

# **Legal and Regulatory Mechanism of Electricity Generation and Distribution in Nigeria: A Review of Ibadan Electric Distribution Outlets**

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## **Abstract**

Power supply is a very fundamental part of man's daily living. It is needed in our homes, hospitals, offices, schools and in the society generally. It also promotes industrialization of countries. It is widely known that efficient power supply is apposite for the economic development of any nation. In Nigeria and some other developing nations, the electricity generation and distribution is at an all round low for more than decades. There is constant failure and instability in power supply and this inhibits the economic growth in Nigeria. This power failure is due to many reasons and this paper examines some of those reasons. The paper analyses electricity generation and distribution in Nigeria with particular reference to Ibadan Electricity Distribution outlets. It also examines the legal and regulatory mechanisms intended to improve the efficiency of power supply in Nigeria. The qualitative approach is used in this article. Secondary data from scholarly published books, journals, articles, on line materials and reports is used in this work. The study concludes that unless the power supply situation improves in Nigeria, the country cannot truly experience sustainable economic development and all round growth. Hence, the paper recommends that, the government dedicate resources and energy into the generation of electricity sufficient for the country and her economic advancement.

**Keywords:** Power supply, generation, distribution, regulatory, legal mechanism.

## **Introduction**

In many developing nations, there have been various attempts at reforming the power sectors, though the movement is at a level similar to what obtains in industrialized nations (Bacon and Besant-Jones, 2002). The genesis of the so called reforms in the Power sector dates back to 1981 in Chile, then to 1990 in Wales and England and to Norway in 1991. Recently, various international financial institutions have made compulsory reforms a pre-requisite before lending money to developing nations. A large amount of financial resources and energy have gone into the reformation of the infrastructure industries in many developing nations, geared by economic reasoning, ideologies and testimonials (Jamasb et al, 2005).

The incessant failure to generate and transmit power supply in Nigeria is a matter of great concern which arises from a series of factors and has led to a serious problem which inhibits Nigeria from attaining real sustainable economic development. Power facilities are apposite for economic development and to ensure that the country is freed from the poverty it currently wallows in. In 2016, the World Bank estimated that about 86 million people survive on US\$1.90 a day in Nigeria. This means that Nigeria takes second place after India in the list of poorest countries in the entire world (World Bank, 2016a). The population of Nigeria was about 182 million in 2015, and this number grows at the rate of 2.6% annually (World Bank, data1). As at 2019, Nigeria's population is about 200 million already.

There is a clear relationship between economic growth and availability of efficient power infrastructures. According to Akinlo (2009), after analysing the connection between economic development and energy usage for a period of 26 years (1980-2011), he established that there exists an integration between electricity consumption and gross domestic products, hence improving the efficiency in power supply and usage of power in Nigeria can help to stimulate the country's growth and development. Also, Iyke (2015) was of the opinion that there is a clear connection from power supply consumption to economic advancement, both in the present and in the far future.

In 2010, the government of Nigeria created a target vision of 40,000MW capacity of electricity generation by 2020 (Roadmap, 2010). As a result of a failure of the market reform and clearly seeing that the vision target was near impossible, the government made a new target of 30,000MW which was to be achieved by 2030 (FGN, 2016b). As at now, the nation has been able to attain the installation of a capacity of electricity generation of 10,584MW (World Bank, 2016c). This capacity is quite unimpressive as even countries with far less population than Nigeria have far higher capacity of electricity generation. Hence, with the level of Megawatts, it comes as no surprise that Nigeria has incessant power outages (IEA, 2014). In a World Bank household survey conducted in 2016, it was shown that only about 56% of Nigerians have grid connection accessible to them. In such areas, the frequent power failure means that either the demand is not met, or other means like the use of diesel-fueled generators, are resorted to (IEA, 2014). Also, World Bank reports also shows that 31% of the populace recorded total blackout in grid connected areas in the past 7 days, and 57% of households recorded daily blackouts in their various areas (World Bank, 2016b).

