2021

Small and Medium Enterprises' Green Energy Strategies for Profitability

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Abstract

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MBA, University of Lagos, 2018

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Doctoral Study Submitted in Partial Fulfillment

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Doctor of Business Administration

Walden University

July 4, 2021

Abstract

Lack of business strategies can negatively impact the generation of green energy, which may hinder business profitability and growth. Managers of small and medium enterprises (SMEs) who struggle to generate green energy to increase profitability are at high risk of their business failure. Grounded in the diffusion of innovation theory, the purpose of this qualitative multiple case study was to explore the business strategies managers of SMEs use to generate green energy to increase profitability. The participants were three SMEs managers in three energy companies in Lagos, Nigeria, who effectively used business strategies to generate green energy to increase profitability. Sources for data collection were semistructured interviews, company archival documents, and field notes. Data analysis involved the use of thematic analysis. Four themes emerged: financing support, renewable energy technology and efficiency systems, education and communication, and customer service and quality of service. A key recommendation is for SME owners to organize seminars and workshops for managers on effective strategies to generate green energy to increase profitability and sustain their businesses. The implications for positive social change include the potential for managers of SMEs to create job opportunities, provide social amenities and welfare, promote a clean environment, and support the economic development of the regional communities.

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Dedication

I dedicate this work to my parents, late Mr. Lawrence Ajom Okpokam and late Mrs Cecilia Aki Okpokam for nurturing me and giving me a good start in life. I also dedicate the work to my wife Mrs. Grace Ann Okpokam, and my children, Ekok Ajom Okpokam Jnr, Dr. Hope Ajom Okpokam, late Peter Ajom Okpokam, and Phebe Ajom Okpokam.

Acknowledgments

First, I want to acknowledge the Almighty God for giving me life, knowledge, understanding, and wisdom to carry out this study to its logical conclusion. Second, my gratitude goes to Dr. Greg Uche, my doctoral degree mentor and chair, who patiently guided and encouraged me to achieve this feat. Third, I acknowledge Dr. Jamiel Vadell, my second committee member, and Dr. Christopher Beehner, my University Research Reviewer (URR), both for taking the pains to read, edit, and made corrections on my work. Fourth, my special thanks go to my colleague and friend, Dr. Faustina Mbadi Igwebuike, who not only encouraged me to start this program but supported me all through the doctoral journey. Fifth, a very special thanks to my wife, Mrs. Grace Ann Okpokam, my two sons Ekok Ajom Okpokam Jnr., and Dr. Hope Ajom Okpokam, and my daughter, Miss Phebe Ajom Okpokam for their understanding and support throughout this journey. I sincerely appreciate all of you from the bottom of my heart.

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Section 1: Foundation of the Study

Small and medium enterprises (SMEs) form the bedrock of the national economy. Nigeria's economy suffers from epileptic electricity supply due to incessant power outages nationwide, leaving managers of SMEs with no option except to use diesel-electric power generators to enhance energy supply, translating to monetary losses (Olowosejeje et al., 2019). Implementing micro-off-grid solutions, SMEs' managers could reduce the dependency on diesel generators, guarantee the reliability of electricity supply, and increase profitability (Ndukwe et al., 2019). This research study focused on how managers of SMEs in Lagos, Nigeria, deploy strategies to generate green energy through the deployment of rooftop solar photovoltaic (PV) panels with inverters and storage batteries for improved profitability.

Background of the Problem

Energy is a crucial ingredient for the social, economic, and industrial development of every nation (Bisu et al., 2016). One of the most significant challenges in Nigeria is energy generation (Igbum et al., 2019). The frequent power outages impact the business performance of SME managers in Nigeria (Alarape, 2014). Lack of access to electricity hinders SMEs' growth and contributes to unemployment, migration, and emigration crises across the globe (Igbum et al., 2019).

Business leaders respond to the energy crises by utilizing fossil-fuel-powered generators to remain in business, which is expensive, pollutes the environment, and erodes the profit margin (Chofreh et al., 2014). The forms of energy consumption by businesses include petrol (premium motor spirit [PMS]), diesel (automotive gas oil

[AGO]), natural gas, electricity, coal, renewable fuels (including solar, wind, and ethanol), and nuclear (Kobelski, 2012). Managers of SMEs in Nigeria rely on standby electric power generating sets that use fossil fuel for their power supply, resulting in carbon dioxide emission and contributing to climate change (Adaramola et al., 2014).

Managers of SMEs in Nigeria need to adopt green energy as an alternative to fossil fuel to enable a clean ecosystem, as well as environmental and economic sustainability (Robinson & Stubberud, 2014). The use of green energy by SMEs could reduce the cost of energy consumption, increase profitability, ensure regulatory compliance, mitigate climate change, generate employment, grow the economy, and enable development (Dombi et al., 2014; Robinson & Stubberud, 2014).

Problem Statement

Nigeria's energy crisis is compelling energy users to explore alternative energy sources (Ebenezer et al., 2018). The World Bank (2016; see also Igbum et el., 2019) estimated 44.4% of Nigerians living in the country lack access to electricity. The general business problem was that conventional energy sources are getting more expensive, are not always available, pollute the environment, and pose a health problem. The specific business problem was that some managers of SMEs lack strategies to generate green energy to increase profitability.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies managers of SMEs use to generate green energy to increase profitability. The targeted population consisted of three managers from three SMEs who have successfully

developed and deployed strategies, generated green energy, and increased business profitability in Lagos, Nigeria. The implications for social change include the potential for managers of SMEs to maintain a steady power supply leading to improved productivity, employment opportunities for the local community, enhanced customer satisfaction, and a clean environment for the society.

Nature of the Study

Researchers use qualitative, quantitative, or mixed methods to conduct studies (Saunders et al., 2015; Zoellner & Harris, 2017). I used the qualitative method for this study. Researchers use the qualitative method to gain insight into the phenomenon under study in a natural setting (Hammarberg et al., 2016). A researcher can recognize principal developments, patterns, trends, and interactions through the qualitative method (Albers, 2017). Conversely, the quantitative method is numerical, and researchers use the quantitative approach to examine relationships among variables or groups of variables (Turner et al., 2017). The quantitative method was not appropriate for this study because the purpose was not to analyze empirical data or examine relationships among variables. The mixed methods approach is a combination of the qualitative and quantitative data collection and analysis process. Some researchers use the mixed methods to gain insight into the phenomenon under study in a natural setting and access relationships among variables or groups of variables (Bester et al., 2017; Bristowe et al., 2015). The mixed method approach was not suitable for this study because the purpose of this study was not to collect and analyze empirical data or examine relationships among variables.

Phenomenology, ethnography, or case studies are some of the designs qualitative researchers use to conduct studies (Castleberry & Nolen, 2018; Gergen et al., 2015). I used a case study design for this study. The qualitative case study design was appropriate to explore SME managers' energy alternatives for profitability. A researcher could use a single case design or a multiple case design to conduct a study (Yin, 2018). Researchers use a single case design to conduct studies under conditions such as a critical test of existing theory, unusual circumstance, revelatory case, or longitudinal purpose (Yin, 2018). A researcher uses a multiple case design to conduct a study to achieve a more compelling and robust outcome (Yin, 2018). A multiple case study design was appropriate for this study.

Phenomenological design is appropriate when a researcher seeks to study the personal meanings of the lived experiences of individuals experiencing a phenomenon (Creswell & Poth, 2017; Korcuska & Flynn, 2018; Saunders et al., 2016). The phenomenological design was not appropriate for this study because I did not want to explore the personal meanings of the lived experiences of individuals experiencing a phenomenon. Researchers use ethnographic design to study organizations or groups' cultures and patterns of a group in a social setting to gain a deeper understanding of study phenomena (Canevacci, 2017; Korstjens & Moser, 2017). The ethnographic design was not suitable for this study because I did not intend to study a group's culture or the beliefs of groups of people.

Research Question

What strategies do managers of SMEs use to generate green energy to increase profitability?

Interview Questions

1. What strategies do you use to improve green energy generation to increase profitability?
2. What key challenges did you encounter developing and implementing the strategies to improve green energy generation?
3. How did you overcome the key challenges you encountered while developing and deploying your organization's strategies to generate green energy to increase profitability?
4. How do you assess the effectiveness of the strategies on the adoption of innovation in green energy generation?
5. What communication channels did you use to convince the members of your organization to accept the change from fossil fuel to green energy to enable increased profitability?
6. How do you assess your organization's success in adopting green energy to increase profitability?
7. What competitive advantage has your organization gained for adopting green energy to increase profitability in Lagos, Nigeria?
8. What, if any, additional strategies are your organization planning to deploy to improve green energy generation to increase profitability?

9. What else can you share with me about your organization's strategies for adopting green energy to increase profitability in Lagos?

Conceptual Framework

Diffusion of innovation theory (DIT) was the conceptual framework for this study. In 1995, Roger proposed the DIT to explain the innovation diffusion within and across the organizations leading to improved performance (Lundblad, 2003; Rogers, 1995). The four central tenets of DIT are (a) innovation, (b) communication, (c) time, and (d) social system (Rogers, 1995). In the DIT, Rogers stipulated that innovation spreads by communication, over time, and through a social system. Rogers identified five key correlates of DIT: advantage, compatibility, complexity, trialability, and observability with the rate of innovation diffusion (Lundblad, 2003; Rogers, 1995). For example, the larger the perceived size of the advantage that innovation will bring to replace or enhance what currently exists, the faster the speed at which the innovation is expected to be adopted (Lundblad, 2003; Rogers, 1995). The perceived improvement that innovation will bring to replace or enhance what currently exists is a relative advantage; the adoption of the change is faster when the perceived relative advantage is greater (Lundblad, 2003; Rogers, 1995).

The measure of alignment of innovation with the needs, values, and experiences of an individual or organization is compatibility; the adoption of the innovation is faster with greater compatibility (Lundblad, 2003; Rogers, 1995). Complexity is the level to which an innovation is perceived as hard to comprehend and apply; the easier the

comprehension, the more rapid the adoption (Lundblad, 2003; Rogers, 1995). The extent to which potential adopters can test innovation is trialability; the easier to test a new idea, the quicker the adoption (Lundblad, 2003; Rogers, 1995). The extent to which the result of innovation is noticeable by other potential adopters is observability; the more visible potential adopters can see the results of an innovation, the faster the adoption of the innovation (Lundblad, 2003; Rogers, 1995).

The tenets of DIT align with this study's objective to explore the strategies that SME managers use to generate green energy to enhance profitability. The principles of communication, compatibility, trialability, and relative advantage are necessary to adopt green energy to replace fossil fuel among SMEs managers. The DIT applied to this study and was the lens for exploring strategies that SME managers use to generate green energy to enhance profitability. DIT's key components involving innovation, communication channels, time, and the social system are relevant to how SMEs could explore green energy alternative for improving energy production to increase their organizations' profitability.

Definition of Terms

Fossil fuels: Fossil fuels are sources of energy derived from dead organic matter buried in the sedimentary rock and include coal, crude oil, and natural gas, which release many pollutants when burned, giving rise to greenhouse gases (Metcalfe, 2019).

Green energy: Green energy is energy from natural sources such as sunlight, wind, tides, geothermal, and organic matter, which are replenished or renewable (Rogers, 2012).

Greenhouse gases: Greenhouse gases have the property to absorb infrared radiation emitted from Earth's surface and reradiate it back to Earth's surface. Greenhouse gases include carbon dioxide, methane, and water vapor, contributing to the greenhouse effect and global warming (Mann, 2014).

Photovoltaic: PV is a process that generates electric power by converting solar radiation into direct current electricity with the use of semiconductors (Bhatia, 2014).

Small and medium enterprises: SMEs are private firms with a fewer number of employees that varies across countries and meet specific size criteria depending on the industry in which the company operates (Liberto, 2019; Mekwunye, 2018).

Assumptions, Limitations, and Delimitations

Assumptions

I made several assumptions in this qualitative research. Assumptions are notions the researcher takes for granted, states as accurate, but cannot verify (Dusick, 2015). The critical assumption in this study was that I could control the questions concerning green energy generation. I assumed the study participants could recall and offer past information as I asked the questions appropriately. The second assumption was rooted in the belief that participants are truthful in answering the exploratory questions. The third assumption was that participants might feel reluctant to divulge information such as their house address, name, and opinion to an unfamiliar person for fear of the potential consequences. I mitigated the risk of losing such participants by assuring them of the confidentiality of their information. The fourth assumption was that managers of SMEs believe they can answer any or all questions. The participant completed the informed

consent form to safeguard against the risks of dishonest responses. The final assumption was that participants would be objective in their views about the strategies they used to generate green energy in their organization in Lagos, Nigeria, for improved profitability.

Limitations

Researchers may face challenges that could restrict them from achieving the desired outcome of their study. Limitations are what the researcher states as potential weaknesses that were out of the researcher's control in the study (Stewart & Gapp, 2014). A significant limitation of this study was restricting the study participants to managers of SMEs who had successfully adopted green energy and reside in Lagos, Nigeria. I conducted multiple case study in Lagos, Nigeria. The study participants were three managers from three SME who have deployed green energy for improving profitability. This study was limited to Lagos, Nigeria. The study phenomenon might be different in other cities in Nigeria when compared to Lagos.

Delimitations

Many researchers define their research boundaries and constrain data collection within the boundaries. Delimitations are the boundaries of the phenomenon under study the researcher articulates to enable choices on the unit and level of analysis considering the research question (Mele et al., 2020). The delimitation of a study is from the limitation in scope and inclusive and exclusive decisions that define the boundaries of the study (Simon & Goes 2013; Yin, 2018). Many researchers use the primary data source for analysis and decision making in their study (Singh, 2018). The study area was limited to Lagos, Nigeria. The delimitations include a lack of strategies to deploy green energy

for profitability and limited demographics in the study population. The delimitations might influence the adoption of green energy by managers of SMEs in Lagos, Nigeria.

Significance of the Study

Contribution to Business Practice

The study finding could be of value to business managers because the adoption of green energy as an alternative to fossil fuel could guarantee a steady power supply and improve business performance. Business managers who address unsteady power supplies in a developing economy can make their companies more productive and competitive. Business manager with improved performance attracts more customers (Chou et al., 2016). Managers of SMEs could gain insights from the study findings on improving products and services, increase profitability, and reduce energy costs from engaging in green energy utilization. Lack of adequate information is a critical reason why managers of SMEs do not take advantage of the benefits of green energy and green environmental strategies to increase profitability (Stewart & Grapp, 2014). Managers of SMEs could acquire knowledge from the study findings that may benefit from using effective strategies to generate green energy to increase business profitability.

Implications for Social Change

The study findings could have a positive social impact on both communities and society. By implementing the study findings, SMEs managers could boost the business of green energy providers and support the creation of job opportunities. The study findings could promote sustainability practices in SMEs business strategies and reduce carbon dioxide emission, giving rise to a cleaner environment in Lagos, Nigeria. The adoption of

green energy in business contributes to a pristine ecosystem and environmental sustainability (Robinson & Stubberud, 2014). Reduction in greenhouse gas emissions and elimination of generator noise by adopting green energy could promote quietness and tranquility in Lagos, enabling the social wellbeing of the city residents (Rizwanul-Fattah et al., 2013).

