

Power and Sustainable Development: The Place of Power in the Transformation Agenda of the Federal Government

By

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Lecture Delivered at the 15th Professor Bassey Andah Annual Memorial Lecture, Organised by Professor Bassey Andah Foundation, in Calabar, on Saturday, 18th of January 2014.

Power has become an indispensable prerequisite for enhancing economic activity and improving human quality of life. Agricultural and industrial production processes are made more efficient through the use of electricity. Households need electricity for many purposes, including cooking, lighting, refrigeration, study and home-based economic activity. Essential facilities, such as hospitals, require electricity for cooling, sterilization and refrigeration. (Extract from “Prospect for African Power Sector”)

“Affordable Energy in ample quantities is the lifeblood of the industrial societies and a prerequisite for the economic development of others” Jon Holdren (2001)

“Coal, in truth, stands not beside but entirely above all other commodities. It is the material energy of the country – the universal aid – the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back in the laborious poverty of early times” William Stanley Jevons, Founder of Mineral Economics (1865)

1. Introduction

It is a great pleasure for me to be here today and an honour I greatly treasure to deliver the 15th Professor Bassey Andah Memorial Lecture on behalf of the Professor Bassey Andah Foundation. It is a great privilege to be counted among notable dignitaries who have delivered past editions of the annual lectures. Professor Bassey Andah laid a solid memorial in his lifetime. He made indelible contributions to the field of anthropology and archeology not just in Nigeria but globally. He was an Africanist, scholar, researcher and widely regarded as “the best Archeologist Africa has yet produced”. It is these unquantifiable recognition and intrinsic hallmarks of great academics to live beyond their times, and to continue to speak past their mortality that drew someone like me into academics. Our rewards may not come in monetary terms, but great academic giants, a rare class to which Professor Bassey Andah belongs, live forever and like prophets, their voices ring through the ages as younger and future academics continue to dissect, interpret, contest, and find inspirations in their deep scholarly writings and research. The shoulders of academic giants provide a ready base for present and future scholars to stand and peer far into the distant tomorrow.

I also wish to express my gratitude to the family of Professor Bassey Andah and the Chairman and members of the Board of Directors of Professor Bassey Andah Foundation, most of who are great minds in their own right, for choosing me among the many options they have to deliver this year’s lecture. I thank you very much for the honour.

The issue that this year's lecture is addressing is very important and continues to remain relevant to our socio-economic development aspirations. The place of electricity in the transformation of our national economy cannot be overemphasized. Any Nigerian leader that is able to reverse the 'curse' of poor electricity supply in Nigeria will indelibly write his name in a platter of gold. Hence, the choice of the lecture theme: **Power and Sustainable Development: The Place of Power in the Transformation Agenda of the Federal Government**" by the Board of Directors of the Foundation is quite relevant, and timely at a time Nigeria is moving to the next but critical phase of the electricity reforms. Electricity shortages, characterized by blackouts and brownouts, have haunted the country for so long and continued to feature in every firm level survey as the most important constraint to the competitiveness of the Nigerian economy¹. The total electricity available to Nigerians through the public source is a little above what is used by the Heathrow Airport in London. It is a situation that is totally unacceptable and that must be reversed if we want to take our rightful place among the comity of nations in the 21st Century and to move millions of Nigerians out of poverty and into a decent livelihood.

The importance of electricity lies in several factors. First, it is both a productive input as well as a consumption commodity that enters into the utility function of the consumer directly. Second, it facilitates the productivity of other factors of production, in particular, labour and capital, and therefore critical to the production process. Third, it is an enabler of new technologies. Fourth, access to electricity is important to the realization of all the goals contained in the MDGs. Access to electricity improves quality of life, impacts on life expectancy and the pace at which an economy transforms from low to middle and high income levels. These are the reasons why there is a very strong correlation between the index of energy consumption and levels of economic development.

¹According to the 2008 Investment Climate Assessment of Nigeria, Electricity was found to be by far the most binding constraint to doing business in Nigeria for more than 80% of firms surveyed. Electricity-induced indirect losses of firms account for 61%, followed by transportation (26%), bribery (11%), theft, robbery and crime (2%). Instantly bridging the power gaps will speed positive outcomes, in terms of improvement in the business climate, growth of the non-oil sector and fall in the incidence of poverty.

Figure 1: Importance of Electricity in Our Society



In the course of this lecture therefore, I will take a quick historical tour of where we are and how we got here. Next, I will discuss attempts to reform the electricity sector in Nigeria and why those efforts failed. Next, I will provide theoretical options for reform of electricity and lessons from some countries that have carried out electricity reforms. I will then spend the remaining part of the lecture to take a critical look at the current reforms under President Goodluck Jonathan, highlighting key achievements and challenges. I will conclude this lecture with my recommendations for connecting electricity to the transformation agenda of the Federal Government.

2. The Journey So far – the Pre-Jonathan Years

The Nigerian electricity sector has undergone important structural changes since its grand entry to Nigeria in the late 19th Century, with the installation of two generating plants in Lagos in 1896. While it is true that electricity came to Nigeria, few years after its introduction into continental Europe and North America, its subsequent development in the country has remained stunted. Key Performance Indicators (KPI) shows that Nigeria is a laggard country with respect to the electricity sector development when compared to comparator countries. Yet, electricity remains vital to the socio- economic transformation of any society.

Nigeria has invested significant amount of resources on electricity development. Investment in electricity constitutes an important component of overall public investment as well as the annual national budgets, especially during the years when the nation had active National Development Plans (1962-1985). However, its growth over the years has remained uneven, and the commitments of successive governments between 1986 and 1999 to “light up” the country varied significantly, leading to a yearning gap between electricity production and electricity demand. The cumulative impact has been the very low quality and quantity of electricity that is available for the economic and social developments of the country. Access to electricity in Nigeria is below 50 per cent. In addition, the access is inequitable, varying with levels of income, and location. The rich and the urban dwellers consume a disproportionate share of electricity that is available in the country.

Admittedly successive administrations in Nigeria have contributed to the current status of electricity development in Nigeria². The cumulative impacts have been below expectations and the model under which the sector operated until 2005 failed to meet the yearnings of the population. In over one hundred years, Nigeria managed to build 2 hydro power plants and 7 thermal plants with combined capacity of 7000MW, to serve a population of over 150 million people. However, with poor record of maintenance, available capacity in these plants for many years was below 50 per cent, and transmission and distribution losses are among the highest in the world.

Investment was uneven across the various segments of electricity supply system – generation, transmission and distribution. In fact, for over a decade, 1989-1999, there was hardly any investment in the power sector, leading to the collapse of many of the generating units, and sharp drop in the quality and reliability of the transmission and distribution infrastructure (Makoju, 2007).

The advent of democracy in 1999, after decades of continuous military rule brought some hope to the sector. The then President Olusegun Obasanjo signed on to power sector reform with the establishment of a Committee to draft a new enabling law that was passed in 2003 and finally signed into law in 2005 as the Electric Power Sector Reform Act (EPSRA), 2005. The EPSRA was to provide the legislative and institutional frameworks for the transformation of

²The Federal Government has over the past 10 years invested about \$3.5 billion annually in the power sector, Chinedu Nebo, minister of power, has disclosed. “Every individual is somehow connected to power. I am ashamed to say that we generate about 4,000 megawatts of electricity. 40,000 megawatts of electricity would not even be enough for Nigeria,” (21 July,2013)

the electricity supply industry (ESI) from a vertically integrated, state owned, supply system to an unbundled system that will be run by the private sector. It was to follow the largely successful model of the reform of the telecommunication industry in the country.

However, political maneuverings' after the exit of Obasanjo in 2007 led to the suspension of the electric sector reform by the Yar'Adua Administration for two years, ostensibly to probe the alleged corruption associated with the various contracts awarded under his predecessor for the building of 7 new power plants, under the National Integrated Power Plan (NIPP). To most observers the suspension of the projects for two years, reversed the progress made in the privatization process and delayed it by several years at a huge costs to the economy.