The use of back-up electricity generation is costly and their usage is most times not included in the statistics on energy (IEA, 2014). Estimates of the IEA shows that 12TWh of the electricity generated in 2012 used back-up generator, and it amounted to about US\$3.75 Billion (Ibid). Despite the use of back-up generator, there is still a high electricity demand that is not met, and many homes suffer from electricity failure (IEA, 2014). People in Nigeria who cannot afford their own private or estate generator live without power supply whenever there is a power failure, and those who can afford the generators do so at a high cost and have to turn on the generator at intervals in other to save cost (Ibid). In correlation, 51% of the Nigerian populace are classified by the world bank as poor, and this includes both the urban and rural areas. The challenging issue of power supply failure in Nigeria stifles the economic, social and all round growth and development of Nigeria, and there is a need for solutions. Thus, Electricity Market Reform was viewed as the solution to Power supply failure in Nigeria.

According to Amadi (2014), the problems which make the reform a necessity are: “i. Poor sectoral capacity ii. Government’s inability to run a world class sector iii. Endless capital injection without corresponding output iv. National power dilemma entangled in Politics v. Ever expanding workforce of the vertically integrated monopoly - Power Holding Company of Nigeria (PHCN) and sundry liabilities far outstripping an ageing asset base vi. Government funding always outstripped by sector’s colossal financial appetite and vii. A national culture of non-payment for public goods.”

Thus, the main goal of the electricity market reform is to ascertain that Nigeria’s power supply industry is efficient and sufficient enough to meet the demands of the citizens in today’s world. Some other objectives are to ensure that the power supply coverage in Nigeria is expanded and modernized, in order to achieve economic, social and national advancement (ECN, 2014). The reform process commenced in 2010 following years of postponement, after the launching if Roadmap (2010) and the passing on of the liabilities and assets of PHCN to new private investors. After some years of delay, the reform process fully started in 2010 after the launch of the Roadmap (2010) and the transfer of assets and liabilities of PHCN to the new investors. Ever since, there has not been any major notable improvement in the power supply industry in Nigeria.

### **Brief History of Nigeria Power Sector**

The history of power supply in Nigeria goes back to the year 1866 when the colony of Lagos had two small electricity generating sets installed to serve her. The electricity corporation was then formed in 1951 by an act of the parliament, for the purpose of providing electricity in Nigeria. After that, the Niger Dam authority was formed for the carrying out of power supply project at Kainji, located on the River Niger. Further to that, the establishments were joined in 1972 and it became the National Electric Power Authority (NEPA) (ECN, 2014).

National Electric Power Authority then became the government owned company, solely in charge of all that is involved in the value chain, i.e., generation, transmission, distribution and retailing of power supply in Nigeria. The National Electric Power Policy 2001, was the reason for the existence of the Electric Power Sector Reform Act, March 2005 (Arowolo and Yannick, 2017). These Act was enacted to make provisions for the unbundling of the power sector, the growth of a competitive market and the forming of the Nigeria Electricity Regulatory Commission (NERC), which is an independent agency for regulation (Ibid). Thirty days after, the Bureau of Public Enterprises (BPE- Government department overseeing the issue of privatization, renamed NEPA to Power Holding Company of Nigeria (PHCN). The liabilities and assets of NEPA was to be taken over by PHCN before the reform and pass it on to private companies after the reform process. Following this, the totality of installed capacity rose up from 30MW which was the megawatts in 1956, to about 6,000 MW in year 2006 (ECN, 2014).

There is general agreement that the system of Nigeria’s power supply sector, i.e., a vertically-integrated public sector kind of market, is not sufficient to provide the amount of electricity needed to adequately match demand with supply (RoadMap, 2013). As a result of this, the National Electric Power Policy (2001) initiated the Electric Power Sector Reform Act of 2005 (Ibid). These Act provided legal support to the establishment of companies and the transfer of assets of NEPA, the growth of a non-monopolized power supply market, and the creation of the Nigeria Electricity Regulatory Commission (NERC), a body with the duty of forming, promoting and preserving a well rounded industry and market structure, and also to ascertain the proper use of assets for the provision of power supply services in Nigeria (EPSRA, 2005).

