

The current and future challenges of electricity market in Nigeria in the face of deregulation process

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ABSTRACT

Electricity is fundamental and inevitable to our daily living as it lightens our environment, powers our homes, schools, hospitals, offices, businesses, and promotes industrialization. It is a known phenomenon that the economic growth of a nation depends on electrical power supply. While telecommunication market in Nigeria has recorded advancement and stability, the electricity market in Nigeria is facing mixed challenges ranging from slow growth in generation capacity, market deregulation process interference by Government, electrical transmission lines and distribution equipment vandalism, poor maintenance of existing electrical facilities and corruption. Nigeria should not be different in the vogue of global electricity market which focuses on building a cleaner, more diverse and more sustainable energy mix, electricity market investment system that is quality, affordable and of proven security. This paper focuses on the challenges facing electricity market in Nigeria and possible ways by which the nation can build a sustainable electricity market.

Keywords: Electricity market, mixed challenges, electric power sector reform, economic growth, Power Holding Company of Nigeria.

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INTRODUCTION

Electricity market has been a sensitive arena that continually attracts global attention and forms a top agenda on the to-do menu of virtually all governments globally. The threat it poses to a national economic sustainability, development and appreciable growth is conspicuously visible in the way each country of the world seek and exploit various alternative energy sources of generating electricity in the most economical and environmental friendly way. In the 2012 United States of America (USA) presidential debate, increase in power supply was seen by both contestants as the roadmap to job creation and national economic improvement (Clarke, 2012). The trend of economic growth in some Middle Eastern countries like the United Arab Emirates (UAE) and Qatar cannot be dissociated from their electric power consumption per capital growth over the years. Nigeria has tremendous energy resources in the form of abundant gas, water and mineral resources. Yet, it is

highly energy deficient (Tallapragada, 2009). The country is rated first among the Oil Producing countries in Africa with average of 2.5 million barrel per day, with highest natural gas reserve in Africa of 176 trillion cubic feet of natural gas. It also has extensive coal resource with inferred reserves estimated ranging from 1.5 billion metric tonnes to 2.75 billion metric tonnes (CPE, 2009) and renewable resources such as water, wind and sun energy from which appreciable electricity can be generated. With the abundance of energy resources, Nigeria need not import energy to achieve a sustainable generating capacity suffices the targeted economic growth. Nigeria had been able to trace the collapse of her industrial sector, small and medium scale businesses and economic downturn to the inadequate and erratic state of the country's electricity market – several commitments by different government of Nigeria, both financial and human capital, has been thrown behind the power sector in Nigeria with its

Table 1. PHCN Plc successor companies.

Generating company (Genco)	Transmission company (Transco)	Distribution company (Disco)
Kainji Power Plc	Transmission Company of Nigeria	Eko Electricity Distribution Co. Plc
Shiroro Power Plc		Ikeja Electricity Distribution Co. Plc
Ughelli Power Plc		Ibadan Electricity Distribution Co. Plc
Sapele Power Plc		Benin Electricity Distribution Co. Plc
Afam Power Plc		Abuja Electricity Distribution Co. Plc
Geregu Power Plc		Port Harcourt Elect. Distribution Co. Plc
		Enugu Electricity Distribution Co. Plc
		Kaduna Electricity Distribution Co. Plc
		Kano Electricity Distribution Co. Plc
		Jos Electricity Distribution Co. Plc
		Yola Electricity Distribution Co. Plc

Source: EPSR 2005.

attendance still continuous with target set. According to Iwayemi (2008), three facts define the scope of the investment problem and enormity of the policy challenges associated with the electricity crisis: the current low level of electricity and energy consumption per capita by global development standards; the dismal state of socio-economic conditions in an economy just recovering from almost two decades of poor performance and deepening poverty; and the low human development indicators. This lack of strategic planning led the nation to the present dearth in electricity that now become difficult to surmount. The need for deregulation as of the sector was stressed by Elusakin (2013), when he opined that privatization of power generation and supply in Nigeria will boost competition for efficiency as it does in developed countries.

NIGERIA ELECTRICITY REFORMS HISTORICAL TREND

Electricity generation grows from few kilowatts used to serve the colonial masters in Lagos when the first generating plant was installed in 1898 (Isola, 2012). In the late 19th century to the Electricity Corporation of Nigeria (ECN) established by Act of Parliament in 1951, a decade later 1962, Niger Dams Authority (NDA) was set up to develop hydroelectricity which was merged with ECN to form National Electric Power Authority (NEPA) in 1972.

