H., Yaqub, M., & Lee, S. H. (2024). Environmental-, social-, and governance-related factors for business investment and sustainability: A scientometric review of global trends. *Environment, Development and Sustainability*, *26*(2), 2965-2987.

Akpan, E. I. (2011). Effective safety and health management policy for improved performance of organisations in Africa. *International journal of Business and Management*, *6*(3), 159-165.

Akpodiogaga-a, P., & Odjugo, O. (2010). General overview of climate change impacts in Nigeria. *Journal of human ecology*, *29*(1), 47-55.

Akufo-Addo, UK PM Sunak Launch Forest and Climate Leaders Partnership. (2022, 20th November. *Daily Graphic. https://www.graphic.com.gh/international/international-news/akufo-addo-sunak-launch-forest-and-climate-leaders-partnership.html*

Al Dakheel, J., DelPero, C., Aste, N., & Leonforte, F. (2020). Smart buildings features and key performance indicators: A review. *Sustainable Cities and Society*, *61*, 102328.

Al-Ababneh, M. M. (2020). Linking ontology, epistemology, and research methodology. *Science & Philosophy*, *8*(1), 75-91. Retrieved from: https://ssrn.com/abstract=3708935

Alharahsheh, H. H., & Pius, A. (2020). A review of key paradigms: Positivism vs interpretivism. *Global Academic Journal of Humanities and Social Sciences*, *2*(3), 39-43. DOI: 10.36348/gajhss. 2020.v02i03.001. Retrieved from: https://gajrc.com/.

Ali, S. S., Kaur, R., & Khan, S. (2022). Evaluating sustainability initiatives in warehouse for measuring sustainability performance: An emerging economy perspective. *Annals of Operations Research*, 1-40. Retrieved from: https://doi.org/10.1007/s10479-021-04454-w.

Altrichter, H. (2020). The concept of quality in action research: Giving practitioners a voice in educational research. In *Qualitative voices in educational research* (pp. 40-55). Routledge.

Amoako, D. K., Zakuan M. N., Okyere-Kwakye, E. & Tetteh, F. K. (2023). Effect of Training and Reward on Social Sustainability in Ghana's Cocoa Supply Chain: The Role of Green Buyer-Supplier Relationship. *Journal of International Food & Agribusiness Marketing, 35*(2), 212-243, DOI: 10.1080/08974438.2021.1981511

Ampofo, J. A. (2021). A Brief Review of the Need for Judicial Service in Strengthening Compliance with Public Procurement Regulations in Ghana. https://www.researchgate.net/

Amponsah-Tawiah, K. (2013). Occupational health and safety and sustainable development in Ghana, *International Journal of Business Administration, (4),* 2, pp. 74–78,

Anane, A., Adoma, V., & Awuah, G. (2019). The effect of procurement practices on service delivery: a case study of VRA, Ghana. *Asian Journal of Economics, Business and Accounting*, *13*(1), 1-23.

Anane, A., & Kwarteng, G. (2019). Prospects and challenges of Procurement performance Measurement in selected Technical Universities in Ghana. *Asian Journal of Economics, Business and Accounting*, *13*(2), 1-18.

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International journal of social research methodology*, *8*(1), 19-32.

Arlbjørn, J. S., & Freytag, P. V. (2012). Public procurement vs private purchasing: is there any foundation for comparing and learning across the sectors? *International Journal of Public Sector Management*, *25* (3), p. 203-220. https://doi.org/10.1108/09513551211226539

Asante Boadi, E., He, Z., Boadi, E. K., Bosompem, J., & Avornyo, P. (2019). Consequences of corporate social responsibility on employees: The moderating role of work motivation patterns. *Personnel Review, 49*(1), 231–249. https://doi .org/10 .1108/ PR-08-2018-0288

Ashby, A., Leat, M., Smith, M. H., Ashby, A., Leat, M., & Hudson-Smith, M. (2012). Making connections: A review of supply chain management and sustainability literature. *Supply Chain Management, 17*(5), 497–516. doi:10.1108/13598541211258573

Asokan, V. A., Yarime, M., & Onuki, M. (2020). A review of data-intensive approaches for sustainability: methodology, epistemology, normativity, and ontology. *Sustainability Science*, *15*(3), 955-974.

Attuaquayefio, D. K., & Folib, J. N. (2005). An overview of biodiversity conservation in Ghana: challenges and prospects. *West African Journal of Applied Ecology*, *7*(1).

Banks, S., & Brydon-Miller, M. (2018). *Ethics in participatory research for health and social well-being*. Routledge.

Barglowski, K. (2018). Where, what and whom to study? Principles, guidelines and empirical examples of case selection and sampling in migration research. In *Qualitative research in European migration studies*, 151-168. Springer, Cham.

Beamon, B. M. (1999). Measuring supply chain performance. *International Journal of Operations and Production Management*, 19(3), 275-292.

Bercht, A. L. (2021). How qualitative approaches matter in climate and ocean change research: Uncovering contradictions about climate concern. *Global Environmental Change*, *70*, 102326.

Berger, R. (2015). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research, 15*(2), 219–234. doi:10.1177/1468794112468475

Bergman, M. A., & Lundberg, S. (2013). Tender evaluation and supplier selection methods in public procurement. *Journal of Purchasing and Supply Management*, *19*(2), 73-83.

Berrone, P., Ricart, J. E., Duch, A. I., Bernardo, V., Salvador, J., Piedra Peña, J., & Rodríguez Planas, M. (2019). EASIER: An evaluation model for public–private partnerships contributing to the sustainable development goals. *Sustainability*, *11*(8), 2339.

Billa, G., Gyamfi, K. & Adamu, M. (2021). Procurement sustainability in public institutions in Ghana – Case Study on selected second cycle institution in Bono and Bono East Region of Ghana. *World Journal of Advanced Research and Reviews, 12(02),* 492–499, DOI: https://doi.org/10.30574/wjarr.2021.12.2.0562

Boar, A., Bastida, R., & Marimon, F. (2020). A systematic literature review. Relationships between the sharing economy, sustainability, and sustainable development goals. *Sustainability*, *12*(17), 6744.

Boddy, D., Macbeth, D., & Wagner, B. (2000). Implementing collaboration between organisations: an empirical study of supply chain partnering. *Journal of Management studies*, *37*(7), 1003-1018.

Bortoluzzi, M., de Souza, C. C., & Furlan, M. (2021). Bibliometric analysis of renewable energy types using key performance indicators and multicriteria decision models. *Renewable and Sustainable Energy Reviews*, *143*, 110958.

Bowler, L., Julien, H., & Haddon, L. (2018). Exploring youth information-seeking behaviour and mobile technologies through a secondary analysis of qualitative data. *Journal of Librarianship and Information Science*, *50*(3), 322-331.

Bowyer, L., Amos, C., & Stevens, D. (2021). What does philosophy do? Understanding the work that philosophy does: A review of the literature on the teaching and learning of philosophy in schools. *Journal of philosophy in schools*, *8*(1), 71-103.

Brammer, S., & Walker, H. (2011). Sustainable procurement in the public sector: An international comparative study. *International Journal of Operations & Production Management, 31*(4), 452–476. https://doi. org/10.1108/01443571111119551

Bratt, C., Hallstedt, S., Robèrt, K. H., Broman, G., & Oldmark, J. (2013). Assessment of criteria development for public procurement from a strategic sustainability perspective. *Journal of Cleaner Production*, *52*, 309-316.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise, and health*, *11*(4), 589-597.

Braulio-Gonzalo, M., & Bovea, M. D. (2020a). Relationship between green public procurement criteria and sustainability assessment tools applied to office buildings. *Environmental Impact Assessment Review*, *81*, 106310.

Braulio-Gonzalo, M., & Bovea, M. D. (2020b). Criteria analysis of green public procurement in the Spanish furniture sector. *Journal of Cleaner Production*, *258*, 120704.

Braun, V., Clarke, V., & Hayfield, N. (2022). 'A starting point for your journey, not a map': Nikki Hayfield in conversation with Virginia Braun and Victoria Clarke about thematic analysis. *Qualitative Research in Psychology*, *19*(2), 424-445.

Brown, N. (2022, March). Teaching reflective practice in teams: In-person and virtual activities. In *2022 IEEE Global Engineering Education Conference (EDUCON)* (pp. 419-422). IEEE.

Brown, N. (2022, March). Teaching reflective practice in teams: In-person and virtual activities. In *2022 IEEE Global Engineering Education Conference (EDUCON)* (pp. 419-422). IEEE.

Bryman, A. (2016). *Social research methods*. Oxford, England: Oxford University Press.

Busch, J., Engelmann, J., Cook-Patton, S. C., Griscom, B. W., Kroeger, T., Possingham, H., & Shyamsundar, P. (2019). Potential for low-cost carbon dioxide removal through tropical reforestation. *Nature Climate Change*, **9**, 463– 466. https://doi.org/10.1038/s41558-019-0485-x

Cai, J., Morris, A., Hohensee, C., Hwang, S., Robison, V., Cirillo, M., ... & Hiebert, J. (2019). Theoretical framing as justifying. *Journal for Research in Mathematics Education*, *50*(3), 218-224.

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Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., ... & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of research in Nursing*, *25*(8), 652-661.

Çankaya, S.Y. and Sezen, B. (2019), "*Effects of green supply chain management practices on sustainability performance*", Journal of Manufacturing Technology Management, Vol. 30 No. 1, pp. 98-121.

Cartwright, C., Hayes, J. A., Yang, Y., & Shires, A. (2021). "Thinking it through": toward a model of reflective practice for trainee psychologists' countertransference reactions. *Australian Psychologist*, *56*(2), 168-180.

Cartwright, C., Hayes, J. A., Yang, Y., & Shires, A. (2021). "Thinking it through": toward a model of reflective practice for trainee psychologists' countertransference reactions. *Australian Psychologist*, *56*(2), 168-180.

Castruccio, S., Hu, Z., Sanderson, B., Karspeck, A., & Hammerling, D. (2019). Reproducing internal variability with few ensembles runs. *Journal of Climate*, *32*(24), 8511-8522.

Cauvain, J. (2018). Social sustainability as a challenge for urban scholars. *City*, *22*(4), 595-603.

Chan, A.P.C., Darko, A., Olanipekun, A.O. & Ameyaw, E.E. (2018). "Critical barriers to green building technologies adoption in developing countries: the case of Ghana," *Journal of Cleaner Production,172*, 1067-1079, doi: 10.1016/j.jclepro.2017.10.235

Charmaz, K., & Belgrave, L. (2012). Qualitative interviewing and grounded theory analysis. *The SAGE handbook of interview research: The complexity of the craft*, *2*, 347-365.

Charmaz, K. (2014). *Constructing grounded theory*. Thousand Oaks, CA: Sage.

Chartered Institute of Purchasing and Supply UK (2020a). Ethical and Sustainable Procurement; Walk Free Foundation.

Chartered Institute of Procurement & Supply UK (2020b). CIPS Ethical procurement. Retrieved from. https://www.cips.org/intelligence-hub/ethics/ethical-procurement

Chatfield, S. L. (2020). Recommendations for secondary analysis of qualitative data. *The Qualitative Report*, *25*(3), 833-842.

Chaudhary, R. (2018). Corporate social responsibility and employee performance: A study among Indian business executives. *International Journal of Human Resource Management, 5192*, 1–24. https://doi .org/10 .1080/0958519 2 .2018 .1469159

Cheaitou, A., Larbi, R. & Al Housani, B. (2018). Decision making framework for tender evaluation and contractor selection in public organisations with risk considerations. *Socio Econ. Plan. Sci.,* 10.1016/j.seps.2018.02.007

Chen, J. R., Zhang, M. G., Yu, S. J., & Wang, J. (2018). A bayesian network for the transportation accidents of hazardous materials handling time assessment. *Procedia engineering*, *211*, 63-69.

Chen, Y., Ghosh, M., Liu, Y., & Zhao, L. (2019). Media coverage of climate change and sustainable product consumption: Evidence from the hybrid vehicle market. *Journal of Marketing Research*, *56*(6), 995-1011.

Chen, Z. S., Zhang, X., Rodríguez, R. M., Pedrycz, W., & Martínez, L. (2021). Expertise-based bid evaluation for construction-contractor selection with generalised comparative linguistic ELECTRE III. *Automation in Construction* (*125)*, 103578.

Cheng, T., Wang, Y., & Sun, Y. (2012). Development and application of tender evaluation decision-making and risk early warning system for water projects based on KDD. *Advances in Engineering Software*, *48*, 58-69.

Cheng, W., Appolloni, A., DAmato, A. & Zhu, Q. (2018). Green Public Procurement, missing concepts, and future trends e a critical review. *J. Clean. Prod. 176*, 770e784. https://doi.org/10.1016/j.jclepro.2017.12.027.

Cheron, C., Salvagni, J., & Colomby, R. K. (2022). The qualitative approach interview in administration: A guide for researchers. *Revista de Administração Contemporânea*, *26*.

Chikwere, G. U., Dzandu, S. S., & Dza, M. (2019). Compliance issues with public procurement regulations in Ghana. *International Journal of Business and Management*, *14*(5), 1-8.

Chiu, S. K. (2019). Innovative experiential learning experience: Pedagogical adopting Kolb's learning cycle at higher education in Hong Kong. *Cogent Education*, *6*(1), 1644720.

Chosen, W. I. B. (2019). Appendix 3.2 Participant Information Sheet: Pilot Study. *The Assessment of Social Anxiety Leading To An Intervention For Untolerated Denture Prostheses*, 122.

Chopra, S. (2019). Conference Review: Sustainability Summit 2019. *FIIB Business Review*, *8*(2), 106-107.

Clark, K. M. (2021). Double-Loop Learning and Productive Reasoning: Chris Argyris's Contributions to a Framework for Lifelong Learning and Inquiry.*24*, 45.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. The psychologist, 26(2), 120-123.

Clarke, V., & Braun, V. (2017). Thematic analysis. *The journal of positive psychology, 12*(3), 297-298.

Claxton, G., Hosie, P., & Sharma, P. (2022). Toward an effective occupational health and safety culture: A multiple stakeholder perspective. *Journal of safety research*, *82*, 57-67.

Coleman, P. (2022). Validity and Reliability within Qualitative Research for the Caring Sciences. *International Journal of Caring Sciences*, *14*(3), 2041-2045.

Corradin, F., & Sartore, D. (2018). Risk Aversion: Differential Conditions for the Iso-Utility Curves with Positive Slope in Transformed Two Parameter Distributions. *University Ca'Foscari of Venice, Dept. of Economics Research Paper Series No*, *24*.

Crespin-Mazet, F., & Dontenwill, E. (2012). Sustainable procurement: Building legitimacy in the supply network. *Journal of Purchasing and Supply Management, 18*(4), 207–217. https://doi.org/10.1016/j. pursup.2012.01.002

Creswell, J.W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Los Angeles, CA: Sage.

Crotty, J., & Hall, S. M. (2014). Environmental awareness and sustainable development in the Russian Federation. *Sustainable Development*, *22*(5), 311-320.

Curry, D. S. (2020). Interpretivism and norms. *Philosophical Studies*, *177*(4), 905-930.

Dalkin, S., Forster, N., Hodgson, P., Lhussier, M., & Carr, S. M. (2021). Using computer assisted qualitative data analysis software (CAQDAS; NVivo) to assist in the complex process of realist theory generation, refinement, and testing. *International Journal of Social Research Methodology*, *24*(1), 123-134.

Daniel, E. & Pasquire, C. (2019). Creating social value within the delivery of construction projects: the role of lean approach, *Engineering Construction and Architectural Management, 26*(6), 1105-1128.

Darus, F., Mohd Zuki, H. I., & Yusoff, H. (2020). The path to sustainability: Understanding organisations' environmental initiatives and climate change in an emerging economy. *European Journal of Management and Business Economics*, *29*(1), 84-96.

Datta, P., & Diffee, E. N. (2020). Measuring sustainability performance: A green supply chain index. *Transportation Journal*, *59*(1), 73-96.

De Giacomo, M. R., Testa, F., Iraldo, F., & Formentini, M. (2019). Does green public procurement lead to life cycle costing (LCC) adoption?. *Journal of Purchasing and Supply Management*, *25*(3), 100500.

De Medeiros, J. F., Ribeiro, J. L. D., & Cortimiglia, M. N. (2014). Success factors for environmentally sustainable product innovation: A systematic literature review. *Journal of Cleaner Production, (65)* 76– 86. Retrieved from: https://doi.org/10.1016/j.jclepro.2013.08.035

de Vaus, D., A. (1991). *Surveys in Social Research*, 2nd ed. University College. London Press. London

Del Río, P., Romero-Jordán, D., & Peñasco, C. (2017). Analysing firm-specific and type-specific determinants of eco-innovation. *Technological and Economic Development of Economy,*
(23) 270– 295. https://doi.org/10.3846/20294913.2015.1072749

Deakin, H., & Wakefield, K. (2013). Skype interviewing: Reflections of two PhD researchers. *Qualitative Research, 14*(5), 603–616. Doi:10.1177/1468794113488126

Delmonico, D., Jabbour, C. J. C., Pereira, S. C. F., de Sousa Jabbour, A. B. L., Renwick, D. W. S., & 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*, *134*, 70-79.

Daneshpour, H. (2016). The key drivers of sustainability. In *2016 IEEE 16th International Conference on Environment and Electrical Engineering (EEEIC)* (pp. 1-5). IEEE.

Denzin NK (2009). *The Research Act: A Theoretical Introduction to Sociological Methods*. New Brunswick: Aldine Transaction.

Deshpande, J. J., Gowda, M., Dixit, M., Khubbar, M. S., Jayasri, B. S., & Lokesh, S. (2020). Permissioned blockchain based public procurement system. In *Journal of Physics: Conference Series*. *1706(*1) p. 012157). IOP Publishing.

Dickson, A. (2017). Challenges to the efficacy of forestry and wildlife policies in Ghana for environmental protection: A review. *African Journal of Agricultural Research*, *12*(39), 2858-2876.

Dodgson, J. E. (2019). Reflexivity in qualitative research. *Journal of Human Lactation*, *35*(2), 220-222.

Dow, S. (2018). Pluralist economics: is it scientific?. In *Advancing Pluralism in Teaching Economics* (pp. 13-30). Routledge.

Duane, B., Ramasubbu, D., Harford, S., Steinbach, I., Swan, J., Croasdale, K., & Stancliffe, R. (2019). Environmental sustainability and waste within the dental practice. *British dental journal*, *226*(8), 611-618.

Dworkin, S. L. (2012). Sample sise policy for qualitative studies using in-depth interviews. *Archives of sexual behavior*, *41*(6), 1319-1320.

Dwyer, C. P., Joyce, R. A., Bane, E. M., Moses, A., Alvarez-Iglesias, A., & Hynes, S. M. (2020). An examination of the effects of a patient-designed-and-informed participant information sheet in comparison with a standard, researcher-designed information sheet on recruitment, retention and understanding: Protocol for a study-within-a-trial. *HRB Open Research*, *3*.

Dyar, K. L. (2022). Qualitative inquiry in nursing: Creating rigor. *Nursing Forum*, *57*(1), 187-200.

Džupka, P., Kubák, M., & Nemec, P. (2020). Sustainable Public Procurement in Central European Countries. Can It Also Bring Savings?. *Sustainability*, *12*(21), 9241.

Electricity Distributor of Ghana. (2022, 12th November). *History of Electricity Provision in Ghana*. Electricity Company of Ghana Ltd - History of Electricity Provision in Ghana (ecg.com.gh)

EDG Strategy Document. (2020, 8th November). *2020-2024 Strategy: Electricity Company of Ghana executive diary.* Available at Corporate Directorate EDG.

Eisner, N. L., Murray, A. L., Eisner, M., & Ribeaud, D. (2019). A practical guide to the analysis of non-response and attrition in longitudinal research using a real data example. *International Journal of Behavioral Development*, *43*(1), 24-34.

El Akremi, A., Gond, J. P., Swaen, V., De Roeck, K., & Igalens, J. (2018). How Do Employees Perceive Corporate Responsibility? Development and Validation of a Multidimensional Corporate Stakeholder Responsibility Scale. *Journal of Management, 44*(2), 619–657. https://doi. org/10 .1177/0149206315569311

Elliott, V. (2018). Thinking about the coding process in qualitative data analysis. *The Qualitative Report*, *23*(11), 2850-2861.

Eriksen, S., Schipper, E. L. F., Scoville-Simonds, M., Vincent, K., Adam, H. N., Brooks, N., ... & West, J. J. (2021). Adaptation interventions and their effect on vulnerability in developing countries: Help, hindrance, or irrelevance?. *World Development*, *141*, 105383.

Etse, D., & Ingley, C. (2015). Higher education curriculum for sustainability: Course contents analyses of purchasing and supply management programme of polytechnics in Ghana. *International Journal of Sustainability in Higher Education*.

Etse, D., McMurray, A., & Muenjohn, N. (2021). Comparing sustainable public procurement in the education and health sectors. *Journal of Cleaner Production*, *279*, 123959.

Etse, D., McMurray, A., & Muenjohn, N. (2022). Sustainable Procurement Practice: The Effect of Procurement Officers' Perceptions. *Journal of Business Ethics*, 1-24.

European Union. (2014). Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC. *Official Journal of the European Union*, *2014*, 65-242.

Falagario, M., Sciancalepore, F., Costantino, N. & Pietroforte, R. (2012). Using a DEA-cross efficiency approach in public procurement tenders, *Eur. J. Oper. Res. (218),* 523–529, https://doi.org/10.1016/j.ejor.2011.10.031.

Farrokhi-Asl, H., Makui, A., Ghousi, R., & Rabbani, M. (2020). Developing a hazardous waste management system with consideration of health, safety, and environment. *Computers & Electrical Engineering*, *82*, 106553.

Farrugia, B. (2019). WASP (Write a Scientific Paper): Sampling in qualitative research. Early Human Development, 133, 69–71. doi: 10.1016/j.earlhumdev.2019.03.016

Fawzy, S., Osman, A. I., Doran, J., & Rooney, D. W. (2020). Strategies for mitigation of climate change: a review. *Environmental Chemistry Letters*, *18*, 2069-2094.

Feng, T. and Wang, D. (2016), "*The influence of environmental management systems on financial performance: a moderated-mediation analysis*", Journal of Business Ethics*,135* (2), 265-278.

Flynn, A. (2018). Measuring procurement performance in Europe. *Journal of Public Procurement*. Fielding, N. (2010). Virtual fieldwork using access grid. *Field Methods, 22*(3), 195-216. Doi:10.1177/1525822X10374277

Filip, B. (2020). The Poverty of Neo-liberalism: The Rise of Mathematical Economics and the Decline of the History of Economic Thought. In *The Rise of Neo-liberalism and the Decline of Freedom* (pp. 287-315). Palgrave Macmillan, Cham.

Finlay L. 2002a. Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qualitative Research, 2*(2),209–230.

Fiorino, D. J. (2023). *Making environmental policy*. Univ of California Press.

Fischer, D., Brettel, M., & Mauer, R. (2020). The three dimensions of sustainability: A delicate balancing act for entrepreneurs made more complex by stakeholder expectations. *Journal of Business Ethics*, *163*(1), 87-106.

FitzPatrick, B. (2019). Validity in qualitative health education research. *Currents in Pharmacy Teaching and Learning*, *11*(2), 211-217.

Flyvbjerg, B. (2006). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, *12* (2). Sage Publication. Doi: 10.1177/1077800405284363. Retrieved from: http://qix.sagepub.com

Fonseca, L. M., Domingues, J. P., & Dima, A. M. (2020). Mapping the sustainable development goals relationships. *Sustainability*, *12*(8), 3359.

Francis, J. J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., & Grimshaw, J. M. (2012). What is an adequate sample size. *Operationalising data saturation for theory-based interview studies. Psychology &*, *392*, 1229-1245.

Fregonara, E., Ferrando, D. G., & Tulliani, J. M. (2022). Sustainable Public Procurement in the Building Construction Sector. *Sustainability*, *14*(18), 11616.

Friberg, L. (2023). Effects of Climate Change on Developing Countries.

Friedlingstein, P., Jones, M. W., O'Sullivan, M., Andrew, R. M., Hauck, J., Peters, G. P., Peters, W., Pongratz, J., Sitch, S., Le Quéré, C., Bakker, D. C. E., Canadell, J. G., Ciais, P., Jackson, R. B., Anthoni, P., Barbero, L., Bastos, A., Bastrikov, V., Becker, M., … Zaehle, S. (2019). Global carbon budget 2019. *Earth System Science Data*, *11*, 1783– 1838. https://doi.org/10.5194/essd-11-1783-2019

Fromm, J., Radianti, J., Wehking, C., Stieglitz, S., Majchrzak, T. A., & vom Brocke, J. (2021). More than experience? -On the unique opportunities of virtual reality to afford a holistic experiential learning cycle. *The Internet and higher education*, *50*, 100804.

