

Understanding SOE responses to the energy crisis in Nigeria and South Africa** Thabang R. Motswaledi ^{(a)*}  Sysman Motloun ^(b)**^(a) School of Government Studies, Department of Political Studies and International Relations, North-West University, South Africa.^(b) PhD, School of Government Studies, Department of Political Studies and International Relations, North-West University, South Africa.**ARTICLE INFO****Article history:**

Received 19 June 2024

Received in rev. form 28 August 2024

Accepted 22 September 2024

Keywords:Energy crisis, Eskom, NESCO,
Responses and SOE's**JEL Classification:**

Q48, H54, Q41

ABSTRACT

This aim of this paper is to present an understanding State-Owned Entities (SOE's) responses to the energy crisis in Nigeria and South Africa. The energy crisis in both Nigeria and South Africa has posed significant challenges, with both countries experiencing severe power shortages that have impacted economic growth and the quality of life. State-Owned Enterprises (SOEs) in the energy sector, such as Nigeria's NESCO and South Africa's Eskom, have traditionally been central to efforts of ensuring energy security. The paper therefore through a qualitative method of research, attempts to reveal the responses of the SOE's in these states to address the energy crisis. Hence, it concludes that South Africa responded by unbundling Eskom and Nigeria privatising the energy sector. But these mechanisms are yet to solve the energy crisis.

© 2024 by the authors. Licensee Bussecon International, Istanbul, Turkey. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 International license (CC BY) (<http://creativecommons.org/licenses/by/4.0/>).

Introduction

The concept of corruption relates to the violation of formal administrative rules, introduction and implementation of laws that enrich office bearers while disregarding public welfare (Kurer, 2005). Corruption relates to the violation of administrative rules when the expected end is to ensure private gain for self, close friends, family, and so forth (Liu, 2016). And the overall consequence of corruption is a disrupted social system and public order (Kurer, 2005). It leads to social inequalities where those who derive benefits from unfair exchange and allocation of public resources get to enjoy a better quality of life while the marginalized are poorer (Liu, 2016).

“Political interference is as much about doing the right thing as it is about serving one’s own narrow interests. It is about getting around a system to help constituents and country; it is about acting to good form and meeting other people’s expectations; it is about survival: and it is about ambition, power, and personal advance” (Hodder, 2009:778 quoted in Batalla et al., 2018:268).

The above excerpt proves that corruption and political interference have resonance and are mutually interdependent. Political interference is about the interface between the political sphere and bureaucracy in public governance (Batalla et al., 2018; de Visser, 2010). Hence the subversion of administrative rules and introduction of unfair laws are at the core of corruption. The above quotation from Hodder captures the core of what political interference is about. That is, illegitimate, illegal actions by politicians or interest groups to influence government processes and programs. This is where a politician could tell public officials what actions to take, contracts to allocate to whom (Goldman, Rocholl, & So., 2007). Or organizations getting government contracts because former government officials sit on their boards (Lu & Wang, 2022). The aspect of politicians telling officials what decisions to make is also referred to as executive discretion. Even when such instructions violate formal rules, standards, and practices of the government. Batalla et al. (2018) noted that the idea of executive discretion [what others may understand better a prerogative] encourages political interference. Prevost (2019) makes it clear how executive discretion operates in cases where political and bureaucratic executives [ministers, mayors, directors, and managers] overturn or delay decisions of state agencies. And it is often state agencies’ decisions based on the best judgement or best practices in response to real life events.

Mngomezulu (2020) argued that such political interference leads to the suppression of decisions of state agencies and to executives determining the appointment of people who are not suited [incapacitated, unskilled, without merit] to occupy public office. Instead,

* Corresponding author. ORCID ID: 0000-0002-3484-1815

people who are loyal and with long service to the dominant political party and its factions get to occupy strategic positions in government organizations. These are people who also favor the governing party, allocating public resources and projecting to their strongholds, in addition to frustrating or ignoring efforts to prosecute the misappropriation of public finances (Mngomezulu, 2020). This political dominance is what de Visser (2010) calls operating state agencies by remote control. And agents who resist such control eventually create mistrust and alienation between themselves and their principals (de Visser, 2010). Hence political appointments are the norm in state agencies where the executives get changed with each change of political administration or once the agents begin to disagree with the principals on strategic decision options (Casey, 2021; Kruuse, Lewis, & Douglas, 2006; Pfifner, 1987). Whereas the popular view is that political interference led to inefficiencies, Willner (2001) argued that it could yield favorable output and employment when channeled properly.

A state-owned enterprise (SOE) is a business entity under the government's control or in which it has majority ownership (Fourie, 2014; Lin et al., 2020). In this regard, the study focused on SOEs responsible for electricity production and supply in Nigeria, i.e., the Nigerian Electricity Supply Corporation (NESCO) and Electricity Supply Commission of South Africa (Eskom) in South Africa. An energy crisis refers to the inability to meet high electricity consumption and poverty demands due to limited production, soaring prices, and regular electricity supply interruptions in society (Pimentel et al., 1973). Another view treats energy as a finite resource where unregulated consumption may lead to the depletion of energy sources; a world without energy would result in a crisis. Therefore, the energy crisis could refer to societal issues, particularly those concerning powering industries and households (Bartlett, 1978; Qureshi et al., 2016). An energy crisis, as the focus of this study, refers to SOEs' insufficient electricity production and supply.

The study compared two large African economies, South Africa, and Nigeria. This comparison depicts the energy challenges that each country is confronting, and the responses implemented to alleviate them. Furthermore, the study describes the most challenging factors hindering SOEs' growth and efficient energy supply strategies. The study also builds a case for the role of SOEs in ensuring security of supply in the energy sector. Although there is existing scholarly literature on South Africa and Nigeria's energy sectors (Chanchangi, Adu, Ghosh, Sundaram, & Mallick, 2023; Ibrahim, Hamam, Alayli, Jamiru, Sadiku, Kupolati, Ndambuki, & Eze, 2021; Andrews & Nwapi, 2018; Ayamolowo, Manditereza, & Kusakana, 2022). There is little focus on how SOEs respond or should respond to the energy crisis. Little scholarly attention has been afforded to a comparative analysis between South Africa and Nigeria regarding SOEs' response to the energy crisis. Hence, this study focused on the role and ability of SOEs in South Africa and Nigeria to supply energy in a manner that drives positive economic growth. Furthermore, this depicts the importance of energy demand meeting supply to ensure sustainable growth in the economy and energy sector. Similarly, comparing South Africa and Nigeria gives a view of developing and underdeveloped countries, which is significant as it demonstrates the importance of energy reform, energy provision, and sustainable response to the energy crisis.

Literature Review

These electricity production and supply challenges range from economic growth to lack of technological development and social enhancement, limiting Africa's potential to generate sufficient and sustainable energy (Wolhuter, 2019). The energy crisis causes countries like South Africa and Nigeria to suffer from low economic growth (Patel, 2008). South Africa and Nigeria, being the economic superpowers in Africa, should be leading and taking centre stage in energy development in the continent (Eberhard, 2008b). South Africa and Nigeria, like other countries, are also seeking to attain a stable energy supply from SOEs. Uganda is the most stable in energy production and supply on the African continent compared to other countries (African Development Bank, 2021). Although Uganda does not have the same population number as South Africa and Nigeria, it efficiently serves electricity to its consumers. The measure of energy supply stability is guided by the load shedding/reduction cycles or power outages implemented by the government. Uganda is not a leading country in terms of its economy compared to Nigeria and South Africa, but it is the most stable regarding energy supply in Africa. The African Development Bank (2021) notes that political interference in the appointment of SOE board members contributes to the instability of the energy supply in most African countries because, at times, board members may not be aware of what they are supposed to do in the entity or deliberately crumple it due to personal ambitions that brew corruption.

