UNIPORT JOURNAL OF BUSINESS, ACCOUNTING & FINANCE MANAGEMENT
DEPARTMENT OF ACCOUNTING
UNIVERSITY OF PORT HARCOURT, CHOBA
PORT HARCOURT, RIVERS STATE
NIGERIA
VOL. 17 NO. 1 JANUARY 2026

THE IMPACT OF IRREGULAR ELECTRICITY SUPPLY ON THE PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES (SMES) IN MAKURDI METROPOLIS: THE IMPLICATIONS OF ALTERNATIVE ENERGY SOURCE

SA'AONDO, SIMON AONDONA
Federal University, Lafia
Nasarawa State, Nigeria
saaondosimon@gmail.com

Abstract

This study investigates the impact of irregular electricity power supply on the performance of Small and Medium Enterprises (SMEs) in Makurdi Metropolis, with specific emphasis on the implications of reliance on alternative energy sources. Using a survey design method, data were collected from 300 registered SMEs in Makurdi including barber shop/hair dressing salon, computer business centres, tailoring/fashion and designing, welder/fabrication, and hotels/restaurants. Quantitative data were analysed through descriptive statistics and chi-square to examine the influence of irregular electricity supply and alternative power usage on enterprise performance indicators. This include profitability, operational cost, employment capacity, and business expansion. The findings reveal that irregular electricity supply significantly undermines SMEs performance in Makurdi Metropolis. Results indicate that frequent power outages increase operational costs, reduce profit margins, constrain employment capacity, and impede business expansion. Although SMEs resort to alternative energy sources such as diesel generators, inverters, and solar systems to mitigate power instability, the high costs of acquisition, maintenance, and fuel consumption exacerbate financial strain and do not adequately compensate for grid unreliability. The study further reveal that there is negative relationship between irregular power electricity and SMEs performance who adopt alternative energy fair significantly. The study concludes that current energy supply challenges pose a substantial barrier to SMEs to compete for sustainability in Makurdi Metropolis. The study recommended that there should be prompt upgrade and maintenance of electricity infrastructure. The relevant agencies in power distribution and government authorities should prioritise the modernisation and maintenance of transmission and distribution networks in Makurdi Metropolis to reduce power outages and to strengthen the existing infrastructure which will improve electricity reliability and lessen the operational burden on SMEs.

Keywords: Privatisation, Power Holding Company of Nigeria, Small and Medium Enterprise (SMEs), Power outage, and Electricity Supply.

Introduction

Electricity is one of the most important components of every nation's economy and development that coordinates the activities of the economy from primary sources, secondary sources, and tertiary sources of production. It creates direct links or bearing on the economy. The direct or indirect impact enhances the performance of every sector of the economy that uses electricity. Virtually all business activities depend on electricity, especially production companies that require constant and effective flow of electricity. Similarly, electricity serves as input in production processes. It also contributes greatly to productive market. The availability of electricity supply plays a significant role in storing finished goods ahead of demand and enhancing consumers' satisfaction by assisting in making available goods to consumers when needed. This also helps in building the firm's image and protecting the firm's reputation as a result of the customer's trust being sustained in having their demand met (Sa'Aondo, 2026).

Small and medium enterprises (SMEs) are considered to engine room of economy of different nations. To this end, SMEs significantly contribute to the Gross Domestic Product (GDP) of nations. They roles in the development of economy and harnessing of untap skills cannot be over emphasis in the sustainable economic development of developed and developing nations (Prasanna, Jayasundara, Naradda, Gamage, Ekanayake, Rajapakshe, & Abeyrathne, 2019). They play a very significant role in employment (generating gross domestic product, GDP). Small and medium enterprises are key to local economic development, contributing to job creation, poverty reduction, and economic growth. They stimulate competition and economic renewal, especially in transitioning and market economies. They are more creativity, innovation, and flexibility than large firms. The performance of SMEs is necessary for three reasons: their significant impact on gross domestic product and employment, their ability to adapt to a rapidly changing environment, and the cultivation of free entrepreneurial initiative (Eklund, 2020). In addition, SMEs contribute significantly to technological progress in society and innovation in the economy. For SMEs to achieve their economic role for which they are known in the society, there exist other economic components that stimulate this achievement, such as industrial production, finance and infrastructure, especially electricity supply.

It is on this ground that Nigerian government in 1972 through decree N0 24 established the National Electricity Power Authority (NEPA) to generate, transmit, and distribute electricity. It was later reformed through privatisation and renamed the Power Holding Company of Nigeria. (PHCN). The Power Holding Company of Nigeria (PHCN) is a public utility company saddled with the responsibilities of managing and maintaining efficient system of electricity supply to all parts of Nigeria. After the renaming of NEPA to PHCN through reform, the government unbundled PHCN into 18 successor companies: six generation companies, one transmission company and 11 distribution companies, with the major aim of sanitising and promoting efficient service delivery (Cloudius, 2014).

Having recognised the importance of both electricity and SMEs in the economy, the Nigerian government initiated some reforms that were aimed at addressing the inefficiencies synonymous with PHCN's operations. Despite various efforts made by the Nigerian government, electricity supply is the major challenge confronting the Nigerian economy**.** A typical Nigerian firm experiences power failure and voltage fluctuation about seven times per week, each lasting for about two hours, without warning (Iweama, Iweka & Alfa, 2018).

This imposes huge costs on the firm arising from idle workers, spoiled materials, lost output, damaged equipment, and restart costs. The overall impacted increased uncertainty cost and lower returns on investment for the aggregate economy, this has seriously undermined Nigeria's growth potential to attract investors (Adenikinju, 2015). With the liberalisation of the power reform to improve infrastructure and establish a competitive electricity market that could alleviate the power constraints stunting SMEs growth. It is on this ground that the study evaluated the impact of irregular electricity supply on the performance of small and medium enterprises in (SMEs) in Nigeria and implications of alternative energy source, with the following researcher questions

1. To what extent does regular power outages affect the performance of SMEs operations in Makurdi Metropolis.
2. What are the financial implications of alternative power sources for SMEs in Makurdi Metropolis.