Fukui, H. & Kobayashi, K. (2010). Optimal comprehensive tendering models for project procurement. *IEEE Int. Conf. on Systems, Man and Cybernetics, Istanbul*, *2010*, pp. 3258-3264, DOI: 10.1109/ICSMC.5642303.

Gani, A., Imtiaz, N., Rathakrishnan, M., & Krishnasamy, H. N. (2020). A pilot test for establishing validity and reliability of qualitative interview in the blended learning English proficiency course. *Journal of critical reviews*, *7*(05), 140-143.

García, C. D., Martínez, F. J. S., & Moreno, Á. G. (2014). Ecoinnovation: insights from a literature review. In *ICSB World Conference Proceedings* (p. 1). International Council for Small Business (ICSB).

Gani, A., Imtiaz, N., Rathakrishnan, M., & Krishnasamy, H. N. (2020). A pilot test for establishing validity and reliability of qualitative interview in the blended learning English proficiency course. *Journal of critical reviews*, *7*(05), 140-143.

Geldermann, J., Bertsch, V., Treitz, M., French, S., Papamichail, K. N., & Hämäläinen, R. P. (2009). Multi-criteria decision support and evaluation of strategies for nuclear remediation management. *Omega*, *37*(1), 238-251.

Gelderman, C. J., Semeijn, J., & Bouma, F. (2015). Implementing sustainability in public procurement: The limited role of procurement managers and party-political executives. *Journal of Public Procurement*, *15* (1), 66-92. https://doi.org/10.1108/JOPP-15-01-2015-B003

Geng, Y., & Doberstein, B. (2008). Greening government procurement in developing countries: Building capacity in China. *Journal of Environmental Management*, *88*(4), 932– 938. https://doi.org/10.1016/j.jenvman.2007.04.016

Ghalayini, A. M., & Noble, J. S. (1996). The Changing Bases of Performance Measurement. *International Journal of Operations & Production Management*, *16*(8), 63-80

Gholisadeh, H., Fazlollahtabar, H., & Khalilzadeh, M. (2020). A robust fuzzy stochastic programming for sustainable procurement and logistics under hybrid uncertainty using big data. *Journal of cleaner production*, *258*, 120640.

Gidigah, B. K., Agyekum, K., & Baiden, B. K. (2021). Defining social value in the public procurement process for works. *Engineering, Construction and Architectural Management*, DOI 10.1108/ECAM-10-2020-0848. Retrieved from: https://www.emerald.com/insight/0969-9988.htm

Gidigah, B. K., Agyekum, K., & Baiden, B. K. (2022). Defining social value in the public procurement process for works. *Engineering, Construction and Architectural Management*, *29*(6), 2245-2267.

Gifford, R. (2011). The dragons of inaction: psychological barriers that limit climate change mitigation and adaptation. *American psychologist*, *66*(4), 290.

Gill, S. L. (2020). Qualitative sampling methods. *Journal of Human Lactation*, *36*(4), 579-581.

Gowreesunkar, V. G., Mohanty, P. P., & Maingi, S. W. (2022). Children as Ambassadors in Sustainability Initiatives of ANPRAS, Mauritius. In *Children in Sustainable and Responsible Tourism*. Emerald Publishing Limited.

Grandia, J. J., & Kruyen, P. P. (2020). Assessing the implementation of sustainable public procurement using quantitative text-analysis tools: A large-scale analysis of Belgian public procurement notices. *Journal of Purchasing and Supply Management*, *26*(4), 100627.

Gray, L. M., Wong-Wylie, G., Rempel, G. R., & Cook, K. (2020). Expanding qualitative research interviewing strategies: Zoom video communications. *The qualitative report*, *25*(5), 1292-1301.

Gruber, M., Eberl, J. M., Lind, F., & Boomgaarden, H. G. (2021, January). Qualitative interviews with irregular migrants in times of COVID-19: Recourse to remote interview techniques as a possible methodological adjustment. In *Forum: Qualitative Social Research*, *22*(1), 1-15. Freie Universität Berlin.

Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PloS one*, *15*(5), e0232076.

Gupta, S., Mathur, N., & Narang, D. (2023). E-leadership and virtual communication adoption by educators: An UTAUT3 model perspective. *Global Knowledge, Memory, and Communication*, *72*(8/9), 902-919.

Hafezi, M., & Zolfagharinia, H. (2018). Green product development and environmental performance: Investigating the role of government regulations. *International Journal of Production Economics*, *204*, 395-410.

Hagaman, A. K., & Wutich, A. (2017). How many interviews are enough to identify metathemes in multisited and cross-cultural research? Another perspective on Guest, Bunce, and Johnson's (2006) landmark study. *Field methods*, *29*(1), 23-41.

Hai-Jew, S. (2105). *Enhancing qualitative and mixed methods research with technology.* Hershey, PA: IGI Global.

Halloran, D. (2017), "The social value in social clauses: methods of measuring and evaluation in social procurement", in Thai, K.V. (Ed.), Global Public Procurement Theories and Practices, Springer International Publishing, Bali, pp. 39-58.

Halonen, K. M. (2021). Is public procurement fit for reaching sustainability goals? A law and economics approach to green public procurement. *Maastricht Journal of European and comparative law*, *28*(4), 535-555.

Harb, A., Antoun, R. A., Kassem, A., & Baena, C. (2019). Empirical classification and effect of procurement process on organisational performance outcomes. *International Journal of Procurement Management*, *12*(1), 88-111.

Harding, G., & Gantley, M. (1998). Qualitative methods: beyond the cookbook. *Family practice*, *15*(1), 76-79.

Hardwick, F. S., Akram, R. N. & Markantonakis, K. (2018). Fair and transparent blockchain based tendering framework – A Step Towards Open Governance, *17th IEEE Int. Conf. On Trust, Security and Privacy in Computing and Communications*, DOI:10.1109/TrustCom/BigDataSE.2018.00185

Hasselbalch, J., Costa, N., & Blecken, A. (2014). Examining the relationship between the barriers and current practices of sustainable procurement: A survey of un organisations. *Journal of Public Procurement*, *14* (3), p. 361-394. https://doi.org/10.1108/JOPP-14-03-2014-B003

Hathcoat, J. D., Meixner, C., & Nicholas, M. C. (2019). Ontology and epistemology.

Hatush, Z. & Skitmore, M. (1998). Contractor selection using multicriteria utility theory: an additive model, *Build. Environ., (33*) 105–115, https://doi.org/10.1016/ S0360-1323(97)00016-4

Hays, D. G., & McKibben, W. B. (2021). Promoting rigorous research: Generalisability and qualitative research. *Journal of Counseling & Development*, *99*(2), 178-188.

Heard, B. R., Kerxhalli-Kleinfield, M., & Holmes, K. J. (2022). Beyond A single stimulus: How to leverage the federal government to advance clean energy innovation?. *Iscience*, *25*(6).

Heller, A., Webb, N. P., Bestelmeyer, B. T., Brungard, C. W., & Davidson, Z. M. (2022). An Inductive Approach to Developing Ecological Site Concepts with Existing Monitoring Data. *Rangeland Ecology & Management*, *83*, 133-148.

Hennell, K., Limmer, M., & Piacentini, M. (2020). Ethical dilemmas using social media in qualitative social research: A case study of online participant observation. *Sociological Research Online*, *25*(3), 473-489.

Hennink, M., & Kaiser, B. N. (2021). Sample sises for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 114523.

Huebner, K. S. (2019). The Place of Emotions in Intervention. *Organisation Development Journal,* 37(1), 31–38.

Hilari, K., Behn, N., Marshall, J., Simpson, A., Thomas, S., Northcott, S., ... & Goldsmith, K. (2019). Adjustment with aphasia after stroke: study protocol for a pilot feasibility randomised controlled trial for SUpporting wellbeing through PEeR Befriending (SUPERB). *Pilot and Feasibility Studies*, *5*(1), 1-16.

Hinrichs, S., & Wettlin, J. (2019). Drivers and Barriers to the Adoption of Sustainable Procurement in SMEs.

Hoogendoorn, G., Sütterlin, B., & Siegrist, M. (2020). The climate change beliefs fallacy: The influence of climate change beliefs on the perceived consequences of climate change. *Journal of Risk Research*, *23*(12), 1577-1589.

Holmberg, J., & Sandbrook, R. (2019). Sustainable development: what is to be done?. In *Policies for a small planet* (pp. 19-38). Routledge.

Hope, K. R. Sr. (2017). Fighting corruption in developing countries: Some aspects of policy from lessons from the field. *Journal of Public Affairs, 17*(4), e1683. https://doi.org/10.1002/pa.1683

Hopwood, C. J., Bleidorn, W., & Wright, A. G. (2022). Connecting theory to methods in longitudinal research. *Perspectives on Psychological Science*, *17*(3), 884-894.

Huang, X. (2011). An analysis of the selection of project contractor in the construction management process. *International journal of business and management*, *6*(3), 184.

Humphries, K., Willoughby, K., & Clarke, C. (2022). *Consent Form and Participant Information sheet.* eprints.soton.ac.uk

Hunt, I., Ryan, A., hAodha, M. Ó., & Rezaei-Zadeh, M. (2022). Industry requirements, thesis-writing, and the emergence of flexible educational programmes: Reflections on the university learner experience. *Industry and Higher Education*, *36*(3), 319-333.

Hürlimann, C. (2019). Research Philosophy and Ethics. In *Valuation of Renewable Energy Investments* (pp. 111-126). Springer Gabler, Wiesbaden.

Igarashi, M., de Boer, L., & Fet, A. M. (2013). What is required for greener supplier selection? A literature review and conceptual model development. *Journal of Purchasing and Supply Management*, *19*(4), 247-263.

Igarashi M, Boer L & Michelsen O (2014). Investigating the anatomy of supplier selection in green public procurement. *Journal of Cleaner Production. 108*(1):442-450

Iizuka, M. (2016). Role of environmental awareness in achieving sustainable development, *Economic Commission for Latin America, and the Caribbean.* https://biblioteca.cejamericas.org/bitstream/handle/2015/3375/

Ishizaka, Alessio, Craig Pearman, and Philippe Nemery. "AHPSort: an AHP-based method for sorting problems." *International Journal of Production Research* 50, no. 17 (2012): 4767-4784.

Ivanov, S., Seyitoğlu, F., & Markova, M. (2020). Hotel managers' perceptions towards the use of robots: a mixed-methods approach. *Information Technology & Tourism*, *22*(4), 505-535.

Ives, C. D., Freeth, R., & Fischer, J. (2020). Inside-out sustainability: The neglect of inner worlds. *Ambio*, *49*(1), 208-217.

Jackson, K., & Bazeley, P. (2019). *Qualitative data analysis with NVivo*. Sage.

Jain, A., Chauhan, N., Singh, V. & Thakur, N. (2018). Seguro digital storage of documents using blockchain, *Int. Research Journal of Engineering and Technology (IRJET) 05*, e-ISSN: 2395-0056, Issue: 04, Apr-2018, p-ISSN:2395-0072

Jain, P.K., Hazenberg, R., Seddon, F. and Denny, S. (2019), "Social value as a mechanism for linking public administrators with society: identifying the meaning, forms and process of social value creation*". International Journal of Public Administration, 43* (10), 876-889.

Jamieson, D., Auron, M., & Shechtman, D. (2010). Managing 'Use of Self' for Masterful Professional Practice. *Organisation Development Practitioner, 42*(3) pp. 1–11.

Jamieson, D. W. & Davidson, J. E. (2019). Advancing Thinking and Practice on Use of Self. *Organisation Development Journal, 37*(1), 39–54.

James, N. (2015). Using email interviews in qualitative educational research: Creating space to think and time to talk. *International Journal of Qualitative Studies in Education, 29*(2) 150–163. Doi:10.1080/09518398.2015.1017848

Jeevan, J., Bandara, Y. M., Mohd Salleh, N. H., Ngah, A. H., & Hanafiah, R. (2019). A procedure of implementing exploratry mixed method research in dry ports management. *Transactions on maritime science*, *8*(02), 157-170.

Jeronen, E. (2020). Sustainable development. In *Encyclopedia of Sustainable Management* (pp. 1-7). Cham: Springer International Publishing.

Jesson, J., Matheson, L., & Lacey, F. M. (2011). *Doing your literature review: Traditional and systematic techniques.* Sage: Los Angeles

Jia, F., Zuluaga-Cardona, L., Bailey, A., & Rueda, X. (2018). Sustainable supply chain management in developing countries: An analysis of the literature. *Journal of cleaner production*, *189*, 263-278.

Johnson, J. L., Adkins, D., & Chauvin, S. (2020). A review of the quality indicators of rigor in qualitative research. *American journal of pharmaceutical education*, *84*(1).

Johnson, M. S. (2020). Regulation by shaming: Deterrence effects of publicizing violations of workplace safety and health laws. *American economic review*, *110*(6), 1866-1904.

Jouzdani, J., & Govindan, K. (2021). On the sustainable perishable food supply chain network design: A dairy products case to achieve sustainable development goals. *Journal of Cleaner Production*, *278*, 123060.

Jowett, A. (2020). Carrying out qualitative research under lockdown-practical and ethical considerations. *Impact of social sciences blog*. https://blogs.lse.ac.uk/impactofsocialsciences/

Juan, Y. K., Perng, Y. H., Castro-Lacouture, D. & Lu, K. S. (2009). Housing refurbishment contractors' selection based on a hybrid fuzzy-QFD approach, Autom. Constr. 18 (2009) 139–144, https://doi.org/10.1016/j.autcon.2008.06.001.

Junior, A. N., de Oliveira, M. C., & Helleno, A. L. (2018). Sustainability evaluation model for manufacturing systems based on the correlation between triple bottom line dimensions and balanced scorecard perspectives. *Journal of Cleaner Production*, *190*, 84-93.

Kabir, S. F., Chakraborty, S., Hoque, S. A., & Mathur, K. (2019). Sustainability assessment of cotton-based textile wet processing. *Clean Technologies*, *1*(1), 232-246.1

Kakwezi, P., & Nyeko, S. (2019). Procurement processes and performance: Efficiency and effectiveness of the procurement function. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, *3*(1).

Kamal, S. S. L. B. A. (2019). Research paradigm and the philosophical foundations of a qualitative study. *PEOPLE: International Journal of Social Sciences*, *4*(3), 1386-1394.

Karikari, A. M., Tettevi, P. K., Amaning, N., Opoku Ware, E., & Kwarteng, C. (2022). Modeling the implications of internal audit effectiveness on value for money and sustainable procurement performance: An application of structural equation modeling. *Cogent Business & Management*, *9*(1), 2102127.

Karmaker, C. L., Ahmed, T., Ahmed, S., Ali, S. M., Moktadir, M. A., & Kabir, G. (2021). Improving supply chain sustainability in the context of COVID-19 pandemic in an emerging economy: Exploring drivers using an integrated model. *Sustainable production and consumption*, *26*, 411-427.

Kaur, H., & Garg, P. (2019). Urban sustainability assessment tools: A review. *Journal of cleaner production*, *210*, 146-158.

Kaur, H., & Singh, S. P. (2019). Sustainable procurement and logistics for disaster resilient supply chain. *Annals of Operations Research*, *283*(1), 309-354.

Kauppi, K., & Van Raaij, E. M. (2014). Opportunism and honest incompetence—Seeking explanations for noncompliance in public procurement. *Journal of Public Administration Research and Theory, 25*(3), 953–979.

Kazancoglu, Y., Ozkan-Ozen, Y. D., & Ozbiltekin, M. (2018). Minimising losses in milk supply chain with sustainability: An example from an emerging economy. *Resources, Conservation and Recycling*, *139*, 270-279.

Kelle, U., Kühberger, C., & Bernhard, R. (2019). How to use mixed-methods and triangulation designs: An introduction to history education research. *History Education Research Journal*, 16 (1), 5–23. DOI https://doi.org/10.18546/HERJ.16.1.02

Kelly, S., Marshall, D., Walker, H., & Israilidis, J. (2021). Supplier satisfaction with public sector competitive tendering processes. *Journal of public procurement*, *21*(2), 183-205.

Keulemans, S., & Van de Walle, S. (2017). Cost-effectiveness, domestic favouritism, and sustainability in public procurement: A comparative study of public preferences. *International Journal of Public Sector Management*, *30* (4), pp. 328-341. https://doi.org/10.1108/IJPSM-10-2016-0169

Khosla, R., Miranda, N. D., Trotter, P. A., Mazzone, A., Renaldi, R., McElroy, C., ... & McCulloch, M. (2021). Cooling for sustainable development. *Nature Sustainability*, *4*(3), 201-208.

Kibria, M. G., Masuk, N. I., Safayet, R., Nguyen, H. Q., & Mourshed, M. (2023). Plastic waste: Challenges and opportunities to mitigate pollution and effective management. *International Journal of Environmental Research*, *17*(1), 20.

Kiefer, C. P., Del Río González, P., & Carrillo-Hermosilla, J. (2019). Drivers and barriers of eco-innovation types for sustainable transitions: A quantitative perspective. *Business Strategy and the Environment*, *28*(1), 155-172.

Kirongo, A., & Odoyo, C. (2020). Research Philosophy Design and Methodologies: A Systematic Review of Research Paradigms in Information Technology.

Klingenberg, B., Rider, C., Rothberg, H. N., & Sloan, K. (2020, December). Knowledge Management Processes and Organisational Change Towards Sustainability: A Case Study. In *ECKM 2020 21st European Conference on Knowledge Management* (p. 425). Academic Conferences International Limited.

Klingler, D. (2020). Measuring what matters in public procurement law: Efficiency, quality and more. *Journal of Management Policy and Practice*, *21*(3), 73-98.

Ko, C. H., Cheng, M.Y. & Wu, T.K. (2007). Evaluating sub-contractors' performance using EFNIM, *Autom. Constr. (16*), 525–530, https://doi.org/10.1016/j. autcon.2006.09.005.

Kolawole, O. A., Mishra, J. L., & Hussain, Z. (2021). Addressing food waste and loss in the Nigerian food supply chain: Use of Lean Six Sigma and Double-Loop Learning. *Industrial Marketing Management*, *93*, 235-249.

Kong, H. M., Witmaier, A., & Ko, E. (2021). Sustainability and social media communication: How consumers respond to marketing efforts of luxury and non-luxury fashion brands. *Journal of Business Research*, *131*, 640-651.

Koopman, W.J., Watling, C.J. & Ladonna, K.A. (2020). Autoethnography as a strategy for engaging in reflexivity. *Glob Qual Nurs Res*. 7:2333393620970508

Koranchie, R. (2015). *Effect of sustainable procurement practices on operational performance–case study Ghana Grid Company Limited (GRIDCo)* (Doctoral dissertation).

Kpienbaareh, D., Kansanga, M. M., Konkor, I., & Luginaah, I. (2021). The Rise of the Fourth Estate: The Media, Environmental Policy, and the Fight against Illegal Mining in Ghana. *Environmental Communication*, *15*(1), 69-84.

Kreitner, R. (2007). *Management. (10th ed.).* Boston: Houghton Mifflin company,

Kumi, N.E. (2017). The electricity Situation in Ghana: Challenges and Opportunities; CGD policy paper. Washington, DC: *Centre for Global Development*.

Kusi, L . Y ., Aggrey, G . A. B., & Nyarku, K . M. (2014). Assessment of Public Procurement Policy Implementation in the Educational Sector (A Case Study of Takoradi Polytechnic). *International Journal of Academic Research in Business & Social Sciences, 4*(10), 260–278. https://doi. org/10 .6007/IJARBSS/v4-i10/1226

Kuteesa, D. (2021). Philosophical Orientation of Primary School Teachers in Uganda: A Case of Teachers in Iganga Municipality. *International Online Journal of Education and Teaching*, *8*(2), 1263-1278.

Kyngäs, H. (2020). Qualitative research and content analysis. In *The application of content analysis in nursing science research* (pp. 3-11). Springer, Cham.

Kythreotis, A. P., Mantyka-Pringle, C., Mercer, T. G., Whitmarsh, L. E., Corner, A., Paavola, J., ... & Castree, N. (2019). Citisen social science for more integrative and effective climate action: a science-policy perspective. *Frontiers in Environmental Science*, *7*, 10.

Lall, D. (2021). Mixed-methods research: Why, when, and how to use. *Indian Journal of Continuing Nursing Education*, *22*(2), 143.

Lamoureux, S. M., Movassaghi, H., & Kasiri, N. (2019). The role of government support in SMEs' adoption of sustainability. *IEEE Engineering Management Review*, *47*(1), 110-114.

Landers, R. N., & Marin, S. (2021). Theory and technology in organisational psychology: A review of technology integration paradigms and their effects on the validity of theory. *Annual Review of Organisational Psychology and Organisational Behavior*, *8*, 235-258.

Lăzăroiu, G., Ionescu, L., Andronie, M., & Dijmărescu, I. (2020). Sustainability management and performance in the urban corporate economy: a systematic literature review. *Sustainability*, *12*(18), 7705.

Lăzăroiu, G., Ionescu, L., Uță, C., Hurloiu, I., Andronie, M., & Dijmărescu, I. (2020). Environmentally responsible behavior and sustainability policy adoption in green public procurement. *Sustainability*, *12*(5), 2110.

Lee, D., Kang, J., & Kim, K. (2020). Global collaboration research strategies for sustainability in the post COVID-19 era: Analyzing virology-related national-funded projects. *Sustainability*, *12*(16), 6561.

Lee, H. (2021). *What is next? Lessons learned from sensitivity model runs using length compositions collected by the Sportfishing Association of California*. ISC/21/PBFWG-2/08.

Lee-Cultura, S., Sharma, K., & Giannakos, M. (2022). Children's play and problem-solving in motion-based learning technologies using a multi-modal mixed methods approach. *International Journal of Child-Computer Interaction*, *31*, 100355.

Leese, J., Li, L. C., Nimmon, L., Townsend, A. F., & Backman, C. L. (2021). Moving beyond "until saturation was reached": Critically examining how saturation is used and reported in qualitative research. *Arthritis Care & Research*, *73*(9), 1225-1227.

Lehtonen, J. M., & Virtanen, K. (2022). Choosing the most economically advantageous tender using a multi-criteria decision analysis approach. *Journal of Public Procurement*, *22*(2), 164-179.

Leisner, C. P. (2020). Climate change impacts on food security-focus on perennial cropping systems and nutritional value. *Plant Science*, *293*, 110412.

Lemon, L. L., & Hayes, J. (2020). Enhancing trustworthiness of qualitative findings: Using Leximancer for qualitative data analysis triangulation. *The Qualitative Report*, *25*(3), 604-614.

Leni W, Victoria C, Maia K & Dan H (2012). Common constraints and incentive problems in service delivery. Overseas Development Institute. 111 Westminster Bridge Road London SE1 7JD. UK; Available: www.odi.org.uk

Li, M., Lan, F ., & Zhang, F . (2019). Why Chinese financial market investors do not care about corporate social Responsibility: Evidence from mergers and acquisitions. *Sustainability, 11*(11): 3144. https://doi .org/10 .3390/su11113144

Li, X., & Zheng, Y. (2017). Lignin-enzyme interaction: Mechanism, mitigation approach, modeling, and research prospects. *Biotechnology advances*, *35*(4), 466-489.

Li, Y., Chen, W., Liu, C., & Deng, M. (2020). Nursesâ€™ psychological feelings about the application of Gibbs reflective cycle of adverse events. *American Journal of Nursing*, *9*(2), 74-78.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. sage.

Linneberg, M. S., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative research journal*.

Liu, B., Huo, T., Wang, X., Shen, Q. & Chen, Y. (2013). The decision model of the intuitionistic fuzzy group bid evaluation for urban infrastructure projects considering social costs, *Can. J. Civ. Eng. (40*) 263–273, https://doi.org/10.1139/cjce-2012-0283.

Liu, B., Yang, X., Huo, T., Shen, G.Q. & Wang, X. W. (2017). A linguistic group decision-making framework for bid evaluation in mega public projects considering carbon dioxide emissions reduction, *J. Clean. Prod. (148*), 811–825, https://doi.org/ 10.1016/j.jclepro.2017.02.044

Liu, J., Hu, S., & Pascarella, E. T. (2021). Are non-native English-speaking students disadvantaged in college experiences and cognitive outcomes?. *Journal of Diversity in Higher Education*, *14*(3), 398.