The SOEs should be leading organisations in the fight against underdevelopment and promote the economic advantage of their countries by ensuring a stable energy supply (Hopkins, 2012). The failure of SOEs to ensure a stable energy supply for years has led to South Africa and Nigeria suffering and underperforming in their economic development. Hence the urgent need to respond to the energy crisis. Scholars such as Emovon et al. (2018), Eberhard (2008b), Pretorius et al. (2015), and Festus and Ogoegbunam (2015) allude to the energy crisis in South Africa and Nigeria. They argue that lack of electricity has a negative economic impact and forces people to use more wood and other toxic resources, leading to environmental degradation. Due to power cuts, the industries perform periodically and at minimal capacity, causing low production levels.

Furthermore, harvesting wood kills wildlife, compromises wildlife habitats, and contributes to increased carbon emissions due to burning, further exacerbating global warming. Eberhard (2004) and Daw and Gibbs (2017) document that fossil fuel production includes adopting coal and gas production to procure electricity at a large scale, which becomes dangerous to the environment. Although it is challenging to calculate fully the costs of load shedding on the economy, Mahlaka (2021) notes that South Africa loses R700 million per load shedding stage per day and R60 billion to R120 billion annually. Load shedding cost the South African economy R50 billion in 2008 (NERSA, 2008). Similarly, Udegbonam (2021) notes that Nigeria loses US\$29 billion annually due to

poor energy supply. Ateba et al. (2019) allude that the persistent power cuts in Nigeria and South Africa pressure businesses to run at a bare minimum capacity, if at all. This significantly inconveniences business owners and their employees because several companies face closure or retrenching due to low production (Ivwurie and Ocholla, 2016). Businesses also lose profits from purchasing from alternative electricity sources or private electrical supply entities (Isa, 2019).

Figure 1 below shows South Africa's electricity production and supply over ten years (2010 to 2019). South Africa's energy production for the mentioned (2010 to 2019) past ten years has been unstable, reaching the highest production level of 23,100 GWh in 2012 and the lowest level of 19,300 GWh in 2019. Furthermore, what is also significant in the case of South Africa is that electricity production has been declining over the past months. Electricity production in South Africa reached 20,098 GWh in April 2021, compared with 20,466 GWh in the previous month, which shows a constant decline in those months. Since the establishment of Eskom in South Africa, electricity has assisted it in being fully industrialised and increasing economic production (CEIC Data, 2021a).

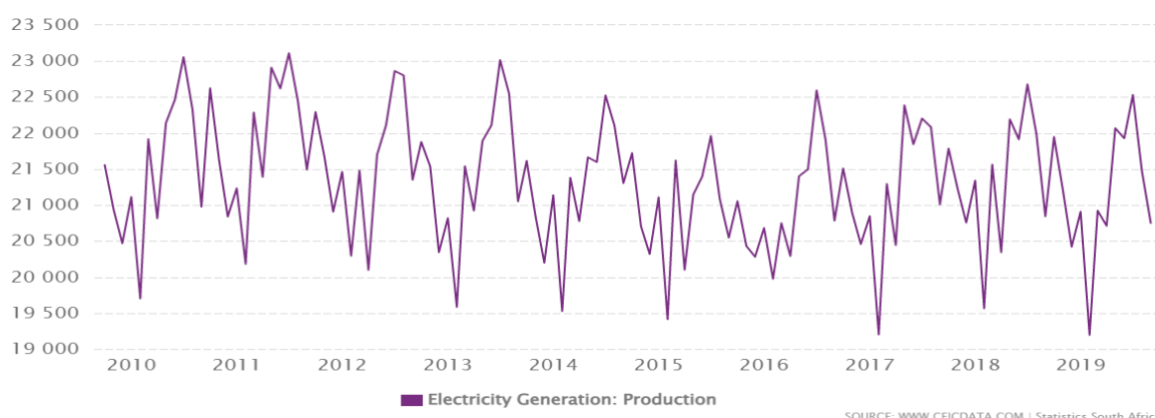


Figure 1: Electricity generation in South Africa (www.ceicdata.com)

Figure 2 below shows Nigeria's electricity generation and supply over ten years (2010 to 2019). The Nigerian trends show much instability in energy production. Like South Africa, Nigeria also saw a steady decline. The electricity production in Nigeria reached 8,089 GWh in December 2020, compared with 9,436 GWh in the previous quarter, vividly showing the constant decline in Nigeria's electricity production. As a developing country, Nigeria relies heavily on electricity for business operations and economic growth. Therefore, rolling blackouts and load shedding inhibit its economy's potential growth (CEIC Data, 2021b).

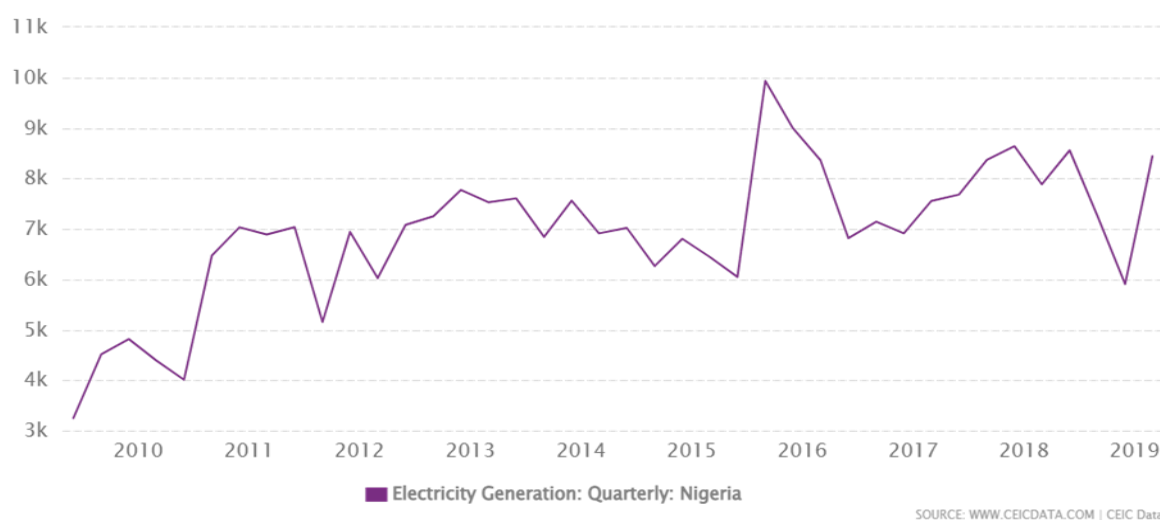


Figure 2: Electricity generation and supply in Nigeria (www.ceicdata.com)

The driver of the energy crisis in Nigeria and South Africa can be attributed to challenges such as political intervention, deterioration, and lack of infrastructure (Gift et al., 2020). Nepal and Paija (2019) further assert that the lack of technological development or enhancement hinders strategies for producing power. Political intervention has been one of the significant obstacles to development across the globe, either in developed or underdeveloped countries (Masike and Vermeulen, 2022). Political intervention can be understood as the ability of political elites to interfere with the day-to-day running of organisations such that they hijack their operations and dictate the organisation's mandate. The lack of infrastructural development worldwide has been associated with industrialisation and economic growth. Hence, economic development in most African countries is associated with low infrastructural

development (Tartibu and Kabengele, 2018). Similarly, Edomah (2018) notes that the slow development of the continent also inhibits the growth of technology, leaving no reliable technological alternatives to produce electricity.

