Journal of Energy Research and Reviews

Volume 14, Issue 4, Page 32-44, 2023; Article no.JENRR.101706
ISSN: 2581-8368

Constitutional and Institutional Governance of Electricity Sector in Nigeria

Olukayode Olalekan Aguda [a++*]

[a] *Department of Minerals, Petroleum, Energy Economics and Law, University of Ibadan, Nigeria.*

Author's contribution

The sole author designed, analysed, inteprted and prepared the manuscript.

Article Information

DOI: 10.9734/JENRR/2023/v14i4291

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/101706

Review Article

Received: 27/04/2023
Accepted: 29/06/2023
Published: 15/07/2023

ABSTRACT

The extensive reform of Nigeria's power industry is focused on deregulation, restructuring, and privatisation. The government started a comprehensive economic reform programme in 1999, which includes this reform. The National Electric Power Policy (NEPP) of 2001 and the Electric Power Sector Reform (EPSR) Act of 2005 both first stated the need for privatising the electricity sector. The privatisation of the entire energy sector made considerable strides in 2013 with the transfer of ownership of six electricity production businesses and eleven electricity distribution companies. The reform has led to the repeal of the EPSR Act 2005 by the enactment of the Electricity Act 2023. This paper therefore seeks to ensure that a reform process is not only set up but prioritized within the Electricity sector.

With the passage of the Privatisation and Commercialization Act in 1988 and the subsequent creation of the Technical Committee for Privatisation and Commercialization (TCPC) in 1993, the reform process got underway. When civilian authority was restored in 1999, the government passed the Public Enterprises (Privatisation and Commercialization) Act, which established the National

[++]*B.A Ibadan, LL.B Lagos, B.L, LL.M Swansea, PhD Ibadan, LL.M International Commercial and Maritime Law, PhD Energy Law, Lecturer;*
**Corresponding author: E-mail: kayus2013@gmail.com;*

Council on Privatisation (NCP) as the top policy-making body on privatization-related matters. The Bureau for Public Enterprises (BPE) was created under the Act to serve as the government's technical operator and task manager for its public enterprise reform initiative.
The reform legislation calls for licencing, liberalisation, the unbundling of the public monopoly utility, corporatization, and the commercialization of successor enterprises. The Power Holding Company of Nigeria (PHCN) was established as a holding company. To ensure a competitive electricity market, the law suggests selling generating and distributing enterprises to core investors.
Despite privatisation attempts, Nigeria's electrical supply reliability remains a serious difficulty, and regulation remains an urgent issue. Due to the inconsistent availability of energy, manufacturers continue to rely primarily on diesel generators. Power plant failures have resulted in significant electrical shortages, with daily power outages lasting several hours.
Conclusively, while the Nigerian power sector has undergone significant reforms, there is still a need for further improvements in regulation and electricity supply reliability to address the country's persistent energy challenges and support economic diversification beyond oil production and manufacturing sector collapse.

Keywords: Electricity; policy development; electric power policy; privatization.

1. INTRODUCTION

One of the most thorough, ambitious, and daring changes in the history of Africa is now taking place in the Nigerian electricity industry [1]. The Nigerian energy industry has seen significant upheaval recently. In order to totally unbundle the oil and gas sector and privatize the power sector, the Nigerian government has made it plain that it aims to deregulate and reorganize the industry.

The National Electric Power Policy (NEPP) of 2001 first stated the necessity for privatization the power industry, which was eventually included in the Electric Power industry Reform (EPSR) Act of 2005. Six energy producing businesses and eleven electricity distribution companies were transferred to private entities in November 2013 by the nation [2]. This came after hiring private management firms to operate the nation's transmission service provider [3]. The two operations nearly brought Nigeria's whole power industry to full privatization [4]. The privatization of the electricity sector is a part of a bigger government economic reform initiative that was launched in 1999 under President Obasanjo. The National Electric Power Policy (NEPP) was established by the Obasanjo administration in 2000, and the Electric Power Sector Reform (EPSR) Act, 2006, was passed in response during his second term.

Following the generally successful reform of the telecommunications sector in the late 1990s and early 2000s comes the reform of the electricity sector. Later attempts to privatize Nigerian Telecommunication Limited (NITEL), a publicly held company, were a colossal failure [5]. The policy further limits the Ministry of Power (or any other name it may go by) to policy-making on power supply as part of the autonomous regulation of the overall electrical industry [6].

Babangida started the transformation by establishing a regulatory framework with the Privatization and Commercialization Act of 1988 [7]. To manage the military administration's privatization and commercialization efforts, the government formed the Technical Committee for Privatization and Commercialization (TCPC) in 1993. The Public Enterprises (Privatization and Commercialization) Act was later passed by the government after the restoration to civil rule in 1999, and it established the National Council on Privatization (NCP) as the top policy-making body for the government with regard to privatization-related matters [8]. Additionally, the Bureau for Public Enterprises (BPE) was established under the Act to take over from the TCPC as the technical operator and task manager of the government's public enterprises reform program [9].

Firstly, it outlines a series of measures aimed at liberalizing the energy sector in Nigeria. These measures include the issuance of licenses, breaking up the public monopoly utility, transforming it into corporate entities, and introducing commercial elements. In the later stages of the transition, the intention is to privatize these newly corporatized entities. To facilitate this process, a holding company called the Power Holding Company of Nigeria (PHCN) was established. The PHCN is further divided into 18 separate companies, consisting of six

electricity generation companies, eleven distribution companies, and a national transmission company.