Liu, J., Liu, Y., & Yang, L. (2020). Uncovering the influence mechanism between top management support and green procurement: The effect of green training. *Journal of Cleaner Production*, *251*, 119674.

Loosemore, M. and Higgon, D. (2015). *Social Enterprise in the Construction Industry: Building Better Communities,* Routledge, London

Loosemore, M., & Barraket, J. (2017, September). The co-creation of social value between social enterprises and private firms in the construction industry. In *Proceeding of the 33rd Annual ARCOM Conference, Association of Researchers in Construction Management, Cambridge* (pp. 673-682).

López-Vargas, J. C., & Cárdenas-Aguirre, D. M. (2021). Performance measures in humanitarian logistics: literature review. *South Florida Journal of Development*, *2*(2), 2462-2473.

Lotfi, R., Mehrjerdi, Y. Z., Pishvaee, M. S., Sadeghieh, A., & Weber, G. W. (2021). A Robust Optimisation Model For Sustainable And Resilient Closed-Loop Supply Chain Network Design Considering Conditional Value At Risk. *Numerical algebra, control & optimization*, *11*(2).

Lowe, N. K. (2019). What is a pilot study?. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *48*(2), 117-118.

Lowe, A., Norris, A. C., Farris, A. J., & Babbage, D. R. (2018). Quantifying thematic saturation in qualitative data analysis. *Field methods*, *30*(3), 191-207.

Lu, K., Jiang, X., Yu, J., Tam, V. W., & Skitmore, M. (2021). Integration of life cycle assessment and life cycle cost using building information modeling: A critical review. *Journal of Cleaner Production*, *285*, 125438.

Lueneburger, C. & Goleman, D. (2010). The Change Leadership Sustainability Demand. MITSloan Management Review, 50-55. Retrieved from: www.pubservice.com/msstore

Luft, J. A., Jeong, S., Idsardi, R., & Gardner, G. (2022). Literature reviews, theoretical frameworks, and conceptual frameworks: An introduction for new biology education researchers. *CBE—Life Sciences Education*, *21*(3), rm33.

Mackieson, P., Shlonsky, A., & Connolly, M. (2019). Increasing rigor and reducing bias in qualitative research: A document analysis of parliamentary debates using applied thematic analysis. *Qualitative Social Work*, *18*(6), 965-980.

Mak, M. A., Winger, T., Anderson, P., Byun, J., Chanley, V., Ettaro, L., ... & Schatz, S. (2016). Government Purchase Cards: Opportunities Exist to Leverage Buying Power.

Malmqvist, J., Hellberg, K., Möllås, G., Rose, R., & Shevlin, M. (2019). Conducting the pilot study: A neglected part of the research process? Methodological findings supporting the importance of piloting in qualitative research studies. *International journal of qualitative methods*, *(18)*, 1609406919878341.

Mani, V., Jabbour, C. J. C., & Mani, K. T. N. (2020). Supply chain social sustainability in small and medium manufacturing enterprises and firms' performance: Empirical evidence from an emerging Asian economy. *International Journal of Production Economics, 227*(January), 107656. doi: 10.1016/j.ijpe.2020.107656

Marcarelli, G., & Nappi, A. (2019). Multicriteria approach to select the most economically advantageous tender: The application of AHP in Italian public procurement. *Journal of public procurement*, *19*(3), 201-223.

Marcarelli, G., & Squillante, M. (2020). A group-AHP-based approach for selecting the best public tender. *Soft Computing*, *24*(18), 13717-13724.

Marcella, H., Michelle M., & Maura, D. (2016). Understanding the Key Tenets of Heidegger's Philosophy for Interpretive Phenomenological Research. *International Journal of Qualitative Methods* sagepub.com/journalsPermissions.nav. DOI: 10.1177/1609406916680634 ijqm.sagepub.com

Marrucci, L., Daddi, T., & Iraldo, F. (2019). The integration of circular economy with sustainable consumption and production tools: Systematic review and future research agenda. *Journal of Cleaner Production*, *240*, 118268.

Martinho, V. J. P. D. (2021). Insights into circular economy indicators: Emphasising dimensions of sustainability. *Environmental and Sustainability Indicators*, *10*, 100119.

Mason, D. M., & Ide, B. (2014). Adapting qualitative research strategies to technology savvy adolescents. *Nurse Researcher, 21*(5) 40–45. Doi:10.7748/nr.21.5.40. e1241

Mason, J. (2017). Qualitative researching. *Qualitative researching*, 1-288.

Maxwell, J. A. (2021). Why qualitative methods are necessary for generalisation. *Qualitative Psychology*, *8*(1), 111.

May, T., & Perry, B. (2022). *Social research: Issues, methods, and process*. McGraw-Hill Education (UK).

McCrudden, C. (2004). Using public procurement to achieve social outcomes. *Natural Resources Forum*, **28**(4), 257– 267. https://doi.org/10.1111/j.1477-8947.2004.00099.x

McGregor, D., Whitaker, S., & Sritharan, M. (2020). Indigenous environmental justice and sustainability. *Current Opinion in Environmental Sustainability*, *43*, 35-40.

McLennan, S., Celi, L. A., & Buyx, A. (2020). COVID-19: putting the General Data Protection Regulation to the test. *JMIR Public Health and Surveillance*, *6*(2), e19279.

McLeod, J., & O'Connor, K. (2020). Ethics, archives, and data sharing in qualitative research. *Educational Philosophy and Theory*, *53*(5), 523-535.

Mehta, K., & Chawla, S. (2024). Illuminating the dark corners: a qualitative examination of cryptocurrency's risk. *Digital Policy, Regulation and Governance*, *26*(2), 188-208.

Melnick, H., & Darling-Hammond, L. (2020). Reopening Schools in the Context of COVID-19: Health and Safety Guidelines from Other Countries. Policy Brief. *Learning Policy Institute*

Merriam SB, Tisdell EJ (2016). *Qualitative Research: A Guide to Design and Implementation*. San Francisco: Jossey-Bass.

Mitchell, J., Boettcher-Sheard, N., Duque, C., & Lashewicz, B. (2018). Who do we think we are? Disrupting notions of quality in qualitative research. *Qualitative Health Research, 28*(4), 673–680. doi:10.1177/104973231774889

Misra, S. (2021). A step-by-step guide for choosing project topics and writing research papers in ICT related disciplines. In *Information and Communication Technology and Applications: Third International Conference, ICTA 2020, Minna, Nigeria, November 24–27, 2020, Revised Selected Papers 3* (pp. 727-744). Springer International Publishing.

Mofokeng, T. M., & Chinomona, R. (2019). Supply chain partnership, supply chain collaboration and supply chain integration as the antecedents of supply chain performance. *South African Journal of Business Management*, *50*(1), 1-10.

Mohammed, A. L., & Özdemir, A. İ. (2019, December). Performance Measurement In Humanitarian Organisations: An Assessment Model. In *INTERNATIONAL CONGRESS ON SOCIAL SCIENCES (FSCONGRESS)* (p. 467).

Mohamed Shaffril, H. A., Samsuddin, S. F., & Abu Samah, A. (2021). The ABC of systematic literature review: The basic methodological guidance for beginners. *Quality & Quantity*, *55*(4), 1319-1346.

Molamohamadi, Z., & Ismail, N. (2014). The relationship between occupational safety, health, and environment, and sustainable development: A review and critique. *International Journal of Innovation, Management and Technology*, *5*(3), 198.

Monica, I. M., Ridwan, A. Y., & Hediyanto, U. Y. K. (2021). Developing Sustainable Procurement System Based on Enterprise Resource Planning. *JATISI (Jurnal Teknik Informatika dan Sistem Informasi)*, *8*(2), 752-763.

Montalbán-Domingo, L., García-Segura, T., Sanz, M. A., & Pellicer, E. (2018). Social sustainability criteria in public-work procurement: An international perspective. Journal of Cleaner Production, 198, 1355-1371.

Montalbán-Domingo, L., García-Segura, T., Sanz-Benlloch, M. A., & Pellicer, E. (2019). Social sustainability in delivery and procurement of public construction contracts. Journal of management in engineering, 35(2), 04018065-1.

Montalbán-Domingo, L., Aguilar-Morocho, M., García-Segura, T., & Pellicer, E. (2020). Study of Social and Environmental Needs for the Selection of Sustainable Criteria in the Procurement of Public Works. *Sustainability*, *12*(18), 7756.

Moon, S., & Lee, D. J. (2019). An optimal electric vehicle investment model for consumers using total cost of ownership: A real option approach. *Applied Energy*, *253*, 113494.

Mor, R. S., Bhardwaj, A., Singh, S., & Kharub, M. (2019). Framework for measuring the procurement performance in the dairy supply chain. In *Sustainable Procurement in Supply Chain Operations* (pp. 61-83). CRC Press.

Morrison-Smith, S., & Ruiz, J. (2020). Challenges and barriers in virtual teams: a literature review. *SN Applied Sciences*, *2*, 1-33.

Muñoz, R. M., de Pablo, J. D. S., & Peña, I. (2015). Linking corporate social responsibility and financial performance in Spanish firms. *European Journal of International Management, 9*(3), 368–383. https://doi .org/10 .1504/ EJIM .2015 .069133

Murray, J. G. (2009). Towards a common understanding of the differences between purchasing, procurement, and commissioning in the UK public sector. *Journal of Purchasing and Supply Management*, *15*(3), 198-202.

Murutu (2016). Sustainable procurement strategies and supply chain performance of five-star hotels in Nairobi County, Kenya. University of Nairobi.

Mwanza, B. G., & Mbohwa, C. (2017). Drivers to sustainable plastic solid waste recycling: a review. *Procedia Manufacturing*, *8*, 649-656.

Narushima, M., Liu, J., & Diestelkamp, N. (2018). I learn; therefore I am: A phenomenological analysis of meanings of lifelong learning for vulnerable older adults. *The gerontologist*.

Nasab, H.H. & Ghamsarian, M.M. (2015). A fuzzy multiple-criteria decision-making model for contractor prequalification*, J. Decis. Syst.* (*24),* 433–448, https://doi.org/ 10.1080/12460125.2015.1081048.

Negi, A., Pérez-Pineda, J. A., & Blankenbach, J. (2020). *Sustainability standards and global governance: experiences of emerging economies* (p. 224). Springer Nature.

Nehls, K., Smith, B. D., & Schneider, H. A. (2014). Video-conferencing interviews in qualitative research. In S. Hai-Jew (Ed.). *Enhancing qualitative and mixed methods research with technology,* 140–157, Hershey, PA: IGI Global. Doi:10.4018/978- 1-4666-6493-7.ch006

Neubauer, B. E., Witkop, C. T., & Varpio, L. (2019). How phenomenology can help us learn from the experiences of others. *Perspectives on medical education*, *8*(2), 90-97.

Neupane, A., Soar, J., & Vaidya, K. (2014). An empirical evaluation of the potential of public e-procurement to reduce corruption. *Australasian Journal of Information Systems, 21*, 21–44

Nguyen, T. N. M., Whitehead, L., Dermody, G., & Saunders, R. (2022). The use of theory in qualitative research: Challenges, development of a framework and exemplar. *Journal of Advanced Nursing*, *78*(1), e21-e28.

Niedbalski, J., & Ślęzak, I. (2022). Social Network Analysis and Its Applicability by Means of NVivo Software. In *World Conference on Qualitative Research* (pp. 14-24). Springer, Cham.

Nair, A., Jayaram, J & Das, A. (2015). Strategic purchasing participation, supplier selection, supplier evaluation and purchasing performance, *Int. J. Prod. Res. 53* (20) 6263–6278.

Nimsai, S., Yoopetch, C., & Lai, P. (2020). Mapping the knowledge base of sustainable supply chain management: A bibliometric literature review. *Sustainability*, *12*(18), 7348.

Nsiah-Asare, E., & Prempeh, K. B. (2016). Measures of ensuring value for money in public procurement: A case of selected polytechnics in Ghana.

O'Kane, P., Smith, A., & Lerman, M. P. (2021). Building transparency and trustworthiness in inductive research through computer-aided qualitative data analysis software. *Organisational Research Methods*, *24*(1), 104-139.

Obal, M., Morgan, T., & Joseph, G. (2020). Integrating sustainability into new product development: The role of organisational leadership and culture. *Journal of Small Business Strategy (archive only)*, *30*(1), 43-57.

Obi-Ani, N. A., Anikwenze, C., & Isiani, M. C. (2020). Social media and the Covid-19 pandemic: Observations from Nigeria. *Cogent arts & humanities*, *7*(1), 1799483.

Ögmundarson, Ó., Herrgård, M. J., Forster, J., Hauschild, M. Z., & Fantke, P. (2020). Addressing environmental sustainability of biochemicals. *Nature Sustainability*, *3*(3), 167-174.

Ogunsanya, O. A., Aigbavboa, C. O., Thwala, D. W., & Edwards, D. J. (2022). Barriers to sustainable procurement in the Nigerian construction industry: an exploratory factor analysis. *International Journal of Construction Management*, *22*(5), 861-872.

Oguntona, O.A. & Aigbavboa, C.O. (2017). Biomimicry principles as evaluation criteria of sustainability in the construction industry, *Energy Procedia (142),* 2491–2497, https://doi.org/10.1016/j.egypro.2017.12.188

Okun, A., Guerin, R., Smith, R., Baker, D., & DiMeo-Ediger, M. (2024). Evaluation of changes in knowledge and attitude among youth after a one-hour introduction to workplace safety and health: Safety Matters. *Journal of Safety Research*.

Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2022). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical teacher*, 1-11.

Opoku, A. and Guthrie, P. (2018). "The Social Value Act 2012: current state of practice in the social housing sector", *Journal of Facilities Management, (16)* 3, 253-268

Owusu-Manu, D. G., Debrah, C., Oduro-Ofori, E., Edwards, D. J., & Antwi-Afari, P. (2020). Attributable indicators for measuring the level of greenness of cities in developing countries: lessons from Ghana. *Journal of Engineering, Design and Technology, 19*(3) p. 625-646. https://doi.org/10.1108/JEDT-06-2020-0257.

Orth, U., Clark, D. A., Donnellan, M. B., & Robins, R. W. (2021). Testing prospective effects in longitudinal research: Comparing seven competing cross-lagged models. *Journal of Personality and Social Psychology*, *120*(4), 1013.

Østern, T. P., Jusslin, S., Nødtvedt Knudsen, K., Maapalo, P., & Bjørkøy, I. (2021). A performative paradigm for post-qualitative inquiry. *Qualitative Research*, 14687941211027444.

Padash, A., & Ghatari, A. R. (2020). Toward an Innovative Green Strategic Formulation Methodology: Empowerment of corporate social, health, safety, and environment. *Journal of cleaner production*, *261*, 121075.

Patil, A., Madaan, J., Chan, F. T., & Charan, P. (2022). Advancement of performance measurement system in the Humanitarian Supply Chain. *Expert Systems with Applications*, 117844.

Paul Jr, M., Molua, E. L., Nzie, J. R. M., & Fuh, G. L. (2020). Production and supply of tomato in Cameroon: Examination of the comparative effect of price and non-price factors. *Scientific African*, *10*, e00574.

Pearson, N., Naylor, P. J., Ashe, M. C., Fernandez, M., Yoong, S. L., & Wolfenden, L. (2020). Guidance for conducting feasibility and pilot studies for implementation trials. *Pilot and feasibility studies*, *(6),1*-12.

Pederneiras, Y. M., Meckenstock, J., Carvalho, A. I. C., & Barbosa-Póvoa, A. P. (2022). The wicked problem of sustainable development in supply chains. *Business Strategy and the Environment*, *31*(1), 46-58.

Pellegrini, L., Locatelli, M., Meschini, S., Pattini, G., Seghezzi, E., Tagliabue, L. C., & Di Giuda, G. M. (2021). Information modelling management and green public procurement for waste management and environmental renovation of brownfields. *Sustainability*, *13*(15), 8585.

Peprah, J. A., Brako, S ., & Akosah, N . B. (2018). The Awareness Level of Green Procurement at the District Assemblies in Western Region in Ghana. *Journal of Management and Sustainability, 8*(1), 46–58. https://doi .org/10 .5539/jms. v8n1p46

Perčić, M., Frković, L., Pukšec, T., Ćosić, B., Li, O. L., & Vladimir, N. (2022). Life-cycle assessment and life-cycle cost assessment of power batteries for all-electric vessels for short-sea navigation. *Energy*, *251*, 123895.

Pernetti, R., Garzia, F., & Oberegger, U. F. (2021). Sensitivity analysis as support for reliable life cycle cost evaluation applied to eleven zero-energy buildings in Europe. *Sustainable Cities and Society*, *74*, 103139.

Peterson, J. S. (2019). Presenting a qualitative study: A reviewer's perspective. *Gifted Child Quarterly*, *63*(3), 147-158.

Pham, L. T. M. (2018). Qualitative approach to research a review of advantages and disadvantages of three paradigms: Positivism, interpretivism and critical inquiry. *University of Adelaide*. researchgate.net

Plaza-Úbeda, J.A.; AbadSegura, E.; de Burgos-Jiménez, J.; Boteva-Asenova, A.; Belmonte-Ureña, L.J. Trends and New Challenges in the Green Supply Chain: The Reverse Logistics. Sustainability 2021, 13, 331. https://doi.org/10.3390/su13010331

Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins.

Popescu, I. S., Hitaj, C., & Benetto, E. (2021). Measuring the sustainability of investment funds: A critical review of methods and frameworks in sustainable finance. *Journal of Cleaner Production*, *314*, 128016.

Pörtner, H. O., Roberts, D. C., Adams, H., Adler, C., Aldunce, P., Ali, E., ... & Ibrahim, Z. Z. (2022). *Climate change 2022: Impacts, adaptation, and vulnerability* (p. 3056). Geneva, Switzerland:: IPCC.

Public Procurement Authority: *E-Bulletin (2017, May) 8,* (3)

Pulla, V., & Carter, E. (2018). Employing interpretivism in social work research. *International Journal of Social Work and Human Services Practice*, *6*(1), 9-14.

Purwanto, E., & Budiman, V. (2020). Applying the technology acceptance model to investigate the intention to use e-health: a conceptual framework. *Technology Reports of Kansai University*, *62*(05), 2569-2580.

Qorri, A., Mujkić, Z., & Kraslawski, A. (2018). A conceptual framework for measuring sustainability performance of supply chains. *Journal of Cleaner Production*, *189*, 570-584.

Rajabi, S., El-Sayegh, S., & Romdhane, L. (2022). Identification and assessment of sustainability performance indicators for construction projects. *Environmental and Sustainability Indicators*, 100193.

Rajeev, A., Pati, R.K., Padhi, S.S. & Govindan, K. (2017). Evolution of sustainability in supply chain management: A literature review. *Journal Clean Prod.*, *162*, 299–314.

Ramadan, O. K. (2022). Current sustainable procurement practices in public funded projects in Northern Ghana. *International Research Journal of Modernisation in Engineering Technology and Science*, *4*(1), 2.

Ramanathan, U., & Gunasekaran, A. (2014). Supply chain collaboration: Impact of success in long-term partnerships. *International Journal of Production Economics, 147*, 252-259.

Raymond J. (2008). Benchmarking in public Procurement. Benchmarking: *An International Journal.15*(6):782-793.

Regulation, G. D. P. (2018). General data protection regulation (GDPR). *Intersoft Consulting, Accessed in October*, *24*(1).

Reilly, A. H. (2022). Sustainability Leadership: Innovation in Governance and Gender. *In World Scientific encyclopedia of Business Sustainability, Ethics and Entrepreneurship*, (pp. 337-356). https://doi.org/10.1142/9789811248863_0012

Ren, Z., Kwaw, P., & Yang, F. (2012). Ghana's public procurement reform and the continuous use of the traditional procurement system: The way forward. *Built Environment Project and Asset Management, 2 (*1), p. 56-69. https://doi.org/10.1108/20441241211235053.

Rezapour Nasrabad, R. (2018). Criteria of validity and reliability in qualitative research. *Journal of qualitative research in health sciences*, *7*(4), 493-499.

Ritch, E. L. (2021). Consumer interpretations of fashion sustainability terminology communicated through labelling. *Journal of Fashion Marketing and Management: An International Journal*, 1361-2026, https://doi.org/10.1108/JFMM-03-2021-0075

Roberts, R. E. (2020). Qualitative Interview Questions: Guidance for Novice Researchers. Qualitative Report, 25(9).

Roda, I., Macchi, M., & Albanese, S. (2020). Building a Total Cost of Ownership model to support manufacturing asset lifecycle management. *Production Planning & Control*, *31*(1), 19-37.

Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. *Science of the Total Environment*, *786*, 147481.

Roman, A. V. (2017). Institutionalising sustainability: a structural equation model of sustainable procurement in US public agencies, *J Clean Prod, 143,*1048-1059

https://doi-org.salford.idm.oclc.org/10.1016/j.jclepro.2016.12.014

Rosskam, E. (2018). Using participatory action research methodology to improve worker health. In *Unhealthy work* (pp. 211-228). Routledge.

Roth, K., Milbich, T., Sinha, S., Gupta, P., Ommer, B., & Cohen, J. P. (2020, November). Revisiting training strategies and generalisation performance in deep metric learning. In *International Conference on Machine Learning* (pp. 8242-8252). PMLR.

Roulston, K (2021) Interviewing: A Guide to Theory and Practice. Thousand Oaks: Sage. Google Scholar

Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. *Science of the Total Environment*, *786*, 147481.

Sah, L. K., Singh, D. R., & Sah, R. K. (2020). Conducting qualitative interviews using virtual communication tools amid COVID-19 pandemic: A learning opportunity for future research. *JNMA: Journal of the Nepal Medical Association*, *58*(232), 1103.

Sajjad, A., Eweje, G., & Tappin, D. (2020). Managerial perspectives on drivers for and barriers to sustainable supply chain management implementation: Evidence from New Zealand. *Business Strategy and the Environment*, *29*(2), 592-604.

Salguero-Caparrós, F., Pardo-Ferreira, M. D. C., Martínez-Rojas, M., & Rubio-Romero, J. C. (2020). Management of legal compliance in occupational health and safety. A literature review. *Safety science*, *121*, 111-118.

Salvia, A.L., Leal Filho, W., Brandli, L.L. & Griebeler, J.S. (2019). Assessing research trends related to Sustainable Development Goals: local and global issues, *J. Clean. Prod., 208*. 841-849, 10.1016/j.jclepro.2018.09.242

Samagaio, A., & Diogo, T. A. (2022). Effect of Computer Assisted Audit Tools on Corporate Sustainability. *Sustainability*, *14*(2), 705.

Sánchez-Flores, R. B., Cruz-Sotelo, S. E., Ojeda-Benitez, S. & Elisabeth Ramírez-Barreto, M. E. (2020). Sustainable Supply Chain Management—A Literature Review on Emerging Economies, *Sustainability (12)*6972; doi:10.3390/su12176972. Retrieved from: www.mdpi.com/journal/sustainability

Santos, D., Quelhas, O. L., Simões Gomes, C. F., Zotes, L. P., França, S. L. B., Pinto de Souza, G. V., de Araújo, R. A. & da Silva Carvalho Santos, S. (2020). Proposal for a Maturity Model in Sustainability in the Supply Chain. *Sustainability, (12*), 9655; doi:10.3390/su12229655, Retrieved from: www.mdpi.com/journal/sustainability

Saunders, M. N. K. (2012). Choosing Research Participants. Qualitative Organisational Research: Core Methods and Current Challenges. SAGE Publications. Retrieved from: http://ebookcentral.proquest.com/lib/salford/detail.action?docID=880788

Saunders, M. N. K., Lewis, P., Thornhill, A., (2015). Research Methods for Business Students. Pearson Ed. ProQuest Ebook Central. Retrieved from: http://ebookcentral.proquest.com/lib/salford/detail.action?docID=5175059

Saunders, M. N., & Townsend, K. (2016). Reporting and justifying the number of interview participants in organisation and workplace research. *British Journal of Management*, *27*(4), 836-852.

Sapiński, A., Mączka, E., & Nastuła, A. (2020). Security education as a practical dimension of implementing sustainable development concept. *Journal of Scientific Papers "Social Development and Security"*, *10*(4), 139-145.

Schoch, L. (2021). Reflections on the Parkinson's Project: learning experiences with the Gibbs' Reflective Cycle. Retrieved from: https://digitalcollection.zhaw.ch/handle/11475/23701 DOI:10.21256/zhaw-23701

Schultze, U. (2015). Skirting SLR's language trap: reframing the 'systematic' vs 'traditional' literature review opposition as a continuum. *Journal of Information Technology*, *30*(2), 180-184.

