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IndustryReport

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Power Sector reform

…Unlocking the Investment Opportunities

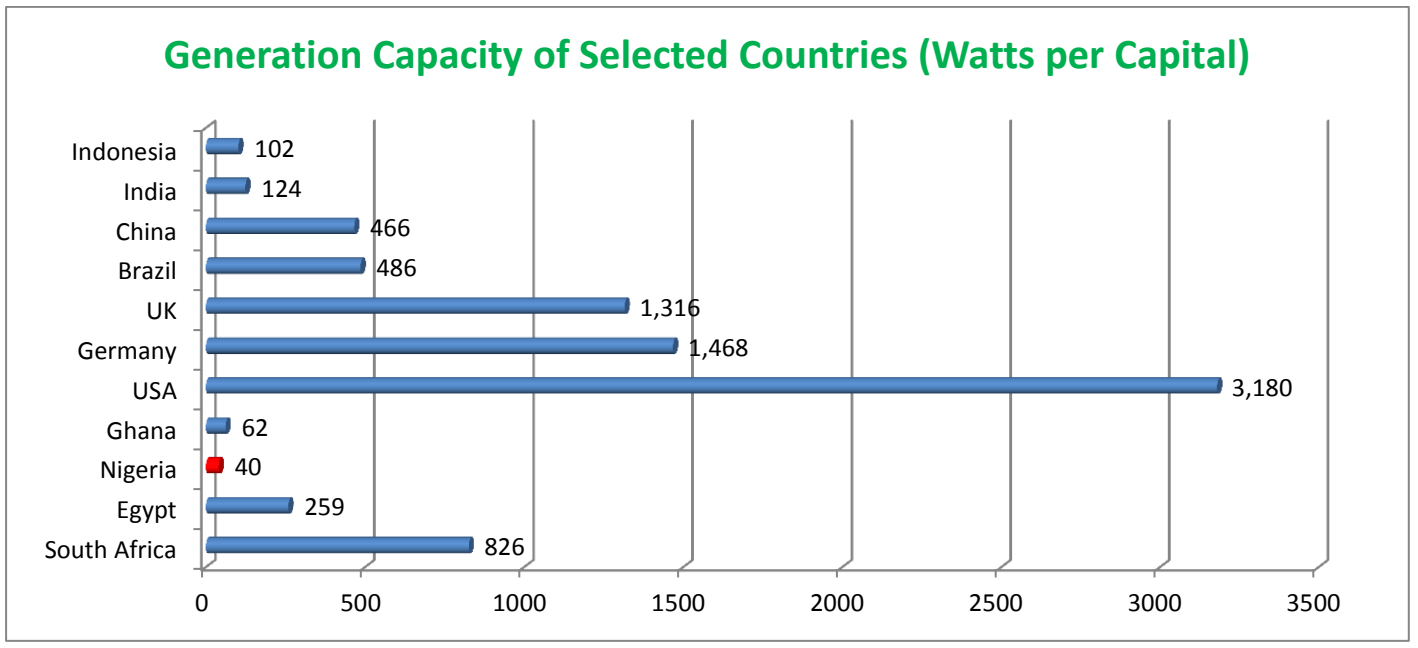
Contents

Background of Nigerian Power Sector

Efficient, affordable and regular supply of electricity is key to economic growth and poverty reduction in emerging and developing economies. Stable supply of power is very important in a country to ensure sustainable development and enhance investors' willingness to put their money in such economy. Experts have emphasized that if power sector remains stagnant, industries cannot grow. Poor electricity supply has been a serious challenge in Nigeria because huge amount of money has been expended by successive governments to restore the power sector but nothing seems to have been achieved as the country still witness recurrent and persistent outages.

Recent survey has shown that about 40 per cent of the population has access to epileptic supply of electricity because of low power generation. Figure 1 below shows that Nigeria's generation capacity is the lowest in some selected countries in terms of watts per capital.