Hypothesis

The study was guided with this hypothesis:

Research Hypotheses

H1: The frequency of power outages by PHCN has a negative impact on the productivity of SMEs in Makurdi Metropolis.

H2: The alternative power sources have no significant influence on the operational cost of SMEs in Makurdi Metropolis.

Literature Review

Conceptual Terms

Privatisation: is the transfer of ownership and administrative control from public enterprise to the private sector. In this context, it refers to the process where the Nigerian government transfers assets, administration and ownership of electricity (NEPA) to a private entity to (PHCN) to private operators.

Power Holding Company of Nigeria (PHCN): Is the former government owned electricity with monopoly character Nigeria, that was unbundled into generation, transmission and distribution companies during the privatisation process.

Electricity Supply: The availability, stability and quality of electric power delivered to end-users, especially SMEs.

Small and Medium Enterprise (SMEs): Businesses owned by individuals, operated with limited resources, labour, and turnover, often seen as engine room of economic growth and employment in Nigeria.

Power outage: It is a sudden blackout or partial brown out of voltage drop when electricity power flow stops without prior information.

Literature Review

Electricity is a common form of energy that involves the movement of electrons between two points when there is a potential difference between them, resulting in what is known as electric current. Consequently, electricity is one of the most important inputs for industrial production and commercial activities in any economic system (Sa'Aondo,2026). One of the distinguished characteristics of reliable is the efficiency impact it possess in transforming and the improvement of socio-economic conditions of the world economy and lives in the society (Ateba, Prinsloo, & Gawlik, 2019). Electricity increased the use of home

appliances for productivity such as cooking, washing, ironing, etc., which turn to reduce physical labour thereby reducing time spent on home activities and freeing up labour for participation in the labour market (Greenwood, Seshadri, Yorukoglu, 2005; Ramey and Francis, 2009; Pirani, Leon, & Lugauer 2010; Dinkelman, 2011& Lewis, (2014); Akpandjar and Kitchens, (2017).

Small and Medium Enterprises

Small and medium enterprises (SMEs) are regarded as the backbone of economic development because they promote economic growth and represent a significant proportion of business activities in growing economies such as Nigeria and many other parts of the world. SMEs are privately owned businesses characterized by limited capital, assets, and workforce, typically employed between 1 and 250 persons, although this range varies from country to country (Uche, 2018) it is classified in different categories ranging from micro-firms that is run by one or two persons, which often experience slow growth to no-growth.

In Nigeria, SMEs is classified as manufacturing, transportation, information and communication technology. They are well-organised and well connected. Udechukwu, (2003) classified SMEs according to labour size of 1 to 10, with a working capacity of 10 workers with monetary value of ₦1.50 million, including working capital but excluding cost of land. Secondly, SMEs is an industry with labour size of 11 to 100 workers, with a financial capacity of ₦50 million, including working strength. Thirdly, SMEs are medium scale industry with labour capacity of 101 to 300 with a financial capacity of ₦50 million to about but not more than ₦200 million.

SME according to Central Bank of Nigeria (CBN) are micro enterprises businesses with fewer than 10 employees, a capital base of ₦500,000. Small enterprises are firms with fewer than 50 employees and a capital base of less than ₦1 million. Medium enterprises are classified as businesses employing between 50 and 99 workers, with a capital base not exceeding ₦1.5 million (Gbenga, 2014 cited in Adamu, Hassan & Saidu, 2017).

The State and Electricity Supply in Nigeria

The role of electricity in the economy of every nation cannot be over emphasised since electricity plays a significant role in the industry. The National Electric Power Authority (NEPA) was established in 1972 with the responsibilities of generating, transmitting and distributing electricity to all part of the federation with four power stations, including: Ijora, Afam, Thermal Station and Kainji Hydro Power Station, with a total installed capacity of 532.6MW, serving more than two million customers, this grew to 5,958MW in 2000, with the additional power stations at Jebba, Shiroro Hydro Power Station, Egbin, Sapele, and Delta. At the establishment of the power sector in the early 1980s, it has the combined installation generating capacity of 2940MW (PHCN, 2010). It was further commercialized in 1988 by an upward review of tariff. This reform enlisted the power sector among privatised firms with the aim of attracting investors to the sector.

However, NEPA became rather more unproductive due to poor management and lack of investment in the power generation, transmission and distribution leading it into full privatisation in 2013 (Sa'Aondo, 2026). The privatisation of NEPA gave birth to Power Holding Company of Nigeria (PHCN) which was unbundled into different companies, power generation, transmission and power distribution. There was high expectation that the distribution company would very proficiently, however, it was a nightmare performance to Nigerian electricity supply industry (Adenikinju, 2015). The power sector is classified with inadequate power generation, transmission and distribution, inadequate and unreliable

electricity power supply, low voltage variations, blackouts and pervasive reliance on self-generated electricity (Adenikinju, 2015).

In an attempt to provide solutions to the Nigerian electricity challenge, the Nigerian government has invested in hydroelectricity power stations which cut across the country to boost power generation through hydrostatic plants with a total capacity of 7,024MW; Mambilla -3,050 MW; Zungeru-700MW; Gurara -11,360MW; Makurdi – 1000MW, Small hydropower – 84MW; Itisi – 40MW and Kashimbila -30MW (IEA, 2019).

According to Okechukwu, (2022) & Adeunle, (2024) Nigerian electricity experienced national grid break down in 2015, 40% in 2016-2019 and 46% in 2020 to 2022, which is the highest, this becomes major challenge in the Nigerian economy, manufacturing firms, SMEs, individual and government spend huge sum investing the alternative power source (Iweama, Iweka & Alfa, 2018).

