ALP BUSINESS REVIEW-Energy

October 2014

The Shale Gas Revolution: Pros and Cons for the Nigerian Oil Industry. By Stephen Olabisi Onasanya, Managing Director & CEO, First bank of Nigeria

The Energy Sector in Nigeria – Current and future perspectives. By Alexander Ogbechie and Claire Lawrie, Ernst & Young

Turning the Lights On in Nigeria.
By Melissa T. Cook, CFA,
African Sunrise Partners

Challenges and Developments in the Nigerian Power Industry. By Yemi Oke, LLB ,LLM , PhD Faculty of Law, University of Lagos

The 'Magic' Of The Sun– Harnessing Solar Energy Technologies to Transform Nigeria's Electricity Supply Industry. By Balkisu Saidu, PhD (Member NAEE)

The Changing Nature of International Renewable Energy Transactions. By James Snape, Head of Infrastructure, Construction & Energy Nabarro LLP

Electricity Reforms In Nigeria: Challenges and Policy Options. By Adeola Adenikinju, PhD (President NAEE)

Commentary on Trends in the Nigerian Oil and Gas Industry. By John Delano, Akindelano Legal Practitioners

ALP Business Review - Energy is a journal of Akindelano Legal Practitioners. It is published annually in conjunction with the ALP Seminar Series.

AKINDELANO
LEGAL PRACTITIONERS

AKINDELANO

LEGAL PRACTITIONERS

ALP BUSINESS REVIEW - Energy
October 2014

ALP Business Review - Energy is a journal of Akindelano Legal Practitioners. It is published annually in conjunction with the ALP Seminar Series.

CONTENTS

Acknowledgement and Thanks to
Nigerian Association for Energy Economics (NAEE) and
The Energy Institute (E.I.)

NIGERIAN ASSOCIATION for ENERGY ECONOMICS
www.naee.org.ng

energy institute
Nigeria

Published by
Akindelano Legal Practitioners
21, Military Street, Onikan-Lagos
Tel: 01-4605511, 08069334178
www.akindelano.com

Printing by
Limitless Print Global Resources

The views expressed in this journal are those of the contributors, and not necessarily those of Akindelano Legal Pracitioners.

ALP BUSINESS REVIEW

Call for submissions

ALP Business Review is published Akindelano Legal Practitioners. It is a leading business journal devoted to issues of relevance to the local and international commercial, legal and academic community. The subject matter of the Review changes from year to year in conjunction with the ALP Seminar Series.

ALP Business Review welcomes submissions from potential contributors from the Nigerian and international corporate sector. Articles should deal with commercial topics affecting business in Nigeria. This could be approached from a local multi-jurisdictional or cross-border stand-point.

ALP Business Review articles should aim to break new ground on commercial issues and provide an in-depth discussion of current developments and timely issues which are of particular interest to our international readership.

Submissions should be 2,000-4,000 words long, although submissions may be considered, if they are below or above this word length. Full guidelines for contributors can be requested from the Content Commissioning Editor of the journal. Details are found on the inside back cover of this journal. All articles are peer-reviewed.

Articles should be sent as a Word document, to the Consent Commissioning Editor (john.delano@akindelano.com).

ALP Business Review is published once a year, in October. To be considered for publishing, an article must be received no later than the second week in June.

Contributors should note that submission of articles to ALP Business Review does not guarantee their publication.

FOREWORD

By Ron Clark,
Energy Partner Aird & Berlis, Toronto Canada.

The future has never been brighter for Nigeria. The World Bank now ranks Nigeria as the largest economy in Africa, and international investors are beginning to take notice. Over $8 billion of foreign direct investment flows to Nigeria each year, the most among African nations, and a significant portion of that investment is directed at energy. Liberalization of the energy sector will play a key role in fostering Nigeria's continued economic growth, as demand for electricity continues to surge.

The restructuring and privatization of generation and distribution assets of National Electric Power Authority will have the twin benefits of increase access to electricity and reduce blackouts, thus, allowing business to flourish. The task of providing stable electricity
to larger portions of the population will remain paramount as Nigeria continues to grow.

As a Canadian lawyer, it is of particular interest to observe the important role that some Canadians are playing in the restructuring of the energy sector. In 2012, Manitoba Hydro International signed a contract with the Transmission Company of Nigeria to assume management responsibility and control of all of its operations.

CPCS Transcom Limited (another Canadian firm) acted as transaction advisor for the Nigerian government in the privatization of generation and distribution assets. Canadians are eager to invest in Nigerian energy, particularly as the sector begins to reduce its dependence on oil exports and incorporate more renewable sources into its electricity generation mix. While Nigeria remains the largest oil producer in Africa and the world's fourth-largest exporter of liquefied natural gas, renewable technologies are poised for growth – allowing diversification of the energy sector and a reduction in greenhouse gases. Technologies like Wind and Solar are rapidly decreasing in cost, while Hydroelectric power already makes up a third of electricity generation in Nigeria and has room to grow.

To be sure, many challenges remain. This issue of the ALP Business Review explores a number of different options and questions to consider as Nigeria moves to meet those challenges by diversifying its energy sector, increasing the stability of electricity provision throughout the country, and decreasing regulatory hurdles that have slowed projects in the past.

As Nigeria steps onto the world stage, it needs to invest in infrastructure in order to meet the demands of its evolving economy. The international community should not miss the opportunity to share in Nigeria's rise on the world stage!

YOUR TOTAL SOLUTION PROVIDER IN GAS, LIQUID AND MULTI-FUEL POWER PLANTS UP TO 600 MW

High efficiency – enabling cost-effective and secure power generation, anywhere in the world, also in Nigeria!
Fuel flexibility – multi-fuel solutions enabling the plants to run on a wide range of fuels from liquid and gaseous fuels to renewables
Modular expansion – makes it easy to meet increasing future demand by stepwise investments
Full EPC solutions backed up with long-term O&M agreements – today, up to 13 GW of installations are covered by Wärtsilä Service agreements
One-stop shop for complete energy solutions – on-time and within budget
55 GW of installed power plant capacity in 170 countries around the world

ENERGY
ENVIRONMENT
ECONOMY

WARTSILA.COM

WÄRTSILÄ

THE SHALE GAS REVOLUTION
Pros and Cons for the Nigerian Oil Industry

By Stephen Olabisi Onasanya,
Managing Director & CEO, First bank of Nigeria

"Implications of the shale gas revolution on Nigeria's oil industry may be broadly grouped into positives and negatives. Both categories speak to one fundamental impact: the decline in Nigeria's dependence on revenue generation from the sale of hydrocarbons."

The publication in 2012 by the US Energy Information Administration (EIA) of its Annual Energy Outlook returned the conversation about shale gas exploration and production to the centre of global energy debate.

The report's estimate that (by 2035) shale production would account for 49% of total US gas production (from 23% in 2010) has implications not only for global energy geopolitics, but exposed a threat to the Organisation of the Petroleum Exporting Countries (OPEC) supply control privileges.

Given that the US is Nigeria's single largest hydrocarbon export market, growing energy self-sufficiency there could have adverse revenue implications for the Nigerian economy. The oil sector's fiscal dominance in the Nigerian economy indicates additional negative externalities from the shale gas revolution. The positive side of this, however, is increased pressure to diversify the economy towards higher non-oil income.

The significance of the changes wrought by commercial exploitation of shale gas lies in the extent to which it provides context for the debate on the impact of the shift in the oil and gas trade. The Middle East has increased its energy consumption, and the US, with 20% of global oil production, is transitioning from being a net energy importer to a net energy exporter.

The US is at the forefront of this game-changing revolution as it produces shale gas in commercial quantities and has significant technically recoverable shale gas resources. In 2013, it overtook Saudi Arabia to become the biggest liquid energy producer in the world.

The US's new energy status and outlook is consistent with the country's pursuit of balanced, evenly weighted energy-policy objectives.

The much expected shale gas impact on energy prices is set to manifest within the next decade, if more countries gain access to shale-gas technology at a reasonable cost and are able to resolve the negative environmental implications associated with shale gas production.

For most economies, the key drivers to achieving a balanced energy policy governing the exploration and production of gas, oil, coal, nuclear, and renewables will revolve around the following:

1. Energy security: The need to ensure optimisation of energy demand and supply metrics for any country is a very critical consideration. Many emerging economies, including Nigeria, have had sustained energy-subsidy programs for several years. These subsidy regimes were designed to make energy affordable to the poor and vulnerable sections of the population and to ensure adequate energy supply for domestic consumption.
2. Impact on climate change: Carbonisation of the ozone layer due to emission of carbon dioxide (CO_2) from the energy combustion cycle and its attendant global-warming impact has continued to give prominence to environmental conservation techniques and forms of alternative energy in renewables and other low carbon-emitting energy substitutes (e.g., ethanol).
3. Cost of technology: China is reported to have in excess of 1,115 trillion cubic feet (tcf) of shale gas resources as well as 3,051 billion standard

cubic metres of natural gas reserves. However, it continues to be a major net consumer of energy resources. This may not be unconnected with the country's limited access to efficient shale gas technology and the associated high cost of shale gas production.

4. Contribution to government earnings: A number of economies' dependence on export earnings from energy resources often constitutes a major portion of their aggregate revenue. Nigeria, for example, realises about 70% of its revenue from oil and gas. A larger proportion of this comes from crude oil. Hence, oil and gas may continue to drive Nigeria's energy policy until the country increases the share of its non-oil earnings.

Shale Gas vs. Shale Oil

Shale Oil

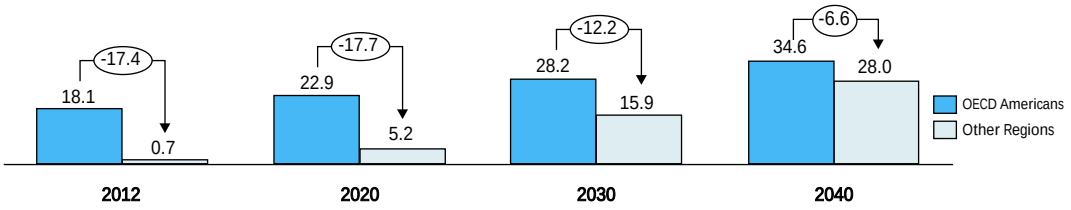
Shale oil is an unconventional liquid hydrocarbon produced from shale rock fragments. Contrary to media hype, its medium- to long-term threat to crude oil production and exports, though worth noting, may not alter crude oil pricing a great deal. Globally, technically recoverable shale-oil resources are only a fraction (about a quarter) of proven crude-oil reserves. Isolating the shale oil resources in the US puts this in better perspective. The United States has only 48 billion barrels of technically recoverable shale oil resources compared to 335 billion barrels of aggregate technically recoverable shale oil resources and 1.48 trillion barrels of total proven crude oil reserves worldwide. This statistic downplays the often overstated impact of new US shale oil production on global oil prices.

Shale Gas

Shale gas, on the other hand, may be found within shale rock and, interestingly, the rock serves as both the source and storage facility for the gas. The gas is extracted through a combination of horizontal drilling and hydraulic fracturing, or "fracking" (i.e., high-pressure dislodgement of underground rocks to free the trapped gas therein).

While production of unconventional gas (UCG) in the OECD Americas region will continue to lead worldwide, production in other regions is expected to rise by 2040. (See Figure 1.)

World Tight Gas, Shale Gas, and Coalbed Methane Production (OECD American vs. Other Region; tcf)



Source: US Energy Information Administration, FirstBank Research

Will Shale Gas revolutionise energy markets?

Until recently, the impact of shale gas on global energy appeared immaterial, perhaps as a result of relatively low oil prices and the non-availability of technologies to produce shale resources at competitive rates. During this period, investment in pipeline and conventional liquefied natural gas (LNG) soared. Key stakeholders in conventional gas markets across regions worked to remove impediments to global conventional gas development.

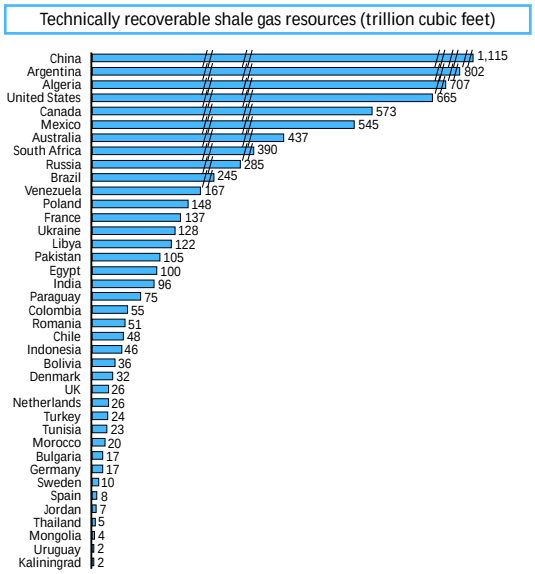
The aim was to propel the emergence of unified international pricing for conventional gas. This led to the creation of the Organisation of Gas Exporting Countries (OGEC), which culminated in the establishment of Gas Exporting Countries Forum (GECF) in 2001.

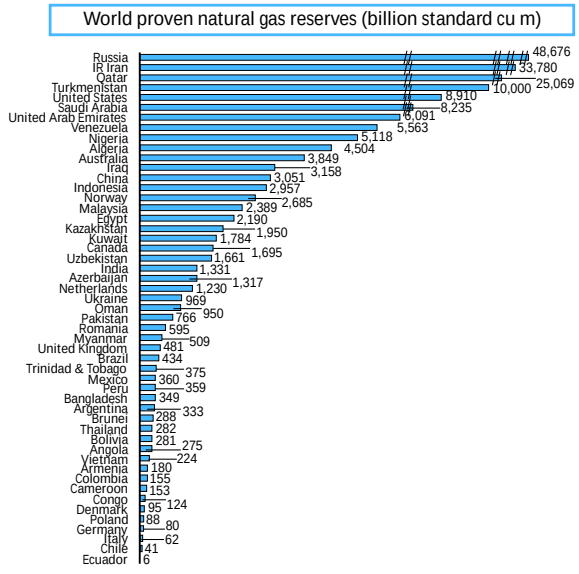
The GECF replicates OPEC's structures in the global gas industry, and its primary objective is to carry out similar tasks as OPEC's. Given this development and attractive projections in conventional gas markets, investors committed huge resources in LNG development. But by 2007, the tide had changed. Shale-gas production, which had seemed insignificant to regional and global gas markets for more than a century, began to pose major challenges to conventional gas markets. In the last seven years, this development (intensified by the 2008 – 2009 global economic recession) has altered trade flows and investment dynamics in energy markets.

On the back of this development, the US has systematically reduced its oil and gas imports. Its natural gas imports from Nigeria, for example, fell from 95,028 million cubic feet in 2007 to 2,590 million cubic feet by 2013, while its oil import from Nigeria dropped from 1,078,000 barrels per day in 2004 to about 239,000 barrels per day in 2013. This decline is acute and may reach 100% by 2020 when the US hopes to become self-sufficient in energy supply.

Exploration activities outside the US have begun, though the scale of production in those countries is still low. This may, however, improve soon as US “exports” its shale-gas technology to other regions that have high deposits of shale gas.

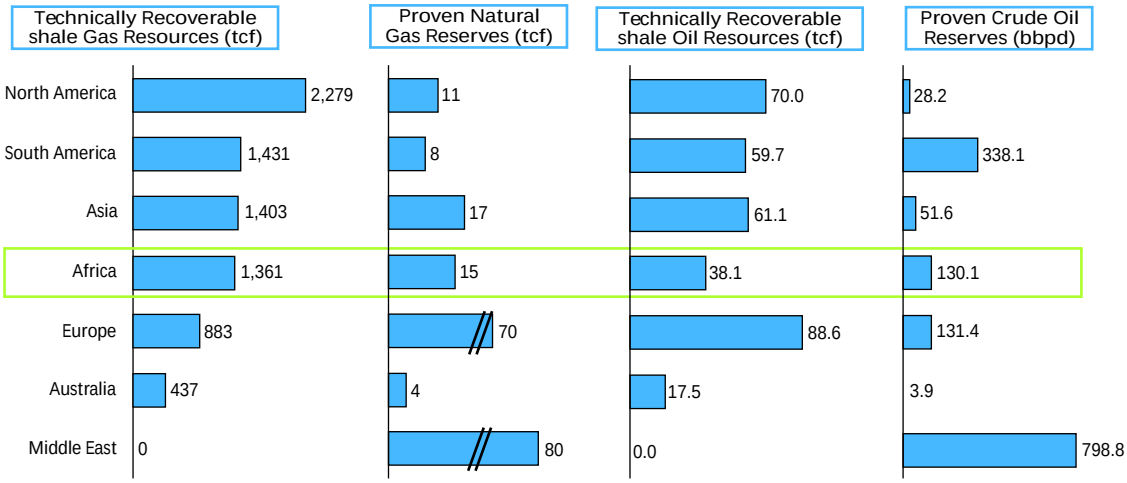
There are reports that international oil companies (IOCs) have started to invest in shale gas extraction in countries like China and Canada. Research on alternative technology for shale gas production has also continued. Any breakthrough





in this regard may strengthen the influence of shale gas production on energy supply, demand, and pricing.