As the transitional period nears its conclusion, the law proposes the sale of the six generating companies and the eleven distribution companies to core investors. This step is seen as crucial for ensuring a competitive electricity market within Nigeria. However, the implementation of the electric reform policy faced delays between 2007 and 2009 during President Yar'Adua's tenure. Subsequently, President Jonathan recommenced the reform implementation in 2010, introducing a Presidential Roadmap for Power Sector Reform [10].

The government privatized the power industry in 2013 in an effort to increase the dependability of the supply after becoming alarmed by the dire condition with the electricity supply. Regulating remains a major problem in Nigeria despite the privatization, which is terrible. The following are among the electrical businesses that make up Nigeria's power sector: power production, transmission, distribution, system operation, and trade [11].

Following the start of commercial oil production in the late 1950s and the collapse of the developing industrial sector starting in the mid-1980s, the Nigerian economy still struggles with insufficient diversification. Diesel generators must still be used by factories since power is still only seldom available. There is a severe scarcity of electricity throughout the nation as a result of the power plants' subpar performance, and there are several hours per day of power outages [12].

2. CONCEPTUAL FRAMEWORK

The conceptual framework for this study is based on the extensive reform of Nigeria's power industry, which is centered on deregulation, restructuring, and privatization. The framework considers the historical background of the reform process, including the National Electric Power Policy (NEPP) of 2001 and the Electric Power Sector Reform (EPSR) Act of 2005 which has been repealed by the Electricity Act 2023. The repealed Act acknowledges the key institutions involved in the reform, such as the Technical Committee for Privatization and Commercialization (TCPC), the National Council on Privatization (NCP), and the Bureau for Public Enterprises (BPE) while the new Act retains existing institutions such as the Nigerian Electricity Regulatory Commission. The framework also recognizes the objectives of the reform, including licensing liberalization, unbundling of the public monopoly utility, corporatization, and commercialization of successor enterprises which has now been made alive by the Electricity Act 2023.

3. METHODOLOGY

This involves a review of relevant literature. This includes scholarly articles, reports, and government documents related to the reform of Nigeria's power industry, focusing on deregulation, restructuring, and privatization. This was used to identify the key issues, challenges, and successes of the reform process. The data collection involves the gathering of relevant data from primary and secondary sources. An analysis of the collected data to identify patterns, trends, and key findings related to the reform process was thereafter carried out. This led to an examination of the impact of privatization on electricity supply reliability, regulation, and economic diversification beyond oil production and manufacturing. Based on the analysis and findings, policy recommendations to address the remaining challenges in the Nigerian power sector reform was carried out. This considered the need for further improvements in regulation, electricity supply reliability, and diversification of the energy sector.

4. NIGERIA AND ITS ENERGY SECTOR

The Federal Republic of Nigeria consists of thirty-six states and the Federal Capital Territory, Abuja. It is situated in West Africa and shares land borders with the Republic of Benin to the west, Chad and Cameroon to the east, and Niger to the north. Its southern region is along the Atlantic coast, specifically the Gulf of Guinea. Since 1991, the capital city has been Abuja. Nigeria's widest span measures approximately 1,200 km from east to west and around 1,050 km from north to south. The country's terrain varies, with lowlands found along the coast and in the lower Niger Valley, while high plateaus dominate the north and mountains line the eastern border. Two significant rivers, the Niger and the Benue, divide the country.

Nigeria experiences relatively high temperatures with minimal seasonal and daily fluctuations but notable regional differences. It has two primary

seasons: the rainy season, typically lasting from April to October, and the dry season from November to March. The dry season begins with the Harmattan winds, a dry and cold spell that persists until February. These winds carry dust from the Arabian Peninsula across the Sahara and bring lower temperatures. The second half of the dry season, specifically February to March, is the hottest period of the year, with temperatures ranging from 33 to 38 °C. The northern regions experience the highest temperatures and aridity during this time. Due to these climatic patterns and the country's size, Nigeria exhibits considerable variation in annual rainfall, both from south to north and, in some areas, from east to west. The southeastern coastal region, particularly Bonny and east of Calabar, generally receives the highest annual rainfall exceeding 4,000 millimeters [13]. These specifics are crucial, especially when taking into account Nigeria's hydroelectric power source.

Many observers believe that Nigeria's electricity industry is the main obstacle to the country's economic growth. In its 2015 Doing Business report, the World Bank evaluated 189 nations based on how easy it was to obtain power, and Nigeria came in at position 187. It takes 260 days for a firm in Lagos to get a permanent energy connection [14]. Once linked to the energy supplier, Nigerian businesses indicate that the unpredictable power supply is their largest issue. More than any other limitation, electrical disruptions were viewed as a major issue by around 83% of all managers polled. The average company reports losses from outages that are greater than 4% of revenues. No peer nation encounters such significant supply-related business losses.

Nigeria is a member of the West African Power Pool (WAPP), an ECOWAS-specific organization. WAPP aims to ensure the integration of regional power systems and the establishment of a regional electricity market. Private and public generating, transmission, and distribution businesses are included.

5. PRIVATISATION OF NIGERIAN ELECTRICITY

Nigeria plunged forward towards privatization in 2013. Nigeria passed the finish line in the privatization process in November 2013, when the transfer of government interests in 17 electrical generating and distribution businesses was completed. This privatization operation [15] is regarded as one of the greatest single privatization initiatives in history [16]. This process had been in the works for quite some time, so it wasn't entirely unexpected. It gained momentum in 2003 when the telecommunications sector underwent liberalization as part of a strategic reform aimed at enhancing efficiency in utility sectors.