Impact of irregular electricity power supply on SMEs Operations

Epileptic electricity supply is common among African nations and thus hinders substantial contribution to economic development. According to Iwayemi et al. (2018) a total loss output estimation of US$470 billion (N71 trillion) in terms of gross domestic product (GDP) was recorded between 2015 and 2022 in the Nigerian economy due to irregular power supply. Irregular power supply led to power outages that diminishes production efficiency in the Nigerian economy Adewuyi and Emmanuel, (2018). A prolonged power outages hindered economic growth, reduced productivity and increased costs of doing businesses and household activities across the country Sa'Aondo, (2026). This led to different electricity reforms in the power sector to curve the menace, since its impacts continue to frustrate many business activities in different parts of Nigeria. different studies have identified poor access to electricity supply as one of the major challenges that faced Nigeria's economic growth since electricity serves as the major source of powering economic activities (Ugwoke, Dike, Elekwa, 2016; Doe and Asamoah, 2014). Electricity served as one of the essential component resources to the development of SMEs in rural areas and to the modern society. Constant electricity supply enhances the performance and sustainability of SMEs operations (Duru & Yusuf, 2017).

According to Nuredeen, Nafiu & Jibo (2018), power outages have a detrimental effect on SMEs' growth which can result in premature liquidation. SMEs' profits are negatively impacted by power disruptions since power outage reduce industrial efficiency. (Abotsi, 2016) stress that electricity outages diminish production efficiency in most developing nations. Over the years, electricity outages have continued to frustrate many business activities in different parts of Nigeria (Adewuyi & Emmanuel, 2018). It is visible that electricity outages have limited to the capacity of SMEs expansion and discouraged many local and foreign investors. Olatunji (2019) declares that electricity outages have led many companies (SMEs) to the migrate from Nigeria to different Nations while Moyo (2012), illustrates that electricity outages affect firms' productivity in the Nigerian manufacturing sector. In a nutshell, unstable electricity supply is a serious problem confronting SMEs in Nigeria.

Impact of SMEs on the Nigerian Economy and Development

The role of small and medium enterprises (SMEs) in national development is widely acknowledged due to the capacity to boost industrial output and improve overall human welfare. SMEs are instruments in tackling unemployment. They serve as a gateway for job creation, absorbing a considerable portion of the labour force (Sa'Aondo, 2026).

Consequently, SMEs have provided jobs to unemployed individuals as a means of self-reliance, rather than depending solely on government-white collar jobs. The Nigerian youths, both graduates and non-graduates have successfully ventured into businesses like poultry farming, animal husbandry, tailoring, soap production, baking, hairdressing, welding/fabrications, laundry services, computer business services, transportation, estate agency, and industrial cleaning. These enterprises spread across both rural and urban areas, they foster economic independence and contributed meaningfully to state and national development (Akinadewo, 2020).

This in return reduces unemployment crisis and social vices such as "armed robbery, drug trafficking, prostitution, and other crimes" (Leo & Sanusi, 2019 & Akinadewo, 2020). In recent times, economic growth has been linked to SMEs as a strategy to boost the economy. Nigeria is not left out among the nations that adopted SMEs as economic components with the primary objective to expand the industry base through creating a sustainable economic growth of SMEs. Chinweuba and Sunday (2015) noted that there is a cordial relationship between SMEs and economic development in Nigeria, since SMEs contribute to job creation and recirculation of national income among the people. SMEs constitute the engine room of Nigeria's economy, despite operating with multiple challenges that constrain their managerial abilities (Motilewa, Ogbari & Aka, 2015), SMEs plays a vital role in stimulating industrial productivity and improving social welfare.

SMEs are regarded as the backbone of industrial expansion because they adopt diverse strategies that facilitate the transformation of raw materials into finished goods. Recognising their importance, governments at various levels have developed economic mechanism policies aimed at strengthening SMEs productivities and ensuring a conducive business environment. These policies interventions are designed to promote the growth and sustainability of SMEs due to their crucial contributions to Nigeria's economy particularly in poverty reduction, employment, and enhancement of social welfare. Consequently, SMEs served as a key mechanism for alleviating poverty and the sustainable economic growth through job creation and wealth generation (Kehinde, Abiodu, Adegbuye & Oladimeji, 2016).

The importance of SMEs in the Nigeria economy is encompassing, since SMEs promote entrepreneurship skills development through developing skills and cultivating financial skills which are explored in every environment, the environment which contributes greatly in setting such SMEs and the products. Such SMEs offer different services to the people, by promoting the economy and securing the community by reducing crime rate in the community, since those who could have engaged in crime activities are offered job opportunities that kept them busy. SMEs explore various opportunities by turning raw materials into finished goods as services that are suitable to the environment (Sa'Aondo, 2026). SMEs contribute significantly to the realisation of various national development goals through their economic output role in income redistribution, promotion of indigenous entrepreneurship, and advancement of local technology. They also play a strategic role in producing intermediate goods that strengthen both inter and intra industrial linkages. According Kehinde, Bankole, Busola and Kejinde, (2024). SMEs account for more than 55% of Nigeria's Gross Domestic Product (GDP) and provide approximately 65% of total employment, underscoring their importance as a critical driver of economic growth and sustainable development.

Empirical Review

Tahir and Inuwa (2019) investigated factors affecting SMEs' performance in Maiduguri, Borno State-Nigeria. The study data was using descriptive and inferential

statistics, correlation and multiple regression analysis which revealed that poverty and insufficient infrastructural facilities are the most critical factors influenced the success of SMEs in Borno State. The study's findings underscore the importance of reliable electricity which is the roadmap that shapes productivity performance of SMEs. This suggests that infrastructure deficiencies, particularly the one associated with the provision of electricity remain the central constraint that limits the performance of SMEs and sustainability.