The unexpected demise of President Yar'Adua, and the elevation of his former Vice President, Dr. Ebele Goodluck Jonathan, first as the Acting President in 2009 and then as substantive President in 2010, changed the whole calculus for those who had canvassed for, or favourably disposed to the revision of the electricity sector reform. Dr. Jonathan who hailed from the oil and gas rich Niger Delta region where several of the new power plants were located was very eager to restart the reform process and garner the goodwill that awaits any President that is able to provide relief to a population reeling under the yoke of electricity brownouts and blackouts.

Thus, the President launched a new Power Sector Road Map, constituted new organisational structures that are fairly independent of the bureaucracy in the Federal Ministry of Power and the then Power Holding Company of Nigeria (PHCN), the holding company that was set up as a transitional company to mid-wife the sale of the assets of the National Electricity Power Authority (NEPA), the highly unpopular state utility in charge of power supply in Nigeria. His administration has successfully completed the sale of the previous assets of the PHCN. No longer will Nigerians should out "PHCN" or "NEPA" in the event of power outages, because those two organisations no longer exist in law.

3. Electricity Reforms: Analytical Discourse and Lessons of Experience from other Land

Chairman, Ladies and Gentlemen, by the turn of the last Century, during the rise of communism and Keynesianism, Energy, including electricity was seen as part of the "Commanding Height" of the economy that the state must

superintend over. The ownership of electricity utilities by the State in most parts of the world during this period was also supported by prevailing economic paradigm that identified electricity as a natural monopoly – a decreasing cost industry in which the optimal number of firm in the industry is a single utility, which the state must own in the public interests in order to prevent a private monopoly from taking advantage of market power to charge exorbitant rate and reduce quantity and quality of output. In addition, to also benefit from the economies of scale, throughout the supply value chain, a vertically integrated utility owned or managed by the state was highly favoured. Hence, a single utility combines the roles of generation, transmission and distribution of electricity. Government utility, in our case, the famous NEPA, built and maintained generating facilities, was to serve as a guarantor of the quality of the electricity supply, built and maintained the transmission network, making sure that available power was dispatched and transported when and where it was needed. NEPA also distributed power produced and billed consumers.

However, a number of factors challenged this economic paradigm of the ‘State and the Commanding Height of the Economy’ starting in the 1970s. First, the failure of the Keynesian school to tackle the stagflation and slow economic growth in the 1970s, and the concomitant ascendancy of the neoclassical/monetarist schools that favoured less government control in the economy. Leading lights of this competing school of thought, Frederick Hayek and Milton Friedman of Chicago School of Economics argued that government control undermines personal freedom and limit the entrepreneurial creativity of non-government actors. In addition, the emergence of Margaret Thatcher in Britain and Ronald Reagan in the USA provided policy support for the neoclassical/monetarist schools. The eventual collapse of the Soviet Union and other Communist states in the early 1990s, quickly unravel communism as a viable alternative to the market system. The international financial institutions (IFI) like the World Bank and the IMF also provided the intellectual backing for the ascendancy of the market. The economic collapse and debt crisis of many developing countries in the mid-1980s led the IFIs to impose structural adjustment programme (SAP) with accompany set of conditionality that rolled back the advances of the state, weakened the power of government and replaced state command of the economy with market institutions and instruments. Hence, the terms commercialization and privatization became a recurring policy prescriptions for the ailing economies of the South. In Nigeria, the two state energy institutions, NEPA and NNPC were slated for partial and full commercialization respectively (Adenikinju, 1999).

Nigeria's experimentation with partial commercialization of NEPA did not work. Rather public investments in all segments of electricity generation reduced drastically. NEPA assets deteriorated significantly and Nigerians turned en-masse to private generators, including "I better pass my neighbour" as a solace to failure of state electricity utility. This was the beginning of Nigeria becoming the world's largest importer of power generating sets. The fall in budgetary allocations to NEPA also led the staff of the agencies to develop creative, albeit sometimes illegal ways to support themselves, as salaries become irregular, staff welfare took a downward trend and security of tenure was undermined. Nigerians started hearing such terms as 'illegal connection', 'crazy bills', cannibalization of power equipments and vandalization. Most of which were actively supported by some rogue staff of NEPA

Other factors that aided the move from government control to markets are the advances in technology that neutralizes the scale economy associated with large power turbines. Efficient and cost-effective small and medium size turbines that became available. The entries of Independent Power Producers (IPPs) who generate small amount of power on emergency basis to national grid or to small contiguous communities alter the electricity market structure. More importantly, the widespread disenchantment with the public owned utilities provided ammunition for the new alliances with varied interests that emerged: the government eager to stop the drain to the treasury from budgetary support to these utilities, the IPPs armed with sweetened and largely skewed Power Purchase Agreements, (PPA) who were making huge monies and the intellectual crusaders in the international financial institutions eager to foster the market forces and the Washington Consensus turned the poor debtor nations into their experimentallaboratory.

The lack of competition and the continuous interference of the government with the utilities under commercialization, led to a push for complete privatization as the best reform options for the electricity sector. There are four models under which the electricity sector operates: The electricity models are distinguished by the type of competition at each stage in supply chain rather than by ownership (Dahl, 2004).

- Model one: No competition at any stage or monopoly as we have known in the past. Often these companies are vertically integrated and they may be publicly or privately owned.
- Model two: Model one but with competition in generation. A single buyer such as a distribution company may buy from a number of different producers to encourage competition in generation. The United States

started moving to this model with the public Utilities Regulatory Policy Act(PURPA, 1978) that required U.S utilities to purchase output from independent power producers(IPP) at avoided costs(the cost of generating a utility avoids by buying power from an IPP).

- Model three: Model two but with common or contract carriage of high voltage transmission lines offered to all wholesale sellers and buyers. Often distribution companies (DISCOS) own the distribution wires and can choose their suppliers with competition in generation and in the wholesale supply.
- Model four: Model three but retail customers also choose their suppliers in full retail competition. There is open access in both transmission and distribution. In the British model, there is also complete separation of generation, transmission, and distribution with an independent company owning the high voltage transmission and perform the dispatch function.

The important differences in these models are whether there is competition among generators, whether retailers or distribution companies can chose the generator to buy from, and whether the final consumer can choose who to buy their power from. The United Kingdom and New Zealand have model four as their goal.

Hunt and Shuttleworth (1996) argue that model four is the most economically efficient if there are

1. a well-established electricity retailing system
2. mature market institutions,
3. constant vigilance against market power, and
4. appropriate methods of dispatch.

With privatization and restructuring, the need for dispatch and coordination becomes crucial, particularly where formerly vertically integrated companies have been broken up. Often an independent system operator (ISO) coordinates the whole physical system based on a wholesale market for electricity or a power pool.

Table 1: Examples of Electricity Restructuring

S/N	Country	Enabling Acts	Key Features
1	United Kingdom	Electricity Act 1983. The Act was revised in 1988 Utility Act of 2001	<ol style="list-style-type: none"> 1. IPPs were allowed access to the national grid with their power purchased by the Central Electric Generating Board (CEGB) at avoided costs. However, the 5% real interest rate paid by the CEGB kept IPPs from entering 2. In 1988 the government launched a 2 year goal for massive restructuring of the sector. It proposed a horizontal and vertical de-integration of the industry across Northern Ireland, Scotland, England and Wales. The area Boards were called Regional Electricity Companies (RECs) which were to be sold off intact. 3. Distributors were allowed to buy a certain percent of electricity not produced by fossil fuel 4. The Office of Electricity Generation was established as a regulator. <ul style="list-style-type: none"> - make sure demand is satisfied - encourage competition - issue licenses to generators and RECs, - regulate transmission and distribution using the price-cap methodology 5. Large customers with maximum demand exceeding 1 MW could disengage from local RECs and choose their supplier 6. Full retail competition was implemented in 1998. 7. in 2001, electricity distribution and supply were disintegrated into separate companies as required by the utility act of 2001
2	New Zealand	1987, Electricity Act of 1992 Electricity Industry Reform Act of 1998	<ol style="list-style-type: none"> 1. In 1987 New Zealand corporatized all the local governmental Electricity Supply Authorities (ESAs) and allowed new firms to enter into generation while retaining transmission as natural monopoly 2. Removal of monopoly franchises for all the 61 ESAs. ESAs were to compete among themselves 3. Most distribution companies were owned by trusts and none were yet privatized. 4. There were no price cap and prices were based on bids and offers 5. The 1998 Act mandated that distribution be separated from retailing and generation. It also allowed for regulation of prices to domestic and rural consumers 6. Commerce Commission serve as regulator to restrict anti-competitive behaviour. In addition, information disclosure rules require that information such as prices, energy and line charges, and conditions of supply must be made available to customers and investors
3.	Norway	1991	<ol style="list-style-type: none"> 1. 99% of Norway's electricity is hydropower, with more than 90 producers and 200 distributors and suppliers who retail electricity. Hence there is a lot competition. 2. Ownership is mixed, allowing yardstick between