“The overarching goal is to privatize all power assets, intending to address the country's persistent power shortages and break the long-standing monopoly held by the state-owned power entity. The reform initiative is built upon the 2005 Electric Power Sector Reform Act, the 2010 Roadmap for Power Sector Reform, and subsequently the 2013 Roadmap for Power Sector Reform Revision 1, along with various other policy documents. While the Act provides the necessary legal foundation for the reform, the roadmaps serve as instruments to expedite the proposed transformative changes in ownership, control, and regulation within the sector as outlined in the Act. Their purpose is to ensure the accomplishment and realization of these changes, primarily for the ultimate benefit of electricity consumers” [17]. T The actions done up to this point will now be reviewed.

Prior to the adoption of the Electricity Power industry Reform Act (EPSRA, 2005), the Federal Government of Nigeria (FGN) was in charge of formulating policies, enforcing regulations, running the industry, and attracting investments. The National Electric electricity Authority (NEPA), a fully owned state-owned organization in charge of electricity generation, transmission, and distribution, managed operations while the Federal Ministry of Power (FMP) was in charge of the sector's regulation. Approximately 94% of the industry's generating capacity and 100% of the transmission and distribution sector were under NEPA's total supervision from 1972 to 2005.

Three stages of the reform were proposed [18]. The initial phase consisted of five planned activities. These included the dismantling and privatization of the longstanding government-owned monopoly power company, previously known as the National Electric Power Authority (NEPA) and later renamed the Power Holding Company of Nigeria (PHCN). Additionally, an independent power sector regulator called the Nigerian Electricity Regulatory Commission (NERC) was established to ensure fair market practices and perform regulatory functions. The PHCN's successor generation and distribution

companies were incorporated, and a multipurpose entity was created to procure electricity from independent power producers and newly established generation companies for subsequent sale to the distribution companies. Lastly, the National Power Training Institute of Nigeria (NAPTIN) was established as a training institute.

The second phase, with a medium-term outlook, aimed to develop a cost-effective electricity tariff to encourage competitive pricing that would attract private sector involvement in the sector. The third phase, which was long-term in nature, focused on achieving a fully competitive power sector.

In 1998, the Federal Government of Nigeria (FGN) made amendments to existing laws, specifically the Electricity and NEPA Acts, to dismantle NEPA's monopoly and encourage private sector participation. The National Electric Power Policy of 2001 outlined the reform agenda, while the Electric Power Sector Reform Act (EPSRA) provided the legal framework for the unbundling of NEPA. NEPA was restructured and transformed into the Power Holding Company of Nigeria (PHCN). From 2007 until September 2013, the PHCN operated as the state-owned entity responsible for electricity generation, transmission, and distribution nationwide. During this time, the FGN aimed to sell off a significant portion of its stake in the electricity services industry, retaining only control of the transmission grid as a public entity.

In the first step of the privatization process, the government offered the state-owned generating companies (GENCOs) for sale. Thermal power stations were sold outright, while hydropower stations were made available as concessions. Distribution was also unbundled into 11 successor distribution companies (DISCOs). The privatization process was conducted through competitive bidding and concluded in November 2013, resulting in the transfer of assets to six private generation companies and eleven distribution companies. The FGN maintained control over transmission and system operations through the Transmission Company of Nigeria (TCN), which consists of a system operator and a market operator division. The transmission lines and generators are interconnected within a unified grid, with a centralized control center in Oshogbo.

In the second step, the FGN established a regulator, the Nigerian Electricity Regulatory Commission (NERC), and a bulk trader, the Nigerian Bulk Electricity Trading Plc (NBET). The NBET would exist until the electricity market was fully privatized, at which point the power purchase agreements it had signed would be transferred to the DISCOs. Additionally, the Operator of the Nigerian Electricity Market (ONEM) was established within the TCN to serve as a wholesale market and settlement operator, managing the metering system between generation, transmission, and distribution companies.

“The third step involved the sale of all ten new National Integrated Power Project (NIPP) power stations, owned by the Niger Delta Power Holding Co. (NDPHC), with a combined capacity of 5,455 MW and scheduled for completion in 2014. To mitigate potential losses that the GENCOs might experience due to power transmission issues or supply shortfalls, the FGN allocated NGN 50 billion (US$ 312.5 million) to escrow accounts. Additionally, the FGN obtained a partial risk guarantee from the World Bank to provide further protection. The Nigerian Bulk Electricity Trading Plc (NBET) was responsible for purchasing electricity from the GENCOs and selling it to the DISCOs during this interim period” [19].

The Nigerian government started the unbundling of TCN in May 2015 by establishing a state-controlled Independent System Operator, which will eventually be privatized and would perform the duties of the former system and market operator divisions.

There are four fundamental power generation alternatives that may be distinguished within the Nigerian electrical power system. Among these power generating choices are:

1. transmission based on-grid generation,
2. embedded generation,
3. off-grid generation and
4. captive generation.

Captive generation merely needs a NERC permission, however operating a generator in accordance with choices i) through iii) requires a license [20].

6. RELEVANT PROVISIONS ON ELECTRICITY IN NIGERIA

Many people believe that the majority of Nigeria's issues are not due to a lack of laws, but rather a

lack of enforcement. Similar to this, there are several laws governing the electricity industry in Nigeria. Some of them will be examined in this article [21].

6.1 The Electricity Act [22]

"This Act was assented to by the regime of President Bola Ahmed Tinubu. The implication of this enactment is that it repeals the Electric Power sector Reform act 2005 and thereafter consolidated the laws relating to the Nigeria electricity supply industry by providing a comprehensive legal and institutional framework for the power sector in Nigeria as it concerns the area of generation of electricity, its transmission, system operation, distribution, supply, trading, enforcement of consumer rights and obligations. The Act further provides for a holistic integrated resource plan and policy that gives recognition to all sources for the generation, transmission and distribution of electricity, including the integration of renewable energy to the energy mix of Nigeria in order to attract investments" [23].