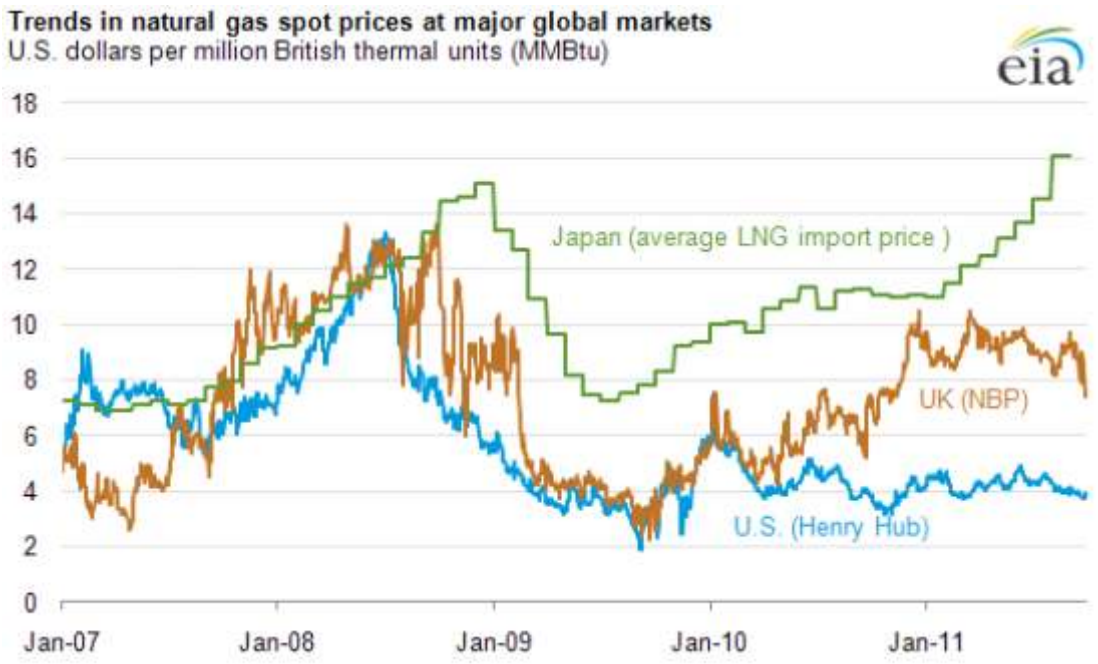
Comparative analysis of shale gas deposits and proven LNG reserves reveals the revolutionary status and potential of the shale gas market. (See Figure 2.) Technically recoverable shale gas resources as of 2012 were in multiples (about 38 times) of proven natural gas reserves. The huge shale gas deposits are not without inherent challenges. Shale wells typically have a higher rate of depletion (and hence a shorter life span) and are spread across wider areas (thus, producing a given volume of gas requires a greater number of wells for shale gas than is needed for conventional gas). In spite of these drawbacks,



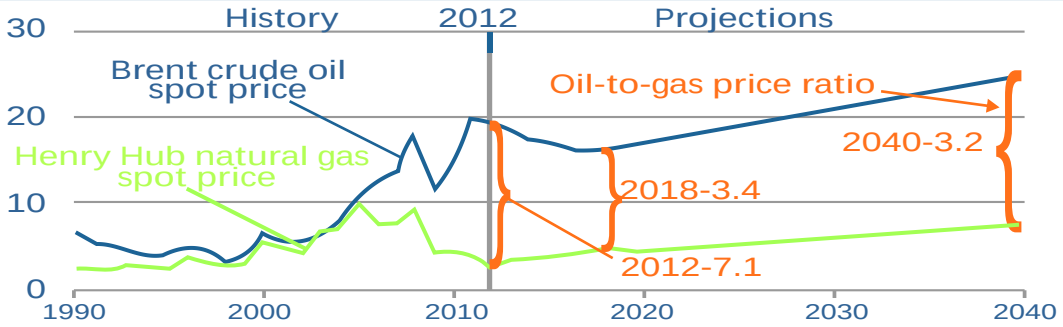
Source: US Energy Information Administration, OPEC, FirstBank Research

shale gas, especially in Africa, remains a potentially strong catalyst to the global energy market revolution. (See Figure 3.)

As of now, the emergence of shale gas as an alternative energy resource in the world has not fundamentally changed the structure of energy policy objectives outside the US, ostensibly because of slow access to shale production technology and the push back on its environmental impact, especially in Europe (EIA Annual Energy Outlook, 2013). Consequently, what we see is a regional price gap – dropping to as low as $4.00MMBtu (USD) in the US, but as high as $16MMbtu in Japan, and $6.50MMBtu in the United Kingdom (EIA, 2013). (See Figures 4 and 5.) But as the lingering challenges in technology exports and water pollution are resolved, these variations in regional gas prices may converge.



Comparison of Spot Prices for Brent Crude Oil and Henry Hub Natural Gas, 1990-2040(2012 dollars per million Btu)



Clearly, concerns about the environmental challenges associated with shale gas production remain a litmus test to determine the impact of these new supply sources on the energy market outside of the US. Current technologies – horizontal drilling and hydraulic fracturing – used in the production of shale gas require chemicals, sand, and large volumes of water. So, the tendency for water pollution is high, and that has become a major source of uncertainty in shale gas development and sales prospects. If these challenges persist, they may slow down the shale gas revolution outside the Americas. But in the likely scenario that the threats do not crystallise, the shale gas revolution could wield considerable influence in the energy market

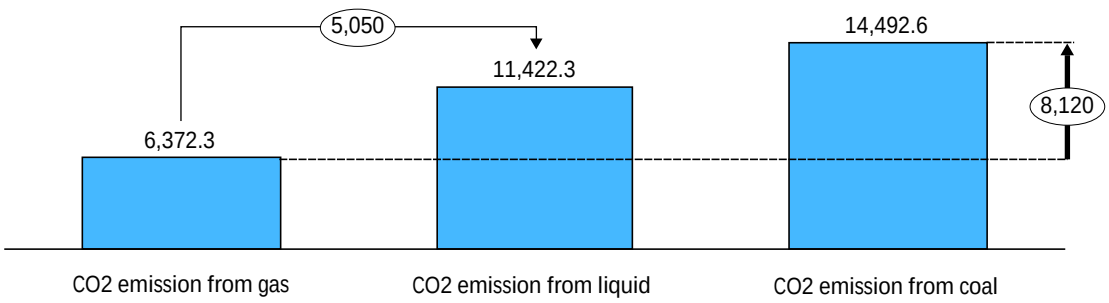
Implications of the Shale Gas revolution on Nigeria's oil industry

Implications of the shale gas revolution on Nigeria's oil industry may be broadly grouped into positives and negatives. Both categories speak to one fundamental impact: the decline in Nigeria's dependence on revenue generation from the sale of hydrocarbons.

Positive implications

First, the shale gas revolution raises hope for the discovery of shale gas reserves in Nigeria once the country's exploration and production (E&P) industry stakeholders embrace the technology. Historically, the exploration of conventional oil and gas yields the leads required to locate shale

World Carbon Dioxide Emissions by Region (Million Metric Tons Carbon Dioxide - Co_2)



gas deposits. Thus, it is likely that conventional oil and gas-exporting countries (including Nigeria) may also have rich deposits of shale gas.

Second, given the right pricing structure for gas and reforms in the power sector, Nigeria may witness increasing domestic gas demand for power generation. The preference for gaseous fuel consumption (as against other energy sources) for electric power generation is a result of its relatively low level of carbon emissions. It is commonly understood that gas fired plants emit the least air pollution of all fossil fuels. (See Figure 6.) The rationale for such investment will however depend on the cost of investment in shale gas technology deployment vis-à-vis current crude oil exploration, which exists as close substitute.

Third, the shale gas revolution may urge Nigeria to enhance its expenditure efficiency. If the shale gas revolution's threats to the energy market crystallises, energy prices may decline considerably. This means lower revenue for Nigeria and increased pressure on the nation's expenditure profile.

This possibility may help refine the government's expenditure plan. Government may discontinue the premium motor spirit subsidy, reduce the number of ministries, departments and agencies, and enhance its crusade against corruption.

Fourth, the shale gas revolution may facilitate the process of domestic economic diversification from oil and gas. Even though the clamour to diversify the economy has been on for decades, the drive to refine and implement relevant policies to achieve this has remained sub-optimal for several years. With the shale gas revolution and its potential downward effect on energy prices, however, Nigeria may be forced to diversify its economy.

Last, shale gas investment resources and attendant reserves may enhance Nigeria's export position in the global energy market. Nigeria is strategically positioned on the African continent. It is the largest economy and has the highest population in Africa. In oil production, it ranks first in Africa and 12th in the world. It is also the seventh largest oil exporting country. In reserves, Nigeria ranks tenth in proven oil reserves and eighth in proven gas reserves in the world. The impact of this includes enhanced government revenue and dominance in the sub-Saharan region, similar to the role played by Russia in Europe.

Negative implications

Since 2007, the shale gas revolution has had a disruptive effect on the global gas market. Investors who had increased their stakes in conventional gas development, and who subsequently suffered low returns/impairment charges on these investments, are now engaged in massive write downs of such impairment charges.

Consequently, any energy policy decision regarding shale gas should proceed with caution based on an in-depth review of project finance mechanics.

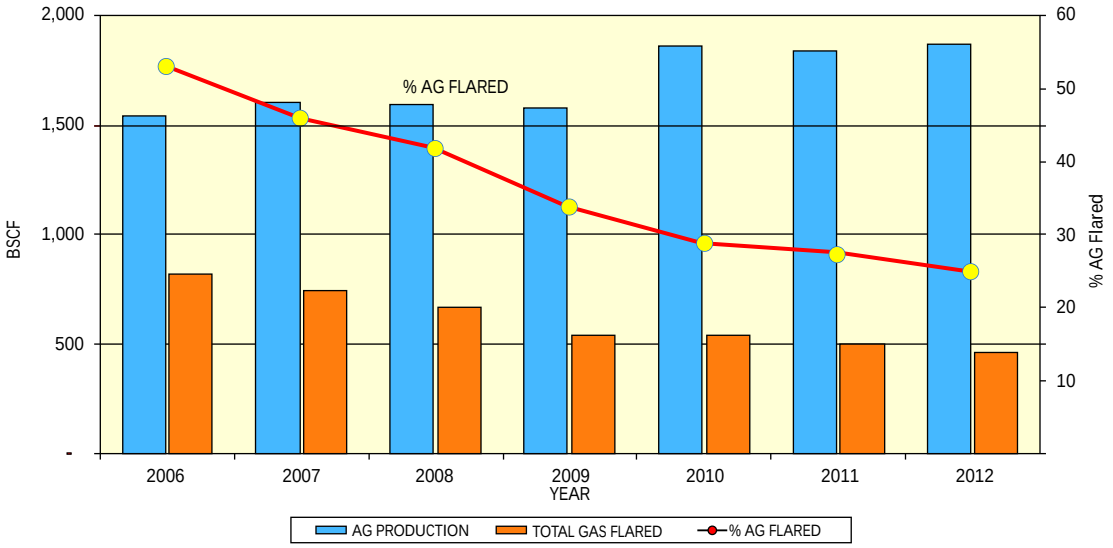
There are projections that oil prices may fall below $100 per barrel in 2015 and remain at that threshold for a long time (perhaps decades). The shale gas revolution is a major factor in this confined oil price outlook. Oil price declines mean lower oil revenue for Nigeria; and since more than two-thirds of Nigeria's revenue is from oil, lower oil earnings implies lower domestic aggregate income and weaker infrastructure development.

Foreign direct investment in the domestic oil and gas industry may reduce considerably. This becomes even more critical given the on-going divestment of IOCs' onshore assets, failure to enact an investment-friendly Petroleum Industry Bill (PIB), and the discovery of new reserves in some African countries.

One other downside is the direct environmental risk associated with shale gas development is the contamination of aquifers by bulk media like brine and associated methane gas released slowly from the hydraulic fracking of shale.

Methane has the negative effect of acidifying aquifers when it mixes with ground water. The treatment of shale gas waste in chloride and

Trend in Nigeria's Gas Flaring Volume 2006 to 2012



totally suspended solids may create serious environmental impacts, potentially worsening communal relations in places like the Niger Delta.

Conclusion

The shale gas revolution is an important turning point in the international oil and gas market. It reminds key stakeholders in the oil and gas industry of the influence that technologies wield on investment outlay and expectations. It remains a veritable game changer in the energy market. The unfolding trend in the global energy industry may whittle down OPEC's influence on oil supply, and by implication, oil price.

In spite of the uncertainties, the potential threats of the shale gas revolution to the global energy markets remain potent.

As more countries gain access to shale gas technologies and devise means to address the associated environmental challenges, OPEC's influence on oil supply may be threatened.

For Nigeria to keep pace with this change trajectory, it must adhere to the rule of investment engagement and balanced energy policy objectives.

It would also need to pro-actively address identified negative effects. In the final analysis, this may wean Nigeria from the "oil curse" as the country focuses more on non-oil revenue sources.

Mr. Stephen Olabisi Onasanya is the Group Managing Director/Chief Executive Officer of First Bank of Nigeria Limited.

A seasoned banker and chartered accountant with over 30 years diverse management and operational experience, Stephen is a highly respected and personable executive who has established a reputation at FirstBank for solid performance and sound judgment.

Stephen sits on the Board of a number of companies including Africa Finance Corporation. He is a Fellow of the Institute of Chartered Accountants of Nigeria and the Chartered Institute of Bankers of Nigeria. He is also an Associate Member of the Nigerian Institute of Taxation.

NEED TO TRANSFER MONEY ABROAD ?

Send it in 24 hours or less with FirstOnline

FirstOnline enables you transfer money to a beneficiary abroad instantly using FirstTrade, our innovative foreign currency transfer platform.

- Quick and Easy Registration
- Secure Transactions
- Instant Local or international transfers within 24 hours

So think FirstOnline when next you need truly instant funds transfer locally or abroad – it's innovation at your fingertips

Visit www.firstbanknigeria.com for details

-You First-

Please ensure you do not reveal your online banking password(s), token number(s) and ATM PIN(s) to a third party. Do not open links, respond to suspicious calls, mails or letters requesting your banking details. These messages are fraudulent and are not from FirstBank.

Contact us: 01-4485500; 0700FIRSTCONTACT (0700-34778-2668228); firstcontact@firstbanknigeria.com

complaints@firstbanknigeria.com | www.firstbanknigeria.com | RC 6290 | SMS short code: 30012

FirstBankofnigeria @FirstBankngr Firstbankngr FirstBank Nigeria FirstBank Nigeria

ABU DHABI ▪ BEIJING ▪ DR CONGO ▪ GHANA ▪ GUINEA ▪ JOHANNESBURG ▪ LONDON ▪ NIGERIA ▪ PARIS ▪ SIERRA LEONE ▪ THE GAMBIA

FirstBank Since 1894

THE ENERGY SECTOR IN NIGERIA – Current and Future Perspectives.

By Alexander Ogbechie and Claire Lawrie, Ernst & Young

"In many respects, Nigeria's economic future is inextricably tied to what it does with its petroleum industry."

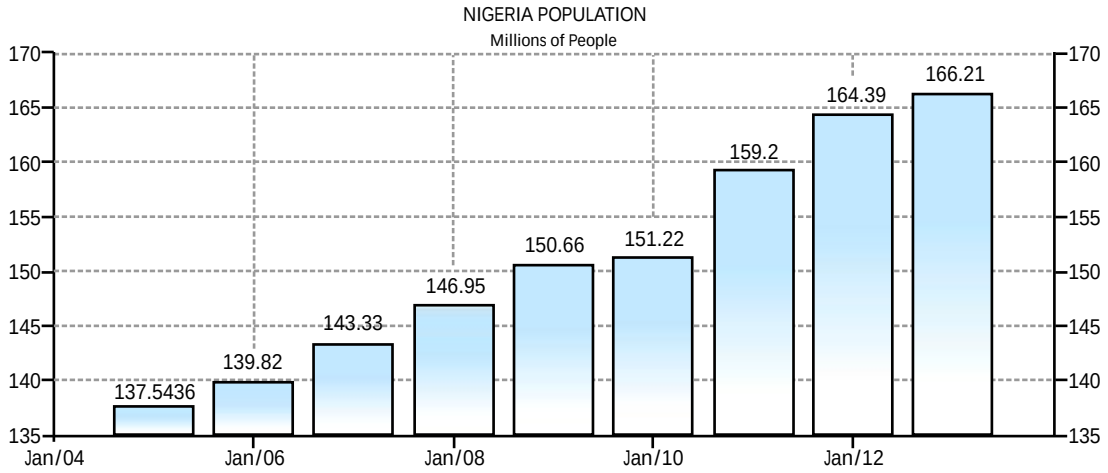
With a population of approximately 160 million people (see Table 1), a nominal gross domestic product (GDP) of $510 billion USD and a projected growth rate of 7.1%,[1] Nigeria's quest to become one of the 20 largest economies in the world by 2020 will depend in most part on the pace at which it can accelerate and continuously attract investments to its energy sector.

To illustrate this fact, President Goodluck Jonathan recently said Nigeria would require about $900 billion to properly address challenges and sustain continuous growth in its energy sector for the next 30 years, with the bulk of the funds expected to come from the private sector and institutional financiers.

Underlying the socio-economic development problems confronting Nigeria and, by extension, the African continent, is the enormous challenge of inadequate infrastructure and access to clean, modern energy services that has stagnated the productive capacity of the economy.

There is no doubt that the present Power crisis afflicting Nigeria will persist unless the government diversifies the energy sources in domestic, commercial, and industrial sectors and adopts new available technologies to reduce energy waste and cost.

Table 1 shows the Nigerian population over the last decade.



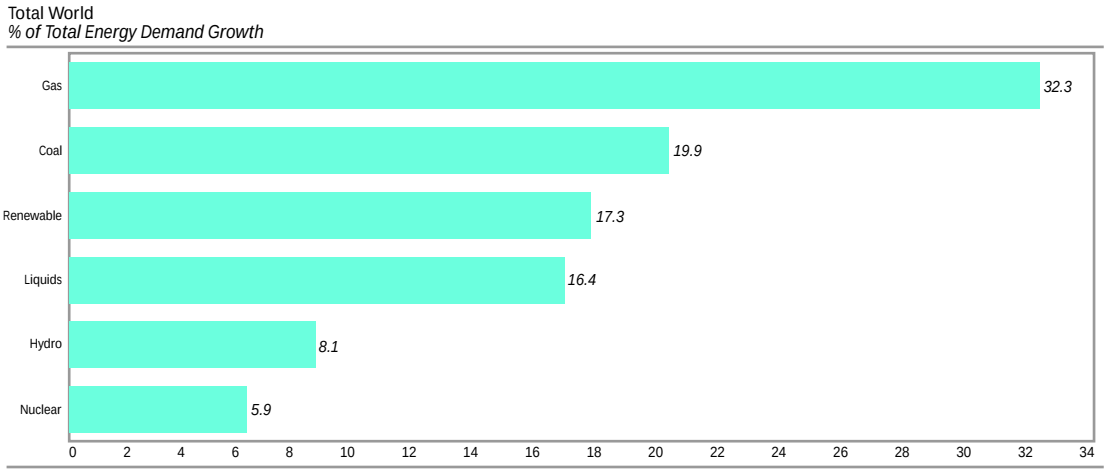
[1] http://www.tradingeconomics.com/nigeria/population

Oil Is Still No. 1, But Gas Is on the Rise

In many respects, Nigeria's economic future is inextricably tied to what it does with its petroleum industry. For a fact, the oil industry remains the highest income earner for the government, even though oil and gas contribution to the GDP represents only about 14%. Oil remains the largest single source of energy, and its use, in combination with other sources such as natural gas and coal, is expected to grow around 25%. Oil, natural gas and coal provide approximately 80%of total energy supplies.