A Review of the Professional and Academic Literature

In this literature review, the information sources included books, dissertations, government and corporate websites, peer-reviewed scholarly articles, and professional and academic journals. The literature review sources consisted of 230 journals, one government report, six books, and two dissertations (see Table 1). Of the 239 resources, 221 (92%) were peer-reviewed, and 195 (82%) were publications within 5 years (2016-2021) of my anticipated graduation date. The research databases and libraries I used to construct this literature review included ScienceDirect, ProQuest, Emerald Management Journals, Business Source Complete, ABI/INFORM, SAGE, EBSCO Primary, Walden University Library, and Google Scholar. The keywords for the literature search included *green energy, SMEs, profitability, green jobs, challenges of microgrids, green buildings, wind power resources, barriers to green energy, hydropower electrification, energy security, and energy risk management, renewable energy sources, bioethanol production, solar energy and storage, green energy and SMEs profitability, concentrated solar power, and biomass energy.*

Table 1

Literature Review Sources of Resources

Reference type	<5 Years	>5 Years	Total
Peer-reviewed journals	187	34	221
Dissertations		2	2
Non-peer reviewed journals	4	5	9
Books	4	2	6
Government or corporate sites	0	1	1
Total	195	44	239

Many researchers have studied energy policy (Ajayi & Ajayi, 2013; Lewandowski, 2019), green energy (Akermi & Triki, 2017), green jobs (Acey & Culhane, 2013), challenges of microgrids (Akinyele et al., 2018), and green buildings (Azeem et al., 2017). Other scholars have studied wind power resources (Mas'ud et al., 2017), barriers to green energy (Azeem et al., 2017; Jabbour et al., 2016), and hydropower electrification (Ebhota & Tabakov, 2018; Korkovelos et al., 2018). With growing global energy concerns, some researchers have explored energy security and energy risk management (Lifan, 2015), renewable energy sources (Medakovic & Vaskovic, 2015), bioethanol production (Ohimain, 2015) and PV solar energy and storage (Altan et al., 2019; Anagnostopoulos et al., 2017; Goebel et al., 2017). Literature exists on green energy and SMEs profitability (Pham, 2018; Vasileva et al., 2018),

concentrated solar power (Omri et al., 2019), and biomass energy (Akinyele et al., 2018; Ebhota & Tabakov, 2018).

The bulk of the research on renewable energy consists of quantitative studies to determine the cause and effect of variables to enable the transition from conventional energy to renewable energy for energy security, equity, and sustainability (Akermi & Triki, 2017). Researchers have conducted numerous studies on green energy. However, evidence from the literature review indicates that few researchers have conducted qualitative studies on green energy (Lifan, 2015). Evidence from the literature review confirmed the limited information on the strategies that managers of SMEs use to generate green energy as an alternative for profitability. Some authors suggested that future studies on green energy as alternative strategies could fill a gap in research (Omri et al., 2019).

DIT

In 1995, Rogers proposed the DIT to explain the innovation diffusion within and across the organizations to enhance performance (Lundblad, 2003; Rogers, 1995). The adoption and implementation of a new process, idea, product, or services by an individual or within and across organizations is the diffusion of innovation (Lundblad, 2003; Rogers, 1995). Diffusion of innovations is a conceptual framework that researchers widely use to study the spread of products, practices, and ideas (Friedrichsen et al., 2017). Min et al. (2018) posited that DIT is a social and psychological theory that researchers used extensively to predict innovation adopters' decision making and

adoption patterns. The DIT is an ideal approach for exploring the strategies managers of SMEs use to generate green energy to increase profitability.

Innovation and national efficiency with the interaction between technology transfer and absorption are critical to productivity growth among nations (Danquah, 2018). Human capital constitutes the engine room of productivity and growth of national economies through technological innovation and adoption (Danqual & Amankwah-Amoah, 2017). The diffusion of innovation affects leaders who have a shared interest in their organizational improvement; these include leaders in education, organizational development, management, information technology, sociology, and healthcare (Lundblad, 2003). Researchers have shown that not all innovations diffuse within and across organizations to realize improvement (Lundblad, 2003). For example, researchers and practitioners in the green energy sector develop new electricity and process advancements. Nonetheless, some of these energy innovations take decades to spread across organizations for wide use in improving profitability. Managers of SMEs should adopt DIT to generate green energy for improving profitability.

The progress, industrialization, and prosperity of nations are dependent on energy efficiency, sustainability, and proliferation of technologies that utilize renewable energy sources to meet the need of populations suffering from energy deprivation (Sheikh et al., 2019). Some renewable energy sources include solar, wind, biomass, geothermal, hydropower, and tidal waves. Rogers (1995) identified four DIT tenets: innovation, communication, time, and the social system. In the following subsections, I discuss these four tenets in detail.

Innovation

An idea, procedure, product, or service that a potential adopter perceives as new is an innovation (Lundblad, 2003; Rogers, 1995). By understanding the functioning of innovation systems and the rate of technology diffusion, leaders and managers of SMEs in Sub-Saharan Africa could adopt and implement renewable energy technologies to address energy poverty and enhance sustainability (Tigabu, 2018). Rogers identified five key characteristics of innovation: relative advantage, compatibility, complexity, trialability, and observability with the rate of innovation diffusion (Lundblad, 2003; Rogers, 1995). The greater the perceived relative advantage that the innovation will bring to enhance what currently exists, the faster the innovation will be adopted (Lundblad, 2003; Rogers, 1995).

Compatibility is the extent to which the innovation aligns with the values, experiences, and needs of a potential adopter; the more significant the compatibility, the faster the adoption (Lundblad, 2003; Rogers, 1995). Complexity is the ease of understanding and use of the innovation; the easier it is to use the innovation, the faster the adoption (Lundblad, 2003; Rogers, 1995). Trialability is the level at which a potential adopter can test the innovation before adoption and implementation; the more the innovation is easily testable, the faster the adoption (Lundblad, 2003; Rogers, 1995). Observability is how visible potential adopters can observe the innovation; the more the innovation is observable, the faster the adoption (Lundblad, 2003; Rogers, 1995).

Communication

The second tenet of DIT is communication. The process by which people develop and share information to derive common understanding is communication (Lundblad, 2003; Rogers, 1995). The adopters of an innovation communicate the innovation to those individuals and organizations yet to know about the innovation (Lundblad, 2003; Rogers, 1995). Communication channels include mass media such as radio, television, newspapers, or one-to-one interpersonal communication (Lundblad, 2003; Rogers, 1995). Interpersonal communication tends to be more effective in making potential adopters know and implement an innovation compared to mass media (Friedrichsen et al., 2017). There exists a relationship between the source of communication about innovation and the rate of adoption. The person delivering the communication about innovation is essential to a potential adopter of the innovation. The more likely the source of information is to the potential adopter, the faster the adoption of the innovation (Lundblad, 2003; Rogers, 1995).

Time

Time is the third tenet of DIT and has three components: innovation-decision process, adopter categories, and adoption rate (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). The innovation-decision process is a time frame from when the potential adopter first becomes aware of the innovation to when they adopt or reject the innovation. The innovation-decision process is divided into five steps: knowledge, persuasion, decision, implementation, and confirmation (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995).

The adopter categories are measures of how inclined an individual is to adopt new ideas as compared with other members of the social system. Adopter categories include innovators, early adopters, early majority, late majority, and laggards (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). Innovators are people who seek and embrace innovation, are venturesome, and not afraid of risk (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). Early adopters are open to change but more connected and respected within the social system but are not as risky as the innovators in their innovation adoption decisions (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). The early majority usually constitute about one third of the members in a social system, adopt innovations just before the average member of the social system, and are more deliberate about their decisions (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). The late majority are also about one third of the members of a social system, are slower to adopt, tend to be skeptical about innovation (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). Laggards are traditionally the last group in a social system to adopt innovation; they are suspicious of new ideas, products, processes, and services (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995).

The rate of adoption is the third component of time as a tenet of DIT. The adoption rate is the speed at which an innovation is adaptable in a social system (Lundblad, 2003; Reddick et al., 2019; Rogers, 1995). The innovation adoption tends to follow an S-curve showing that only a few individuals adopt the innovation. However, more people become open to adopting the innovation with time, and the rate increases

(Hopkins, 2019; Lundblad, 2003; Rogers, 1995). The adoption rate of innovation is influenceable by the social system (Hopkins, 2019; Lundblad, 2003; Rogers, 1995).

Social system

The last of the four tenets of DIT is the social system (Hopkins, 2019; Lundblad, 2003; Rogers, 1995). Every diffusion of innovation occurs in a social system that includes individuals, groups, and organizations who share a common goal that connects them as a social system. The members of a social system are diverse concerning their readiness to adopt an innovation (Hopkins, 2019). For example, a social system could be families in a neighborhood, organizational employees, and association members. Change agents, opinion leaders, and champions in a social system can influence innovation diffusion (Hopkins, 2019; Lundblad, 2003; Rogers, 1995).

Related and Contrasting Theories

Related theories to the DIT, which some researchers may use as lenses to study the transition from fossil fuels to green energy for profitability, include the theory of disruptive innovation (TDI) and radical innovation theory (RIT). Scholars employ TDI and RIT to define products that cause discontinuities in technology and the market (Gurtuer & Reinhard, 2016). In the proceeding section, I discuss these two theories.

TDI

In 1997, Christensen formulated the TDI to explain the process by which new entrant firms with fewer resources successfully challenge established incumbent companies in existing markets (Christensen et al., 2015; Riesmeier, 2020). The introduction of technologies in green energy businesses such as PV rooftop panels for

microgrids into the energy market could be disruptive to conventional technologies in energy systems that use fossil fuel (Hansen, 2017). Disruptive innovations could be introducing new services or technological products by an entrant firm that could change the market forces of demand and supply, causing the entrant company to gain market share and the incumbent firm to lose (Krell, 2017). Disruptive innovation theory explains how managers of firms could capture a market by introducing new products or services.

Leaders of disruptive companies use various market penetration strategies to gain a competitive advantage. Developers of disruptive technologies could reinvent a product by creating new qualities that could become a significant competitive advantage (Bohnsack & Pinkse, 2017). Only customers at the lower end of the market value the new attribute and adopt the product or service at the initial stage. The mainstream customers usually feel reluctant to adopt the new product because they are usually more comfortable with the incumbent firm's established product. When mainstream customers value the new technology, they could switch to the new product, and disruption may occur.

Managers of new entrant firms capitalize on less saturated market segments to penetrate the market. The managers of new entrant companies target the segment of the market overlooked by the incumbent established firms to gain a foothold by offering more suitable and less expensive products or services (Hopp et al., 2018). The leaders of incumbent established firms are usually unable to respond to the disrupters because the incumbents chase higher profitability in the more demanding market segments. The leaders of the disruptive company could also create a new market and raise new

customers. Disruption could result from the introduction of new technology or a new business model.

New entrants' disruptive firms could improve on the quality of their offerings to attract mainstream customers. Disruption in the market occurs when the mainstream customers adopt the new entrant companies' offerings in large volumes enabling the entrant firms to move up-market (Christensen et al., 2015; Riesmeier, 2020). The disrupters usually focus on getting the business model right and offering the right products or services. The disruptive firm from the lower end of the market or a new market to the mainstream will first erode the incumbent market share and profitability.

A well-thought-out business model could be a game-changer in the marketplace. Christensen et al. (2015) stated that disrupters usually establish business models that are entirely different from those of the incumbent. Therefore, incumbent companies should respond to disruption as it occurs and avoid dismantling a currently profitable business. An incumbent firm's reasonable response to disruption in the market could strengthen the relationship with core customers by investing in sustainable innovation.

New entrant firm's effort in market penetration could be more profitable by targeting the low end of the market. A disruptive business leader could first gain acceptance in the lower end of the market. The incumbents often neglect the segment in pursuit of more lucrative high-end customers (Christensen et al., 2015; Riesmeier, 2020). Disruptive innovation is related to business model variations and low-end market. In contrast, radical innovation depends on organizational and individual capabilities and human organizational capital.

RIT

RIT deals with creating new knowledge and commercializing novel products or services (Hopp et al., 2018). The abilities of organizational leaders to develop business ideas and innovations depend on the quality of human capital in the companies (Danquah & Amankwah-Amoah, 2017). Radical innovation influences a firm's long-term competitive advantage over other innovations in a rapidly changing technological environment (Zhang et al., 2018). Incumbent firms could leverage technology to transform their businesses to survive disruptive entrant companies radically. Both incumbent and new entrant firms can introduce radical innovation (Riesmeier, 2020).

Radical innovation enhances a firm's performance and growth in a competitive global market (Kiani et al., 2020). Many scholars believe that there is a relationship between entrepreneurial passion and a firm's radical innovation (Kiani et al., 2020). Radical innovation deals with new technologies or methods that are significantly different from the current ones. Entrepreneur passion stimulates idea generation, opportunity recognition, and prospect exploitation, which relate to fundamental, innovative venture processes, and growth. Radical innovation is discontinuous and is different from incremental or continuous change. Radical innovation is new-to-the-market innovation with a significant effect on the firms' economy in each market (Hervas-Oliver et al., 2019). The radical change enables leaders of a firm to sustain a competitive advantage.

Radical innovation occurs in a prone-to-innovation local environment. Radical innovation brings drastic changes in an organization. Radical innovation relates to organizational culture and capabilities, social and human capital, and project management

(Hopp et al., 2018). Radical innovation completely transforms the way firms engage with the marketplace. Radical innovation requires entirely new technical skills and organizational competencies by employees of firms undertaking this innovation type.

Sources and Types of Green Energy

Green energy is naturally replenishing, inexhaustible in duration, but limited in the amount of available energy per unit of time (Treki & Urban, 2015). Green energy sources include energy sources and technologies that have minimal effect on the environment, such as solar energy, wind, small and medium hydro, biomass, geothermal, and tidal wave energy (Ministry of Power, 2015). The advantages of green energy over fossil fuels include being replenishable and nonpolluting. The deployment of various technologies enables the utilization of different types of green energy resources.

Solar energy is the conversion of solar radiation to heat or electricity (Reddy, 2020). The two types of technologies for converting sun radiation to energy include PV and concentrating solar power (CSP; Bousselamti & Cherkaoui, 2019; Mauritzan, 2017). PV technology is cheaper due to the rapid fall in the cost of solar PV panels compared to CSP technology (Bousselamti & Cherkaoui, 2019). CSP technology system involves large scale generation of electricity into a centralized network. Through the PV technology system, electricity generation could be for a centralized grid or microgrid for a distributed network (Mauritzan, 2017). Solar energy is intermittent, but energy experts use efficient storage devices to address the intermittent nature of solar radiation (Ministry of Power, 2015).

Wind energy is the energy in the air movement as wind, which experts use to turn the blades of windmills or wind turbines to drive electrical generators to produce electricity (Nadour et al., 2020). Wind energy's intermittent nature poses system reliability challenges to a centralized network system but could serve better in a distributed network (Dalero & Musa, 2018; Mijakovski et al., 2018). Nigeria has the potential for wind energy growth (Mas'ud et al., 2017). Wind power is an untapped renewable energy resource in Nigeria despite its abundance in different parts of the country (Dalero & Musa, 2018).

Hydropower is a source of green energy from water movement through turbines to generate electricity (Fleten et al., 2018). There are two types of hydropower plants: (a) those that store water in a reservoir in a dam and (b) run-of-river hydropower (Fleten et al., 2018; Korkovelos et al., 2018). The hydropower plants that store water in a reservoir are controllable by adjusting production at low cost to provide reserve generation when necessary (Ebhota & Tabakov, 2018). In contrast, hydropower plants from the river as a direct water source without storage may not be controllable (Ebhota & Tabakov, 2018; Fleten et al., 2018). The development of small and medium hydropower plants to provide electricity could serve the need for remote off-grid communities (Ebhota & Tabakov, 2018).

Biomass is a non-fossil organic material of biological origin (Orjiakor et al., 2017). Biofuels production from biomass includes biogas, bioethanol, and biodiesel (Ohimain, 2015; Oliver & Khanna, 2017). Biomass sources include sugarcane, cassava, miscanthus, switchgrass, poplar, and crop residues from corn, wheat, forage grasses and

shrubs, and rice husks. Other sources of biomass include animal wastes and wastes arising from forestry, agricultural, municipal, and industrial activities, such as saw-dust, as well as aquatic biomass (Bisu et al., 2016; Ohimain, 2015; Oliver & Khanna, 2017). Biofuels such as ethanol and butanol could be an alternative resource for liquid fuel, which is fast depleting world petroleum reserves (Orjiakor et al., 2017). Ethanol could substitute conventional gasoline for liquid transportation fuels and cooking fuels; ethanol should replace kerosene (Ohimain, 2015).

Geothermal energy could be due to the intrusion of igneous rocks into near-surface rock layers giving rise to hot springs on the earth's surface (Lewerissa et al., 2020). Geothermal energy resources are areas of the earth's crust with high temperatures near the surface due to geologic processes. Energy experts could utilize the heat energy from geothermal sources to supply heat to homes and industries (Ayuba & Lawal, 2019). Other origins of geothermal energy include mantle plume, thermal uplift, pressure from sediments, radioactive decay of minerals, and residual heat from the planet (Ayuba & Lawal, 2019). Geothermal resources abound in Nigeria, with some surface manifestations such as warm springs in the Southwestern region and an indication of steam at about 1.3 km depth in the Southeastern area (Abraham et al., 2019). There is no evidence of the utilization of geothermal energy in Nigeria.