Figure 1: Generation Capacity of Selected Countries



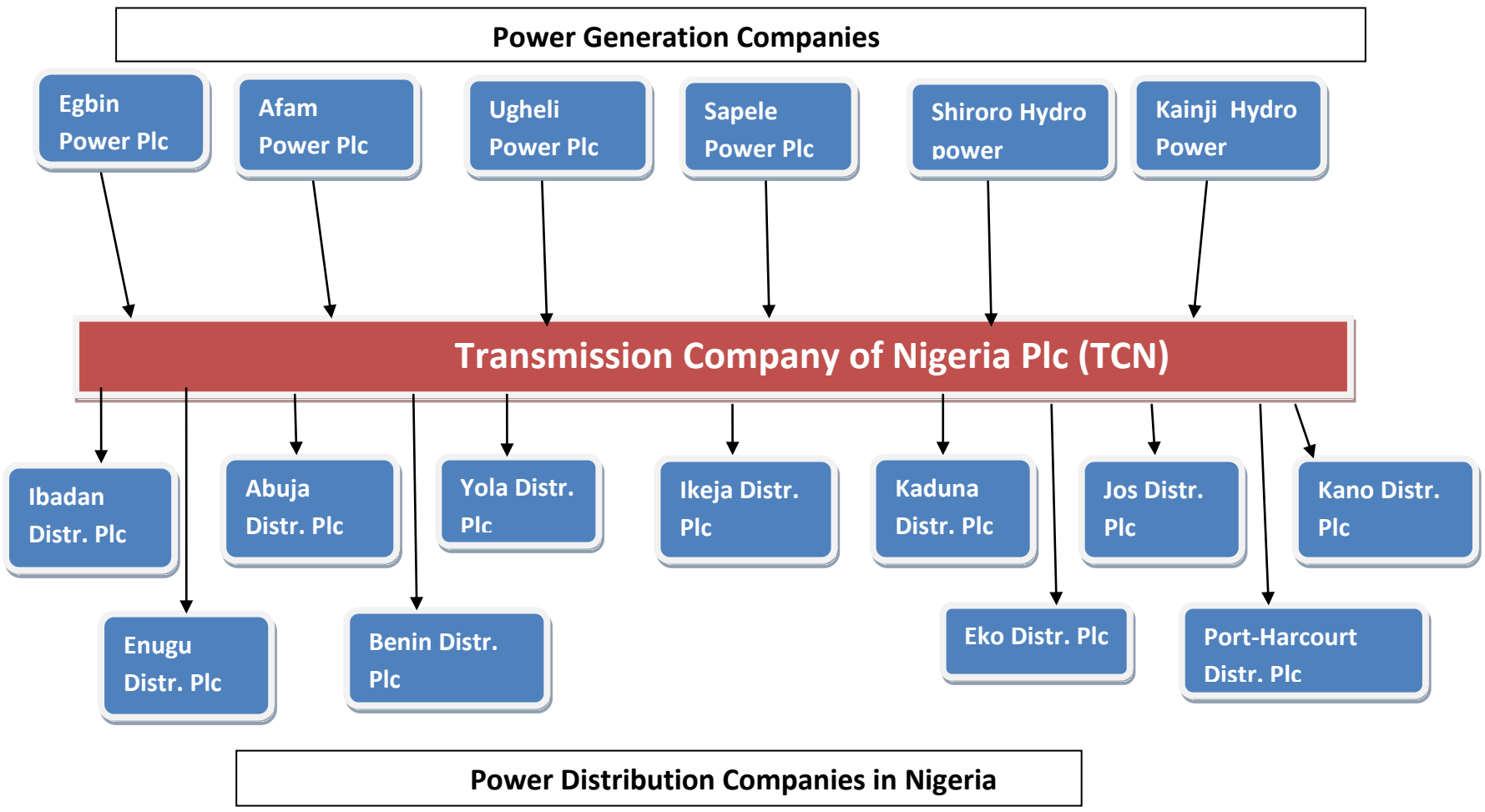
Source: World Fact book, PAC Research

As a result of strategic existence of Nigeria in African and West African Sub-region in relation to population and economic might, international communities and foreign countries have extended assistance in various forms to the country in the recent past. Recently, Senator Hilary Clinton announced a $1.5 million in technical support for Nigeria's power sector at the end of a high level bilateral meeting with the nation's Minister of Foreign Affairs, Mr. Odein Ajumogobia. World Bank had previously agreed to provide $100 million to assist in Nigeria's power sector privatization efforts.

Government Action Plan on Power Sector

The unbundling of the nation's power sector has taken a new dimension as President Good Luck Jonathan has taken the bull by the horn by unveiling the power sector reform roadmap indicating the genesis of full implementation of the Electric Power Sector Reform (EPSR) Act 2005 by making the eighteen (18) successor companies of Power Holding Company of Nigeria (PHCN) private sector driven (figure 2). The roadmap stipulates that only the eleven (11) distribution companies and six (6) generation companies would be fully privatized while the Transmission Company of Nigeria (TCN) would be retained by the government but with private sector management under a five-year management contract.