			<p>public and private companies. Thus the public companies compete with private companies. If they did not do as well as the benchmark firms, they were pressured to do so.</p> <p>3. There is a third-party access (TPA) for all networks. Anybody is allowed to buy in the spot market – even households.</p>
4	Sweden	1992, 1994	<p>1. Competitive electricity market was adopted in 1992.</p> <p>2. With reform, generation was separated from the transmission and international connection network</p> <p>3. In 1994, the government slowed down liberalization over concerns that it would discourage a planned nuclear power phase out and increase rural prices.</p> <p>4. Liberalization was resumed in 1996 with third party access to the network and Sweden joining Norway's Power pool, Nord Pool.</p> <p>5. No formal price control, but customers can switch suppliers. Distribution is ring-fenced from transmission and generation.</p>
5	California	1996	<p>1. California commenced its reforms in 1996. It immediately adopted the model 4 above.</p> <p>2. With opening up the market, new producers and consumers were faced with lower price.</p> <p>3. Existing higher cost plants were driven out of business.</p> <p>4. The law required mandatory nondiscriminatory open access to transmission and distribution with the existing utilities owning the grid.</p> <p>5. By 2000, demand outstrips supply. There were capacity shortages. The environmentalists were quite powerful in California as Nuclear Plants were decommissioned.</p> <p>6. With high demand and restricted supply, wholesale prices shot up; at the same time retail prices were capped.</p> <p>7. Brownouts and blackouts were consequences, the government then had to intervene in the market</p>

Source: Information obtained from Dahl, 2004

There are several lessons to learn from the selected cases above. First, for most of the countries there is gradualist approach in the reform process to allow for learning and tailoring the relevant enabling acts to take care of observed lapses and strengthen the system. Second, in most of the countries, there is a co-existence of both private and public participation in almost all segments of the supply chain. The natural monopoly component – transmission and distribution infrastructure, remain under open access for all parties to have unfettered access, with some sort of regulatory restraint or oversight. Competition in the system is very critical – either through direct competition or contestable market provision. Hence, ownership structure seems to have significant impact on outcome. The roles of the public regulators

are crucial, even when prices are market determined, they still ensure that there are ring-fencing of the competitive segment of the supply chain, full disclosure of costs and prices to consumers and investors. The California case shows that rushing to full privatization where there are capacity challenges may not augur well for full privatization, especially where aspects of prices are capped (Dahl, 2004).

4. The Status of the electricity sector before Jonathan

Before I start to examine the contributions of the Jonathan administration, it is important to highlight some of the problems confronting the Nigerian power sector. This will be useful to draw a baseline for the assessment of the regime albeit in a very short period.

The electricity sector in Nigeria has underperformed relative to national needs and in relation to other countries. The statistics on the power sector has been appalling: less than 50 per cent of Nigerians have access to electricity. Table 2 shows that whereas peak demand stood at 10,500MW as at March 2010, peak generation at the same period stood at 3,216MW. Transmission and distribution infrastructures were in a dilapidated and deplorable state making it difficult to evacuate power from generation sites to consumption centres. Table 2 shows the generation profile for the country as at March 2010.

Table 2: Generation Profile*: National Statistics as at March 2010

	MW	Date
Peak Demand Forecast	10, 500	15 th March 2010
Actual Generation Capacity	4, 507	15 th March 2010
Peak Generation	3, 213.6	15 th March 2010
Lowest Generation	2, 802.6	15 th March 2010
Peak Generation (to date)	3, 774.4	8 th August 2005
Maximum Installed Capacity (to date)	5, 482.3	23 rd December 2009
Available		

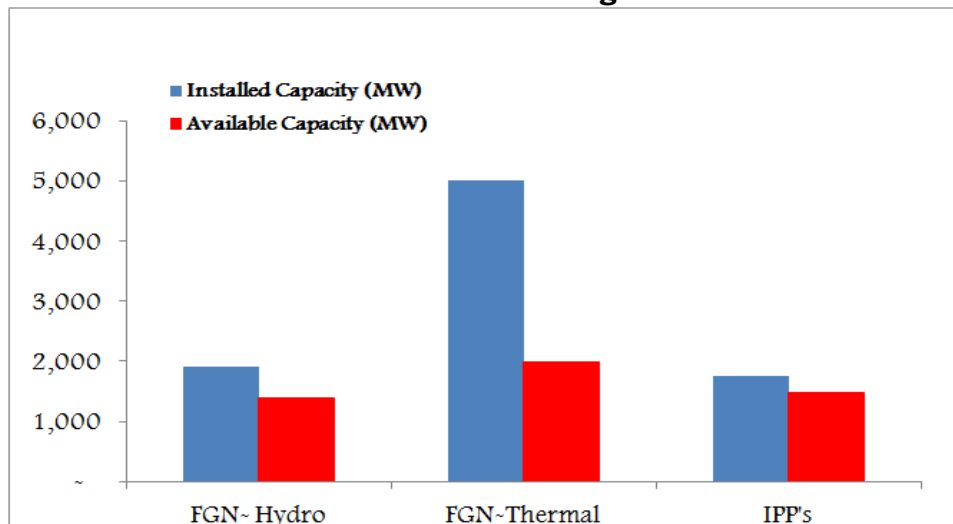
* Data obtained from Nigerian Regulatory Commission (NERC) on 16th March 2010

Source: Saidu (2010)

Another feature of the ESI during the period was the wide gap between installed and available capacity. The figure below shows that the capacity utilization was highest among IPPs, follow by hydro power plants and lowest among the thermal power stations³ (see figure 2).

³ This is not unconnected with inadequate or unavailable gas supply to the power stations. Some of the new power stations were constructed without connecting them to gas pipelines.

Figure 2: Installed and Available Power in the Nigerian Power Sector



Source: Diji, C.J 2013. *IOSR Journal of Electrical and Electronics Engineering (IOSR-JEEE)*

A major consequence of the inefficiency in the sector is the high dependence on auto-generation (Adenikinju, 2003). Table 3 shows the results of power and energy audit for industrial areas in Lagos state, the commercial capital for Nigeria. The survey results show that the bulk of electricity demand in the industrial clusters in Lagos is met through self-installed generating capacity.