Structurally, the Act is divided into 22 parts with 233 sections and accompanying schedules. The major thrust of the Act is that it introduced several reforms in the electricity sector. These reforms and innovations are contained variously in the Act. Thus, the Act introduces the national integrated electricity policy and strategic implementation plan under Part II which would be reviewed periodically. This part also introduced and gives the Minister the power to supervise activities within the power sector [24].

Interestingly, it should be noted that the Act introduced under part 17 renewable energy and energy efficiency. This takes care of the various agitations and clamour by numerous authors on the need to have dedicated legislations to incorporate renewable energy into the Nigerian electricity mix.

Institutionally, the Act also gives recognition to three agencies that would be directly involved with electricity management in Nigeria. These institutions are Nigerian Electricity Regulatory Commission (NERC), Nigerian Electricity Management Services Agency (NEMSA) and the National Power Training Institute of Nigeria (NPTIN).

6.2 The Electric Power Sector Reform Act [25]

This legislation initially governs the Nigerian electricity sector, which encompasses electricity generation, transmission, distribution, supply, and trading. Its primary objective is to facilitate the formation of companies responsible for taking over the functions, assets, liabilities, and personnel of the National Electric Power Authority. Furthermore, the Act aims to promote the development of competitive electricity markets and establish the Nigerian Electricity Regulatory Commission (NERC) as an independent regulatory body. The NERC is entrusted with the task of licensing and regulating individuals and entities engaged in electricity generation, transmission, system operation, distribution, and trading within Nigeria. The Act also serves to enforce performance standards, protect consumer rights, and address various aspects related to electricity generation, transmission, and distribution. Additionally, it provides provisions for the determination of tariffs and addresses other pertinent matters associated with the electricity sector.

The Act provides for the licensing requirements to operate in the electricity sector of the Nigerian economy. *Section 62* of the Act states that *"no person except in accordance with a license issued pursuant to this Act shall construct, own or operate an undertaking other than an undertaking specified in subsection 2 of this Section, or in any way engage in the business of;*

a. electricity generation, excluding captive generation;
b. electricity transmission;
c. system operation;
d. electricity distribution; or
e. trading in electricity".

It also provides for the procedure for the application for a license under Section 70.

Furthermore, Section 96 of the Act grants NERC the authority to "make regulations prescribing all matters required or permitted to be prescribed to which in the discretion of the Commission are necessary or convenient to be prescribed for carrying out or giving effect to the Act." In carrying out this duty, the NERC has published a number of rules to put the Act's provisions into practice. Several of these rules include:

a. **NERC Regulations for Independent Electricity Distribution Networks (IEDN Regulations) 2012**: This regulation's goal is to set uniform guidelines for the issue of distribution licenses to eligible applicants so they can distribute power without relying

on the Nigerian Distribution Company's distribution network. It applies to all independent power distribution networks in Nigeria, as well as their owners, operators, and consumers.

b. **Regulations for the Investment in Electricity Networks 2015**: The Regulation outlines the process for making investments in Nigeria's power networks. The Regulation's goal is to establish compelling incentives for the Transmission Company of Nigeria (TCN) and the Distribution Companies (DISCOs) to invest sustainably in capacity expansion, ensuring that capacity is delivered at levels already anticipated in the sector's revenue requirements. Additionally, it involves assisting to cover any possible fine expenses that would result from the relevant utilities' incapacity to provide service under the existing pricing regulation. The Regulation also seeks to safeguard consumers.

c. **Regulations on National Content Development for Power Sector 2014:** The purpose of this regulation is to encourage the industry's intentional use of Nigerian materials, labor, and human resources. Additionally, to open the Nigerian electric supply industry at all of its levels of complexity so that Nigerians can participate, to develop Nigerian capabilities to support increased investment in the sector, and to leverage both current and future investment to spur the growth of Nigerian-based businesses.

d. **The Nigerian Electricity Health and Safety Standards Manual:** It was developed by NERC to address difficulties with workplace health and safety in Nigeria's power supply sector. In order to protect both their employees and the general public from the risks related to the industry sector, NERC works to guarantee that employers and their designated corporate representatives are required to do so by both moral and legal standards.

e. **NERC (Embedded Generation) Regulation 2012:** The Regulation was created by NERC to establish uniform guidelines for integrated power generation and distribution in order to guarantee a reliable, secure, and effective electricity supply. Users of distribution networks, embedded generation licensees, applicants for embedded generation licenses that the Commission processes, and potential embedded generation licensees are all subject to this.

f. **NERC License and Operating Fees Regulation 2010:** The Regulation specifies the application processing charges. a non-refundable application processing fee, as listed in the Schedule of Fees, must be submitted with each license application submitted to the Commission. The necessary fees must be paid by bank draft or check made payable to NERC. Additionally, the Commission must issue an official receipt to acknowledge any fees it has received.

g. **NERC Regulation for Mini-Grid 2016**: The Regulation's goal is to outline the method, licensing, and management of mini-grids in Nigeria. The Regulation specifies the prerequisites and responsibilities for running mini-grids.

h. **NERC MAP Regulation 2018**: This Regulation's goal is to give Meter Asset Providers a framework. Prior to this Regulation, the majority of Distribution Companies were not fulfilling their obligations to give their consumers meters. This Regulation gave NERC permission for MAP's enterprises and other third parties to fill the gap and offer meters to Nigerian power customers.

i. **NERC Eligible Customer Regulation 2017**: The Regulation's goals include promoting a competitive electricity market and a quick increase in generation capacity. In order to promote complete retail competition in the Nigerian electric market, other goals include granting third parties access to the transmission and distribution facilities. The Regulation also grants access to underserved and unserved clients to licensed generating businesses with uncontracted capacity.