Globally, the most significant shift will occur as natural gas displaces coal as the second-largest fuel by 2025. (See Table 2.) Gas will grow faster than the other major fuels, with demand up 65% by 2040.This is important for an oil and gas resource-rich country like Nigeria and provides incentive to implement investment friendly and competitive policies – development of gas plants, pipelines, etc. The growth in Nigerian Gas, which is a cleaner burning fuel than the coal, can only bode well for the nation's economy and its environment. New sources of gas, both conventional and unconventional, bring greater diversity to global supply. China and Russia recently signed a $400 billion gas-supply deal, securing the world's top energy user a major source of cleaner burning fuel.

Table 2 shows the percentage of Energy Demand Growth till 2035.



Source: BP Energy Outlook 2035, January 2014

According to the long term projections of global energy markets elaborated by BP, global energy demand will rise by 41% between 2011 and 2035 but with a gradually moderating pace.

Moreover, major share (95%) of this growth will be contributed by developing countries. Among all fuels, natural gas will contribute the most to the global energy demand growth, while demand for oil will continue to dominate in absolute terms.

The Energy Sector Today

In order to look into the future of the Nigeria's oil industry, we must first understand the present state of the industry.

The Nigerian oil and gas industry has had many successes and setbacks. In recent times, it has emerged from the scourge of militancy in the Niger-Delta, when production was at a low of 1.6 million barrels per day in 2009 to current levels of about 2.4 million barrels per day.

http://nigerianstat.gov.ng
http://www.ogj.com

This growth is mainly attributable to the success of the government's amnesty program, which has guaranteed sustainability in oil production, with Joint Ventures (JVs) with International Oil Companies (IOCs) accounting for about 64% of the total oil production of the country.

Further, Nigeria has recently witnessed onshore asset divestments by the IOCs, largely from Shell, Total, and ENI, which have seen the emergence of new largely indigenous-led independent companies.

This demonstrates a maturing oil and gas sector in which bigger players are re-aligning their asset portfolios to the benefit of newer non-major players.

Similarly, Nigeria now has a Gas Master Plan, and Nigerian gas produced for sale has increased to a historic high level of over 4.3 billion cubic feet per day in 2014, out of which more than 1.1 billion cubic feet per day is sold domestically.

Given the domestic gas obligation and the developments in the power sector that will increase demand, the growth in gas production is particularly relevant if the government's planned transformation of the sector is to succeed.

The midstream and downstream have witnessed significant challenges, which is why the government has focused its reforms on liberalizing these sectors.

Nigeria has three refineries with a capacity of 445,000 barrels per day, 5,120 km of product and crude pipelines, 21 storage depots, and one import terminal at Atlas Cove, all of which have suffered from vandalism and poor maintenance over the years because of the lack of a commercially viable framework for cost recovery.

The Importance of the PIB

The recent boom in North America's domestic production of unconventional oil and gas has changed global supply and demand markets.

Nigeria needs to develop clear regulatory and competitive policies and make plans around a potential scenario where the U.S. and new players from Africa compete for the same export market.

Nigeria must recognize that a significant resource shift has turned a key trade region into possibly a direct competitor and avoid creating barriers with potential to make her industry uncompetitive for investments.

Coupled with the emergence of other resource basins in East, Central and South African countries, Nigeria must work to maintain her place as a key contributor to global energy supply.

- The government's focus on restructuring the industry through the Petroleum Industry Bill (PIB) is therefore timely, but it must be designed and implemented correctly. This means addressing the need for:
- Globally competitive fiscal terms to attract foreign capital
- A stable and fair business investment climate with appropriate protections
- Ensuring that fundamental issues, such as funding limitations and operations inefficiencies, are addressed
- Developing a completely thought-through transition, to avoid major disruptions
- Maintaining the sanctity of contracts and stability provisions to enhance confidence in the system

Passing the PIB will bring investment certainty in the oil and gas sector and a robust, clear and transparent acreage management system that will provide competitive access to all qualified investors and remove rent seeking and arbitrage in the upstream sector.

The Right Balance

From the energy outlook of Nigeria, it is very clear that energy demand is very high and is increasing geometrically, while supply remains uncertain. The mix hitherto has been dominated by fossil resources, which are fast being depleted as well as being environmentally non-friendly. The energy supply mix must thus be diversified through installing an appropriate infrastructure and creating full awareness to promote and develop the abundant renewable energy resources present in the country as well as to enhance the security of supply.

There is clear evidence that Nigeria is blessed with abundant resources of fossil fuels as well as renewable energy resources, such as Solar and Wind. The major challenge is the current inefficient use of energy in the country. As a result, there is an urgent need to encourage the evolution of an energy mix that will emphasize the conservation of petroleum resources in such a manner that enables their continued export for foreign earnings for as many years as possible.

Alex Ogbechie is a manager in the Oil and Gas Advisory Department of EY Business Advisory. He holds a degree in Mechanical Engineering from the University College London (UCL) and an MSc in Petroleum Engineering from Heriot Watt University.

Claire Lawrie is a Partner in the Oil & Gas Lead Department of Ernst & Young (Africa). She holds a BSc (Econ) from the London School of Economics.

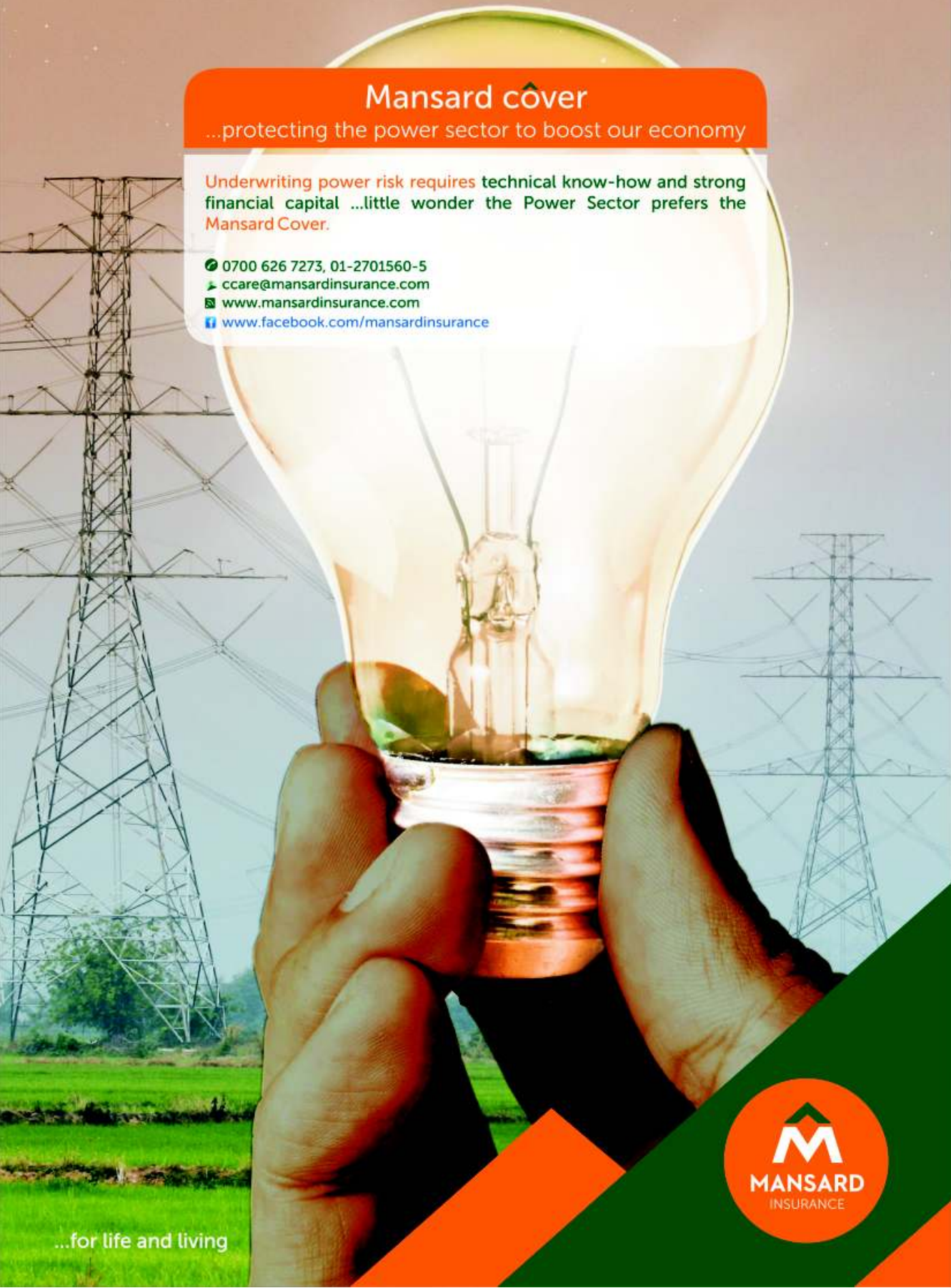
Life Insurance | General Insurance | Investments | Health Maintenance

Mansard cover

...protecting the power sector to boost our economy

Underwriting power risk requires technical know-how and strong financial capital ...little wonder the Power Sector prefers the Mansard Cover.

0700 626 7273, 01-2701560-5
ccare@mansardinsurance.com
www.mansardinsurance.com
www.facebook.com/mansardinsurance



MANSARD
INSURANCE

...for life and living

TURNING THE LIGHTS ON IN NIGERIA

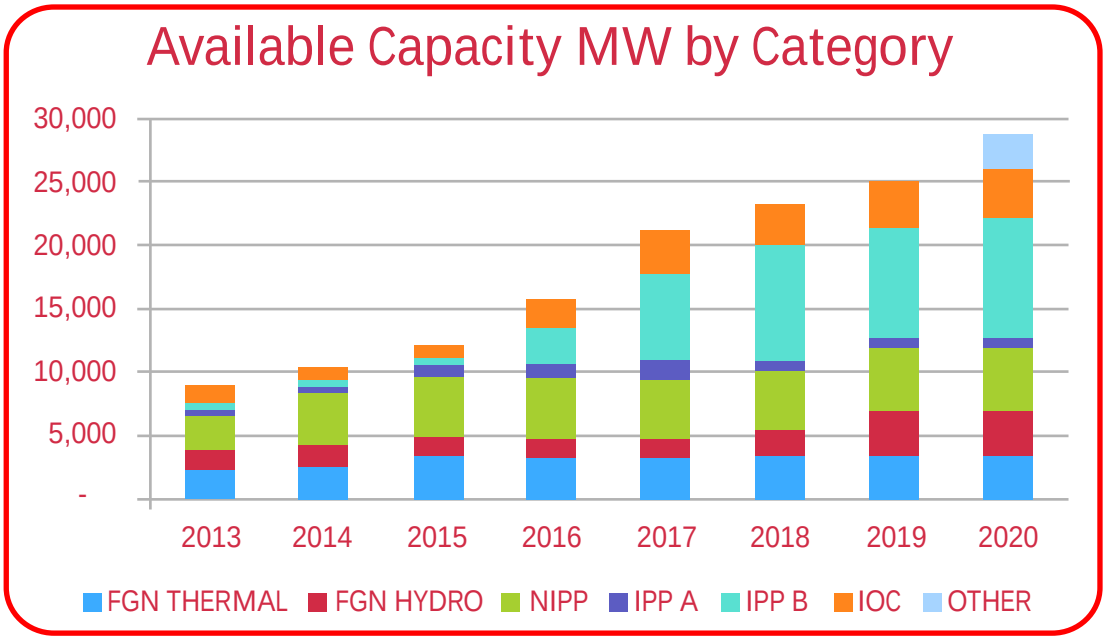
By Melissa T. Cook, CFA, African Sunrise Partners

"Widespread access to electricity could be a game-changer for Africa's largest economy."

The headlines about Boko Haram's deadly and vicious attacks in Nigeria threaten to overshadow what we see as considerable progress on one of the country's top priority sector: power reform and privatization.

Despite ongoing challenges ranging from inadequate gas supply to funding shortfalls and antiquated wiring and transformers, the Nigerian power sector is moving full-steam ahead.

Figure 1. Blueprint to Reach 30MW of Power Nationwide by 2020



Source: Federal Republic of Nigeria, Presidential Task Force on Power.

Widespread access to electricity could be a game-changer for Africa's largest economy. We realize that it may take years to get Nigeria's power capacity up to the government-sponsored 40GW target by 2020 from today's 4-5GW. (See Figure 1.)

But we see barriers to business, household activity, and entrepreneurial activity gradually dropping as power generation and distribution companies – and the government-owned transmission company – refurbish or repair assets. In a country of 170+ million people hungry for a better life, we see power reform as a turning point for the economy – and as an important foundation for long-run political stability.

Why are we optimistic?

High-quality private-sector companies and investors are deep into the sector. One notable

example is Transcorp Ughelli, which brings its own significant Nigeria experience to bear in the transformation of a major power generation asset. Transcorp's partner, Symbion Power, is a US-based firm with extensive experience in running power stations in challenging parts of the world.

Together with equipment partner GE, these companies have already brought power output at the Ughelli plant from a paltry 160MW at the time of acquisition in 2012 up to over 250MW, through refurbishment of existing assets.

Further investment in new equipment, worker training, and improved operating procedures is slated to bring the plant closer to its 1000MW-engineered capacity over the next year or two.

Other examples include Sahara Power, which has businesses throughout the power-generation and energy-value chains; as well as Oando, Seplat and Seven Energy, which are preparing to put large amounts of capital into gas exploration, production, and distribution.

These globally experienced actors aren't about to walk away from a major investment of capital, time, and reputation. Everyone – including regulators and government officials –appears to be pulling in the same direction.

Panelists at the ALP Power Seminar in Lagos in early March articulated actionable, no-nonsense solutions and ideas. Rather than pointing fingers and citing problems, everyone is focused on making the current system work.

Who is selling into the sector?

Equipment suppliers including GE and Siemens are already at work refurbishing, repairing, replacing and upgrading power-generation capacity. Next up are the vendors of every type of electrical equipment, including prepaid meters for households. It's too soon to say who will win contracts here, but we are watching names likes Eaton, Wasion Meters, Emerson and 3M – as well as local service providers like Adroit Metering Services, Momas Systems Nigeria Limited, and Mojec International Limited. Monitoring, system-control and customer-billing software are also essential. Procurement and system design are happening right now.

For example, Eko Disco announced a procurement program for prepaid meters, and for meters to replace estimated power billing for very large customers. All of the gencos and discos are working as fast as they can to stabilize operations, repair broken equipment, and prepare for capacity expansion.

New transmission equipment, software, and smart-grid technology are badly needed. The most urgent need is Funding. Mechanisms are being structured now, with a workable financing system particularly for the Transmission Company of Nigeria.

Gas shortages reduce the ability of power generation companies to meet targets. The rising number of well-funded and properly operated indigenous Nigerian oil and gas companies brings some optimism here.

It's important to remember that Nigeria is the largest oil producer in Africa and holds the ninth largest proven natural gas reserves in the world. We anticipate that these companies will push for improved domestic gas pricing and pipeline security in order to support the power and nascent petrochemicals sectors.

Why does power matter so much?

The first and most obvious answer is that improving availability of electricity should act as a giant tax cut on the Nigerian economy in coming

Figure 2. Gas for Power Is Too Cheap to Support Large-Scale Investment Right Now

Country/Region	Nigeria	Nigeria	U.K.	Europe	Asia Pacific	Latin America	North America
Sector	Power	Industry	Average	Average	Average	Average	Average
Unit	Per 1000SCF	Per 1000SCF	MMBTU	MMBTU	MMBTU	MMBTU	MMBTU
Price (USD)	1.50	2.00	9.25	10.50	11.00	4.10	4.10

Note: Table shows wholesale domestic gas prices (International Gas Union, 2013).
SCF = Standard Cubic Foot. One SCF =1,020 BTUs.
Source: Nigeria's Presidential Task Force on Power; www.nigeriapowerreform.org; African Sunrise Partners LLC.

years. If Nigerian firms can operate on a competitive cost structure, they can produce goods domestically, create jobs and reduce forex outflows for imported products.

Second: Improved power availability underpins demand in the consumer sector. If households can buy TVs and tablet computers, or pay school fees instead of buying generators and filling diesel tanks, the economy can be more productive. Brewers, food processors and telcos can pass lower operating costs along to customers, making products more widely affordable. These wealth-producing economies of scale are tantalizingly within reach in the near term.

Third: Entrepreneurs may see that their ideas are now economically viable. One simple example: A haircutter with electric shears or a tailor with a sewing machine can set up shop in the most convenient location if he or she doesn't have to source power independently. Small shop owners can keep food fresh and offer an improved shopping experience once they can run refrigerators and lights at will. We think the unleashing of entrepreneurial energy, particularly at the lower end of the income spectrum, is one of the most underestimated aspects of power reform.

Fourth: Success in a top-priority reform effort boosts confidence in future reforms. Nigeria has already implemented successful telecom, banking, and agriculture reforms. Petroleum-industry reform remains a thorny challenge, requiring large reserves of political capital and business willpower.

The Goodluck Jonathan government has staked its reputation (and, we think, its 2015 re-election prospects) on its ability to deliver power reform and improve the lives of its citizens.

Where will the money come from?

Nigerian banks were major lenders to the initial round of privatization, but they are extended about as far in their power-sector lending as is prudent. Funding from the Nigerian Sovereign Wealth Fund and development financial institutions helps, but it is far from enough. Cash is not yet flowing through the power system in a sustainable way, threatening the viability of many investments.

First: Regulatory and technical issues must be solved. The transitional rules must come into play, allowing enforcement of contracts and unlocking the flow of funds. Tariffs and business plans must be adjusted for the realities of power delivery, payment, costs, and revenues.

For example, as illustrated in Figure 2, Nigeria's gas tariffs are far below global norms – implying that it will be difficult to attract large-scale investment into the gas supply and infrastructure arena.

Second: Companies, deals, and projects must be structured in order to provide adequate risk-adjusted returns over appropriate time periods. Global institutional investors are keenly interested in this space but only if appropriate vehicles, bankable deals and well-managed listed companies are available for investment.

The bottom line:

We see the glass as half full. Nigeria has moved past the point of no return in privatizing and reforming its power sector.