However, there was a decline in electricity generation capacity despite an increase in population, with no visible plan to commensurately increase generating capacity. This caused electric power demand to increasingly overshoot available supply. By year 2000, the problem had sent Nigeria into electricity supply crisis, which caused the Federal Executive

Council (FEC) in year 2001 to approve the National Electric Power Policy (NEPP), which called for fundamental changes of ownership, control and regulation of the power sector. The 2001 NEPP actually set the roadmap for Nigeria's power sector privatization, but due to the bureaucracy in government; the policy could not be signed into law until 2005. The signed document became the Electric Power Sector Reform (EPSR) Act of 2005 (EPSR, 2005). The reform is expected to generate some economic implications for the citizens and the prospective investors (Makwe et al., 2012). According to Agboola (2011), Nigeria electricity problem will be a forgotten issue if the IPP participation comes into effect because the financial investment is to be sort outside government resources. By this Act, NEPA was translated into the newly incorporated Power Holding Company of Nigeria (PHCN) Plc, comprising of 18 separate successor companies that took over the assets, liabilities and employees of NEPA, and responsible for the generation (6 companies), transmission (a company) and distribution (11 companies).

The PHCN's incorporated successors in the unbundling process are given in Table 1.

According to Alohan (2012), the problems which led to the reforms as highlighted by the Bureau of Public Enterprises (2011) are as follows:

- 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.

Table 2. Thermal station for divestiture.

S/N	Generating station	State	Status	Installed capacity (MW)
1	Egbin	Lagos	Existing	1320
2	Ughelli	Delta	“	912
3	Sapele	Delta	“	1020
4	Geregu	Kogi	“	434
5	Omosho	Ondo	“	335
6	Olorunshogo	Ogun	“	335
7	Afam	Rivers	“	726
Total				5082

Source: Eberhard and Gratwick (2012).

Table 3. Existing integrated power project.

Project name (technology)	Location	Designed capacity (MW)
Calabar	Calabar, Cross River State	563
Egbema	Egbema, Imo State	338
Ihovbor	Ihovbor, Edo State	451
Gbarain	Gbarain, Bayelsa State	225
Sapele	Sapele, Delta State	451
Omoku	Omoku, River State	225
Alaoji	Alaoji, Abia State	961
Olorunsogo - Phase 2	Olorunsogo, Ogun State	676
Omosho - Phase 2	Omosho, Ondo State	451
Geregu	Geregu, Kogi State	434

Source: Eberhard and Gratwick, 2012.

j) Unclear description of roles and responsibilities.

With the problems identified, the Reform Bill sought solution through achieving the following five (5) objectives:

1. Unbundle NEPA through 18 separate successor companies incorporated in PHCN.
2. Privatize the unbundled entities
3. Establish a regulatory Agency (The Nigerian Electricity Regulating Commission (NERC)).
4. Establish a rural electrification agency and fund (the same infested with corruption to the tune of ₦52 billion causing its suspension between 2006 and 2009)
5. Establish Electric Power Consumer Assistance Fund.

THE CURRENT CHALLENGES IN THE ON-GOING ELECTRICITY MARKET REFORM PROCESS

To confront the problems identified by the Government, decision to embark on increasing generation capacity and, subsequently, expansion of the transmission and distribution lines become key

issues as shown in Tables 2, 3 and 4.

From a detailed study of the infrastructure plan for electricity generation in Tables 2, 3 and 4, it looks like the government is taking bold steps towards confronting the epileptic electricity challenges of the past two and a half decade. In August 2010, the government drew a “Roadmap for Power Sector Reform”. The blue print revealed various target of Government for PHCN Successor companies as shown in Table 5, with purpose of improving power supply in Nigeria.

With all these plans and targets with huge investment disbursed to achieve these, it is just right to ask:

- i) “Where are we” in this power sector reform journey?
- ii) Are we getting it right?
- iii) Is the vision 20:2020 which largely depend on the power sector reform feasible as we draw close to 2020?

These are just few questions one could amongst many, and answers to them depending on each individual paradigm view.

The figures in Table 5 are far above the achieved

Table 4. Hydroelectric power plants.

S/N	Generating station	State	Status	Installed capacity (MW)
1	Kainji	Niger	Existing	760
2	Jebba	"	"	578
3	Shiroro	"	"	600
4	Mambilla	Taraba	Planned	2600
5	Zungeru	Niger	"	950
	Total			5,488

Source: Tallapragada PVSN, 2009.

Table 5. Targeted increase in generation, transmission and distribution capacity.