j. **The Nigerian Electricity Management Service Agency Act (NEMSA Act):** In order to guarantee the efficient production and delivery of safe, reliable, and sustainable electric power supply and to ensure the safety of lives and property in the electricity supply industry, the Act establishes the Nigerian Electricity Management Service Agency (NEMSA) as the regulatory body responsible for the enforcement of technical standards, inspections, testing, and certification of all categories of

electrical installations, electricity meters, and instruments.

k. **Environmental Impact Assessment Act 1992:** The Act's goal is to identify factors that may significantly impact the environment or have an impact on those activities before any person, authority, or corporate body, including the Federal Government, State, or Local Governments, decides to undertake or authorise the undertaking of any activity.

The corpus of laws that govern the production, transmission, distribution, and trade of electricity is included in the Nigerian electricity legislation. The Electric Power Sector Reform Act of 2005 established the Nigerian Electricity Regulatory Commission, which is the governing government body responsible for overseeing the regulation of electricity in Nigeria.

7. THE DIFFERENT ERAS IN THE NIGERIAN POWER SECTOR

Even before the arrival of the colonialists, the many eras that the Nigerian energy industry has seen will be reviewed. Nigeria switched from using coal (black triangles) and diesel (red diamonds) to hydroelectricity (blue squares) throughout the decade from 1960 to 1970. This time period began with Nigeria's independence. Following Nigeria's admission to OPEC (Organization of the Petroleum Exporting Countries), there was also a switch from hydro to gas-fueled thermoelectricity (gray circles) between 1970 and 1980. Finally, after 2005, a gas-fueled installed capacity domain was consolidated along with the acceleration of liberal economic reform [26].

The history of electricity in Nigeria began with thermal experiments at the close of the 19th century, influenced by the British Metropole's desire to utilize coal and other natural resources [27]. The colonists were in charge of bringing in the technical, financial, and people resources required setting up an energy sector on Nigerian soil. Oil basins (natural capital) were found at the start of the 20th century, but have not yet demonstrated economic viability, mostly due to low oil prices. In contrast, the metropole was eager to explore and export coal and other natural resources, in part because of those resources' closeness to the ocean ports. The choice for thermal coal generating during this time was influenced by the metropole's lack of interest in oil and its concentration on coal extraction.

In the beginning, coal-fueled power plants were used for public lighting, governmental structures, and hospital operations. The metropole provided the controlled state monopoly (PWD - Public Work Department) with capital in the form of money, connections, people, and technology [28]. In accordance with British objectives, PWD also set up the infrastructure required to utilize the region's natural resources. During this initial time frame, PWD was given jurisdiction for the generation, transmission, and distribution of electricity throughout Nigeria [29]. By 1922 [30], PWD was absorbed by NESCO (Nigerian Electricity Supply Corporation), which took over responsibility for regulatory duties as well as "developing electrical energy supply (generation) infrastructure". In order to integrate and organize the efforts of energy generation for the utilization and export of natural wealth, NESCO was established to uphold the interests of Metropole.

At Oloibiri, along the beach (72 kilometers west of Port Harcourt), Shell D'Arcy found oil deposits of adequate commercial grade and significant amount by 1956 [31]. Shell's technological and financial resources, however, were insufficient at the time to start the exploitation of the oil deposits (natural capital). The metropole continued to be increasingly interested in coal extraction even after the decision was made to change the engines of the trains in the middle of the 1950s [32]. Due to its greater endowments of relational, human, and cultural capital compared to the emerging local elites and Shell, it maintained the domain in the game. Up until 1960, the metropole had amassed sufficient social and economic resources to keep local elites in Nigeria and other foreign actors from interfering with the results of the action arenas.

After gaining independence from the Metropole, a civil war ensued, which resulted in the installation of a military administration and the creation of state monopolies over the infrastructure of the energy sector [33]. Once British planners and managers left for home, the sector suffered a loss of human capital, and the newly formed military elites chose to change the electricity's source. As a result, the Niger Dam Authority (NDA) was founded by the Federal Government in 1962 to manage hydroelectric power projects and transmission lines [34]. The Kainji Dam Hydroelectric, with 720 MW of installed capacity on the Niger River in central Nigeria, is the product of such changes in the institutional scenario.

The discovery of oil deposits in 1955 was not enough to stop the transition to hydroelectricity, at least not right away [35]. Even though the installed capacity of diesel-fueled power plants increased during this time, the Kainji Dam and the establishment of the NDA served as significant drivers (built capital and rules-in-use, respectively) for the domination of hydro by the end of the 1960s. As a result, Nigeria's usage of oil for producing power was once again insufficient (given the resource's availability). The dearth of financial resources to develop the energy business during this time may have been made worse by the civil war. Nigeria, like the majority of developing nations, depends on the World Bank and the IMF to provide investments and loans for increasing the generation capacity, including building the Kenji Dam.

Nigeria joined OPEC (Organization of the Petroleum Exporting Countries) in 1971 [36]. In 1979, the Energy Commission of Nigeria (ECN) assumed the role of coordinating and overseeing the energy resources in Nigeria. Two regulatory agencies, the National Electricity Power Authority (NEPA) and the Nigerian National Petroleum Corporation (NNPC), were established in 1977 to govern the electricity, oil, and gas sectors. NEPA, aside from its regulatory responsibilities, was also the predominant owner of nearly all assets in the electricity industry until the liberal reforms of the 1990s. The simultaneous establishment of NNPC and NEPA indicates a shared interest in oil exploitation and electricity during this period.