Afukonyo (2023) investigated the impact of inadequate power supply on small and medium scale enterprises: a case study of Takum Local Government Area of Taraba State. The study also used thirty (30) structured questionnaires to collect primary date directly from the selected SMEs. The study identified that epileptic power supply has a negative impact on SMEs, making them to spend about 20% -30% on electricity backup energy. The study also revealed that epileptic power supply affects the operational performance of SMEs and the supply of power to SMEs is not sufficient. The findings however affirmed that unstable electricity disrupts production cycles which lead to inefficiency of SMEs and increase operational risks. The persistence in unreliable power supply not only undermines output but also deters SMEs' capacity to generate profits, create more jobs, and the ability to expand.

Sa'Aondo (2026) investigate the impact of privatisation of power holding company of Nigeria (PHCN) and performance of small and medium enterprises (SMEs) in Nasarawa state, with major focus on selected small medium scale in Nasarawa (Barber shop/salon, computer business centres, hotels/restaurant, welder/fabrication and tailoring/fashion and designing). Data were generated from the 13 local government of the state. The study employed descriptive statistical analysis in testing the research hypothesis. The study finding indicated that, even after privatization of the power sector, the sector is confronted with challenges ranging from power outage, high electricity tariff, poor management of resource, this has negatively impacted on the production capacity of SMEs Nasarawa state hindering profits generated by SMEs, limiting employment capacity of SMEs as well as limiting SMEs expansion. The study recommended that, government should invest more in a workable electricity subsidy policies or grants that will aid SMEs cushion the effects of power outages in the state.

Umar (2020) investigated the effects of privatisation on organisational performance of the Abuja Electricity Distribution Company, using primary data collected under the jurisdiction of the company. Duration of electricity supply, infrastructure, complaint response time, quality of electricity supply, estimated billing, metering, power supply rationing, etc., were used in the Ordinary Least Squares (OLS) analysis. The empirical result showed that electricity supply did not increase in post privatisation period. Idowu et al. (2019) revealed that the electricity sector reform has not yielded a desired outcome as technical and market constraint posed limitation to the privatisation gains. Both findings justified the failure of electricity reform in Nigeria, despite the intended goals of the reforms. Privatisation did not improve service efficiency for SMEs. Instead, inefficiencies persisted on the distributions of electricity. This suggests that structural reforms alone are insufficient, without robust regulatory mechanisms, political will and accountability.

Alo and Adeyemo (2021) conducted a study on distorted electricity supply and the profitability of small and medium scale enterprises: a survey of selected inhabitants in South-West Nigerian state. The correlation coefficient and simple regression analysis techniques were used to analyse the responses from the respondents. Findings from the study showed that effective power supply significantly impacted negatively on the profitability of business

enterprises, and the cost of maintaining generators as alternative sources of power has a negative impact on the profitability of the enterprises. The study concluded that power supply has a negatively influence on the profit of SMEs in Nigeria. The findings displayed various challenges that erode profit margins and constrain SMEs' ability to reinvest in expansion or innovation, thereby weakening their growth trajectory.

Victor, Bridget and Mlumun (2023) examined the impact of SMEs on employment creation in Makurdi Metropolis of Benue State. A sample size of 340 entrepreneurs was chosen from the population of (SMEs) in Makurdi Metropolis. The study employed logistic regression to analyse the impact of SMEs activities on employment creation or generation in the state. The study's findings showed that SMEs contribute significantly to employment generation in the state but often face with the challenges of lack of capital, absence of business plan, lack of confidence in the face of competition, unfavourable environment condition for development of SMEs, high government taxes and inadequate technical knowledge. The study, therefore, recommended that government should implement capital or credit policies that will enhance enabling environment for smooth running of the SMEs. Tax incentives should also be granted to infant enterprises and tax administration should be monitored to avoid excessive tax imposed by tax collectors.

From the empirical review, it is evident that most existing studies have primarily concentrated on the general effects of electricity supply across various sectors of the economy such as manufacturing, chemical industries, banking, food processing, paper production, textiles, and furniture, while paying limited attention to small and medium enterprises (SMEs), despite their inclusion within the same industrial category. It is needless to point out that both consume the same electricity but different voltage and capacity, SMEs such as computer centres, welders, barber shops/hair dressing salons, tailoring shops and hotels/restaurants should be treated differently, since the voltages they consume through their equipment and their financial output differ. This study fills this gap by comprehensively examining the relationship between power outages and the performance of small and medium enterprise (SMEs).

Theoretical Framework: Resources- Based View Theory

The study adopted Resource-Base View Theory as its theoretical framework. Resources – Based View Theory is a resource strategy in which an organisation focuses on internal resources available to enable it to compete in the market and achieve superiority. The theory suggests firms' competitive advantage as primarily determined by their capabilities. The availability of resources enhances a firm's capacity and promotes the development of assets that are valuable, rare, inimitable, and non-substitutable (Utami & Alamanos, 2023). The Resources Based View (RBV) theory emphasises firm performance by focusing on the characteristics of internal resources and capabilities that contribute to a sustainable competitive advantage and improved organisational outcomes. According to the RBV perspective, firms can achieve superior performance relatives to competitors within the same industry by effectively combining and utilising their technical, human and other strategic resources when human capital is recognized as a critical resource. It becomes essential to optimise employees' capabilities in order to enhance productivity and strengthen overall firm performance (Brandon- Jones, Squire, Autry, & Petersen, 2014). These resources have the capabilities to provide competitive advantage among firms. Such resource are not replicated by competitors. On the other hand, they are most valuable resources because of their worthiness which enable companies have efficiency and effectiveness.

Pankaj (2014) explained that Valuables (V) are those resources that create strategic value for a firm by enabling it to explore market opportunities and mitigate potential threats. Resources provides no real advantage if it does not enhance the firm's productivity, efficiency, or integrity. Rare (R) resources, on the other hand are resources that possess measurable market value and uniqueness, making them difficult for competitors to acquire or replicate. Imperfectly inimitable (I) resources refer to those that cannot be easily replicated by competitors due to their complexity, unique acquisition process, or the ambiguity of their relationship with competitive advantage. These resources create barriers to imitation and contribute to the sustainability of a firm's superior performance. Non-substitutable (N) resources are those that cannot be replaced by other alternatives without loss of value: in other words, competitors cannot achieve equivalent performance by using substitute resources. In Nigeria context, the Power Holding Company of Nigeria (PHCN) possess VRIN attributions; valuable, rare, inimitable, and non-sustainable competitive advantages and ensure a stable electricity supply for SMEs. However, if PHCN's resources fail to meet the VRIN criteria, it risks losing its competitive edge and may struggle to meet the energy needs of SMEs.