The 2010 power sector reform was a customer based plan to ensure stable electricity in Nigeria. The reform had a well thought out strategy for the process. The privatization commenced with the Electric Power Sector Reform Act of 2005 and the implementation strategies which ensued in that year after the commencement of the Power Sector Reform Roadmap in 2010, led to the unbundling of the vertically-integrated and monopolized PHCN, into six generation enterprises, eleven distribution

companies, and a transmission network. The transmission network however remained Government owned, overseeing the six geopolitical zones in Nigeria. Hence, the privatization covered not just the redistribution of the rights to the properties from being state owned to private investors, but also the establishments of institutionalized structures to manage trading and provide protection to securities, intangibles and lands (Sonja, 2008). Also, there are about ten National Integrated Power Plans owned by the three tiers of government jointly. These NIPP were under formation during the reform, and yet to be privatized, and the Independent Power Plants which are owned by some private investors and some state governments.

## **Nigeria's Energy Crisis**

Nigeria is a country on the west of Africa. It is Africa's most populous country, with more than 150 million living in the country. The Nigerian Energy Policy report in 2003 estimated that the population which has access to the grid system does not have electricity 60% of the time(Okoye, 2007).Also, about 40% of the Nigerian population has no connection to the grid system at all (Ibid). The truth about the situation is that the electricity generated is not sufficient to provide for the whole population. Despite the fact that the government has acknowledged that electricity is a major problem in Nigeria, it has not succeeded in properly organizing and financing the sector.

In a bid to improve the situation of things, the government separated the NEPA into two different sectors in 2005. One sector to oversee the generation of power, and the other sector to oversee the distribution of the power generated (Akinrinade, 2008). A part of the plan was the privatization of the sectors in order to ensure a well organized and financed development of the sector. Most of the population in Nigeria was opposed to this supposed privatization, it however still took place. The privatization to many has still not yielded much benefit as the power supply sector in Nigeria is still in a state of disarray. As a result, many Nigerians are opposed to any attempt at further privatization.

The dislike of privatization by the average Nigeria also arises from the failure of the government as regards the privatization of the water sector years back. The privatization led to a situation where many Nigerians could not afford clean and good water and had to resort to unsanitary water from streams in the community. This occurrence according to a study conducted by Ariyo (2007) led to a shared hatred for privatization of utilities in Nigeria (Ibid). However, study has shown that the Nigerian government is almost incapable of providing the needed amount of electricity to go around the country's population without financial support from private enterprises. The dislike of privatization also exists amongst the workers of the energy sector as it is feared that jobs will be lost in the process. This led to series of talks of sabotage by employees of the energy sector (Akinrinade, 2008).

## **Electricity Generation in Nigeria**

The pioneer electricity generating set in Nigeria was made in 1896 in Lagos state. The installation was done at hidden units which were owned and managed by the Native authorities in Kano or Ibadan, or by the departments of public works in Port-Harcourt and Warri. These hidden units were then joined together when the ordinance No.15 of 1950 was passed by the Nigerian Colonial government. The ordinance established the Electricity Corporation of Nigeria (Uwaifo, 1994).Further, the Niger Dams Authority which was established in 1962 by an Act of the parliament to explore the water resources of the River Niger area, and the Corporation, were then merged in 1973 to form the National Electric Power Authority by decree No. 24, 27th June, 1972 of the Federal Military Government (Ibid).

The first generating set in 1956 was known as Ijora 'B' Power station and was commissioned in Lagos by Queen Elizabeth and the head of the British Commonwealth. By the first half of the 1960's, there was in existence a grid power transmission structure which linked major power stations in Ughelli Delta, Jebba, Egbin, Lagos, Kainji, Ogorode Sapele, Afam and Shiroro (Ibid). The grid system functioned for every capital of states in Nigeria. As at 1992, the totality of generation plant capacity

installed had culminated to about 5,900 megawatts. The main power supply available was about 3,000 megawatts, and there was a coincident highest demand of 2,400 megawatts (Uwaifo, 1994). The total installed strength of the electricity generating station in Nigeria by 2009 was 5,000MW. However, only about 2,900MW was recorded to have been generated by November 2009 (Babalola, 2009).