The concept of response can be an action or inaction that an institution or person does to react to a specific situation. The study adopted a response as a concept to understand what SOEs have done to address the energy crisis in South Africa and Nigeria. Although the study recognised that to deal with constraints on the power grid, utilities typically resort to load shedding, reduction, and power cuts, it took the view that these responses are consequences or rather indicators of the energy crisis (Eberhard, 2008b; Festus and Ogoegbunam, 2015). In South Africa, the government has developed measures to allow independent power producers (IPPs) to produce about 100 MW (megawatts) of power. This will ease the pressure on Eskom and allow the utility to function without experiencing a crisis, leading to fewer power cuts. In addition, the state has also sought to invest in nuclear energy to produce power and limit future power cuts (Pretorius et al., 2015).

Similarly, the sector has also made means of renewable energy by investing in technology that allows renewable energy production, such as solar, steam and wind energy production, instead of burning fossil fuels. Yetano et al. (2020) note that besides investing in renewable energy, Nigeria has developed a five-year electricity plan, prioritising combating the energy crisis and aiming to increase energy access by 45% by 2030. In this regard, the government has emphasised the need to build more gas and solar power plants by 2030. The Nigerian government also plans to understand the energy demand by profiling customers' demands to forecast and avoid future energy crises (Emovon et al., 2018). Of late, the government has also adopted a metering policy to regulate customers who buy power so that those who do not can be cut off from the grid (Iwayemi, 2008). This ensures that the government can preserve energy for the paying customers to ensure growth and energy reserves and assist in the energy crisis.

Theoretical Framework: Agency Theory

The agency theory is concerned with depicting and explaining the relationships between the principal (owner/shareholder) and agent (CEOs/managers) in SOEs (Mitnick, 1975; Eisenhardt, 1989). In addition, Eisenhardt (1989) further asserts that the principal relies on the manager to implement prudent financial measures and execute decisions that sustain corporations. Hence, Mitnick (1975) notes that conflict of interest threatens SOEs and the harmony of the relationships between the principal and the manager. The agency theory justifies the relevance of SOEs in economic activity and energy security because there is no economic development without energy availability (Panda and Leepsa, 2017). Public ownership is a fundamental principle that shapes contestations about SOEs and their competitive nature (Tao and Zhu, 2001; Stan and Bruton, 2013). Public ownership is essential when SOEs consider the pay-as-you-use principle versus the political preference for free services and excuses for poverty and unaffordability. This affects SOEs' ability to perform effectively and efficiently discharge their duties. Therefore, agency theory is suitable and applicable to analyse the claims of sabotage to power plants, overdue construction projects of power plants leading to rolling load shedding, and the contestations against unbundling Eskom as an organisation. Furthermore, managers play a significant role in ensuring stability and provision in solving the energy crisis and responding to issues created by energy poverty.

Mitnick (1975) and Eisenhardt (1989) agree "that managers in a corporation may follow a personal agenda instead of working on behalf of and for the interest of the principals (the state) who own the company". Ding et al. (2015) add that these personal interests include the need to enrich oneself and friends with business opportunities from the corporation. Meanwhile, the government appoints SOE managers, and in most cases, these appointments are based on political affiliation rather than merit (Sun et al., 2002). Hence, the owner and the principal agent are often from the same political party. For instance, in South Africa, the minister of enterprises is a member of the African National Congress (ANC), the current ruling political party. Therefore, most of those who will serve on the SOE board will be members of the same political party or be intricately connected with its leaders. This appointment is based on political friendship (Masungwini, 2021) and political principles protecting agents deployed to SOE leadership despite the poor performance of those organisations because of this. Sun et al. (2002) found that agents prefer personal gains over organisational successes. In a way, the dominant interests are of the agent, not that of the principal (the state), and self-enrichment supersedes public good and service.

Similarly, in Nigeria, Governor El-Rufai removed several political appointees from office (Maishanu and Agency Report, 2021) to reduce corruption, improve public service, and protect the mandate of SOEs. Therefore, the agency theory depicts how personal ambitions lead to the demise of SOEs and limit the capacity of states to supply energy and respond to the crisis. Lastly, applying the theory to the study made evident the relationship between the principal/owner and the agent and its impact on SOE responses to the energy crisis.

The theoretical argument informing this study was that SOEs in Nigeria and South Africa do not have long-term solutions to the energy crisis due to the lack of leadership capacity to overcome socioeconomic barriers in the energy sector. South Africa and Nigeria are facing an energy crisis, and the SOEs responsible for power production are under immense pressure to ensure adequate energy supply. Selfish management with personal ambitions and corruption is why SOEs in Nigeria and South Africa fail to achieve their power supply mandate (Pretorius et al., 2015; Festus and Ogoegbunam, 2015). Not only that, but the failure to introduce new energy sources to make the power grid capacity sufficient is also a dominating factor in both countries (Emovon et al., 2018; Eberhard, 2008b). For comparison, first-world countries such as the United States of America and China have resorted to sustainable energy.

Therefore, the solutions to the energy crisis that the government should implement include focusing on sustainable ways to produce energy and adopting a policy of meritocracy when appointing executive members to serve on SOE boards.

Research and Methodology

Research approach and design

The research followed a qualitative method for in-depth analysis of the energy crisis in Nigeria and South Africa (Bhandari, 2020). Qualitative research helps understand experiences, attitudes, and opinions that can improve the efficiency of SOEs in the global environment of energy transition (Pathak et al., 2013). The study employed a case study design focusing on South Africa and Nigeria's energy sector SOEs. Baxter and Jack (2008) note that a case study design approach ensures the study focuses on its context. Furthermore, Crowe et al. (2011) note that a case study research design generates a rich, in-depth understanding of a complex issue to bring it into a tangible everyday life context. Therefore, a case study design helped validate the principal-agent relationship, explain what prevents SOEs from ensuring energy sustainability, and describe the impact of the energy crisis in Nigeria and South Africa. Moreover, this type of research design was suited to a study of two or more phenomena, such as this one with Eskom and NESCO, to understand the complexities of each better (Zainal, 2007). Zainal (2007) argues that a case study design is beneficial when there is a need for an in-depth understanding of a phenomenon.

Empirical research methods

The study used document reviews as the primary data source to explain SOEs' responses to the energy crisis in Nigeria and South Africa. Clarke (2020) refers to document review as a research technique that relies on various texts and sources the researcher replicates to create new and better content, ideas, or theories. This process systematically provides rich insights into the comparative analysis of South Africa and Nigeria with specific reference to the SOEs and energy crises. This study dealt with qualitative and non-numerical material, which helped provide a narrative and in-depth understanding of principal-agent relations in SOEs. These materials are available from the North-West University library repository, Google Scholar, LibGenesis, Science Direct, the NERSA website, Eskom's website, and the NESCO website, allowing for a reliable comparative analysis of the response of SOEs in South Africa and Nigeria regarding the energy crisis.

Descriptive content analysis of the energy crisis in South Africa and Nigeria, including the responses by SOEs in their respective countries, will assist in generating solutions. A descriptive analysis focuses on the characteristics of phenomena (Nassaji, 2015; Grbich, 2012). Hence, this study focused on a) the characteristics of the energy crisis, b) the SOEs' roles in energy security and their impact on economic growth, and c) the nature of the agents/interests in the energy sector.

Population and choice of study material

The purposive sampling of SOEs responsible for power generation in Nigeria and South Africa guided this research (Suen et al., 2014). Selecting South Africa and Nigeria, being significant economies in Africa, helped to understand the energy crisis and its impact on economic development, hence their selection for the case study. A purposeful sampling of case studies (SOEs responsible for energy supply in Nigeria and South Africa) was used due to its strength in identifying and selecting information-rich literature on comparative analysis of Nigeria and South Africa. A document review process also does not present ethical concerns as it relies on public documents and reports.