Research Design

The study employed survey research design as its chosen research methodology. The rationale behind this is that it is suitable for this type of study. The study is structured in such a manner that survey research is the most suitable. The study adopts a mixed research method that combined qualitative and quantitative approach within a single study to produce a comprehensive account of the research. Employing this method, the study effectively collected data and examined the significance of the data within the confines of the study using uniform sets of well-structured questionnaire and semi-structured questionnaire contents. The targeted population for the study comprises registered SMEs in Benue State within Makurdi metropolis totaling 1,900. These included: welding shops, barber shops, business centres, hotels/restaurants and tailoring shops which contribute to the economic growth of Makurdi Metropolis. Adapting Yamane's formula of 1967, the study arrived at 330 as a sample size of the study.

Presentation of Data

In presenting the data, only 300 questionnaire forms were distributed in the in Makurdi local government area of Benue State among the targeted SMEs selected for the study (welder shops, barber shops/ hair dressing salons, computer centres, hotels/restaurants and tailoring shops), representing the total targeted sample size of 100%.

Table 1: Sex of the Respondents

Variables	Frequency	Percentage
Male	190	63
Female	110	37
Total	**300**	**100**

Source: Field survey, 2024

The study sought to determine the ratio between male and female in the study areas in relation to ownership of SMEs within the scope of the study. It was assumed that the sex of respondents being males or females could contribute to knowledge on the gender ownership of SMEs. The analysis showed that 63% were males and 37% were females as

shown in table 1. This indicates that there were more males who participated in SMEs than females.

Table 2: Demographic Representation of SMEs

Variables	Frequency	Percentage
Welders' shops	95	32
Barber shops	78	26
Computer centres	47	15
Hotels/restaurants	35	12
Tailoring shops (fashion and design)	45	15
Total	**300**	**100**

Source: Field Survey, 2024

Table 2 shows the demographic representation of the targeted SMEs across Makurdi the Benue state capital with 32% were Welders' shops, 26% were barber shops, 15% were computer business centres, while 12% were hotels/ restaurants and 15% were tailoring shops (fashion and design). This implies that different SMEs participated in the study.

Table 3: How frequent does your organisation experience power outage after the privatisation of PHCN?

Variables	Frequency	Percentage
Few hours a day	140	47
5 hours a day	80	27
1 day in a week	50	17
2 days in a week	20	6
Whole week	10	3
Total	**300**	**100**

Source: Field Survey, 2024.

Table 3 shows how frequently SMEs experienced power outage across Makurdi the Benue state capital after the privatisation of the power sector. From the table, 47% of the respondents agreed that they experienced power outage just few hours in the day. This indicates that such SMEs experienced delay in the production or delivery of their services as expected by their customers. 27% stated that they experienced power outage for about five hours in a day, five hours of production time each day of the week, pointing to loss of confidence and weak production by such SMEs. 17% of the SMEs experienced at least one day of the productive week without power supply from PHCN. This has a negative impact on the performance of SMEs, since they may resort to alternative sources of electricity or may not engage in any business activity. 6% of the SMEs experienced power outage for a period of two days from PHCN. The remaining 3% of SMEs experienced total blackout for as long as a week, especially in the rural areas.

The longer the duration of power outage, the more they lost production as equipment became idle or unutilised but still incurred maintenance cost and depreciation in value.

Table 4: Profit made by SMEs in Makurdi Metropolis after the privatisation of PHCN

Variables	Profits	Frequency	Percentage
Barber shops	N2000-N8000	100	33
Welders' shops	N40000-N100000	85	28

Computer centres	N50000-N70000	80	27
Hotels/restaurants	N70000-N120000	20	7
Tailoring shops (fashion and design)	N2000-N50000	15	5
Total		**300**	**100**

Source: Field Survey, 2024.

Table 4 explains the level of profit generated by SMEs in Makurdi local government area of Benue state after the privatisation of PHCN. 33% of the SMEs operators indicated that they generated between N2000-N8000 monthly. This category of SMEs were mostly barber shops and hair dressing salons which shows decrease in profits generated before privatization of the power sector. 28% affirmed that, they earned N40000-N100000 as profits after privatisation of the power sector. This also indicates a decrease in profit generation from this category of SMEs. 27% of the SMEs generated between N50000 and N70000 after the privatisation of the power sector. This indicates an increase in profit as compared to the pre privatisation period while 7% of the SMEs earned between N70000-N120000 after the privatisation of the power sector. Lastly, 5% of the SMEs were tailoring shops (fashion and designing). They generated between N20000 and N50000 which also indicates decrease in the profit generated.

Table 5: Employment rate by SMEs in Makurdi Metropolis after the privatisation of PHCN

Variables	Employment	Frequency	Percentage
Barber shops	2-4	90	30
Welders' shops	4-10	20	7
Computer centres	3-9	80	27
Hotels/restaurants	6-12	85	28
Tailoring shops (fashion and design)	5-10	25	8
Total		**300**	**100**

Source: Field Survey, 2024.

Table 5 shows the statistics of employment by SMEs in Makurdi local government area of Benue State after the privatisation of the power sector. From the table, there is drastic decrease in employment status by SMEs in Makurdi metropolis after the privatisation of the power sector. 30% of the respondents of SMEs which were barber shops indicates that they dropped employment from 3-5 personnel to 2 -4 employees. Welder's shops with previous employment capacity of 5-15 also dropped to 4-10. Consequently, computer centres with 27% of the SMEs employment capacity also dropped to 3- 9 in their respective capacities. However, 28% of the SMEs employed between 10 -15 were restaurant staff who were directly affected by poor power supply. Most of them were cleaners, waiters, etc. Most cases, they also dropped to 6-12 employees. Lastly, 8% of the SMEs respondents only employed 5– 10 staff in their establishments, since inadequate electricity supply has created additional cost on production.