Electricity generation can be from hydro, wind, solar or thermal generation stations. At thermal generating stations, the said power supply is derived where fossil fuels like natural gas, coal, or crude oil, are burnt down to achieve high pressure, mostly 2,400 to 3,500 lb/in<sup>2</sup>, and the temperature steam is as high as 1,000°F. This is used to drive turbines at 3,600 rev/min, which then drives the electrical generating sets to produce power supply (Donald, Beaty, Miley and Clapp, 2000). As for the solar power generating sets, lenses or mirrors are used to focus the sun into a limited area and then the heat derived is used to raise the steam in order to drive the generators and steam turbines to create what is known as Alternative Current power. Generally, there are two ways of generating electricity, the conventional way, and the unconventional way. Prime movers like diesel or petrol engine, steam turbines, are used for the conventional ways, while prime movers are not adopted for the unconventional way (Hadi, 2004).

## **Causes of Implausible Electricity Generation, Transmission and Distribution in Nigeria**

There are quite a number of factors causing the failure of the power supply sector in Nigeria. Of the plethora of reasons, the main ones are:

- (i) Destruction of various oil and gas pipelines, exploration of oil and gas and the wrong use of equipment and facilities as a result of the trouble ensuing in the Niger Delta area (Yusuf, Boyiand Muazu, 2007).
- (ii) The forceful taking, i.e., kidnapping of local and foreign personnel who are responsible for overseeing various oil and gas facilities in Nigeria, leading to the abandonment (Yusuf, Boyiand Muazu, 2007).
- (iii) The failure of the government to appropriately work together with multinational oil corporations to explore and use completely, the gas, as a result of gas flaring. Such gas being a great energy source for power supply generation (Ibid).
- (iv) A low degree of yearly rain in Nigeria as a result of the issue of global warming, thus leading to a global climate change which has an effect on the size of water at the hydro reliable generation stations. The quantity of available water usually determines the level of dependency on hydro during seasons that have low turn out of rainfall. This period is usually between March to June of every year (Sada, 2007).
- (v) Failure to efficiently manage water in Nigeria affects the quantity of water at hydro reliable generation stations.
- (vi) High level of corruption, mismanagement and bribery occurring in the Power supply sector in Nigeria.
- (vii) In-existence of strategies for advancement, growth and research which has its main focus on the conduction of investigations of the various kinds of power generating strengths in Nigeria, and the proper use of same. The research and growth in the power generation area, transmission and even distribution of same can ensure that adequate data is collected, and proper services offered to private enterprises and the government involved in the power sector (Ibid).
- (viii) Failure to appropriately find and develop various methods of power generation in Nigeria. Nigeria only makes use of gas, oil, and dams for the generation of power supply. There are other numerous sources like, wind, biomass, and solar, and also nuclear, which can be adopted to assist the use of oil, gas and hydro. The Katsina state government claims that it is already investing in the use of bio-mass and wind as sources of energy (Yusuf, Boyiand Muazu, 2007).

- (ix) The preservation culture in Nigeria and the strategies for the achievement of same is relatively poor. Timely maintenance is not conducted regularly. If the equipment and facilities are well maintained, it will ensure that the utilities and electricity is available for every residence of Nigeria almost at all times (Oroge, 1991). It is highly difficult for the power sector to be maintained if there is not enough finance to get the equipment required and fund the cost of management. Maintenance is very important with regards to any physical structure, for example, readiness of facilities required for generation transmission and distribution. The maintenance involves all the activities carried out to maintain the state of such facilities, preserve it, and restore back to the usual state. Such maintenance can be either planned or unplanned. Most of the times, the sort of maintenance conducted by the Nigerian power sector are usually unplanned as they are mostly spontaneous following a system failure.
- (x) As a result of the incessant power failure, corruption of the workers of the PHCN and bill collectors in Nigeria, many Nigerians are usually reluctant to pay their electricity bills; hence, there are a large number of people owing the Power Holding Company of Nigeria electricity charges. Illegal connection by some people, and destruction of equipment by vandals, also result into the PHCN having a low revenue generated to them.
- (xi) Also, there have been situations when electricity transmission and distribution lines have either been destroyed by vandals, wind, or by construction workers, soil erosion and even fluid.
- (xii) The wide distance between the generating stations and the various load centres causes a loss of transmission lines (Yusuf, Boyland Muazu, 2007).