Table 3: Results of 2007 Power and Energy Audit of Manufacturers Association of Nigeria

RESULTS OF 2007 POWER & ENERGY AUDIT OF MANUFACTURERS ASSOCIATION OF NIGERIA						
S/N	INDUSTRIAL AREAS	No of Industries	Present Maximum Power Demand (MW)	Self Installed Generating Capacity (MWA)	5 Years Projected Power Demand (MW)	Percent of Grand Total (%)
1	WEST I (Lagos & Ogun States)	871	484.53	311.18	969.09	56.07
2	WEST II (Oyo, Osun & Ekiti States)	175	33.58	9.776	67.16	3.89
3	Edo and Delta States	44	11.82	27.95	23.64	1.37
4	Rivers, Abia, A/Ibom & C/River States	90	39.1	35.141	78.2	4.52
5	Anambra, Enugu & Imo States	164	81.4	69.555	162.8	9.42
6	Plateau, Gombe & Bauchi States	28	30.2	47.675	60.4	3.49
7	Kano State	106	160.73	201.998	321.46	18.6
8	Kaduna, Sokoto & FCT	22	22.8	25.548	45.6	2.64
	GRAND TOTAL	1,500	864.16	728.821	1,728.32	100
NOTES						
a)	Total No. of industries = 1,500					
b)	All Industries are supplied Power at 11KV and 33KV					
c)	Only Ashaka, Ewekoro & sagamu Cement Coys. Are supplied at 132 KV					
d)	Maximum Power Demand from the Audit is 1728.32 MW by 2012					
e)	The Audit recommends 2,500 MW to make up for any shortfall in arriving at 1728.32 MW for 2012					

Source: David, A. (2010) A Presentation at the one-day conference of the Nigerian Society of Chemical Engineers (a Division of NSE) on 7 October 2010, held at the Ikeja Sheraton Hotel and Towers, Lagos

Figure 3: High Rate of Self Generators Used in Nigeria



To further understand the dimension of electricity problem in Nigeria, we provide a comparison of key electricity indicators with the BRICS countries of Brazil, Russia, India, China and South Africa. Although China produced the highest electric power among the BRICS countries between 2000 and 2010, the per capita electric consumption in Russian Federation and South African are higher than that of China (see Table 4). Russian Federation has the highest electric power per capita among the BRICS countries. It increased from 5209 kWh in 2000 to 6431 kWh in 2010. South Africa's electric power consumption per capita marginally increased from 4,681 kWh in 2000 to 4803 in about a decade. Nigeria's electric power consumption is very low compared to all the BRICS countries. Despite the fact that Nigeria's per capita electric power increased from 74 kWh in 2000 to 135 kWh in 2010, it is very small to enhance the industrialization the country aims at.

Table 4 also shows the percentage of the population that has access to electricity in the various BRICS countries and Nigeria. Almost the entire population of Brazil and China has access to electricity as at 2010. The percentage of those that have electricity access in China is 99.7 percent, while it is 98.7 percent in Brazil. Moreover, over 70 percent of people in India, Russian Federation and South Africa have access to electricity as at 2010. In the case of Nigeria however, only half of the 170 million people have access to electricity as at 2010.

Table 4: Comparison with the BRICS

Country	Dominant source of Electricity & its share	Electricity Access (% of Population) 2010	Time to get electricity (days)	Electricity production (Billion KWh) 2010	Electric Power Consumption (KWh per capita) 2010
Brazil	Hydroelectric (78.2%)	98.7	57	515.7	2381
Russia	Natural gas (50.2%)	75.8	281	1036.1	6431
India	Coal (68%)	75	67	959.9	626
China	Coal (77.8%)	99.7	145	4208.3	2944
South Africa	Coal (94.2%)	72.5	226	256.6	4803
Nigeria	Natural gas (64.3%)	50.3	260	26.1	135

Source: US Energy Information Administration, Energy data 2010

Energy access is even much less than what obtains in many other parts of Africa. Poor access to modern energy services in Nigeria hinders the exploitation of economic opportunities and invariably sustained economic growth and achievement of higher living standards. Therefore, the issue of adequate, reliable and expanded access to modern energy services should be given greater policy focus and urgency more so in the context of meeting the goals of the Millennium Development Goals (MDGs).

Table 5: Electricity Access

Electricity Access(% of Population)				
Country	HDI	National	Rural	Urban
Algeria	0.754	99.3	98	100
Angola	0.564	26.3	10.7	38
Botswana	0.694	45.4	12	68
Cameroun	0.523	29.4	9	45
Cape Verde	0.708	70.4	44.9	87.5
Cote d' Ivoire	0.484	47.3	18	78
Egypt	0.703	99.4	99.1	100
Ethiopia	0.414	15.3	2	80
Gabon	0.755	36.7	18	40
Ghana	0.526	54	23	85
Kenya	0.541	15	5	51.3
Libya	0.847	99.8	99	100
Mauritius	0.804	99.4	99	100
Morocco	0.654	97	96	98
Nigeria	0.511	46.8	26	69
Senegal	0.464	42	18	74.7
South Africa	0.683	75	55	88
Sudan	0.531	31.4	19	47.5
Tunisia	0.769	99.5	98.5	100
Uganda	0.514	9	4	42.5

Source: UNDP/WHO (2009) Energy Access op.cit

Table 6: Access to Modern Fuels in % of Population

Country	Year	% of the national population with access to modern fuels	% of the rural population with access to modern fuels	% of the urban population with access to modern fuels
Algeria	2006	98.7	97.1	100
Angola	2006-07	52.1	10.6	86.1
Botswana	2006	56.2	25.1	78.3
Cameroun	2006	21.4	2.6	39.9
Cape Verde	2006	62.5	27.6	86
Cote d' Ivoire	2006	13.8	0.3	31.4
Egypt	2005	99.6	99.2	99.7
Ethiopia	2005	4.2	0.2	28.1
Gabon	2006	68.3	22.6	79.6
Ghana	2006	11.1	2.3	23.7
Kenya	2005-06	17.3	3.6	58.4
Libya	2009	95.6		>95
Mauritius	2004	95.8	95.6	96
Morocco	2003-04	91.2	78.1	99.2
Nigeria	2007	24.3	7.6	57.7
Senegal	2006	41.1	12.1	74.4
South Africa	2007	83.2	57.3	86.2
Sudan	2006	6.9		
Tanzania	2007-08	2.8	0.4	10.2
Tunisia	2006	98.4	97	99
Uganda	2006	0.4	0.1	2.6
Argentina	2001	94.8	67.1	97.8
Brazil	2003	87.2	47	95.4
Chile	2007	95.6		64.3
China	2007	42	25.5	
India	2005-06	28.8	9.5	68.3
Korea S.	1998	99.9	99.5	100
Malaysia	2003	96.7	95.3	97.4
Mexico	2003	85.6	55.1	96.1

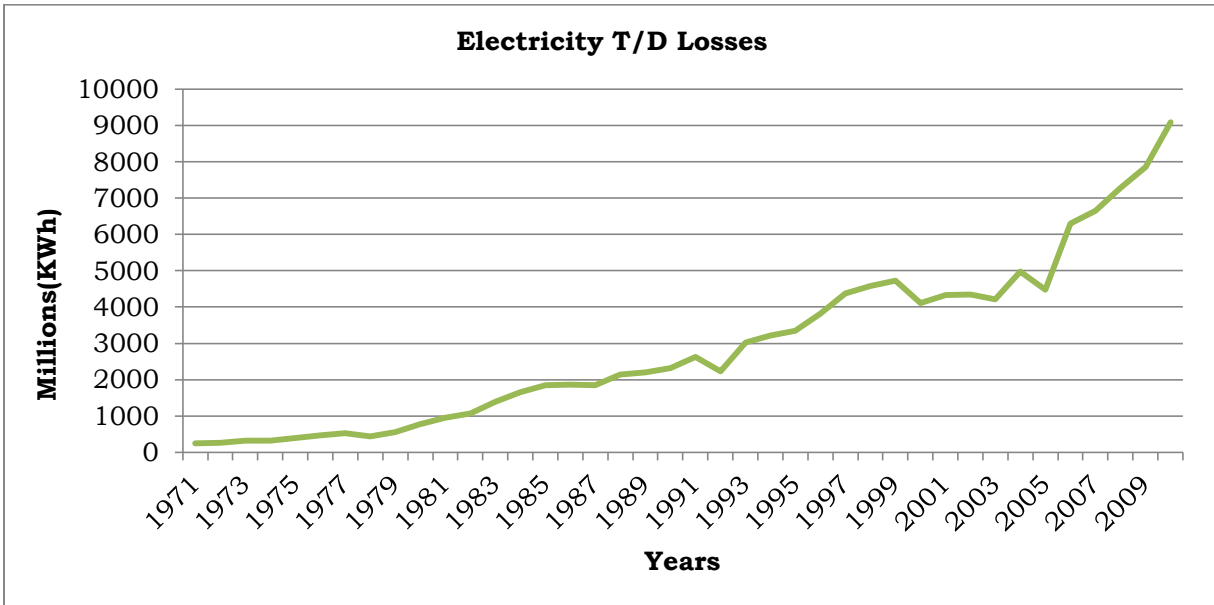
Source: UNDP/WHO Energy Access in Developing Countries

Available data indicate the presence of a big difference between the amount of electricity produced and the amount delivered to end users. This big difference reflects the huge electricity losses mainly due to transmission and distribution shackles and substantial illegal access to public power supply. Nigeria records the largest transmission and distribution losses in Africa.