Table 6: How do power outages affect the production capacity of SMEs in Makurdi Metropolis?

Variables	Frequency	Percentage
Power outages affect production lines, resulting in loss of production time, missing deadlines and decreased output.	180	60
Frequent power outages and voltage fluctuations	40	13

damage machinery and equipment, leading to costly of repairs and downtime.		
Power outages damage products due to power interruptions, it affects refrigerator, computers processing and other equipment.	50	17
Power outages increase cost of production when resort to alternative power solutions.	30	10
Total	**300**	**100**

Source: Field Survey, 2024

Table 6 indicates the magnitude of effects of power outages on SMEs operating in Makurdi local government of Benue State. 60% of the respondents indicated that power outage affected their production lines, resulting into loss of production time, missing deadlines and decreased output, while 13% affirmed that power outage and voltage fluctuations damaged their machinery and equipment, leading to additional expenses on the business. However, 17% of the respondents were of the view that frequent power outage damages products due to power interruptions which affect refrigerators, computers and other processing equipment. 10% of the respondents believed that power outage increases loss of production; therefore, they resort to alternative sources of power to maintain customer relationships and to keep their businesses running.

Table 7: What strategy do you use in coping with electricity power outage in Makurdi Metropolis?

Variables	Frequency	Percentage
Use of diesel generators	100	33
Use of fuel generators	180	60
Use of solar panels	20	7
Total	**300**	**100**

Source: Field Survey, 2024.

Table 7 indicates different strategies adopted by SMEs in Makurdi metropolis of Benue State as alternative power sources. From the table, 33% of the respondents used diesel generators as alternative power source, while 60% of them used fuel generators, and 7% of used solar energy as alternative source against power outage. In this category, barber shops largely used solar energy mostly as a result of its lower units. The table demonstrates that there is no reliable or constant supply of electricity in Makurdi Metropolis of Benue State, since most SMEs resort to alternative power sources.

Table 8: On average, how much do you spend in a month maintaining alternative power source?

Variables	Frequency	Percentage
N10,000-N20,000	70	23
N30,000-N80,000	180	60
N100,000- above	50	17
Total	**300**	**100**

Source: Field Survey, 2024.

Table 8 indicates costs of maintaining alternative power sources in the absence of public electricity supply from PHCN. The data reveal that 23% of the SMEs spent between

₦10,000 and ₦20,000 on maintaining alternative power sources, particularly among SMEs. In contrast, 60% of the respondents reported spending between ₦30,000 and ₦80,000 on maintaining their mini generators, which served as their primary backup during power outages. In addition, 17% of the respondents indicated that they incurred maintenance costs of ₦100,000 or more for the maintenance of an alternative power source.

The financial costs of maintenance of alternative power sources such as inverter, battery replacement and regular maintenance of fuel/diesel generators are relatively high. There is no doubt, this creates additional cost of production by SMEs in Makurdi local government of Benue State.

Testing of Hypothesis

Table 9: Chi-square analysis on the impact of irregular electricity supply on the productive performance of SMEs in Makurdi Metropolis.

Variables	N	DF	LS	Critical x^2 Value	Calc X^2 Value	Decision
Impact of irregular electricity supply on the productive performance of SMEs in Makurdi Metropolis	300	5	0.05	11.070	14.478	Rejected

Table 9 shows that at a degree of freedom of 5 and a significance level of 0.05, the calculated Chi -Square value (14.478) exceeds the critical chi-square value (11.070). This indicates the impact of irregular electricity power supply on productive performance of SMEs in Makurdi Metropolis. Hence, the null hypothesis is rejected, and the alternate hypothesis is accepted, confirming that, irregular electricity power supply significantly affects SMEs productivity.

Hypothesis 2: The costs of alternatives power sources negatively influence the operational cost of SMEs in Makurdi Metropolis.

Table 10 Chi-square analysis for the influence costs of alternative power sources on the operational costs of SMEs in Makurdi Metropolis.

Variables	N	DF	LS	Critical x^2 Value	Calc X^2 Value	Decision
The cost of alternative power sources and the operating costs of SMEs	300	1	0.05	3.841	13.345	Accepted

Table 10 indicates that at the df of 1 and the alpha level of 0.05, the calculated X^2 value of 13.345 is greater than the table X^2 value of 3.841. This shows that the costs of alternative power sources negatively influenced the operational cost of SMEs in Makurdi Metropolis. Therefore, the alternate hypothesis was accepted and null hypothesis rejected.

Discussion of the Findings

The discussion section is aimed at clarifying the implications of the findings derived from the research on the influence of the Power Holding Company of Nigeria (PHCN). The impact of irregular electricity supply on the productive performance of SMEs in Makurdi Metropolis. This analysis explains how the unavailability, unreliability, irregular supply of electricity, power outages, and alternative power supply affect the operational efficacy, financial sustainability, and overall performance of SMEs in Makurdi Metropolis.

First, the study findings revealed that there are constant power outages in Makurdi local government of Benue State, the period revealed in the study. The study findings shows that this has negative impact on the production process of SMEs, resulting into loss of production, damage to equipment, and above all increased cost of production as displayed in table 6. The research findings conform with the work of Moyo (2012), which revealed that electricity outages affect firm production capacity in Nigeria in the manufacturing sector, and the study also confirms with the Resources-Based View theory that rare resources determine the significant image of a firm and its production strength.