## **The Electricity Reforms in Nigeria**

The Nigerian electricity generation developed from the small kilowatts serving colonial leaders in 1998 in Lagos where the initial generating set was laid down (Isola, 2012), in the 19<sup>th</sup> century, to the Electricity Corporation of Nigeria (ECN), created in 1951 by an Act of parliament. In 1962, one decade after, the Niger Dams Authority was established for the development of hydroelectricity and was joined with the Electricity Corporation of Nigeria (ECN), which then formed the National Electric Power Authority in 1972. Despite the increase in the population of Nigeria, the electricity generation reduced and there was no actual strategy put in place to ensure a rise in capacity. As a result of this, power supply in Nigeria deteriorated, and the demand for power became far more than the power available for supply. As at 2000, this problem had led Nigeria into a power supply crisis, leading the Federal Executive Council in 2001 to formulate the National Electric Power Policy (*Ibid*).

This policy was intended to ensure critical changes in the ownership of the power sector, the regulation and the control and management of same. This 2001 policy was what set the road for the subsequent privatization of the power sector in Nigeria. However, the inadequacies of the Nigeria government delayed the signing of the bill into Law till 2005. After being signed into Law, it then became the Electric Power Sector Reform Act of 2005. It was expected that the reform will cause a number of economic implications and effects for the investors and the citizens (Makwe et al., 2012). Agboola (2011) is of the opinion that Nigeria's power supply challenge will be resolved if and when the IPP participation is effected, since it would help improve financial investments which the government are unable to provide. By the Reform Act, the National Electric Power Authority became incorporated as the Power Holding Company of Nigeria PLC.

According to Alohan (2012), the challenges which caused the reforms as stated by the Bureau of Public Enterprise (2011) are:

- a) “Limited access to infrastructure.
- b) Inadequate power generating capacity.
- c) Inefficient usage capacity.
- d) Lack of capital for investment.
- e) Ineffective regulation.

- f) High technical losses and vandalism.
- g) Insufficient transmission and distribution facilities.
- h) Inefficient use of electricity by consumers.
- i) Inappropriate industries and market structure.
- j) Unclear description of roles and responsibilities.”

Ensuing from the enumerated challenges, the Reform Act tried five objectives in a bid to resolve the challenges:

1. Unbundling of the National Electric Power Authority into 18 different successor companies all incorporated in the Power Holding Company of Nigeria.
2. Making private the entities that were birthed from the unbundling.
3. Creation of a regulatory agency for the control and regulation of the sector. The agency established is the Nigerian Electricity Regulating Commission.
4. Creation of a fund and agency for ensuring rural electrification. This was done, and it was affected by corruption which caused it to be suspended from year 2006 to 2009.
5. Establishment of a Customer Assistance Fund for the power supply sector.

### **Legal and Regulatory Measures: The Reform Act**

Overtime, there have been various legal and regulatory measures adopted by the government, in form of reforms and establishment of agencies to oversee the regulation of the power industry, and to provide better electricity supply for the citizens of Nigeria. In line with Nigerian Power Sector Guide (2013), the Electric Power Sector Reform Act, 2005 can simply be seen as the solid beginning of the restructuring of the power sector in Nigeria. The Act which was birthed from the National Electric Power Policy, first adopted in 2001, saw the creation of the foundation by which numerous private corporations are now involved in the transmission, generation and even distribution of power supply in Nigeria.

According to Victor and Ismail (2013), the reform was commenced in March of 2005 because of incessant power supply, total failure in some areas and frequent issues with electricity bills. The primary aim of the reform is to enable and ensure an absolute deregulation of the Electricity Supply Industry within two years after the implementation. Some of the objectives are: providing more electricity generation capacity and fulfilling the demand of consumers, ensuring that the power sector is inviting and friendly to investors, and the unbundling of NEPA. All this was achieved to an extent with the passing of the Reform Act of 2015 which came into force on March 11, 2005.