Figure 4: Transmission and distribution problems in Nigeria



Figure 5: Indicators of Power Crisis in Nigeria 1971 to 2009



Source: Derived from African Development Indicator (ADI) 2012

Finally, Nigeria and Iran both had 6,000MW op power delivery 4 decades ago. Today, Iran has upwards of 70,000MW. Nigeria regressed to almost as low as

2,000MW before recent increases to 4,000MW. The challenges are tremendous. Changing the course from prescriptions of the old industrial economy to a new realistic green platform that can reshape Nigeria's growth paradigm will require huge investment (Adelaja, 2012).

- ▶ At \$2.5 million/MW, will cost \$50 billion to reach 40,000 MW.
- ▶ It would take at least 15% of our national budget for at least 10 years.

5. Powersector during Jonathan Administration

The administration of President Goodluck Jonathan's remarkable commitment to the power sector rekindled the hope and confidence of both consumers and investors in the reform of the sector. On August 26, 2010, the President launched the Road Map for Power Sector Reform in order to fast-track the implementation of the EPSR Act of 2005 and to strengthen the policies and institutions to achieve the goals of the electricity sector reforms. He inaugurated the Presidential Action Committee on Power (PACP) and the Presidential Task Force on Power (PTFP) that report to him directly to fast track the implementation of the Roadmap. High level government officials, including state governors were co-opted into the membership of some of the Committees.

The Road Map for Power Sector Reform is a set of policy plans expected to ensure a more reliable electric power sector that guarantees stable electricity supply in Nigeria. Also, it sets strategies rather than introduce new policies to fast-track actions for achieving the objectives of the National Electric Power Policy (2002) as embedded in the Electric Power Sector Reform Act (EPSRA) 2005, with the basic objective of creating a private-sector-driven electricity supply industry.

The following strategies identified for actions in the Roadmap are:

1. Removing the current constraints to private investment in the power sector.
2. Setting a more transparent strategy for divestiture of the PHCN successor companies (11 Discos and 6 Gencos).
3. Reforming the fuel-to-power policies at the upstream energy sector which influence electricity generation, especially gas.

5.1 Power Sector Under President Jonathan's Transformation Agenda

There are several notable achievements of the administration in the electricity sector. The first relate to putting in place the appropriate institutional structure to oversee the sector. Setting up appropriate organizational structure is critical for the success of the ESI. The electricity market is different from the market for normal economic goods and services because of the peculiar structure of the industry. Hence, the absence of some critical organisations that are important to support the operation of the market may undermine the success of the reform. These organisations are needed as complement to the market to function effectively, especially in the early stage of the reform process. The Jonathan administration revamped, revived and in some cases constituted and formally inaugurated the management of some of these organisations and agencies to enable them play their roles in the transition process.

The first is the re-constitution of the Board of the Nigerian Electricity Regulatory Commission. Members of the former Board had been removed and charged to court on allegation of corruption. The reconstitution helps to provide appropriate regulatory direction for the electricity market in Nigeria and ensure regulatory stability. The Rural Electrification Agency (REA) Board and Management Team were also reconstituted to oversee the functions of the Agency as envisaged under the EPSRA.

Furthermore, in August 2011, the Nigerian Bulk Electricity Trading Plc (NBET Plc) otherwise refer to as Bulk Trader was created. This provides the requisite environment for private sector investment in the Nigerian Power Sector and confidence to the power generating companies that they will be able to recoup the cost of their investment at a profit. The failure to establish this agency in the past has left a yearning gap in the reform process as private investors were reluctant to do any business with PHCN companies because of their bad credit ratings. The NBET backed by partial credit guarantee scheme from the World Bank and the African Development Bank provide significant relief to potential investors in the upstream electricity sector, in the case of default by the distribution companies.

Similarly, the Nigerian Electricity Liability Management Company (NELMCO) and National Power Training Institute of Nigeria (NAPTIN) were set up. While the former was to legally settle any outstanding liabilities after the PHCN successor companies have been taken over by the management of new private sector investors, the latter, was put in place to help related need for skilled manpower development which the reform will demand in the sector. The

National Power Training Institute of Nigeria (NAPTIN) was therefore established to train both the existing and new entrants to the sector to help in curtailing the tendency of the investors replacing Nigerians with expatriate staff.

Table 7: Institutions and Roles

Name of institution	Year of establishment	Mandate
1. Nigerian Electricity Liability Management company(NELMCO)	2010	- To manage legacy liabilities and stranded assets
2. Nigerian Electricity Bulk Trading Co Ltd	2011	- To serve as a Special Trader with bulk purchase and resale license - To manage existing PPAs and new procurement of power in the transition.
3. Electricity Management Services Ltd	2012	- To carry out consulting services and provide shared services such as logistics and meter testing.
4. National Power Training Institute of Nigeria	2009	- To provide world class training to support the utilities manpower.
5. Transmission Corporation of Nigerian (TCN)	2012	- This has been handed over to Manitoba Hydro International for management contract.

Source: Excerpted from the document on Federal Republic of Nigeria’s Roadmap for Power Sector Reform, August 2010.

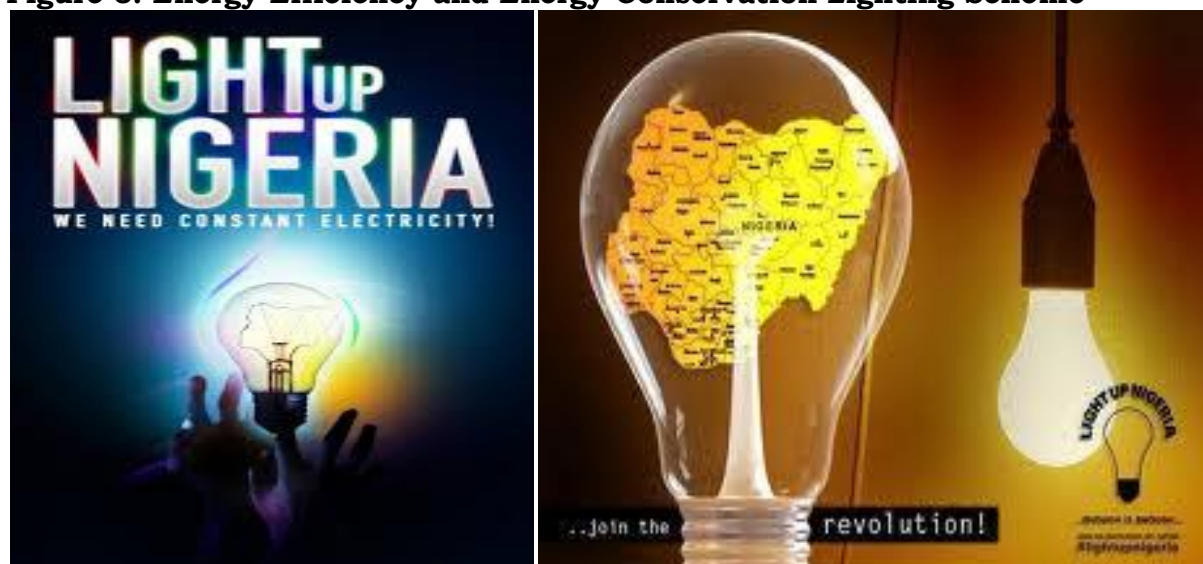
The Nigeria Gas Aggregator company was also established to ensure the smooth functioning of the gas market during the transition period and assure adequate flow of gas to the power sector to support electricity generation. Most of the new power plants are mainly gas fired and would require substantial and predictable flow of gas to guarantee their continuous operations.

Furthermore, commercially viable gas pricing framework has been developed to solve the issues of gas to power. Bankable Gas Sales and Purchase Agreements (GSPA) and Power Purchase Agreements (PPA) templates have been developed for the gas to power chain. These will move the industry from the best endeavor supply and transportation basis to commercially viable framework.