“By 1985, the electricity industry remained under state control, with NEPA taking on the role of regulation and ownership instead of British Metropolis or NDA. The military elites in the government prioritized the expansion of the electricity industry, focusing on industrialization and the exploitation of fossil fuels. Social development took a backseat as their main emphasis was on oil and gas, and they received support from the World Bank and OPEC. The military elites, who held significant power and resources, shaped the rules and policies to align with their interests. NEPA and NNPC worked to increase the capacity of gas-fueled power plants by 1980” [37].

In 1986, the Nigerian Federal Government changed its views in favor of privatization, retaining the State's planning and regulatory prerogatives in line with a global trend of liberalization in the power industry [38]. The areas of generating, transmission, and distribution were separated off to form the electrical industry. This unbundling process has its origins in the World Bank's liberal industry and sectoral guidelines, which were placed as restrictions on the funded nations [39]. Similar liberalization processes were sparked by such meta-constitutional restrictions in Chile, England, Brazil, South Africa, and other nations. As a result, the NEPA-controlled regulation and asset ownership of the power sector started to be privatized. The SAP (Structural Adjustment Program), which funded and oversaw the privatization and commercialization of public utilities, was the manifestation of these liberal goals in Nigeria [40].

To define guidelines for the transportation, distribution, marketing, and price of natural gas, the Nigerian Gas Company (NGC) was established in 1988 [41]. The Federal Government issued a directive granting tax breaks to financiers of gas projects in 1990. The Oil and Gas Pipeline Regulations were put into effect in 1995 to establish guidelines for pipeline operation and maintenance as well as design, construction, inspection, and testing [42].

These are manifestations of gas supply choices at the constitutional level.

From 2000 onward, Nigeria's privatization policies became more aggressive. The growth of the electrical business was influenced by both private agents and the World Bank. In the meta-constitutional arena, the political elites started to voice their concerns about the environmental pressures coming from international multilateral accords like the COPs (Conference of the Parties) on the UN Climate Change Convention. We saw the establishment of two organizations in charge of climate change concerns in addition to the FME, founded in 1999: the Special Unit of Climate Change (SUCC) and the Special Unit on Renewable Energy (SURE) [43]. Concerns about climate change and the depletion of reserves in relation to power growth schemes were evident at this time. However, the amount of power generated from natural gas continued to rise.

The National Electric Power Policy (NEPP), which was established in 2001 and is now in charge of carrying out changes, was founded. The National Integrated Power Project (NIPP) was created in 2004 with the goal of increasing the capacity of gas power plants to generate energy. The Federal Government finally

undertook a series of structural changes in 2005, resulting in The Reform Act (Electric Power Sector Reform Act - EPSRA), which gave private holders ownership and management of the industry [43]. They received recognition as Independent Power Producers and were given permission to sell power to NBET (Nigerian Bulk power Trading) [44]. Additionally, the Nigerian energy Regulatory Commission (NERC) was established as the regulatory agency in 2005. Its mandate is to oversee new private agents in the energy sector in accordance with instructions from the Federal Government. In addition, the Power Holding Company of Nigeria (PHCN), which was in charge of the privatization agreements with eleven distribution firms, started to run. With 18 autonomous businesses split between public and private agents, the Nigerian energy sector is now set up as a result of this reform [45].

8. THE PROBLEMS OF THE ELECTRICITY SECTOR AND RECOMMENDATIONS

In fact, in Nigeria, 60% of the time, there is no access to electricity [46]. A few studies have attempted to evaluate Nigeria's energy sector reform [47]. Some have concentrated on the reform's investment potential and dangers [48], others have assessed the impact of the reform [49]. Yet others have looked at it from consumer perspective [50]. Generally speaking, the political economics of the reform process has received less attention in these studies than the obstacles and possibilities presented by the change. The most obvious and difficult political economics problem affecting the power sector reform continues to be political interference. Privatization should have resolved this problem, but because of ongoing bailouts, it still continues. The industry must be entirely private with just public regulation in order to resolve this issue permanently. This will guarantee productivity, no disruption, and improved service.

The weakest link in Nigeria's energy value chain is the transmission portion of the industry [51]. Transmission lines in Nigeria are infamous for their age and fragility. Some of the cables have been compromised and are no longer able to handle the demands of carrying electricity. Furthermore, the transmission network has limited coverage across the country. It is crucial for the sector to adopt international best practices as the current infrastructure is not only ineffective but also hazardous.

Corruption stands out as a major factor behind the deterioration of the Nigerian electricity sector, which necessitated its reform. However, the reform process itself has been marred by allegations of corruption right from the start. One instance involves the claim that a significant portion of the US$16 billion invested in the National Integrated Power Project (NIPP) during President Obasanjo's administration was mismanaged. Under President Yar'adua, a two-year gap in funding NIPP projects occurred due to rigorous legal, political, and financial scrutiny aimed at rectifying the alleged corruption. Several high-ranking officials of the Rural Electrification Agency and key members of the House of Representatives Committee on Power were charged by the Economic and Financial Crimes Commission for embezzling NGN6 billion belonging to the Rural Electrification Agency. Additionally, during the privatization process involving negotiations with former Power Holding Company of Nigeria (PHCN) employees, allegations arose that the workers' pension fund of approximately NGN88 billion, which had been deducted from their salaries at a rate of 7.5 percent, was misappropriated.