Tidal wave energy in shallow seas and coastal regions is due to ocean bottom friction (Musgrave, 2019). In the deep ocean away from coasts, tidal wave originates from topographically trapped waves propagation along the ocean floor (Musgrave, 2019). Energy experts use liner generators to convert the kinematic and potential energy of

ocean waves into electricity (Castellucci et al., 2016). Tidal wave technology is more expensive than other renewables technologies (Stegman et al., 2017). Like solar and wind energy, tidal wave energy is intermittent.

Strategies for Developing Green Energy

Managers of SMEs could take advantage of government policy on tax incentives on green energy technologies to invest in green energy development for profitability. Tax incentives are a proven strategy that most governments adopt to promote renewable energy production and utilization (Anagnostopoulos et al., 2017; Johansson et al., 2019; Lewandowski, 2019). Business leaders worldwide seek appropriate energy policy to meet the increase in energy demand (Giama & Papadopoulos, 2018). Tax incentives are a sound energy policy strategy that could promote renewable energy resources and technologies and guarantee an uninterrupted power supply.

A combination of renewable energy sources and storage is a necessary strategy that managers of SMEs can use for efficient energy supply in developing economies (Tsai et al., 2020). The integration of renewable energy sources and energy storage is key to extending energy access into remote areas of developing countries (Barelli et al., 2019). Hybrid systems that integrate different renewable generation sources with energy storage technologies could be more sustainable and cheaper than fossil fuel energy (Reddy, 2017). The advantages of hybrid microgrids systems include reduced risks associated with fuel availability, less exposure to fuel price volatility, cost savings, and carbon dioxide emissions reduction (Song et al., 2018).

Managers of SMEs in green energy development businesses need a collaborative approach as a strategy in the provision of services (Pitt & Congreve, 2017). By collaborating, managers of energy SMEs could provide customers service-enhanced products that include financing and insurance support, product installation and configuration, and operation and maintenance (Camarinha-Matos et al., 2017). To face the challenges of market changes and globalization of the economy, managers of SMEs who are active in the solar PV energy sector should cooperate to acquire the size, agility, and resilience to operate in different business ecosystems.

A suitable decision tool for designing and implementing PV self-consumption solar systems could enable SME managers to drive green energy diffusion. Managers of SMEs could use net present value, internal rate of return, discounted payback time, and net cash balance to evaluate economic and financial feasibility of green energy project (Guzman et al., 2018; Talavera et al., 2019). Researchers have highlighted some shortcomings in available tools for conducting profitability analysis of green energy projects, such as the PV system. Some shortcomings include poor definition of the economic and financial scenarios, non-provision of relevant information, non-usage of the most common financial criteria, and the complexity and training requirements for correct implementation of the tools (Talavera et al., 2019). The shortcomings might discourage the use of the tool.

Managers of SMEs could use the concept of an intelligent community as a strategy to develop and grow green energy. The developers of intelligent off-grid communities and bright economic zones use green energy (Sheikh et al., 2019). Using

renewable energy sources with microgrids such as PV cells could cater to remote communities without electricity. Managers of SMEs could use the emerging intelligent, sustainable community concept to boost green energy adoption and diffusion.

Managers of SMEs could use high-end small devices for energy storage systems for renewable energy sources as a strategy to drive the energy transition and the growth of green energy. The use of small systems for energy storage and renewable energy sources could ensure the transition to a viable economic future and a decarbonized economy (Ciocan et al., 2017; Rascon et al., 2016). Thermo-electric storage could solve the challenge of micro off-grid PV systems and stimulate further development in green energy (Rascon et al., 2016). Green energy capture and storage during the on-peak period could enable continuous energy supply during the off-peak period. Solar power could be storable in Li-Ion batteries, wind energy in compressed air systems, and thermal energy in thermal storage systems (Ciocan et al., 2017).

Cool coating paint on the rooftop is a strategy that managers of SMEs can use to increase solar reflectance and thermal emittance. Using cool surface paint and integrating with solar PV technology on the building's roof could deliver higher solar reflectance and higher thermal emittance, leading to higher electricity generation than standard roofing products (Altan et al., 2019). The benefits of applying cool roof techniques in the built environment include decreased surface temperatures due to reduced urban heat island effect and offset in warming caused by greenhouse gases (Altan et al., 2019). Managers of SMEs could use cool roof applications to improve the electricity generation power from solar PV panels.

The concept of outspread urban development could enable SME managers to increase the generation of green energy from rooftop PV panels. Higher urban density may reduce vehicle travel and associated energy use, limiting on-site rooftop solar energy utilization due to more shade on rooftops in dense urban settings and less available rooftop area per person (Ko et al., 2017). Compact urban development may conflict with green technology for greenhouse gas (GHG) emission reduction. Reducing energy consumption and the associated GHG emissions through sustainable urban development is the goal of many cities and nations worldwide but a hindrance to green energy generation.

Managers of SMEs could leverage high solar radiation in Nigeria to generate green energy from solar PV on rooftops. Song et al. (2018) developed an approach that simulated the monthly and annual solar radiation on roofs at an hourly time step. Song et al. estimated the solar PV potential based on the rooftop feature, which included 2D rooftop outlines and 3D rooftop parameters. Several rooftop types that energy SMEs use for solar PV panels installation to generate green energy include flat rooftops, shed rooftops, hipped rooftops, gable rooftops, and mansard rooftops (Song et al., 2018). Managers of SMEs could use the parameters of the PV modules derived from the building features combined with solar radiation data to evaluate the solar PV potential of a city.

An integrated energy management strategy could lead to energy-efficient and cost-effective solutions for SMEs. The application of environmental management schemes and implementation of sustainability policies in SMEs production processes

could reduce energy consumption and raw materials utilization, to benefit from cleaner, leaner, and more cost-efficient production (Giama & Papadopoulos, 2018). Business leaders and governments consider the reduction of carbon emissions as a top priority in the decision-making process. Energy experts could use carbon footprint analysis as a tool to monitor the energy performance of the production processes of SMEs (Giama & Papadopoulos, 2018).

The adoption of greenness in supply chain management by managers of SMEs could be a viable strategy in promoting green energy development. The supply chain's eco-friendly structure concentrates on an organization's accountability in valuing the entire ecological effects of yields through its complete life cycle, from the raw materials procurement to the final utilization and product disposal (Kathiresan & Ragunathan, 2017). Factors which could enhance the implementation of green supply chain management (GSCM) include technology advancement, organization motivation, skilled human resources, availability of government funds and support, execution of green practices, vendor willingness to transition towards GSCM, and customers' awareness. Other factors which could improve GSCM include management commitment, green procurement, green marketing, and eco-friendly proposal in the entire supply chain system (Kathiresan & Ragunathan, 2017).

The optimization of green energy technologies such as solar energy could be a strategy manager of SMEs use to develop green energy. Bousselamti and Cherkaoui (2019) modeled green energy generating plants which included PV plant, CSP plant, and hybrid PV/CSP plant, to evaluate the influence of design parameters on the plants. The

parameters evaluated include orientation angles, solar multiple (SM), thermal energy storage (TES) capacity, and a fraction of hybridization. The optimal orientation angles and TES/SM, respectively, affected the performances of PV and CSP plants. The study revealed that PV/CSP systems had the benefits to increase the annual energy produced, reduce the cost, and offer the highest dispatchability to supply energy generated (Bousselamti & Cherkaoui, 2019). The abundance of solar energy is a promising source to produce clean energy.

Managers of SMEs could benefit from the renewable energy policies of governments as a strategy to develop green energy. World leaders have adopted the concept of sustainable development of communities involving energy and energy efficiency, raising the demand for increased use of renewable energy sources (RES) to meet the increasing total energy needs (Medakovic & Vaskovic, 2015). Developed countries, transition countries, and developing countries define short-term and long-term development strategies in renewable energy sources and sustainable development at local, state, and regional levels. United Nations (UN), European Parliament, and other relevant international institutions and organizations in their directives had defined clear and precise directions and frameworks for activities geared towards sustainable development (Medakovic & Vaskovic, 2015). The use of green energy could mitigate climate change, high energy consumption, and the disappearance of biodiversity and natural resources.

Knowledge of the solar PV potential of a city could enable managers of SME to plan for green energy utilization strategically. Understanding the distribution of the

monthly solar PV potential of rooftops in a city about the orientations and slopes of the rooftops is vital to green energy development (Polo et al., 2018). The amount of solar energy that reaches the terrestrial surface depends on the local weather conditions, atmospheric effects, the orientation of the slopes, and solar incident angle in the area (Polo et al., 2018). Governments and policymakers support solar energy because it is the most effective green energy source for combating climate change. Low-carbon electricity production using PV panels on rooftops contributes to the increased use of renewable energies.

Managers of SMEs in energy businesses use green energy strategies for both electrical power generation and heat supply. CSP, hydropower, and geothermal power plants are promising technologies for power generation. The geothermal district heating, pellet based non-grid heating, and solar thermal heating could offer significant advantages in heat supply (Dombi et al., 2014). Renewable energy could be a veritable tool for rationalizing energy consumption, efficient energy usage and adopting a new energy structure to achieve a shift from the conventional fossil fuel energy structure towards sustainable energy. The use of renewable energy technologies by managers of SMEs could guarantee climate change mitigation, job creation, economic growth, and rural development.

The promotion of renewable energy technologies by managers of SMEs could be a strategy that could address energy poverty and environmental sustainability challenges. The focus of renewable energy technology diffusion research in Africa had primarily centered on identifying technological, economic, and social factors, determining the end-

user's adoption decision. However, diffusion and uptake of renewable energy technology remain marginal (Tigabu, 2018). Understanding of the enabling institutional context of renewable energy technologies by managers of SMEs could improve the diffusion and adoption of renewable energy. Institutionalization of the appropriate regulatory framework could fast-track the diffusion of renewable energy technologies in Africa.

Energy only and capacity remuneration markets are two strategies that managers of SMEs could use for electricity market designs to enhance green energy development. Electricity market designs vary, with some countries adopting "energy-only" markets and others utilizing capacity remuneration mechanisms (Nelson et al., 2018). The electricity industry historically has three supply chain components, which included generation, transmission and distribution, and retail supply. The wholesale generation market could enable trading between generators, retailers, and other financial intermediaries for short-term delivery of electricity and future delivery periods (Nelson et al., 2018). Deregulation and privatization of energy markets could reduce GHG emissions and achieve social equity.

Effective implementation of renewable energy policies by policymakers could be a strategy to encourage managers of SMEs to invest in green energy diffusion. Some renewable energy policies such as feed-in tariffs (FITs), tradable green certificates, renewable portfolio standards, and bidding and tendering are significant drivers that could enable SME managers to develop renewable energy (Treki & Urban, 2015). Sustainability and going green are becoming an integral part of business and management. The major global concerns are that traditional sources of electricity

generated from fossil fuels are non-renewable, depleting, and increasing GHG emissions, leading to climate change and a risk to the security of future energy requirements.

The application of sustainability by managers of SMEs could be a strategy for green energy implementation in the real estate sector. Real estate is responsible for about 40 percent of energy consumption worldwide, reflecting the enormous potential of buildings contributing to global change (Cajias & Piazolo, 2013; Jones et al., 2019). Researchers have called for actions and initiatives in the real estate sector to reduce the negative ecological impacts. The real estate market managers could respond to climate change through the establishment of certification labels, promoting sustainable development, and increasing the attractiveness of green investment impacts (Jones et al., 2019). The advantages of renewable energy in real estate include energy efficiency, enhanced tenant investment decisions, and improved performance of investor portfolios. Other benefits of renewable energy in real estate are reduced GHG emission, improved public health and societal welfare, optimization of operational costs, reduction in depreciation costs, and increment in building value (Jones et al., 2019).

Green logistics could be a viable strategy that managers of SMEs could use for developing green energy. Renewable energy is a driving factor of green logistics and supply chain operations, promoting environmental and economic sustainability (Yu et al., 2018). Green logistics indicators could positively correlate with green energy sources, foreign direct investment (FDI) inflows, and trade openness. GHG emissions and carbon emissions could negatively correlate with green logistics (Yu et al., 2018). The implementation of green energy by managers of SMEs could positively impact green

supply chain performance, energy demand, economic growth, and environmental sustainability.

The adoption of green energy in educational campuses could be a strategy manager of SMEs use to develop and diffuse green energy. Educational campuses leaders should shift from carbon energy sources to green energy sources by providing green energy on campuses. Educational leaders could generate power on campuses through an energy awareness program, adoption of energy policies, provision of incentives, and development of green energy projects which could pay for themselves (Sheikh et al., 2019; Simpson, 2003). The development of a sustainable energy program in educational campuses could reduce carbon emissions and address global warming. Switching to clean renewable energy sources such as PV, biomass, and wind power could reduce carbon emission on campuses.

SMEs and Development of Green Energy in Nigeria

SMEs are businesses that employ less than 250 staff (Giama & Papadopoulos, 2018). Managers of SMEs could create green jobs by adopting green energy and implementing energy efficiency measures to increase profitability (O'Keeffe et al., 2016). SMEs' strategic importance to the Nigerian economy includes contributing to employment growth, a bedrock of the economy, producing mainly for the domestic market, and facilitating technological innovation (Luta, 2017). Managers of SMEs could be significant drivers of green energy growth in Nigeria.

The adoption of green energy by managers of SMEs could enhance energy efficiency, financial savings, profitability, and competitiveness (Minciuc et al., 2017). A

firm that effectively controls pollution could control other production costs, improve efficiency, and earn a higher return (Pham, 2018). Implementing environmental management and sustainability policies in the production process could reduce energy consumption, raw materials usage, and lead to a cleaner, more cost-efficient production (Giama & Papadopoulos, 2018). Managers of SMEs should adopt green energy to increase profitability.

About 44.4% of the Nigerian population does not have access to electricity (Dioha & Kumar, 2018; The World Bank, 2016). Managers of SMEs could contribute to Nigeria's utilization of green energy sources such as rooftop solar PV for the urban areas where land availability is limited (Dioha & Kumar, 2018; Olowosejeje et al., 2019). Rural communities in Nigeria could benefit from managers of SMEs' efforts to generate electricity from small hybrid power consisting of solar PV, battery storage, and power electronic converter (Ndukwe et al., 2019). To effectively integrate solar PV power generation into Nigeria energy delivery system, electricity sector managers of SMEs require a good knowledge of solar PV technology and economic viability for investment decisions, policy formulation, and utility planning (Dioha & Kumar, 2018; Olowosejeje et al., 2019). The unusual grid power supply situation in Nigeria is causing households and companies to resort to captive power generation using gasoline and diesel generator sets during blackouts leading to pollution (Dioha & Kumar, 2018; Edereka-Great, 2015; Olowosejeje et al., 2019). Managers of SMEs should have basic knowledge of the generation of green energy.

Managers of SMEs in Nigeria could engage in ethanol production from cassava feedstock using locally fabricated technology due to the abundance of cassava (Ohimain, 2015). Ethanol is a source of green energy for liquid transportation and cooking fuels (Ohimain, 2015; Oliver & Khanna, 2017). The advantages of fuel ethanol production as a renewable energy source include environmental, economic, and social benefits for sustainable development (Ohimain, 2015; Oliver & Khanna, 2017). Ethanol could replace conventional gasoline for transportation and kerosene for cooking.

The productive wind energy potential in Nigeria could be an attraction for SME managers to invest in wind power projects to generate electricity (Dalero & Musa, 2018). There are no visible operational wind farms in Nigeria (Mas'ud et al., 2017). The challenges managers of SMEs could face in developing wind energy in Nigeria may include inadequate funding for wind projects, lack of sufficient budget for research, and lack of technical knowledge (Dalero & Musa, 2018; Mas'ud et al., 2017). Nigeria does not have a working wind farm despite vast wind potentials and a clear policy.

Small hydropower is another green energy resource in Nigeria that the managers of SMEs could venture into for energy generation as an alternative to fossil fuel and for economic development (Ebhota & Tabakov, 2018; Fleten et al., 2018). The inadequate supply of power has resulted in a high unemployment rate, poverty, and high production costs in Nigeria (Ebhota & Tabakov, 2018; Fleten et al., 2018). Small hydropower (SHP) systems could be an alternative energy source for satisfying the new energy attributes of low carbon dioxide emissions with the environmentally friendly flow and renewable

energy sources (Ebhota & Tabakov, 2018). Managers of SMEs could generate electricity for rural communities from run-off-rivers because the resource is readily available.