The implementation of the gas policy will eventually culminate in a willing buyer –seller structure under a fully market driven environment.

In addition, to address the important issue of energy efficiency and conservation, the Jonathan administration launched the Energy Efficiency and Energy Conservation Lighting Scheme. This is to promote and encourage the use of energy efficient bulbs and lighting systems in order to create an energy conservation culture.

Figure 6: Energy Efficiency and Energy Conservation Lighting Scheme



The Federal Government of Nigeria entered into an MOU with the General Electric. Under the MoU General Electric will invest up to 15 percent equity in power projects in the country summing up to 10,00MW capacity by the year 2020. General Electric also agreed to establish local packaging facility for small aero-derivative turbines in Nigeria which will promote job creation. The Jonathan administration also signed a Memorandum of Understanding with the US- ExIm Bank to provide an investment window of up to \$1.5billion for investors willing to invest in the Nigerian Power Sector.

The transmission infrastructure has been described as the weakest link in the country's electricity supply chain with lines that are aged, failing, dilapidated and in need of replacement. It has been estimated that about US\$3.07 billion would be needed over time to increase the capacity of the transmission system according to the Minister of Power, Prof. Chinedu Nebo. According to the Minister, Nigeria has sourced \$1.47 billion from the World Bank; African

Development Bank, ADB; French Development Bank and the Chinese EXIM Bank for the improvement of the electricity transmission infrastructure⁴. It is also being planned that the proceeds of the sale of the 10 NIPP power plants will be allocated for the use of the TCN (Oketola, 2013).

Electricity generation has also increased to the highest level under the administration. Power generation rose to 4502MW in December 2012 the highest since Nigeria returned to democratic rule in 1999. In addition there has been improvement in the completion of a number of Power Plants under the National Integrated Power Projects (NIPP) scheme as nearly all of them are primed to come on stream by 2014.

Table 8: Completion Stage of the ongoing National Integrated Power Project⁵

S/N	National Integrated Power Projects	Capacity	Proposed Date of Completion	
1	Calabar (Cross Rivers)	561	May 2014	5 gas turbines
2	Egbema (Imo States)	338	December 2013	3 gas turbines
3	Ihovbor (Edo States)	450	Completed	4 gas turbines
4	GbarainUbie (Bayelsa States)	225	November 2013	2 gas turbines
5	Sapele (Delta States)	450	March 2014	4 gas turbines
6	Omoku II (Rivers States)	250	December 2013	2 gas turbines
7	Alaoji (Abia States)	1131	May 2014	7 gas turbines
8	Olorunsogo II (Ogun States)	750	March 2014	6 gas turbines
9	Omotosho II (Ondo States)	500	Commissioned	4 gas turbines
10	Geregu II (Kogi States)	434	Commissioned	3 gas turbines
Total	Total Proposed	5089	June 2014	40 gas turbines

Source: Excerpt from Bureau of Public Enterprises (2011), Abuja, Nigeria

Administration officials now boast that large parts of an unprecedented number of cities and towns across the country are enjoying between 14 to 16 hours of uninterrupted power supply daily, except in some few areas where localized problems of power distribution network have created bottlenecks for smooth transmission⁶.

Perhaps the most notable achievement of the administration is the completion of the privatization of the PHCN successor companies in spite of the huge

⁴World Bank - \$800 mill; the French Development bank, \$170 m. and \$500 m from the Chinese EXIM bank.

⁵ During the Obasanjo tenure, six new power stations (Main V, Delta III, Agip-Okpai, Papalanto, Omotosho, Omoku and Gereku) were completed, commissioned and connected to the grid (Makoju, 2013).

⁶ While many Nigerians would accept that power supply has improved marginally, not many of them will agree with the official claim of electricity supply of up to 14 hours per day on a continuous basis.

resistance from very powerful pressure groups spanning the electricity workers, the diesel sellers and the importers and traders of generators, and their highly connected ‘godfathers’ who realized that change in the industry meant a possible end to the ‘business as usual’. The phase ended with the handing over the physical assets of PHCN to nine generation and five transmission companies on the 1st November, 2013. This brought to conclusion the tortuous and tasking process that commenced in 2005 and was originally designed to last for few months.

Tables 9 and 10, show the breakdown of the privatization proceeds. A total sum of US\$2.26 billion was realized from the sale of the assets of the distribution and generation companies. While the official claim is that the process has been very transparent, quite a few people are of the opinion that the assets were sold on the cheap.

The Vice- President gave a tacit concession to this allegation when he informed Nigerians that the privatization programme was different from what obtained in the past as it “was driven by the need for efficiency and investment rather than optimization of proceeds for the government”⁷ .

Table 9: Breakdown of the amount realized from the sale of 10 distribution and 5 generation Companies

Preferred Bidders	Distribution Company	Total Amount Paid (US \$ million)
Integrated Energy Distribution & Marketing Company	Ibadan	169
Integrated Energy Distribution & Marketing Company	Yola	59
4Power Consortium	Port Harcourt	126
Interstate Electrics Limited	Enugu	126
Vigeo Consortium	Benin	129
Kann Consortium	Abuja	184
Aura Energy	Jos	82.44
Sahelian Power SPV	Kano	137
NEDC/KEPCO	Ikeja	131
West Power & Gas	Eko	135
Sub-Total		1278.44
	Generation Company	
North-South Power Company	Shiroro Power Plc	111.6
Transcorp/Woodrock Consortium	Ughelli Power Plc	300
CMEC/EUAFRIC Energy JV	Sapele Power plc	201

⁷ Cited in The Guardian Oct 1, 2013.

Mainstream Energy Ltd	Kainji Power Plc	237.87
Amperion Power Company Limited	Geregu Power Plc	132
Sub-Total		982.47
Total		2260.91

Source: Excerpt from Nigeria Intel Report “Nigerians wait for steady electricity supply” on 21 November 2013

Table 10: Amount Received for the successor companies

Federal government received:	Business Day Newspaper	Calculated Figure ¹
Amount expected(US \$ billions)	3.3	
Amount realized(US\$ billions)	2.137	2.261
Amount realized(N billion)	351.8	361.7

Source: Excerpt from Business Day Newspaper (published on September 30, 2013) available at <http://businessdayonline.com/2013/09/fg-hands-over-phcn-gencos-discos-to-new-owners-today/> and Nigeria Intel Report on 21 November 2013

Note: ¹ calculation based on data from Nigeria Intel

The Administration set a very ambitious electricity development plan for itself under its Transformational Agenda. A trip back the memory lane shows that successive governments often set and often fail to meet up with their highly optimistic targets. Table 11 shows key performance indicators set for electricity outcomes by 2020. It is envisaged that average number of hours of power availability will rise to 24 by 2020. In other words, for areas with electricity, availability will be 100 per cent. Similarly installed capacity is expected to increase to 23000MW, more than double the present level. In addition number of system collapse will fall rapidly from 15 in 2012 to 0 by 2020.

Table 11: Key Performance Indicators of Nigerian Electricity Sector

	2012	2015 ^a	2020 ^a
Average number of hours of power availability per day	16	22	24
Installed capacity(MW)	9920	19258	23000
Available Capacity(MW)	6522	9758	18500
Capacity delivered(MW)	4517.6	9213	16032
Number of System Collapse per Year	15	6	0
Rural Electrification:			
Number of Local Governments electrified	698	728	774
Number of Towns connected to the Grid	32000	35000	38520
Percentage of Towns connected to the Grid (%)	40	43.75	48.15
Percentage of Towns connected to the off Grid (%)	40	95	100
Number of Staff Trained in the Sector	1227	1554	2260
Number of Jobs created in the Sector	1528	6588	10596

Note: ^a Planned Target

Source: National Monetary and Evaluation Report 2013

Realizing the highly ambitious targets above require huge investments across the whole spectrum of the electricity supply chain. Table 12 shows that in the distribution segments alone, over N204.6 billion (US\$1.3billion) has to be invested as capital expenditure in the next five years by the distribution companies alone to revamp their respective assets and bring the companies into full capacity utilization, going by government calculations. These investments are to cover provision of new meters, health, safety and environmental practices; improving customer connections and networks expansion, improving customers’ services and complaints handling procedures and meeting their other commitments under the privatization contract for expansion of the system.