The institutional framework for power sector reform exhibited inherent structural weaknesses. These weaknesses stem from evident gaps, overlaps, confusion, and interconnections in the mandates and relationships among these institutions as outlined in their respective enabling laws. The issue of which institution is responsible for assuming a coordination and leadership role in the power sector often remains ambiguous. For instance, while the National Power Training Institute of Nigeria (NAPTIN), a capacity-building institution, is mandated to ensure effective monitoring and compliance with technical and operating standards, this same responsibility is also assigned to the Standards Organization of Nigeria and the National Environmental Standards and Regulations Enforcement Agency, revealing an overlap of mandates among these institutions.

The government should prioritize the continual development of an effective institutional framework that ensures the sustainability of reform efforts. Significant attention must be given to the regulatory, institutional, and human capacity aspects required for managing post-privatization challenges. The multitude of policy pronouncements, documents, committees, commissions, and other frameworks related to power sector reform should be reviewed and

appropriately aligned to reflect current realities. Continuous development of the power sector through legislation and regulations, as well as their enforcement, is also vital. Furthermore, increased investment in clean and renewable power generation is necessary to achieve an optimal energy mix for the country [52].

9. CONCLUSION

This article has critically analysed the Nigerian electrical sectorcarefullyhighlighting the institutional framework as well as the legislations governing the sector. It also analysed the history and development of the sector till date as well as the issues plaguing it with ways of solving most of them. This article also looked into the merits and demerits of theprivatisation and how effective or useful it has been to the average Nigerian and the Nigerian government.

Bearing this in mind, this article submits that there is still much left to do from all players in the sector and if there is to be any improvement, there is the need for a thorough overhauling of the entire sector and not merely privatization.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Ogunleye EK. Political Economy of Nigerian Power Sector Reform. 2017;391-409.
2. The six generating companies include two hydro stations that were sold as a concession to private firms. Those are Kanji Hydro Plant Station and Shiroro Hydro Plant Station.
3. The country's transmission service provider – the Transmission Company of Nigeria (TCN) was contracted in 2012 to the Manitoba Hydro of Canada for managers preparatory to possible privatization. See Editorial, "Canadian firm wins USD24m Nigerian power deal"Biztech Africa; 5 April 2012.
   Accessed on Tuesday, 29 August 2017.
4. The only exceptions are the 10 Nigerian Integrated Power Plants (NIPPs), which are awaiting completion of the privatization and a few power plants owned by some major oil companies in Nigeria.
5. Ngozi Okonjo-Iweala, Reforming the Unreformable: Lessons from Nigeria (MIT Press, 2012) 43-45 for a brief discussion of the liberalization of the telecom sector and the privatization of NITEL and its mobile arm, MTEL.
6. National Council on Privatization, National Electric Power Policy (Federal Republic of Nigeria, 2001) for the policy thrusts of the electricity sector reform in Nigeria.
7. Privatization and Commercialization Act. 1988;3.
8. Public Enterprises (Privatization and Commercialization) Act. 1999;9.
9. ibid s. 12.
10. Amadi S. The Rule of Law Approach to Regulating Electricity Supply in Nigeria. 2017;27.
11. Jegede OJ, Idiaru W. Nigeria: Overview of Electricity Law In Nigeria; 2021.
    Accessed on April 6, 2023.
    Available:https://www.mondaq.com/nigeria/oil-gas--electricity/1075234/overview-of-electricity-law-in-nigeria
12. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), (2015), The Nigerian Energy Sector: An Overview with a Special Emphasis on Renewable Energy, Energy Efficiency and Rural Electrification 2nd Edition.
13. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), (2015), The Nigerian Energy Sector: An Overview with a Special Emphasis on Renewable Energy, Energy Efficiency and Rural Electrification 2nd Edition.
14. data.worldbank.org/indicator/EG.USE.COMM.GD.PP.KD Energy use (kg of oil equivalent) per $1,000 GDP (constant 2011 PPP).
15. Amadi S. The rule of law approach to regulating electricity supply in Nigeria
16. The need for privatizing the electricity sector was originally articulated in the National Electric Power Policy (NEPP) 2001 and later incorporated in the Electric Power Sector Reform (EPSR) Act; 2005.
17. Ogunleye EK. Political Economy of Nigerian Power Sector Reform. WIDER Working Paper 2016/9; 2016.
18. Ogunleye EK. Political Economy of Nigerian Power Sector Reform. 2017;391-409.
19. African Development Bank.
    Available:http://nigeria.opendataforafrica.org/