Seddon, N., Smith, A., Smith, P., Key, I., Chausson, A., Girardin, C., ... & Turner, B. (2021). Getting the message right on nature-based solutions to climate change. *Global change biology*, *27*(8), 1518-1546.

Sekarwinahyu, M., Rustaman, N. Y., Widodo, A., & Riandi, R. (2019, February). Development of problem-based learning for online tutorial program in plant

development using Gibbs' reflective cycle and e-portfolio to enhance reflective thinking skills. In *Journal of Physics: Conference Series*, *1157*(2), 022-099. IOP Publishing.

Seyfang, G. (2003). Environmental mega-conferences—from Stockholm to Johannesburg and beyond. *Global Environmental Change*, *13*(3), 223-228.

Shaheen, M., & Pradhan, S. (2019). Sampling in qualitative research. In *Qualitative techniques for workplace data analysis*, p. 25-51. IGI Global. DOI: 10.4018/978-1-5225-5366-3.ch002

Shirazi, M. R., & Keivani, R. (2019). The triad of social sustainability: Defining and measuring social sustainability of urban neighbourhoods. *Urban Research & Practice*, *12*(4), 448-471.

Shufutinsky, A. & Long, B. (2017). The distributed use of self-as-instrument for improvement of organisational safety culture. *OD Practitioner, 49*(4), 36–44.

Shufutinsky, A. (2019). From Salutes to Staff Meetings: A Triangulated Qualitative Inquiry Study of the Experiences of Wounded Warriors in Post-Military Corporate Positions *(Doctoral Dissertation, Cabrini University).*

Shufutinsky, A. (2020). Employing use of self for transparency, rigor, trustworthiness, and credibility in qualitative organisational research methods. *Organisation Development Review*, *52*(1), 50-58.

Shukla, P. R. (2019). Justice, equity, and efficiency in climate change: a developing country perspective. In *Fair Weather?* (145-159). Routledge.

Silvestre, B. S., & Ţîrcă, D. M. (2019). Innovations for sustainable development: Moving toward a sustainable future. *Journal of cleaner production*, *208*, 325-332.

Smit, B., & Scherman, V. (2021). Computer-Assisted Qualitative Data Analysis Software for Scoping Reviews: A Case of ATLAS. ti. *International Journal of Qualitative Methods*, *20*, 16094069211019140.

Smit, B., & Scherman, V. (2021). Computer-Assisted Qualitative Data Analysis Software for Scoping Reviews: A Case of ATLAS. ti. *International Journal of Qualitative Methods*, *20*, 16094069211019140.

Smith, T. M. (2014). Experiences of therapists and occupational therapy students using video conferencing in conduction of focus groups*. The Qualitative Report, 19*(19), 1-13. https://nsuworks.nova.edu/tqr/vol19/iss19/3

Smith, B. (2018). Generalisability in qualitative research: Misunderstandings, opportunities and recommendations for the sport and exercise sciences. *Qualitative research in sport, exercise, and health*, *10*(1), 137-149.

Smith, I., & Felix, M. S. (2019). *A practical guide to dissertation and thesis writing*. Cambridge Scholars Publishing.

Smith, Z. A., & Jacques, P. (2022). *The environmental policy paradox*. Taylor & Francis.

Somboonpisan, J., & Limsawasd, C. (2021). Environmental weight for bid evaluation to promote sustainability in highway construction projects. *Journal of Construction Engineering and Management*, *147*(4), 04021013.

Sönnichsen, S. D., & Clement, J. (2020). Review of green and sustainable public procurement: Towards circular public procurement. *Journal of cleaner production*, *245*, 118901.

Spriggs, M. J., Douglass, H. M., Park, R. J., Read, T., Danby, J. L., de Magalhães, F. J., ... & Carhart-Harris, R. L. (2021). Study protocol for “Psilocybin as a treatment for anorexia nervosa: a pilot study.” *Frontiers in Psychiatry*, *12*, 1770.

Staller, K. M. (2022). Confusing questions in qualitative inquiry: Research, interview, and analysis. *Qualitative Social Work*, *21*(2), 227-234.

Starks, D., & Robertson, M. J. (2023). *50 Things to Think About When Writing a Thesis: Paving Your Own Path to Submission*. Taylor & Francis.

Stentoft Arlbjørn, J. and Vagn Freytag, P. (2012). "Public procurement vs private purchasing: Is there any foundation for comparing and learning across the sectors?", *International Journal of Public Sector Management*, *25*(3),203-220. https://doi.org/10.1108/09513551211226539

Stilger, P. S., Siderius, J., & Raaij, E. M. V. (2017). A comparative study of formulas for choosing the economically most advantageous tender. *Journal of public procurement*, *17*(1), 89-125.

Strauss, A., & Corbin, J. (1998). Basics of qualitative research techniques.

Strong, C. (1997). The problems of translating fair trade principles into consumer purchase behaviour. *Marketing Intelligence & Planning, 15*(1), 32–37. doi:10.1108/02634509710155642

Strijker, D., Bosworth, G., & Bouter, G. (2020). Research methods in rural studies: Qualitative, quantitative, and mixed methods. *Journal of Rural Studies*, *78*, 262-270.

Suchek, N., Fernandes, C. I., Kraus, S., Filser, M., & Sjögrén, H. (2021). Innovation and the circular economy: A systematic literature review. *Business Strategy and the Environment*, *30*(8), 3686-3702.

Sudarwanto, A. S., & Kharisma, D. B. B. (2021). Comparative study of personal data protection regulations in Indonesia, Hong Kong, and Malaysia. *Journal of Financial Crime*, 1359-0790. https://doi.org/10.1108/JFC-09-2021-0193

Sudusinghe, J. I., & Seuring, S. (2020). Social sustainability empowering the economic sustainability in the global apparel supply chain. *Sustainability*, *12*(7), 2595.

Sui, Y., Ding, R., & Wang, H. (2020). A novel approach for occupational health and safety and environment risk assessment for nuclear power plant construction project. *Journal of Cleaner Production*, *258*, 120945.

Suleiman, Y., Ishola, M. A., Shakirat, S. O., Oluwaseun, L. S., & Kamal, O. M. (2022). A Qualitative Study on The Contribution of Private Universities to Development of Kwara State, Nigeria: Evidence From AL-Hikmah University. *Journal of Management in Practice (Online Only)*, *7*(1).

Swayamsiddha, S., & Mohanty, C. (2020). Application of cognitive Internet of Medical Things for COVID-19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(5), 911-915.

Swygart-Hobaugh, M. (2019). Bringing method to the madness: An example of integrating social science qualitative research methods into NVivo data analysis software training. *IASSIST Quarterly*, *43*(2), 1-16.

Tang, M., Walsh, G., Lerner, D., Fitza, M. A., & Li, Q. (2018). Green Innovation, Managerial Concern and Firm Performance: An Empirical Study. *Business Strategy and the Environment, 27*(1), 39–51. https://doi .org/10 .1002/bse .1981

Team, S. (2020). Environmental Policy. *Facilities*, *6*, 0.

Teh, Y. Y., & Lek, E. (2018). Culture and reflexivity: Systemic journeys with a British Chinese family. *Journal of Family Therapy, 40*, 520–536. doi:10.1111/1467-6427.12205

Terry, G., & Hayfield, N. (2020). Reflexive thematic analysis. In *Handbook of qualitative research in education* (pp. 430-441). Edward Elgar Publishing.

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*, *2*, 17-37.

Thielmann, I., Spadaro, G., & Balliet, D. (2020). Personality and prosocial behavior: A theoretical framework and meta-analysis. *Psychological Bulletin*, *146*(1), 30.

Tincani, M., & Travers, J. (2019). Replication research, publication bias, and applied behavior analysis. *Perspectives on Behavior Science*, *42*(1), 59-75.

Tokan, M. K., & Imakulata, M. M. (2019). The effect of motivation and learning behaviour on student achievement. *South African Journal of Education*, *39*(1).

Tokan, M. K., & Imakulata, M. M. (2019). The effect of motivation and learning behaviour on student achievement. *South African Journal of Education*, *39*(1).

Tölkes, C. (2018). Sustainability communication in tourism–A literature review. *Tourism Management Perspectives*, *27*, 10-21.

Tomaszewski, L. E., Zarestky, J., & Gonzalez, E. (2020). Planning qualitative research: Design and decision making for new researchers. *International Journal of Qualitative Methods*, *19*, 1609406920967174.

Tovey, T. L., & Skolits, G. J. (2022). Conceptualising and engaging in reflective practice: Experienced evaluators' perspectives. *American Journal of Evaluation*, *43*(1), 5-25.

Tovey, T. L., & Skolits, G. J. (2022). Conceptualising and engaging in reflective practice: Experienced evaluators' perspectives. *American Journal of Evaluation*, *43*(1), 5-25.

Trionfetti F. (2000). Discriminatory public procurement and international trade. *World Economy23(1):*57-76.

Trudel, R. (2019). Sustainable consumer behavior. *Consumer psychology review*, *2*(1), 85-96.

Truong, N. B., Sun, K., Lee, G. M., & Guo, Y. (2019). Gdpr-compliant personal data management: A blockchain-based solution. *IEEE Transactions on Information Forensics and Security*, *15*, 1746-1761.

Tsafouros, A., & Roussos, P. A. (2020). The possible bottleneck effect of polyamines' catabolic enzymes in efficient adventitious rooting of two stone fruit rootstocks. *Journal of plant physiology*, *244*, 152999.

Tukamuhabwa B. R. (2012). Antecedents and consequences of public procurement non-compliance behavior. *Journal of Economics and Behavioral Studies.4*(1):34-46.

Turner III, D. W., & Hagstrom-Schmidt, N. (2022). Qualitative interview design. A Practical Guide for Novice Investigators." *The Qualitative Report* ,*15* (3), 754-760. https://doi.org/10.46743/2160-3715/2010.1178

Tutu, S. O., Kissi, E., Osei-Tutu, E., & Desmond, A. (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, *12*(1), 1-14.

Ülgen, V.S., Björklund, M., Simm, N. & Forslund, H. (2019). Inter-Organisational Supply Chain Interaction for Sustainability: A Systematic Literature Review. 11 (5488), 1-25, doi:10.3390/su11195488, Retrieved from:www.mdpi.com/journal/sustainability

Umeokafor, N., Windapo, A., & Evangelinos, K. (2019). Causal inferences of external–contextual domains on complex construction, safety, health, and environment regulation. *Safety science*, (*118)*, 379-388.

Usmani, Z., Sharma, M., Awasthi, A. K., Sivakumar, N., Lukk, T., Pecoraro, L., ... & Gupta, V. K. (2021). Bioprocessing of waste biomass for sustainable product development and minimising environmental impact. *Bioresource Technology*, *322*, 124548.

Uttam, K. & Roos C. (2015). Competitive dialogue procedure for sustainable public procurement. *Journal of Cleaner Production.86*(1):403-416.

Vahdani, S.M. Mousavi, H. Hashemi, M. Mousakhani, R. Tavakkoli-Moghaddam, A new compromise solution method for fuzzy group decision-making problems with an application to the contractor selection, Eng. Appl. Artif. Intell. 26 (2013) 779–788, https://doi.org/10.1016/j.engappai.2012.11.005

Vahdani, B., Mousavi, S.M., Hashemi, H., Mousakhani, M. & Tavakkoli-Moghaddam, R. (2013). A new compromise solution method for fuzzy group decision-making problems with an application to the contractor selection, *Eng. Appl. Artif. Intell. (26*), 779–788, https://doi.org/10.1016/j.engappai.2012.11.005

van Dijk, N., Tanas, A., Rommetveit, K., & Raab, C. (2018). Right engineering? The redesign of privacy and personal data protection. *International review of law, computers & technology*, *32*(2-3), 230-256.

Van Ruijven, B. J., De Cian, E., & Sue Wing, I. (2019). Amplification of future energy demand growth due to climate change. *Nature communications*, *10*(1), 2762.

Varpio, L., Paradis, E., Uijtdehaage, S., & Young, M. (2020). The distinctions between theory, theoretical framework, and conceptual framework. *Academic Medicine*, *95*(7), 989-994.

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*, *18*, 1-18.

Vaughn, L. M., & Jacquez, F. (2020). Participatory research methods–Choice points in the research process. *Journal of Participatory Research Methods*, *1*(1), 13244.

Vejaratnam, N., Mohamad, Z. F., & Chenayah, S. (2020). A systematic review of barriers impeding the implementation of government green procurement. *Journal of public procurement*, *20*(4), 451-471.

Voinea, C. L., & Fratostiteanu, C. (2018). *Corporate Social Responsibility in Emerging Economies: Reality and Illusion*. Routledge.

von Schönfeld, K. C., & Ferreira, A. (2021). Urban planning and european innovation policy: Achieving sustainability, social inclusion, and economic growth? *Sustainability*, *13*(3), 1137.

Walsh, Z., Böhme, J., & Wamsler, C. (2021). Towards a relational paradigm in sustainability research, practice, and education. *Ambio*, *50*(1), 74-84.

Walker, H., & Brammer, S. (2009). Sustainable procurement in the United Kingdom public sector. *Supply Chain Management: An International Journal*, *14*(2), 128-137.

Walker, H., & Brammer, S. (2012). The relationship between sustainable procurement and e-procurement in the public sector *Int J Prod Econ, 140,* 256-268

https://doi-org.salford.idm.oclc.org/10.1016/j.ijpe.2012.01.008

Walliman, N. (2010). Research methods: The basics. Routledge.

Wan, Z. (2019). Participant Selection and Access in Case Study Research. In *Challenges and Opportunities in Qualitative Research* (pp. 47-61). Springer, Singapore.

Wandosell, G., Parra-Meroño, M. C., Alcayde, A., & Baños, R. (2021). Green packaging from consumer and business perspectives. *Sustainability*, *13*(3), 1356.

Wang, B., Liang, Y., Zheng, T., Yuan, M., & Zhang, H. (2019). Optimisation of a downstream oil supply chain with new pipeline route planning. *Chemical Engineering Research and Design*, *145*, 300-313.

Weise, A., Büchter, R., Pieper, D., & Mathes, T. (2020). Assessing context suitability (generalisability, external validity, applicability, or transferability) of findings in evidence syntheses in healthcare—An integrative review of methodological guidance. *Research Synthesis Methods*, *11*(6), 760-779.

Weller, S. C., Vickers, B., Bernard, H. R., Blackburn, A. M., Borgatti, S., Gravlee, C. C., & Johnson, J. C. (2018). Open-ended interview questions and saturation. *PloS one*, *13*(6), e0198606.

WHO. (1994). *Global strategy on occupational health for all: The way to health at work.* Recommendation of the second meeting of the WHO Collaborating Centres in Occupational Health, Beijing, China. [Online]. Available: http://www.who.int/occupational_health/globstrategy/en/

Widiastuti, I., & Budiyanto, C. W. (2018). Applying an Experiential Learning Cycle with the Aid of Finite Element Analysis in Engineering Education. *Journal of Turkish science education*, *15*, 97-103.

Willems, T. (2018). Seeing and sensing the railways: A phenomenological view on practice-based learning. *Management learning*, *49*(1), 23-39.

Willig, C. (2013). *EBOOK: introducing qualitative research in psychology*. McGraw-hill education (UK).

Wilhelm, M. M., Blome, C., Bhakoo, V., & Paulraj, A. (2016). Sustainability in multi-tier supply chains: Understanding the double-agency role of the first-tier supplier. *Journal of Operations Management*, *41*(1), 4260. https://doi.org/10.1016/j.jom.2015.11.001

Willig, C. (2019). Ontological and epistemological reflexivity: A core skill for therapists. *Counselling and Psychotherapy Research*, *19*(3), 186-194.

Wilson, K., Roe, B., & Wright, L. (1998). Telephone or face-to-face interviews?: a decision made on the basis of a pilot study. *International journal of nursing studies*, *35*(6), 314-321.

Winiarska, A. (2017). Qualitative longitudinal research: Application, potentials, and challenges in the context of migration research. *CMR Working Papers, 103*(161), 1-29. https://depot.ceon.pl/bitstream/handle/123456789/15189/WP103161.pdf?sequence=1 &isAllowed=y

Wiprächtiger, M., Haupt, M., Heeren, N., Waser, E., & Hellweg, S. (2020). A framework for sustainable and circular system design: Development and application on thermal insulation materials. *Resources, Conservation and Recycling*, *154*, 104631.

Witjes, S. & Lozano R. (2012). Towards a more circular economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resources, Conservation and Recycling. 112*(9): 37-44.

Wong-Parodi, G., & Feygina, I. (2020). Understanding and countering the motivated roots of climate change denial. *Current Opinion in Environmental Sustainability*, *42*, 60-64.

World Commission on Environment and Development (1987). Our common future—The Brundtland report, Report of the World Commission on Environment and Development, *World Commission on Environment and Development.*

Wu, Z., Shen, L., Ann, T. W., & Zhang, X. (2016). A comparative analysis of waste management requirements between five green building rating systems for new residential buildings. *Journal of Cleaner Production*, *112*, 895-902. Prod. 112, 895e902. https://doi.org/10.1016/ j. jclepro.2015.05.073.www.graphic.com.gh

Xue, Q., Wang, Z., & Chen, Q. (2022). Multi-objective optimisation of building design for life cycle cost and CO2 emissions: A case study of a low-energy residential building in a severe cold climate. In *Building Simulation (15)*1, pp. 83-98). Beijing: Tsinghua University Press.

Yang, C. S., Lu, C. S., Haider, J. J., & Marlow, P. B. (2013). The effect of green supply chain management on green performance and firm competitiveness in the context of container shipping in Taiwan. *Transportation Research Part E: Logistics and Transportation Review*, *55*, 55-73.

Yardley, L. (2000). Dilemmas in qualitative health research. *Psychology and health*, *15*(2), 215-228.

Yogalakshmi, K. N., & Singh, S. (2020). Plastic waste: Environmental hazards, its biodegradation, and challenges. *Bioremediation of Industrial Waste for Environmental Safety: Volume I: Industrial Waste and Its Management*, 99-133.

Yuan, M., Zhang, H., Wang, B., Zhang, Y., Zhou, X., & Liang, Y. (2020). Future scenario of China's downstream oil reform: Improving the energy-environmental efficiency of the pipeline networks through interconnectivity. *Energy Policy*, *140*, 111403.

Zaidi, S. A. H., Mirza, F. M., Hou, F., & Ashraf, R. U. (2019). Addressing the sustainable development through sustainable procurement: What factors resist the implementation of sustainable procurement in Pakistan?. *Socio-Economic Planning Sciences*, *68*, 100671.

Zaid, A.A., Jaaron, A.A. and Bon, A.T. (2018), "*The impact of green human resource management and green supply chain management practices on sustainable performance: an empirical study*", Journal of Cleaner Production, Vol. 204, pp. 965-979.

Zhang, H., Leung, X. Y., & Bai, B. (2021). Destination sustainability in the sharing economy: a conceptual framework applying the capital theory approach. *Current Issues in Tourism*, 1-18.

Zhang, Y., Jia, X., Liu, S., Wu, K., Zhang, J., & Conibeer, G. (2021). Explore the correlation between intervalley scattering and phonon bottleneck effect on the hot carrier relaxation in bulk GaSb and InN for hot carrier solar cells. *Journal of Applied Physics*, *130*(20), 205705.

Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). Philosophy and paradigm of scientific research. *Management culture and corporate social responsibility*, *121*.

Żywiołek, J., Rosak-Szyrocka, J., & Mrowiec, M. (2021). Knowledge Management in Households about Energy Saving as Part of the Awareness of Sustainable Development. *Energies*, *14*(24), 8207.

Zeng, X., Yu, Y., Yang, S., Lv, Y., & Sarker, M. N. I. (2022). Urban resilience for urban sustainability: Concepts, dimensions, and perspectives. *Sustainability*, *14*(5), 2481.

Zhao, J., & Li, S. (2022). Life cycle cost assessment and multi-criteria decision analysis of environment-friendly building insulation materials-A review. *Energy and Buildings*, *254*, 111582.

Zhongming, Z., Linong, L., Xiaona, Y., Wangqiang, Z., & Wei, L. (2021). Let's build food systems for people, planet, and prosperity. *World Business Council for Sustainable Development,* http://119.78.100.173/C666/handle/2XK7JSWQ/339118

Zhu, Q., Geng, Y., & Sarkis, J. (2013). Motivating green public procurement in China: An individual level perspective. *Journal of environmental management, 126*, 85-95.

Appendix

Interview Questions:

Question 1.	Informed by	Comments	Notes
1. How long have you been working with the Electricity Company of Ghana?	Weller et al (2018), Roberts (2020) & Roulston, K (2021).	Question 1 has been designed to elicit the level of experience of the interviewees in ECG.	introductory question will seek to leverage on participants' experiences and to help answer objective 2
Question 2. What about your professional life in ECG?	Turner III & Hagstrom-Schmidt (2022).	Q.2 is to categorize interviewee	To identify human capacity in addressing sustainability procurement issues and answer objective 2 & 3
Question 3. What has been the mode or process of buying products for ECG?	Roberts (2020), Roulston, K (2021)	Q.3 is to find out the general knowledge of the procurement process in ECG	Answer objective 2 & 3
Question 4. What do you know about sustainability?	Weller et al (2018) & Roberts (2020).	Question 4 is meant to test the knowledge of interviewee on sustainability	To identify human capacity in addressing sustainability procurement issues and answer objective 2 & 3
Question 5. Does ECG practice sustainability procurement?	Weller et al (2018) & Roberts (2020).	Q.5 will look out for any mention of the sustainability mix of Environment, Social and Economic	based on answer to Q4, Q5 will be used to probe further on the subject
Question 6. How would it benefit ECG to practice Sustainability procurement?	Roberts (2020) and Turner III & Hagstrom-Schmidt (2022).	Q.6 would solicit interviewee views on benefits of sustainability	Answer objective 3
Question 7. Would you support a policy change in ECG for sustainability procurement?	Weller et al (2018) & Roberts (2020).	Q.7 will serve as reference to the percentage of participants that will want to see the practice of sustainability in ECG	Answer objective 3
Question 8. On a scale of 1 to 10 how would you rank sustainability in ECG?	Weller et al (2018) & Roberts (2020) and Turner III & Hagstrom-Schmidt (2022)	Q.8 will tell us how important participants view sustainability	i.e., 1=not important, 10=very important: Answer objective 3

CONSENT FORM

Study title: *Sourcing Sustainability Products for Desired Outcome- A Case of Public Sector Procurement at Electricity Company of Ghana*

Researchers name:

Student number:
Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet and I have had the opportunity to ask questions about the study.	
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher.	
I understand that special category information (i.e. Profession, Experience, Gender etc.) will be collected about me to achieve the objectives of the study.	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g. my name will not be used).	
I wish to be sent the anonymous findings or have someone from my team share this with me.	

Name of participant (print name).....

Signature of participant.....

Date.....

Name of Researcher (print name).....

Signature of researcher .....*Date:*.....

DOCTORAL SCHOOL

Participant Information Sheet (PIS)

1) Title of study: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.

2) Name of Researcher: Raymond Afari Sam, Doctor of Business Administration (DBA) Student at the University of Salford

3) Invitation paragraph:
You are being invited to take part in a research project "Using sustainable variables in the goods procurement Tendering process: A case of the electricity distributer in Ghana". Before you decide on whether to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully before you decide whether you wish to take part. You are welcome to discuss this project with others before you make your decision. Please contact me by email:R.A.Sam@edu.salford.ac.uk, if there is anything that is not clear or if you would like more information.

4) Primarily the purpose of this research study is to fulfill a requirement as part of a Doctor of Business Administration (DBA) course. It will seek your opinion on issues related to sourcing and use of sustainable Products by the Electricity Distribution Company of Ghana (EDG) with the aim of improving the tendering process in goods procurement.

5) You have been chosen among 20 stakeholders in the procurement of goods in EDG for being a Supplier/User/Buyer of goods used at EDG.

6) Taking part in the research is entirely voluntary. If you do decide to take part, you will be given this information sheet to keep and asked to sign a consent form. You may still withdraw at any time without it affecting you in any way. Please, note that the University may continue to process the information or samples you have already provided. It will only do this for research purposes and in a way that you cannot be identified.

7) You will be expected to be interviewed on issues related to EDG sustainable product procurement practices. Examples will be the extent to which the supply chain activities promotes or otherwise:

good health and safety requirements, the pollution of the environment/waste generation or waste management/environmental protection, the depletion of natural resources, end of product life recovery, recycling etc.

The interview will be open-ended. Will not go beyond one (1) hour and would be done on "face-to-face" bases, virtual/video conference or by phone call (which ever will be convenient to the participant).