Secondly, the study findings show that the costs of alternative power sources negatively influence the financial operations of SMEs in Makurdi the Benue State capital. This is as a result of solving the challenge posed by power outages, it led to additional spending on SMEs with negative influence on the finances of SMEs. This cuts across geographical locations in Benue State, which underscores the relationship between PHCN and SMEs in Makurdi local government of Benue State. Power outage prompts SMEs to resort into alternative source of electricity supply which furthermore imposes financial constraints on SMEs as extra cost of maintaining the alternative sources of electricity per month, this affects the profit generated by SMEs.

The study also aligned with Bankole et al. (2023) whose findings indicated that alternative power source creates additional cost on SMEs production. This demonstrates a strong negative correlation with the profitability of SMEs. The research finding is also linked to the study theory (RBV) where valuable resources are considered essential resources to determine and project the production image of firm (SMEs) to the market. Such resources increase the credibility of the SMEs where different methods are employed by the SMEs to determine valuable resources.

Summary

This study assessed the impact of irregular electricity supply on the performance of small and medium enterprises in (SMEs) in Makurdi metropolis: The Implications of alternative energy source. The study was conducted based on two objectives. To what extent does regular power outages affect the performance of SMEs operations in Makurdi Metropolis and what are the financial implications of alternative power sources on SMEs in Makurdi Metropolis.

A survey design was adopted, and a mixed method of data collection was also use. The study findings indicated that there is irregular electricity supply in Makurdi Metropolis as such frequent power outages negatively impacted on the productivity of SMEs, leading to production deficiency where unreliable electricity supply triggers SMEs of profits in Makurdi metropolis. To solve the power outage challenge, SMEs resulted by investing into alternative power source. Going by this, the costs associated with the maintenance of alternative power as solutions such as inverters, battery replacements, and routine servicing of fuel/diesel generators not only increase operational costs but also erode profit margins. Over time, these additional costs hinder reinvestment by slowing down profit generation which hinders business expansion and compromise the long-term sustainability of SMEs in Makurdi Metropolis in Benue State.

Conclusion

In conclusion, the study captured the multifaceted impact of irregular electricity supply on the performance of small and medium enterprises in (SMEs) in Makurdi metropolis. Irregular electricity power supply significantly increase expenditures of SMEs,

since they resort to alternative power sources, such as generators and inverters, thereby escalating operational costs. This imposes financial strain that hampers competition among SMEs in Makurdi local government area of Benue State. irregular electricity supply reduces profit margins and stunts business expansion. The low performance and growth of SMEs in Makurdi Metropolis of Benue State have been tied to inconsistent and unaffordable electricity supply.

Recommendations

Based on the findings in the study, is recommended that:

1. The relevant electricity agencies should upgrade and maintain electricity infrastructure. This include electricity power distribution agencies and government authorities. They should prioritize the modernisation and maintenance of transmission and distribution networks in Makurdi Metropolis to reduce the weight of power outages on SMEs, this will strengthen existing infrastructure and improve electricity reliability that will lessen the operational burden on SMEs.
2. There should be affordable support that will sustain alternative energy as a solution. The relevant electricity and government authority should enact a policy intervention that will encourage the adoption of cost-effective and environmental sustainability for alternative energy sources, such as solar mini-grids and hybrid systems. This can be achieved through tax incentives, subsidies, and access to concessional financing tailored specifically for SMEs.
3. There should introduction of different electricity tariff schemes for SMEs. Relevant agencies in in the power and government should create a regulatory authority that will implement different electricity tariffs for small and medium enterprises. A good subsidy tariff structure will reduce the disproportionate energy cost burden on SMEs face due to frequent reliance on costly alternative sources.
4. Government should establish energy support and resilience funds. The government, private sector, and development partners should collaborate to establish an energy resilience fund for SMEs. Such a fund could provide grants or low-interest loans for energy efficiency upgrades and the deployment of reliable power backup systems.
5. Relevant authorities should promote public private partnerships (PPPs) in power delivery. To enhance power reliability, stakeholders should foster PPPs that attract private investments in decentralising energy infrastructure within Makurdi Metropolis. This would diversify power sources, reduce dependence on a single grid system, and bolster enterprise performance.

References

Abotsi, A. (2016). Power outages and production efficiency of firms in Africa. International of energy economics policy, 6(1), 98-104.

Achimugu, H., Abdullahi, A., and Yakubu, S. A. (2020). Power sector reform and service delivery by Abuja electricity distribution company in Nigeria. KIU Interdisciplinary *Journal of humanities and Social Sciences,* 1(1),60-80.

Adamu, Muhammed, Y., Hassan and Musa, S. (2020). Effect of erratic power supply on the performance of small and medium enterprises (SMES) in Sokoto Metropolis Sospoly. *Journal of Engineering, Entrepreneurship & Environmental Studies,* 3(2),1-15 ISSN: 2536-7183.

Adewuyi, A., and Emmanuel, Z. (2018). Electricity outages and firm performance across the six geo-political zones in Nigeria: *The Role of Corruption. Munich Personal RePEcArchive.* https://mpra.ub.unimuenchen.de/92091/MPRA paper No. 92091.

Adenikinju, O. S. (2015). Analysis of the cost of infrastructure failure in a developing economy: The case of electricity sector in Nigeria, AERC Research paper 148; Kenya.

Afukonyo, S. D. (2023). The impact of inadequate power supply on small and medium scale Enterprises: A Case study of Takum Local Government Area of Taraba State. Sapientia Foundation, *Journal of Education, Sciences and Gender Studies (SFJESGS)* 5(2), 273-298.

Akinyele, S. T., Akinyele, F. E., and Ajagunna, O. D. (2016). Infrastructural development as predictor to SMEs performance in Nigeria. *Kuwait chapter of Arabian Journal of business and Management Review,* 6(3), 40-53.

Alo, E. A., and Adeyemo, T. T. (2021). Distorted electricity supply and the profitability of small and medium scale enterprises: A Survey of selected inhabitants in Southwest Nigerian States. *Journal of Economic and Allied Research,* 6(1), 190-200.