Benefits and Profitability of Green Energy

There are several benefits when managers of SMEs adopt green energy for the company and society. The benefits include (a) profitability in operating businesses, (b) regulatory compliance, (c) reduction in the cost of energy consumption, and (d) improve the corporate image (Ali et al., 2017; Leloux et al., 2015). Society could benefit from a pristine ecosystem, environmental sustainability, and green jobs (Cucchiella et al., 2017; Goebel et al., 2017). Managers of SMEs who adopt green energy and those who produce green products benefit from increased patronage by customers (Goebel et al., 2017). Managers of SMEs should implement strategies for generating green energy to increase profitability.

Managers of SMEs who generate green energy for self-consumption could increase profitability in business operations. The average energy consumption by SME managers for most economies is about 25.5% of national power, which constitutes 30-35% of the operating cost for high energy demanding businesses (Leloux et al., 2015). The use of renewable energy by managers of SMEs could reduce energy consumption and save cost on expensive fossil fuel that causes damage to human health and the environment due to carbon emission (Ali et al., 2017; Leloux et al., 2015). The adoption of green energy by managers of SMEs could reduce the energy consumption cost, leading to increased profitability.

The implementation of green energy by managers of SMEs could contribute to the reduction of GHG emissions. The utilization of renewable energy sources by managers of SMEs could contrast climate change, reduce GHG emissions, and achieve energy independence (Cucchiella et al., 2017). The concept of GSCM among SMEs' managers incorporates environmental thinking into supply chain management activities to arrest environmental degradation, reduce carbon dioxide emissions and climate change. (Ali et al., 2017). Reduction in GHG emissions could contribute to a pristine ecosystem and environmental sustainability. The embracing of green energy by managers of SMEs could create green jobs. The generation of off-grid renewable energy by SME managers could contribute to a post-carbon economy and green jobs (Acey & Culhane, 2013). The managers of SMEs could stimulate green livelihood practices through work (Acey & Culhane, 2013). Managers of SMEs should generate green energy to increase business profitability.

Managers of SMEs could adopt green energy to benefit from external financial support, such as government incentives. Leaders of SMEs who receive external financial support for adopting green energy could become efficient in using resources, leading to reduced production costs (Bodas-Freitas & Corrocher, 2019). The use of green energy by managers of SMEs could enable the move towards a more sustainable path, efficient use of resources, effective product design, and optimization of value-chains to generate significant savings (Bodas-Freitas & Corrocher, 2019). Policymakers globally are encouraging companies to go green to support the achievement of carbon dioxide reduction targets.

Challenges in Implementing Green Energy Strategies

Inadequate income could be one of the problems that affect SME managers from transitioning conventional fossil energy sources to green energy (Vand et al., 2019). Financial barriers such as low fiscal incentives, inadequate energy market trading mechanisms, and low priority of energy-saving issues could affect managers of SMEs' ability to embark on green energy projects (Jun & Huijuan, 2017). Policymakers could compel financial institutions to relax loan terms to enable SME managers to access funds to execute green energy projects. Managers of SMEs should overcome the financial and institutional challenges hindering the generation of green energy to increase profitability.

The inability of managers of SMEs to make use of market and non-market forces could constitute barriers to green energy adoption. The market-based effects could enable SME managers to obtain financial incentives and profit from net benefits associated with renewable technologies (Liu & Wei, 2016). The non-market factors from institutional and regulatory frameworks could induce the adoption of green energy technological (Liu & Wei, 2016). Lack of awareness of market and non-market forces by managers of SMEs could constitute challenges to the quest to adopt green energy. When managers of SMEs fail to take advantage of the market and non-market effects on green energy, it could delay green energy adoption and diffusion (Liu & Wei, 2016). Managers of SMEs should understand the market and non-market effects of green energy.

Lack of interest by civil society in green energy could constitute a barrier to the promotion of green energy. Civil society plays a significant and complementary role in the government's efforts to raise SME managers' awareness about the green energy

transition to move towards a sustainable energy future (Akermi & Triki, 2017). Suppose civil society is not opened to accepting green energy as an alternative to fossil fuel. In that case, it could be difficult for SME managers to adopt green energy successfully. A highly motivated civil society toward green energy adoption is vital to green energy diffusion in any economy (Akermi & Triki, 2017). Managers of SMEs should understand civil society's role in the adoption of green energy for increased profitability.

Ineffective technology could affect the implementation of green energy projects by managers of SMEs. Ineffective technology could make it difficult for managers of SMEs to install green products and reduce their day-to-day operating costs significantly in their effort to realize growth and sustainable development (Memka & Lekhanya, 2017). The problem associated with transmission and accommodation of wind, PV, and hydropower into centralizing the grid system could discourage investors in green energy (Yang, 2017). Improvement in green energy technologies is a continuous process to ensure adequate energy delivery. Ineffective green energy technologies could slow down green energy adoption by managers of SMEs (Memka & Lekhanya, 2017). Managers of SMEs should adopt effective technology in implementing green energy.

Political influence by utility owners who generate electric power from fossil fuel could constitute barriers to green energy technologies. Managers of SMEs could face obstacles in green energy proliferation due to the political influence of owners of fossil fuel electric power utilities within existing legal and regulatory regimes (Prehoda et al., 2019). Investors who own energy-related services could use their political power to perpetuate utility structures that worked towards financial interests rather than the best

interest of consumers, firms, and residents. Large, centralized coal plants continue to be significant sources of power in some economies globally despite the availability of much lower-cost renewable energy generation technologies because of some vested interests (Prehoda et al., 2019).

Lack of knowledge of green energy by leaders of organizations could contribute to a low level of green electricity utilization. Managers of SMEs' decision to adopt green electricity could depend on decision-makers perceptions of the sustainability, continual availability, and price premium of green electricity (Rahbauer et al., 2018). Researchers have opined that low awareness of the demand for green electricity will be limited, the supply will be small, and green energy investment will be unattractive (Rahbauer et al., 2018). The creation of knowledge among decision-makers in the firms could boost green energy adoption.

Conclusion and Summary

This study aimed to explore the strategies that managers of SMEs employ to generate green energy for profitability. The theoretical framework I used as a lens to ground this study was the DIT postulated by Rogers in 1995. The DIT enables researchers to explain how an innovation spreads over time in a social system through communication (Friedrichsen et al., 2017). Other related theories to the DIT are disruptive innovation (Christensen et al., 2015; Riesmeier, 2020) and radical innovation theories (Hopp et al., 2018).

There are many sources of green energy that managers of SMEs could use to increase profitability in Lagos, Nigeria, which includes solar, wind, hydropower,

biomass, geothermal, and tidal waves (Ministry of Power, 2015). Some green energy sources are intermittent such as solar, wind, and tidal waves. Storage technologies are means that energy experts use to address intermittency challenges in green energy (Dalero & Musa, 2018). The most familiar green energy source and technology that managers of SMEs employ to generate green energy is solar energy from rooftop PV panels combined with inverters and batteries for storage (Bousselamti & Cherkaoui, 2019; Mauritzan, 2017). The widespread use of solar PV technology for green energy generation by managers of SMEs in Lagos, Nigeria, is cheaper than other green energy technologies (Bousselamti & Cherkaoui, 2019).

Some strategies that managers of SMEs use to generate green energy are: (a) leveraging on government tax incentives, (b) collaborating with other providers of green energy technologies, (c) combining green energy technologies with inverters and storage batteries, and (d) adopting the smart community concept (Camarinha-Matos et al., 2017; Sheikh et al., 2019). The adoption of greenness in supply chain management by managers of SMEs could be a viable strategy in promoting green energy development. GSCM includes management commitment, adoption of green procurement and green marketing, and eco-friendly proposal in the entire supply chain system (Kathiresan & Ragunathan, 2017).

The importance of SMEs to the Nigerian economy includes a contribution to employment growth, the bedrock of the economy, production mainly for the domestic market, and facilitation of technological innovation (Luta, 2017). The adoption of green energy by managers of SMEs could enhance energy efficiency, financial savings,

profitability, and competitiveness (Minciuc et al., 2017). Managers of SMEs could contribute to Nigeria's energy security from green energy sources such as rooftop solar PV for the urban areas where land availability is limited (Dioha & Kumar, 2018; Olowosejeje et al., 2019). Managers of SMEs in Nigeria could engage in ethanol production from cassava feedstock using locally fabricated technology due to the abundance of cassava (Ohimain, 2015).

The benefits of generating green energy by managers of SMEs include (a) profitability in operating businesses, (b) regulatory compliance, (c) reduction in the cost of energy consumption, and (d) improvement in the corporate image (Ali et al., 2017; Leloux et al., 2015). The utilization of renewable energy sources by managers of SMEs could contrast climate change, reduce GHG emissions, and achieve energy independence (Cucchiella et al., 2017). The generation of off-grid renewable energy by managers of SMEs could contribute to a post-carbon economy and green jobs (Acey & Culhane, 2013).

Some challenges that managers of SMEs face in implementing green energy strategies include inadequate income, inability to take advantage of the market and non-market forces, lack of interest by civil society in green energy, and ineffective technology (Akermi & Triki, 2017; Liu & Wei, 2016; Vand et al., 2019). Further challenges include the political influence of fossil fuel utility owners, and lack of knowledge of green energy (Memka & Lekhanya, 2017; Prehoda et al., 2019).

I conducted the study on one of the green energy sources due to time constrain. I limited this study to solar energy from rooftop solar PV panels combined with inverter

and storage batteries. I chose green energy from rooftop PV panels with inverter and storage batteries because it is the most common green energy source and technology in Lagos, Nigeria. Managers of SMEs could generate green energy from rooftop PV panels with inverter and storage batteries as a standalone distributed off-grid system for self-consumption. Rooftop solar PV could be suitable in an urban area such as Lagos, where land availability is limited (Dioha & Kumar, 2018; Luckett, 2013; Olowosejeje et al., 2019). Managers of SMEs should implement strategies to generate green energy to increase profitability.

Transition and Summary

This study aimed to explore the strategies managers of SMEs use to generate green energy to increase profitability. Section 1 contains information on the foundation of the study, a background of the problem, problem statement, purpose statement, the nature of the study, conceptual framework, and extensive review of the literature. The conceptual framework was the DIT. The literature review contains discussions on DIT, alternative theories, sources of green energy, renewable energy, strategies and challenges associated with generating green energy, usefulness and profitability of green energy, and green energy as the future energy. Section 1 also contains the operational definition of terms, assumptions, limitations, delimitations, and the significance of the study.

In Section 2, I restate the purpose statement, discuss the researcher's role, explain the research methods and designs, and examine ethical research issues concerning participants. Other areas discussed in Section 2 include population and sampling, data collection instruments, data collection technique, data organization, data analysis, and

reliability and validity. In Section 3, I will discuss study findings, application to professional business practice, implications for social change, recommendations for action and further study, reflections, and summary and conclusion of the study.

Section 2: The Project

The need for SMEs to explore green energy strategies to improve energy production and increase company profits is critical to business growth and development. In this section, I provide information on the strategies that SME managers use to generate green energy and enhance profitability. I restate the purpose statement of the study, discuss the role I played as the researcher, describe the study participants, and explain the research method and design. Other areas discussed in Section 2 include the study population and sampling, and the ethical issues researchers must observe in a research study. I also discuss the data collection instruments and technique, data organization techniques, data analysis, and the reliability and validity of the research.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies managers of SMEs use to generate green energy to increase profitability. The targeted population consisted of three managers from three SMEs who have successfully developed and deployed strategies, generated green energy, and increased business profitability in Lagos, Nigeria. The implications for social change include the potential for managers of SMEs to maintain a steady power supply leading to improved productivity, employment opportunities for the local community, enhanced customer satisfaction, and a clean environment for the society.

Role of the Researcher

This study aimed to explore the strategies managers of SMEs use to generate green energy for profitability. In a qualitative study, the primary role of the researcher is

to serve as the instrument for data collection and analysis (Marshall & Rossman, 2016). My roles as the researcher in this study included gaining access and recruiting three participants, one manager from three SMEs who have successfully adopted green energy for profitability. According to Yin (2018), a researcher is responsible for objectively analyzing and interpreting the information obtained from participants to generate relevant findings. My other researcher roles included conducting interviews with the participants, audio-recording the information participants provided, taking notes, transcribing, coding, and organizing the data into themes.

According to Cluley et al. (2020), the researcher needs to have technical skills and the ability to engage participants, add value to data, and interpret data. I sent an invitation via email with attached consent form to the potential participants. The participants replied through email stating their consent. I gained access to the participants through telephone. I used the interview protocol (see Appendix A) to conduct a semistructured telephone interview by asking the interview questions (see Appendix B) to collect data from the study participants. I collected data through different sources to gain proper insight into the strategies managers of SMEs use to generate green energy for profitability.

As a senior manager in the Nigeria National Petroleum Corporation (NNPC) for over 20 years, I have experienced the need to explore using green energy as an alternative energy source to protect the environment and generate profits for SMEs in Nigeria. During my work career, I developed personal experiences and perspectives about the study phenomenon. My personal experience in the energy sector was the primary motivating factor for conducting this study on how SME managers could benefit from

strategies to generate green energy and enhance profitability. I have no direct relationship with the participants I selected for this study.

A qualitative researcher maintains a neutral stance and avoids implying a correct answer (Taylor, 2019). I established a relationship with the participants and interviewed them in a conducive environment and atmosphere to enable them to feel free to speak their minds without bias. Qualitative researchers keep an open mind, report consistently on their study's progress, do member checking or allow a third party to review their work to avoid researcher and participant bias (Haven & van Grootel, 2019). I did not conduct this study within the organization where I work to avoid personal bias. I obtained the participants' consent before I commenced the research study. I informed the participants of their right not to answer any question they feel uncomfortable about and of their freedom to withdraw from participating at any time during the study. I will keep the participants' identities and the collected data confidential, in line with *The Belmont Report* protocol on human subject protection.

The role of the researcher includes adhering to the ethical research issues outlined in *The Belmont Report*. The report produced in 1978 by the National Commission for the Protection of Human Subjects, contains ethical principles and guidelines for protecting human subjects from abuse (Adashi et al., 2018). *The Belmont Report* aims to ensure that researchers adhere to three principles: (a) respect for participants, (b) beneficence, and (c) justice (National Institute of Health, 2015). These principles stipulate that researchers must give participants the freedom to assess the risks and benefits of taking part in a study and voluntarily accept through an informed consent process (Brothers et al., 2019).

I adhered to *The Belmont Report* principles and guidelines by respecting participants' beliefs, values, feelings, and opinions while reducing risks and avoiding bias in recruiting participants. I attended the CITI training course on the protection of human research participants and obtained the requisite certification.

Researchers use the interview protocol to organize open interview sessions and obtain information from participants that align with the overarching research question on the phenomenon under study (Yin, 2018). I used the interview questions (see Appendix B) to conduct a semistructured interview and obtained information from the participants. Researchers use interview questions to collect rich and detailed qualitative data to understand participants' experiences and the meaning participants make of those experiences (Castillo-Montoya, 2016). I used the interview questions (see Appendix B) to gain insight into the participants' experiences on the strategies managers of SMEs use to generate green energy alternatives for business profitability.

Researchers are responsible for mitigating bias and avoiding perceiving information and data participants provide through a personal lens (Boddy, 2016). Some of the techniques qualitative researchers use to mitigate bias include (a) ensuring they reach data saturation during the interview process, (b) using consent form and interview protocol to engage participants, (c) member checking data collected to ensure validity, and (d) using experts for validating well-constructed interview questions to minimize bias (Fusch & Ness, 2015; Yin, 2018). I used an informed consent form, and an interview protocol (see Appendix A) to gain participants' attention and obtain data and information. I also conducted member checking to validate data collected from participants. I ensured

data saturation by continuing to interview participants until no new information or themes are emerging.

Participants

Qualitative researchers establish criteria for participant eligibility to avoid ineffective data collection (Yin, 2018). Researchers select participants who can best address the research questions and give a better understanding of the phenomenon under study (Pelosi, 2015). The eligibility criteria for selecting the study participants included (a) being a manager of a green energy SME and, (b) having successful deployed strategies and generated green energy for profitability in Lagos, Nigeria. I engaged the managers from SMEs who have generated green energy for profitability.