Interview will be audio recorded and transcribed for purely research or academic purpose. Data protection and confidentiality of participants will be respected per the UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018.

The audio recordings of your comments and conversations will only be used for analysis. No other use will be made of the recordings without your written permission.

8) There would be no need for any expense on your part as a participant since the researcher will visit your chosen location/premise or call via phone/virtual at participant's convenience or set time.

9) The information we get from the study will help to improve transparency and fairness in the goods procurement tendering process and your participation in this research helps us to achieve that.

10) If you have a concern about any aspect of this study, you should ask to speak to the researcher, Raymond Afari Sam, email: R.A.Sam@edu.salford.ac.uk, who will do his best to answer your questions.

11) Participant's confidentiality will be safeguarded during and after the study. Participants Data will be stored by encryption, anonymised and later destroyed according to UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018. Specifically, the following will used to safeguard data:

- A master list identifying participants to the research codes data, and all electronic data will be held on a password protected computer accessed only by the researcher.
- Authorised persons such as the research team and supervisors will have access to view identifiable data.

DOCTORAL SCHOOL

DECLARATION 1 FORM
Declaration of Originality by Postgraduate Candidate
(first submission of thesis)

1

Candidates for postgraduate degrees must present this completed form along with the electronic version of the thesis (pdf format) to SA-PGR@salford.ac.uk AskUS, Student Administration, ground floor, University House and the candidate's Research Support Officer.

Name of candidate (in BLOCK CAPITAL LETTERS as it appears on the thesis)

RAYMOND AFARI SAM

Student number: .....**@00383076**.....

School: ..... **SALFORD BUSINESS SCHOOL**.....

Thesis Title: **Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana**

Degree (PhD, DMA, **Professional Doctorate**, MSc, MPhil, MRes – Please specify): **Doctor of Business Administration (DBA)**.....

This is to certify that the copy of my thesis, which I have presented for consideration for my postgraduate degree: -

1. embodies the results of my own course of study and research
2. has been composed by myself
3. has been seen by my supervisor before presentation
4. has been granted the appropriate level of ethics approval

If you have Reasonable Adjustment Plan, please indicate if you would like this to be shared with your examiners

.....**NA**.....

Signature of candidate: ..... Date:...30-05-2024.....

Address (to which information concerning the examiners' decision can be sent):

.....**R.A.Sam@edu.Salford.ac.uk**.....

.....

The candidate's supervisor is asked to declare here that to the best of their knowledge the candidate has complied with the conditions for their candidature and Ethics Review requirements, and that the title proposed for the thesis/portfolio/report is appropriate. If the supervisor decides to withhold approval, the candidate shall have the right of appeal to the Associate Dean of Research and Innovation. A candidate may be permitted to submit a thesis despite the Supervisor withholding approval, providing the Associate Dean of Research and Innovation approves submission

HeCoS codes (please add up to 3 HeCoS codes which best fit with the student's research area)

.....

Sep 2023 v2
Form owned by the Doctoral School

DOCTORAL SCHOOL

DECLARATION 1 FORM
Declaration of Originality by Postgraduate Candidate
(first submission of thesis)

1

Signature of Supervisor: ..... Date: .....

[For your information the dates of the Postgraduate Research Awards Board are published here https://testlivesalfordac.sharepoint.com/sites/DoctoralSchoolHub/SitePages/Postgraduate-Research-Awards-Board-(PRAB)-Dates.aspx]

Please note that the completed declaration form must accompany the thesis when submitted to Student Administration via SA-PGR@salford.ac.uk

Raymond Sam

From: ethics
Sent: Sunday, 5 March 2023 6:35 pm
To: Raymond Sam
Cc: Neil Robinson
Subject: Ethics Application: Panel Decision

Importance: Low

The Ethics Panel has reviewed your application: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.
Application ID: 10744

The decision is: Application Approved.

If the Chair has provided comments, these are as follows:

Comments

This application is to an extent appropriately completed- however the content and descriptions are hypothetical- the researcher will benefit by evaluating the sanitised justifications of their research choices-

Indeed, the applicant is advised to be clearer regarding their research objectives- which are mainly hopeful activities-

Find Sustainable Procurement variables for tender evaluation...

Create a template that will include sustainable variables ...

Test the template using goods, ...

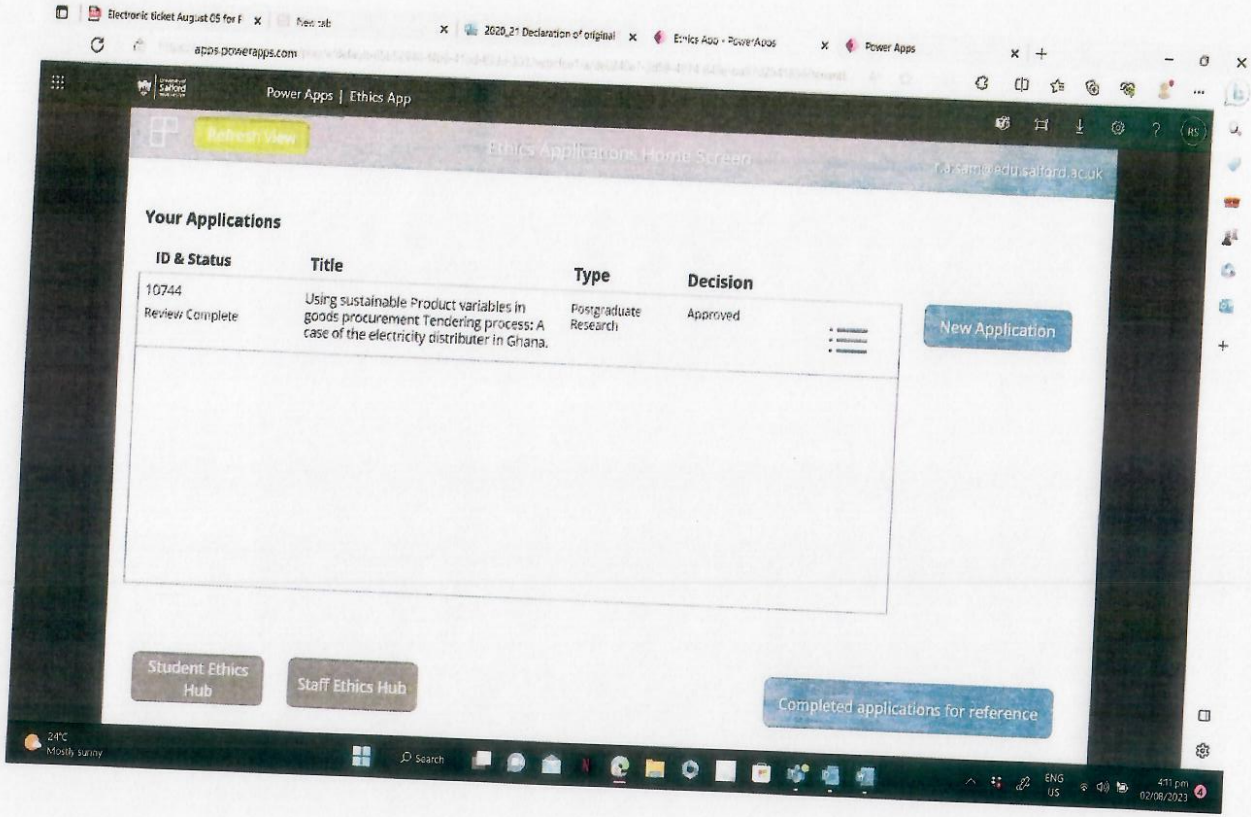
their research strategy and approach and tools- somehow are all dependant on finding the **right gatekeepers**, and then dependent on the **right respondents**- their claim of **inductive** approach is not appropriate and on shaky grounds- considering the description of the research- how will they design interview questions considering their claim-

what is pasted in the description of research is a long - basically a hypothetically justified account/claims

You will no longer be able to edit your application in the system.

Link to the Ethics Application Tool: https://apps.powerapps.com/play/de0240e7-3d59-4974-849e-ba87d2541856?tenantId=65b52940-f4b6-41bd-833d-3033ecbcf6e1

1


Power Apps | Ethics App
Refresh View
Ethics Applications Home Screen
Your Applications
ID & Status
Title
Type
Decision
10744
Review Complete
Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.
Postgraduate Research
Approved
New Application
Student Ethics Hub
Staff Ethics Hub
Completed applications for reference

DOCTORAL SCHOOL

CONSENT FORM

Study title: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: ES-2 G

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (***dated 23.05.2023***) *for the above study* and I have had the opportunity to ask questions about the study.	YES
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	YES
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	YES
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	YES
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	YES
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	YES
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	YES
I wish to be sent a copy of the anonymous findings.	YES

Name of participant (print name) DANIEL AMOATO

Signature of participant.....

Date.....06 - 06 - 2023

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher .....

Date.....23-05-2023.....

[23.05.2023] [Version Number 1]

[reference: ES-2E]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: *IS- 2P*

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (dated 23.05.2023) for the above study and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) FREDERICK A. MYADROH

Signature of participant

Date 23/05/2023

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher

Date.....23-05-2023.....

[23.05.2023] [Version Number 1]

[reference: IS-2P]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: *IS-1 E*

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (dated 23.05.2023) for the above study and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) ELI ATTAKPAH

Signature of participant

Date 23/05/23

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher

Date.....23-05-2023.....

[23.05.2023] [Version Number 1]

[reference: ES-2E]

CONSENT FORM

Study title: Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: ES 2 G

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (***dated 23.05.2023***) for the above study and I have had the opportunity to ask questions about the study.	RSM
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	RSM
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	RSM
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	RSM
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	RSM
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	RSM
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	RSM
I wish to be sent a copy of the anonymous findings.	RSM

Name of participant (print name) ROBERT LARBI-MENSAH

Signature of participant [signature]

Date 1ST AUGUST 2023

Name of Researcher (print name) RAYMOND AFARI SAM

Signature of researcher .....

Date 23-05-2023

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: ES-GG

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) ..... NANA TAWI DANIELS .....

Signature of participant.....

Date..... 30 - 03 - 2024 .....

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher .....

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: ES-GG]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: IS-PP

Participant Identification Number (if applicable*):*

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) ..... ATSU FRED .....

Signature of participant..... .....

Date..... 04-04-2024 .....

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher ....

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: IS-PP]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: IS-PP

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) Charles Dogbey

Signature of participant.....

Date..... 03/04/2024

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher ..... Ray Sam

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: IS-PP]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: IS-PP

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) EUNICE NAANA QUAMPAH (MRS)

Signature of participant.....

Date 26-03-2024

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher .....

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: IS-PP]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: ES-E

Participant Identification Number (if applicable*):*

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) ..... REGINALD PAPAFIO

Signature of participant.....

Date..... 30th March 2024

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher .....

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: ES-E]

DOCTORAL SCHOOL

CONSENT FORM

Study title: Evaluating Tender Using Sustainable Products Model in Goods Procurement: A case of the electricity distributer in Ghana.

Researchers name: ***Raymond Afari Sam***

Ref number: ES-GG

Participant Identification Number (if applicable):

Please initial the box(es) if you agree with the statement(s):

I have read and understood the Information sheet (***dated 01.03.2024***) *for the above study* and I have had the opportunity to ask questions about the study.	✓
I agree for my interview to be audio recorded for the purpose of this study. I will be told when the recording starts and when the recording stops.	✓
I understand that my recording will be transcribed (typed up), anonymised (any names removed) and then analysed by the researcher Raymond Afari Sam.	✓
I understand that special category information (i.e., Age, gender, ethnicity, Senior Staff, Profession etc.) will be collected about me to achieve the objectives of the study.	✓
I agree to take part in this research project and agree for my data to be used for the purpose of this study or support other research in the future.	✓
I understand that I may withdraw from the study at any point. Should I withdraw once the interview is completed, the information collected may still be used to complete the study.	✓
I understand that what I have said may be quoted directly in reports of the research but that I will not be directly identified (e.g., my name will not be used).	✓
I wish to be sent a copy of the anonymous findings.	✓

Name of participant (print name) ..... Nii ANKRAH .....

Signature of participant..... .....

Date..... 28 - 02 - 24 .....

Name of Researcher (print name).....RAYMOND AFARI SAM.....

Signature of researcher ....

Date.....01-02-2024.....

[01.02.2024] [Version Number 2]

[reference: ES-GG]

APPENDIX – M

QUALITATIVE INTERVIEW QUESTIONS FOR INTERNAL STAKEHOLDERS OF THE ELECTRICITY DISTRIBUTION COMPANY IN GHANA

This interview is an academic exercise in partial fulfilment of a Doctor of Business Administration (DBA) award programme offered by the University of Salford.

The purpose of the interview is to seek your opinions in relation to issues associated with sourcing sustainable goods and use of sustainable products by the Electricity Distributor in Ghana (EDG) with the aim of improving their tendering process in goods procurement.

1. How long have you been working with the EDG organisation?
2. Can you briefly detail which department/s you have worked in during your employment time with EDG?
3. What are your expectations in relation to a product that has been bought for you to use?
4. With reference to the EDG procurement guide, consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?
5. In your opinion how would buying sustainable products benefit EDG in the context of improving employee health and safety?
6. How can buying sustainable products address environmental concerns in your work environment?
7. What, in your opinion, has been some of the challenges in obtaining sustainable products by EDG?
8. How can EDG improve its process for obtaining sustainable products?
9. According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with

environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.

Which of the following policies would you consider when buying sustainable products.

a) Health and safety policy.
b) Environmental policy.
c) Waste disposal policy.
d) Recycling policy.
e) Green Footprint policy.

10. EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of technical factor will you give to sustainable procurement technical requirements and why?

APPENDIX – X

QUALITATIVE INTERVIEW QUESTIONS FOR EXTERNAL STAKEHOLDERS / SUPPLIERS OF THE ELECTRICITY DISTRIBUTION COMPANY IN GHANA

This interview is an academic exercise in partial fulfilment of a Doctor of Business Administration (DBA) award programme offered by the University of Salford.

The purpose of the interview is to seek your opinions in relation to issues associated with sourcing sustainable goods and use of sustainable products by the Electricity Distributor in Ghana (EDG) with the aim of improving their tendering process in goods procurement.

1. How long has your organisation been supplying products to EDG?
2. Can you briefly detail which department/s you have worked in during your employment time with your organisation?
3. What product has your organisation been supplying to EDG?
4. With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?
5. In your opinion how would buying sustainable products benefit EDG in the context of improving employee health and safety?
6. How can buying sustainable products address environmental concerns in your work environment?
7. What, in your opinion, has been some of the challenges in supplying sustainable products to EDG?
8. How can EDG improve its process for obtaining sustainable products?
9. According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.

   Which of the following policies would you consider when buying sustainable products.

APPENDIX - 4

QUALITATIVE INTERVIEW QUESTIONS FOR INTERNAL STAKEHOLDERS OF THE ELECTRICITY DISTRIBUTION COMPANY IN GHANA

This interview is an academic exercise in partial fulfilment of a Doctor of Business Administration (DBA) award programme offered by the University of Salford.

The purpose of the interview is to seek your opinions in relation to issues associated with sourcing sustainable goods and use of sustainable products by the Electricity Distributor in Ghana (EDG) with the aim of improving their tendering process in goods procurement.

1. How long have you been working with the EDG organisation?
2. Can you briefly detail which department/s you have worked in during your employment time with EDG?
3. What are your expectations in relation to a product that has been bought for you to use?
4. With reference to the EDG procurement guide, consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?
5. In your opinion how has buying sustainable products benefited EDG in the context of improving employee health and safety?
6. How has buying sustainable products addressed environmental concerns in your work environment?
7. What, in your opinion, has been some of the challenges in obtaining sustainable products by EDG?
8. How has EDG improved its process for obtaining sustainable products?
9. According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with

environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.

Which of the sustainability policies would you consider when buying Sustainable Products?

10. EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. Of the technical factor what percentage weight will you give any sustainable procurement policy in place and why?

APPENDIX-2

QUALITATIVE INTERVIEW QUESTIONS FOR EXTERNAL STAKEHOLDERS / SUPPLIERS OF THE ELECTRICITY DISTRIBUTION COMPANY IN GHANA

This interview is an academic exercise in partial fulfilment of a Doctor of Business Administration (DBA) award programme offered by the University of Salford.

The purpose of the interview is to seek your opinions in relation to issues associated with sourcing sustainable goods and use of sustainable products by the Electricity Distributor in Ghana (EDG) with the aim of improving their tendering process in goods procurement.

1. How long has your organisation been supplying products to EDG?
2. Can you briefly detail which department/s you have worked in during your employment time with your organisation?
3. What product has your organisation been supplying to EDG?
4. With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?
5. In your opinion how has buying sustainable products benefit EDG in the context of improving employee health and safety?
6. How has buying sustainable products address environmental concerns in your work environment?
7. What, in your opinion, has been some of the challenges in supplying sustainable products to EDG?
8. How has EDG improve its process for obtaining sustainable products?
9. According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.

   Which of the sustainability policies would you consider when buying Sustainable Products?

10. EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of technical factor will you give to sustainable procurement technical requirements and why? Of the technical factor what percentage weight will you give any sustainable procurement policy in place and why?

ELECTRICITY COMPANY OF GHANA LTD.

MEMORANDUM

From: GM/Learning & Development

To: Raymond Afari Sam
M/Local Goods Procurement
(163058)

Ref: 163058/96

Date: 26 May 2023

Re: REQUEST FOR APPROVAL TO CONDUCT RESEARCH

Your letter dated 20th April 2023 on the above-mentioned subject matter has reference.

Approval has been granted for you to carry out the study on "Using Sustainable Product Variables in Goods Procurement Tendering Process: A case of the Electricity Distributor in Ghana" in the Company.

We wish you well.

SOLOMON N.A. MENSAH

The Director of Human Resource

Thro' GM/Goods Procurement 25/04/23

Electricity Company of Ghana

Eletro-Volta House

P. O. Box 521

Accra.

20th April 2023

RECEIVED
ELECTRICITY COMPANY OF GHANA LTD.
26 APR 2023
GLORIA A. A.
Signature of Recipient:

Dear Madam,

REQUEST FOR APPROVAL TO CONDUCT RESEARCH

I would like to request for your approval to conduct research in Electricity Company of Ghana (ECG).

I am a staff of ECG and currently with the procurement division.

The title of study is "Using sustainable Product variables in goods procurement Tendering process: A case of the electricity distributer in Ghana."

This research is an academic exercise in partial fulfilment of a Doctor of Business Administration (DBA) award programme offered by the University of Salford, UK.

The research will seek opinion on issues related to sourcing and use of sustainable Products by the Electricity Company of Ghana with the aim of improving the tendering process in goods procurement.

Taking part in the research will be entirely voluntary. An information sheet will be given to staff who decide to take part and asked to sign a consent form. Participants may still withdraw at any time without it affecting them in any way. Data obtained will only be used for research purposes and in a way that participants cannot be identified.

Participants will be expected to be interviewed on issues related to sustainable product procurement practices. Examples will be the extent to which the supply chain activities promotes or otherwise issues such as: good health and employee safety, pollution of the environment/waste generation, waste management/environmental protection, depletion of natural resources, end of product life recovery, recycling etc.

Interview will be video and/or audio recorded and transcribed for purely research or academic purpose. Organisation data protection and confidentiality of participants will be respected per the UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018.

The audio recordings of participant comments and conversations will only be used for analysis. No other use will be made of the recordings without participant written permission.

The information we get from the study will help to improve the procurement tendering process and participants in this research will help us to achieve that.

Data and participant confidentiality will be safeguarded during and after the study. Participants Data will be stored by encryption, anonymised and later destroyed according to UK General Data Protection Regulation (GDPR) and the Data Protection Act 2018. Specifically, the following will used to safeguard data:

- A master list identifying participants to the research codes data, and all electronic data will be held on a password protected computer accessed only by the researcher.
- Authorised persons such as the research team and supervisors will have access to view identifiable data.

Results of the research study will be published and made available to participants upon request. Participants will, however, not be identified.

The University may keep the data and use it in future studies. In such case it will only be in a completely anonymised way.

The participant, who should be an adult, i.e., 18 years and above, will be given a copy of the Participants Information Sheets (PIS) and a signed consent form to keep.

Approval is kindly being sought to conduct the above-mentioned study in ECG.

Yours sincerely,

Raymond Afari Sam
(Manager/ Local Goods Procurement)
Staff No. 163058

Transcript (Edited)

Date of interview : June 16, 2023, 12:32PM

Interviewee's location, position in organization: **Accra-Ghana, Chief Executive Officer**

Stakeholder type/ Reference: **External/ES-1G**

Question 1.
How long has your organization been supplying product to EDG?

Answer (from interviewee)
"approximately about 12 years."

Interpretation (via interviewer)
Having supplied goods to EDG for 12 years is an indication that interviewee is familiar with the **procurement process** in EDG. Respondent appears to also to have had company registered with the **Registrar General department** in Ghana, under the Ghana company code. This is because firms or organisations cannot operate in Ghana without being registered with the Registrar General's department.

Key themes to emerge from interview (NVivo 12).
EDG procurement process, Registrar General department in Ghana

Question 2.
Can you briefly detail which department/s you have worked in during your employment time with your organisation?

Answer (from interviewee)
"I'm the chief executive officer of the organization. So, I coordinate, literally, all the activities, but with my other managers, so chief executive."

Interpretation (via interviewer)
It was clear from the respondent's answer that he was in a **decision-making** and **policy formulation** position with the organisation.

Key themes to emerge from interview (NVivo 12).
CEO, 'Policy formulation' and 'decision-making'

Question 3.

What product has your organisation been supplying to EDG?

Answer (from interviewee)

"we've been supplying computing and accessories and we've been supplying electronics. So let me break the two down. So, with computing we have normal computers, laptops, mouse, keyboards and when we come to electronics within the electronics sector. We have two divisions, so we have the main electronics, that is the TV's and tabletop fridges and we have also the other side of the electronics, the protection electronics."

Interpretation (via interviewer)
From the answer it was obvious that the supplier supplied ICT products with accessories to EDG. Such products need licensing such as manufactures certificate from the manufacturer to deal or distribute products.

Key themes to emerge from interview (NVivo 12).

products licensing, manufactures certificate.

Question 4.
With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?

Answer(from interviewee)

"from my view, initially, when I started supplying, I believe that it wasn't really well thought through, but around the 2016, 2017 going you realize that EDG is doing a bit better than before in terms of when they specify the product they want, in terms of products which can be recycled easily and when if it goes out of service, so that they don't lie down and creates problems in terms of creating damage and stuff.
So currently, EDG has improved far better than before, and I believe that going forward they will learn from now and become even better. With so much information on sustainable goods available EDG can rely on it and become better. So right now they are far better than before."

Interpretation (via interviewer)
The interviewee detailed how EDG for the past decade had been adopting **sustainable practices** in the **procurement process.** Mention was made of **product recycling, product**

disposal, product safety, sustainable goods etc. interviewee was, however, optimistic that ECG could do better with procuring sustainable products.

Key themes to emerge from interview (NVivo 12).
sustainable practices, procurement process, product recycling, product disposal, product safety, sustainable goods.

Question 5.
In your opinion how would buying sustainable products benefit EDG in the context of improving employee health and safety?

Answer(from interviewee)
"buying sustainable products would impact positively on the health and safety of its employees. When you buy something which, it is not of a quality. For example, let's take a television. You have a television or a fridge, and that fridge is a four-star fridge. It means that energy consumption wise is very good.
And then when he uses the right gas, the right gas available, you don't get bad fumes coming out of the fridge, affecting the lungs and stuff of staff."

Interpretation (via interviewer)
The interviewee was of the view that while sustainable products impact positively on employee health & safety, **highly rated and green products** are also less **hazardous to human health.** This was clearly captured in the statement, "You have a television or a fridge, and that fridge is a four-star fridge. It means that energy consumption wise is very good" and "when he uses the right gas, the right gas available, you don't get bad fumes coming out of the fridge, affecting the lungs".

Key themes to emerge from interview (NVivo 12).

highly rated green products, hazardous products.

Question 6.

How can buying sustainable products address environmental concerns in your work environment?

Answer(from interviewee)
"when the product is very sustainable and one within, the company saves a lot of money within their work environment. It saves a lot of money too. So, it does not repeat buying the same product over within the shortest possible time. Money is saved too. 2 the work environment, when the product is sustainable, it gives the right environment.
You have a right environment to work in. You don't have pollutants and stuff around, so the work environment is really clean, and you know it's very clean. So in all you realize that

longevity of the product is assured as well, and then the environment itself also safe place to work in as well."