Findings and Discussions

South Africa and Nigeria are among the fastest economically developing countries in the world and depict a reasonable growth rate (Ayadi and Ayadi, 2008). To maintain growth, they depend on the contribution of citizens and entities in sectors that are most important to economic growth, such as the energy sector. Despite being one of Africa's foremost and fastest-growing economies, South Africa has failed to be a leading energy producer (Ayadi and Ayadi, 2008; Ndako, 2010). Similarly, Nigeria has abundant oil and natural resources; energy should be one of their last crisis issues. Eskom and NESCO are the two public utility grids supplying power in their respective countries (Babatunde and Shuaibu, 2009). Established in 1923, Eskom is the sole power generating and supply agent in South Africa (Woode-Smith, 2019; Murphy, 2011) and is one of the largest power producers within the Southern African region. Eskom compares with other large global entities worldwide, such as EnergyAustralia Investments (Pty) Ltd and State Grid Corporation of China (Watt & Passey, 2011; Yi-chong, 2018). Moreover, it compares with the abovementioned corporations by producing the biggest turnouts in sales and power generation capacity (Eberhard, 2008a). However, the recent Eskom reports and the dominance of load shedding in South Africa have shown that Eskom is falling short and cannot fully discharge its mandate. This has led to the power utility moving from the highest sales producer and highest power-producing entity to just producing under the bare minimum, much to investors' unhappiness (Trollip et al., 2014). Investors concluded that South Africa is under a power supply crisis, and load shedding leads to financial losses for corporations (Goldberg, 2015; Pretorius et al., 2015). Therefore, Eskom does not only affect the social lives of South Africans, but it further affects economic stability. The failure of the power utility has tremendous effects on the energy crisis (Nowakowska and Tubis, 2015). Although there is vast scholarly attention on the energy crisis of South Africa from scholars such as Trollip et al., (2014) and Pretorius et al. (2015), this attention is exclusive to the comparison between South Africa and Nigeria.

NESCO was founded in 1929 as Nigeria's first integrated utility company (Fabiya et al., 2016). The power utility has grown over the years and established itself within the local government sphere (Mackintosh, 1965). Initially, NESCO was meant to supply power to the mines in the Benue-Plateau area of Nigeria. However, the persistence and consistency of energy supply led to growth in the capacity of the SOE (Kennedy-Darling et al., 2020). Like Eskom, NESCO, as a power utility, plays a significant role in Nigerians' economic and social emancipation (Oruwari and Otombosoba, 2021). Hence, when it is not discharging its mandate and playing its role in this regard, it contributes to the demise of the different native communities of Nigeria. Understanding that Nigeria has abundant oil, the power utility could seek other measures, such as oil consumption or utilisation, to ensure a stable power supply, but that has not been the case (Fabiya et al., 2016; Kennedy-Darling et al., 2020). To this extent, NESCO's energy supply within Nigeria is undependable and uncertain.

SOEs are an integral part of ending energy poverty. Countries such as Australia, Germany, America, and China primarily invest in SOEs to foster growth and increase capacity to provide energy (European Commission, 2016; Lo, 2021). Similarly, even African countries seek to invest in SOEs to limit the energy poverty prevailing throughout the continent. South Africa and Nigeria have invested in their respective SOEs (Eskom and NESCO) to ensure they play a role in energy production. Oluwatosin (2020) and Ting and Byrne (2020) argue that the role of these entities is to assist the government in providing energy to society adequately. In addition, they also have a role to play in assisting the government in getting more revenue, which can be redirected to other sectors of society, such as social welfare and infrastructural development. Over and above that, being established in highly divided country such as South Africa due to racial barriers, unequal opportunities and access to economic emancipation, the entity has a social and economic responsibility (Sarkodie and Adams, 2020). Ye et al. (2018) comment that the power utility provides monthly subsidies to those who cannot afford it. Hence, in South Africa, Eskom provides approximately one hundred units of energy to those in need monthly. In Nigeria, divisions are based on ethnic balances and access to economic opportunities among other factors. Like South Africa regarding establishing SOEs to ensure that they provide free electricity meters for the poor communities as a government measure to provide intervention and ensure energy justice (Dahunsi et al., 2021).

Privately-owned entities are in a quest to provide competition in energy production and supply. Amongst their role in providing competition, IPPs have taken the niche the government fails to address (Salci and Jenkins, 2018). Private entities such as City Power, Sasol, Exxaro, Acea SpA, EnergyAustralia Investments, and the State Grid Corporation of China exploit the local, continental, and international energy-producing spectrum. The gap of being unable to provide stable energy due to the power grid's inability to capacitate the nation, corruption and maladministration are reasons for this gap (Okoro and Chikuni, 2007; Giwa, 2010). IPPs then become the answer to solving the energy crisis, particularly between the haves and the have-nots, as they respond to the energy crisis by adopting measures which address the crisis. Although this may lessen the pressure on the government regarding energy provision, they will also lose a significant number of customers as many will now use privatised energy suppliers (Zeng et al., 2017).

In political studies, the agency theory focuses on the principal and agent (Tao and Zhu, 2001; Stan and Bruton, 2013). These issues arise due to supply chain management and economics, which occurs when one person makes decisions on the entity's behalf (Stan and Bruton, 2013). Furthermore, these decisions may have a tremendous negative or positive impact on the entity affiliated by the individual/principal or manager of other people or entities. Henceforth, the study deduced from the core of the agency theory that these managers, in most cases, may seek to foster their agenda as opposed to those of the organisation (Sheikh et al., 2018). Their selfish agenda may lead the cooperation or the entity to collapse due to looting, which causes maladministration and chaos in the entity (Sheikh et al., 2018). Over the years, the commonness between Eskom and NESCO has been the employment of managers appointed based on political and religious affiliation, respectively (Masungwini, 2021; Sun et al., 2002), which has led to corruption and maladministration being central to the energy crisis. Maintenance at the two power-generating giants was neglected, leading to poor energy production (Aliyu et al., 2018). In addition, corruption funds meant to expand the capacity of the entities were being looted by political elites and managers of these entities (Maishanu and Agency Report, 2021). This was made easier as many of them were friends at the social, religious, or political levels of affiliation. The negligence and selfish ambitions of the managers of Eskom and NESCO brewed the energy crisis. Infrastructural decay due to minimal maintenance and looting are among the biggest challenges that have led to the energy crisis, as depicted by the agency theory.

Responses to the energy crisis in Nigeria and South Africa vary. Through its Department of Energy, South Africa allowed the operation of independent power producers to alleviate energy poverty. Furthermore, the Department of Mineral Resources and Energy has adopted new mechanisms, such as nuclear energy production through the Koeberg nuclear power station (Sarkodie and Adams, 2018; An and Mikhaylov, 2020). This will not only strengthen the ability of South Africa to produce energy but also strengthen its relations with Russia (An and Mikhaylov, 2020). And Mikhaylov (2020) assert that the Koeberg power station was established to explore new energy means by the South African government and reduce energy supply constraints. President Ramaphosa also announced the unbundling of Eskom, which is one of the means for the entity to resolve the energy crisis (Kumar, 2019; Lawrence, 2020). This will ensure that the entity operates efficiently and allow the manager to manage it properly at fewer costs and operations. Kumar (2019) further asserts that Eskom will become a three-phased entity with generation, transmission, and distribution phases. This process is expected to be fully completed in December 2022, and the government believes this is a good attempt to resolve the energy crisis (Lawrence, 2020). However, this has not been fully implemented. On another note, this energy crisis is brought about by ghost grid users who steal energy from the power line, and Eskom consistently seeks to cut these users from the system (Shokoya and Raji, 2019). Similarly, Dahunsi et al. (2021) note that Nigeria has also tried to alleviate the energy

crisis by rolling out new meters, which assist the government in tracking electricity users. Such methods assist the government in removing those who are not paying for electricity and ensure that they are cut off from the power grid or pay as per energy prices in Nigeria (Dahunsi et al., 2021). Therefore, this will relieve the pressure on the system, hence providing for those who pay, thus solving the energy crisis (Shokoya and Raji, 2019; Dahunsi et al., 2021).