20. Available:www.nercng.org/index.php/document-library/func-download/312/chk,d6b1bfbe4d840a2d18d6206c31798caa/no_html,1/
Market rules - For Transitional and Medium Term Stages of the Nigerian Electricity Supply Industry.
21. Jegede OJ, Idiaru W. Nigeria: Overview of Electricity Law In Nigeria; 2021.
Accessed on April 6, 2023.
Available:https://www.mondaq.com/nigeria/oil-gas--electricity/1075234/overview-of-electricity-law-in-nigeria
22. 2023 Laws of the Federation of Nigeria.
23. Explanatory Memorandum of the Electricity Act; 2023.
24. Section 3,4 and 5 Electricity Act; 2023.
25. CAP E7, Laws of the Federation of Nigeria 2004 (EPSRA); 2005.
26. Pavanelli JM, et al. An Institutional Framework for Energy Transitions: Lessons from The Nigerian Electricity Industry History Pre Print; 2023.
27. Ayamolowo OJ, Buraimoh E, Salau AO, Dada JO. Nigeria Electricity Power Supply System: The Past, Present and the Future, IEEE PES/IAS Power Africa Conference: Power Economics and Energy Innovation in Africa, Power Africa 2019;2019:64–69.
Available:https://doi.org/10.1109/PowerAfrica.2019.8928767.
28. Oladipo K, Felix AA, Bango O, Chukwuemeka O. Power Sector Reform in Nigeria: Challenges and Solutions Power Sector Reform in Nigeria: Challenges and Solutions; 2018.
Available:https://doi.org/10.1088/1757-899X/413/1/012037
29. Akpen P. Electricity Regulatory Institutions in Nigeria: From Colonial to Post Colonial Periods, Ovidius University Press; 2017.
30. Edomah N, Foulds C, Jones A. The role of policy makers and Institutions in the Energy Sector: The Case of Energy Infrastructure Governance in Nigeria; 2016.
Available:https://doi.org/10.3390/su8080829.
31. Steyn P. Oil exploration in colonial Nigeria, c. 1903-58, Journal of Imperial and Commonwealth History. 2009;37:249–274.
Available:https://doi.org/10.1080/03086530903010376
32. Edomah N. The governance of energy transition: lessons from the Nigerian electricity sector, Energy Sustain Soc. 2021;11:40.
Available:https://doi.org/10.1186/s13705-021-00317-1
Also MO. Oseni, An analysis of the power sector performance in Nigeria, Renewable and Sustainable Energy Reviews. 2011;15:4765–4774.
33. Edomah N. Historical Drivers Drivers of Energy Infrastructure Change in Nigeria (1800 – 2015), in: S. Gokten, G. Kucukkocaoglu (Eds.), Energy Management for Sustainable Development, 1st ed., Intech Open, London, UK; 2018.
Available:https://doi.org/10.5772/intechopen.74002
34. Pavanelli JMM, Oliveira CE, Igari AT, O desafio das mudanças institucionais da economia ecológica: Um framework a partir do IAD de Ostrom, Revista Iberoamericana de Economia Ecológica. 2022;35:36–55.
Available:https://redibec.org/ojs/index.php/revibec/article/view/vol35-1-3
35. Aliyu AS, Ramli AT, Saleh MA. Nigeria electricity crisis: Power generation capacity expansion and environmental ramifications, Energy. 2013;61:354–367.
Available:https://doi.org/10.1016/j.energy.2013.09.011
36. Ladan MT. Overview of recent development in Energy Resources Law in Nigeria, SSRN Electronic Journal. 2014;26.
Available:https://doi.org/10.2139/ssrn.2404337
37. Akpen P. Electricity Regulatory Institutions in Nigeria: From Colonial to Post Colonial Periods, Ovidius University Press; 2017.
38. Junior HQP. Edmar fagundes de Almeida, josé vitor Bomtempo, M. Iootty, R.G. Bicalho, Economia da Indústria Elétrica, in: Economia Da Energia, 4a tiragem, Campus Elsevier, São Paulo. 2007;343.
39. Oladipo K, Felix AA, Bango O, Chukwuemeka O. Power sector reform in Nigeria: Challenges and Solutions Power Sector Reform in Nigeria: Challenges and Solutions; 2018.
Available:https://doi.org/10.1088/1757-899X/413/1/012037
40. Victor DG, Heller CT. The Political Economy of Power Sector Reform: The Experiences of Five Major Developing Countries, 1st ed., Cambridge University Press, Cambridge, UK; 2007.

41. North DC. Institutions and the Performance of Economies Over Time, in: Handbook of New Institutional Economics. 2008;21–40.
42. Ladan MT. Overview of Recent Development in Energy Resources Law in Nigeria, SSRN Electronic Journal. 2014;26. Available:https://doi.org/10.2139/ssrn.2404337.
43. Emodi NV. Frontiers in African Business Research Energy Policies for Sustainable Development Strategies: The Case of Nigeria, 1st ed., Springer; 2016.
44. Victor DG, Heller CT. The Political Economy of Power Sector Reform: The Experiences of Five Major Developing Countries, 1st ed., CAMBRIDGE UNIVERSITY PRESS, Cambridge, UK; 2007.
45. Agboola OP. Independent power producer (IPP) participation: Solution to Nigeria power generation problem, in: Proceedings of the World Congress on Engineering 2011, WCE 2011, London, England. 2011;2084–2087.
46. Aliyu A, Ramli A, Saleh M. Nigeria Electricity Crisis: Power Generation Capacity Expansion and Environmental Ramifications. Energy. 2013;6(8):354–67.
47. Adenikinju AF. Electric Infrastructure Failures in Nigeria: A Survey-based Analysis of the Costs and Adjustment Responses. Energy Policy. 2003;31(14): 1519–30.
Oke C.A. Resuscitating and Sustaining the Nigerian Power Sector'. Paper presented to the Nigerian Association for Energy Economics (NAEE) at the NNPC Towers; 14 August 2008.
Okoro OI, Chikuni E. Power Sector Reforms in Nigeria: Opportunities and Challenges. Journal of Energy in Southern Africa. 2007;18(3):52–7.
48. David-West A. Nigerian Power Sector: Value Investment Opportunity or Value Trap? CSL Stockbrokers Power Sector Infrastructure Review, UK; 2014.
Also, Onochie UP, HO Egware, TO Eyakwanor. The Nigeria Electric Power Sector (Opportunities and Challenges). Journal of Multidisciplinary Engineering Science and Technology. 220;15(4):494–502.
49. Adoghe AU, Odighe A, Igbinovia SO. Power Sector Reforms: Effects on Electric Power Supply Reliability and Stability in Nigeria'. International Journal of Electrical and Power Engineering. 2009;3(1):36–42.
50. Ochugudu AI, Onodugo VA. Power Sector Reform Deliverables: How Well and How Good to Customers? International Journal of Management Technology. 2013;1(1):1–14.
51. Ogunleye EK. Political Economy of Nigerian Power Sector Reform. 2017;391-409.
52. Ibid.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/101706