

Erratic Power Supply In Nigeria: Causes And Solutions

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ABSTRACT: *The erratic power supply in Nigeria is generally believed to be the bane of economic and industrial development in the Country. In this work, factors responsible for this erratic power supply were discussed. The factors include government's inconsistent and misguided power reform policies; inefficiency in power generation, transmission, distribution and consumption; and the incompetent work force of the energy companies. Recommendations towards solving the erratic power supply problem were proffered. One of the recommendations is the adoption of energy conservative policies such as policies to encourage shift from the use of energy inefficient electric devices like incandescent bulbs, old model refrigerators, computers and televisions, to the use of energy efficient LED bulbs, modern refrigerators, computers and televisions. Other recommendations include the immediate discontinuation of default or estimated billing system adopted by the power distribution companies; upgrading of power distribution and transmission equipment; and the immediate engagement of competent and qualified work force by the electric power companies. It was categorically stated that despite the general belief that the erratic power supply problem of Nigeria is as a result of the low power generation capacity of the Country, the major cause of this problem is energy wastage by consumers occasioned by the default or estimated billing system adopted by power distribution companies.*

KEYWORDS: *Erratic power, Nigeria, Energy, LED bulb, Default billing, Estimated billing*

I. INTRODUCTION

It is a widely acknowledged fact that erratic power supply in Nigeria is the bane of economic and industrial development in the country. With the abundant human and natural resources the country is blessed with, it becomes paradoxical that after one hundred years of existence and fifty-four years of independence, Nigeria is still not getting it right in terms of energy sufficiency. If the problem is only that the power is insufficient, it would have been a much more bearable situation but the major problem is that the power supply is erratic. Being erratic mean that the residents and companies requiring electricity cannot predict when this electric power from the national grid will be available for their consumption. In most situations erratic power supply can be equated to no power supply as the work the power is needed for, might have been done before the supply is made available or the power is interrupted before what it is to be used for, is gotten ready. Erratic power supply can also be equated to negative power in situations where the flip-flop nature of the supply causes damage to the equipment being powered. To understand and resolve the pathetic power supply situation in the country, it is pertinent we take a look at where we are coming from, where we are, and where we should be, then analyze the situations and propose how to move from where we are to where we should be.

II. HISTORICAL DEVELOPMENT OF ELECTRIC POWER SUPPLY IN NIGERIA

According to Ubi et al (2012), between the time electricity was introduced to Nigeria and the time Federal Government embarked on reform, three main periods are discernable. First, the period that predated the establishment of the Electricity Corporation of Nigeria (ECN) in 1950, which is characterized by isolated generation facilities with low rates of electrification. In this period, electricity supply in Nigeria was confined to a few urban areas and to mining centres. Some of the power plants constructed in this period include:

- [1] The Ijora, Lagos power plant built in 1898 by the colonial government under the jurisdiction of the public works department. Later, other plants were set up by native and municipal authorities.
- [2] The 2MW hydroelectric power plant at Kurra falls near Jos, constructed in 1925 by a privately owned company, the Nigeria Electricity Supply Company (NESCO).
- [3] The Sapele power plant owned by the African Timber and Plywood Limited, which became operational in 1930.
- [4] And the Shell development Company of Nigeria power plant operated at Bonny and Delta areas from 1942.

The second phase is the period between the establishment of the Electricity Corporation of Nigeria (ECN) in 1950 and the establishment of National Electric Power Authority (NEPA) in 1972.

The need for co-ordination and integration of the operating plants necessitated the establishment of ECN through ordinance No.15 of 1950. The power and functions of the ECN were set out in sections 21, 29, 30 and 50 of the 1950 ordinance. A look at the provision of these sections reveals that ECN was charged with the responsibilities of electric power generation, transmission, distribution and sales throughout Nigeria. In addition, ECN was granted the power to acquire, hold and dispose-off lands for purpose of effective operation and actualization of the objectives of regular power supply. At the completion of the Niger Dam Hydroelectric project at Kanji in 1962, the Niger Dam Authority (NDA) was established leading to the existence of a parallel electricity body. The NDA was mandated to oversee the development of hydro electric facilities in Nigeria. The enabling Act charged NDA with the responsibility for constructing and maintaining dams and other projects on the river Niger and elsewhere in Nigeria. Its functions also included generating electricity by means of water power, improving navigation and promoting fisheries and irrigation.