We see a markedly changed attitude amongst our business contacts across many Nigerian sectors: People now believe that change can happen, reforms can work, and that the country will finally deliver on its long-deferred promise of becoming a viable destination for global business and investment capital.

Melissa T. Cook is the Founder and Managing Director of African Sunrise Partners, LLC. She holds an AB degree (History) from Dartmouth College and an MBA in Finance from the Stern School of Business at New York University. She is also a Chartered Financial Analyst Charterholder (CFA Institute).

FIRST STANDARD INSURANCE BROKERS LIMITED

INSURANCE, RE-INSURANCE AND PENSION CONSULTANT

SINCERE QUALITY SERVICE IS ALL WE OFFER!!!

TEL: 08033297067, 08022238073
E-MAIL: firststandardins@gmail.com
Web: www.firststandardins.wix.com/fsib

ALP 20

CHALLENGES AND DEVELOPMENTS IN THE NIGERIAN POWER INDUSTRY

By Yemi Oke, LLB ,LLM , PhD Faculty of Law, University of Lagos

"There is need to stimulate interest in power sector financing in Nigeria through appropriate legal, regulatory, policy, and institutional frameworks, including the development of debt financing via bond and derivatives markets to stimulate increased private-public sector financing."

The Nigerian electric power supply industry is being transformed, and it is anticipated that the private sector will drive growth in the new dispensation. But there are still a number of challenges in the reformed power sector, some of which have historical origin, while others are due to the socio-political structure of the country.

The history of electric power generation in Nigeria dates back to 1896 under colonial rule, when electricity was first produced in Ijora, Lagos, by the British Colonial Government. The Nigerian Electricity Supply Company (NESCO) was later established and commenced operations in 1929. In 1946, the Colonial Government took over electricity governance by establishing the Public Works Department (PWD).

The PWD took over the responsibility of electricity supply in Lagos. Four years later, in 1950, the Electricity Corporation of Nigeria (ECN) was created pursuant to the Electricity Corporation Ordinance 1950 while the Niger Dams Authority (NDA) was also established about the same time by an Act of Parliament.

Fusion of generation and transmission began formally in Nigeria on April 1, 1972, when the amalgamation of the ECN and NDA was effected by a military decree to form the National Electric Power Authority (NEPA). NEPA was exclusively responsible for generation and distribution of electricity in Nigeria.

NEPA unsuccessfully managed electricity generation, transmission, and distribution in Nigeria, and after about four decades was unbundled and divided into eighteen new companies and semi-autonomous business units under the now dissolved holding company called the Power Holding Company of Nigeria (PHCN).

In 2005, the Nigerian Electricity Regulatory Commission (NERC) was formed to serve as the country's main regulatory body through the Electric Power Sector Reform Act (EPSR Act). The main difference betweeen NEPA and NERC is that NEPA was intended to govern a wholly state-owned and government-controlled electricity sector in Nigeria. NEPA merely served as a statutory body to effectuate state monopoly in the sector.

The EPSR Act of 2005 marks a sharp departure from the old paradigm of state monopoly in electricity governance in Nigeria.

Some Legal and Constitutional Challenges

While it is conceded that the legal, regulatory, and policy frameworks of the reformed power sector now reflect an interconnected dynamic of options and stakeholders, in a number of ways the provisions of the EPSR Act would appear to contradict the Nigerian Constitution.

The Nigerian Constitution provides for electricic power regulation under items 13 and 14 of the Second Schedule, Part II, Concurrent Legislative List to the extent that: "The National

1. See generally, "Update On Sale of Generation Companies (Gencos) and Distribution Companies (DISCOS)," MJS Quarterly Newsletter of Nigerian Electricity Law and Regulation, Volume 1, Number 3, 2012, MJS Partners.
2. "Development of Electricity Industry in Nigeria (1960-1985)," 1985, pp. 1 – 6, Niger Power Review.
3. See Electricity Ordinance Act of 1929.
4. See Electricity Corporation Ordinance No. 15 of 1950.
5. Manafa, N., Electricity Development in Nigeria, Rasheen Publisher, Lagos, 1995, pp. 37 – 51.
6. See the National Electric Power Authority Decree No. 4, 1972.

Assembly may make laws for the Federation or any part thereof with respect to – (a) electricity and the establishment of electric power stations; (b) the generation and transmission of electricity in or to any part of the Federation and from one State to another State."

A potential challenge in the sector is that, by virtue of paragraph 14, State Governments in Nigeria are at liberty to engage in licensing and regulation of electricity as provided by the Constitution.

Item 14 states that: "A House of Assembly may make laws for the State with respect to – (a) electricity and the establishment in that State of electric power stations; (b) the generation, transmission, and distribution of electricity to areas not covered by a national grid system within that State; and (c) the establishment within that State of any authority for the promotion and management of electric power stations established by the State."

Experts have pointed out that rural electricity is off-grid and comes squarely within the ambit of regulatory purviews of the State Governments in Nigeria, bearing in mind that the Constitution vests Local Government administration in the State Governments. Electricity generation through captive, embedded, and other systems also comes within the ambit of regulation by State Governments.

An attempt to bring local, off-grid power generation subject to the National Grid is tantamount to what the writer has referred to in another piece as "National Greed".

Power to Regulate Captive Electricity Generation

The power to regulate captive electricity generation should ordinarily vest in State Governments. Therefore, the NERC Regulations for the Granting of Permits for Captive Power Generation, 2008 is, ipso facto, unconstitutional.

Under this regulation, the NERC grants captive electricity permits to an individual, a company, partnership or any association of individuals whether incorporated or not.

The phrase *Captive Power Generation* means "generation of electricity which is in excess of one (1) MW for the purpose of consumption by the generator, and which is consumed by the generator itself, and not sold to a third party".

The writer anticipates that, as the sector develops, State electricity regulatory commissions may be established by State Governments in Nigeria to license private companies to engage in off-grid electricity generation, transmission, and distribution, including renewable electricity, captive electricity generation, rural electrification, and others.

The ultimate objective is to ensure a regular supply of power for economic development. Therefore, Federal and State Governments must act as collaborators, not as competitors, regarding electricity governance in Nigeria.

Technological Needs

The power sector requires a high degree of technical knowledge and sophistication – its engineering, accounting, legal, and other technical requirements can be overwhelming for a developing country like Nigeria.

Drafting and negotiating power-sector agreements, for example, are two specialised skills yet to be sufficiently internalized by a large number of Nigerian lawyers, apparently because this area of the law is just evolving.

This challenge reared its ugly head in the Management Service Contract between Nigerian Government and Manitoba Hydro International (MHI) on the management of Transition Company of Nigeria (TCN).

This is a typical case of technological needs in

7. The Technical Committee on Privatisation and Commercialisation (TCPC) listed NEPA as one of the State enterprises to be commercialised. See Privatisation and Commercialisation Decree No. 25, 1988.
8. See Electric Power Sector Reform Act, 2005, s. 31.
9. "Beyond Power Sector Reforms: The Need for Decentralized Energy Options (DEOPs)," Yemi Oke, (2012) 18:1 Nigerian Journal of Contemporary Law, University of Lagos, 67 at 68 – 71. See also Yemi Oke, "National Grid or National Greed?", The Punch (7 December 2011) 14 and (8 December 2011) 16. See also Chigbue, I.N., "Electric Power Sector Reform: Privatization, Regulation and Other Challenges", a presentation at the National Workshop on Electric Power Sector Liberalization, 30 March, 2006, on-line at: http://worldstagegroup.com/truecolour/media/11152404144.ppt>, accessed April 18, 2013.
10. See for example, Sections 1 and 3 of the NEPA Act, supra note 6.
11. Ibid, sections 25, 26, 28, 29, and 82.

the Nigerian power sector. The Manitoba deal has become controversial lately due to certain local factors and bureaucratic inconsistencies, which the author predicted. Nonetheless, the writer wishes to acknowledge that some Nigerian lawyers have distinguished themselves in power-sector transactions, having skillfully transitioned their competence in related specialties, notably oil and gas and general commercial transactions.

Power Sector Financing

As the Federal Government of Nigeria strives to stimulate private sector investment in the power sector, a noticeable challenge is that government policies are bedeviled by needless bureaucratic bottlenecks that often make attracting private sector funding difficult, though not impossible.

There is an urgent need for gap-bridging policies in public-private partnership financing in the power sector through the adoption of more sustainable alternatives like derivatives and other debt-financing options.

However, investors, local or foreign, would need to be sure that an energy resource project is bankable.

In the Nigerian energy sector, bankability often becomes very crucial. According to one scholar, the process of making investment decisions is as much idiosyncratic as it is scientific. This often leads to the piercing of deceptive incentives, and a careful consideration of the political, social factors that would make investing in a country a reasonable business decision.

There is need to stimulate interest in power sector financing in Nigeria through appropriate legal, regulatory, policy, and institutional frameworks, including the development of debt financing via bond and derivatives markets to stimulate increased private-public sector financing.

This reality becomes apparent as a number of new owners of the generation and distribution companies have had a herculean task raising funds and are now under heavy debt burdens while countless others bowed-out because of funding challenges.

Gas Supply and the Power Sector

In addition to its crude oil reserves, Nigeria is endowed with abundant reserves of natural gas. Nigeria's natural gas reserves have been estimated at about 166 trillion standard cubic feet. (Source, inter alia: National Petroleum Investment Management Services – NAPIMS.)

The country has witnessed gas utilization projects designed solely or partly for power generation, such as the Olokola Gas, Afam Gas, Olorunsogo Gas, and Papalanto Gas Projects, including the West African Gas Project and West African Power Pool Project (WAPPP).

Nigeria's new gas policy seeks to prioritize domestic demand over Liquefied Natural Gas exports , but this remains a merely declaratory statement. The dedicated gas for power generation has continued to be threatened by pricing issues and host communities' hostilities. Host community hostility has been described as a new generation of risk to the energy sector.

There is need to strike a good balance between the estimated gas exports by the operators, quantum of gas reserved for the power sector ,and the huge capital outlay for re-injection of gas vis-à-vis the success of gas-to-power initiative and sustainability of the reformed power sector.

Prosecuting Electricity Matters

Prosecuting electricity matters might still prove difficult, as legal and regulatory frameworks of the power sector are yet to be popular among consumers and other stakeholders, including members and officers of sector regulators,

12. See Item 14, of the Schedule II to the Constitution of the Federal Republic of Nigeria (CFRN) 1999 (as amended).
13. Ibid, s. 6 (7) CFRN 1999 (as amended).
14. See "National Grid or National Geed?", Yemi Oke, supra note 9.
15. The Nigerian Electricity Regulatory Commission (NERC) Regulations for the Granting of Permits for Captive Power Generation, 2008 is made pursuant to Section 96 (1) of the Electric Power sector Reform Act, 2005 which gives the Commission power to make regulations for the granting of permits for captive power generation.
17. See section 2 of the Regulations. The section defines 'person' to include an individual, a company, partnership or any association of individuals whether incorporated or not.
18. See Section 2 (1) of the Captive Power Generation Regulations, supra note 15. "Rural Electrification and Captive Power Generation," Yemi Oke, Nigerian Lawyers' Journal, Law Digest (UK), Summer 2013, at 51 – 52.

agencies, and institutions.

The civil society and other advocacy groups do have crucial roles to play in entrenching a culture and consciousness for consumer protection given the negative trends evidenced in Amadi vs. Essein as it affects electricity regulation and the protection of rights of electricity consumers in Nigeria.

Metering and Tariff Methodology

Metering and tariff Methodology also pose a potential challenge to the power sector in Nigeria. Tariffs are statutory charges and fees payable on electricity consumption or related activities.

In line with the above provisions, the NERC adopted the Multi-Year Tariff Order (MYTO) on July 1, 2008, and MYTO-2 in 2012.

One of the conditions for the implementation of MYTO-2 by distribution companies is extensive metering of electricity customers. Metering remains a dream, as arbitrary and speculative billing continues to be perpetrated even under the new owners of the generation and distribution companies.

Land Acquisition for Power Projects

One of the most potentially controversial issues in the EPSR Act is the provision that, for the purpose of electricity, a generation, transmission, or distribution licensee may apply to the NERC for a declaration that privately-owned land is required.

The author has argued elsewhere that, when and if it becomes inevitable on grounds of national exigencies, a declaration that land is required for purposes of generation, transmission, or distribution of electricity should be by way of "Compulsory Purchase" as against "Revocation of Title" upon payment of compensation equal to the current commercial or market value of the land in question.

This is to mitigate the apparent social injustice of the declaration that a person's right of occupancy would be revoked for going concerns and mercantilist entities engaging in electricity trading on ground of "public need".

Dispute Resolution Mechanisms

The Dispute Resolution Mechanisms of the reformed power sector of Nigeria also appear potentially counter-productive as they contradict the traditional principle of adjudication. For

19. See "Manitoba Hydro and Electricity Undertakings in Developing Countries: The Case of Nigeria", Yemi Oke, (2012) 36: 1 Manitoba Law Journal, at 37 – 65.
20. Multiple approaches to the financing of energy-resource development have arisen in response to the increasingly dynamic nature of the sector in developing countries. See "Structuring and Financing Project", Christopher Carr and Flavia Rosembuj, Climate Change – A Guide to Carbon Law and Practice, Paul Q. Watchman (Ed.) (London, Globe Publishing Limited; 2008) at 39.
21. "Financing Solid Minerals Business in Nigeria: An Appraisal of the Socio-Political Aspects of the Requirements of Bankability", Yemi Oke, Legal Aspects of Finance in Emerging Markets (Durban, South Africa: LexisNexis Butterworths, 2005) at 107-118.
22. "Safeguards for Foreign Investment in Mining", Robert Pritchard, International and Comparative Mineral Law and Policy: Trends and Prospects, Bastiba, E.; Walde, T., and Warden-Fernandez, J., (Eds.) (The Hague: Kluwer Law International, 2005) at 73.
23. "Relevance of Derivatives and Related Debt Instruments in Public-Private Sector Financing of Energy Resources in Nigeria", Yemi Oke, (2012) 1 NAILS Journal of Law and Public Policy, at pages 183-221.
24. See "Boosting the Electricity Sector in West Africa: An Integrative Vision", E. Gnansonuou, (2008) International Association of Energy Economies, Third Quarter, at 23.
25. G. S. Akpan, "Host Community Hostility to Mining Projects: A New Generation of Risk?", Bastiba, E.; Walde, T., and Warden-Fernandez, J., (Eds.) International and Comparative Mineral Law and Policy: Trends and Prospects (The Hague: Kluwer Law International, 2005) at 311.
26. "Electricity Regulation and the Protection of Rights of Electricity Consumers In Nigeria: Revisiting Amadi vs. Essein", Yemi Oke, (2013) Journal of Contemporary and Allied Issues-Ife Juris Review, Obafemi Awolowo University, Ile-Ife, at 406-417.
27. See"Legal Issues in Multi-Year Tariff Order (MYTO) 2012 and the Power Consumer Assistance Fund (PCAF)," Volume 1, Number 2, MJS Quarterly Newsletter of Nigerian Electricity Law and Regulation", at 1, MJS Partners.
28. See s.77 (1) of the EPSR Act, supra note 8.
29. See "Compulsory Purchase as an Alternative to Revocation of Title to Land for Electricity Purpose in Nigeria", Yemi Oke, (2013) 30 Journal of Private and Property Law, 36-59.
30. See Rule 11 of the Business Rules of the Nigerian Electricity Regulatory Commission, 2006.
31. Rule 17 (1)
32. Rule 22 (1).
33. See Items 13 and 14, of the Schedule II to the CFRN, 1999 (as amended).
34. See section 251(1) CFRN on exclusive jurisdiction of the Federal High Court.

example, the provision for re-hearing raises certain legal questions.

Re-hearing a matter before the same panel that sat to judge the earlier proceeding, for whatever reason or motive, is immoral, unjust, and illegal – it offends the principle of natural justice. The later decision arising from such a re-hearing would ordinarily be tainted with elements of bias.

Re-hearing sometimes comes up before the same panel on certain conditions. However, it is advocated that re-hearing in this circumstance should come up before a new panel.

It is a settled principle of justice that a court or panel or tribunal becomes functus-officio once it has rendered its decision on the issue.

Conclusion

On a final note, practitioners often commit an innocent professional blunder in filling suits regarding electricity matters at the Federal High Court (FHC) as against a State High Court. Electricity is a concurrent legislative item for which National and State Houses of Assembly have powers to make laws. Electricity is not one of such matters for which the Federal High Court is vested with exclusive jurisdiction under the Constitution. To this extent, a valid objection could and/or may be raised to the jurisdiction of the Federal High Court in respect to electricity matters unless the reliefs are carefully framed to confer jurisdiction on the FHC.

Dr. Oke is a Senior Lecturer in the Department of Jurisprudence and International Law, Faculty of Law, University of Lagos, Nigeria.

He holds LLM and PhD degrees from the Osgoode Hall Law School, York University, Canada, an LLB from the University of Ilorin, Nigeria, and a BL from the Nigerian Law School, Abuja.

He is the author of the pioneering electricity law book, Nigerian Electricity Law and Regulation.

Part of the original text of this paper was delivered at the 4th Nigeria International Power Expo & Conference held at the International Conference Centre, Abuja, on 17 – 19 October, 2013. Contact: <yoke@unilag.edu.ng>.

SHALE OIL RECOVERY AND THE NIGERIAN ECONOMY: Medium Term Outlook

By Kanya Williams, Msc Head of the Oil & Gas Office,
Research Department, Central Bank of Nigeria and Member of NAEE

"We are confronting a fiscal state of emergency.
The task before the managers of Nigeria's economy today is
to search for new competitive, enduring markets to immediately
replace the loss of Bonny Light market share in the US and Europe."

Production of world crude oil, which began a sharp rise from 1999 and continued steadily without any sign of abating, elicited a revisit to oil shale prospecting in the early 2000. This endeavour has enabled the United States of America (US) to record huge success thereby replacing its crude oil import by about 800,000 barrels per day (kbpd) in 2011 to almost 3 million barrels per day (mbpd) by June 2013.

This entrance of US shale oil and gas has completely altered the dynamics world energy market. Specifically, the oil and gas sub-markets in terms of structure have completely changed, leading to loss of markets especially from the US and Europe for world supply oil and gas giants like Nigeria and Russia.

The US shale oil assay shares common geological properties with conventional crude oil, particularly, the light and sweet Nigerian type that has partly fuelled the US economy for decades. It is therefore expected that this scenario will create great concerns for Nigeria, and from 2012 it has been a source of worry.