Table 12: Distribution Projections

Year	Additional Capacity(MW)	Funding Source	Distribution Capability Index	Investment Required(NGN Billion)
2013	3,298	NIPP + MYTO I Subsidy funded projects(on-going+ new ones)	0.88	51,119
2014	2,326	NIPP Projects + Private investment	0.9	36,053
2015	3,300	Private investment	0.9	51,150
2016	3,300	Private investment	0.9	51,156
2017-2020	13,200	Private investment	0.95	204,600

Source: Excerpted from the Document on Federal Republic of Nigeria’s Roadmap to Power Reform Revision 1, August 2013

5.2 Challenges of the Power Sector Under President Jonathan

The privatization policy of the administration has been described as quite radical. Although the goal post was shifted several times, the successful completion of the privatization process and the physical handing over of the privatized assets to their owners across the country on 1st of November, 2013 has put the country in an uncharted territory⁸.

Proponents of the privatization have argued that it will generate huge socio-economic benefits to Nigerian electricity consumers, including increasing access to electricity, improving efficiency by increasing collections rate,

⁸ According to local media, some international electronic media like the BBC and the Sky News Television claimed that those fronting as the buyers of the power plants in Nigeria are “actually rent seekers and arm chair investors whose stock in trade is to roam around Europe in search of real investors with the financial and technical capacity to buy up their shares of these recently acquired national assets sold to them at ridiculously cheap price after so much public fund were committed to upgrade these power plants”. The government insisted that the quality of the core investors met the required technical, managerial and financial capacity to deliver on its mandate.

reducing technical and non-technical losses and thus reducing costs of retail business, ensuring fair tariffs to all end-users, and improving quality of customer service. They have also argued that the reform will ensure transparent and responsible management, limit political interference, eliminate government's involvement in utility management, promote Private Sector Participation Management and technical operations, encourage private investment in generation to address inadequate supply, ensure level playing field for all investors and release government funds to finance core activities.

Figure 7: Electricity Supply Problem in Nigeria



In spite of the assurances to the contrary, there are still several challenges confronting the sector. These include institutional and regulatory capabilities, transparency and independence of the various organisations established to oversee the new ESI that will emerge post privatization. Privatisation does not imply absence of regulation. It simply involves that the focus of regulation will have to change to ensure that all actors play according to the rule, that interests of all economic agents, especially the vulnerable consumers are protected, that quality of services are not compromised and that there are no attempts to hijack the normal functioning of the economic process through anti-competition practices. This is not a trite issue. Both in the telecommunication and airline industries there are claims of regulatory captures and a very weak capacity of regulators to enforce rules and protect consumer rights. In other cases, assets of privatized organisations have been stripped, cannibalised and exported by their new owners in the past. Ariyo and Jerome (2009) in a review of performance of privatized companies have found out that there has been weak oversight by the Bureau of Public Enterprises post-privatisation and that the performance of some privatized companies actually deteriorated after their privatization.

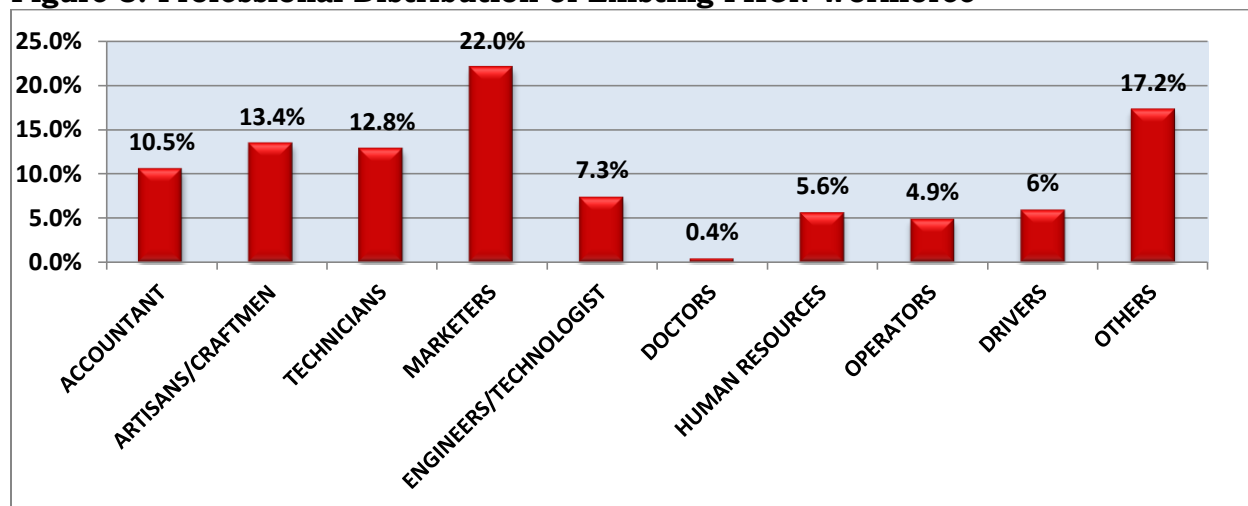
During the transition phase of the new ESI, the distribution companies will enjoy some form of monopoly status until the segment is opened up for competition. This will require a lot of monitoring to ensure that the discos operate efficiently. The government has insisted that both the NERC and the BPE will continually monitor the operations of the successor companies and would not hesitate to sanction any of the core investors that did not deliver on the performance agreement that was executed with the government.

Second, electricity supply security remains an important issue even post privatization. The system needs to be optimized in terms of location of new power plants to ensure even distribution across the country as well as minimize the cost of location between access to fuel and consumption centres. Presently, gas is the overwhelming preferred source of fuels for electricity supply. Natural gas at present is located in one region of the country. This throws out some potential risks in terms of stability of supply. The present reform has also not provided enough incentives for private sector participation in renewable energy and other energy sources to diversify the electricity supply base for the country and provide more energy security and access. This will be particularly important in the rural areas where grid connections may not be feasible economically or physically.

There is also a huge capacity gap that needs to be overcome in the new industry that will evolve. It is difficult to see how skill development can keep pace with the expected increase in generation capacity between now and 2020. NAPTIN will definitely not be able to meet the training required to match the industry skill needs. A baseline study of PHCN workforce conducted in 2012 and reported in figure 8 shows that the skill mix in the electricity sector is not balanced. Engineers and technologists account for less than 8 per cent of the workforce that is dominated by marketers, accountants, drivers and the likes⁹.

⁹ The National Power Training Institute of Nigeria (NAPTIN) has trained more than 230 electricity engineers in generation, distribution and transmissions. However, much more still has to be done.

Figure 8: Professional Distribution of Existing PHCN Workforce



Source: Excerpted from Reuben Okeke (2013) NAPTIN Presentation to the National Planning Commission on Power Sector Human Capacity Requirement (PHCN HR statistics March 2012)

Another critical issue is how to fully and fairly resolve the legacy issue with the staff of the former PHCN. Both the government and electricity workers have failed to agree on the amount of indebtedness and payment made so far to resolve the claims of former workers of PHCN. On the eve of the handing over of the PHCN assets to their new owners on the 1st of November, the President of the Senior Staff Association of Electricity and Allied Companies (SSAEAC), Comrade Bede Opara claimed that all the labour issues have not been settled. According to the Union President, “in Benin, 50 per cent of the workers are not paid yet and in Jos 55 per cent are not paid yet, while in Sapele, 77 per cent of the workers are not paid. He continued “from the available records, 60 per cent of the workers in Egbin are not paid, 60 per cent of workers in Ughelli are not paid, 67 per cent of workers in Afam are not paid and 100 per cent of the workers in Kaduna, Abuja and Jebba are yet to collect their payment. “Also none of the workers in transmission has been paid while their RSA entitlements have not been paid to anyone”. (Opara, 2013).

Government however claimed that over N384.06 billion has been spent on meeting the emoluments of labour.