The third phase is the period after the establishment of the National Electricity Power Authority (NEPA). Owing to the then prevalent buck passing between ECN and NDA on intermittent power failure in Nigeria, the Federal Government decided to merge the two organizations into one body. To achieve this, the Federal Government appointed a Canadian firm of consultants to look into the technical details of the merger in 1971. The reports submitted by the consultants, induced the Federal Governments of Nigeria to establish the National Electric Power Authority (NEPA) through the amalgamation of ECN and NDA. Decree No. 24 of 1972 gave the necessary legal backing. The decree mandated NEPA to maintain an efficient, co-ordinated and economic system of electricity supply for all parts of the federation. NEPA thus became a government monopoly, responsible for the production, transmission and distribution of electricity to end consumers. It generated electricity from the following power stations:

- a. Ijora Thermal Power Station established in 1956
- b. Afam Thermal Power Station established in 1962
- c. Delta Thermal Power Station established in 1966
- d. Kanji Hydro Power Station established in 1968
- e. Ogorode Thermal Power Station established in 1980
- f. Jebba Hydro Power Station established in 1985
- g. Lagos Thermal Power Station established in 1986
- h. Shiroro Hydro Power Station established in 1989.

All the power stations, distribution stations and substations were specially interlinked by a transmission network, the national grid. The whole output of electricity generated nationwide was collected in a pool at the national control center, Osogbo. From there, the electricity generated was redistributed to all parts of the federation. In order to obtain smooth transmission of the electricity generated at the different power stations, NEPA put in place a total of 11,000 Kilometers of transmission lines nationwide. In the same vein, extensive distribution of transformers and other relevant facilities were installed to ensure an even distribution of electricity to all customers across the federation. Despite all these efforts, the situation of power supply in the country keeps worsening. This led the government to the current phase of reform which started with the formation of PHCN. The Electric Power Sector Reform Bill, signed into law on March 11, 2005, enabled private companies to participate in electricity generation, transmission, and distribution. The signing into law of the bill ushered the restructuring and the privatization of the electricity sector. The Act further provided for the establishment of the Nigeria Electricity Regulatory Commission (NERC) to monitor and regulate the power sector as it undergoes reform. The law also terminated the existence of the National Electricity power Authority and in its place, established the power Holding Company of Nigeria, which was issued a temporary license (www.thisdaylive.com).

In accordance with the EPSR Act, the federal government duly incorporated and constituted the board of directors of PHCN as a public limited liability company mandated to take over all the assets and liabilities of NEPA. The Act also provided for the unbundling of PHCN into new business units comprising six generation companies, eleven distribution companies and one transmission company, which will be handed over to private sectors through outright core investor sales and concessions. Under the Act, PHCN was required to remain in existence for only eighteen months, following which its staff and other assets and liabilities were to be assigned to the new business units created from its unbundling. This process is currently ongoing.

III. FACTORS RESPONSIBLE FOR ERRATIC POWER SUPPLY IN NIGERIA

The factors that affect the efficiency and stability of power supply in any developing country/region can be classified as follows: government policy; economic factor; natural factor; society/community factor; effective energy management; skilled personnel; efficient technology and security factor (Oricha and Olarinoye, 2012). These factors can be broken down to the following factors believed to be responsible for the erratic power supply in Nigeria:

3.1 GOVERNMENT POLICY

Government’s inconsistent energy policies have been a major contributor to the Nigerian energy crisis. For instance, the government’s policies for over fifty years now have been favoring monopoly in the power generation, transmission, distribution and sales. From the establishment of ECN in 1950 to the setting up of NEPA in 1972, the policy has been that of having an entity with full control of power generation and supply. If after these years, government is now bringing up policies to unbundle the power sector of the economy, then it is obvious that the earlier policies have not helped the system.

3.2 INEFFICIENCY IN POWER GENERATION, TRANSMISSION, DISTRIBUTION AND CONSUMPTION

From the point of power generation in Nigeria, there is over fifty percent power loss. For instance, a study of Delta four power plants revealed a total average power generation of 30.5% out of the installed capacity (Oyem, 2013). This means that a total of 69.5% of power that would have come out of these four power plants and added to the national grid, is lost just at the point of generation. At the stage of transmission and distribution, a reasonable amount of power is also lost due to transmission lines and equipment that are grossly ill maintained or below capacity. According to the international Energy Agency report (2012), electric power transmission and distribution losses in Nigeria stood at 17.22% in 2010, and the maximum figure between 1971 and 2010 occurred in year 1981 where the loss stood at 49.27%. Figures 3.1 and 3.2 give a plot of electric power transmission and distribution losses in Nigeria from the year 1971 to 2010 in terms of total power loss and percentage loss of the total power generated, respectively, as extracted from IEA report (2012).

At the point of consumption, majority of power consumers in Nigeria leave their electric devices ‘ON’ even when they are not needed, because of the default billing method adopted by the power distribution companies. This results to great power loss to the system and also to the over loading of the transmission and distribution equipment.