Figure 2: PHCN Successor Companies



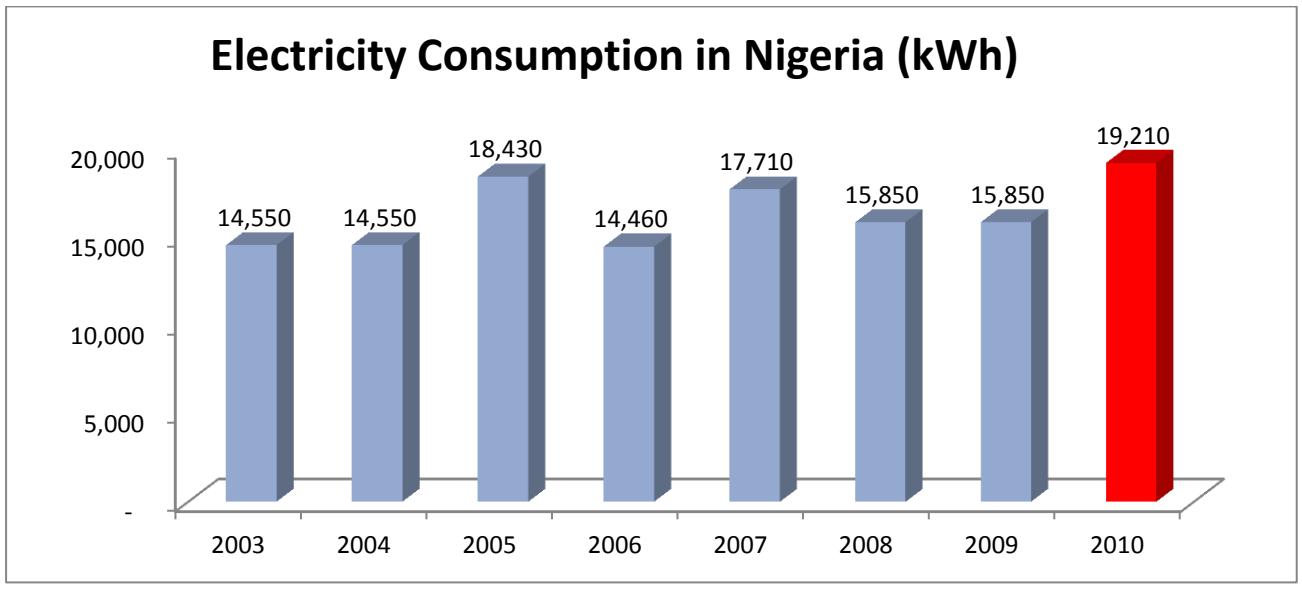
Source: BPE, PAC Research

It was indicated in the roadmap that the government will divest a minimum of 51 per cent equity of the generation and distribution companies to core investors that clearly demonstrate the technical and financial ability to operate and expand each plant. It was also stated that National Electricity Regulatory Commission (NERC) will ensure that a monopoly or oligopoly of market in the generation sector is prevented. It is believed that the sale of these companies will stress the reduction of technical and commercial loses and increase efficiency of revenue collections. Ultimately, government will provide credit enhancement to the private investors to enable them produce at least 5,000 megawatts of new capacity between 2012 and 2013.

Moreover, the presidential action committee of the federal government on power is determined to achieve results by putting up the following objectives:

- To establish and sustain effective communication with stakeholders and the public on the action plan
- To make every Nigeria electricity consumer a responsible customer complying with tariff and service obligation
- To establish a competitive power procurement framework that delivers increased power generation to meet increasing customers' demand.

Figure 3: Electricity Consumption in Nigeria Over Eight Years



Source: CIA World Fact book

However, we are delighted to raise some issues on the protracted power sector reform roadmap of the president. The reform states (above) that only the generation and the distribution companies would be privatized while the transmission company would be retained. That means a single firm cannot own and control generation, transmission and distribution of power. This may vitiate investors' confidence to some extent if they cannot control the entire power production chain and deliver to consumers. In a nutshell, for the prospective investors to be able to efficiently recoup their investment from generation and distribution, Transmission Company must not be owned by government despite any power purchase agreement.

Table 1: Power Generation Companies in Nigeria

Power Generation Companies in Nigeria						
S/N	**Name**	**Type**	**Installed Capacity (MW)**	**Generating Capacity (MW)**	**Year of Construction**	**Cost**
1	Kainji	Hydro	760	283	1968	175 Million
2	Afham	Thermal	699	-	1963	-
3	Shiroro	Hydro	600	434	1990	800 Million
4	Egbin	Thermal	1320	839	-	-
5	Jebba	Hydro	578.4	278	1985	800 Million
6	Delta VI	Thermal	200	210	1991	2.2 Billion
7	Sapele	Thermal	1020	179	1976	-

Source: PHCN

Standing of National Integrated Power Project (NIPP) Policy

Government also reiterated its plans on the National Independent Power Project (NIPP) plants by managing the projects under Operation and Maintenance (O & M) contracts now being prepared by the Niger Delta Power Holding Company (NDPH), the parent company of these plants. The manner and strategy for their subsequent divesture will then be made known to the public once these plants have been commissioned.