Interpretation (via interviewer)
According to the interviewee sustainable products **saves cost** and are **durable (longevity)**. They are **environmentally friendly** and does not **pollute the atmosphere.**

Key themes to emerge from interview (NVivo 12).

saves cost, durable(durability), environmentally friendly, pollute the atmosphere.

Question 7.

What, in your opinion, has been some of the challenges in supplying sustainable products to EDG?

Answer(from interviewee)
Question was skipped since interviewer believed it had been answered in the previous answer (i.e., for question 6)

Question 8.

How can EDG improve its process for obtaining sustainable products?

Answer(from interviewee)
"EDG can **collaborate** with distributors and research to get the right sustainable product for its environment. It can collaborate with, so you, there's so many information online, companies and United Nations have its own **sustainable policies**. And so, it can **collaborate with distributors**. The second thing is EDG himself can do its own personal investigation. You know, their procurement team can have a **section where they can really investigate about the products** they want. Look at the market.
..... positive feedback and ... can just (be communicated to) their supplies (that) this is exactly what we want, and then by doing that, they can have the right sustainable product."

Interpretation (via interviewer)

The respondent was of the opinion that **buyer/seller collaboration** could be a vital approach to introducing sustainable products to EDG. Interviewee further indicated that existing **sustainable policies** of companies and the United Nations could be a starting point to introducing sustainable products to EDG. Again, EDG can set up a **sustainability unit to exclusively research** and make recommendations for the introduction of sustainable products.

Key themes to emerge from interview (NVivo 12).

buyer/seller collaboration, sustainable policies, sustainability research unit.

Question 9.

According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.
Which of the following policies would you consider when buying sustainable products.

a. Health and safety policy.
b. Environment Policy.
c. Waste disposal policy.
d. Recycling policy.
e. Green Footprint policy.

Answer(from interviewee)
"I would consider. And the reason why I would consider is and when you have a healthy environment and a healthy staff, then your work can go on well….. every time your staff or the environment is not conducive. It's not healthy. There's no safety in there. Nobody will come to work. Who loses? the company. So, I'm going to consider that…. I would consider the environment (policy) as well, because when your environment, you might be saying that ohh! it's my workplace I can't be bothered about their rest, but when there's a problem around you, it will come back again to you…. Waste disposal policy is very key. The way we dispose, or we even handle waste within EDG is key, so that sometimes products are in good shape. But if you don't know, you will dispose it off and it become cost…. EDG, the main company, has sometimes old stock, and they're able to recycle or sell it to people in recycle so that they can reuse it. So, it is very key that we don't just dump them in landfills, but if these products can be recycled and used for another product, why not?... Green footprint policy, normally because it's mostly within the advanced country, where you are paid or you are giving points for how best to use sustainable product. And when it comes to, normally, Africa, we are not, there is no encouragement for that. So, what I will say is, I would consider that if the government can give EDG some points, for example, and if EDG imports a product and they meet all these standards, they get a discount on import duty…"

Interpretation (via interviewer)

Interviewee appeared to have a fair knowledge of all five policies of : **Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy** and the cost and benefits accruing from them. It was realised that Green Footprint policy is **not used in Ghana as in other advanced countries**. This could be found from the statement, "Green footprint policy, normally because it's mostly within the advanced country, where you are paid, or you are giving points for how best to use sustainable product". Interviewee, therefore, recommended its introduction in EDG where companies are given **points or rebates for using such policy**.

Key themes to emerge from interview (NVivo 12).
These are apriori codes: Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy. Other themes: not used in Ghana as in other advanced countries, points or rebates for using such policy.

Question 10.

EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of technical factor will you give to sustainable procurement technical requirements and why?

Answer(from interviewee)
"I'll give and the technical and I'll give it **60%**.
The reason being that uhm you buy this sustainable product to use it for the long haul. So technically that products have to be up to the scratch. You need to be excellent, the **technical specifications** have to be excellent because you can't spend maybe $1,000,000 on a product and within one year it's not marching the technical specification. Secondly, and the reason why I will give technical specification is that kind that product, the product has to be upgradable. So, these for example, you have a desktop and currently the technical specification is about maybe one terabyte and then a memory is maybe 8 gig. Technically, can the product be **upgradable** in the next three to five years? So, can we upgrade the memory to about 16 gig and can we upgrade the hard drive to maybe 2 terabytes without buying the whole product again? So, the company then saves money technically, so the technical specification I would give 60%... there, it's a **combination of the technical with a sustainable**, it needs to be part, ... the **sustainable has to be part of the technical**."

Interpretation (via interviewer)

The interviewee was of a strong opinion that a weight of 60% should be given to sustainable technical specification with the remaining 40% going to other technical requirement of a product. Respondent opined, for example, that if a product can be upgraded to last longer than usual it could be considered as sustainable. He agreed that sustainable product has to be part of the technical specification.

Key themes to emerge from interview (NVivo 12).
60% technical specifications for sustainable products, upgradable.

Please note these are edited highlights from interview 1. A full transcript of the interview can be made available upon request.

Transcript (Edited)

Date of interview : June 6, 2023, 11:01AM

Interviewee's location, position in organization: **Accra-Ghana, Chief Executive Officer**

Stakeholder type/ Reference: **External/ES-2G**

Question 1.

How long has your organization been supplying product to EDG?

Answer (from interviewee)

It's been about, close, to 14 years.

Interpretation (via interviewer)

Having supplied goods to EDG for 14 years is an indication that interviewee is familiar with the **procurement process** in EDG. Respondent appears to also to have had company registered with the **Registrar General department** in Ghana, under the Ghana company code. This is because firms or organisations cannot operate in Ghana without being registered with the Registrar General's department.

Key themes to emerge from interview (NVivo 12).

EDG procurement process, Registrar General department in Ghana

Question 2.

Can you briefly detail which department/s you have worked in during your employment time with your organisation?

Answer (from interviewee)

"This is a business of which I am a 90% shareholder and if I'm to put it more appropriately, then, you are dealing with the business owner or I'm the CEO of the company.
... Basically, I determine the policy direction for the organization."

Interpretation (via interviewer)

It was clear from the respondent's answer that he was in a **decision-making** and **policy formulation** position with the organisation. "I am a 90% shareholder and if I'm to put it more appropriately, then, you are dealing with the business owner or I'm the CEO of the company".

Key themes to emerge from interview (NVivo 12).

CEO, 'Policy formulation' and 'decision-making', 90% Share holding.

Question 3.

What product has your organisation been supplying to EDG?

Answer (from interviewee)

"Initially we started doing **printing** with EDG, but as a business, we also realized that, uh, they (EDG) were in need of other services and so straight away we needed to **diversify** to meet those needs and so we are also into the area of supplies which centers on **office supplies** mainly toners and stationary items like stapler, when they need **office stationary** also like printers, computers and book, we diversify and then we go into those areas as well".

Interpretation (via interviewer)

The interviewee made it clear of an initial business focus area as printing but identified then opportunity to diversify into the supply of other products needed by EDG. This was captured in the statement, "we needed to diversify to meet those needs and so we are also into the area of supplies which centers on office supplies mainly toners and stationary items like stapler, when they need office stationery also like printers, computers". Some of the products, such as computers, need licensing from the manufacturer to deal or distribute products.

Key themes to emerge from interview (NVivo 12).

Printing, diversify, office supplies, office stationery, products licensing, manufactures certificate.

Question 4.

With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?

Answer(from interviewee)

"Well, I think they have, they [have] a certain standard and they expect you to **meet those standards** and so for us as suppliers, **we cannot delve deeper into their activities**. But [what] we can say is that with the sort of requirements that they put across it means that they are very particular about certain things. And **I'm sure** this sustainable product is something that, they take very much into consideration when doing their things.
But they're very particular and they set a **very high standard**, that we need to follow in, as it were, meeting the sort of demands that they want, and so I'm sure they take into account all these sustainable issues. That is why they give us such high standard for us to meet [] But I think they take into account the substandard within the sustainable chain.".

Interpretation (via interviewer)

From the answer to question 4 it was obvious that the interviewee was not aware of any sustainable products strategy put in place by EDG. Such policy should be shared or captured

in all contract documents with suppliers. Interviewee uncertainty was captured in the statement, "And I'm sure this sustainable product is something that, they take very much into consideration when doing their things". However, respondent was clear on quality product standards required by EDG when he said, "But they're very particular and they set a very high standard, that we need to follow in, as it were, meeting the sort of demands that they want".

Key themes to emerge from interview (NVivo 12).

Very high standards, unawareness of sustainable product policy by EDG, substandard within the sustainable chain.

Question 5.

In your opinion how would buying sustainable products benefit EDG in the context of improving employee health and safety?

Answer(from interviewee)

"...as an organisation, as a huge organisation like that, I'm sure health issues or staff health should be of **prime concern to them** because obviously that will **increase their expenditure**. And so I believe that they take those things into account in order not for them to have a situation where [] businesses that they procure [from] or they undertake ends up, as it were, **affecting their Staffs medically**, which in the **long run they are going to pay** for, because their **staff depend on them on issues of medical support**".

Interpretation (via interviewer)

According to the respondent he was certain, "health issues or staff health should be of prime concern to" EDG. This, he believes, would increase organisational cost if not attended to. In the same vain sources of supply are investigated to avoid the supply of harmful products which in the "long run" will have negative health consequences on the EDG staff.

Key themes to emerge from interview (NVivo 12).

prime concern, increase organisational cost, harmful products, negative health consequences.

Question 6.

How can buying sustainable products address environmental concerns in your work environment?

Answer(from interviewee)

"Well, you see environmental issues for me, I see it as **a chain**. And so, once there is a break in the chain then it means that the rest cannot follow. And so, [], as an organization ourselves, [if] we do not take environmental issues seriously, then obviously we are going to **pass it on to others**. We also ensure that what we are offering them, [or] make, we **take particular notice or whatever is going out** because there are instances where **they identify your organisation, ...by the things you give to them.** And so, if there is an issue, let's say there is a damage on the goods or it is bad such that it gets to the place and **people inhale it and it gives them all manner of health issues or health complication it goes against our organizations** as well".

Interpretation (via interviewer)

Interviewee is of the opinion that environmental issues have a "chain" effect in the procurement process. particular attention must be taken not to dent organization image with environmentally harmful products that also affect staff health with complications.

Key themes to emerge from interview (NVivo 12).
"chain" effect, organization image, environmentally harmful products, affect staff health with complications.

Question 7.

What, in your opinion, has been some of the challenges in supplying sustainable products to EDG?
"it's something that is coming up and in our part of the world, it is **now actually creeping into our scheme of things** and so it's a bit difficult sometimes when you are looking for the best as I put forward earlier. **When you're looking for the best and it means that you need to comb around, not only in Ghana, but you need to look at other markets like elsewhere**, and sometimes there are a **lot of delays** because you want the best, you cannot just take anything and give it to your client so that it will bring another issue to you all together. You need to give your clients the best. And so sometimes there are bit of delays, but I think in a way it helps, but it is important that you **let the clients know that it is for your own good.** It is the best that I want for you. Also, what I expect on the part of the client is that he or she will not sit and **wait till everything is out of hand** before he gets to the supplier to say that. [] even with the UN they set some targets for the rest of the world for everybody to meet that target and in our part of the world, I mean, from the way things are, it takes a while and so it's important that we always try to get a balance".

Answer(from interviewee)
According to the interviewee sustainability issues are now "creeping" into the Ghana's procurement processes. Looking for sustainable products could cause some delays since supplier may have to look for them beyond the local market. Interviewee was of the opinion that communicating the cause of delay and benefit of diligently sourcing for sustainable products to the client or buyer is the best. He adviced the buyer to be proactive so they do not run out of stock of sustainable product. Mention was made about the UN's effort in championing the sustainability course.

Key themes to emerge from interview (NVivo 12).

"creeping" into the Ghana's procurement processes, delays, beyond the local market, communicating the cause of delay and benefit, proactive, UN they set some targets for the rest of the world.

Question 8.

How can EDG improve its process for obtaining sustainable products?

Answer(from interviewee)
"..there should be a **speed up in terms of its implementation.** I mean if it means that the set time and you can actually bring it forward and also … other **developing nations to catch up with the rest of the world**, so whatever effects one part of the world affects the other. And to those in the advanced world, if I'm to put it that way, once we set the target, they should also

see how best they can help the advancing countries to catch up as quickly as possible so that we can all benefit from it.

Interpretation (via interviewer)
The external stakeholder believes that processes to implement sustainability issues are long overdue and that developing nations should, "catch up with the rest of the world".

Key themes to emerge from interview (NVivo 12).
Implementation of sustainability issues, developing nations should, "catch up with the rest of the world".

Question 9.

According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.
Which of the following policies would you consider when buying sustainable products.

a. Health and safety policy.
b. Environment Policy.
c. Waste disposal policy.
d. Recycling policy.
e. Green Footprint policy.

Answer(from interviewee)
"I would consider that. Because I think it's also higher on the agenda (environmental policy), I think it's also higher (safety policy), it's worth considering (waste disposal policy), I think it's also important (recycling policy), I'll also want to consider that as part of what we do (green footprint policy), …"

Interpretation (via interviewer)

Interviewee agreed to have all five policies of : **Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy** in place.

Key themes to emerge from interview (NVivo 12).
These are apriori codes: Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy.

Question 10.
EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of technical factor will you give to sustainable procurement technical requirements and why?

Answer(from interviewee)
"I think that I will place it at 60%.. because there is a goal that we are all aspiring to that, we are all aspiring to reach as far as sustainable development goals are concerned so as part of the process to gets achieved the target. I think that if we are to place emphasis on it when it

comes to our procurement (sustainability) issues, it will also help so that in the long run, it can serve for our benefit. And so, I think I'll go for,I'll give it a 60"

Interpretation (via interviewer)
The interviewee was of a strong opinion that a weight of 60% should be given to sustainable. He thinks that to achieve sustainable development goals (SDG's) emphasis must be placed on procurement suatainablity.

Key themes to emerge from interview (NVivo 12).
60% technical specifications for sustainable products, SDG.

Transcript (Edited)

Date of interview : June 13, 2023, 02:31PM

Interviewee's location, position in organisation: **Accra-Ghana, Snr Procurement Officer**

Stakeholder type: **Internal** / IS-2P

Question 1.

How long have you been working with the EDG organisation?

Answer (from interviewee)

"20 years. I've been working here 20 years."

Interpretation (via interviewer)

Indeed, the interviewee demonstrated that he is a **procurement professional** with 20 years work experience. Respondent must, therefore, be very **conversant** with the procurement processes and policies in the EDG organisation.

Key themes to emerge from interview (NVivo 12).

"Procurement Professional, Familiar and experienced with EDG procurement process"

Question 2.

Can you briefly detail which department you have worked in during your employment time with the EDG?

Answer (from interviewee)

"I started with the customer service directorates. I worked there for 10 years, then, and change trade to procurement department and I've been there for 10 years and counting".

Interpretation (via interviewer)

From the response it was clear that interviewee have had a split working life with 2 departments, i.e., **Customer Service** and **Procurement**. Respondent could, therefore, be answering questions from a **professional viewpoint** as well as an **end user of products** bought by the organization.

Key themes to emerge from interview (NVivo 12).

Customer Service department, Procurement department, professional viewpoint, end user of products.

Question 3.
What are your expectations in relation to a product that has been bought for you to use?

Answer (from interviewee)
"my expectations are that the product should, do or I should use it to do what I want to do with it **efficiently**, so that, it should do what I expect from it. So **quality**, yes, you meet **quality standards** to do what I expect to use it for, yes."

Interpretation (via interviewer)
Interviewee expressly indicated **efficiency** and **quality standards** as what to look out for in a product bought for use.

Key themes to emerge from interview (NVivo 12).
Efficiency, quality standards

Question 4.
with reference to EDG procurement guide, consideration must be given to the buying of sustainable products. How has EDG Pursued this strategy?

Answer (from interviewee)
"It's not that good enough yet, but it's still ongoing. I wouldn't say it's up to scratch. Aiming at sustainable issues to make buying, no, I wouldn't say we've looked at that angle that much, that properly, yes."

Interpretation (via interviewer)
While the interviewee expressed **doubt about EDG buying sustainable products** when he said "It's not that good enough" yet he was quite **optimistic of it being considered** in the near future.

Key themes to emerge from interview (NVivo 12).
doubt about EDG buying sustainable products, optimistic of it being considered.

Question 5.
how would buying Sustainable products benefit EDG in the context of improving the employee health and safety?

Answer (from interviewee)
"I think it will benefit [EDG] because these days the Materials [Products] we use, ... we should be aiming at what should not affect our health. You know [the] side effect of chemicals and other things used that may not be natural. You know when we use these

materials [Products] and these goods, my expectation is that it should not affect us, our staff, negatively. If something at all, is it should live us .. nothing untoward, nothing negative so to speak."

Interpretation (via interviewer)
According to the interviewee we should be conscious about our health needs while buying products for use as an organisation. **Side effects from consuming or using chemical Products** should not have **negative consequences on staff health**. Interviewee seem to **advocate for natural products** when he said, "side effect of chemicals and other things used that may not be natural".

Key themes to emerge from interview (NVivo 12).
Side effects from consuming or using chemical Products, negative consequences on staff health, advocate for natural products.

Question 6.
How can buying sustainable products address environmental concerns in the work environment?

Answer (from interviewee)
"if we don't consider sustainability issues, we will also be leaving **organisms in the environment.** It will have some effects, positive effect on us, so, we should focus on that [buying sustainable products]".

Interpretation (via interviewer)
It could be explained from interviewee answer that the environment could be **polluted with organisms** that could affect life if we do not buy sustainable products. Therefore, buying sustainable products could be a **hygienic form of life preservation.**

Key themes to emerge from interview (NVivo 12).
polluted with organisms, hygienic form of life preservation.

Question 7.
What has been some of the challenges in obtaining sustainable products by the EDG?

Answer (from interviewee)
"Costs. And because other things that may not be sustainable will be a little bit on the affordable side, so probably, is the reason why EDG would want to be going to [buy them] and not going more into the sustainable issues. And I will say also that its ongoing, so we are catching up somehow".

Interpretation (via interviewer)
According to the interviewee **sustainable products tend to be expensive** when compared with **"unsustainable" products**. This could be the reason for EDG not buying sustainable products. However, interviewee hinted of **efforts being made on the part of EDG to buy sustainable products** in the statement, "I will say also that its ongoing, so we are catching up somehow".

Key themes to emerge from interview (NVivo 12).
Sustainable products tend to be **expensive**, "unsustainable" products, **efforts** being made on the part of EDG **to buy sustainable products.**

Question 8.
How can EDG improve its process for obtaining sustainable products?

Answer (from interviewee)
"I think by the companies we engage. If we send a word out there, what our intention and our policy directions are, then we'll select companies and make them aware. [] to a large extent it will improve the companies that approach us, because [] the companies we have available is what we will use. So, if from the start we put some education out there as to where the world is going now on sustainability issues and they also are aware and start towards that line, I'm sure as a company [we] will improve in that direction."

Interpretation (via interviewer)
It was clear from interviewee that by **engaging with its suppliers** of products EDG would be in a position to **corroborate** and educate them (suppliers) on its **sustainable policy directions**. This will improve on the **working relation between EDG and its suppliers**. Interviewee, therefore, advocated that EDG begin by **educating stakeholders on sustainability issues** and start **implementing them**.

Key themes to emerge from interview (NVivo 12).
Engaging with its suppliers, corroborate, sustainable policy directions, working relation between EDG and its suppliers, educating stakeholders on sustainability issues, implementing them.

Question 9.
According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development.
Which of the following policies would you consider when buying sustainable products. I would mention five policies that you would consider and at each mention you would indicate

whether you will consider that one.

a) Health and safety policy.

Answer (from interviewee)
Yes! very much so.

b) Environmental policy.

Answer (from interviewee)
Very much so, yes, I will consider that.

c) Waste disposal policy

Answer (from interviewee)
"To a large extent, yes. Why I would consider is, [because] our environment has been engulfed with waste. I think these are things we need to put in from the beginning of issues and transactions to prevent that happening at the end, yes."

d) Recycling policy

Answer (from interviewee)
Yes, yes.

e) Green Footprint policy

Answer (from interviewee)
Yes, very much so.

Interpretation (via interviewer)
While Interviewee agreed for the introduction of all five policies of : **Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy,** there was little demonstration of level of knowledge of all policies except Waste disposal where there was indication of a deteriorating situation, i.e., "our environment has been engulfed with waste". Interviewee, however, believes that such policies should be prioritised when initiating any transactions for preventive purposes.

Key themes to emerge from interview (NVivo 12).
These are apriori codes: Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy. Other themes: deteriorating situation, prioritised when initiating any transactions.

Question 10.
EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What

percentage weight of technical factor will you give to sustainable procurement technical requirements and why?

Answer(from interviewee)

"I will estimate some 40% for now. Like I mentioned earlier, we are heading there, but it appears we are not [there]. As a country we are not, that's, on that speed level. So, we need to encourage our suppliers ourselves, our all-other stakeholders to come along and in that encouragement, I think 40% will play it safe. So that we'll encourage one another and come along in the sustainability drive".

Interpretation (via interviewer)

Interviewee believes 40% weight of technical factor should go to sustainable product when evaluating bids or tenders. He advocated for an all stakeholder concerted efforts in making it a reality.

Key themes to emerge from interview (NVivo 12).

40% technical specifications for sustainable products, stakeholder concerted efforts.

Transcript (Edited)

Date of interview : June 7, 2023, 11:49AM

Interviewee's location, position in organization: **Accra-Ghana, Snr Procurement Manager, Electrical Engineer**

Stakeholder type/ Reference: **Internal/IS-1E**

Question 1.

How long has your organization been supplying product to EDG?

Answer (from interviewee)

"I've been there for 20 years".

Interpretation (via interviewer)

The respondent has been working with EDG for a minimum of 20 years. As a Senior manager in the procurement department and an Electrical Engineer by profession it can be said that he is a procurement practitioner.

Key themes to emerge from interview (NVivo 12).

Senior manager, Electrical Engineer, procurement practitioner, 20 years.

Question 2.

Can you briefly detail which department/s you have worked in during your employment time with your organisation?

Answer (from interviewee)

"I've primarily worked in two departments and three divisions. So, I started with the engineering department or directorate and worked in the R&D section and also the System planning section. Then I've also worked in procurement where I am now with their works and services division".

Interpretation (via interviewer)

Interviewee has had working experience in 3 department in EDG, i.e., engineering department, Research & Development (R&D), System planning, Procurement, "I've also worked in procurement where I am now with their works and services division". That puts the interviewee in a Practitioner position.

Key themes to emerge from interview (NVivo 12).

engineering department, Research & Development (R&D), System planning, Procurement Practitioner.

Question 3.

What are your expectations in relation to a product that has been bought for you to use?

Answer (from interviewee)

"the expectation is to make sure that, first of all, the purpose for which we requested the **product meets the expectation**. For example, if we ask of a particular **quality** in their particular **shelf life**, we expect that when we receive that product, it will satisfy us in terms of the **quality requirements** and also how long we are expecting to use the item. So basically those are the expectations []from a product".

Interpretation (via interviewer)

It was clear from the interviewee that a product bought should be able to meets the expectation, quality requirements and be durable, i.e., have a "particular shelf life" as "long [as] we are expecting to use the item".

Key themes to emerge from interview (NVivo 12).

meets expectation, quality requirements, durable.

Question 4.

With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?

Answer(from interviewee)

"EDG have considered sustainability and it's procurement in different ways. Even though it is still an area that is continuing to develop and receive attention. I mean procurement of **Transformers** for example, we'll make sure that the **oil** that is used in this Transformers are not products that will **injure the environment**. Now we also ensure that the **efficiency level of the Transformers** is very high so as not to be lossy, because a lossy transformer will mean that we need to generate more to service our customers. And by generating less through an efficient transformer, it means that we are **safeguarding the environment**, so that is the area in which we are looking at using sustainability. The other area at a point was in the **procurement of vehicles** and where **efficiency and maintenance cycles** were considered as part of the evaluation to make sure that for the same, kind of vehicle, we get an efficient vehicle using criteria that makes us and ensure that we get best value for the vehicles that we buy in terms of efficiency. So, for the **same price, we may get a better vehicle**, that's safeguards the environment as compared to the other. So, those are the areas that we've also looked at and also with our **wood poles procurements**, we make sure that the **treatments** that is used for our wood poles **meets specifications**. So that any **leakage into the environment** will not be **harmful to the community**. So those are the areas in which we are considering sustainability procurement decisions".