In addition, the government has adopted renewable energy methods to assist in the energy crisis (Olatunji et al., 2018; Amir and Khan, 2021). This ensures that the existing power stations do not take strain as the government would need to build new infrastructure to produce energy. What is most notable from South Africa and Nigeria is their quest to address corruption within the energy sector (Mykhalchenko and Wiegratz, 2022). However, the constant political interventions prevent these SOEs from running independently and efficiently (Olukaju, 2004). Hence, Andrews and Nwapi (2018) state that political intervention and corruption can be attributed as a contributor to the energy crisis. Hence, the response by the government to deal with corruption is one of the actions of overcoming the energy crisis. Moreover, the government is also seeking to build new infrastructure that will assist in energy production (Edomah, 2018). This will increase the power-energy sector SOEs' capacity and ability to function efficiently. Hence, the current rolling blackouts and load shedding are because the SOEs seek to maintain infrastructure and energy-generating units (Tartibu and Kabengele, 2018).

Recommendations

Infrastructure development

South Africa has depicted that one of the primary reasons why the country is suffering power cuts is because of old infrastructure (Tshidavhu and Khatleli, 2020). The government and the power utility have invested little attention in developing and maintaining sustainable measures to deal with the energy crisis. Although the power utility invested in the Medupi and Kusile power stations as long-term solutions to the energy crisis in South Africa, these are not viable for future generations (Tshidavhu and Khatleli, 2020). However, Tshidavhu and Khatleli (2020) further note that these power stations depend on producing energy through coal, which has proven to be unsustainable, hazardous and contributes to global warming. Coal is a natural resource South Africa supplies; however, multiple countries may not have this resource overall.

Similarly, Nigeria is also large regarding land area, and the government cannot reach some areas. Even with the privatisation of the energy sectors and the breaking down into eleven energy distribution entities, there is still a vast gap in the energy supply in rural areas (Dada, 2014). Furthermore, the plan to roll out new meters indicates that the old infrastructure is faulty, with several inconsistencies that can be bypassed to steal energy from the grid. Thus, the government's investments in new meters not only address electricity theft but will also assist in ensuring the delivery of reliable infrastructure that can be used for extended periods (Utazi and Obuka, 2014). Utazi and Obuka (2014) allude that the current meter system is not secure, making electricity theft easier.

In the same vein, to adequately implement measures to address the energy crisis, the government must invest in rural development and power through the distribution entities. The government can curb the vast migration from rural areas by powering these areas, which may result in energy supply constraints in urban areas. Similarly, these measures by the Nigerian government contribute to infrastructural development in rural areas and assist in curbing inequality. In addition, the local communities will also be able to get jobs from the power utility, limiting their reliance on the government for free electricity as they can afford to buy, which could also solve the crisis of energy theft. Therefore, infrastructural development is also crucial in addressing the energy crisis.

Policy changes for the security of supply

Policy changes and transformation are among the biggest challenges in addressing the energy crisis. Not only are the policies unclear in both states, but they are also not inclusive of new cooperation (between the government and private sector) that can assist the government in addressing energy poverty. Several civil society movements have also raised concerns about the policy implementation restriction within the energy sector. Furthermore, the statements made by custodians who may also be gatekeepers of the sector may also be an issue when policy inclusion or change is concerned. Hence, even political leaders such as Gwede Mantashe, a politician who is the head of the Department of Energy, threaten sectors that do not support their vision and policies (Felix, 2022; Mantashe, 2022). Felix (2022) further asserts that the minister of energy and mineral resources in South Africa has declared that he will fire anyone who does not support his nuclear energy programs.

In addition, the vast issues within the energy sectors are also due to the restrictions of the non-policy implementation phase of the projects. The Nigerian government, for instance, depends on thermal and hydropower energy production, while other measures can be explored. Policy measures such as nuclear energy enrich the energy sector of Nigeria, while South Africa also explores the wind power and hydropower mechanism to address the energy crisis. Although the government has tried to touch on these sectors to improve its energy supply system, it does not have enough capacity to invest in them.

In addition, revenue to roll out the program might also be in the private sector, where the government must rely on a public-private partnership to ensure the project's success. However, due to the enclosed policy market, the private sector may not necessarily invest in the sector as they view that it will not help anything. Thus, the government must take measures to open the market and accommodate IPPs and investors looking to assist the government in solving the energy crisis. In addition, the South African government also depended on coal for energy production for an extraordinarily long time, whereby in these years, some policies

could have been articulated to explore other sources of electricity. This would attract new energy means, and the investors would also contribute as the sector would seek to move to greener energy production. In another view, the South African government could also integrate policy through the energy and RDP policies to ensure that each household built by the government has access to solar panels, contributing to fewer communities being dependent on the national power utility.

Not only will such a policy relieve the constraint of the power utility in terms of supply, but it will also assist society in ensuring the success of greener energy production. Since the local government is more at a ground roots level and is concerned with service delivery, this will also enable the management and distribution of elections through this level of government. Moreover, according to the energy transition report, various municipalities across the county are indebted to Eskom, totalling R356,852 billion in 2021 (Hermanus, Scholtz and Kritzinger, 2022). This sphere of government (local government) is given the responsibility of societal needs, and they are better equipped as they are at the local level, so delivering services would be easier.

Furthermore, Hermanus et al. (2022) mention the importance of allowing more energy production from IPPs, which will assist the private sector instead of the state to relieve the pressure. Similarly, big corporations that use vast amounts of energy can also be allowed to produce their own power. Industries such as the mining sector can be encouraged to build small plants to ensure their sector's power. Then, the government will only monitor in terms of tariffs being paid by these industries, either when sourced from an IPP or their own they can be regulated by the state. This will ensure licensing exemptions for private energy generation up to 100 MW gain momentum as broad liberalisation of the energy sector will now be open to the private sector. Thus, such initiatives will also open the market for more jobs from the private sector, allowing the government to monitor their electricity production mechanism and ensure they pay tariffs or taxes.

For Nigeria, the government must first maintain the policy and eliminate outdated or dilapidated equipment and buildings (Abdullahi et al., 2022). They must develop a policy that ensures merit in hiring staff members and stops employment based on religion, politics, or favouritism. Similarly, Abdullahi et al., (2022) further argues that staff must be given proper training and equipment to work safely. In addition, the government's policies should understand and input scientific research such that measures to address the crisis are not politically motivated and in vain. Hence, the government can source funding for resolving the energy crisis by addressing these policy-related challenges.

Securing funding for the security of supply

One of the essential elements of energy security is to secure funding for maintenance and electricity production. The study notes the energy sabotage caused by illegal strikes and unions over wage disputes. This was after the power utility indicated they did not have enough capacity to raise pay to the extent the workers and union asked. In a statement by Eskom on the 26th of June 2022, the power utility announced an anticipated stage four load shedding due to the illegal industrial action by some workers and the unions.