The shale oil business is as old as conventional oil commerce, with a history dating back to the late 17th century. By June 2013, it was estimated that the world is sitting on 345 billion barrels and 7,399 trillion cubic feet (CF) of technically recoverable shale oil and gas.

These volumes, however, form only 10.3% and 31.9% of the total world oil and gas, estimated at 3,357 billion barrels and 22,882 trillion CF respectively. Topping the list of world's 10 richest shale oil endowed countries are Russia with 75 billion barrels, the US with 58 billion barrels, and China with 52 billion barrels.

China tops the gas list with 1,115 trillion CF of shale gas, followed by Argentina with 802 trillion CF, Algeria and the US, with 707 trillion CF and 665 trillion CF respectively.

TABLE 1 TECHNICALLY RECOVERABLE CONVENTION AND SHALE OIL AND GAS RESOURCES THE WORLD ESTIMATED AS AT JUNE 2013

	Crude Oil (billion barrels)	Wet Natural Gas (Trillion cubic feet)
Shale Oil/Gas unproved Resources	345	7,299
Other proved resources	1,642	6,741
Other unproved resources	1,369	8,842
Total	3,357	22,882
Shale as percent of total	10.28%	31.89%

Sources: 1 Oil & Gas Journal, Worldwide Report, December 3, 2012.
2 Sources: U.S. Geological *Survey, An Estimate of Undiscovered Conventional Oil and Gas Resources of the World,* 2012, Fact Sheet 2012-3028, March 2012: U. S. Geological Survey, *Assessment of Potential Additions to Conventional Oil and Gas Resources of the World (Outside the United States) from Reserve Growth,* 2012, Fact Sheet 2012-3052, April 2012.

A key factor that drives the shale oil business is the price of crude oil.

Producing oil from shale plays is economically viable to the extent that the price of the conventional crude exceeds that of the total cost of producing the same volume of oil from shale without compromise to technical feasibility or recourse to some financial aids in the form of concessions or government provisions for infrastructural facilities.

Many shale oil plays that were in production in recent decades were closed down in the eighties when crude oil prices crashed.

Nigeria is a strategic player in the global oil business and a key member of Organization of the Petroleum Exporting Countries (OPEC). Nigeria's reference crude, Bonny Light, plays a crucial role in OPEC's power in world oil price management.

On the world stage, Bonny Light is tantamount to Brent and recovered shale oil in geological properties, market power, and consumer's preference.

Exhibit 2 presents recent movements of Brent and Bonny Light crude prices, portraying that they share the same movements both in magnitude and directions, signifying the close similarity of the two crudes in all aspects.

Should shale oil be sold in the open world market, it would share the same price characteristics with Nigeria's Bonny Light.

It is therefore no surprise that industry stakeholders conclude that the entry of shale oil – causing a steady withdrawal by the US from the world market – will hurt the Nigerian economy. It is difficult to argue against this claim; however it is the window this likely assertion will pass through that is in dispute.

This is not far-fetched because a fall in revenue can result only from either a drop in price or a loss of market share and, in extreme cases, both. The exercise of finding this conduit dictates that we begin with a brief story of Nigeria's Fiscal Profile.

Nigeria's Fiscal Profile

Data from the Federal Ministry of Finance and the Central Bank of Nigeria reveal that form 2000 to 2011 Nigeria generated a total of N58.92 trillion. In Exhibit 3, a total of N48.43 trillion, which translated to 82%, came from crude oil alone.

Exhibit 4 shows that in years like 2007, the nation survived almost entirely on oil as the non-oil revenue source dried up.

A comparison of Exhibit 3 and Exhibit 2 on Bonny Light prices from 1980 to 2011 brings out a perfect correlation between crude price and the financial life of Nigeria.

The fiscal profile of Nigeria follows exactly the trend of oil price depicting a perfect symmetry. The fear that a likely price fall as a result of US shale oil success will upset Nigeria's Fiscal Profile is a genuine and well-founded concern.

Exhibit 2

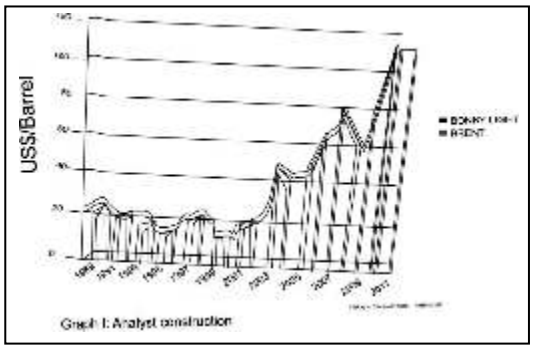


Exhibit 3

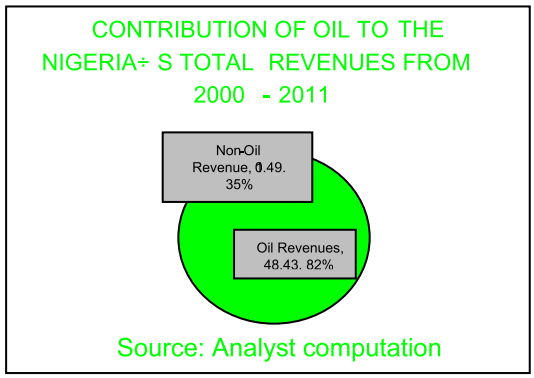


Exhibit 4

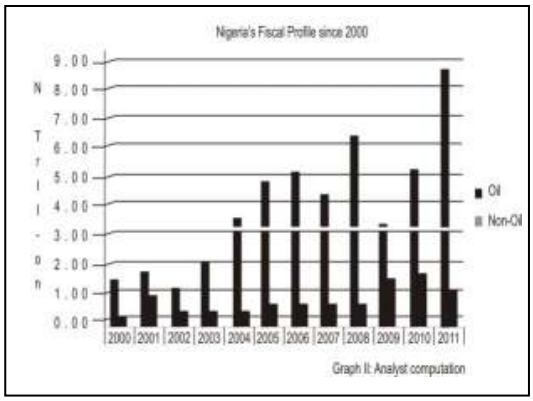
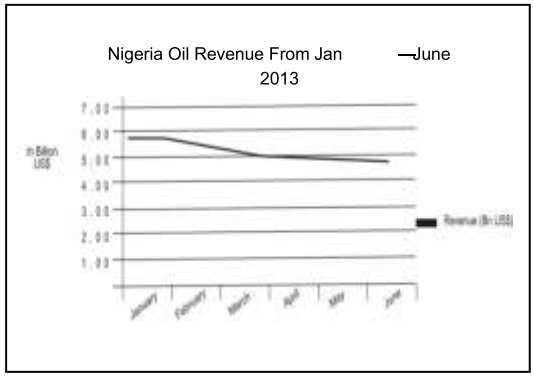


Exhibit 5



US Shale Oil and the Nigeria's Oil Revenue so far Emerging in the Nigerian revenue profile in first half of 2013 reveals a steady decline in revenue reflecting almost the exact increase in shale oil boom of the US. Therefore, the expectation is that revenue will decline due to the subsisting scenarios.

Exhibit 6, however, points out that the decline in revenue has less to do with price but more to do with production output that has consistently been on decline since the beginning of the year partly due to crude oil theft.

The Concerns

Sustainable shale oil business success capable of causing concerns to an oil dependent nation like

Exhibit 6

Estimated Nigeria's Oil Revenue from January – June 2013

	Revenue in Billion US$	Price Per Barrel	Average Production
January	5.80	115.58	2.09
February	5.87	118.68	2.06
March	5.39	111.77	2.01
April	5.00	105.68	1.97
May	4.89	105.05	1.94
June	4.73	105.31	1.87

Source:

1) Reuters Price and Crude Production Data
2) Revenue is estimated by analyst based on 24 days/month net working monthly period

Nigeria begins with satisfactory infrastructure provision, meeting a set standard of environmental requirements, achieving a significant level of capacity to contend with the amount of energy to be spent in bringing out oil or gas from shale plays, and the ability to accommodate a reasonable gestation period. With these basics – which are the irreducible minimum for any promoter of a shale/gas business – settled, the key determinant is economic profitability gauged by a breakeven point between the market price of conventional

oil and the cost of producing the same from shale.

The numbers reeled out above are the world's barrels of crude oil and measures of natural gas that can be produced using current technology without reference to economic profitability. But it is economic profitability that holds the key to both entry and existence in shale oil production ventures.

The major determinants of economic profitability include cost of drilling and completing wells, quantity of oil produced over the lifetime of a well and, most important, the price received for the oil produced.

Exhibit 2 explains the effect of oil price in shale oil business more succinctly. Between 1989 and 2003, it was economically unrealistic to engage in shale oil production at a Brent price below $40 (US) per barrel.

The graph also sheds light on what attracted a revisit of sale production by the US and current re-starters into the business. From 2005, the Brent price began a steady and sustainable upward trend exceeding $100 by 2011.

It was therefore easy for US oil shale in many of its formations with a breakeven rate of between $29 and $79 to conveniently undertake the production steps that resulted in the success we notice today.

Implication of Shale Re-entry to Nigeria's Economy: Price vs. Market Share

In the short to medium term, it is estimated that US shale oil entrance will have little effect on world crude prices. This bold assertion is predicated on the history of OPEC spare capacity, which has for a long period been extremely powerful in moderating price swings.

Second, industry experts like British Petroleum (BP), the World Bank, and many market traders have predicted an increase in crude oil demand, especially from emerging markets like the BRICS (Brazil, Russia, India, China and South Africa).

Among the OPEC countries, success is being recorded by countries like Saudi Arabia in expanding their domestic markets, which portends a reduction in their contribution to OPEC supply.

Third, success in shale oil production is at a very high economic cost. US success is primarily predicated on its vast infrastructure facilities around shale plays, sound environmental conditions, and efficient legal frameworks and strong political support.

In the worst-case scenario of a price fall, it is doubtful if this will create great unease to Nigeria. The country has experienced several adverse falls in crude oil price and has survived them all.

In 1992, the price dropped to below $20 and continued so till 1995. In 1998, the situation repeated itself with prices dropping from $28 to less than $20 for a year. From 2003, the country started enjoying a sharp and steady price rise, from about $25 in that year to almost $100 in 2008.

The price then suddenly crashed to about $60 in 2009 at the height of militancy, bringing a sharp drop in crude revenue from N6.5 trillion to about N3.0 trillion in the same year. Prices quickly rebounded consistently climbing to more than $100 and have remained in this region to date.

It is evident that Nigeria can and does indeed survive price crashes. In the words of Adeola Adenikinju (2008), “Nigeria has experienced all the phases of oil – the good, the bad and the ugly”. Price falls as a result of shale oil rediscovery, therefore, cannot be of great concern to Nigeria in the short and medium term; rather, it is the loss of American and some European markets that is the threat to Nigeria's economy occasioned by the entry of US shale oil.

Nigeria has evidently lost most of its international markets. In the US, more than half of Nigeria's market has been lost to the entrance of shale in just about two years. Nigeria's cargoes dropped from over 1mbpd by 2010 to a paltry average of about 500kbpd in 2012.

The problem became so severe that, for the first time, Nigeria's crude was sold at discounts. The Organisation for Economic Co-operation and Development (OECD) Europe, BP Statistical review of World Energy in 2013 revealed that energy efficiency has led to a gradual reduction of crude oil demand affecting the price of Nigeria's Bonny Light in this zone. These two major market places are the main buyers of Nigeria's crude oil with the

US, alone, procuring as much as 1.6mbpd of Nigeria's average 2.3mbpd at the peak of U.S participation in the world oil market. Signals of withdrawal by the US market started manifesting in July 2010.

Thereafter, exports to the US took a drastic decline to about 543kbpd in October 2012. This decline showed a direct correlation with the increasing fortunes of US shale oil, which took a steep upward climb in the same period.

The entrance of the US shale oil has completely altered the world oil market in general and changed the age-long trade business partnership of Nigeria's crude. Nigeria's fiscal revenue is a basically crude-dependent. The direction of world crude oil prices and the quantity of crude the country is able to push into the world market at any time are crucial to its fiscal profile.

It is a sad indication that most of Nigeria's crude cargo could be left unsold at the port in the short and long term, hurting the fiscal profile of the nation as we have started to experience. A new market is required immediately to redeem this ugly situation.

Conclusion: The Need for New Markets

Nigeria's fiscal outlook from crude oil revenue in the short and long run is depressing. This is not because of a price fall as a result of US shale oil recovery but because of a sudden and unexpected loss of a large captive market.

Nigeria is not new to managing the vagaries of oil price fluctuations since the beginning of her crude oil economy in the seventies. But one ugly reality that Nigeria has not experienced is the loss of market share in the international oil industry.

This could be a tragedy and should wisely be seen as such. It would be foolhardy to underestimate the fiscal dislocation this dangerous event could unleash on the Nigerian economy, if not abated. We are confronting a fiscal state of emergency.

The task before the managers of Nigeria's economy today is to search for new competitive, enduring markets to immediately replace the loss of Bonny Light market share in the US and Europe. While making efforts to gain grounds in the eastern market is commendable, a dragnet should be spread over the world.

In doing this, countries where Nigeria can exert some market power to get value for her principal asset should be prioritized.

Such markets are the emerging economies with potentials for immediate and future energy need, including the local Nigerian market.

Note: A version of this article first appeared in the NAEE Energy Forum, February 2014.

Kanya Williams, is Head of the Oil & Gas Office, Research Department, Central Bank of Nigeria (CBN). A graduate in Economics from Ahmadu Bello University, Zaria, he holds an MSc in Energy Studies, specialising in Oil and Gas Economics, from the Centre for Energy, Petroleum, Mineral Law and Policy, (CEPMLP), University of Dundee (UK). He is a member of the NAEE. Email: williamkanya2@gmail.com

References

Adeola Adenikinju, "Efficiency of the Energy Sector and its impact on the Competitive of the Nigeria's Economy", International Association for Energy Economics Fourth Quarter 2008.

"What Drives Crude Oil Prices," Energy & Financial Markets, US Energy Information Administration, 2014:
chttp://www.eia.gov/finance/markets

"The Triple-digit barrel", The Economist, June 15, 2013:
http://www.economist.com/news/finance-and-economics/21579471-are-high-oil-prices-here-stay-triple-digit-barrel

U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves, U.S. Energy Information Administration Independent Statistics & Analysis, April 10, 2014:
http://www.eia.gov/naturalgas/crudeoilreserves/

BP Statistical Review of World Energy, June 2013

Moshiri M. and Foroutan F., "Forecasting Nonlinear Crude Oil Futures Prices", The Energy Journal, Vol. 24. N. 4., 2006.
"Shale oil and shale gas resources are globally abundant", US Energy Information Administration, June, 2013:
http://www.eia.gov/todayinenergy/detail.cfm?id=11611

Li, Shuyuan; Qian, Jialin; Ma, Yue, "Chinese current oil shale business", 31st Oil Shale Symposium, Oct. 19, 2011, Golden, Colorado: Colorado School of Mines.

"Jilin and Shell to develop oil shale resources", Asia Times, April 5, 2006: http://www.atimes.com/atimes/China_Business/HD05Cb02.html).

Proposed Oil Shale and Tar Sands Resource Managing Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final programmatic Environment Impact Statement, Bureau of Land Management, September 2008, Chapter 4, "Effects of Oil Shale Technologies":
http://ostseis.anl.gov/documents/fpeis/vol1/OSTS_FPEIS_Vol1_Ch4.pdf.

Qian Jialin; Wang Jianqui, "World oil shale retorting technologies", International Oil Shale Conference China Petroleum University, Amman, Jordan: Jordanian Natural Resources Authority, Nov. 7, 2006:
http://www.sdnp.jo/International_Oil_Conference/rtos-A118.pdf.

Sakelaris, Nicholas, "U.S. shale oil could reach 5 million barrels per day by 2017", Dallas Business Journal, July 16, 2013:
http://www.bizjournals.com/dallas/news/2013/07/16/us-shale-oil-could-reach-5-million.html?page=all

Insurance just got easier

INTRODUCING

L - Leadway

H - Household

A - Automobile

P - Personal accident

Py - Policy

L-HAPPy is the all-in-one policy that looks after everything you hold dear. From your cars to your home, from a liability cover to a personal accident cover that includes your domestic staff, L-HAPPy offers you affordable and convenient insurance in one tidy plan.

ONE PREMIUM
MULTIPLE COVER
▪ AFFORDABLE ▪ CONVENIENT ▪ RELIABLE

Call Zara toll free on 0800 CALL ZARA
(0800 2255 9272)
or email: easier@leadway.com

www.facebook.com/leadwayassurance www.twitter.com/leadwayinsure

LEADWAY
ASSURANCE COMPANY LIMITED

TRANSITION AND INVESTMENT IN THE ELECTRIC POWER SECTOR: – A Review of NERC's Recent Approval of the Interim Rules for Transitional Electricity and its effect on Potential Investment in the Power Sector

By Wale Shonibare, MBA
Managing Director – Investment Banking, UBA Capital PLC

"The transmission system is the weakest link in the value chain of the Nigeria electricity network."

Despite privatisation of the Power Holding Company of Nigeria (PHCN) in 2013, Nigeria's electricity generation level has declined from a peak of about 4,520 megawatts (MW) recorded in December 2012 to about 3,400 MW in June 2014.

The combination of persistent gas shortages and an inadequate transmission infrastructure continue to depress power generation and supply, as power output from the national grid shed 10.52% in June 2014.

The transmission system is the weakest link in the value chain of the Nigeria electricity network. Inadequate transmission infrastructure has been consistently cited by industry analysts as being responsible for stranded capacity that is characteristic of the electricity grid.

Consequently, significant investment is required to improve the transmission system in order to improve power supply.

Interim Rules

In April 2014, the Nigerian Electricity Regulatory Commission (NERC) approved rules for the interim period between completion of privatisation and the start of the Transitional Electricity Market (TEM).

The Interim Rules were developed and issued by NERC in December 2013 to conduct the market in the pre-TEM phase until the declaration of TEM. The Interim Rules order was later modified with a revision taking effect from May 1, 2014.

The Interim Rules are intended to cover all electricity taken from the transmission system by the distribution companies (DISCOs) with adjustment made to account for any bilateral arrangements between generation companies (GENCOs) and DISCOs.

The objectives of the rules are to:
Establish a framework to govern trading arrangements during the interim period when Power Purchase Agreements (PPAs) between the privatised PHCN successor GENCOs and Nigerian Bulk Electricity Trading PLC (NBET) and Vesting Contracts (VCs) between NBET and the privatised PHCN successor DISCOs will not be effective.