Qualitative researchers use purposive sampling, different from probability sampling, to select appropriate participants to obtain rich information (Vasileiou et al., 2018). Qualitative researchers can purposefully select a minimum of three participants for a study (Yin, 2018). I purposefully selected three participants for this study from managers of three SMEs who have successfully generated green energy for profitability.

To gain access to participants, the researcher should explore several strategies. According to Merriam and Tisdell (2015), researchers should use the organization's gatekeepers to access participants. Some researchers face obstacles when seeking access to participants as organizations sometimes deny access to researchers because of a lack of trust and value for academic research. I gained access to the participants through the public domain from the companies' websites, email, and telephone. Researchers should gain the participants' confidence and acceptance to enhance successful data collection

and analysis processes (Johl & Renganathan, 2010; Ortiz, 2015). Qualitative researchers carry out constant negotiations to obtain the agreement and consent of participants (Hoyland et al., 2015). After obtaining approval from Walden University Institutional Review Board (IRB; Approval number 01-20-21-0992065), I gained access to the participants by sending out an email with attached informed consent form to potential participants. The informed consent form contains information explaining the study's purpose and seeking the study participants' agreement to participate in the study.

The researcher should build rapport with the participants to facilitate data collection. Researchers try to establish relationships with the participants and negotiate the control of the research process to keep track of the phenomenon under study (Rheim et al., 2016). A researcher who develops a good working relationship with participants gains participants' trust, preventing participants from withholding information (Jack et al., 2016). To ensure a good working relationship with participants, I assured the participants of their confidentiality and explained the background and purpose of the study to curtail any negative impressions about the data collection process. To accomplish the goal of building a good working relationship, I provided each participant with an informed consent form before commencing the interviews. The informed consent form clearly stated the purpose of the study, background information, duration of the interview, procedure, sample interview questions, the voluntary nature of the study, risks, and benefits of participating in the study, payment if any although no payment, privacy, and contact information.

Research Method and Design

Research methods are the techniques researchers use to collect data for analysis to reveal new information or enhance the understanding of a current issue. The types of research methods with different data collection tools that researchers use include qualitative, quantitative, and mixed research methods (Zoellner & Harris, 2017). Qualitative researchers collect data about lived experiences, behaviors, or emotions and the meanings individuals attribute to them (Edwards & Brannelly, 2017; Ramani & Mann, 2016). Quantitative researchers gather numerical data, which they use statistical analysis to rank, categorize, or measure relationships between variables (Turner et al., 2017). Mixed methods researchers blend qualitative and quantitative research by doing statistical data analysis and obtaining a deeper contextual insight into a phenomenon (Bester et al., 2017). I used the qualitative case study design for this study. In this subsection, I discussed the rationale for using the qualitative case study design as opposed to other research methods and designs in this study. I also explained how I reached data saturation.

Method

I used a qualitative method to explore the strategies managers of SMEs use to generate green energy for profitability. Researchers conduct studies using qualitative, quantitative, or mixed methods (Catherine et al., 2014; Zoellner & Harris, 2017). A qualitative researcher gains insight into the phenomenon under study in a natural setting using the qualitative method (Albers, 2017; Hammarberg et al., 2016; Pienaar et al., 2019). A researcher can recognize key developments, patterns, trends, and interactions

using the qualitative method (Collingridge & Gantt, 2019; Doyle & Buckley, 2017; Leong et al., 2019). Researchers use qualitative methods to explore the phenomenon within its context with various data sources because it is flexible and rigorous (Lock & Seele, 2018). Researchers use the qualitative research method to clarify complex interactions between persons and their settings (Gerbera et al., 2014; Nelson, 2017; Walby & Luscombe, 2018). Qualitative researchers present situations, perceptions, and events holistically and realistically in natural environments from data collection methods such as observation, interview, and document analysis (Kazemi et al., 2020; McEntee & Happel-Parkins, 2016; Smit et al., 2020). The qualitative method was appropriate in exploring the strategies managers of SMEs use to generate green energy to increase profitability.

Some common characteristics in the qualitative method, irrespective of the theoretical framework, include participants' involvement in the data collection process, data collection in a natural setting, and face-to-face interaction between researchers and participants (Aletaha et al., 2020). Other features of qualitative research are (a) researchers as the principal data collection instruments, (b) multiple sources of data in the analysis, (c) emergent research process, (d) inductive data analysis, and (e) the meaning participants hold regarding the issue under study is central (Kashihara & Sakamoto, 2020). Researchers interpret what they see, hear, and understand and develop a complex picture of the issue under study (Aletaha et al., 2020; Catherine et al., 2014; Kashihara & Sakamoto, 2020). I used the qualitative method in this study because I intended to gain

insight into the strategies managers of SMEs use to generate green energy for profitability in a natural setting, Lagos, Nigeria.

The quantitative method is numerical, and researchers use the quantitative approach to examine relationships among variables or groups of variables (Turner et al., 2017). The quantitative method was not appropriate for this study because I did not intend to analyze empirical data or examine relationships among variables. The mixed methods approach is a combination of the qualitative and quantitative data collection and analysis process. Some researchers may use mixed methods to gain insight into the phenomenon under study in a natural setting and examine the relationships among variables or groups of variables (Bester et al., 2017; Bristowe et al., 2015). The mixed methods approach was not suitable for this study because the study's purpose was not to collect and analyze empirical data or examine relationships among variables. I used the qualitative method for this study because I intended to rigorously explore the strategies managers of SMEs use to generate green energy for profitability to gain insight into the phenomenon in a natural setting.

Research Design

Phenomenology, ethnography, narrative enquiry, and case studies are some of the designs qualitative researchers use to conduct investigations (Castleberry & Nolen, 2018; Eisenhower, 2019; Saunders et al., 2015). The case study design approach enables the researcher to enhance the rigor and credibility of the investigation (Gergen et al., 2015; Larrinaga, 2017). A case is a phenomenon that occurs in a bounded context and is the unit of analysis in a qualitative case study (Bakhuys-Roozeboom et al., 2020; Shiells et

al., 2020). I used the case study design for this study. The qualitative case study design was appropriate for exploring the strategies that some managers of SMEs use to generate green energy for profitability.

A researcher undertaking a qualitative case study collects in-depth data from multiple sources and reports a description of themes to explore a bounded system (Ekmekçioglu & Şen, 2018; Miovsky et al., 2019). A researcher conducts a qualitative case study when: (a) the aim is to answer how and why questions, (b) manipulation of the participants' behavior is not possible, (c) the focus is to address the phenomenon within its context, or (d) no apparent boundaries exist between the event and the background (Eisenhower, 2019; Okoroikpa, 2019). The variations in case study designs include single and multiple case study designs within the same methodological framework (Yin, 2018). A researcher could use a single case design or a multiple case design to conduct a study. I used a multiple case design for this study to enable replication of the study across the cases.

Researchers use a single case design to conduct studies under conditions such as a critical test of existing theory, unusual circumstance, revelatory situation, or longitudinal purpose (Caldwell et al., 2016; Reichow et al., 2018). A researcher uses multiple case study design to replicate and confirm an emerging construct by identifying corresponding aspects of the phenomenon under study within and across settings (Soeker & Pape, 2019; van Leusen et al., 2016). A researcher uses a multiple case design to achieve a more compelling and robust outcome (Killingback et al., 2017; Stocker & Abib, 2019; Yin, 2018). A multiple case replication study design was appropriate for this study.

Phenomenological design is appropriate when a researcher seeks to study the personal meanings of the lived experiences of individuals experiencing a phenomenon (Creswell & Poth, 2017; Korcuska & Flynn, 2018). The phenomenological design was not appropriate for this study because I did not intend to explore the personal meanings of the lived experiences of individuals experiencing a phenomenon. Researchers use ethnography design to study organizations or groups' cultures and patterns in a social setting to gain a deeper understanding of study phenomena (Canevacci, 2017; Korstjens & Moser, 2017). Ethnography design was not suitable for this study because I did not intend to study a group's culture and beliefs. Narrative inquiry is a qualitative design that some researcher may use to document experiences of lived and told stories of a person or a small number of chronologically connected individuals (Catherine et al., 2014). Narrative inquiry was not appropriate for this study because I did not intend to document lived or told stories of a person or a small number of chronologically connected individuals.

I used multiple case study design with three cases to achieve a literal replication of how and why managers of SMEs generate green energy for profitability in Lagos, Nigeria. Researchers could select four to six cases to carry out either multiple holistic or embedded case studies to enable the achievement of literal and theoretical replications and investigation of contrasting theories or preposition (Yin, 2018). I did not carry out multiple embedded case study with four to six cases to achieve theoretical replication due to financial and time constraints. A multiple holistic case study design with three cases

was appropriate for exploring the strategies managers of SMEs use to generate green energy to increase profitability.

Data saturation is proof of rigor in qualitative research. Qualitative researchers achieve data saturation in the data collection process when additional data produce redundant information (Korstjens & Moser, 2017). Data saturation is a step at which researchers stop collecting further data because the information at hand could yield enough depth of understanding to conclude the study (Nelson, 2017). No new analytical information on the phenomenon under study can result from additional data after data saturation. Qualitative researchers use a small sample size to obtain rich information from knowledgeable participants on the study phenomenon. Saturation is when the data enable the researcher to confirm that analytical categories are sufficiently rich and thick. I used a small purposive sample of informants who are well conversant with the strategies managers of SMEs use to generate green energy for profitability. I continued to collect and analyze data from these participants until I reached data saturation, the point where I did not derive new information from additional data.

Population and Sampling

A sample is a subset of a population. Researchers use different sampling procedures to select a sample size as a representative of the community for a study because it may not be possible to study the entire population (Nakkeeran, 2017). The samples could be individuals, groups, roles, cultural elements, activities, processes, events, time, or locations. Identifying the study population and appropriate sample size is

vital for a successful study. In this subsection, I provided a narrative regarding the population and sampling strategy for this study.

Researchers sample a population for a study because it might be impossible to study the whole community. A universe in research is the entire set of events, individuals, or objects that display the characteristics of interest that the researcher intends to study (Mawhinney & Rinke, 2019). The subgroup that a researcher selected from the population for a study is the sample. The sampling method is the process of selecting the sample from the population. A rigorous sampling method enables the researcher to ensure that the sample represents the population, minimize error, and bias, and enable generalization (Berndt, 2020). This study's population consisted of all managers of SMEs who have deployed strategies and generated green energy for profitability in Lagos, Nigeria. From the population of the study, I used the purposive sampling to select three managers, one each from an energy SME for the multiple case study. I excluded other categories of SMEs managers who have not deployed and generated green energy for business profitability.

A qualitative researcher adopts a non-probability sampling method depending on the researcher's judgment. Sampling methods in qualitative research include purposive sampling, quota sampling, and snowball sampling (Griffith et al., 2016). I conducted purposive sampling to select three managers from three SMEs who have deployed strategies and generated green energy for profitability in Lagos, Nigeria. A researcher considers some factors when choosing a sampling method: the research question, knowledge of the study population, population size, familiarity with cases in the

population, the study methodology, time and financial constraints, and generalizability (Berndt, 2020).

The benefits of purposive sampling in qualitative research include obtaining appropriate and helpful information from the informants and using limited research resources effectively (Campbell et al., 2020). Qualitative researchers adopt a purposive sampling strategy to align with the research objectives and assume that some people may have information on the phenomenon under study and require inclusion as a sample to the study (Kimani-Murage et al., 2019). Purposive sampling enables the maximization of research resources.

A purposive sample size of three managers from three SMEs who have deployed strategies and generated green energy for profitability in Lagos, Nigeria, was adequate to fulfill the multiple case study data collection and literal replication requirements. A qualitative researcher may purposively select a relatively small sample to increase the depth, instead of breadth, of understanding the phenomenon under study (Morris, 2016). A qualitative researcher attains saturation in data collection at a point of conceptual data density that enables enough depth of understanding of the phenomenon under study to allow for conclusions (Nelson, 2016). A purposive sampling method was suitable for the study design and the aim of this exploratory study. A researcher undertakes purposive sampling to match the cases to the research objectives. Purposive sampling enables a researcher to improve rigor and trustworthiness, including credibility, transferability, dependability, and confirmability (Bagheri, 2019). The purposive sampling technique

was the most appropriate sampling approach for exploring the strategies managers of SMEs use to generate green energy to increase profitability.

Conventional sample and sample size do not strictly apply to qualitative multiple case study research. Data collection is not numerical but open-ended, progressively unfolding, iteratively repetitive interview process, or a combination of observation and repeated interviews (Nakkeeran, 2017). Qualitative researchers using multiple case study designs could purposively select cases who are informants with knowledge of the phenomenon under study. A qualitative researcher employing a multiple case study design uses multiple data collection sources to achieve data triangulations like data saturation (Yin, 2018). I selected participants for this multiple case study using a purposive sampling technique.

Ethical Research

A researcher addresses ethical concerns throughout the study. Qualitative researchers need to pay attention to research ethics and professional codes of conduct when conducting studies with human subjects (Shaw et al., 2019). I completed the Human Research Participant training as a requirement by Walden University. I obtained the Collaboration Institutional Training Initiative (CITI) certification covering research ethics on human subjects. I sought approval from the IRB of Walden University before embarking on the participants' consenting process.

An informed consent form is a vital tool the researcher uses to establish a relationship with participants for data collection (Jack et al., 2016). After obtaining IRB approval, I sent an email with attached informed consent form to potential participants.

The consent form contains information on the study's purpose, the procedure for consenting, the voluntary nature of the study, the risk and benefit of being in the study, and payments, if any. Other contents of the informed consent form include privacy of the participant, my contact information, request for participant consent, and an email reply stating 'I consent' if they are willing to participate. I recruited those participants who agreed to participate in the study by calling them on the telephone to agree on the interview date and time convenient to them.

A participant is free to withdraw from the study at any time. Some principles that apply to the respectful treatment of participants in qualitative research include participants' free and informed consent, confidentiality, and withdrawal (Doyle & Buckley, 2016). The participant can decide to withdraw from the study at any time by informing the researcher either by a phone call, text message, or email without necessarily stating any reason. There was no penalty for withdrawing from the study. No participant notified me of the desire to withdraw from this study.

I informed the participants that there would be no payment or any other incentives for participating in this study. However, there are benefits from the learnings that outweigh any risk. Robust methodology and design should enable a qualitative researcher to demonstrate trustworthiness and credibility and avoid unnecessary ethical risks that could harm participants and discredit the research (Quadrelli, 2018). Researchers should offer benefits instead of risks to human subjects. The research environment should be conducive for ethical conduct, such as voluntary informed consent, autonomous decision-making, and privacy protection (Gomes & Duarte, 2018).

I protected the participants' rights by securing the data in a safe place for five years. Researchers must observe procedural and data analysis ethics before, during, and after data collection (Gomes & Duarte, 2018). I recorded the interviews digitally, transcribed, downloaded them onto a computer, and stored the data. I carried out data analysis using the NVivo 12 software for qualitative data analysis to identify themes concerning the research questions. I carried out procedures in this multiple case study involving human participants following the Walden University and the United States of America Federal Regulation on ethical standards. I used a secure password to store the data for this study, and only I can access the device. After 5 years of completing this study, I will delete all data and shred all confidential documents.

I conducted the study observing all required standard concerning human subjects. Qualitative researchers are usually under intense scrutiny and should comply with all ethical standards to enable an effective response to such scrutiny (Esposito et al., 2018). In qualitative research, the resolution of ethical dilemmas should be made as they arise to enable the formation and development of ethical conduct of the researcher (Head, 2018). Each phase of data collection in qualitative research could spring a surprise, and researchers should always watch for such surprises and maintain ethical standards (Hesse et al., 2019; Walby & Luscombe, 2018). I maintained the ethical standards for academic research in this study.

I conducted one-on-one telephone interview, used emails to obtain participants' consent, and ensured data confidentiality by removing all possible personal identifiers. I printed the emails with an expression of consent which contains the informed consent

procedures and debriefing to avoid compromising anonymity when the email addresses are identifiable with either first or last names. I archived the informed consent form in a paper form and deleted the electronic version. I used codes such as P1, P2, and P3 to identify participants and EC1, EC2, and EC3 to mask the identities of the SME cases.