In addition, funding security will ensure that the power utility can source the best personnel to promote the entity's vision. After a series of load shedding ravaging South Africa, the minister of public enterprises had to reshuffle the Eskom board (Winkler, 2022). In this, the minister resorted to sourcing new personnel to work towards solving the energy crisis (Winkler, 2022). Hence, the team included various professionals, such as engineers, who would ensure that the generation capacity is improved, particularly with the conversation of the energy transition at hand. However, Imran & Amir, (2015) alludes that these are short-term solutions to the energy crisis and that the government needs to invest heavily in the utility to see long-lasting results, including sourcing funding from external or international investors as the crisis is rooted in infrastructure capacity, leadership at the utility, and corruption, among others.

Abdullahi (2022) asserts that the inability to secure funding for the Nigerian government also contributes to the under-provision of energy. Abdullahi (2022) is of the view that although Nigerians are constantly seeking ways to bypass the meters such that they do not have to pay their electricity tariff fees, corruption by agents at the energy utility (NEPA) is also causing a lack of profit, resulting in a lack of funding. In some instances, although the energy might be available for transmission, the lack of electric lines because of incomplete projects by the power utility also causes energy poverty. Particularly in the villages, NEPA officials misuse the funds directed to the projects deemed to expand electricity to the villages.

Therefore, energy security in both countries is embezzled with lack of funding for the functionality of the power utilities. Thus, this is guided by the targets of the entity. In South Africa, Eskom has only worked to service its foreign debts for years without making a profit, contributing to its ill performance. While NEPA is entrenched in vast corruption in and out of the entity, leaving workers without equipment in some instances. However, nepotism, mismanagement, and white-collar crime are the business order in Nigeria and South Africa. Therefore, to adequately curb this, there needs to be serious sourcing of funding that will contribute to the growth of these entities, especially since there is a high reliance on fossil fuel from both countries, and they need to transition to clean energy, which can only be achieved through sourcing external funding.

Conclusion

The paper laid the foundation for understanding the source of the energy crisis in Nigeria and South Africa. In spelling out what constitutes the energy crisis in the two selected countries, the paper deduced from the existing literature that the key indicators of the

energy crisis include frequent power cuts, load shedding, load reduction, and, in some instances, the complete failure of the power grid. The paper points to arguments that the energy crisis is caused by the government's SOEs' inability to maintain proper business processes and planning, leading to their mediocre performance in ensuring the security of supply.

Acknowledgement

All authors have read and agreed to the published version of the manuscript.

Author Contributions: This work resonates from my master's dissertation completed at the North- West University. Motswaledi, T. R. (2023). A comparative analysis of State-Owned Entities' responses to the energy crisis in South Africa and Nigeria (master's dissertation, North-West University (South Africa)).

Funding: The paper acknowledges the NorthWest University and the National Institute for the Humanities and Social Sciences (NIHSS)-South African Humanities Deans Association (SAHUDA) for funding this project.

Informed Consent Statement: The study was a desktop study, and no subjects were involved for consent issues.

Institutional Review Board Statement: Ethical review and approval were waived for this study, due to that the research does not deal with vulnerable groups or sensitive issues.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Abdullahi, D., Renukappa, S., Suresh, S., & Oloke, D. (2022). Barriers for implementing solar energy initiatives in Nigeria: An empirical study. *Smart and Sustainable Built Environment*, 11(3), 647-660.
- African Development Bank. (2021). Uganda tops African Development Bank's Electricity Regulatory Index for fourth consecutive year. <https://www.afdb.org/en/news-and-events/press-releases/uganda-tops-africandevlopment-banks-electricity-regulatory-index-fourth-consecutive-year-47734>
- An, J., & Mikhaylov, A. (2020). Russian energy projects in South Africa. *Journal of Energy in Southern Africa*, 31(3), 58-64.
- Andrews, N., & Nwapi, C. (2018). Bringing the state back in again? The emerging developmental state in Africa's energy sector. *Energy Research & Social Science*, 41, 48-58.
- Ateba, B. B., Prinsloo, J. J., & Gawlik, R. (2019). The significance of electricity supply sustainability to industrial growth in South Africa. *Energy Reports*, 5, 1324-1338.
- Ayadi, F. S., & Ayadi, F. O. (2008). The impact of external debt on economic growth: A comparative study of Nigeria and South Africa. *Journal of Sustainable Development in Africa*, 10(3), 234-264.
- Ayamolowo, O. J., Manditereza, P. T., & Kusakana, K. (2022). South Africa power reforms: The path to a dominant renewable energy-sourced grid. *Energy Reports*, 8, 1208-1215.
- Babatunde, M. A., & Shuaibu, M. I. (2009). The demand for residential electricity in Nigeria: A bound testing approach. In *Proceedings of the 2nd International Workshop on Empirical Methods in Energy Economics*.
- Bartlett, A. A. (1978). Forgotten fundamentals of the energy crisis. *American Journal of Physics*, 46(9), 876-888.
- Batalla, E. V. C., Torneo, A. R., & Magno, F. A. (2018). A survey of political interference patterns and modalities in national roadworks in the Philippines. *Asia-Pacific Social Science Review*, 18(2), 267-281.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544-559.
- Bhandari, P. (2020). An introduction to qualitative research. <https://www.scribbr.com/methodology/qualitative-research/>
- Casey, C. (2021). Political executive control of the administrative state: How much is too much? *Maryland Law Review*, 81(1), 257-275.
- Ceicdata. (2021a). Nigeria electricity production. <https://www.ceicdata.com/en/indicator/Nigeria/electricity-production>
- Ceicdata. (2021b). South Africa electricity production. <https://www.ceicdata.com/en/indicator/south-africa/electricity-production>
- Chanchangi, Y. N., Adu, F., Ghosh, A., Sundaram, S., & Mallick, T. K. (2023). Nigeria's energy review: Focusing on solar energy potential and penetration. *Environment, Development and Sustainability*, 25(7), 5755-5796.
- Clarke, R. (2020). The challenges involved in establishing a research technique. *Australasian Journal of Information Systems*, 24.
- Crowe, R. K., Probst, Y. C., Norman, J. A., Furber, S. E., Stanley, R. M., Ryan, S. T., ... & Okely, A. D. (2022). Foods and beverages provided in out-of-school hours care services: An observational study. *BMC Public Health*, 22(1), 1-9.
- Dada, J. O. (2014). Towards understanding the benefits and challenges of Smart/Micro-Grid for electricity supply system in Nigeria. *Renewable and Sustainable Energy Reviews*, 38, 1003-1014.
- Dahunsi, F. M., Olakunle, O. R., & Melodi, A. O. (2021). Evolution of electricity metering technologies in Nigeria. *Nigerian Journal of Technological Development*, 18(2), 152-165.
- Daw, O. D., & Gibbs, V. (2017). The impact of private sector participation in the South African electricity supply industry.
- de Visser, J. (2010). The political-administrative interface in South African municipalities assessing the quality of local democracies. *Commonwealth Journal of Local Governance*, 5, 86-101.
- Ding, S., Jia, C., Wilson, C., & Wu, Z. (2015). Political connections and agency conflicts: The roles of owner and manager political influence on executive compensation. *Review of Quantitative Finance and Accounting*, 45, 407-434.