Manage the probable revenue shortfall in the industry by determining the revenue allowable to market participants and service providers during the interim period.

- Establish the payment arrangement and flow of funds from DISCOs through the Market Operator to all beneficiaries.

- Establish the sources of funds required to ameliorate the probable shortfall in revenues collected by the DISCOs during the interim period.

Under the interim period the Federal Government of Nigeria (FGN) and NERC will work towards resolving the issues and challenges in the sector before the commencement of the TEM.

Postponement of TEM

The Electric Power Sector Reform Act (EPSRA) 2005 established three market stages that define

gradual competitiveness in the power privatization market, which include
(1.) TEM,
(2.) a mid-term electricity market, and
(3.) the final/mature electricity market.

The TEM stage represents the first step to move the electricity market in an orderly manner from an integrated whole utility to a fully competitive market structure with more differentiated players.

The postponement of the official commencement of TEM by the NERC until the satisfaction of all expected conditions in the Nigeria Electricity Supply Industry (NESI) has been attributed in large part to the gas challenge in the power sector. TEM is a period when the electricity market would be governed by contracts between market participants across the value chain. Upon commencement of TEM:

- PPAs, the VCs, and the 2013 Gas Supply Agreement (GSA) will become effective and operational;

- The market rules will also become fully effective;

- NBET will step in as a counterparty to the GENCOs and the DISCOs with respect to relevant industry contracts (that is, the PPAs and Vcs);

- The GENCOs will be assured of adequate gas supply since gas suppliers will be guaranteed to receive due payments for gas supplied; and

- The Nigerian Gas Company (NGC) will be liable to pay liquidated damages for failure to fulfill its obligations to deliver gas to GENCOs in accordance with the terms of the GSA signed between the NGC and some of the GENCOs.

Solutions for the Way Forward

That said, it is encouraging to note that NERC is working with the FGN towards making the sector financially viable by introducing creative measures to address challenges in the power sector value chain.

These include measures to offset the ? 25 billion outstanding legacy gas related debts owed to gas suppliers by the defunct PHCN, and the FGN's approval of a new gas-to-power pricing benchmark from what used to be about $1.50/mcf (USD) of gas supplied to $2.50/mcf, and $0.80/mcf as transportation costs for new capacity.

In addition, NERC is presently concluding a review of the baseline case for Aggregate Technical, Commercial, and Collection (ATC&C) losses submitted by the distribution companies. This will be followed by a review of the revenue requirement for the power sector that is to be covered by a revised Multi-Year Tariff Order (MYTO).

Recently, UBA Capital, in conjunction with NERC, hosted a seminar titled “Understanding and Enhancing the Bankability of the Nigerian Electricity Supply Industry”. The seminar was aimed at key market players, GENCOs, DISCOs, and the banking community, in order to address the major challenges in the power sector and propose solutions to enhance the attractiveness of the sector.

The following items and solutions were proposed at the seminar:

Conduct a Review of MYTO 2.

NERC is currently reviewing MYTO 2 to reflect losses accurately and enable recovery of Interim Rules shortfalls. It will ensure that at the revision will enable DISCOs to:

- Recover Operating Expenses
- Service Debt Obligations and
- Finance Capital Expenditure.

Issue a Bond

A bond issuance was proposed via a Special Purpose Vehicle (SPV) owned by the DISCOs and (possibly) the GENCOs.

The proceeds of the bond would be used to pay legacy gas debt and debt incurred during the Interim Rules period.

The bond would be supported by credit enhancement mechanism through the Central Bank of Nigeria(CBN)

Restructure Bank Facilities
NERC intends to propose the following to the CBN:

- Deepen/modify the Power and Airline Infrastructure Fund to lend Naira at the lowest possible rates for capital expenditure and refinance existing acquisition facilities and
- Allow banks to extend moratorium on capital for another 18 months without any penalties/provisions to the banks.

Ensure Business Continuity.
NERC proposed a Business Continuity regulation for DISCOs and GENCOs to identify and resolve issues quickly without harming the electricity and financial sectors.

The proposed business continuity regulations would assist with asset management, debt restructuring, and reservation of customer and commercial efficacy.

It was agreed that CBN and NERC will work closely to ensure business continuity for the DISCOs and GENCOs in order to make sure that the interests of customers, banks and electricity stakeholders are considered and protected.

Establish a Unified Metering Technology.
NERC and the DISCOs will work together to adopt a metering technology that will capture the particular challenges in determining electricity usage and charge in Nigeria.

These initiatives should spur the necessary investment in infrastructure for Gas supply and energy transmission In parallel, the move from Interim Rules to TEM is expected to commence in November 2014. its critical to the power sector, as it will result in a competitive market structure that ensures cost recovery.

This should, in turn provide a further boost to investor confidence in the power sector.

Wale Shonibare is the Managing Director, Investment Banking, at UBA Capital. He has more than 4 years' experience in Infrastructure finance and development spanning Asia, Europe, Middle East and Africa.

Prior to joining UBA Capital, he was Managing Director and Head of Infrastructure, Africa, Middle East and New Markets at Renaissance Capital. He holds an BA from Imperial College, University of London and a BEng (Hons) degree in Civil Engineering from the University of Glasgow.

THE 'MAGIC' OF THE SUN – Harnessing Solar Energy technologies to transform Nigeria's Electricity Supply Industry

By Balkisu Saidu, Ph.D, Member of NAEE

"The sun emits more energy in one second than humans have used in the last 10, 000 years."

Nigeria's ongoing electricity reform programme envisages a gradual disengagement of government from the electricity supply industry (ESI), retaining a system, in the interim, of public and private generation, distribution and supply of electricity.

The policy emanated from decades of failure of the government-dominated monopoly system of electricity supply, exemplified by the National Electric Power Authority (NEPA) and its successor, the Power Holding Company of Nigeria (PHCN).

The insecurity of electricity supply in the country has often been attributed to inadequate capacity at all levels of the supply chain due to such causes as long-term planning in the sector, poor maintenance of existing infrastructure, haphazard policy and programmes development, lackadaisical implementation, and official ineptitude and corruption, among others.

There is, however, another significant cause of insecurity of electricity supply in Nigeria that is yet to receive the prominence it deserves. That is the over-reliance on fossil fuel and the refusal to prioritize solar technologies in the design and choice of primary sources of electricity generation in Nigeria.

Energy Mix Priorities

Nigeria's electricity priority as provided for in the National Energy Policy 2003 states that one of the objectives of the policy is to broaden the energy options for generating electricity by intensifying the national effort in training, research, and development with a view to generating electricity, using solar, among other resources, to conserve the nation's fossil fuel.

However, Nigeria's ESI is still heavily dependent on fossil fuel for its generation. The Energy Commission of Nigeria (ECN) designed an energy mix of 50% natural gas, 25% hydro, 20% coal and 5% renewable energy for the generation of electricity in Nigeria; hence, a majority of the Independent Power Producers (IPPs) licenced by the Nigerian Electricity Regulatory Commission (NERC), use fossil fuel as their primary source for power generation.

In a National Energy Policy forecast that dates back to 2003, the Energy Commission of Nigeria (ECN) calculated that at the current reserves and rate of exploitation of about 2 million barrels per day (mb/d), the expected life-span of Nigeria's crude oil would be about 44 years, while that for natural gas would be about 88 years, based on the 2001 production rate of 1850 billion standard cubic feet (bscf).

Of course, this is discounting the possibility of making new discoveries and using modern technology in accessing the hitherto inaccessible crude oil and gas.

Notwithstanding this gloomy outlook for the dominant primary source of electricity generation in Nigeria, the country appears not to be in a hurry to abandon or greatly reduce its use. It is a finite source with negative effects on the environment and located in a volatile geographical area. And yet, it is a source that, by our own defined national policy, is accorded 50% priority over other sources.

Admittedly, the determination of the electric energy-generation mix in a country is largely influenced by the geographic region in which the country is located and the resources readily available.

Equally admitted is the fact that Nigeria is blessed with abundant wealth of fossil fuel resources. However, Nigeria is also located in a region with abundant solar energy. The country lies within a high sunshine belt in which solar radiation is fairly well distributed. It is not limited to any one particular part of the country.

The annual average of total solar radiation varies from about 12.6 mJ/m2-day (megajoule per square metre per day) in the coastal latitudes to about 25.2 mJ/m2-day in the far north. This means that all parts of Nigeria have, relatively all-season, a strong solar radiation presence suitable for electricity generation.

The Promise of Solar Energy

The use of solar technologies can, therefore, bring about economies of mass production instead of economies of scale.

The pervasive nature of solar radiation in the country would allow for the provision of all electricity requirements of rural and sparse populations through the use of, for example, solar-based village pilot schemes; and this can be done in remote and otherwise fragmented low-density areas that are impractical to supply using conventional grid-based systems, because the use of solar technologies negates the need for large-scale transmission apparatus, making the system more secure, and less vulnerable to attack.

In addition, the variations between supply and demand could be blurred if generation is made at the point of supply and consumption.

Although in many ways fossil fuel currently provides a simple, easy-to-use energy source, the contentious issues associated with its widespread use are numerous, consisting of some of the world's most difficult and large-scale global political, economic, health, and environmental problems. Solar technologies are now the way to go.

The sun emits more energy in one second than humans have used in the last 10, 000 years and more energy per second (3.827×10^{26}J) than is available in all of the fossil fuels present on earth (3.9×10^{22}J), and therefore has the potential to provide all of the current and future global energy requirements.

That could explain why most countries, developed and developing, are moving towards strengthening their ESIs via the use of solar energy resources and moving away from over-reliance on fossil fuel as primary source of generation.

In Japan, the Electric Power Companies plan to introduce mega solar power generation facilities in about 30 locations with generating capacity of 140 megawatts (mW) by 2020. This is in spite of the existence of a saturated residential demand in the ESI in the country. The United States of America has also unveiled a new clean energy policy as articulated by President Barrack Obama in his 2011 State of the Union Address. In it, the President set a new government goal that aims to generate 80% of its electricity from clean energy sources by 2035.

This would be generated from the use of wind and solar sources, among others. In the same year, the German Chancellor, Angela Merkel, set a new target for Germany that aims to move the renewable (not limited to solar) share of electricity from 17% in 2011 to 35% in 2020.

As of August 2011, the ESI in the UK was producing about 200 gigawatt hours per year of electricity from solar photovoltaic. In Brazil, renewable energy accounts for more than 85% of the country's domestically-produced energy.

Nigeria could equally pursue this line of development. Since the solar source for renewable energy is clean and free, Nigeria can supply secure and sustained electricity to its people, protect the environment, and promote present and future economic development by using solar energy technologies.

The Solar Solution

If the hallmark of the ESI reform process is to provide secure electricity through gradual government disengagement from the sector as well as a suitable environment for the private sector to run the industry, the influx of IPPs in the industry, as approved by the Electric Power Sector Reform Act (EPSRA) 2005, should provide the regulator an opportunity to design a system of allocation of licenses to reflect the energy mix needs of the nation, which should prioritize solar over other sources.

Nigeria stands to benefit immensely from the use of solar energy technologies; not only will such use increase its technology base and generation capacity, it will also improve its environmental protection record.

The environmental effect of the fuel used to generate electricity is increasingly becoming a variable in the determination of price rate of electricity in certain parts of the world.

This is because of the additional cost that the use of certain energy sources adds to the environment in the form of clean-up and payments of fines/charges for emission of greenhouse gases.

Additional cost of electricity and environmental degradation from the use of fossil fuel could be avoided by redirecting focus to the use of solar energy to generate electricity.

Such a step foreshadows a cleaner, efficient and secure electricity supply industry in-the-making in Nigeria.

Solar energy is without doubt cleaner, and it is getting cheaper by the day. Nigeria cannot continue to apply the same technology for its future development as it has in the past.

Let us harness the magic of the sun!

Note:
Previously published in the NAEE Forum (April 2013), this article originally appeared in expanded form as "Roadmap for Power Sector Reform in Nigeria 2010: Out of the Dark into the Dark Age" in the Journal of Structured Finance, Fall 2011.

Dr. Balkisu Saidu Born in Sokoto, Nigeria, Dr Balkisu Saidu obtained her Bachelors in Law (LLB) from Usmanu Danfodiyo University Sokoto, Nigeria in 1998; was called to the Nigerian Bar as Barrister and Solicitor of the Supreme Court in 2000; obtained Masters in Petroleum Law and Policy from University of Dundee, Scotland, United Kingdom in 2005; and PHD/SJD in Energy Law and Policy from Keio University, Tokyo, Japan in 2012. She is a Senior Lecturer in the Faculty of Law, Usmanu Danfodiyo University Sokoto, Nigeria and an Associate in the Law Firm of Umaru Shinkafi & Co., Sokoto, Nigeria. Her research interests include Energy Law, Jurisprudence, Human Rights Law and ICT Law. She is a Chevening and Monbukagakusho Scholar. Her hobbies include running and mountain climbing.

The Changing Nature of International Renewable Energy Transactions

By James Snape
Head of Infrastructure, Construction & Energy
Nabarro LLP

In a time of economic, political and environmental change, the world is becoming increasingly interested in pursuing sustainable ways of supplying the ever-growing demand for energy and the demand for renewable energy transactions is rising.

In particular, Nigeria has a growing population and does not currently have the power infrastructure in place to support its economic status and must therefore look at alternative ways to source its energy supply.

It is clear that Nigeria and other countries all over the world are waking up to the opportunities that renewable energy brings and consequently their governments are moving to make investment in renewables more attractive.

The Nigerian government has attempted to address its problems by introducing the National Integrated Power Project (NIPP). The NIPP has involved the privatisation of the state-owned generation company (Power Holding Company of Nigeria), construction of a new 700 kilovolt transmission grid and opening up the electricity generation market to independent power producers.

In addition, the government has also committed itself to targeting 20% of renewable energy capacity by 2030 (including 4GW of solar by 2025) and is currently developing a feed-in-tariff regime. Ernst & Young has labelled Nigeria as a market to watch in its Renewables Country Attractiveness Index.

In addition, Nigeria Vision 20 shows commitment to a long term plan for stimulating Nigeria's growth. The strategic priorities are clearly focused around the country's energy sector and how this can be used as a key driver for economic stimulus.

Priorities include:

- providing incentives to attract private investment to facilitate energy capacity expansions
- establishing effective institutional and regulatory frameworks within the energy sector
- achieve energy supply security by utilizing the nations renewable energy resources
- Development of efficient and sustainable energy generation and consumption patterns.

This is clear commitment from the government to create an environment to facilitate the utilization of Nigeria's vast renewable energy resources. When it comes to renewable international energy transactions parties must be aware of the multiple regulatory regimes and of all of the compliance duties that go with these transactions.

One example is the Kyoto Protocol, which sets internationally binding emission reduction targets that aim to reduce Greenhouse Gas emissions. Renewable energy transactions are a key part of meeting that target.

Knowledge of local regulations and rules makes it possible to manage risk and to maximise results in the lucrative energy market.

In addition, project evaluation is essential. Developing countries that have an abundance of natural resources may not be able to offer the infrastructure needed to support the project within the required timescales; for example, local transmission and distribution networks must be sophisticated and powerful enough to cope with the energy output.

It can also be harder to find staff with the appropriate skills outside of larger cities, which is important because developing and maintaining renewables requires a certain level of technical

expertise; for example solar panels must be cleaned in a specific way to ensure that they are not damaged.

The types of renewable energy transactions that take place are always changing. Conventional sources of energy such as oil and gas remains the predominant sources of energy in Nigeria but Hydropower is now establishing itself as a key energy source within the country.

Across the globe wind power (both on and off shore) and solar power are becoming increasingly popular as alternative sources of energy.

This has become increasingly evident in the transactions we (Nabarro) have been instructed on recently. Just last year we were appointed to advise on one of the world's largest renewable energy projects – Tafila Wind Farm. A117MW wind farm comprising of 38 turbines and located in the Governante of Tafila.

This was a particularly challenging project given its size and the number of stakeholders involved which included funders, technical advisers, the state utility, associated government bodies and the contractor.

We are also seeing an increase in the number of projects being commenced in the energy from waste sector. These types of projects are becoming increasingly common across Asia; we are currently working with a number of projects in this area.

Another key consideration when undertaking renewable energy projects is who the counterparties to the Power Purchase Agreement (PPA) will be.

In countries where the state is the only electricity provider, the government will enter to the PPA, having state backing can be good for security and consequently for providing comfort to project investors.

Some investors actually require evidence of state-backed equity or debt investment in the project before making their own investment. However, only being able to sell to one customer, even if it is a guaranteed customer, also increases the challenges of negotiation.

Countries with more than one electricity provider allow for greater scope for negotiation but perhaps less contract security. Secure credit enhancement programmes can go some way to mitigating the risk.

Financing a project in a different jurisdiction provides new challenges due to the extra due diligence required to satisfy investors. Import duties, tax, interest rates, changes to inflation and exchange rates and local politics all pose risks.

However, as the renewable energy market becomes more competitive, the cost of equipment is decreasing and support from organisations such as the International Finance Corporation (IFC) and the African Development Bank (AfDB) can provide security to investors through their support for the renewables industry.

The AfDB has a Green Bond program, as does the IFC, the IFC's green bond program raised $2 billion in 2013. In the last financial year the IFC invested $2.5 billion into climate - related projects, which included providing financing through commercial banks.

In addition, there are also individual funds created for individual countries, Nigeria has the Nigerian Clean Technology Fund (CTF) which has a particular focus on downstream energy.

These funds provide vital support for those wanting to pursue energy related projects. The CTF's can help fill financing gaps that may result from a lack of understanding or support for such projects from mainstream financial institutions.

Countries are now looking to connect on a regional level instead of an individual country level to increase the available energy market.

The Regional Economic Communities in Africa (such as the East African Community, made up of the Republics of Burundi, Kenya, Rwanda, Uganda and the United Republic of Tanzania) are leading energy access programmes attempting to integrate energy markets at a regional level.

There is huge potential for renewable energy transactions in countries that are rich in sun, wind and water that is suitable for hydroelectric power.

This positive outlook promises a bright future with lots of opportunities for international investors, contractors and suppliers.

James Snape is a partner in Nabarro's Infrastructure, Construction and Energy group and is also head of the firms waste industry group.

He is a recognised expert in public private partnerships, outsourcing and joint ventures. His focus areas include energy waste and large infrastructure projects. He works with a broad range of clients both in the UK and internationally.