The reform was informed by a need for competition in the power supply industry to curb the excesses caused by the monopoly of the sector by the government. The competition would also serve as a means of bettering the efficiency of the sector which will result into lower energy prices and more electricity supply. Also, the reform was intended to ensure price transparency and clear declaration of any subsidies in existence, the prevention and curbing of corruption, incompetency in management and inefficiency of workers. The reform also had the aim of causing sustainable development, good policy decisions by the government.

The Reform Act replaced the previous law which established the National Electric Power Authority. Subsequent to that, the Power Holding Company of Nigeria was established and administered the role of providing electricity. Also, it led the sector to be reformed from a monopolized vertically made structure into eighteen unbundled entities, which comprises of one power transmitting company known as Trans-CO, six power generation enterprises, called the Gens-COs, and eleven power distribution companies known as the Dis\_COs.

Victor and Ismail (2013) further stated that the Reform Act laid its attention on the privatization and liberalization of the major provider of electricity, i.e., Power Holding Company of Nigeria while bringing in other Independent Power Producers. The Reform Act makes for a complete market which commences with a person buying electricity made by Power Holding Company of Nigeria and the

Independent Power Producers, same would then be offered for sale to the eleven DisCOs who will then offer it for onward sale. Inugonam (2005) thus expressed the view that the Act also provides for the establishment of the Nigeria Electricity Regulatory Commission (NERC), a body responsible for:

- (i) The regulation and monitoring of quality services and tariffs.
- (ii) Supervising of the activities of the sector to ensure efficient results.
- (iii) Ensure compliance with the rules and regulations of the regime.
- (iv) The provision of licenses for the generation, distribution, trading and transmission companies that were birthed from the unbundling of NEPA.

Provision of a legal basis with the needed enabling laws for the establishment, enforcement, changing, and regulation of the technical and practical rules, and market standards.

In November 2005, the Nigeria Electricity Regulatory Commission was commissioned and they assumed full duty. Other areas of the reform provided for the formation of the National Electric Liability Management Company, an entity established for the management of residual liabilities and assets of the former National Electric Power Authority.

## **Recommendations**

Following from the Electricity situation in Nigeria, the author makes the following recommendations:

The government need to adequately and sincerely tackle corruption in the power sector. The citizens of Nigeria have zero trust in the government and this causes distrust in the privatization and leads to refusal to pay electricity charges as at when due. The refusal to pay these charges results in unavailability of enough revenue for the power supply sector to better the industry.

Also, the involvement of the government at all levels, in the investments into the power supply market should be based on professionalism, integrity and efficiency, not based on the so called quota system or politics.

Foreign participation should be encouraged as the investments is important, and such participation should be on the basis of performance, experience and financial ability.

The generating capacity of the various generating sets should be increased in order to curb the menace of power outages, and in achieving this, the numbers of generating plants locations should be decreased. This will help to reduce the difficulty of gas pipeline network and will also minimize the risks of vandal's destruction.

Several teams should be created from the relevant ministries and government departments to work together for the all round sustainable development in the power supply industry in Nigeria. This will ultimately be favorable for the growth and development of the nation as a whole.

## **Conclusion**

Many countries in the world have reached a point where electricity is no longer a luxury and is available for all, whether poor, average, or rich. It is an important infrastructure to any growing economy and it is needed for the full functioning of the home, offices, industries, railways, bus stations, schools, hospitals and all other organizations. In recent times, many developing countries have achieved a great feat with regards to the supply of electricity in their countries. However, it is saddening that such is not the case in Nigeria. For many decades, the power supply sector have been nothing short of a failure. Although there are areas in Nigeria that fairly enjoy electricity supply, it is not the case for most places. Over time, there have been legal and regulatory measures taken by the government, in form of reform Acts, to ensure that the situation gets better. The Power Supply sector has evolved over time into the Power Holding Company of Nigeria with Private enterprises in charge of various segments of the company. The author hopes that with the recommendations made, the power sector in Nigeria improves for the better.

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