Table 2: National Integrated Power Projects (NIPP)

National Integrated Power Projects (NIPP)			
S/N	**Name**	**Location**	**Installed Capacity**
1	Calabar Thermal Power Station	Cross River	561
2	Oji River Power Station	Enugu	120
3	Ijora Power Station	Lagos	30
4	Omotosho Power Station	Ondo	300
5	Olorunshogo Power Plant	Ogun	335
6	Geregu Power Plant	Kogi	414
7	Alaoji Power Plant	Abia	504

Source: NERC

Government also intend to commission new NIPP power plants by bringing on stream additional brand new capacity by adding to the existing ones from Alaoji, Olorunshogo, Sapele, Ihovbor and Gbarain power plants. It is important to note that the three tiers of government, through excess crude account, spent about $3.07 billion to fund NIPP prior to 2007 and increased to $5.375 at present which was warehoused and called Power Emergency Fund.

As a result of the abundance of gas in the country wasting away, NIPP decided to make its projects gas oriented so as to meet the time frame and budget for completion of the projects. It is crystal clear that Nigeria is blessed with Liquefied Natural Gas (LNG) that is hitherto not fully tapped; it has been described as a wise idea to channel the wasting gas to fueling electricity generation under NIPP and other power projects.

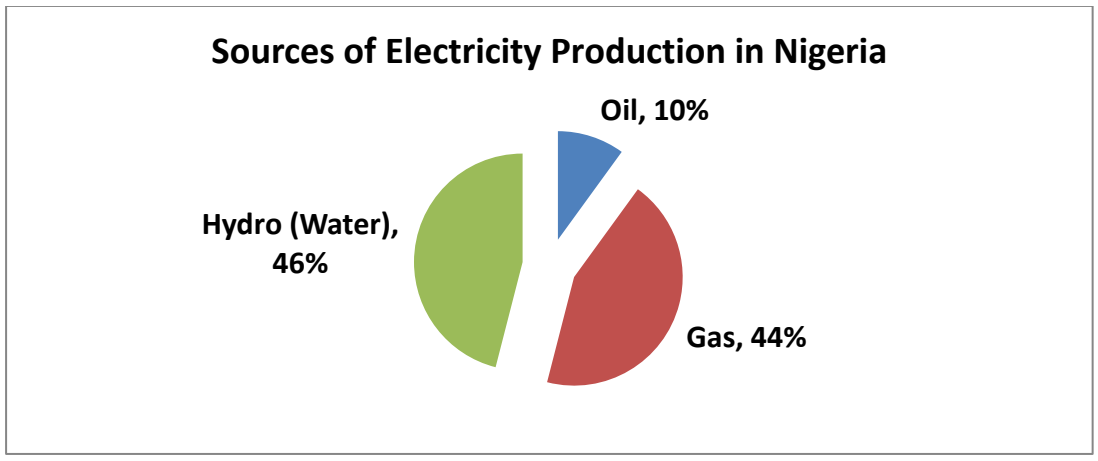
Management of NIPP has assured that the project will add about 4,774 MW of electricity when completed to the national grid. It is believed the NIPP will holistically solve power problem in Nigeria and this explains the reason while federal government has deemed it fit to open up and deregulate the sector to allow further private sector investment in order to ameliorate power sector problem and make electricity available to all. Of course the recent roadmap on power sector reform cannot put an end to the power crisis; the efforts must be on going for Nigeria to be among the best economically empowered 20 countries in the world in year 2020. It is a good thing if the country can mirror South African power policy; the country of about 48 million people has 48,000 MW and 8,000 MW as backup in case of unforeseen circumstances.

Policy Actions of Previous Governments Since 1999

The 1999 constitution allows all the three tiers of government to participate in most aspects of electricity supply in Nigeria. The popular NEEDS program spelt out some policies on electricity in terms of increased generation and transmission capacity. In 2007, late president Yar'adua unfolded a seven-point agenda top of which was provision of steady electricity supply. President Goodluck Jonathan

recently approved the composition of a new Power Reform Committee (PRC) in order to transform the sector so that downtrodden Nigerian populace can have access to permanent and stable electric power as well as adequate and modern energy consumption. The action plans put together by the committee advocated for increased generation, provision of frame work for private sector participation and investment, integration of all renewable energy-base power supply through effective utilization of energy resources and encouragement of all state government to take over and operationalise all rural electrification projects.