Time	Available generation capacity (MW)	Transmission capacity (MW)		Distribution capacity (MW)
		330 KV lines	132KV lines	
July, 2010	4612	5155	6677	5758
December, 2010	5379	5515	7328	6334
April, 2011	7033	5995	7328	6900
December, 2011	9769	6555	7488	7485
December, 2012	11879	7866	8986	8061
December, 2013	14218	8653	9885	9059

Source: Roadmap for Power Sector Reform – Presidency, August 2010.

actual figures courtesy of the following challenges:

- i) Slow growth in generation capacity.
- ii) Market deregulation process delay and interference by Government.
- iii) Power lines and distribution equipment vandalism.
- iv) Poor maintenance of existing power system.
- v) Corruption.

Slow growth in generation capacity

The was growth in generation capacity compared with demand between 70s and 80s since then no significant investment has been made in generating more power in the country (Somolu, 2007). Sambo (2008) argued that the current electricity challenges were due to lack of substantial investment in infrastructural development of the sector for nearly two decades prior to 1999. Albeit, awareness of improving the electric power sector as pivot for economic growth in Nigeria has commenced since year 2000 yet the generation capacity growth is relatively slow. The huge investment committed to make more recovery from existing plant capacities and increase generation through National Integrated Power Projects (NIPPs) and Independent Power Producers (IPPs), through the birth of EPSR Act of 2005 to achieve this by various governments were thwarted by bureaucracy and corruption. If the figures of the power delivered in the past three years as shown in Table 6, after the Federal Government well

celebrated "Road Map for Power Sector" was rolled out in Lagos in 2010, are compared with target in the blueprint as shown in Table 5, the result does not in any way march. The average generation capacity is shown in Table 6. Over the years, the awareness became prominent as it reveals slow growth generation capacity.

In 2005, Federal Government was to boost power generation to 10,000 MW by embarking on National Integrated Power Project (NIPP) (Somolu, 2007). The project suffered a serious setback courtesy of political lock jam and corruption. Ironically, though the electricity crisis has deepened, the new government suspended the NIPP citing constitutional reasons associated with its financing from excess crude funds (Iwayemi, 2008). Consequentially, the per capita consumption, as shown in Table 6, dwindles below 1 kW which cannot support any serious economic growth agenda. However, many energy experts see the cause of slow growth in generation to be due to insufficient supporting transmission and distribution facilities, lingering dispute between the Federal Government and Power Sector workers and bureaucratic approach of government.

Market deregulation process delay and interference by Government

This is clearly visible from the government approach to matter related to the process and the recent outcome

Table 6. Electricity generation capacity in Nigeria.

Year	Total generation capacity (GWh)	Average generation capacity (MW)	Per capita consumption (kW)
1999	16,089	1837	0.151
2000	14,727	1681	0.134
2001	15,463	1765	0.138
2002	21,544	2459	0.178
2003	20,183	2304	0.172
2004	24,275	2771	0.201
2005	23,539	2687	0.187
2006	23,110	2638	0.178
2007	22,978	2623	0.177
2008	21,110	2410	0.16
2009	18,817	2148	0.139
2010	24,872	2839	0.179
2011	23,652	2700	0.167
2012 (Oct.)	-	4100	-

Source: World Bank (Energy Information Administration (www.eia.doe.gov/emeu/iea)).

of the generation Plant's bidding as commented below:

1. The National Electric Power Policy (NEPP) for power sector privatization in Nigeria, which called for changes to ownership, control and regulation of power sector, was approved by the Executive arm of Government in year 2000, but due to delay within the arms of Government, the policy was not signed into law until 2005.

2. Multiple Committee and Task Force on power, created bureaucratic delay in process. The "Presidential" Action Committee on Power (PACP) was set-up with a view to eliminating red tape and the often over-bureaucratic and inefficient nature of decision-making in government. The same government set up "Presidential" Task Force (PTF) on power saying it will be the engine room that drives the PACP vision. The two groups are "Presidential committees" saddled with the same task. This creates unnecessary bottle in the pace of decision-making. Besides, it increasing administrative costs, delay time and process and caused avoidable conflict of superiority by concern bodies.

3. On creation of Rural Electrification Agency (REA) aside the eleven Distribution Companies (DISCOs) in the power sector unbundling Agenda. Amadi (2011) opined that since we have DISCOs who are also mandated by the law to ensure that electricity reaches the rural parts of the country, it is not right when you look at the bureaucracy it will create, the cost implications and the propensity for corruption.

4. Lagos Chamber of Commerce and Industry in a recent forum states that "It is heartrending that the choice of locations of many of the Independent Power Projects (IPPs) was informed more by politics than the

economics of power generation. Access to a major input in power generation, which is gas, was not sufficiently taken into account. This reality has badly affected the cost profile of the IPPs" (LCCI, 2012).

Transmission lines and distribution equipment vandalism

The vandalism of the transmission infrastructures and the distribution equipment has been a common occurrence, even before the on-going reforms. Most times, the sabotage is blamed on the power brokers who imports power generators.