ELECTRICITY REFORMS IN NIGERIA: CHALLENGES AND POLICY OPTIONS.

By Adeola Adenikinju, PhD, Current President, NAEE

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 1986.

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.

Even though electricity remains vital to the socio-economic transformation of any society, key Peformance Indicators (KPI) show that Nigeria is a laggard country with respect to the electricity sector development when compared to comparator countries.

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 is critical to the production process.

Third, it is an enabler of new technologies.

Fourth, access to electricity is important to the realisation 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.

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 development of the country. Access to electricity is Nigeria is below 50 percent.

In addition, the access is inequitable, varying with levels of income, and location.

The rich and the urban dwellers consume a disproprotionate share of electricity that is available in the country.

Historical Development Successive adminstrations in Nigeria have contributed to the current status of electricity development in Nigeria. The cummulative impacts and the model under which the sector operated until 2005 fall below expectations and 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.

Investment across the various segments of

electricity supply system generation, transmission and distribution was uneven. 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 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 a largely successful model of the reform of the telecommunication industry in the country.

However, political maneuverings' after the exit of Obasanjo in 2007 let 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, reverse the progress made in the privatisation process and delayed it by several years at a huge loss to the economy.

The sudden demise of President Yar'Adua, and the elevation of his former Vice President, Dr. 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 or are favourably dispose 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 good will 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 fairly independent of the bureaucracy in the Federal Ministy of Power and the Power Holding Company of Nigeria (PHCN), the holding company that was set up as a transitional company to midwife the sale of the assets of the National Electricity Power Authority (NEPA), the highly unpopular state utility in charge of power supply in Nigeria.

Challenges of the Electricity Sector Reforms in NigeriaThe privatisations policy of the administration has been described as quite radical. Although the goalpost was shifted several times, the successul completion of the privatisation process and the physical handing over of the privatised assets to their owners across the country on 1st of November, 2013 has put the country in an uncharted territory[1].

Proponents of the privatisation have argued that it will generate huge socio-economic benefits to Nigeria electricity consumers, including increasing access to electricity, improving efficiency by increasing bills' collections, 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.

In spite of the assurance to the contrary, there are still several challenges confronting the sector. These include institutional and regulatory capabilities, transparency and independence of the various orgnizations established to oversee the new ESI that will emerge post privatisation. Privatisation does not imply absence of regulation. It simply implies that the focus of

regulation will have to change to ensure that all actors paly according to oversee the new ESI that will emerge post privatisation. Privatisation does not imply absence of regulation.

It simply implies that the focus of regulation will have to change to ensure that all actors paly according to the rules; that interests of all economic agents, especially the vulnerable consumers are protected, that quality of services are not compromised and that there are not attempts to hijact 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 privatised organisations have been stripped, canibalised and exported by their new owners in the past.

Ariyo and Jerome (2004), in a review of performance of privatised companies have found out that there has been weak oversight by the Bureau of Public Enterprises post-privatisation and that the performance of some privatised companies actually deteriorated after their privatisation.

Second, electricity supply security remains an important issue even post privatisation. The system needs to be optimised in terms of location of new power plants to ensure even distribution across the country as well as minimise 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 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. A baseline study of PHCN workforce conducted in 2012 shows that the skill mix in the electricity sector is not balanced. Engineers and technologists account for less 8 per cent of the workforce that is dominated by marketers, accountants, drivers and the likes[2].

Another critical issue is how to fully and fairly resolve the legacy issue with 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 2013, 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 and that less than half of the former employees have been fully settled (Opara, 2013).

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

There is also the problem of inadequate transmission and distribution Infrastructure. Even if all the IPP project developers were to set up power plants, the existing transmission and distribution infrasture, will not be able to wheel the quantity of electricity generated.

In spite of this, the Nigeria Bulk Electricity Trader, one the basis of the current power purchase agreement will have to pay the power generating plants (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 Multi-Year Tariff Order (MYTO) 1 and 2.

This has let to almost double of electricity tariff between 2005 and 2010, with the government having to pay huge subsidy to electricity producers though the NERC. By 2020

according to MYTO 2, electricity tariffs would have risen from N6-8kWh at the onset of reforms in 2005 to N26-N32/kWh by 2020. The fixed charges are also very high.

Conclusion

recent reforms in the Nigeria electricity sector are simply following global trends. The old paradigm of government dominance has given way to private sector led energy delivery systems.

Combination of factors including fiscal pressures, environment consideration, poor performance of state owned utilities and the need to attract huge investment, etc, have led to the paradigm shift.

Reform of the energy sector has suceeded in some countries, and failed in others. Therefore, certain conditions that are precedent to a successful reform must be carefully studied and integrated into the reform process: rules of the game must be well defined; credibility of the reform process and the regime promoting the reform; stakeholders buy-in; factoring in the interests of potential losers; effective legal framework; fast judicial system; effective and capable regulator that is transparent, well-tained, well-trained, well-remunerated and fair in punishing infraction; creation of a competitive/contestable market system; presence of a competition policy; and innovative policy instruments and institutions.

The Clear line of authority among energy regulators and institutions is also essential in the success of reform. There must be periodic review of the performance of the regulatory agencies, the regulated organisations and their impact on welfare of end-users.

On the balance, the jonathan administration in its short span has provided fillipt 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 and tenuous. If he succeeds, his legacy will be preserved for generations.

References

Ariyo, A. and A. Jerome (2004) "Privatisation in Africa: Lessons from the Ghanaian and Nigerian Experience", Public and Private Sectors: Towards and Balance, Unit 3, African Development Yearbook Perspective, Volume 10, (2003/2004), Edited by Karl Wohlmuth and Tobias Knedlik.

Makoju, J. (2007), Report on Electricity Sector Performance in Nigeria, 2003-2007. President Brief, unpublished.

NAPTIN (2013), NAPTIN's Presentation to the National Planning Commission on Power Sector Human Capacity Requirement.

Oketola, D. (2013). The Nigeria Transmission Infrastructure. The Punch, August 22, p.32.

Opara, B. (2013), Interview reported in the Nation Newspaper, Monday October 28, p.39.

Owan, R. (2013). There is Optimism over Power Sector Privatisation. Interview in the Guardian, November 9, p. 54.

Presidential Action Committee on Power (PACP) 2013 Report "Federal Republic of Nigeria Roadmap for Power Sector Reform"

Professor Adenikinju is a Professor of Economics at the University of Ibadan, Nigeria. He is also a Research Professor at the Centre for Econometrics and Allied Research. Adeola has consulted for several local and international Organizations. His research interests include Petroleum and Energy Economics, Macroeconomic modeling, and Economic Development Issues. He has published extensively in reputable Local and International Journals. He is currently the President, Nigerian Association for Energy Economics. He had previously served as a Special Assistant to the Presidential Adviser on Energy Matters, and Senior Special Assistant to the President, Office of the Chief Economic Adviser to the President. He is currently the Director, Centre for Petroleum, Energy Economics and Law (CPEEL), a MacArthur Foundation Regional multidisciplinary Centre of Excellence at the University of Ibadan that provides training, research and consultancy on all aspects of energy.

We Have You Powered

Environmental Accord Limited (EnvAccord) is a world-class environmental and sustainability risk management advisory firm. Since its establishment 10 years ago, **EnvAccord** has successfully executed over 120 environmental projects.

EnvAccord has a deep knowledge of the regulatory framework of the Nigerian power sector.
We were recently engaged by the Federal Government (through the Federal Ministry of Environment) to develop Environmental Impact Assessment (EIA) guidelines for the sector.

In conjunction with our international partners, we worked on a World Bank- supported EIA project for Azura Power. **EnvAccord** is currently executing World Bank-supported EIA projects for the Transmission Company of Nigeria (TCN) and Chevron Nigeria Limited.

Our services:

- Environmental Impact Assessment (EIA) studies
- Environmental and Social Due Diligence (ESDD) studies
- Environmental Management Systems (EMS) design and implementation
- Environmental and Social Audit/Monitoring studies
- Sustainability Strategy and Implementation advisory services

Some of our clients:

tcn · Chevron · SHORELINE POWER · SIEMENS · AZURA · ASB VALIANT COMPANY LIMITED · Federal Ministry of Environment, Nigeria

environmental accord
...superior sustainability solutions.

Environmental Accord Limited
13, Alabi St., Off Oguntona Crescent,
Gbagada (Phase 1), Lagos.

Tel: +234-1-892-3090

E-mail: info@envaccord.com
http://www.envaccord.com

Contact Us Today

Ibrahim
Tel: +234-802-360-9591
E-mail: isalau@envaccord.com

Linda
Tel: +234-803-200-8640
E-mail: luneze@envaccord.com

GLOBAL ENERGY CONSUMPTION: Rhetoric and Reality

Ubohmhe Glenn Olowojaiye, Msc, LLM, MBA
Fidelity Bank

"A critical analysis of global energy consumption strongly suggests a pattern that tends towards energy security as the overriding policy objective."

From Kyoto to Durban and Doha to Rio de Janeiro, attempts have been made to chart global consensus towards a carbon-constrained world to avert the deleterious consequences of global warming and other environmental catastrophes.

The planet's oceans and glaciers are going through significant changes. Oceans are warming and becoming more acidic, Ice caps are melting, and sea-levels are rising, we are told.

Satisfying the world's huge appetite for energy while at the same time faithfully observing the oath of allegiance (where one exists) to the protection of the environment is one of the greatest dilemmas of this fossil fuel age.

Energy (conventional or unconventional) is the lubricant of any modern economy, and the energy intensity of most developing countries is especially high. It is therefore unsurprising that a critical analysis of global energy consumption strongly suggests a pattern that tends towards energy security as the overriding policy objective.

When It Comes to Electricity: Coal Is Still King

What is the underlying goal of energy security?
Energy security seeks to reduce dependence on a particular fuel and to achieve a broad portfolio of energy-supply alternatives and sources.

In essence, the aim is to ensure reliable and adequate supplies with minimal interruptions and exposure to market disruptions that deliver the "cheapest energy" to consumers.

The call for a transition to a more environmentally friendly energy has seen some analyst proclaim the end of coal and other forms of "extreme energy". And yet, coal currently constitutes 30% of total primary energy consumption behind oil at 33%. To further put this in perspective, at present, coal is the predominant fuel for electricity generation globally with 40% of total electricity fuel mix, followed distantly by gas and oil at 22% and 5% while hydro and nuclear have equal contributions of 17% each and the balance of 3% from other sources according to the International Energy Agency (IEA).

The Petroleum Economist also observed recently that coal is making an unexpected comeback in Europe. It was reported that hard coal consumption across the continent rose by 7.77 million tonnes i.e 8% year-on-year, in the first four months of 2012 while lignite coal consumption increased by 3.9 million tonnes, or 2.6% during the same period.

Spain recorded a more than 80% increase in coal consumption, whereas the UK has also seen a 26% upward spike to 6.3 million tonnes in the first five months of 2012. Coal-generated power supply in the UK increased by 10% in 2012 from 29% in the preceding year, on the back of cheap supplies of coal and a carbon price collapse.

At another level, and especially depressing for environmentalists, the EU Emission Trading Scheme (ETS) has collapsed and is in urgent need of redemption.

A number of Western European countries subsidize coal production, and most countries in Eastern Europe subsidize its consumption. Coal consumption within the EU notched up by 3.4% in 2012.

German nuclear plants scheduled for decommissioning are mostly being replaced with 10 GW (or 10,000MW) of new fossil-fuelled generation, mainly hard coal with some lignite (brown coal) – the dirtiest fossil fuel. China

maintains the front-runner position with 50% of global coal consumption.

The Global Shale Game

Although, coal consumption contracted by 2% in North America as a percentage of total primary energy consumption by fuel type (oil, natural gas, coal, nuclear energy, hydroelectric and renewable) due primarily to shale gas revolution.

One can place a bet, with a high degree of assuredness, that the UK and other shale-rich countries will follow suit in no distant future.

How clean is shale? The quest for shale in North America and other countries is a strategic choice framed by energy security. But proponents of shale appear to have conveniently sidestepped its environmental impact and sometimes, festooned with self-serving rhetoric, argue that shale is less carbon intensive than coal, as if comparison with coal is a pass for environmental compliance. The narrative on fossil fuel and climate change is evolving.

Interestingly, studies by experts in the field estimate fugitive emission from shale gas at 4% – 9% of total gas captured from fracking.

This position is also supported by Professor Ekins of the University College London (UCL) Energy Institute and Professors Anthony Ingraffea, Robert Howarth and Renee Santoro of Cornell University, all fracking experts.

The study by Cornell University researchers, published in the journal Climatic Change, asserts thus: "Compared to coal, the carbon footprint of shale gas is at least 20% more than and perhaps more than twice as great on the 20-year horizon and is comparable when compared over 100 years.

" If this assertion holds, emission from shale gas nullifies any purported carbon savings shale gas has over coal thereby making shale gas more harmful to the environment than coal.

Energy Security vs. the Environment

Make no mistake, difficult choices and bold attempts have been made (and will continue to be made) to secure energy supplies.

Some of the landmark projects driven primarily by energy security concerns include: Investment in LNG plants by major energy-consuming nations, promotion of renewable energy, the shale gas revolution in North America, exploration of tar sand deposits in Canada, investment in alternative transit pipeline routes through the Southern Corridor to transport gas from the Caspian Sea basin to Europe meant to diversify Europe's energy supply from Russia, and the recent signing of a $10 billion USD shale gas Production Sharing Agreement by Ukraine.

Shale and other unconventional energy sources may rule the next age, not because they are environmentally compliant but because the energy arc, for most countries, bends towards security.

Economic benefits inherent in energy security cannot be ignored, it seems. Environmental consideration is only a footnote in the global energy narrative.

What this Means for Nigeria

The lesson for Nigeria in the evolving global marketplace for energy is the need for proactive policy measures.

Diversification of export earnings and emphasis on internal and regional consumption of energy resources are tasks that must not be ignored. To borrow from the wisdom of a former Saudi oil minister:

"The Stone Age did not end because the world ran out of stones and the petroleum age will not end because of shortage of petroleum resources" but because cheaper and more securable energy sources are discovered through innovative technologies.

Ubohmhe Glenn Olowojaiye is a Credit Analyst/Relationship Manager at Fidelity Bank, PLC. He studied accounting at Ambrose Alli University (BSc), where he was Editor-In-Chief of the Accounting Journal. He holds advance degrees in Petroleum Taxation and Finance (LLM) and Energy Finance (MSc) from the University of Dundee, and an MBA from Lagos Business School.

Ughelli Power Plant – 972 MW
(Transcorp Ughelli Power Ltd)
Syndicated Acquisition Finance Facility
Syndication Member

Egbin Power Plant – 1320 MW
(Kepco Energy Resources Ltd)
Syndicated Acquisition Finance Facility
Syndication Member

Kano Electricity Distribution Co.
(Sahelian Power)
Acquisition Financing
Mandated Lead Arranger

Akute Power Ltd. 12.5 MW IPP
(Commissioned in 2010)
Project Finance
Sole Lender

Benin Electricity Distribution Co.
(Vigeo Power Limited)
Syndicated Acquisition Finance Facility
Co-Arranger & Facility Bank

Ikeja Electricity Distribution Co.
(NEDC)
Syndicated Acquisition Finance Facility
Syndication Member

Island Power Limited - 10 MW IPP
(Commissioned in 2010)
Project Finance
Sole Lender

Alausa Power Ltd. 10.4 MW IPP
(Nov. 2013 Commission Date)
Project Finance
Sole Lender

Our commitment to the Power Sector Reforms is reflected in the number of projects we have supported in this area. We have become the bank of choice for Power, Infrastructure and Real Sector Financing in Nigeria.

To know how we can support you in these and other areas, please call: +234 1 773 3199 or visit: www.fidelitybankplc.com

FIDELITY
Fidelity Bank Plc RC: 103023
We're Fidelity, we keep our word

www. twitter.com/fidelitybankplc www. facebook.com/fidelitybankplc

Commentary on Trends in the Nigerian Oil and Gas Industry

"Oil has brought out the best and worst of Nigeria."

By John Delano,
Akindelano Legal Practitioners

Year in and year out, the Nigerian oil Industry remains the object of focus for most economists looking at Nigeria. Perhaps predictably so, because it is the key driver for the Nigerian economy and the greatest source of foreign exchange earnings. The figure is as high as 90%. Gradually (as other sectors have started to emerge, such as retail and telecom) the figure is getting smaller each year .

Even so, the significance of the Nigerian oil industry is not purely economic. The attention heaped on the industry lies in it's poignancy as a Barometer by which the Nigerian malaise (or progress) is measured. To date, it is the symbol of the potential of the Nigerian economy and at the same time the most visible failing of Nigeria's Fifty-Four year existence as an independent nation. Oil has brought out the best and worst of Nigeria.

In the Beginning We Did Some Things Right.

Oil production began in 1958 by Shell (the first major oil company in Nigeria), and by the late sixties and early seventies, the Government had forged relationships with other foreign companies besides Shell, including BP, Total, Agip, and Mobil, to explore for oil and to produce oil.

Also, by the late fifties Nigeria had built four petroleum refineries and provided much of the petrol in its domestic market.

Nigeria quickly attained a production level of more than 2 million barrels of crude oil a day. Things worked well. In 1977, the Nigerian National Petroleum Corporation (NNPC) was established to safeguard the Government's interest in joint ventures with the oil majors.

But NNPC was also supposed to use its joint ventures (with the Independent Oil Companies) IOCs as leverage, to ensure a transfer of skills and industry development for Nigerians.

In addition to this, the plan was for NNPC (NDPC- Nigeria Petroleum Development Company established in 1988) to develop into an Oil producing company itself capable of undertaking its own production and exploration projects, much like Brazil's Petrobas does today.

Nigeria and the Oil Glut

It was in the 1980s, that Nigeria's problems began, with the oil glut, when suddenly, there was a large surplus of crude oil sparked by falling demand resulting from the Energy Crisis of the 1970s.

The World price of Oil, which had peaked in 1980 at more than $35 (USD) per barrel ($100 per barrel today), fell in 1986 from $27 to below $10 ($58 – $22 in today's prices).

The collapse of Oil prices benefited oil-consuming countries such as the United States, Japan, Europe, and Third World nations, but represented a serious loss in revenue for Oil-producing countries in Northern Europe, the Soviet Union, and OPEC, including, of course, Nigeria.