- Eberhard, A. (2004). The political economy of power sector reform in South Africa. <https://www.gsb.uct.ac.za/files/stanfordpsreberhardsep2004final.pdf>
- Eberhard, A. (2008a, July). Africa's power crisis: and power shortages in South Africa. *Africa Energy Forum (ppt)*, Nice, 2-4.
- Eberhard, A. (2008b). South Africa's power crisis: Understanding its root causes and assessing efforts to restore supply security. Cape Town: University of Cape Town.
- Edomah, N. (2018). Historical drivers of energy infrastructure change in Nigeria (1800–2015). *Energy Management for Sustainable Development*, 24-44.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57-74.
- Emovon, I., Samuel, O. D., Mgbemena, C. O., & Adeyeri, M. K. (2018). Electric power generation crisis in Nigeria: A review of causes and solutions. *International Journal of Integrated Engineering*, 10(1).
- European Commission. (2016). State-owned enterprises in the EU: Lessons learnt and ways forward in a post-crisis context. *Institutional Paper 031*.
- Fabiyi, S. D., Abdulmalik, A. O., & Tiamiu, H. A. (2016). Dwindling electrical power supply in Nigeria: Causes and possible solutions. *International Journal of Science and Research*, 5(5), 635-639.
- Felix, J. (2022). 'I will fire you' - Gwede Mantashe promises those who do not support nuclear programmes. <https://www.news24.com/news24/southafrica/news/i-will-fire-you-gwede-mantashe-promises-those-who-do-not-support-nuclearprogrammes-20220507>
- Festus, M. O., & Ogoegbunam, O. B. (2015). Energy crisis and its effects on national development: The need for environmental education in Nigeria. *British Journal of Education*, 3(1), 21-37.
- Fourie, D. J. (2014). The role of public sector enterprises in the South African economy. *African Journal of Public Affairs*, 7(1).
- Gift, R. A., Raimi, M. O., Owobi, O. E., Oluwakemi, R. M., Anu, B., & Funmilayo, A. A. (2020). Nigerians crying for availability of electricity and water: A key driver to life coping measures for deepening stay-at-home inclusion to slow COVID-19 spread. *Open Access Journal of Science*, 4(3), 69-80.
- Giwa, F. A. (2010). Failures of independent power producers in Nigeria: The inimical challenges. <https://www.semanticscholar.org/paper/Failures-of-IndependentPower-Producers-in-Nigeria%3AGiwa/d265c6aed746425cb3a5c3634013ee1bd9da3c75>
- Goldberg, A. (2015). The economic impact of load shedding: The case of South African retailers (Doctoral dissertation). Pretoria: University of Pretoria. <https://repository.up.ac.za/handle/2263/52398>
- Goldman, E., Rocholl, J., & So, J. (2007). Political connections and allocation of procurement contracts. <https://www.governmentcontractslawblog.com/wp-content/uploads/sites/37/2008/04/Gov-Con.pdf>
- Grbich, C. (2012). *Qualitative data analysis: An introduction*. 1-344.
- Hermanus, L., Scholtz, L., & Kritzing, K. (2022). Understanding South African just urban transitions: Goals, challenges and responses for transforming local electricity systems. https://justurbantransitions.com/our_publications/understanding-south-african-just-urban-transitions-goals-challenges-and-responses-for-transforming-localelectricity-systems/
- Hopkins, M. (2012). *Corporate social responsibility and international development: Is business the solution?* Routledge.
- Ibrahim, I. D., Hamam, Y., Alayli, Y., Jamiru, T., Sadiku, E. R., Kupolati, W. K., Ndambuki, J. M., & Eze, A. A. (2021). A review on Africa energy supply through renewable energy production: Nigeria, Cameroon, Ghana, and South Africa as a case study. *Energy Strategy Reviews*, 38, 100740.
- Imran, M., & Amir, N. (2015). A short-run solution to the power crisis of Pakistan. *Energy Policy*, 87, 382-391.
- Isa, M. (2019). What a revolution in SA's electricity landscape can do for the economy. *Finweek*, 2019(8), 36-39.
- Ivwurie, O. M., & Ocholla, D. N. (2016). The status and development of infopreneurship in Nigeria and South Africa. *Education for Information*, 32(4), 323-342.
- Iwayemi, A. (2008). Nigeria's dual energy problems: Policy issues and challenges. *International Association for Energy Economics*, 53(1), 17-21.
- Kennedy-Darling, J., Hoyt, N., Murao, K., & Ross, A. (2008). The energy crisis of Nigeria: An overview and implications for the future. *University of Chicago*, 775-784.
- Krause, G. A., Lewis, D. E., & Douglas, J. W. (2006). Political appointments, civil service systems, and bureaucratic competence: Organizational balancing and executive branch revenue forecasts in the American states. *American Journal of Political Science*, 50(3), 770-787.
- Kumar, K. (2019). Possible impact of the unbundling of Eskom. *CIGFARO Journal (Chartered Institute of Government Finance Audit and Risk Officers)*, 19(4), 28-29.
- Kurer, O. (2005). Corruption: An alternative approach to its definition and measurement. *Political Studies*, 53(1), 222-239.
- Lawrence, A. (2020). Energy decentralization in South Africa: Why past failure points to future success. *Renewable and Sustainable Energy Reviews*, 120, 109659.
- Lin, K. J., Lu, X., Zhang, J., & Zheng, Y. (2020). State-owned enterprises in China: A review of 40 years of research and practice. *China Journal of Accounting Research*, 13(1), 31-55.
- Liu, X. Z. (2016). A literature review on the definition of corruption and factors affecting the risk of corruption. *Open Journal of Social Sciences*, 4, 171-177.