Recently, the contractor handling the Olorunshogo Power Plant in a nationwide broadcast expressed his ordeals in the hands of vandals, despite all the financial settlement made to the chiefs and settlers of the plants' environment to ensure security of infrastructure. The news captured the transmission lines and equipment terribly vandalized. Vandalism is one of the current challenges that will likely translate into future in the reformation process, as is has been a way of forcing government and multinationals with business stake to a roundtable settlement.

Poor maintenance of existing power system

Over the years of electricity infrastructures in Nigeria, poor maintenance has been one of the major causes of epileptic nature of power supply, even when generation capacity rises; its utilization is limited by the malfunctioning of the transmission and distribution infrastructure. The only known maintenance carried out

by the power sector workers is fault clearing while scheduled maintenance for healthy function and life extension of such infrastructure is non-existent.

Corruption

The menace of corruption has set the nation backward among her contemporaries. Corruption is a ubiquitous practice that has ravaged every sector of the economy in Nigeria, including the power sector. Reform is not spared from its venom. The instances of corruptions in the power sector include:

1. Inability to account for sum of Sixteen Billion Naira voted for NIPP project and allied power project during Former President Obasanjo's regime.
2. Rural Electrification Agency (REA) formed through the Power Sector Reform Agenda in 2006 was suspended in 2009 due to an alleged ₦5.2 billion fraud involving top management of REA, the officials of the Ministry of Power and some members of National Assembly (Alohan, 2012).
3. The puzzle surrounding the ₦88 billion PHCN workers pension fund accrued from the 7.5% deductions from workers salary is another clog in the wheel of the reform process.
4. For two decades, the Federal Government claimed to be spending an average of \$2 billion annually to sustain the power sector with an average generation capacity stuck at 2000 MW over the period (Presidency, 2010). If such amount as \$40 billion was truly committed power sector over the two decades, there should be a definite growth in the sector. The current set of \$3.5 billion investment per year for the next 10 years to raise the generation capacity to 40,000 MW, as projected in the reform agenda may likely go down the drain if corruption is not properly checked.
5. Among the alleged corruption against Prof. Barth Nnaji (past Minister of Power) includes the collection of ₦395 million from PHCN (allegedly for the media for 3 months), collection of ₦280 million from PHCN (allegedly for the Nigerian Army), collection of ₦200 million from PHCN for an unknown project in the Power Ministry, collection of ₦86 million from PHCN for a bullet-proof car, etc (Abdullahi, 2012).

All these are indications of entrenched corruption mix among arms of government and top power brokers.

THE FUTURE CHALLENGES OF THE ELECTRICITY REFORM PROCESS

The future challenges that will confront Electricity Reform process in Nigeria, as it is now, will include:

- a) Keeping pace with the world clean energy campaign.
- b) Meeting up with the world electricity market current pursuit which focuses on economy of generation at affordable price and power generation mix trend.
- c) Gas availability due to IPP stations remote locations and cost of transporting the gas.
- d) Vulnerability of the gas line and Plants to vandals in remote locations.
- e) Securing of gas infrastructures.
- f) Adequacy of investment in gas infrastructures.
- g) Security and adequacy of the transmission lines.
- h) Inherent labor issues.
- i) Risk of investment in the sector.
- j) Revenue recovery of the power consumed.
- k) Achieving the 1 kW per capita generation accepted power consumption standard rate.

POSSIBLE WAYS OF BUILDING A SUSTAINABLE ELECTRICITY MARKET

The following discussion among others will contribute to building a sustainable electricity market in Nigeria:

- a) An industrial favorable tariff system like that of South Africa. This can be achieved through proper implementation of Bulky Power Purchase as highlighted in Electric Power Sector Reforms Act no 6 section 68 of 2005 (EPSR, 2005).
- b) Honesty in tackling corruption.
- c) Government investment at any level in the electricity market should not be based on politics or quota system but strictly on integrity, competence and professionalism.
- d) Encourage foreign participation based on experience, financial capacity and performance record.
- f) Reduce the number of thermal generating plants locations and increase their generating capacity to avoid the complexity of gas pipeline network. Reduce risk of vandal and achieve cost savings.
- g) Set up an effective environmental agency for carbon emission control.
- h) Set up team from relevant ministries to continuously work on building sustainable electricity market in Nigeria that is favorable to the Nation's economic growth.

CONCLUSION

To achieve a sustainable electricity market that will ensure national economic growth target towards vision 20:2020, all hands must be on deck to monitor the Power Reform process, criticize, encourage and praise where necessary rather than folding arms and calling it a government affair.

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