Data Collection

Instruments

I was the main instrument for data collection and analysis in this study. The primary role of the researcher in a qualitative study is to serve as the instrument for data collection and analysis (Marshall & Rossman, 2016). I established a cordial relationship with the participants, which enabled them to speak freely and honestly about their lived experiences on the phenomenon under study. I also ensured interviewing at the participant's convenience time when they can give in-depth answers to the questions, I posed to them.

I used semistructured interviews as a data collection tool for this study to conduct a telephone interview with participants. The use of a telephone in qualitative data collection by researchers is an alternative to face-to-face individual and focus groups interviews (Namey et al., 2019). Telephone communication is flexible in time and location for data collection and could enable researchers and participants to conform to health and safety restrictions (Archibald et al., 2019). I used the list of semistructured open-ended interview questions (see Appendix B) approved to interview all the participants involved in this study. I used the interview protocol (see Appendix A) to

interview each participant, which enabled me to draw similar and contrasting responses across cases for analysis and findings.

I collected data using field notes during the interview sections. Researchers could make notes during the interviews and observations as part of the data collection process (Yin, 2018). Researchers could read valuable meanings from the participants' tone and expressions during interviews that could be written down in field notes to aid data analysis and interpretation. Taking notes during interviews enable data triangulation in qualitative research. By collecting information from multiple sources, a researcher could achieve data triangulation to corroborate the same finding (Yin, 2018). I enhanced data triangulation using multiple case interviews, field notes, and secondary document data analysis.

Data Collection Technique

I conducted a telephone interview using the interview protocol (see Appendix A) with open-ended interview questions (see Appendix B). One of the options qualitative researchers use to conduct interviews from a distance instead of in-person face-to-face interviews in the era of pandemic and social distancing is telephone interviews (Lobe et al., 2020). A researcher could use a video conferencing platform for a one-on-one interview with the participants who have an internet connection on their computer or other suitable digital devices such as tablets and smartphones with working speakers, microphone, and camera (Lobe et al., 2020). Due to the uncertainty of internet availability in Lagos, Nigeria, which could occur during the interview with the participant, I adopted the telephone option for conducting the interview.

I asked follow-up questions to get in-depth information on the participants' lived experiences regarding how they lead their company to generate green energy for profitability. I briefed the participant on the research overview, the purpose, and the time duration of the interview. I thanked the participant for agreeing to participate in the interview. I sent a copy of the informed consent form by email and reviewed its contents with the participant. I obtained the participant's consent through email reply on the consent form, signifying an agreement to participate in the study. Before commencing the interview, I confirmed the participant's consent to record the interview.

To ensure confidentiality during the interview recording, I implemented a serial coding system such as P1, P2, and P3 for participants' names and EC1, EC2, and EC3 for energy companies' names to identify the cases (participants and energy companies). Researchers use multiple cases to increase insight and analyze patterns to enhance understanding of a phenomenon (Brogan et al., 2019). I recorded the interview using an audio device. The audio recording included a voice stamp of the date, time, and interview location. I explained to the participants that their participation is voluntary, and they could withdraw from the interview at any time without prior notice and through a verbal or email request. During the interview process, I listened for verbal cues, paraphrased interview questions as needed, and asked follow-up probing questions to get an in-depth response. I allowed all participants ample time to answer each interview question, including follow up or probing questions.

I provided participants with information about the member checking process, which occurred after completing the interview, and data transcription. Participants who

know they will have feedback on the interview the grant may be motivated to give accurate data (Wenz et al., 2019). After transcribing the interview responses from each participant, I sent the interview transcript to the participant for member checking to enhance the reliability and validity of the data and the effectiveness of the data collection instrument. I concluded the interview and thanked the participant for their time and contribution to the study.

Data Organization Techniques

I used the interview protocol, which prescribed procedures such as digital recording, field notes taking, and data transcription. Data analysis involved using Nvivo 12 software to organize data and information in this study. Researchers use organization technique such as interview guide or protocol to enable consistent and orderly data collection process, analysis, and storage (Yin, 2018). I recorded the interviews digitally, transcribed, downloaded them onto a computer, and stored the data in a password protected electronic device. I conducted data analysis using the NVivo12 software for qualitative data analysis to identify themes concerning the research questions.

I coded the data using serial alphanumeric codes such as P1, P2, and P3 for participants' names and EC1, EC2, and EC3 for energy companies' names to identify the cases during data collection to ensure confidentiality and anonymity. Coding techniques have become necessary to ensure privacy for human subjects and companies in qualitative research (Fletcher & Islam, 2015). I stored the soft copies of the data safely in a password protected electronic storage device and hard copies in a confidential file and lock accessible to me alone. Researchers should ensure data security and confidentiality

during and after the study (Gomes & Duarte, 2018). I will store the soft and hard copies containing the study information for 5 years and destroy them after that.

Data Analysis Technique

I used NVivo 12 qualitative data analysis software (QDAS) tool to analyze the study data. Computer assisted qualitative data analysis software enable qualitative researchers to present analysis and findings transparently to enhance trustworthiness (O'Kane, 2019). Researchers use QDAS to analyze data from various research designs such as open-ended interview questions, documents, focus groups, and field notes (Woods et al., 2015). I first analyzed the data collected from each SME manager before analyzing the data across the participants. Researchers address themes that emerge from cross-case analysis (Lee et al., 2020). I textually added both transcribed, and field notes data into the computer for data analysis.

I created initial codes relating to my research question and design from the data and imputed the codes into the computer with the NVivo application for data analysis. Yin (2018) posited that a researcher defines the initial codes after entering the textual data into the computer system. The analytical software such as NVivo will locate the textual data and themes and match the patterns, count the occurrence of the codes, and show multiple combinations that are found (Yin, 2018). I repeated the code matching process iteratively to build the categories of themes. I constantly studied the computer output to observe emerging patterns that answer the research questions. I manipulated my data to search for insights, patterns, or concepts that relate to my research question and study phenomenon by juxtaposing the data collected from the interviews of three

different managers of SMEs. I presented the information from the three interviews in a matrix of categories to observe the similarities and differences in concepts, which helped me draw the study conclusions.

Reliability and Validity

A significant role of a researcher is to establish the reliability and validity of their study findings. In qualitative research, the researcher has the responsibility to ensure the validity and reliability of the study findings (Dikko, 2017). Reliability is a critical yardstick for determining the quality of a research design and the dependability of findings (Noble & Smith, 2015). Qualitative researchers use the term dependability to explain the process of establishing reliability in a study (Harvey, 2015). Reliability ensures the consistency, dependability, and replicability of research findings (Cypress, 2017). The critical elements in establishing the reliability and validity of a qualitative case study are dependability, credibility, confirmability, and transferability (Yin, 2018). The following subsections contain discussions on how I ensured my research study's reliability and validity through member checking, self-reflexivity, triangulation, and the provision of thick description.

Reliability

An essential role of qualitative researchers is to establish the criteria for determining the reliability of their study. Qualitative researchers should establish the dependability of their research study (Coetzee et al., 2017). The reliability of a study depends on the researcher's ability to replicate the study results and ensure consistency. Yin (2018) stated that researchers acknowledge a study is reliable if the results are

dependable, consistent, and replicable. Dependability is the term qualitative researchers use to explain the process of ensuring reliability in a study.

Dependability is the process qualitative researchers use to ensure the reliability of data participants provided (Fusch & Ness, 2015). According to Kallio et al. (2016), dependability ensures the reliability of data as applied in different research contexts. Member checking involves participants' review of interpreted data to ensure the dependability of the study (Harvey, 2015). Researchers use member checking to prevent inaccuracies in the interpreted data and ensure the dependability of study findings (Birt et al., 2016). In this study, I used member checking to establish dependability. After conducting the initial interviews with participants, I transcribed and interpreted the participants' information. Then, I shared the interpretation documents with the participants for validation.

Validity

Qualitative researchers should establish the validity of their research. In a qualitative study, researchers use different methods to ensure the validity of the study results (Yin, 2018). Validity refers to the accuracy and trustworthiness of the results of a research study (Yardley, 2016). The purpose of validity in qualitative research is to minimize errors, eliminate bias, and establish truthfulness, integrity, and accuracy of data (Noble & Smith, 2015). Most researchers use validity to ensure data collection instruments relate correctly to the research question, and findings reflect the participants' accurate perceptions and experiences (Leung, 2015). To establish validity, qualitative researchers should ensure the credibility, confirmability, and transferability of data

collected (Yin, 2018). The terms qualitative researchers use to explain the validity of their study findings are credibility, confirmability, and transferability. In the following subsection, I discussed the approach to establish the validity of my research tool and study findings.

Credibility

Qualitative researchers should establish the credibility of their research. Credibility refers to the extent to which the research findings of a study are accurate and believable (Hays et al., 2016). The credibility of a study depends on the accuracy of the procedure the researcher used throughout the research process (Yin, 2018). To ensure credibility, a qualitative researcher should provide detailed and extensive descriptions of the interconnections of concepts and constructs about the consistency with research findings (Smith & McGannon, 2017). Some methodological strategies that qualitative researchers use to ensure credibility include selecting a sample representing research phenomenon adequately, reflexivity, achieving audit ability, and applying study conclusions to different contexts (Noble & Smith, 2015). A researcher could ensure the credibility of a research study by (a) using appropriate research method in conducting the study, (b) applying peer scrutiny, (c) conducting member checking, and (d) triangulation (Iivari, 2018; Yin, 2018). The approaches I used to establish the credibility of my research study are member checking and data triangulation.

Member checking and triangulation are essential strategies that qualitative researchers use to establish the credibility of a study (Smith & McGannon, 2018). Through the process of member checking, a researcher offers participants the opportunity

to review the responses they provided for accuracy (Birt et al., 2016). Using member checking, researchers seek participants' view on the accuracy of collected data, descriptions, and interpretations (Harvey, 2015). Triangulation is a validity technique that researchers use to ensure the accuracy of their study results (Houghton et al., 2015). Researchers use triangulation to enhance the credibility of research findings. Triangulation refers to the researcher using different sources to obtain data and ensure data are adequate to support the accuracy of findings (Yin, 2018). Researchers could ensure data triangulation by collecting data from different sources such as interviews, observation, and company documents. I used member checking and triangulation techniques to ensure the credibility of the study findings and results.

Confirmability

An essential role of qualitative researcher was to establish the confirmability of their study findings. Qualitative researchers use the process of confirmability to ensure data is an accurate representation of the responses the participants provided, devoid of the researcher's opinion and bias (Kallio et al., 2016; Squires & Dorsen 2018). According to Kisely (2015), confirmability refers to the extent to which other researchers could substantiate the result of a study. Some strategies that qualitative researchers use to ensure confirmability include audit trail and reflexivity. The audit trail strategy involves a detailed description of the researcher's decisions throughout the study. Researchers achieve reflexivity by keeping reflective diary notes. To establish confirmability, the researcher should demonstrate the connection between research findings and data

collected from participants (Kiln & Ihantola, 2015). In this study, I used the audit trail and reflexivity strategies to ensure the confirmability of the findings.

Transferability

Qualitative researchers should establish the transferability of their research findings. Transferability is the degree to which researchers' findings are applicable in other contexts and settings (Sutton & Austin, 2015). The primary strategy researchers use to determine transferability is a detailed verbatim description of the research process (Maree et al., 2016). Researchers use triangulation and purposive sampling method to enhance transferability (Yin, 2018). In this study, I presented a detailed verbatim description of the response participants provided in the narratives of the research findings to ensure transferability. I also used the purposive sampling method for data collection and data triangulation strategy to establish the transferability of my study findings.

Data saturation

A significant aspect of qualitative research is the researcher's ability to achieve data saturation. Data saturation refers to when new information is no longer attainable, and coding is no longer possible (Ness & Fusch, 2015). Data saturation occurs when additional interview data does not add new information, and no new data is necessary to replicate the study (Saunders et al., 2017). According to Lowe et al. (2016), data saturation could lead to data adequacy and increase the rigor of a qualitative case study. The key strategies researchers use to reach data saturation include: (a) no new information emerging, (b) stop the coding process, (c) no new themes, and (d) ability to replicate the study (Fusch & Ness, 2015). To reach data saturation in this study, I

continued to collect data through semistructured interviews, field notes, and archival company documents until no new information is emerging. I also used triangulation and member checking techniques to attain data saturation.

Transition and Summary

Section 2 contains narrations on the purpose statement, the role I played as the researcher in this study, the strategies I used to identify the participants, justifications for selecting research methods and design, description of the population, and sampling method. Section 2 also contains information on ethical research standards, data collection instruments and technique, data organization techniques, data analysis, reliability, and validity. In Section 3, I present the study findings and discuss the application to professional practices, implications for social change, recommendations for action and further research, a reflection of my experience with the research process, and the concluding statement.

Section 3: Application to Professional Practice and Implications for Change

In this section, I provide an overview of the study and present the strategies some managers of SMEs use to generate green energy to increase profitability in Lagos, Nigeria. I use illustrations from the research participants to link the study findings with the conceptual framework regarding DIT. Other topics in this section include the applications to professional practice, implications for social change, recommendations for action and future research, reflections, and summary and study conclusions.

Overview of Study

The purpose of this qualitative multiple case study was to explore the strategies managers of SMEs use to generate green energy to increase profitability. The conceptual framework was DIT. The overarching question was, what strategies do managers of SMEs use to generate green energy to increase profitability? Study participants were three managers of SMEs from three energy firms in Lagos, Nigeria, who have successfully implemented strategies to generate green energy for increased profitability. The participants provided me with primary and secondary data to answer the overarching research question. The primary data source was the participants' responses to the semistructured interview questions.

The secondary data sources included archival documents, field notes, and observations. I achieved data saturation when no additional information emerged from the interview process and document review. Based on the participants' responses to the interview questions, I identified four themes: (a) financing support, (b) renewable energy technology and efficiency systems, (c) education and communication, and (d) customer

service and quality of service. By relating DIT to the findings, I developed a better understanding of the strategies some managers of SMEs use to generate green energy for increased profitability in Lagos, Nigeria. The study findings indicate that some managers of SMEs use a combination of strategies to generate green energy to increase profitability in Lagos, Nigeria.

Presentation of the Findings

The lack of access to electricity hinders SMEs growth and contributes to global unemployment, migration, and emigration crises (Igbum et al., 2019). Nigeria's economy suffers from unreliable electricity supply due to incessant power outages nationwide, forcing managers of SMEs to use diesel-electric power generators to ensure the security of supply, translating to monetary losses (Olowosejeje et al., 2019). By implementing micro-off-grid solutions, managers of SMEs could reduce the dependency on diesel generators, guarantee the reliability of electricity supply, and increase profitability (Ndukwe et al., 2019). Using the triangulation method, I collected data from interviews and combined data from company archival documents such as sales and audit reports and field notes. Upon completing the third participant interview, no new information or themes emerged, indicating that I have reached data saturation. I organized the study data using NVivo 12 QDAS tool and conducted the thematic analysis.

Many researchers have studied green energy and SMEs profitability (Lifan, 2015; Omri et al., 2019; Pham, 2018; Vasileva et al., 2018). Managers of SMEs could create green jobs by adopting green energy and implementing energy efficiency measures to increase profitability (O'Keeffe et al., 2016). By adopting green energy, managers of

SMEs could enhance energy efficiency, financial savings, profitability, and competitiveness (Minciuc et al., 2017). The four themes I identified in this study were (a) financing support, (b) renewable energy technology and efficiency systems, (c) education and communication, and (d) customer service and quality of service. In the following subsections, I presented the four themes that emerged from the thematic analysis of the participants' responses to the interview questions (see Table 2).

Table 2

Strategies Managers of SMEs Adapted to Generate Green Energy to Increase Profitability (N = 3)

Strategies	Percentage of use by participants
Financial opportunities	100%
Renewable energy technology and efficiency systems	100%
Education and communication	100%
Customer service and quality of service	100%

Theme 1: Financing Support

Managers of SMEs could use net present value, internal rate of return, discounted payback time, and net cash balance to evaluate economic and financial feasibility of green energy project (Guzman et al., 2018; Talavera et al., 2019). Managers of energy SMEs could provide customers service-enhanced products that include financing and insurance support, product installation and configuration, and operation and maintenance (Camarinha-Matos et al., 2017). The first theme to emerge was financing support, which involved providing adequate financing to generate green energy. The theme financing

support emerged from Interview Questions 1-8. All participants affirmed using financing support as a strategy to generate green energy to increase profitability.