Figure 4: Sources of Electricity Production in Nigeria (Percentage)



Source: NERC

Legal and Regulatory Framework

Electric Power Sector Reform Act (EPSR) 2005

In order to provide a legislative framework for the reform of the Nigerian power sector in accordance with the policies set out in the National Electric Power Policy, Electric Power Sector Reform (EPSR) Act 2005 was put in place. The Act removes operational and regulatory responsibilities of the electricity industry from the Federal Government. It provides the legal backing for the unbundling of NEPA, formation of successor companies to take over the various functions, assets, liabilities and staff of NEPA. It is also the background that will enable the development of a competitive electricity market, creation of a regulatory body that will license and regulate the generation, transmission and distribution and supply of electricity. EPSR Act 2005 also annulled the Electricity Act and the National Electric Power Authority Act. After passage of the act in 2005, BPE took necessary steps to incorporate the initial holding company called Power Holding Company of Nigeria (PHCN) Plc to take over the assets, liabilities and personnel of NEPA. EPSR Act 2005 led to the formation of Nigerian Electricity Regulatory Commission (NERC) to carry out the monitoring and regulation of the electricity industry, issuance of licenses to market participants and ensure compliance with market rules and regulations.

For the recent government reform in the industry to be effective, government should review all the grey areas in the EPSR Act 2005 and make meaningful changes that will provide incentives to all investors. We expect changes in the areas of licensing to investors in generation and distribution, also the area of revenue collection is very vital for any meaningful investment to be attracted to power sector.

Assets and Liabilities in Power Sector

BPE has done all possible to ensure that only asset, not liabilities, in the power industry are put up for sale. Nigeria Electricity Liability Management Company (NELMCO) will take up all the liabilities of the existing power companies functioning in the mode of the Asset Management Company of Nigeria (AMCON) set up by the Central Bank of Nigeria (CBN) to address toxic assets in the banking sector.

Liabilities to be taken over by NELMCO consist of unfunded debts that are made up of bank loans, taxes, debt to contractors, power purchase agreement. It will also handle other legacy issues so as to have a private sector driven power industry.

Suggested Regulatory frame

There are stern indications that the federal government may ascent to the plea of the Chairman of the Presidential Task Force on Power to allow revision of the EPSR Act 2005 by all stake holders so as to position the sector for real turn around by investors. We want to suggest that the following regulatory frame should be incorporated into EPSR Act 2005 after the review:

Consumer Protection

The main justification for regulating the electricity industry was to protect consumers from market power of monopoly. As competition is introduced into the electricity market, the role of regulation needs to be reconsidered, given that the stated intent is to enable market forces and consumer choices to restrain the exercise of market power by electricity suppliers. Consumer protection regulation addresses various issues in the retail electricity market that are common in other markets as well, such as fair metering and billing practices and price transparencies. Too little protection leaves consumer vulnerable to exploitation and too much inhibit the efficiency of the market.

Service Discrimination

In order to reflect consumers' different request for reliability and power quality, electricity suppliers should offer different levels of services that would allow each consumer to select and pay for the level of service desire. Differentiating service levels can enable deployment of optimal asset and investment from local and foreign investors creating benefits for all consumers in the market.

Pricing in Deregulated Electricity Market

Pricing reform in retail electricity market constitute a key component of the industry restructuring. Electricity prices play a central role in coordinating decisions between suppliers and consumers. Many features of the current electricity market price worry consumers, most consumers do not receive real-time price information and billing occurs with a significant delay after usage (usually after a month). Also, many consumers do not receive any information on how their usage varies with time except on month to month. Mechanics of price determination in Nigeria should be based on efficient resource allocation and not just cost recovery.

Rural Electrification

Nigeria is strictly urban focus when it comes to electrification some years back until the enactment of EPSR Act 2005 that stipulates that a policy must be put in place for rural electrification. The new framework should promote income generation opportunities for rural dwellers through renewable energy solutions by making off-grid electricity generation a participatory one. This can come inform of bio mass and wind forms of electricity generation.

Interplay of Demand and Supply of electricity

The imbalance existing between demand and supply of electricity in Nigeria is a serious challenge that is giving government and policy makers a sleepless night. This was linked to both technical and institutional deficiencies in the sector. It is obvious that demand for electricity in Nigeria is on the increase as a result of self generation by the use of diesel and petrol generating set in many households. The Nigerian Electricity Regulatory Commission (NERC) is set to address the problem of poor supply of electricity by establishing a regulatory frame work for Embedded Generation to exploit recent advances in technologies that have made medium size power plant competitive so as to resolve the demand-supply gap. Government, through NERC, is trying to create, promote and preserve efficient industry structures to ensure optimal utilization of resources for electricity generation and facilitate consumers' connection to distribution systems in both rural and urban areas for adequate supply.

Demand Side Management

In another dimension, successive governments in Nigeria have really focused investment on power generation, distribution and transmission (supply side) neglecting the demand side management of the sector. A common practice on the demand side management style is the use of pricing mechanism to restrict demand for electricity by consumers as being practiced in the developed world.