- Lo, K. (2021). Authoritarian environmentalism, just transition, and the tension between environmental protection and social justice in China's forestry reform. *Forest Policy and Economics*, 131, 102574.
- Lu, S., & Wang, H. (2023). How political connections exploit loopholes in procurement institutions for government contracts: Evidence from China. *Governance*, 36(4), 1205-1224. <https://doi.org/10.1111/gove.12735>
- Mackintosh, J. P. (1965). The struggle for power in Nigeria. *Transition*, 22, 21-25.
- Mahlaka, R. (2021). Staying power: Happy 14th birthday, load shedding. <https://www.dailymaverick.co.za/article/2021-11-02-staying-power-happy-14thbirthday-load-shedding/>
- Maishanu, A. A., & Agency Report. (2021). El-Rufai sacks 19 political appointees. <https://www.premiumtimesng.com/news/top-news/463940-just-in-el-rufai-sacks19-political-appointees.html>
- Mantashe, G. (2022). Minister Gwede Mantashe: Coal Colloquium. <https://www.gov.za/speeches/minister-gwede-mantashe-coal-colloquium-1-feb2022-0000>
- Masike, K., & Vermeulen, C. (2022). The time-varying elasticity of South African electricity demand. *Energy*, 238, 121984.
- Masungwini, N. (2021). ANC blasts Eskom for load shedding, suspects it is playing politics. <https://www.news24.com/citypress/news/anc-blasts-eskom-for-loadshedding-suspects-it-is-playing-politics-20211027>
- Mitnick, B. M. (1975). The theory of agency: The policing "paradox" and regulatory behavior. *Public Choice*, 24(1), 27-42.
- Mngomezulu, S. (2020). Political interference in the administration of service delivery in Umlazi Local Municipality of KwaZulu-Natal, South Africa. *Journal of Economics and Behavioral Studies*, 12(1), 38-45.
- Murphy, M. (2011). Historical highlights of the rise and demise of South Africa's nuclear capability. *Africa Insight*, 40(4), 121-135.
- Mykhalchenko, N., & Wiegatz, J. (2022). Anti-fraud measures in Western Africa and commentary on research findings across the three regions analyzed. *Review of African Political Economy*, 49(173), 472-486.
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, 19(2), 129-132.
- Ndako, U. B. (2010). Stock markets, banks, and economic growth: Time series evidence from South Africa. *African Finance Journal*, 12(2), 72-92.
- Nepal, R., & Paija, N. (2019). Energy security, electricity, population, and economic growth: The case of a developing South Asian resource-rich economy. *Energy Policy*, 132, 771-781.
- Nowakowska, M., & Tubis, A. (2015). Load shedding and the energy security of the Republic of South Africa. *Journal of Polish Safety and Reliability Association*, 6(3), 99-108.
- Okoro, O. I., & Chikuni, E. (2007). Power sector reforms in Nigeria: Opportunities and challenges. *Journal of Energy in Southern Africa*, 18(3), 52-57.
- Olatunji, O., Akinlabi, S., Oluseyi, A., Abioye, A., Ishola, F., Peter, M., & Madushele, N. (2018, September). Electric power crisis in Nigeria: A strategic call for change of focus to renewable sources. In *IOP Conference Series: Materials Science and Engineering*, 413, 012053. IOP Publishing.
- Olukoju, A. (2004). 'Never expect power always': Electricity consumers' response to monopoly, corruption, and inefficient services in Nigeria. *African Affairs*, 103(410), 51-71.
- Oluwatosin, A. (2020). A comparison of the energy market in Scandinavia and in Nigeria and the role of framework for independent hydropower producers (Master's thesis). <https://ntnuopen.ntnu.no/ntnuxmlui/bitstream/handle/11250/2779515/no.ntnu%3Ainspera%3A67701620%3A35354118.pdf?sequence=1>
- Panda, B., & Leepsa, N. M. (2017). Agency theory: Review of theory and evidence on problems and perspectives. *Indian Journal of Corporate Governance*, 10(1), 74-95.
- Patel, S. (2008). Whistling in the dark: Inside South Africa's power crisis. *Power*, 152(11), 53-53.
- Pathak, V., Jena, B., & Kalra, S. (2013). Qualitative research. *Perspectives in Clinical Research*, 4(3), 192.
- Pfiffner, J. P. (1987). Political appointees and career executives: The democracy-bureaucracy nexus in the third century. *Public Administration Review*, 47(1), 57-65. <https://doi.org/10.2307/975472>
- Pimentel, D., Hurd, L. E., Bellotti, A. C., Forster, M. J., Oka, I. N., Sholes, O. D., & Whitman, R. J. (1973). Food production and the energy crisis. *Science*, 182(4111), 443-449.
- Pretorius, I., Piketh, S. J., & Burger, R. P. (2015). The impact of the South African energy crisis on emissions. *WIT Transactions on Ecology and the Environment*, 198, 255-264.
- Prevost, G. J. (2019). Varieties of interference and protection from interference in official statistics. <https://www.europarl.europa.eu/cmsdata/163746/Prevost.pdf>
- Qureshi, M. I., Rasli, A. M., & Zaman, K. (2016). Energy crisis, greenhouse gas emissions and sectoral growth reforms: Repairing the fabricated mosaic. *Journal of Cleaner Production*, 112, 3657-3666.
- Salci, S., & Jenkins, G. P. (2018). An economic analysis for the design of IPP contracts for grid-connected renewable energy projects. *Renewable and Sustainable Energy Reviews*, 81, 2410-2420.
- Sarkodie, S. A., & Adams, S. (2020). Electricity access, human development index, governance, and income inequality in Sub-Saharan Africa. *Energy Reports*, 6, 455-466.

- Sheikh, M. F., Shah, S. Z. A., & Akbar, S. (2018). Firm performance, corporate governance, and executive compensation in Pakistan. *Applied Economics*, 50(18), 2012-2027.
- Shokoya, N. O., & Raji, A. K. (2019). Electricity theft mitigation in the Nigerian power sector. *International Journal of Engineering and Technology*, 8(4), 467-472.
- Stan, C., & Bruton, G. D. (2013). Theory of the (State-Owned) Firm. In *Academy of Management Proceedings*, 2013(1), 14904. Briarcliff Manor, NY: Academy of Management.
- Suen, L. J. W., Huang, H. M., & Lee, H. H. (2014). A comparison of convenience sampling and purposive sampling. *Hu Li Za Zhi*, 61(3), 105.
- Sun, Q., Tong, W. H., & Tong, J. (2002). How does government ownership affect firm performance? Evidence from China's privatization experience. *Journal of Business Finance & Accounting*, 29(1-2), 1-27.
- Tartibu, L. K., & Kabengele, K. T. (2018). Forecasting net energy consumption of South Africa using artificial neural network. In *2018 International Conference on the Industrial and Commercial Use of Energy (ICUE)* (pp. 1-7). IEEE.
- Ting, M. B., & Byrne, R. (2020). Eskom and the rise of renewables: Regime resistance, crisis and the strategy of incumbency in South Africa's electricity system. *Energy Research & Social Science*, 60, 101333.
- Trollip, H., Butler, A., Burton, J., Caetano, T., & Godinho, C. (2014). Energy security in South Africa: Migration action plans and scenarios. https://media.africaportal.org/documents/Energy-Security_in-South-Africa.pdf
- Tshidavhu, F., & Khatleli, N. (2020). An assessment of the causes of schedule and cost overruns in South African megaprojects: A case of the critical energy sector projects of Medupi and Kusile. *Acta Structilia*, 27(1), 119-143.
- Udegbonam, O. (2021). Nigeria businesses lose \$29 billion annually to poor electricity. <https://www.premiumtimesng.com/news/top-news/456904-nigeria-businesseslose-29-billion-annually-to-poor-electricity.html>
- Utazi, D. N., & Obuka, N. S. (2014). Inadequate and poor electricity metering affect energy efficiency end-user behavior in Nigeria. *International Journal of Engineering Trends and Technology*, 12(8), 371-377.
- Watt, M., & Passey, R. (2011). Prepared for the International Energy Agency Cooperative Programme on PV Power Systems. *Australian PV Association*. <https://apvi.org.au/sites/default/files/documents/APVA%20Status%20Reports/PV%20in%20Australia%202010.pdf>
- Willner, J. (2001). Ownership, efficiency, and political interference. *European Journal of Political Economy*, 17(4), 723-748.
- Winkler, H. (2022). South Africa's efforts to tackle its energy crisis lack urgency and coherence. <https://www.dailymaverick.co.za/article/2022-03-10-south-africas-efforts-to-tackle-its-energy-crisis-lack-urgency-and-coherence/>
- Wolhuter, C. C. (2019). Education in Sub-Saharan Africa. *Annual Review of Comparative and International Education* 2018, 37, 225-242.
- Woode-Smith, N. (2019). A history of Eskom: Why did it fail? *Cabo*, 2019(1), 21-30.
- Ye, Y., Koch, S. F., & Zhang, J. (2018). Determinants of household electricity consumption in South Africa. *Energy Economics*, 75, 120-133.
- Yetano, R. M., Verolme, H., Agbaegbu, C., Binnington, T., Fishedick, M., & Oladipo, E. O. (2020). Achieving sustainable development goals in Nigeria's power sector: Assessment of transition pathways. *Climate Policy*, 20(7), 846-865.
- Yi-Chong, X. (2018). China's giant state-owned enterprises as policy advocates: The case of the state grid corporation of China. *The China Journal*, 79(1), 21-39.
- Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan*, 5(1).
- Zeng, S., Liu, Y., Liu, C., & Nan, X. (2017). A review of renewable energy investment in the BRICS countries: History, models, problems, and solutions. *Renewable and Sustainable Energy Reviews*, 74, 860-872.

Publisher's Note: Bussecon International stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



International Journal of Business Ecosystem and Strategy by [Bussecon International Academy](#) is licensed under a [Creative Commons Attribution 4.0 International License](#).