Financial barriers such as low fiscal incentives, inadequate energy market trading mechanisms, and low priority of energy-saving issues could affect managers of SMEs' ability to embark on green energy projects (Jun & Huijuan, 2017). In response to Interview Question 1, P1 stated, "The most important thing is that whatever strategy you are going to use here in Lagos, Nigeria must be something that will be of financial support to the end-users." P1 explained how they "try to key into the financial area" by working "around the finances to see how well we can assist people so that they have access to green power." Responding to Interview Question 2, P1 said, "The strategy we adopted is to see how to assist people in terms of finances. … We were able to assist with the support of some of the financial houses." P1 asserted, "Most of the financial houses are asking for the kind of collateral that is impossible for many potential clients to provide."

Inadequate income could be one of the problems that affect managers of SMEs from transitioning conventional fossil energy sources to green energy (Vand et al., 2019). In response to Interview Question 2, P2 noted, "The currency exchange plus the ridiculous fluctuation in the naira is what hurt our business. We struggle to get the foreign exchange from the banks, but the banks do not always provide the foreign exchange." Responding to Interview Question 2, P3 affirmed, "The cost is a big challenge. I am not talking about the cost in the long run but the cost of initial capital expenditure (CAPEX)

to implement the solar energy system." P3 opined, "We have the challenge of initial capital outlay to deploy this system," and further explained,

> If we do not do our financial analysis and look at the figures, it might look like you are spending too much money to implement renewable energy. However, we look at the benefit in the long run; we will be saving money in the long run.

Leaders of SMEs who receive external financial support for adopting green energy could become efficient in using resources, leading to reduced production costs (Bodas-Freitas & Corrocher, 2019). In response to Interview Question 3, P1 said, "We cut our coat according to our size using our financial strategies and work along with some financial institutions who have responded positively." P1 asserted, "We can achieve with the help of a few financial houses in breaking the barrier for green energy generation." Responding to Interview Question 3, P2 remarked, "We build in a lot into our prices to compensate for the exchange rate in currency. Hence, the amount of money we make for our transaction is smaller." In response to Interview Question 3, P3 posited,

> I do the cost analysis. You must do stuff like how long it will take you to have the payback, what is the return on your investment. You may also want to work out the stuff like the net present value of the system. You can convince the rest of the team that this is something we can invest our money in. We may also want to say, the existing light that we have if we remove them and put these new ones, this is what it will cost us, but this is what we will be saving in terms of energy cost. In the long run, this is what you are going to save. So, showing these analyses make the stakeholders buy-in.

The market-based effects could enable managers of SMEs to obtain financial incentives and profit from net benefits associated with renewable technologies (Liu & Wei, 2016). Responding to Interview Question 4, P1 attested, “The initial cost is the biggest disadvantage in acquiring green energy. Most clients do not have the facility to raise that initial fund.” P1 stated, “We have a package that enables clients to access renewable energy without committing a dime to the procurement of the materials.” According to P1, “We are making every effort to continue to get the support of the financial houses to enable us to cope with the demand.” In response to Interview Question 5, P1 commented, “This fossil fuel you are using, this is the cost analysis. Moreover, when you embrace green power, this is what you have the chance to gain and save within this stipulated period.” P1 also noted the need for “re-investment to sustain the system by replacing your batteries when they expire.” Responding to Interview Question 5, P3 stated, “The financial analysis enables stakeholders to see that what you are proposing to them make sense. I use tools to show stakeholders the payback period of the investment, the return on the investment, and the net present value.”

In response to Interview Question 6, P1 said, “These financial institutions work with us; they get clients and projects and bring to us.” Responding to Interview Question 7, P1 explained their financial support strategy, “We finance everything we install in our customers’ premises and the clients pay us monthly tariffs like they do when they use the national grid.” According to P1, the financial support strategy “has given customers confidence and put us at a huge advantage. Although, some people still default in the monthly payments of the tariffs.” In response to Interview Question 8, P1 asserted, “We

are still trying to harmonize with the financial houses on funding the strategy to enable us to extend green power to all."

A significant challenge that managers of SMEs face in implementing green energy strategies is inadequate income (Akermi & Triki, 2017; Liu & Wei, 2016; Vand et al., 2019). The study findings indicated that managers of SMEs used financing support as a strategy for generating green energy to increase profitability in Lagos, Nigeria. As applied in this study, 100% of the participants acknowledged using financing support as a strategy to generate green energy to increase profitability. The participants acknowledged using various strategies to overcome the implementation barriers regarding lack of fund or inadequate financing support to generate green energy for increased profitability.

Theme 2: Renewable Energy Technology and Efficiency Systems

A combination of renewable energy sources and storage is a necessary strategy that managers of SMEs could use for efficient energy supply in developing economies (Tsai et al., 2020). Managers of SMEs in green energy development businesses need a collaborative approach as a strategy in the provision of services (Pitt & Congreve, 2017). The diffusion and uptake of renewable energy technology remain marginal (Tigabu, 2018). Ineffective technology could make it difficult for managers of SMEs to install green products and reduce their day-to-day operating costs significantly in their effort to realize growth and sustainable development (Memka & Lekhanya, 2017). The theme of renewable energy technology and efficiency systems emerged from Interview Questions 1, 3-6, and 8-9. All participants attested to using renewable energy technology and efficiency systems to generate green energy for increased profitability.

Hybrid systems that integrate different renewable generation sources with energy storage technologies could be more sustainable and cheaper than fossil fuel energy (Reddy, 2017). Responding to Interview Question 1, P3 stated, “We use renewable energy by harnessing energy from the sun with PV panels placed on the roof of our office building and connected to batteries for storage.” According to P3, “Fifty percent of our load in the office run on the solar system while the remaining non-essential load run on the national grid. This strategy minimizes our dependence on the national grid and eliminated diesel-electric generator.” Explaining further, P3 added, “We adopted an energy efficiency strategy by retrofitting our systems to use energy-saving appliances such as electric lamps, air conditioners (ACs), and refrigerators in our offices. This strategy enables us to save up to 70% cost on power.”

The use of small systems for energy storage and renewable energy sources could ensure the transition to a viable economic future and a decarbonized economy (Ciocan et al., 2017; Rascon et al., 2016). In response to Interview Question 3, P1 said, “With support from financial institutions, power generation from renewable sources is coming to the limelight in Nigeria.” Responding to Interview Question 3, P3 noted, “I do the cost analysis of the renewable system we want to implement and show how it will bring a return on our investment eventually.”

Ineffective green energy technologies could slow down green energy adoption by managers of SMEs (Memka & Lekhanya, 2017). Managers of SMEs could use a combination of green energy technologies with inverters and storage batteries to generate

green energy (Camarinha-Matos et al., 2017; Sheikh et al., 2019). In response to Interview Question 4, all the participants said,

- "Majority of them want renewable power, but they do not have funds." (P1)
- "We have effectively enabled our clients to reduce their energy cost from the national grid by about 50% and from fossil fuel generators by about 80%. These we have done by prioritizing what energy source they can use at a time such that even when the national grid power is present, they will not use the grid but only use the solar system installed with inverter and batteries for storage. What that does is to minimize our clients' cost of electricity." (P2)
- "During the day, they are powering their houses and charging the batteries. In the evening, they discharge the batteries until they start using the national grid supply when the batteries are discharged. This reduction in electricity bill is from using the grid, not from their fossil fuel generators. From their fossil fuel generating sets, our clients discover they saved 80 to 90 percent cost from what they used to spend before they started using solar power." (P2)
- "The strategies have been very effective, especially in the adoption of renewable energy because what has happened is that we suddenly have electricity now for 24 hours. With green energy, productivity has improved because we are not under any pressure to shut down and go home quickly. The energy-efficient systems we have put in place has also drastically reduced our energy cost." (P3)

Energy experts could use carbon footprint analysis as a tool to monitor the energy performance of the production processes of SMEs (Giama & Papadopoulos, 2018). The use of green energy by managers of SMEs could enable the move towards a more sustainable path on efficient use of resources, effective product design, and optimization of value-chains to generate significant savings (Bodas-Freitas & Corrocher, 2019). In response to Interview Question 5, P3 stated, "There are various customers with varying needs. Some customers want to save cost, and we give them a cost-saving solution." Answering a follow-up question, P3 explained the procedures and strategies to ensure the installation of reliable systems. According to P3,

> We are aware of these technical and scientific issues which we bring into our designs. We design fit for purpose solar systems. Second, we use quality materials that are not overly expensive but functional. Third, as a standard practice, we do a site survey. The survey enables us to determine the right orientation of solar panels, inverter distance from the batteries, the appropriate size of the charge controller, and the required protection for the solar system. The protection of the system includes the earthing of the system and adequate lightning protection in place. Fourth, we do robust commissioning of our installations to eliminate mistakes that may occur during installation using a different engineer from the ones who do the installation to reduce the chances of failure.

The use of renewable energy by managers of SMEs could reduce energy consumption and save cost on expensive fossil fuel that causes damage to human health and the environment due to carbon emission (Ali et al., 2017; Leloux et al., 2015). The

utilization of renewable energy sources by managers of SMEs could contrast climate change, reduce GHG emissions, and achieve energy independence (Cucchiella et al., 2017). Responding to Interview Question 6, P3 said, “We have been very successful since 2018 when we fully implemented this renewable energy, we have not had cause to run the generator.” In response to Interview Question 8, P2 noted, “We remove generators and give them a solution that does not involve batteries. As long as the sun is shining, they can run their pumps using solar energy. That is a new area we support fish farms to minimize cost.” Responding to Interview Question 8, P3 affirmed, “Another strategy we are looking at is to provide lighting for poultry farmers to save customers cost of running the generator throughout the night. We are also looking at helping farmers get water for their irrigation using the solar system.” On further explanation, P3 stated,

> For example, if a customer wants to power a refrigerator for 10 hours, we install a timer which will switch the fridge on and off at certain times of the day, making the system more robust. So, that is something we need to implement. We are also trying out energy-efficient security lighting for our offices.

The real estate market managers could respond to climate change through the establishment of certification labels, promoting sustainable development, and increasing the attractiveness of green investment impacts (Jones et al., 2019). Ineffective technology is a significant challenge that managers of SMEs face in implementing green energy strategies (Akermi & Triki, 2017; Liu & Wei, 2016; Vand et al., 2019). Responding to Interview Question 9, some participants said:

- "We provide you the green energy system, open the opportunities, and the profit will trickle in." (P1)
- "You do an energy mix. You install a solar system, and some portion of the load is taking off the national grid or diesel generator so that way you begin to save money on fuel. If you implement it correctly, you can immediately save between 20% to 30% on your electricity bill. So, this is one strategy for the industry." (P3)
- "For smaller homes and individual such as someone running a barbing saloon, we have a product designed to help them cut off from the national grid and the use of fossil fuel generators altogether." (P3)

The participants' responses to the interview questions aligned with Ciocan et al.'s (2017), Sheikh et al.'s (2019), and Tsai et al.'s (2020) statements that managers use renewable energy technology and efficiency systems to generate green energy to increase profitability. The study findings demonstrated that managers of SMEs used renewable energy technology and efficiency systems as a strategy to generate green energy for increased profitability in Lagos, Nigeria. As applied in this study, 100% of the participants attested using renewable energy technology and efficiency systems as a strategy to generate green energy to increase profitability.

Theme 3: Education and Communication

Researchers have opined that low awareness of green electricity demand will be limited, the supply will be small, and green energy investment will be unattractive (Rahbauer et al., 2018). The theme education and communication emerged from

Interview Questions 3, 5, and 6. All participants recognized the importance of education and communication for the effective generation of green energy to increase profitability.

A significant challenge that managers of SMEs face in implementing green energy strategies is the lack of knowledge of green energy (Memka & Lekhanya, 2017; Prehoda et al., 2019). In response to Interview Question 3, P3 explained, "The second approach is educating all the stakeholders and staff members on the benefits of embracing renewable energy. The need to change the way we approach things was another strategy that we used to overcome the challenges." Responding to Interview Question 5, all the participants stated,

- "We do one-on-one contact. Most of the jobs that come in are based on reference. When we come across any human being or company that want to embrace renewable power, we try to let them know what they are going into, the advantages and disadvantages, and the key advantages over fossil fuel. Then we try also to do quite a several analyses that will be self-explanatory and hand it over to them to sit down and look at the analysis" (P1).
- "Usually, we run a training program. We share the knowledge with people to enable them to know and do the right thing. We have a few that have trained with us" (P1).
- "So, we have a social media presence. Nevertheless, let me start from the most obvious, I have a YouTube where I do video and video training, sometimes telling customers how to get the best out of their systems" (P2).

- "So, I have people all over the world, and they come to my channel to view, and then if they have issues, they ask questions or know how to resolve certain issues that they experience. For every client, we have a WhatsApp discussion group where we communicate with the customers, so I am always in touch with the groups" (P2).
- "I use figures to communicate to members of my organization on what they stand to gain when we adopt green energy. People are made to understand the effect of global warming and climate change due to carbon emission and what we can do to contribute in our little way to reduce the carbon footprint into the environment and ultimately combat the menace of global warming. We communicate to our clients and convince them of the benefits of green energy using figures" (P3).

In response to Interview Question 6, P2 commented, "YouTube videos, and what our YouTube videos do is drive the products that come into Lagos, Nigeria. Our customers also are our best spoke people." P2 added, "We do not have to advertise. Ninety percent of the projects come from our customers telling other people. So, to us, that just shows how successful we have been in the industry."

The participants' responses to the interview question aligned with Memka and Lekhanya's (2017), Prehoda et al.'s (2019), and Rahbauer et al.'s (2018) statements on the importance of education and communication in generating green energy to increase profitability. The study findings demonstrated that managers of SMEs used education and communication as a strategy to generate energy for increased profitability in Lagos,

Nigeria. As applied in this study, 100% of the participants attested using education and communication as a strategy to generate green energy to increase profitability.

Theme 4: Customer Service and Quality of Service

By collaborating, managers of energy SMEs could provide customers service-enhanced products that include financing and insurance support, product installation and configuration, and operation and maintenance (Camarinha-Matos et al., 2017). The theme of customer service and quality of service emerged from Interview Questions 1-3, 7, and 9. During the interviews, all participants attested using customer service and quality of service to generate green energy to increase profitability.

In response to Interview Question 1, P2 explained, “We continue to bring into Lagos and Nigeria as a whole new technology and innovation that differentiate us from what others have done.” According to P2, “From 2020, every installation we do has monitoring devices that are internet-enabled and operated using smartphones. We could do real-time monitoring and adjustments of our solar systems. These are the kind of things that clients like.” P2 ascribed their competitive advantage to, “The clients could look at their phones and see how their solar systems are performing, the level of the power consumption, and the level of the power production.” Responding to Interview Question 1, P3 remarked, “We develop the right attitude among our workforce on the appropriate use of energy to improve energy efficiency.” According to P3, “We do not put on any appliance or gadget that we do not need in use. These are what we do and use to convince our clients we provide solar energy to do the same.”

In response to Interview Question 2, P3 posited, “Trying to make people follow a lifestyle that hitherto they are not used to is also difficult. To get people to unplug stuff that they do not need was a little bit difficult.” Responding to Interview Question 3, P2 stated, “We give our customers consistent services. We do not change pricing often. We change pricing twice a year, not keep changing it each month as our competitors do.” In response to Interview Question 7, some participants said:

- “One of the things that make us stand out from our competitors is our customer service. We can visit a customer 10 times to solve problems. These customers have come to a certain expectation that they know that we will be there for them if they call us. A good deal of the time, before they call us, we already know the problem because we are monitoring what is going on with their solar system online. Sometimes, I can log into their solar system and fix their problem from my laptop without sending someone to the customer. Today, I have sent out my team to perform free service to all our customers. Our clients get one-free service per year” (P2).
- “Many customers are looking for us to deliver according to promise, and so we have several businesses today based on referrals. We may be a little more expensive than the other companies, but they still go for us. This is one area that works for us, and our job quality is also speaking for us. We have maintained a high level of professionalism, and we have also delivered on our promises all the time. This is our unique selling advantage, and we also use professionals. So, we work with our customers hand in hand from day one,

> and the customers have confidence in us that we know what we are doing, and they have value for money. When it comes to delivering professional jobs, we are one of the best" (P3).