Nevertheless, it has been established that governments in this part of the world (Africa) may not allow interplay of demand and supply to determine price so as not to prevent lower class consumers (low income earners) from consumption of electricity.

Suggested Strategies for Sustainable Electricity Generation

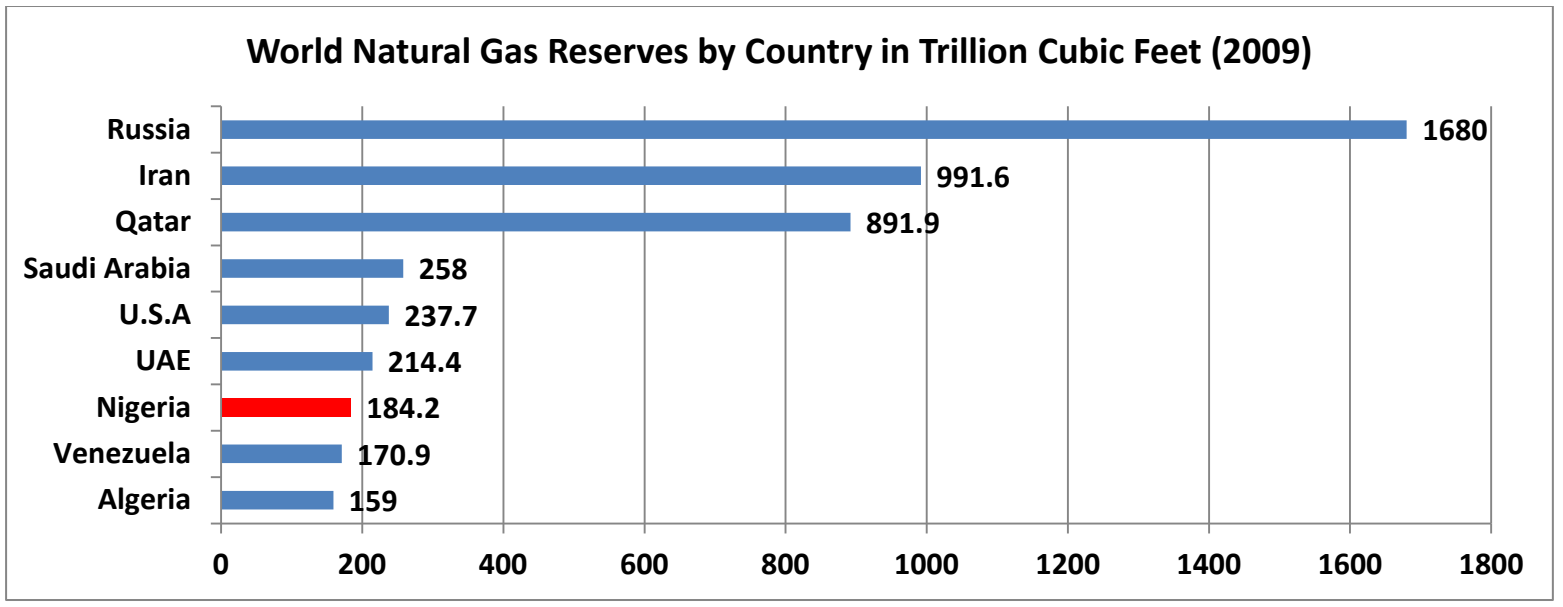
Federal Government needs to perfect all necessary plans and policies to ensure that the nation resolve the recurrent problem of electricity in the country so that its Millennium Development Goal (MDG) and Vision 2020 ambitions are achieved. The following strategies are proposed for sustainable electricity generation:

- Full development of hydro potential irrespective of size as a renewable source of electricity
- Domestic coal to remain primary source for electricity generation or importation of coal for power generation in coastal states
- Introduction of wind power generation especially in the top hill cities
- Further development of key enabling technologies such as gas and steam turbines
- Incorporation of nuclear technologies in the nation's power development

Gas as an Essential Input for Electricity Generation

Despite the world ranking of Nigeria as one of the leading exporter of Liquefied Natural Gas (LNG), thermal production of electricity in the country is not something to write-home about. Nigeria's proven natural gas reserves stood at approximately 184 trillion cubic feet (TCF) as at 2009 which made the country 7th largest in the world (Figure 3). United States Geological survey says Nigeria has the potential for additional reserve of 600 TCF making it the fourth largest after Qatar Republic.

Figure 3: World Natural Gas Reserves by Country in Trillion Cubic Feet (2009)



Source: Oil & Gas Journal, PAC Research.

Despite these attributes of the natural gas subsector, reality on ground is not consistent with expectations. The nation's gas-dominated electric grid experienced distortion due to inadequate gas supply. Gas pipeline vandalisation with resource control-linked militancy in Niger Delta region compounded supply problem before the disturbance was brought under control by federal government amnesty programme. Unending wasteful gas flaring in the Nigerian oil sector since 1958 has ranked Nigeria among the world's largest source of carbon emission which is a foremost factor in global warming.