Arowolo, W. and Perez, Y. (2020). Market reform in the Nigeria power sector: A review of the issues and potential solutions market reform in the Nigeria power sector: a review of the issues and potential solutions, Energy Policy, doi:10.1016/j.enpol.2020.111580i.

Brandon-Jones, E., Brian, Chad, W., Autry, and Kenneth, J, P. (2014). A Contingent Resource Based Perspective of Supply Chain Resilience and Robustness, *Journal of supply Chain Management,* https://doi.org/10.1111/jscm.12050.

Chinweuba, E. T., and Sunday, C. O. (2015). Quantitative analysis of the impact of small and medium scale enterprises on the growth of Nigerian economy: (1993-2011). *International Journal of Development and Emerging Economics,* 3(1),26-38.

Claudiu, C., Ion, P., Corina, M., and Simona, C. S. (2014). Determinants of SMEs' performance: evidence from European countries; *Economic research – Econmska Istrazivinja.* 32(1),1602-1620. https://doi.org/10.1080/1331677.

Doe, A., and Asamoah, F. (2014). The effect of electric power fluctuations on the profitability and competitiveness of SMEs: A study of SMEs within the Accra Business District of Ghana, *Journal of competitiveness,* 6(3),32-48.

Duru, I. and Yusuf, A. (2017). Effect of electricity services on microenterprise: Evidence from Ganaja Village, Kogi State, Nigeria. *Asian Research Journal of Arts & Social Sciences,* 4(4),1-11.

Eklund, C. M. (2020). Why do some smes become high-growth firms? The role of employee competences, *Journal of Intellectual Capital,* 21(5),691-707, https://doi.org/10.1108/JIC- 07-2019-0188.

EPSRA, (2015). Overview of the Nigeria Power Sector Reform. The Implementation of the Road Map for Power Sector Reform of August 2010.

Gbenga, B. (2014). Introduction to Productivity Improvement Strategies. Methodologies Techniques and Tools.

Greenwood, J., Seshadri, A., and Yorukoglu, M. (2005). Engines of liberation. *Ther review of economic studies,* 72(1), 108-133.

IEA, (2019). African Energy Outlook; https://www.iea.org/reporst/africa-energy-outlook-2019.

Iweama, V. O., Iweke, A. N., Alfa, H. (2018). Impact of deficient Electricity Supply to Small and Medium Scale Enterprises in Kano-Nigeria; *Advances Journal Management,* 17(2), 1-30. ISSN (0795-6967) www.researchgate.net.

Kehinde, S., Bankole, O. A., Busola, S. and Kehinde, K. (2024). Impact of government policies on the growth of SMEs in the Nigerian economy, *Journal of Management Information and Decision Sciences,* 27(3),1-11.

Kehinde, O., Babaremu, K. O., Akpanyung, K. V., Remilekun, E., Oyedele, S. T and Oluwafemi, J. (2018). Renewable energy in Nigeria-a review, *International Journal of Mechanical Engineering and Technology,* 9(10), 1085-1094.

Kehinde, O. J., Abiodun, A. J., Adegbuyi, O. A., Oladimeji, and Temitayo, E. (2016). Small and medium scale enterprises: Pivotal to sustainable economic development: The Nigerian experience. *International Journal of Current Research,* ISSN 0975-833X.

Leo, D. S., and Sanusi, S. T. (2019). Impact of small and medium enterprises on Nigerian economic development: An empirical analysis, *Lapai International Journal of Administration LIJAD,* 12 (6), 23-45.

Nigerian Electricity Regulatory Commission (NERC). (2024). *Annual Report.* Retrieved from https://nerc.gov.ng.

Nuredeen, Y., Nafiu, A. and Jibo, A. (2018). An investigation of electricity power fluctuations and performance of small and medium enterprises in Dekina, Kogi State. *Journal of Energy Research and Reviews,* 1(3), 1-10.

Moyo, B. (2012). Do power cuts affect productivity? A case study of Nigerian manufacturing firms, *International Business & Economics Research Journal,* 11(10),23-32.

Olatunji, O. (2019). Electricity insecurity and the performance of small -scale businesses in Akoko area of Ondo State, Nigeria. *International Journal of business and social science,* 10(7),158-167.

Prasanna, R., Jayasundara, J., Naradda, Gamage, S. K., Ekanayake, E., Rajapakshe, P., and Abeyrathne, G. (2019). Sustainability of SMEs in competition: A systemic review on technologic challenges and SMEs performance, *Journal of Open Innovation: Technology, Market, and Complexity,* 5(4), 100-120. Doi.org/10.3390/joitmc5040100.

Sa'Aondo, S. A (2026). *Privatisation of power holding company of Nigeria (PHCN) and performance of small and medium enterprises (SMES) in Nasarawa state, 2015-2024*. [Unpublished doctoral dissertation], Federal university, Lafia Nasarawa state.

Tahir, F. A., and Inuwa, F. U. (2001). Empirical investigation of the factors affecting micro, small and medium scale enterprises performance in Borno State, Nigeria. *International Business Research;* 12(4),1-36.

Utami, H., and Alamanos, E. (2023). *Resource – based theory: A review.* In S. Papagiannidis (Ed), theory hub book. Available at https://open.ncl.ac.uk/ISBN: ISBN:9781739604400.

Umar, A. A. (2020). The effect of privatisation on organizational performance of Abuja electricity distribution company. *International Journal of Management Research and Review*, 10(21),1- 10.

Uche, M. (2018). Nigeria: Small and Medium Scale Enterprises in Nigeria – An overview of initial Set Up: *Maomdaq*

Victor, U. I, Bridget, N. M., and Mlumun, Q. I (2023). Impact of SMEs on employment creation in Makurdi metropolis of Benue State. *International Journal of Economics & Management Science.* 12(3), 1-7. Doi: 10.37421/2162-2023.12.684.

Yucesoy, B., and Barabasi, A. L. (2016). Untangling performance from success. EPJ data science. 5(1), 17.