Interpretation (via interviewer)

From the answer to question 4 it was obvious that the interviewee had knowledge about sustainable products and their impact, though admitting that sustainability was in the early stages of consideration for inclusion in the procurement process. This was evident in the statement, "though it is still an area that is continuing to develop and receive attention". Examples of environmentally safe transformer oil, highly efficient transformers to safeguard the environment. Mention was also made about procurement of vehicles with high efficiency at competitive pricing. Wood poles treatments meets specifications to ensure no toxic leakages into the environment will harm the community around.

Key themes to emerge from interview (NVivo 12).

continuing to develop, environmentally safe transformer oil, safeguard the environment, vehicles with high efficiency, competitive pricing, Wood poles treatments, toxic leakages into the environment will harm the community around.

Question 5.

In your opinion how would buying sustainable products benefit EDG in the context of improving employee health and safety?

Answer(from interviewee)

"…So especially for construction related areas we are looking at getting products that ensures that the operation of those products do not injure staff. So the safety requirements that goes with the procurement of these items are very much part of our evaluation criteria to make sure that even in our construction, the kind of gear that is used to climb up our poles or to install our Transformers, the people who are involved in this are given adequate protection against injury and safety from the use of the electrical items. So, our policies are very strong on that, and that goes into our procurement decision as well".

Interpretation (via interviewer)

According to the respondent products are bought for construction related areas are considered in relation with employee safety. Therefore, "safety requirements that goes with the procurement of these items are very much part of our evaluation criteria to make sure that even in our construction, the kind of gear that is used to climb up our poles or to install our Transformers, the people who are involved in this are given adequate protection against injury and safety from the use of the electrical items". Strong policies back this, interviewee indicated.

Key themes to emerge from interview (NVivo 12).

construction related procurement consider employee safety, evaluation criteria, gear that is used to climb up our poles or to install our Transformers, protection against injury and safety from the use of the electrical items, Strong policies.

Question 6.

How can buying sustainable products address environmental concerns in your organization?

Answer(from interviewee)

Interviewer was convinced that the answer to question 6 had been given in previous responses.

Question 7.
What, in your opinion, has been some of the challenges in obtaining sustainable products by EDG?

Answer(from interviewee)
"I think that especially in I'm determining products that eventually would be beneficial and sustainable to the environment and to other things that are involved in sustainability, they **tend to have an upfront higher cost** than those that you check without evaluating the sustainability side of things. So the challenge is to be able to **explain to management or top management** that even though 2 items, one of which may be more expensive than the other because you've **considered sustainability in determining the best value**, explaining that and **getting adequate support** has been a challenge because the **immediate cost looks more expensive** than one that has not adequately considered for sustainability.
So if we are able to explain that adequately, that we are **looking at value and not price**, sure we will be able to discuss that better, but that is the challenge we have upfront, **the costs looks higher**….".

Interpretation (via interviewer)
Interviewee was of the opinion that sustainable products "tend to have an upfront higher cost". Explaining that to management or top management to "considered sustainability in determining the best value" and getting support has been the challenge. To the interviewee, "we are looking at value and not price" because the cost of value "looks higher" than cost of "price".

Key themes to emerge from interview (NVivo 12).
Sustainable products tend to have an upfront higher cost, Explaining that to management or top management, sustainability in determining the best value, value and not price.

Question 7.

How can EDG improve its process for obtaining sustainable products?

Answer(from interviewee)
"I think that's for us if we can focus on the critical and high value items that may contribute to sustainability, issues, I think that we should begin to incorporate that in our discussions, with our management. So that the higher or the riskier the product is to the environment, the more we need to consider sustainability, because in the end, if it does happen, it doesn't only affect EDG, it also affects the community and the country at large. So, I think that if we can focus on some key equipment and products that are of high value and that we spend a lot of money on without considering the sustainable aspect, we can start from there and begin to **conscientise management** on that. And I think there are so many laws in the country that will support that argument or focusing on those areas".

Interpretation (via interviewer)
According to the interviewee the journey to introducing sustainability into EDG procurement process should start with focusing "on the critical and high value items that may contribute to sustainability". Such products which are deemed to be high risk to the environment must be considered in relation to sustainability impact on "the community and the country at large". Interviewee advocated for management buy-in on this while "laws in the country will support that argument or focusing on those areas".

Key themes to emerge from interview (NVivo 12).

critical and high value items, high risk to the environment, sustainability impact, the community and the country at large, management buy-in, laws in the country.

Question 8.

According to the Public Procurement Authority's (PPA, 2019) standard tender document, tenders shall be evaluated taking into account compliance with Environmental protection, policies, laws and regulations applicable in Ghana as well as policies for the promotion of sustainable development. Which of the following policies would you consider when buying sustainable products.

a) Safety, Health policy
b) Environment Policy
c) Waste disposal policy.
d) Recycling policy.
e) Green Footprint policy.

Answer(from interviewee)

Safety, Health Policy.

"Yes, we need to consider that because it's very critical in the business that we do, of selling electricity to customers or consumers to ensure that safety is high. So that is key".

Environmental policy.

"Yes, environmental policy will be considered as said earlier, our equipment that we use, the product that we use to ensure electricity to our customers. We have to make sure that it complies with our environmental policy in terms of pollution management and so on, so that that is that is key".

Waste disposal policy.

"Our activities and the product that we use does not generate significant amount of waste, but in terms of disposal of what we are no more in need, we will need to consider that if we want to dispose off some of the items, we no more use. We need to consider that".

Recycling policy.

"Recycling yes, but not to be considered for our buying decisions as of now, but it's something that can be looked at in the future".

Green Footprint policy.

"because I was trying to link it to the environmental policy and I think that it's not very obvious for us to use the green policy".

Interpretation (via interviewer)

Interviewee agreed to have all policies of : Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy except Green Footprint policy which he seemed not to be familiar with, so, "it's not very obvious for us to use the green policy".

Key themes to emerge from interview (NVivo 12).

These are apriori codes: Health and safety policy, Environment Policy, Waste disposal policy, Recycling policy, Green Footprint policy. Emerging themes: consumers safety, complies with our environmental policy, Recycling be looked at in the future.

Question 9.

EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of technical factor will you give to sustainable procurement technical requirements and why?

Answer(from interviewee)
"as of now, there is no weight that I can remember for sustainability or sustainable factors. As you rightly said, we have weights for technical and financial, for determining lowest bidder and if you ask me the focus, I indicated earlier that if we take critical items or high value items, I will pick a range, because for any item the environmental or sustainable considerations may be higher for some products than for others. So, I would rather propose a range of between 10% to 30% as a sustainability weight to add to our financial and technical considerations".

Interpretation (via interviewer)
The interviewee preferred a weight range of between 10-30% to be given to sustainable products. He thinks that "environmental or sustainable considerations may be higher for some products than for others" so weight must be commensurate with "critical items or high value items" level.

Key themes to emerge from interview (NVivo 12).
10-30% technical specifications for sustainable products, weight must be commensurate with "critical items or high value items" level.

Transcript (Edited)

INTERNAL STAKEHOLDER 1

Interviewee's location, position in organisation: Accra-Ghana, Manager/Planning & Stock Control

Question 1.

Madam, how long have you been working with EDG organization?

Answer.
"I've been working with this company for the past about 30 to 31 years. I joined the company in 1993 as an account officer."

Clarification as corroborated by interviewee.
The interviewee is a manager with many years work experience in EDG.

Question 2.
Can you briefly detail which department(s) you have worked in during your employment time in EDG?

Answer
"So I worked in the accounts section for about 10 years. Then I decided to pursue a course in procurement and supply chain management and later on moved to join the Materials management division. So, I'm now working with the materials management division as the planning and stock control manager Materials section."

Clarification as corroborated by interviewee.
Respondent is a Supply Chain Professional and a Practitioner.

Question 3.

What are your expectations in relation to a product that has been bought for use?

Answer.
"That leads to the talk about having a product that can meet the purpose for which it is procured. That the products must meet my expectation, can perform their function for which it is procured. That is my main objective for buying a product."

Clarification as corroborated by interviewee.
Respondent explained that a product must be "fit for purpose" to meet expectations.

Question 4.
With reference to the EDG procurement guide, consideration must be given to the buying of sustainable products. How has EDG pursued this strategy?

Answer

"EDG has come up with a policy framework, on sustainable procurements, and also by ensuring that the policy is followed by all stakeholders, they have created the awareness for all stakeholders to be on the same page. So that the organizational goal, in terms of the procurement of sustainable products will be met with ease and within the policy framework."

Clarification as corroborated by interviewee.
Interviewee seemed to be aware of a policy framework and its application.

Question 5.

How has buying sustainable product benefited EDG in the context of improving employee health and safety?

Answer
"Buying EDG projects has seriously improved the environmental issues, because the company tries to buy products that can withstand the weather condition, especially in terms of safety apparel. We normally buy products that can withstand the weather. That even when the staff uses it, they will not have a (skin) reaction due to the harsh weather conditions in the company, in that country. So, we look at all that and also in disposing of the products, we make sure that the product is appropriate or when we are disposing off, we'll be able to do that safely. We don't just buy any products. For example, we used to buy shackles and insulators. We used to buy porcelain. Currently we are using a polymeric. It's all because of disposal issues. That's why we decided to shift from porcelain to polymeric insulators for our jobs."

Clarification as corroborated by interviewee.
interviewee indicated that there is an organizational move to do away with products that are not environmentally friendly when disposed off and the wearing of protective gears against harsh weather conditions.

Question 6.

I think you've also answered its relationship with our environment.

Answer
"Yes, yes."

Clarification as corroborated by interviewee.

Respondent dealt with the Health and Safety together with environmental issues which seem to suggest that all three issues, i.e., Health, Safety and environmental, are considered together in EDG.

Question 7.
What in your opinion has been some of the challenges in obtaining sustainable products by your company?

Answer
"Change is not easy. Change is not welcome. We have challenges with employees accepting the change, it's not easy. And then we also have issues with limited time and resources to buy such products. Sometimes some of these products are expensive. And even their source, getting to that source where these products are is sometimes a problem and it also comes with high cost, sustainable product comes with high costs and it sometimes a challenge, and also sometimes lack of support from suppliers because of product development. Sometimes you have to engage them (suppliers) and ensure that they produce their item to suit your requirements and sometimes changes in some of these products creates some challenges for the suppliers. So sometimes they feel reluctant to accept some of our requests. Sometimes searching for the right source is also a challenge. Where to get exactly what you want in terms of sustainable products is also a challenge."

Clarification as corroborated by interviewee.
Respondent identifies accepting change, limited time and resources, high products price, getting to the right source, lack of support from suppliers because of product development as main challenges.

Question 8.

How has EDG improved its processes for obtaining sustainable products?

Answer
"Yes. So, we try to engage the suppliers continuously. And we also try to continuously audit and evaluate our product performance. The product that we use, we engage the R&D, that is the research and design section, for them to sometimes evaluate some of the products for us to know their performance and how best they can get us better items that can also sustain or help the environment. And we also try to include in our policies some of these sustainable product policies, so that suppliers will abide by them and ensure that we get the right materials.

Clarification as corroborated by interviewee.
Respondent corroborated earlier indication of knowledge about existing sustainable policy and application through continuous supplier engagement, research into environmentally friendly products by the R&D department and effort to get suppliers to abide by the sustainability policies.

Question 9.

According to the public procurement authority, standard tender documents, tenders shall be evaluated taking into accounts, Environmental Protection policies, laws and regulations that are applicable in Ghana, as well as policies for promoting sustainable development. Which of the sustainability policies, would you consider when buying sustainable products?

Answer
"I think how to manage the disposal of that item. Disposal is and serious issue. Not only the acquisition, but also disposal. That's together, every time, manage the environment."

Clarification as corroborated by interviewee.
Respondent referred to Waste Disposal policy to be crucial.

Question 10.

Procurement guide allows weights to be given to, technical and financial factors in the evaluation of tenders. This is to find the lowest bidder in the procurement of products. Of the technical factors, what percentage weight would you give any sustainable procurement policy in place and why?

Answer
Give it like 20%, at least, because I believe suppliers or producers should not only look at how the materials is produced, but they should also think about how it will be delivered and how it would be disposed of. So, I will give it like 20%. We must be able to incorporate it in our procurement act and ensure that institutions, all institutions or organizations go by these policies on sustainable procurement because until we work together as a team we will not succeed.

Clarification as corroborated by interviewee.
Respondent allocates 20% to sustainable policy (Waste disposal policy) and called for its inclusion as law for all institutions to abide by it.

Transcript (Edited)

Internal Stakeholder 2.
Interviewee's location, position in organization : Accra-Ghana, Senior Procurement Officer

Question 1.
How long have you been working with EDG?

Answer
"I've been here for 22 years now, yes."
Clarification as corroborated by interviewee.
Respondent has experience and a good understanding of procurement activities in EDG.

Question 2.
Can you briefly detail which department you have worked in during your employment time with EDG?

Answer
"I joined the EDG at the customer services dealing with customers as we sold power etc. and all other things with the customers. Then, after 10 years, I moved to the procurement departments and that's where I'm now."
Clarification as corroborated by interviewee.
It was evident from the response that the interviewee had worked in multiple departments, i.e., Customer services and Procurement department, while working with EDG.

Question 3
With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. How has the EDG pursued this strategy?

Answer
"So buying sustainable as a country, we are now, inching into the sustainable. Gradually, these sustainable policies and sustainable drives and moves to make sure that we buy, or our products are sustainable product, and our activities go to enhance sustainability. We are into it. I wouldn't say not very deep into it, but we are."
Clarification as corroborated by interviewee.
Respondent acknowledges that EDG is moving towards adopting sustainability policy in her operations.

Question 5.
In your opinion sustainable how has buying sustainable products benefited EDG in the contest of improving employee health and safety?

" to a very large extent we have imbibed these sustainable measures to make sure that we don't affect our environment negatively. So that for example, our drums that carry the cables because of the sustainable drive, we made sure that we use biodegradable materials like wood and not plastic. And so, these are very helpful to the staff handling them and in keeping the waste you know after cables have been taken out of the drum the drum itself doesn't affect us and the environment negatively. Thereby does not affect the staff and also other. Some of the cables come with a grease and oils so we make sure that they are not hazardous. Materials and chemicals and substances that will affect the staff, so we make sure staff or employee live a healthy life."

Clarification as corroborated by interviewee.
Interviewee indicated that EDG had measures in place to ensure sustainability issues are addressed. The use of biodegradable materials is a clear manifestation of EDG effort to adopting a Sustainability policy.

Question 6
It looks as if in your answer you also alluded to environmental concerns in your work environment.

Answer
"Yes."

Clarification as corroborated by interviewee.
Interviewee seemed to corroborate the non-separable issues of Safety, Health and Environment in EDG.

Question 7.
What in your opinion has been some of the challenges in obtaining sustainable products by EDG?

Answer.
"Well, the main challenge I can mention is because we are, in a new area where venturing into (sustainability) is started for some time change is difficult to accept, so the drive is on and you know dealing with suppliers who don't have this in mind, it becomes new to them. So some arbitrary resistance, but dedication is going on. The drive is going on. But by and large, I will say it's picking up, I wouldn't call it a big challenge. Only compared to other countries where they are advanced, I would say is the only challenge."

Clarification as corroborated by interviewee.

Though respondent sounds optimistic, the uncertainty of accepting change seem to be the main challenge to adopting sustainability in the procurement process.

Question 8.
How has EDG improved its processes for obtaining sustainable products?

Answer
"We have put in some measures, for instance in registering the suppliers we look out for those who have a hint of it (sustainability) and ability in mind, e.g., not employing child labour and not using harmful materials. We look out for signs of awareness first of all. And furthermore, has to show some effort towards sustainability. Now those are the things we look out for before we register (a supplier) in the 1st place to do business with you. We provide specification for the supplier and by extension to the manufacturing, so we make sure our specification is focused on sustainability. Our technical (Research & Development) people look in that direction to make sure that the materials we are buying meets our specification and are sustainable."

Clarification as corroborated by interviewee.
Interviewee indicated that there is some level of prequalification done to determine the right supplier of a product. This is to find out if the potential supplier has some measures in place to address sustainability issues in the production or supply chain processes. The research & development department ensures that materials or products supplied are per specifications provided with is also sustainability focused.

Question 9.
According to the public Procurement Authority standard tender documents, tenders shall be evaluated taking into account compliance with Environmental Protection policies, laws and regulations that is applicable in Ghana as well as policies for promoting sustainable development. Which of the sustainability policies would you consider when buying sustainable products?

Answer
"Specifically I'll say Labour's policy, to make sure that the companies and the suppliers and manufacturers who we are dealing with employs in ways that is consistent with the laws. For instance, children which the law frowns upon. I'll consider that materials we buy and the components of the materials, like our cables, use certain chemicals to preserve them to make sure the weather doesn't have effect on them. We also have to make sure that the chemicals and other substances used are not harmful to the people using them. Health and safety policy,

so that we make sure we preserve the lives of our workers going forward. We don't want to create an environment that will affect them."

Clarification as corroborated by interviewee.

Respondent preferred Labour policy and Health, Safety & Environment policy given the opportunity to include any sustainability policies in the tender evaluation process to select the right supplier

Question 10.

EDG procurement guide allows weights to be given to both technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. Of the technical factor, what percentage weight would you give any sustainable procurement policy in place and why?

Answer

"I'll give a high percentage and it's 70. Why, Because the people matter for us as a going concern. And why not 100? Because we are now inching into this sustainability things so we want to do the education and catch up to get to the hundreds.?

Clarification as corroborated by interviewee.

Respondent, if given the option, would allocate at least 70% weight to sustainability policies in the tender evaluation process to select the right supplier.

Transcript (Edited)

INTERNAL STAKEHOLDER 3
Interviewee's location, position in organisation: Accra-Ghana, Snr Materials Officer/Planning & Stock Control

Question 1.
How long have you been working with the EDG organization?

Answer
"16 years".
Clarification as corroborated by interviewee.
Interviewee happens to be familiar with the EDG supply chain environment.

Question 2.
Can you briefly detail which department(s) you have worked with during your employment time with EDG?

Answer
"Yes, I worked with the Materials and transport directorates, and specifically at the Materials division."
Clarification as corroborated by interviewee.
Respondent is an experienced supply chain professional.

Question 3.
What are your expectations in relation to a product that has been bought for use in your organisation?

Answer
"One, the product must best fit for purpose, two must be of high quality and three must be environmentally friendly so as not to damage the ecosystem."
Clarification as corroborated by interviewee.
Expectation from a product bought, according to the respondent, will not only be quality but bear environmentally friendly features.

Question 4.
With reference to the EDG procurement Guide, consideration must be given to the buying of sustainable products. How has EDG Pursued this strategy?

Answer

"So, there was a time when a particular type of transformer oil that was deemed to be very hazardous to both the users and the environment was, through the assistance of the Environmental Protection Agency, drained out of the Transformers and then disposed off professionally so as not to cause further damage to the users or the operational staff as well as the environment. So, I think the EDG has pursued that to ensure that the products that are being used are environmentally friendly and user friendly as well."

Clarification as corroborated by interviewee.

Respondent agreed that EDG had practiced safety, health and environment as a standard of operation and as a caution to protect staff and nature.

Question 5.

In your opinion, how has buying sustainable products benefited EDG in the context of improving employee health and safety?

Answer

"Once the product is not environmentally sustainable or it's not sustainable product, the safety of the users or the staff is at risk and EDG takes safety very seriously.
As such, has a general manager solely in charge of safety and environment which give credence to the fact that it (EDG) considers safety and the working of the environment very seriously."

Clarification as corroborated by interviewee.

Interviewee explained that a nonsustainable product is of risk to staff and environment and the fact that EDG has a manager in charge of Safety, Health and Environment suggests the level of importance it puts on sustainability.

Question 6.

How has buying sustainable products addressed environmental concerns in your work environment?

Answer

"I believe that I alluded to that at my previous answer …"

Clarification as corroborated by interviewee.

Respondent corroborates the combined and inseparable attention given to all three sustainability dimensions, i.e., Social, Economic and Environment (Safety, Health & Environment).

Question 7.

What in your opinion has been some of the challenges in obtaining sustainable products by EDG?

Answer

"I think, and I believe one of the major challenges is the **noncompliance by vendors** introducing environmentally friendly and sustainable products because maybe the feel **cost of producing them are higher** compared to the non-environmentally friendly ones. So, it's because you also want to cut down costs they may not comply with the environmentally friendly products productions."

Clarification as corroborated by interviewee.

Respondent mentioned that non-compliance with sustainability regulations and high cost of sustainable products are some of the challenges for sustainability policy implementations.

Question 8.

How has EDG improved its processes for obtaining sustainable products?

Answer

"I believe it does that through vendor education and assessment system where they are assessed or educated on the need for environmentally friendly products and then the company's policy or safety and health. That includes the environment, as well as, why the environmentally sustainable goods must be produced."

Clarification as corroborated by interviewee.

While respondent expressed some uncertainty, he was optimistic that processes for obtaining sustainable products had improved through vendor education and assessment system on the need for environmentally friendly products and company's policy or safety, health and environment.

Question 9.

So according to the public Procurement Authority standard tender documents tenders shall be evaluated, taken into account compliance with Environmental Protection policies, laws and regulations applicable in Ghana, as well as policies for the promotion of sustainable development. Which of the sustainability policies would you consider when buying sustainable products?

Answer

"I believe the enforcement of the Environmental Protection policies as well as the strict enforcement of the laws and regulations in that regard. Because if the law says a particular product should not be imported or produce, it should be enforced to the letter so as not to give room for the harmful gas released into the environment."

Clarification as corroborated by interviewee.

Interviewee preferred waste disposal policy as crucial when evaluating tender for the supply of sustainable products and the strict compliance of same.

Question 10.

Procurement guide allows weights to be given to, technical and financial factors in the evaluation of tenders. This is to find the lowest bidder in the procurement of products. Of the technical factors, what percentage weight would you give any sustainable procurement policy in place and why?

Answer

"Yes, I will look at about 45%, because the specifications of the products are very important and the quality as well. In the long term there will be cost savings because they tend to last longer and curb the recurrent purchases of products frequently. Because if they're not of high quality, sustainable or environmentally friendly they tend to have financial implications which in the long term render the company insolvent.

I suggest that EDG must prioritize the vendors that deal with environmentally friendly or sustainable products higher than the non-producers of the environmentally friendly products and then oftentimes make the non-compliant organizations aware of EDG policy on health and safety and on sustainable products. So, the policy must be a policy framework or a policy guide as to that kind to procure environmentally sustainable, friendly products."

Clarification as corroborated by interviewee.

Respondent would allocate 45% weight to sustainability (Waste disposal policy) in the evaluation of tender and suggested that EDG prioritized vendors that dealt with environmentally friendly or sustainable products higher than the non-producers of same.

Transcript (Edited)

Qualitative interview for External Stakeholder.1

Interviewee's location, position in organization : Accra-Ghana, CEO

Question 1.
How long has your organisation been supplying to EDG?

Answer
"We've been in it for 15 years now".

Clarification as corroborated by interviewee.
Response suggests that interviewee is familiar with EDG procurement process.

Question 2.
Can you briefly detail which department(s) you have worked in during your employment time in your organisation?

Answer
"Alright, so first of all, I'm the MD of my organization.
And so in terms of policy direction, as far as the day-to-day management issues is concerned, I am in charge".

Clarification as corroborated by interviewee.
Respondent is in a strategic decision position.

Question 3.
What product has your organization been supplying to EDG, the electricity distributor in Ghana?

Answer
"Initially we started by offering printing, but as you know, to keep your situation, you need to diversify and so along the line we realised the need for other stationary items like toners, envelops and then printers etc. And so, along the line, we began to look in that direction and through that we get opportunities".

Clarification as corroborated by interviewee.
Respondent is into consumables and a tier 2 Supplier not a manufacturer.

Question 4.
With reference to the electricity distributor.
EDG procurement guide gives consideration to buy sustainable products.
How has EDG pursued this strategy of buying sustainable product?

Answer
"I think when it comes to procurement issues, EDG don't usually compromise on quality. And so, they set high benchmarks for you. Quick to set standard to actually satisfy that this is exactly what they requested for, and that is also exactly what you have provided before they distributed same to the department and other agencies within the company."

Clarification as corroborated by interviewee.
Interviewee is aware of EDG supply chain processes.

Question 5.
How has buying sustainable products benefited EDG in the context of improving the employee health and safety?

Answer
"So they actually buy goods that, first of all, will not harm their employee in anyway. And I believe that other items, such as the safety equipment that they buy for their workmen, I am very much sure that the sort of process that they subjects us through as a supplier, there they explain to those who are the suppliers to supply items that come into contact with their staff. They have people to actually certify that they did exactly what they require. We also don't compromise on that and we make sure that we need that information in order to avoid any situation where your goods might be rejected, or you might even be blacklisted in the near future".