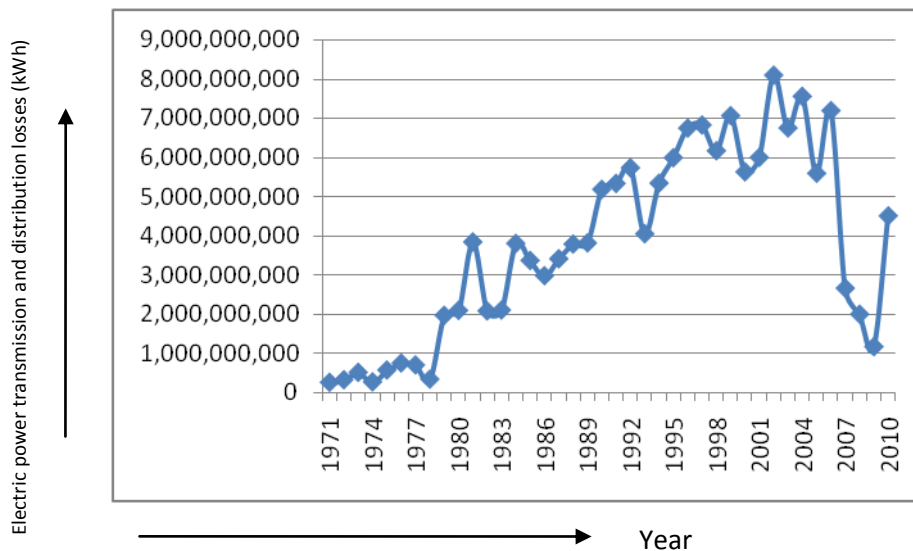


Fig. 3.1 Electric power transmission and distribution losses in Nigeria from the year 1971 to 2010

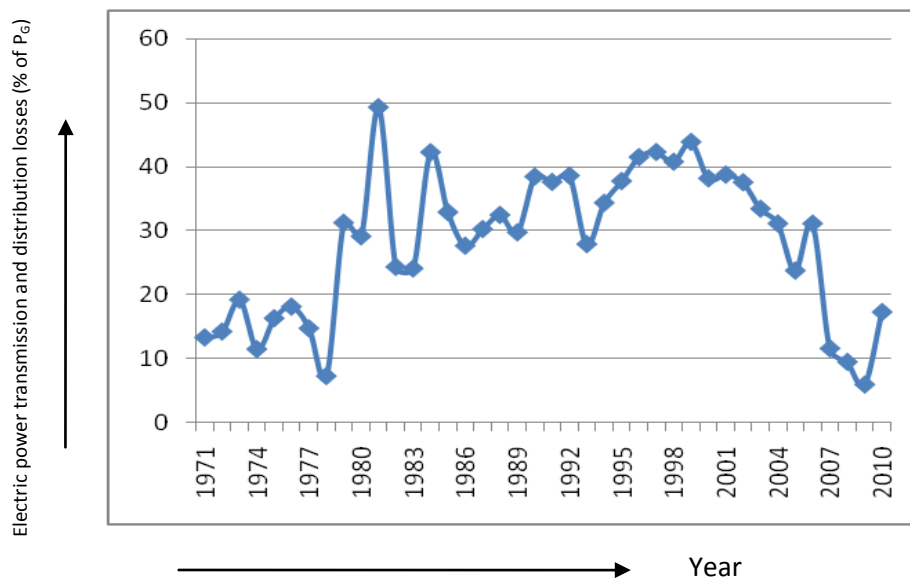


Fig. 3.2 Electric power transmission and distribution losses in Nigeria from the year 1971 to 2010 in terms of percentage loss of the total power generated

3.3 INCOMPETENT STAFF OF THE ENERGY COMPANIES

This is a general Nigerian problem where companies especially government firms, employ workers not based on merit and competence but on favoritism and tribalism. Because of this, no government company in Nigeria that requires workers with professional and technical competence has ever succeeded. NEPA and PHCN had staff, majority of which were employed through the back door and therefore, the only thing they seemed to know was how to climb electric poles and cut cables.

On November 5, 2013, Nigerians rejoiced as government handed over generation, transmission and distribution of electricity to private companies. At least Nigerians believed that with the private ownership of these companies, the companies would immediately hire competent staff that will work towards the growth and betterment of the system. But six months after, Nigerians from all walks of life continue to grumble that power supply has gone from bad to worse (Ukoko et al, 2014). These new companies still retain the old incompetent staff of NEPA and PHCN for reasons best known to them.