Nonetheless, frantic efforts have been made in the oil sector but the Nigerian gas subsector is still nascent with considerable opportunities in order to deliver economic growth. Despite all the potentials in Nigerian gas subsector, major barriers of the sector have prevented substantive investment. Pricing is a major barrier; gas price in Nigeria is extremely low especially in the domestic

sector compared to what is obtainable in the international market. PHCN pays about $1.00/mcf of gas while to export projects pay $3.00/mcf. This has been a disincentive for sector growth. We are optimistic that deregulation of the power sector will lead to increase in demand for gas and that will in turn lead to growth in the gas subsector to fuel power industry.

Unlocking the Investment Opportunities

It is incumbent on Nigerian Government to make enabling law that would protect prospective investors in the eventual opening up of the sector for liberalization and privatization. Once again, the country requires substantial investment to sustain economic growth and development. Investment is needed to rehabilitate and construct new generation capacity, expand transmission, including interconnection between cities, and to expand electricity distribution networks in urban and rural areas. The following areas can be explored for investment in the power sector:

- **Merchant Power Plants (MPP):** This is the production and supply of electricity to consumers by private enterprises. Merchant power plant differs from traditional rate base power plants in terms of finance and where they sell the electricity generated. MPP is financed by private investors and sells electricity in the competitive wholesale power market. A traditional rate-based power plant is built and operated by a regulated electricity company to serve utility retail consumers. The MPP is not tied with long-term power purchasing agreement (PPA). It also compete for customers and absorb the full market risks, there are no guarantees that they have a minimum off-take of their output. MPP is a product of restructuring the electricity industry, they cater for different niches in the market, some provide steady supply to the grid, while others supply only when demand is highest and meet the peak load. This project is suitable for retail consumers and wholesales in form of Independent Power Project (IPP) for companies.

- **Wind Farm:** This a group of wind turbines in the same location used for production of electric power. A large wind farm may consist of a few dozen to several hundred individual wind turbines. Wind Power Density is used to select location for wind energy development. Access to the power grid is a factor, the farther from the power grid the more transmission lines will be needed to span from the farm directly to the power grid. Investment in wind farm close to an industrial estate will provide electricity for the use of the companies in the cluster under IPP.

- **Thermal Power Plant:** This involves the use of heat engine that transform thermal energy, often from combustion of fuel, into electricity. Thermal Power Plant can be fueled by substances such as natural gas with the use of combustion turbines, nuclear reactor, hot underground rock, biomass, solar and steam turbines. In Nigeria today, thermal power plant contributes second highest percentage of power to the national grid (Figure 2). We believe that the availability of abundant Liquefied Natural Gas in the country will boost investment in thermal power plant.

- **Hydro Electric Power:** Construction of dams for Hydro Electric Power Station is highly capital intensive but once a dam is built, the energy is virtually free. It is more reliable than wind , solar or wave power and no waste or pollution is produced. Hydro-electric power station can increase to full power very quickly, unlike other power stations and it generates electricity

constantly. We can have large scale hydro-electric power generation and smaller hydro-electric power generation designed for smaller communities, institutions, remote settlement and for single residence. Two major conditions for hydro power are source of flowing water and topographic landscape. China and Canada have the best hydro-electric power dams in the world, seeking for technical partners from those countries will enable hydro-electric power investment in Nigeria. Hydro-electric power can be financed by equity financing, joint venture relationship and mostly by project debt financing.

- **Investment in the Distribution Companies of PHCN:** The recent action plan of the Federal Government of Nigeria shows its readiness to sell the eleven distribution companies out of the 18 successor companies of PHCN. Under the proposed privatization strategy for the distribution companies, private sector operators will acquire controlling equity interest in the distribution companies with a view to rapidly improving its operational efficiency. Bidders would bid on the basis of a trajectory of technical, commercial and collection loss improvements, usually during the first five years of post-privatization operations. This method will be built around the Multi Year Tariff Order (MYTO) issued by the Nigerian Electricity Regulatory Commission (NERC) which set out the commercial and economic indices that provide the financial model for the industry.

Investment strategies

Most developed countries of the world have deregulated their power sectors since early 70's and have encouraged investment in various divisions of the sector. The following investment strategies will go a long way to guide us in investment propositions in the industry:

- It is important to note that investment in distribution companies take shorter gestation period for delivery.

- For transmission it is a little longer than distribution while generation takes longer time for delivery which means income will be tied down accordingly based on each company.