Clarification as corroborated by interviewee.
Respondent demonstrated his awareness of quality control measures in place at EDG.

Question 6.
How has buying sustainable products addressed environmental concerns in your work environment?

Answer
"Yes. like I said earlier, once we know that there's a certain benchmark or certain standards that we are supposed to follow we are always guided by that to meet customer demands or their expectations. We can't be in business and so we are very guided by the tender document that we work with and that's precisely the sort of standard that we also offer to people, to our clients".

Clarification as corroborated by interviewee.
Respondent suggests that issues of environmental concerns are indicated in tender documents that guides the procurement process.

Question 7.
What in your opinion has been some of the challenges in supplying sustainable products to ECG?

Answer
"They don't compromise on their safety. There are standards they require. It is a bit time consuming to get specifications. And for you, it's a bit time consuming, but that is the only way to keep us in business".

Clarification as corroborated by interviewee.
Interviewee is of the opinion that it takes time to source for sustainable products.

Question 8.
How has EDG improved its process for obtaining sustainable product?

Answer
"I think to a larger extent that is the case because I'm very sure that the sort of standard that they subject our organisation to, they replicate same for others. And the instances where I witnessed a situation whereas I go through my process, in their bid to receive my items and when some also come and we try to look around they subject other people to same because I think that they also want to be on the safer side because of the environment within which they are operating. And so, I think that they don't compromise on that. It is good, it's a good initiative."

Clarification as corroborated by interviewee.
Respondent indicates that there are attempts by EDG to improve processes towards buying sustainable products.

Question 9.
According to the public Procurement Authority Act standard tender documents, tenders shall be evaluated, taken into account compliance with Environmental Protection policies, laws and regulations applicable in Ghana, as well as policies for the promotion of sustainable development. Which of the sustainability policies would you consider when buying sustainable products?

Answer
"Well, I think worldwide now it is the ISO standard that we are all guided by. And so, once we have that in mind, we make sure that whatever we are bringing out are ISO certified. Most of our things, we do import them, and once they arrive, we make sure that even before they arrive, they are ISO certified and so that once they get to our port, there might not be any back and forth as to its quality or otherwise. And so, I think that now that the world is moving towards ISO certification that is what we subject our standards to."

Clarification as corroborated by interviewee.
Respondent would subject all products to ISO standards.

Question 10.
EDG procurement guide allows weights to be given to technical and financial factors in the evaluation of tenders to find the lowest bidder in the procurement of products. Of the technical factor what percentage weight would you give any sustainable product policy in place and why?

Answer
"I don't think that mostly they should be the lowest bidder, cause for instance, I may not compromise on quality and therefore I may not go for any cheap or inferior products. But it should be about the benchmark, the standard. To me we must ensure that everybody else is leaving that particular specification and when that happens, I realize that lowest bidder might not exactly be the consideration moving forward. Anything between 80 to 90%."

Clarification as corroborated by interviewee.
While respondent would allocate as high a percentage of 90% to sustainable product policy he would not consider price as the main determinant of selecting supplier to a product.

Transcript (Edited)

External Stakeholder 2.

Interviewee's location, position in organization : Accra-Ghana, Executive Director

Question 1.

How long has your organization been supplying products to EDG?

Answer

"It's close to two decades of experience with the EDG, and we've been a consistent stakeholder. And then supply partner of EDG for 17 years to be exact. So, yes, we've, seen different processes come and go and we've seen the transformation of EDG by time to be more aware of the UN sustainable Goals for development, of which I think one of them is the sustainable procurement. So, I think we're best place to speak to it and to be able to contribute to it."

Clarification as corroborated by interviewee.
Respondent has had a high level of business dealings with EDG.

Question 2.

Can you briefly detail the department you have worked in during your employment time in your organization?

Answer
"So My organisation is "R" cables limited and I'm currently the Executive Director, but I've had experience throughout the company in sales and procurement, in quality control and some parts of fulfilling orders to do with customer service provision. So, I've had basically a cross section of experiences in the organisation, and because EDG has been a partner for a long time, I've seen various aspects of our operations to do with EDG, so, basically, I'm director at the moment, but I've seen the different aspects of the value chain in our processes."

Clarification as corroborated by interviewee.
It was made clear that interviewee is very much abreast with the supply chain activities within and outside his organization.

Question 3.

What goods has your organization been supplying to EDG?.

Answer

"Our core product is electrical cables and conductors and because EDG deals with the full value chain from energy distribution, from the power supplies to actually getting the energy to people's homes. We been able to supply a wide range of cables and electrical products to the various customers of EDG, so that's really our core function to produce cables for the various consumers within the EDG and customer brackets, you know, so both industrial materials and domestic cables and conductors have all been under our remit."

Clarification as corroborated by interviewee.
The respondent's organization is in the manufacturing bracket upstream and therefore, a tier 1 supplier to EDG.

Question 4.

With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. Are you aware of any strategies that EDG has pursued in this regard?

Answer

"I think one of the main policies that I'm aware of is to buy an indigenous, locally produced materials and I think it's been very influential in the decision making within EDG and a bedrock of the initiative to generate a sustainable procurement and sustainable value chains, because I think once you have locally produced materials you have a better handle over the process and also you have ability to affect more of the society within your procurement catchment by sourcing locally and then also the immediate impact of the value chain is seen. So, I think this is the main thing. That is a local procurement policy that allows, I won't say preference, but allows, skew, towards procuring locally as opposed to a, maybe, globally and internationally. And I think that's one of the main principles that I have seen and being applied, and it's been very useful to us. And I think fundamental to that sustainability because in having that relationship, you can also see that the stakeholders begin to understand better the process of procurement and can entrench their process within the organisations so they become stronger and stronger partners over time. So, I would say the main one is to procure locally and to look at that option 1st and in relation to the global and international markets."

Clarification as corroborated by interviewee.
The respondent showed a EDG strategy to procure locally to enhance social policies and benefits and, boost indigenous industry.

Question 5

In your opinion, how has buying sustainable products benefited EDG in the context of improving employee health and safety?

Answer

"I think one thing that I noticed was a serious, very vigorous campaign within EDG towards the mentality at the workspace. Very positive mentality towards achievement and certain principles of workspace attitude, of which health and safety and adhering to safety procedures, I think was one of the main keys that I saw. You know, in visiting as a stakeholder, in visiting EDG offices and locations, you see a lot of write ups and literature. A lot of posters and hanging information and sensitizing all stakeholders, both the staff and supplies about the principles that govern the workspace and adherence to safety. And from our particular supply side that relationship, I mean, we always are told to, for example, the weight restrictions on our packaging so that it's easier to lift on and off vehicles and to handle within the warehousing and framework of supply of EDG. So, we see a lot of educational culture around that safety and around the adherence to certain procedures, for example walking within the warehouse complex, we see a lot of markings on the floor where pedestrians should be and where vehicles should be as a testament. But there's been a very thorough campaign over the years on that."

Clarification as corroborated by interviewee.
Clearly interviewee demonstrated in-dept knowledge about safety, health and environmental practices within EDG.

Question 6.
How has buying sustainable products also addressed environmental concerns particularly in your work environment?

Answer

"Yeah, environmental concerns, for example, we supply cables, as I've said earlier and with those cables, what I've seen is that, we are asked to provide a lagging and wooden drums that are, for example, sourced from sustainable sources where there is replanting and where there are companies that are particular about replanting of trees that provide the wood for the drums. So, their particular standard stated within the provisions that make sure that those woods that are sourced are from sustainable sources and certain companies that have been a standardized or given approval to provide wood that is from sustainable forest where people replant seeds, etc. So, we have particular suppliers that we have to go to who are particularly certified under ISO and other criteria to provide that kind of wood to our process. So that's one aspect that I've seen, and the other aspect is also an actual reliance less on wood in order to help the environment. For example, in the drums we provide we have outer lagging that's supposed to protect the material in the drums. But what we've seen over time is the transition from using that lagging to using more durable materials that are multi use materials to cover the products as opposed to using wood so that we can lessen the burden on the environment and we have adopted that and along with the whole supply chain we have also adopted this packaging, which is a difference from or change from what we used to do previously.
So I see that there's consciousness within the system and that has allowed us also to plug into it. So, we are using more multi use materials as opposed to the ones that we have to discard. And again, some of our old drums, we require to be redelivered to us, so we don't need to keep sourcing or getting new drums. So, there's a program of reuse of those drums that we supply, which has also helped in terms of less burden on the environment."

Clarification as corroborated by interviewee.
Respondent again, demonstrated the organisation's conscious effort to preserve the forest by buying wood from sustainable sources and adopting a recycling policy to reduce the rate of wood disposal.

Question 7.
what in your opinion has been some of the challenges in supplying sustainable products to EDG?

Answer
"I think the challenges are really about, you know, technology from our point of view because some of the products that we supply in general, they are products that have been developed by the industry over time and some of them, for example, the things that we use in our products because they are industrially recognized and from an engineering point of view, they are standardized, they are very few deviations around that. So, unless there is a real

watershed moment in which there's a new type of, maybe, more biodegradable material being used, for example, we use PE and PVC and those materials. By design, they are not biodegradable and fully biodegradable, so they either have to be recycled, or we'll just have to use less of it. And this is what has been in use for many, many years.
So we see that unless there's a change in standards of products and maybe the technology behind producing some of these materials is very little in terms of making them more sustainable, unless we reuse them, you know and that's really some of the challenges that I see. Over time certain organizations get used to behaving in certain ways. And so, when you bring in certain changes where you want to be more sustainable, and I think it's difficult for them to adapt, nothing is applicable to us. But I can foresee that maybe some companies that are not as aligned to these concepts as we would have challenges in doing that. You know, especially in the smaller scale companies. So, I think those are the two points I can think of."

Clarification as corroborated by interviewee.
The respondent indicates that standardization of raw materials and technology in used in the manufacturing of the end products is a hinderance to sustainability since those components are hard to degrade. PVC or plastic is highly not biodegradable.

Question 8.

How has EDG improved its processes for obtaining sustainable products?

Answer

"From my experience, what I've seen over the time that we've worked, EDG in some of the documentation processes within the organization, we used to see a lot of heavy reliance on paperwork. That is the use of more paper as opposed to the computer. But now, I've seen a transition to an ERP system that seems as being able to track, for example, our documentation without a heavier reliance on the transfer of physical paper. And I see that to be a cultural thing within the organization, that apart from the less use of paper, I think there's more plugging in of suppliers and stakeholders into a computerized environment and that allows the stakeholders to plan better. That allows them to coordinate the needs of EDG to reduce waste and to generally save time in the process of movement of information and coordination of demand related items. I see that, for example, has brought less waste within the organization because where you would have, for example, three different departments procuring something from maybe several suppliers, you're having a coming together of needs, pulling together of needs and single procurements. I see that to be a trend that's picking up within the organization, although I think there needs to be a lot more work to be done in that area. But I can see that computerization has allowed better entrenchment of stakeholders into the processes of EDG and I think that can only benefit the sustainable procurement process."

Clarification as corroborated by interviewee.
Respondent showed appreciation for the introduction of the ERP system or computerisation of the procurement processes in EDG. Also, the less reliance on paper work by same.

Question 9.

The Public Procurement Act in Ghana and according to the standard tender document, tenders shall be evaluated taking into account compliance with Environmental Protection policies, laws and regulations applicable in Ghana, as well as policies for the promotion of sustainable development. Which sustainability policies would you consider when buying sustainable products?

Answer

"The policy that I think is most relevant to us is, for example, the policy around the guidelines for framework agreements because of our amount of time that we spend. As a stakeholder of EDG, I think it's more of that, that those guidelines are more applicable to us because they create a certain standard and principle of work that governs our relationship. And I think that is very essential to creating sustainable partnerships because when behaviors are predictable it also allows closer and closer cooperation in terms of needs, in terms of standards, in terms of safety, in terms of even being able to make adjustments into the production processes of your partners or stakeholders in their value chain and that allows the procurement of EDG as an organization, for example, to be more felt in a deeper way. Because those framework agreements are able to give a certain predictability that allows for stakeholders to feel more comfortable to work with EDG. And I think that is also able to translate across board, not only in terms of the processes of procurement, but more importantly around the financing, because I think one of the aspects of making sustainable procurement is the financial impact that organizations like EDG can have on small scale and maybe larger organizations. So those framework agreements give Peace of Mind to everybody in terms of being able to function in a predictable and long-term way and in our part of the world we have the impact of the exchange rate which impacts us because of raw material suppliers for example. So that predictability around the framework agreement is always useful and being able to plan long term to mitigate loss and to generate a better value adding in our decision making. So, I think that for me it's the paramount one.
I mean in all, as I said in our locality, the use of foreign exchange in procuring and I think that's also very important to us because of the balance between being paid in local currency and transacting business with other partners in the foreign domain. I think those are very key policies and I think when you have frameworks like that it helps everybody to be settled because at the governmental level within our country, we have a structure that defines the behavior. And I think it's always important to keep reminding each partner of their obligations under those arrangements."

Clarification as corroborated by interviewee.
Respondent introduced framework agreement as a sustainable way of maintaining work relationships and dealing with fluctuating or unstable trading currencies.

Question 10.

The EDG procurement guide allows weights to be given to both technical and financial factors during the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of the technical factor would you give to sustainable procurement technical requirement and why?

Answer.

"Yes, but for me, I feel that I will give it about 70% rating when it comes to sustainable procurement because I feel that every company has a standard in terms of how it wants to approach the customer. But because of the type of customers we are dealing with, the volume of investment that is going in and the likelihood of the cost that (electricity/energy) losses could bring, I think it's very important to adhere to the technical standards so that the product by itself is speaking to the quality that it is supposed to manifest. And in the long term saves orgainisations like EDG money because it doesn't have to go and repair or reinstall certain components or materials that have been procured, which over time could cost it more if it went for only the price component, you know, and then again I know that there's a program to cut losses within the organization in terms of distribution of power to the customer and the main factor of cutting loss is the quality of material being used because you don't have waste within the transmission lines. For example, if you use lesser quality material, you have more waste. So, this actually impacts the revenue ability or generation capacity of EDG in terms of being able to recuperate revenue if the distribution lines are not of quality, you will lose a lot within the transmission. So, for me, from the material that we produce, I think quality is much more important than price. And I think when you approach that in all materials, you actually cause your stakeholders to force them to give you more value when you eliminate, when you focus on the cost aspect because for example within our space, the raw material has a standard international price. So, if you go towards quality, you then make the customer do give you more value on top of the standard product that are supposed to be supplied. So, they compete on giving you more value through other means instead of the actual product itself. You know, so they don't reduce the quality of the product. They actually give you more value through other aspects of the value chain, and I think that is to the benefit of an organization like EDG. So, for me 70% is what I will look at and even for our organization, you know I think cost."

Clarification as corroborated by interviewee.
The interviewee will allocate 70% to the quality of materials against going for a low priced product which in the long run increase the organization energy losses and cost.

Transcript (Edited)

External Stakeholder 3.

Interviewee's location, position in organization : Accra-Ghana, Chief Executive Officer (CEO)

Question 1.

How long has your organization been supplying products to EDG?

Answer

"My firm has been working for the EDG since the year 2010. We have been supplying them (EDG) under various management since we were first registered to be one of their suppliers and I think we are now like a partner to them."

Clarification as corroborated by interviewee.
Respondent has had an appreciable business relation with EDG to consider themselves as partners with EDG.

Question 2.

Can you briefly detail the department you have worked in during your employment time in your organization?

Answer
"I am the Chief Executive Officer (CEO) of Tripple "X" Limited and have a number of departments under my supervision. As the CEO I also have a general manager who supervises all department, i.e., finance, operations, personnel etc. So, I have a fair control of all department in my firm."

Clarification as corroborated by interviewee.
Respondent was succinct about the governance structure and control in his organisation.

Question 3.

What goods has your organization been supplying to EDG?

Answer

"My firm is in the printing business, so we produce all kinds of printing works and consumables for many organisations. For EDG we produce their billing forms and many books that are used in their operations. In fact, we do most of their value books and stationery like payment receipt books, payment advice books, credit and debit notebooks etc. But with recent movement towards the use of computers and on-line transactions less of such printed products are used so we are considering diversifying to supply some of the electrical goods."

Clarification as corroborated by interviewee.
The interviewee's organisation is in the production of printed goods mainly customized and, therefore, a tier 1 supplier to EDG. It was indicated from the response that EDG was shifting

from the use of paper-based work to computer-based work activities so, the need for diversification in the sort of products being supplied in order to stay in business with EDG.

Question 4.

With reference to the EDG procurement guide consideration must be given to the buying of sustainable products. Are you aware of any strategies that EDG has pursued in this regard?

Answer

" As I mentioned earlier it looks like EDG is moving from the use of paper to a paperless organization where no or very little paper and stationery is used at the workplace. As we know, paper is produced from trees or wood which means the more paper is produced, more trees will need to be felled. If no proper measures are put in place to replant the trees, there will come a time no tree will be left when more paper is produced. This I think is a very good attempt by EDG to protect the environment and nature."

Clarification as corroborated by interviewee.
The respondent demonstrated that EDG has a strategy to procure phase out the overreliance on the paper for their day-to-day activities. Interviewee also showed knowledge of hoe EDG strategy would help preserve the ecosystem.

Question 5

In your opinion, how has buying sustainable products benefited EDG in the context of improving employee health and safety?

Answer

"EDG buys their products from companies that demonstrate that measures are put in place to protect the wellbeing of their workforce. I am saying this because at times they will visit your company to see the sort of safety measures being practiced by their suppliers and even ask for some policy documents to show if the company is actually practicing safety measures. For instance, in a contract it is clearly stated how packaging should be done in order to make materials handling at the point of delivering goods easy and safe for the people who offload the product at the receiving end. This in a way shows how EDG is mindful of the safety and the health of their workforce instead of leaving that for an injury to occur and then spending to cure the staff."

Clarification as corroborated by interviewee.
Interviewee demonstrated conscious effort towards ensuring safety, health and environmental practices within and outside EDG.

Question 6.
How has buying sustainable products also addressed environmental concerns particularly in your work environment?

Answer

"My organization deals not only with EDG but supply to some firms in other countries apart from Ghana. Therefore, our organization is ISO certified to produce quality goods and also conform with regulation regarding sustainable development goals. In fact, the registrar general (Ghana) require us to provide all those supporting documents before our registration certificate is renewed every year, so we make every effort to keep within the laws on the environmental protection agency (Ghana) and others"

Clarification as corroborated by interviewee.
Respondent corroborated the organisation's effort to preserve the environment in the previous answer by showing compliance of the laws and regulations regarding same.

Question 7.
what in your opinion has been some of the challenges in supplying sustainable products to EDG?

Answer
" You see, everything that comes with quality is expensive and if your offer something which is expensive while a competitor offers a relative cheaper product the most likely choice will be the cheap one. The sustainable products usually are not cheap and also not easily available. Take for instance, electric cars which are not easily available on the market. Before you bring such a car to Ghana you will have to pay huge taxes that eventually makes it more expensive than the petrol and diesel ones that we use. I think there need to be more education on the use of sustainable products and also some deliberate effort by government to give some preference to sustainable products. Or else, people will still go for the products that are not sustainable simply because of the low price which will also further worsen the environmental challenges that we face."

Clarification as corroborated by interviewee.
The respondent appears to understand the need for education on the benefits of sustainable products and conscious effort by authorities to demonstrate preference for such products by lowering taxes on sustainable products and encouraging its use.

Question 8.

How has EDG improved its processes for obtaining sustainable products?

Answer

"EDG has now put in place a lot of health and safety measures in the workplace. When it comes to the use of paper for their activities, like I said, they are moving away from the use of paper to computerisation which means less trees being felled. I also believe more need to be done to buy the sustainable products, for example, some kind of discount can be given to companies that supply sustainable products so that they can compete well with the others."

Clarification as corroborated by interviewee.
Respondent showed that some efforts have been put in place by EDG to improve its processes to procure sustainable products referring to the example of the paperless policy in

place. Interviewee, however, suggested some form of preferential treatment for companies willing to offer sustainable products and services against those who provide unsustainable products.

Question 9.

The Public Procurement Act in Ghana and according to the standard tender document, tenders shall be evaluated taking into account compliance with Environmental Protection policies, laws and regulations applicable in Ghana, as well as policies for the promotion of sustainable development. Which sustainability policies would you consider when buying sustainable products?

Answer

"I will call for some kind of recycling policy that will take care of the waste that is produced in our production process. Ones such a policy is put in place all the waste we generate will be useful in one way or the other. Most of the paper we use can be recycled to produce things like toilet paper, and other consumables. Even the plastic waste can be used for other things instead of leaving them to litter everywhere."

Clarification as corroborated by interviewee.
Respondent choice of a Recycling policy is to also address waste management challenges.

Question 10.

The EDG procurement guide allows weights to be given to both technical and financial factors during the evaluation of tenders to find the lowest bidder in the procurement of products. What percentage weight of the technical factor would you give to sustainable procurement technical requirement and why?

Answer.

"About 50%, yes, because we need to be made aware of the implications of what the products that are not sustainable causes to the environment and climate change. Dealing with climate change alone could be more expensive than the 50% allocated to sustainable products. So, I think we need to give some preference to sustainable products instead of only considering the price."

Clarification as corroborated by interviewee.
The interviewee will allocate 50% to sustainable products against going for a low-priced product which are not sustainable.

ELECTRICITY [redacted] OF GHANA

SUPPLY AND INSTALLATION OF FINGERPRINT BASED EMPLOYEE TIME AND ATTENDANCE MANAGEMENT SYSTEM

TENDER NO.: [redacted]

MAY 20[redacted]

	E. Evaluation and Comparison of Tenders
ITT 30.4	The alternate source for pricing missing or nonconforming items for evaluation purposes is not applicable.
ITT 33.1	The currency and exchange rates that shall be used to convert all tender prices into a common currency used for tender evaluation purposes are the Ghanaian Cedi and the selling exchange rate established for similar transactions by the Bank of Ghana on the date of the deadline for tender submission.
ITT 32	Percentage Weight for Technical Merit Factor shall be 70% Weight for Financial Factor shall be 30%
ITT 34.4	Implementation Schedule deviations and adjustments are will apply
ITT 34.5	Payment schedule deviations and adjustments are not permitted.
	F. Award of Contract
ITT 43.1	The maximum percentage by which quantities may be increased is: 30% The maximum percentage by which quantities may be decreased is: 15%
ITT 45.2	No additional days are allotted for signing and returning any Supplemental Agreements to the Purchaser.

Section III. Evaluation and Qualification Criteria

The Evaluation and Qualification Criteria specify the criteria that the Purchaser will use to evaluate the tenders. This section specifies the parameters for and any other adjustments to the ITT Clauses related to the evaluation of tenders and the qualification of Tenderers and the proposed IT products, similar to the role of the TDS.

III.A. Cost Evaluation Parameters

The discount rate (I) to be used in the present value calculation as described in ITT Clause 37 shall be **12.7 percent**.

III.B. Technical Merit Evaluation Criteria

As part of the determination and comparison of Evaluated Tender Prices, responsive tenders will be evaluated by the Purchaser against technical and qualifications criteria using the procedures specified herein and in ITT Clauses 32 and 38. The Technical Score (st) for each tender will be calculated as the sum of scores given by the Purchaser's Technical Evaluation Team to the criteria shown in the following table.

Percentage Weight for Technical Factor shall be 70%

Weight for Financial Factor shall be 30%

Evaluation criteria	Weighting Factor	Minimum Requirements
Experience and references	20	• Last three (3) years financial statement showing average net positive results • Ideally, 5 years history in Ghanaian or other relevant market(s) • Additional Minimum 2 projects of relevant scope and ideally also of size (including participation as subcontractor or lead contractor) in Ghana or other relevant market(s)
Approach to system delivery	55	• Approach to fulfilment of hardware and software requirements of the Time & Attendance Management System as required by the specifications **(20 Marks)** • Approach to overall Project Management including installation and deployment strategy **(10 Marks)** • Approach to Integration with existing systems **(15 Marks)** • Approach to fulfilment of Support and Network Security requirements **(5 Marks)** • Approach to Training of administrators and key users **(5 Marks)**
Project team qualifications	15	• Minimum 5 years of relevant experience of each key personnel • Detailed knowledge and experience of Time and Attendance Management Systems • Relevant IT work experience
Capacity and project schedule	10	• Experienced Human resource availability in line with project scale/geography • Project time schedules proposed and their alignment with the estimated duration to complete the project as defined in the Data Sheet
Total	**100**	