In response to Interview Question 9, P1 asserted, "We try to make sure that our service is of standard. We believe that whenever we give you the service, you will be happy with it." Responding to Interview Question 9, P2 stated, "Our focus is being the best among the players in the green energy industry. If you are considered the best by your customers, you will build a very profitable business." According to P2, "We have customers who wait three months for us to do their projects. We do not focus on profitability; we give our customers the experience they do not expect in Lagos, Nigeria. For us, the customer is the king."

The participants' responses to the interview questions demonstrated that customer service and quality of service are essential for generating green energy for increased profitability. All managers of SMEs who participated in this study confirmed using customer service and quality of service as a strategy to generate green energy to increase profitability. The participants' responses aligned with Camarinha-Matos et al.'s (2017) assertions that managers should enhance customer service and quality of service to generate green energy to increase profitability. The study findings demonstrated that managers of SMEs used customer service and quality of service as a strategy to generate energy for increased profitability in Lagos, Nigeria. As applied in this study, 100% of the participants attested using customer service and quality of service as a strategy to generate green energy to increase profitability.

Findings Related to DIT

DIT was the conceptual framework for this study. Diffusion of innovations is a conceptual framework that researchers widely use to study the spread of products, practices, and ideas (Friedrichsen et al., 2017). The four tenets of DIT are innovation, communication, time, and the social system (Rogers, 1995). The diffusion of innovation within and across organizations enhance the adoption of new technology, improving business performance and profitability. The study findings indicate that managers of SMEs could increase profitability by implementing effective strategies to generate green energy based on DIT. As applied in this study, all participants attested using a combination of strategies to generate green energy to increase profitability.

Min et al. (2018) posited that DIT is a social and psychological theory that researchers used extensively to predict innovation adopters' decision making and adoption patterns. By understanding the functioning of innovation systems and the rate of technology diffusion, leaders and managers of SMEs in Sub-Saharan Africa could adopt and implement renewable energy technologies to address energy poverty and enhance sustainability (Tigabu, 2018). The rate of innovation diffusion within organizations depends on the advantage, compatibility, complexity, trialability, and observability in replacing or enhancing what currently exists. When managers of SMEs implement renewable energy technology and efficiency systems, they are improving performance through innovation. As applied in this study, managers of SMEs should establish strategies for generating green energy to increase profitability. All participants confirmed

the DIT model regarding using business strategies to generate green energy to increase profitability.

Adopters of an innovation communicate the innovation to those individuals and organizations yet to know about the innovation (Lundblad, 2003; Rogers, 1995). Interpersonal communication tends to be more effective in making potential adopters know and implement an innovation compared to mass media (Friedrichsen et al., 2017). The more likely the source of information to the potential adopter, the faster the adoption of the innovation (Lundblad, 2003; Rogers, 1995). Communication is essential to clarify the application and benefits of new technology. As applied in this study, managers of SMEs should establish effective strategies for generating green energy to increase profitability. Based on the themes the participants presented, Rogers' DIT tenets were present in the blend of strategies used to generate green energy for increased profitability. All participants confirmed the DIT regarding using communication as a business strategy to generate green energy to increase profitability.

Change agents, opinion leaders, and champions in a social system can influence innovation diffusion (Hopkins, 2019; Lundblad, 2003; Rogers, 1995). The members of a social system are diverse concerning their readiness to adopt an innovation (Hopkins, 2019). Change agents and opinion leaders are important because they act as mediators to decrease resistance to new technology and influence the fast adoption of green energy for increased profitability. Business leaders use DIT to spread innovation by communicating it over time through their social system. As applied in this study, all participants' responses echoed Hopkins' statement on the importance of social systems in the

generation of green energy for increased profitability. As applied in this study, managers of SMEs spread innovation by communicating it over time through their social systems to generate green energy to increase profitability. All participants' responses validated the application of DIT to generate green energy to increase profitability.

The tenets of DIT aligned with the study objective of exploring the strategies that managers of SMEs use to generate green energy to enhance profitability. The managers of SMEs applied the principles of complexity, compatibility, trialability, observability, and relative advantage in adopting green energy to replace fossil fuel. All participants used various strategies involving financing support, renewable energy technology and efficiency systems, education and communication, and customer service and quality of service. As applied in this study, all participants applied DIT's key components involving innovation, communication channels, time, and the social system to achieve diffusion of innovation within and across the organization to generate energy to increase profitability.

Applications to Professional Practice

Identifying the strategies that managers of SMEs use to generate green energy is crucial to increasing organizational profitability. Business manager with improved performance attracts more customers (Chou et al., 2016). Lack of access to electricity hinders SMEs growth and contributes to global unemployment, migration, and emigration crises (Igbum et al., 2019). All participants affirmed using a combination of strategies to generate green energy to increase profitability. The results of the study could help managers of SMEs to generate green energy to increase profitability. The study findings could significantly contribute to information sharing among managers of SME's

who are seeking strategies to increase profitability. Some SMEs with weak strategies may apply this study's findings to green energy generation to increase profitability. This study findings could significantly enhance SMEs performance on strategies to generate green energy for increased profitability in Nigeria's energy sector.

Business leaders respond to the energy crises by utilizing fossil fuel-powered generators to remain in business, which is expensive, pollutes the environment, and erodes the profit margin (Chofreh et al., 2014). Lack of adequate information is a critical reason why managers of SMEs do not take advantage of the benefits of green energy and green environmental strategies to increase profitability (Stewart & Grapp, 2014). Based on the study findings, the most significant contribution to professional practice may be identifying potential strategies that SME managers use to generate green energy for increased profitability. Managers of SMEs could use this study results to improve the generation of green energy and enhance their business profitability.

Nigeria's energy crisis is compelling energy users to explore alternative energy sources (Ebenezer et al., 2018). The diffusion and uptake of renewable energy technology remain marginal (Tigabu, 2018). Managers of SMEs in green energy development businesses need a collaborative approach as a strategy in the provision of services (Pitt & Congreve, 2017). This study findings could provide managers of SMEs with knowledge on how to diffuse innovation to generate green energy to increase profitability effectively. The study findings could contribute to the literature on renewable energy and provide SMEs with new insight into business strategies to improve green energy generation. New and upcoming managers of SMEs may use the study findings to

understand the importance of implementing various business strategies to generate green energy to increase profitability.

Policymakers should establish renewable energy policies to promote private sector participation in renewable energy development (Treki & Urban, 2015). Managers of the real estate market could respond to climate change by increasing the attractiveness of investments in green energy (Jones et al., 2019). Renewable energy is a driving factor of green logistics and supply chain operations, promoting environmental and economic sustainability (Yu et al., 2018). The findings from this study could contribute to the literature on green energy generation for improved business profitability. The study findings may help organizational leaders, including governmental and non-governmental agencies, small business owners, and entrepreneurs, to gain helpful information on strategies to generate green energy, increase profitability, and sustain their businesses.

Implications for Social Change

The study findings might significantly contribute to providing managers of SMEs with strategies to generate green energy to increase profitability. Adopting green energy in business contributes to a pristine ecosystem and environmental sustainability (Robinson & Stubberud, 2014). By implementing excellent strategies, SME managers could generate green energy to increase profitability in their firms. As demonstrated in this study findings, adapting business strategies might help SME managers to generate green energy, increasing productivity and profitability, thereby generating economic growth for local communities. With improved business profitability, SME managers

would pay more corporate taxes, which state and local governments could use to provide citizens with social amenities.

The study findings might contribute to positive social change by assisting managers of SMEs in understanding the strategies for generating green energy to increase profitability and gain adequate knowledge to establish a valuable business model. As illustrated in this study, generating green energy might help SMEs to increase profitability, thereby sustaining their firms and providing job opportunities to the local community. By applying the findings from this study, managers of SMEs might increase their business profitability, resulting in improved welfare and wellbeing for the employees and their families.

Reduction in greenhouse gas emissions and elimination of generator noise by adopting green energy could promote quietness and tranquility in Lagos, enabling the social wellbeing of the city residents (Rizwanul-Fattah et al., 2013). The study findings could promote sustainability practices in SMEs' business strategies and reduce carbon dioxide emission, giving rise to a cleaner environment for regional residents. By generating green energy, SME managers could enhance their firm productivity and profitability and fulfil their corporate social responsibilities to the residents through the award of scholarships, sponsorship of local events, and the building of healthcare facilities, libraries, and schools. The general public might learn from the study findings the business strategies managers of SMEs use to generate green energy to increase profitability.

Recommendations for Action

An effective business strategy is crucial to generating green energy to increase profitability. Implementing micro-off-grid solutions managers of SMEs could reduce the dependency on diesel generators, guarantee the reliability of electricity supply, and increase profitability (Ndukwe et al., 2019). Managers of SMEs in Nigeria should adopt green energy as an alternative to fossil fuel to enable a clean ecosystem, environmental and economic sustainability (Robinson & Stubberud, 2014). I recommend that managers of SMEs should implement a blend of practical business strategies to generate green energy to increase business profitability.

By implementing business strategies to generate green energy, SMEs managers could increase business profitability. The use of green energy by SMEs could reduce the cost of energy consumption, increase profitability, ensure regulatory compliance, mitigate climate change, generate employment, grow the economy, and enable development (Dombi et al., 2014; Robinson & Stubberud, 2014). Researchers have demonstrated that lack of adequate information is a critical reason hindering SME managers from taking advantage of the benefits of green energy and green environmental strategies to increase profitability (Stewart & Grapp, 2014). I recommend that managers of SMEs adopt effective business strategies to generate green energy to increase their business profitability and growth.

Communication is a valuable tool that SME managers could use to enhance the generation of green energy to increase profitability. Adopters of an innovation communicate the innovation to those individuals and organizations yet to know about the

innovation (Lundblad, 2003; Rogers, 1995). Interpersonal communication tends to be more effective in making potential adopters know and implement an innovation compared to mass media (Friedrichsen et al., 2017). I recommend that SME managers implement communication and education to generate green energy to increase profitability.

SME managers lack business strategies for generating green energy to increase profitability. The study findings indicate that managers of SMEs use a blend of business strategies to generate green energy to increase profitability. I recommend that SME managers have adequate skills, experience, and competency to adopt appropriate business strategies to generate green energy to increase business profitability. I will disseminate this study result to interested stakeholders through the presentation at literature seminars, conferences, and training; publications in business and academic journals; and sharing knowledge in my network, social media, and workplace.

Recommendations for Further Study

This qualitative multiple case study aimed to explore the strategies managers of SMEs use to generate green energy to increase profitability. Some researchers have suggested that future studies on green energy as alternatives strategies could fill a gap in research (Omri et al., 2019). This study was limited to a cross-sectional, qualitative multiple case study involving managers of SMEs in three energy companies in Lagos, Nigeria. I recommend that further studies involve using longitudinal, quantitative or mixed methods on participants selected from varying management levels in different industrial sectors at various geographical locations.

The study findings provided rich information that future researchers could explore regarding the strategies managers of SMEs use to generate green energy to increase profitability. A significant limitation of this study was the small sample size of three managers SMEs from three energy companies in Lagos, Nigeria. By using a larger or smaller sample size, researchers might obtain different themes. Therefore, I recommend that future researchers consider using a larger size of participants from different management levels in diverse industrial sectors.

My competency and knowledge of doctoral study are evolving. The study was limited to my subjective evaluation and accurate interpretation of the participants' responses to the interview questions. The study was also limited to my personal beliefs and professional experience with the topic involving the strategies managers of SMEs use to generate green energy to increase profitability. I recommend that future researchers should comprise of experts from related multi-disciplines in renewable energy innovation to divulge some details I must have omitted in this doctoral study.

Reflections

The purpose of this multiple case study was to explore the strategies managers of SMEs use to generate green energy to increase profitability. From the study findings, I gained an in-depth knowledge of the research problem from three SMEs managers in three energy companies in Lagos, Nigeria, regarding their use of business strategies to generate green energy to increase profitability. I learnt that managers of SMEs use a blend of business strategies involving financing support, renewable energy technology and efficiency systems, education and communication, and customer service and quality

of service to generate green energy to increase profitability. My new knowledge and understanding of the research problem positively changed my preconceived ideas and values, personal bias and perceptions, and beliefs on business strategies managers of SMEs use to generate green energy to increase profitability.

In conducting this study, I used the purposive sampling technique to select three managers of SMEs from three energy companies in Lagos, Nigeria, who had successfully used business strategies to generate green energy to increase profitability. Using the purposive sampling technique, I selected participants who had the relevant knowledge, experience, and competence to answer the overarching research question. During the purposive sampling process, I interacted with the participants, which improved my communication, emotional intelligence, inspirational, interpersonal, and networking skills.

Using the qualitative research method, I conducted semistructured interviews and interacted with the participants, which improved my communication, listening, observation, self-confidence, and problem-solving skills. I conducted interviews at participants' preferred time and date, which enabled the respondents to express themselves freely and allowed me to gain an in-depth knowledge of the research problem. During the data organization and analysis process, I understood the research problem, which enabled me to identify the themes and patterns and establish the study findings. Reflecting on my experience, I gained a better understanding of the doctoral study research process, thereby improving my skills in conducting academic research work.

Summary and Study Conclusions

Managers of SMEs face challenges in using effective business strategies to generate green energy to increase profitability. This qualitative multiple case study aimed to use DIT to explore the strategies that managers of SMEs use to generate green energy to increase profitability. I administered nine open-ended questions through semistructured interviews with three SME managers from three energy companies in Lagos, Nigeria, to collect the primary data to answer the research question. The sources of secondary data include company archival documents and field notes. The four themes that emerged from the thematic analysis of data were: (a) financing support, (b) renewable energy technology and efficiency systems, (c) education and communication, and (d) customer service and quality of service. The study findings indicated that managers of SMEs used a blend of business strategies to generate green energy to increase profitability.

Adapting business strategies might help managers of SMEs to generate green energy, which may increase productivity and profitability, thereby generating economic growth for local communities. With improved business profitability, SME managers will pay more corporate taxes, which local and state governments could use to provide social amenities to the local citizens. Also, improving green energy generation might help managers of SMEs to increase profitability, thereby sustaining their firms and continuing to provide job opportunities to the residents. The public might learn from the study findings the business strategies managers of SMEs use to generate green energy to increase profitability. The use of DIT as a lens for this study involving managers of SMEs may fill a gap in the literature on green energy generation to increase profitability.

The study findings align with previous scholars' conclusions regarding the need to implement effective business strategies to generate green energy to increase profitability.

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Appendix A: Interview Protocol

The purpose of this interview is to answer the research question on strategies managers of SMEs use to generate green energy to increase profitability.

The interview protocol will consist of the following nine steps:

1. Invite managers of SMEs who had deployed strategies to generate green energy for profitability via email with attached consent form to seek their consent to participant in the study.
2. Receive reply via email from managers who consented to participate in the study.
3. Set up an interview with three mangers, one each from an SME who consented to be participants in the study.
4. Conduct telephone interviews with each invited participant and record the interview.
5. Transcribe the recorded interview data into text.
6. Send transcripts to participants for member checking and validation.
7. Import recorded interview raw data into NVivo 12 qualitative data analysis software.
8. Code and analyze data using themes in NVivo 12 qualitative data analysis software.
9. Store data in a password protected hard drive for 5 years before permanently destroying.

Ekok Okpokam (Walden Research Student)

Appendix B: Interview Questions

1. What strategies do you use to improve green energy generation to increase profitability?
2. What key challenges did you encounter developing and implementing the strategies to improve green energy generation?
3. How did you overcome the key challenges you encountered while developing and deploying your organization's strategies to generate green energy to increase profitability?
4. How do you assess the effectiveness of the strategies on the adoption of innovation in green energy generation?
5. What communication channels did you use to convince the members of your organization to accept the change from fossil fuel to green energy to enable increased profitability?
6. How do you access your organization's success in adopting green energy to increase profitability?
7. What competitive advantage has your organization gained for adopting green energy to increase profitability in Lagos, Nigeria?
8. What, if any, additional strategies are your organization planning to deploy to improve green energy generation to increase profitability?
9. What else can you share with me about your organization's strategies for adopting green energy to increase profitability in Lagos?