There is also the problem of inadequate transmission and distribution infrastructure. Between electricity suppliers and consumers is transmission. Even if all the IPP project developers were to set up power plants, the existing transmission and distribution infrastructure, will not be able to wheel the quantity of electricity generated. Full funding of government obligation to the TCN is quite imperative. Currently with the new power plants coming on stream, the ability for TCN to transmit the power to load demand centres would

be approaching breaking point. “This would impose challenges on power generating plants. Their power plants would not be dispatched at 100% of capacity. And according to the power purchase agreement that are on the basis of take or pay, when a power plant is ready to supply power and the buyer cannot take it, the generator would get paid the capacity cost, because it is ready to willing and able to do so., and because it has spent money to make the capacity available to the off taker – the Nigerian Bulk Electricity Trader”. (Owan, 2013).

The protection of the consumers, in particular the vulnerable has to be given proper attention in the new electricity market. One major outcome of the reform has been the steep increase in tariffs established by the NERC under MYTO 1 and 2. This has led to almost double of electricity tariff between 2005 and 2010, with the government having to pay huge subsidy to electricity producers through the NERC. By 2020 according to MYTO2, electricity tariffs would have risen from N6-8/kWh at the onset of reforms in 2005 to N26-N32/kWh by 2020. The fixed charges are also very high.

In addition, the mechanisms for immediate engagement and partnership with civil society and CSOs on ways of safeguarding the consumers’ right of electricity consumers in Nigeria have to be instituted. The distribution companies have already formed the Disco Roundtable as a pressure group that will eventually transmute into a trade association to protect their interests¹⁰. Who will protect the interests of the consumers? Protection of consumers is very important. Some have advocated for the establishment of antitrust laws to govern the activities of the business actors in the newly privatized sector. The NERC/BPE that the government has charged with monitoring the activities of the new owners may not be able to effectively curtail antitrust activities of these private investors.

In Nigeria, we have cases where the sector regulator has been compromised or ‘captured’ by powerful interest groups within the sector in what is called ‘regulatory capture’. This calls for the establishment of a broader agency with mandates that are not sector specific. Ayanruoh (2013) has called for two-track regulations of the sector –direct regulation through administrative processes – NERC and indirect regulation under antitrust laws.

¹⁰ The NERC has already claimed that trade union among the producers in any form is illegal.

6. Concluding Remarks

Mr. Chairman, distinguished Ladies and Gentlemen, permit me to end this lecture with some reflections on the way forward. The journey we started on 1st of November 2012 was truly remarkable. We are on an uncharted terrain where there will be significant ups and downs, hiccups and distractions. It was a great courage against a very powerful network of political and economic interests groups to have proceeded with the privatization of the generation and distribution segments of the electricity supply chain in one single stroke. It is indeed a milestone. Should we have chosen a more cautionary approach as we saw in some country cases we mentioned earlier? Should we have allowed a public corporate company to co-exist with private company in improving our electricity supply? Is the reform model we chose the most appropriate for the country? We may never know the answers to these probability questions.

Figure 9: Nigerians need Sustainable Electricity Supply



However, one fact is that we have commenced a journey. It beholds on the government, its agencies and other stakeholders to make it work. I have few suggestions. First, we need to promote a more balanced electricity generation mix in order to improve energy security. The overwhelming reliance on gas-thermal from a relatively volatile part of the country, easily put the whole supply chain in jeopardy and at the mercy of vandals¹¹. We must promote other sources of generating electricity, even if they are more expensive – renewables, coal, and others¹². Second, access to electricity should not be

¹¹On 25 November 2013, electricity generation to the national grid dropped by 450MW due to the vandalism of the pipeline that supplied gas to Okpai power plant in Delta state. This led to the power supply to the national grid to drop to about 3300MW. Prior to this, the total generation capacity was between 3,600 MW and 3,700 MW.

¹² * Fossil sources of energy will eventually run out:

restricted to the urban centres alone. Electrifying the rural areas is one of the fastest ways to massively reduce poverty. China relied heavily on small hydro power to connect the rural and isolated communities with electricity. The current body of legislation guiding electricity reforms does not provide appropriate incentives for small hydro, wind, solar PV, biogas, and others to rapidly expand electricity to the unreached areas. The lesson from Germany and China could be very relevant to us.

Third, competition is very important and the role of the electricity regulator very crucial. The latter must be ahead of the curve in terms of capacity and regulatory instrument. There are genuine fears that not only the rural areas, but the low income neighbourhoods in our towns and cities may lose out as distributors divert electricity supply to more affluent parts. We must do all to prevent regulatory capture by politically connected and organized operators. The regulator must walk carefully the tight rope of balancing the interests of consumers and investors.

Fourth is that the enabling laws and regulations must be regularly revised to ensure that lessons learnt are quickly coded in enabling laws that will deepen the reforms and make the gains of reforms more evident and equitable.

The crucial dependence of the sustainable socio-economic advancement of any nation on research, development and training activities is now universally acknowledged. Government must encourage and fund research and development in the sector to improve sectoral performance, and innovation. The private sector in Nigeria is hardly enamored with research and development. This is a “common good” that government may be persuaded to take leadership role. Tertiary institutions in Nigeria should be challenged and motivated to not just provide the human capital required, but also continue to explore application of local resources and adoption and adaptation of developments in technology in the energy sector to the Nigeria environment.

Presently, energy utilisation in our national economy is far from efficient. Apart from direct losses, using energy inefficiently has three major implications to the national economy: first, investments in energy supply infrastructure in excess of what is required with more efficient equipment and practices; second, increased environmental problems; and finally, increased cost of goods. The

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- Uranium in 35 years, Crude oil in 40 yrs, natural gas in 65 years and coal in 180 yrs.
 - Renewable energy sources are tied to nature and will never run out.
 - The prices of non-renewable energy sources will continually rise, while the prices of renewable energy sources will drop as technology improves. (Adelaja, 2012)

potential for energy savings in the Nigerian economy is huge, especially in the three main energy demand sectors, namely household, industry and transportation.

Resource potential is important, but appropriate and dynamic policy is a game changer. Policy always precedes the market (Adelaja, 2012). Policies must be designed to incentivize or mandate the development of renewable energy technology, for instance, insisting that the electricity supply by discos must include certain proportion of renewable energy. Such demand will spur supply. Similarly political will is also critical to tap into the exhaustible power of renewable energy. I also want to call for the revision of the EPSR 2005 to reflect the federal nature of our economy and to bring existing laws in tandem with current socio-economic reality of the state.

Mr. Chairman, permit me to end this lecture with a famous quote from one of our leading Energy Lawyer in the country, Professor Yinka Omorogbe:

“The fact is that the difference between the rural dweller in a village in Africa and a city dweller lies in the amount of energy available for his use. The city dweller is free from matters that are a major concern of the rural dweller because of the energy at his disposal. The average city dweller wakes up in the morning, walks up to his bathroom, turns on the tap, and takes a bath. He then plugs in a kettle for his tea or coffee, turns a knob on his conventionally powered cooker to make his breakfast, walks to the bus stop, waits a few minutes, and then gets into a bus which takes him to his office. By contrast the rural dweller in Africa wakes up, treks to the stream to fetch the water for his bath, cuts firewood that he must use to cook his food, and then treks to his farm where he works to make ends meet. If he is more than moderately sick, he is almost sure to die because he has no modern medical facilities, which are dependent on modern energy. The ease of life of the westerner compared to the Africa rural dweller reflects the amount of energy available to the different persons...” Omorogbe (2004)

Nigeria cannot develop faster than her electricity development. It is a binding constraint on our development. Achieving the goals in the transformational agenda, will never happen until electricity supply in rural and urban areas, cities and villages, North and South and every part of this great country has access to a more reliable, affordable and quality electricity supply. It is only then that the latent potentials and greatness of this blessed country will be truly unshackled for greatness.

On the balance, the Jonathan administration in its short span has provided fillip to electricity reforms. The President has demonstrated his commitments and determination to break the vicious circle of poor electricity supply on the economy and welfare of Nigerians. He has taken important steps. However, the

journey ahead is still long. If he succeeds, his legacy will be preserved for generations.

Thank you so much for listening.

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