IV. RECOMMENDATIONS TO SOLVING NIGERIAN ERRATIC POWER SUPPLY

Having studied and analyzed the causes of erratic power supply in the Country, the following recommendations to solving the Nigerian erratic power supply are hereby made:

4.1 ADOPTION OF ENERGY CONSERVATIVE POLICIES

Government should outlaw the use of electric gadgets and devices that waste electric energy and encourage the use of models of these gadgets that save energy. For instance, a 10W LED electric bulb can give the same illumination as a 100w incandescent bulb. This means 90% energy saving. Also a 120W modern refrigerator can render the same service as a 600W older version of the fridge. Worldwide, nations are beginning to face up to the challenge of sustainable energy by re-evaluating the way energy is generated and utilized so that social, environmental and economic aims of sustainable development are supported. The benefits of energy efficiency upon the environment are self-evident and the economic benefits of improving energy efficiency have been well documented since the first oil crisis in early 1970's. Many forward-thinking industrial and commercial concerns have already adopted energy efficiency as a key policy towards maximizing profits. Niger republic which relies partly on Nigeria for its electric energy supply, were able to achieve some level of high energy conservation and efficiency by the adoption of energy saving policy that mandated the consumers to shift from the use of incandescent bulbs to fluorescent lamps (Ruma et al, 2011). Also, Ghana adopted a similar policy whereby the government collaborated with product and sales companies, and asked residents to return their energy inefficient refrigerators for modern energy efficient ones at a good discount. Nigeria can adopt a similar policy and also outlaw the use of incandescent bulbs. The price of LED bulbs should be subsidized, as high price of these bulbs has been a major factor responsible for low use of the bulbs in Nigeria. The

Government can withdraw the subsidy after sometime, when the people have gotten used to the new technology and have realized that one LED bulb can outlast ten incandescent bulbs.

4.2 IMMEDIATE DISCONTINUATION OF DEFAULT/ESTIMATED BILLING SYSTEM

As a matter of urgency, the default billing system adopted by NEPA and is still used by the new power distribution companies, should be outlawed as it is stupid, criminal, exploitative and destructive. A billing system that charges the same amount of money on a consumer with ten LED bulbs of 10W each (= 100W), another consumer with ten 200W bulbs (= 2000W) and still a third consumer that did not use electric power in his house for the whole month either because the power transformer in his area was faulty or because the family travelled, should be condemned and discontinued. If this is not done because of the criminal nature of the billing system, let it be done because of the fact that it encourages power wastage and leads to breakdown of power distribution and transmission equipment

4.3 UPGRADE OF POWER DISTRIBUTION AND TRANSMISSION EQUIPMENT

The new companies that took over electric power transmission and distribution business in Nigeria should embark on immediate upgrading of the power transmission and distribution infrastructures. More emphasis should be on distribution infrastructure now and then after ensuring that the equipment on ground can comfortably distribute the power currently being generated and the amount of power the generating companies intend to generate in the near future, then emphasis will now shift to power generation.

4.4 ENGAGEMENT OF COMPETENT AND QUALIFIED STAFF BY THE ELECTRIC POWER COMPANIES

The new power generation, transmission and distribution companies should retain only the staff of NEPA and PHCN which they have tested and certified as qualified and competent, and dismiss all those that were engaged through the back door. They should then employ qualified and technically competent workforce to drive the new efficient and sustainable system.

V. CONCLUSION

It is widely believed that the problem of erratic power supply in Nigeria is as a result of low power generation capacity of the country. This is because Nigeria with a population of over 150 million has power generation capacity of around 3,600 megawatts out of the installed capacity of about 6,000 megawatts (PTFP, 2014). This is very low when compared to that of other countries like Brazil with a generation capacity of 100,000MWs of grid-based electric power for a population of 201 million people, South Africa which generates 40,000MW of electricity for 50million citizens, and even our neighboring Ghana which generates 2,111 megawatts for a population of 23.84million people. While it is true that Nigeria's power generation capacity is currently below what it should be, the low power generation capacity of Nigeria is not the cause of erratic power supply in the country. Low power generation should only result to not enough power available for consumption and not the power supply becoming erratic. The major cause of erratic power supply in Nigeria is energy wastage by consumers occasioned by default or estimated billing system adopted by power distribution companies. Other contributors include government misguided power reform policies, low standard and ill-maintained transmission and distribution infrastructure; and the use of unqualified and technically incompetent work force by the power generation, transmission and distribution companies. These problems can be solved by adopting energy conservative policies like the use of LED bulbs and other energy saving electrical and electronic devices, immediate discontinuation of default/estimated billing system by the electricity distribution companies, upgrading of power distribution and transmission equipment, and the engagement of competent and qualified staff by the electric power companies.

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