- Therefore, we recommend special focus on the distribution aspect of the industry because it is close to revenue collection which is important for any meaningful investment to be attracted to power sector.

- We can initiate investment on this privatization strategy of government by strategic alliances with technical partners/experts (i.e. Project firms) from advanced countries and strong relationships with the Bureau of Public Enterprises (BPE) and National Electricity Regulatory Commission (NERC).

Financing the Power Sector

Power sector is highly capital intensive and it takes long time to realize return on investment (ROI). It has been estimated that large funding is required over time, close to $50 billion (N7.5 trillion) is required over the next 10 years. It is believed that funding requirement in the power sector will grow as the economy and population grow. Events have shown that annual funding of power sector may take 80 per cent of annual budget, this necessitated the need for government to make power industry private sector driven.

In developing countries like Nigeria, projects were financed by borrowing from international banking market, multilateral institutions such as World Bank or through export credits. These methods are fading away in the developing countries as privatization and deregulation have changed the approach to financing investment in major projects by transferring the significant share of the financing burden to the private sector. Loan commitment provided by private sector lenders in recent years illustrates these trends (Figure 3). Project finance has been used all over the world in the following areas:

- Finance for natural resources projects such as mining, oil, and gas which were developed in the Texas oil field in the 1930s.
- Finance for Independent Power Projects (IPP) in electricity sector mainly for power generation in the United States in 1978.
- Finance for public infrastructure (roads, transport, public buildings etc) was developed through the United Kingdom's Private Finance Initiative (PFI) since early 1990s.

Figure 3: Private Sector Project Finance Loans Commitments, 1996-2001

($ Millions)	19196	1997	1998	1999	2000	2001
Power	**18,283**	**18,717**	**21,663**	**37,262**	**56,512**	**64,528**
Telecoms	13,296	19,864	16,275	24,929	36,735	25,445
Infrastructure	5,037	7,436	9,006	12,673	16,755	14,473
Oil and Gas	3,417	15,386	10,666	7,792	12,552	12,638
Real Estate	290	465	369	1,573	1,638	6,530
Petrochemicals	4,100	4,603	3,129	5,356	3,337	3,898
Industry(Process Plant)	1,964	2,144	2,641	1,396	3,538	3,646
Mining	1,234	6,307	2,694	1,377	629	2,323
Total	**47,621**	**74,922**	**66,443**	**92,358**	**131,696**	**133,481**

Source: Project Finance International, issue 233 (January 23, 2002)

Project finance is different from structured finance; it is a method of raising long-term debt for financing major projects based on lending against the cash flow generated by the project. Structured finance involves highly complex financial transactions offered by many large financial institutions for companies with very unique financial needs.

Project finance has two elements:

I. Equity, provided by the investors in the project
II. Project finance-based debt, provide by one or more groups of lenders.

Contracts entered into by the project company provide support for the project finance, particularly by transferring risks from the project company which can come inform of:

a. **Built-transfer-operate (BTO) projects:** Here the ownership of the project is transferred to the public sector while the project company will continue to operate over a given period of time.
b. **Build-own-operate (BOO) projects:** These are projects whose ownership remains with the project company throughout its life e.g. a power station in a privatized electricity industry or a mobile phone network.

Risk Management as a Characteristic of Project Financing

The best way government can ensure successful project financing is to structure the financing in such a way that investors are provided with sufficient credit support by guaranteeing investors or third party that the lender of the debt will enjoy credit risk. Applications for project financing are capital-intensive projects associated with high risks. Risks that must be taking into consideration by investors and lenders are:

- Country risk
- Political risk
- Foreign exchange risk
- Inflation risk
- Interest rate risk
- Fuel prices
- Availability of permit and licenses
- Litigation

Conclusions and Recommendation

Recent roadmap of the Federal Government in the power sector is termed as a giant stride to transform the sector so as to establish a competitive power procurement framework that delivers increased power generation to meet increasing customers' demand. This effort came at the wake of the collapse of the sector after huge amount of money has been wasted without any result.

It is of utmost importance to amend the controversial and non-investor friendly sections and sub-sections of the Electric Power Sector Reform (EPSR) 2005 Act in order to correct all anomalies in the act so that investors can be unequivocally attracted to invest in the sector. The regulatory act must also be biffed to protect consumers from profit-oriented investors.

In this new model in the electricity industry, government should also look into the area of demand side management option to curtail supply of unwanted or unnecessary electricity. We commend the effort of the presidency for appointing Dr. Sam Amadi, a development law specialist, as the new chairman of NERC.

Investment opportunities are immense in the sector in generation, transmission and distribution. Critical alliance with all government agencies and the regulatory bodies will facilitate participation in the prospects. We recommend a queue-up for investment in the distribution sub-sector which can come in the form of advisory services, project financing or in form of factoring.

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