Nigeria's economy, which had expanded in the 1970s, was now plunged into near-bankruptcy. It was an austere time. For the first time, it was clear that the country's economy was over dependent on oil. Its currency suffered a devastating devaluation against international currencies, and inflation galloped at rates of more than 20% from the mid 1980s onwards.

Nigeria's foreign debt became impossible to manage. Oil had truly become Nigeria's Achilles' heel. Up to this point the industry itself had made significant progress, but its weaknesses began to show.

The Most Significant Problem

But the most significant problem was that NNPC had not found its feet in the crisis. Instead of becoming the kind of Colossus that Petrobas has become in Brazil, NNPC's dependency (on the oil majors) set in, and with it, a culture of corruption was prevalent in the industry.

Other failings included the neglect of the gas industry, the destruction of the environment, the sense of inequality and injustice felt by local communities, which led to insurgency, kidnappings and terrorism by the discontent local communities.

But Nigeria's worst error was not that it failed to prepare for the fluctuations in the price of oil, but that it had neglected all the other sectors of the economy that could have cushioned its economy and gone a long way to cementing the country's emergence as an African super power and, by now, a significant player on the global stage.

The Advent of Democracy

In the late 1990s the Obasanjo administration (January 1998), began to address an industry which had now become notorious for the danger it posed to foreign oil workers. The industry struggled with security issues, vandalism and environmental degradation. Little or no investment was being made.

The IOCs and their Nigerian counterparts had made a hash of community relations and the environment. At the height of the problems, the Industry itself was almost crippled. The amnesty forged by Obasanjo did a great deal to quell militant insurgency and restore order to the industry, which it now enjoys.

The last Ten Years Although production figures dropped in the eighties because of an economic slump, 2004 saw a total rejuvenation of oil production to a record level of 2.5 million barrels per day. In the last ten years or so, the statistics have not changed significantly. Nigeria is still the 4th largest oil exporter in the OPEC and the 11th worldwide. At current figures, it produces about 2.8 million barrels a day. The picture is even rosier on the gas side.

Nigeria has an estimated 159 trillion cubic feet (Tcf) of proven natural gas reserves where the country is reputed to have the 9th largest reserve of gas in the world

So What's New ?

Marginal Fields, Divestment, and the Local Content Act. In a bid to revive the industry and increase production of oil, in 2003 the Government created a policy of forcing the foreign oil majors to sell smaller undeveloped oil fields to indigenous oil companies. These were called Marginal Fields.

According to the guidelines, these indigenous Oil companies (Independents) are permitted to have foreign technical partners with equity participation of not more than 40%. In a twist of good fortune, discoveries were now being made offshore that made divestment of onshore oilfields a practical and economic solution for the oil majors.

The passing of the Local Contents Law in 2010 also represents an epochal phase in the Industry's history and development. It started to address the over-reliance on foreign contractors and gross under representation of indigenous workers.

The thrust of the law is that indigenous oil companies must be given priority in the award of oil wells as well as Oil service contracts and that foreign oil companies who cannot demonstrate a Nigerian element will not be awarded contracts.

The combination of these policies has been successful and have led to the emergence of a new tier of oil companies made up of indigenous players.

In recent times, the most significant trends in the Nigerian oil Industry derive from the three strands mentioned above.

Recent Trends in the Oil and Gas Industry

Banking and Finance.

Prior to the Marginal Fields Policy and the emergence of independents, Nigeria's banks were not very active in the industry because the IOCs shipped all their money into the country from offshore banks with whom their parent entities had developed relationships in jurisdictions other than Nigeria.

But the Central Bank of Nigeria's (CBN) recently released Financial Stability Report tells a different story today. It shows that the indebtedness of Oil and Gas firms to Nigeria banks stood at N2.644 trillion at the end of December 2013.

The report reveals that total bank loans and advances to the various sectors of the economy grew by 13.9% to N10.043 trillion at end-December 2013. The oil and gas sector recorded the highest growth rate, with a share of 24.4%, followed by manufacturing (12.9%), and the general sector (11.6%).

The Emergence of Corporate Governance

Access to capital remains a major problem for independents, but this is changing as new players emerge with a long-term vision within the industry. Players like Oando, Caverton, Afren, and Seplat have all been able to raise money from the Nigerian Stock Exchange as well as foreign exchanges such as in Toronto and Johannesburg.

Other Milestones in the Industry 2013 – 2014

The MD of the NSE, Oscar Onyema, has indicated that he expects other promising oil companies to list on the exchange in due course.

The acquisition by Oando of the assets of Conoco Phillips, is perhaps the most significant deal of the year, if only because it had been delayed for more than a year (by the requirement to obtain Ministerial Consent). It confirmed Oando as a player to watch in Nigeria and hopefully on the global scene. Coincidentally Oando shares are also quoted on the NSE, the Toronto Exchange (TSE), and the Johannesburg Stock Exchange.

Shell's sale of two onshore oil fields to Addax and several other indigenous oil companies marks the continued divestment by the IOCs in support of offshore exploration with less interaction with local elements and avoidance of environmental issues.

More Sales of Marginal Fields

The Qua Ibo field, located onshore on Oil Mining Lease (OML) 13, which is being developed by Network Exploration and Production and Oando, seems to be on course to become the next producing Marginal Field. All indications are that work is progressing at a good pace on the field and its facilities. The joint venture partners have been targeting Q4 of 2014 for first Oil delivery, and recent developments indicate that the field located near the mouth of the Qua Iboe River in Akwa Ibom State is set to come on stream by the end of the year. They are likely to be followed by Sirius Petroleum if it succeeds in finding the funding for its own development plans.

Divestment Continues

Shell Petroleum Development Company (SPDC) has finalized key sales and purchase agreements on four oil blocks. The company has signed all major documents on the sale of the assets worth $3 billion, while buyers, including Aiteo, Televeras, and other winners are already in talks with lenders to raise funds for the assets. All that remains for the deal to be completed is the official ratification by way of the Statutory Minister's consent.

The Environment – Agip Ordered to Close Facility Over Bayelsa Oil Spill

In a significant development for the industry, Farmers from the Ayarabele and Kalaba Communities in the Okordia Clan of Yenagoa Local Government Area in Bayelsa have succeeded in getting their State government to come to their aid over a recent spill from an Agip pipeline. The communities had complained to the State Government that the pipeline was continuing to discharge oil and gas at high pressure into the area causing environmental damage and affecting the livelihoods of farmers in the area.

Responding swiftly to the appeal made by the communities, the State government has ordered that Agip close the facility immediately to enable an investigative team to go in and tackle the oil spill. In a statement, the State Commissioner for Environment, Mr. Inuro Wills, said, “Following the recent gas spillages, which occurred on September 4 at a facility operated by the Nigerian Agip Oil Company in the two communities, the ministry has asked the company to temporarily shut down operations in the facility.”

A meeting is now scheduled to take place between the leaders of the communities affected by the spill, State Government officials, and Agip to discuss the incidence of frequent spillage that Mr Wills said has had grave consequences for the people. The State Government intends to use this occasion to signal the start of the "State Government programme of rapid and sustained environmental protection and enforcement," he said.

Where Are We today?

The industry is in better shape today than it was ten years ago at the height of security breakdown. Although some issues remain, such as oil theft and environmental damage, production has stabilised and the communities around the Delta are largely assuaged.

In economic terms, the most significant progress is a renewed focus on developing the gas industry, which is a knock-on effect of the demand for gas emanating from the privatised power industry.

Nigeria has an estimated 159 trillion cubic feet (Tcf) of proven natural gas reserves, giving the country one of the top ten natural gas endowments in the world. The Government has undertaken a number of interim policies, including a compulsory Domestic Supply Quota imposed on the IOCs.

The new industry strategy is to collect the associated gas and process it into liquefied natural gas (LNG), greatly enhancing Nigerian natural gas revenues while simultaneously reducing carbon dioxide emissions.

Conclusion

According to ABC Orjiako, chairman of Seplat, "The future of the Nigerian oil and gas industry is closely tied to the emergence and continuing growth of Nigerian independents."

For now, IOCs are still responsible for 95% of Nigeria's oil production. Independents produce 5%, but this is not a true reflection of the growing maturity of the Industry and the Nigerian players who are now poised to usher in an era of growth and development.

When the issue of the anticipated Petroleum Industry Bill (PIB) is safely put to bed, for the first time in it's history the industry will truly be in a transformative stage with Nigerians enjoying the very best that oil has to give.

John Delano graduated from Hull University with an LLB (honours) decree in 1988 and became a registered lawyer in Nigeria a year later. He practiced as a solicitor with Irving & Bonnar in capital markets transactions and corporate, and company law. He later worked in the field of publishing law in the UK for such companies as Informa and The Independent. He is currently a focusing his practice on strategic planning and arbitration with a keen interest in company law and the energy and the telecom sectors. John is a Partner at ALP.

A TALE OF TWO NIGERIAN CITIES – BILLING METHODS AND ELECTRICITY CONSUMPTION

"Energy efficiency has become one of the main drivers of sustainable development worldwide."

By Adeola Adenikinju, PhD, and Oluyemisi Olatokunbo

Electricity consumption is one of the most important indices for measuring the standard of living of a country. This is so because almost all aspects of modern living such as education, health care delivery, information technology, entertainment, etc., all depend on electricity for their functioning. Electricity demand has been experiencing growth at a very rapid rate since the early days of power generation.

With both population and economic growth, the gap between demand and supply of electricity has been increasing significantly (Krishnan, 2006).

Nigeria, with a population of more than 170 million people, is endowed with sufficient energy resources to meet its present and future development requirements. Despite its endowments, however, about 60% – 70% of Nigerians do not have access to electricity and modern energy services, and those who are connected to the national grid experience power outages that last for several hours daily (Etiosa, 2008).

The small percentage of Nigerians who have access to publicly supplied electricity, as well as those who self-generate power, are wasting it without considering the implications (Etiosa, ibid), with energy loss close to 40%. Nigeria has underestimated the importance and gains of energy efficiency to the environment and for economic growth.

Rather than give attention to the way energy is used, it has focused almost entirely on power generation and distribution. According to Etiosa (ibid), energy wastage is mainly due to the use of inefficient technologies, human behavior, and low, poor infrastructural development.

Energy efficiency has become one of the main drivers of sustainable development worldwide (UN Development Programme, 2000). The goals of energy efficiency include reduction in the amount of energy used to produce a service or a unit of economic output and indirectly reduce emissions, helping to minimize construction of new power stations, reducing electricity bills, leaving more energy available to extend to other segments of the population, increasing the efficiency and resilience of the economy, and reducing the negative environmental and human health impacts from energy production and use (Etiosa, ibid).

A corrective measure that has been adopted by Power Holding Company of Nigeria (PHCN) as a technological solution is to provide new ways in achieving and sustaining energy efficiency through the introduction of Prepayment Metering, also known as Pay- As-You-Go system (1). It is a flexible payment option that requires customers to pay in advance for the electricity, gas, or water they expect to use and enables customers to manage their electricity use efficiently (Aidan, 2003).

The mechanism offers information that could help consumers reduce their household consumption of electricity in addition to other potential benefits. A relatively new innovation, electricity prepayment metering is being installed by PHCN as part of its power supply programme.

The PHCN started a pilot project of installing prepaid meters in Lagos in 1997 using Conlog of South Africa in collaboration with Eskom. Six years later, it still remained largely a pilot project (Nexant, 2003). Before the introduction of prepaid meters, there was a conventional method adopted by suppliers, which makes the buyer pay after the consumption of electricity (2).

There are many benefits of prepaid meters over conventional meters for the utility company and consumers. These include improved cash flow, elimination of the need for account posting or additional billing processes, elimination of bad debts, elimination of disconnection and reconnection fees, ease of installation and elimination of prior assessment of consumers' property.

Other benefits include elimination of inaccurate meter readings, reduction of paperwork and the associated costs of postage, printing, and handling, improved budget management, control of energy usage, removal of the need to payback debts, and finally, with prepayment there is no monthly bill (Nexant, 2003).

This paper, based on a study of two cities, compares the relative impact of the prepaid billing method and the conventional method on electricity consumption in Nigeria. The two communities selected for the study were the Redeemed Christian Church of God (RCCG), Redemption Camp, Mowe, Ogun State, and Osogbo town in Osun State.

The study evaluated the relationship between the mode of electricity payment and consumers' electricity consumption behavior. It also assessed whether consumers preferred the conventional to the prepaid method of billing (3).

Methodology

The study was based on a survey and interviews of respondents in both locations. A set of pre-tested questionnaires were administered in the two communities, using purposive sampling techniques. The choice of the cities was quite deliberate.

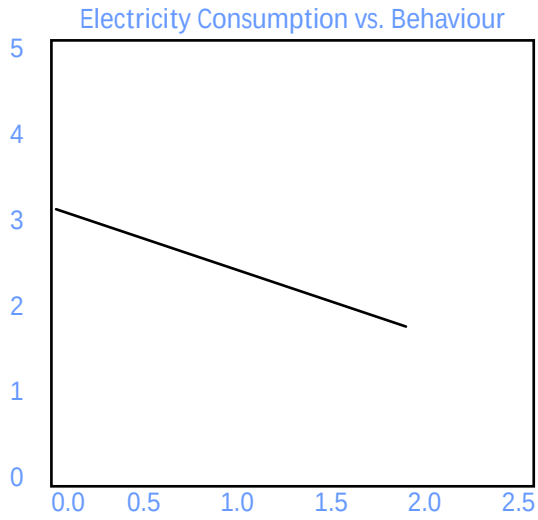
The Redemption Camp is wholly dependent on privately supplied electricity, and nearly all residents are on prepaid meters. Osogbo, on the other hand, is made up of two classes of consumers – those on prepaid meters and those who still depend on conventional billing. However, unlike those in the Redemption Camp, all consumers sampled in Osogbo depend on publicly supplied electricity from PHCN. The surveys were conducted in 2011.

A total of 565 usable questionnaires were recovered; 196 from Redemption Camp, Move, 174 from Osogbo prepaid and 195 from Osogbo conventional billing.

Findings

Billing Payment Method and User's Behaviour. Electricity consumption and the behaviour of prepaid users are inversely related (Fig. 1). This is consistent with earlier studies on prepayment metering, which established that prepaid metering can have measurable effects on behaviour, as it encourages energy conservation and enables customers to manage their electricity usage more efficiently.

Figure 1.
Effect of Prepaid Metering on Electricity Consumption Behaviour



Source: Adenikinju & Oluwayemisi, 2011

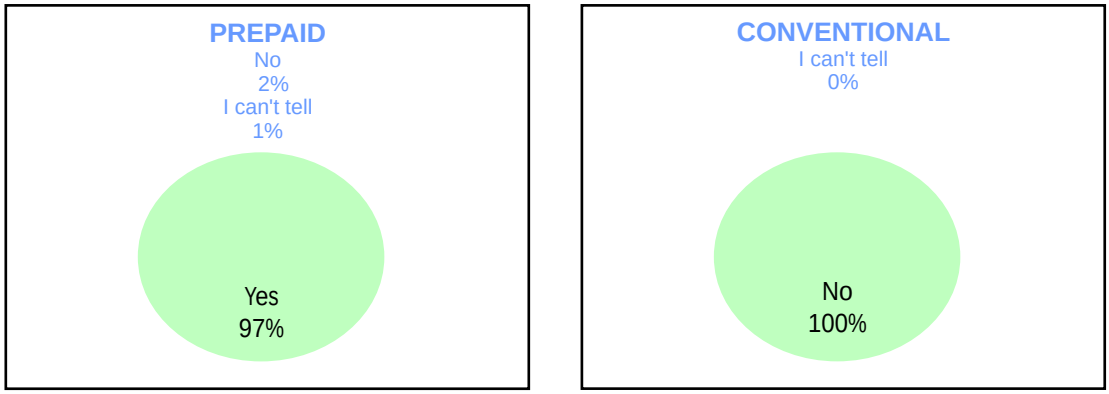
1. It is not a new concept. It was introduced in the form of coin gas meters in the United Kingdom before the Second World War, and in 1980s change took place when electronic or numeric transfer of credit was introduced (Nexant, 2003).

2. Deliberate attempts have been made in more recent times to expand the supply of pre-paid meters to consumers by PHCN.

3. The full paper provides detailed information on the literature review, methodology and empirical analysis of the study. This can be obtained from the authors:Toksyem572@yahoo.co.uk, Af.adenikinju@ui.edu.ng.

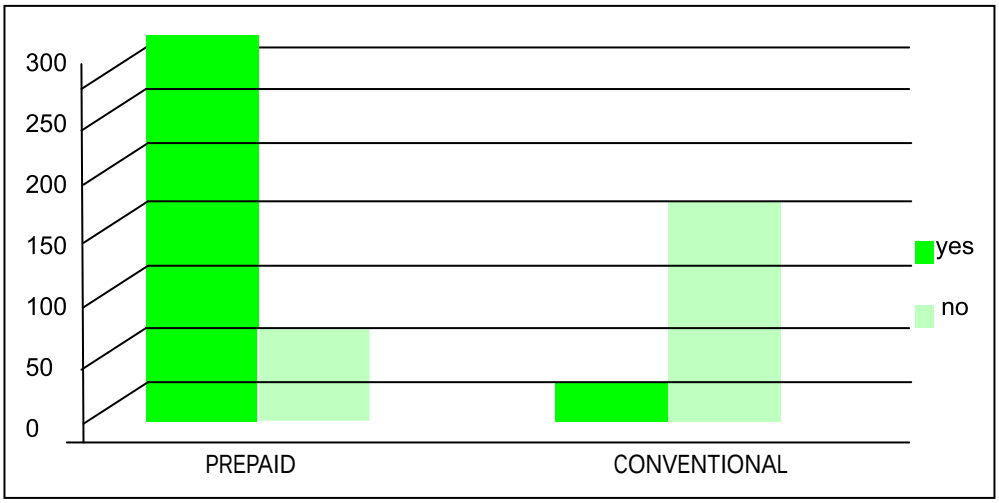
In terms of electricity management by users, Fig. 2 reveals that 97% of prepaid users are conscious of how their electricity is used, while 100% of consumers on conventional meters are less conscious of efficiency in their electricity usage. This suggests that consumers on conventional meters have little incentive to be efficient in energy use because there is hardly any link between electricity bills from PHCN and actual units of energy consumed.

Fig. 2. Electricity Management



Source: Adenikinju & Oluwayemisi, 2011.

Figure 3: Electricity Usage (switching off all the appliances when not at home)

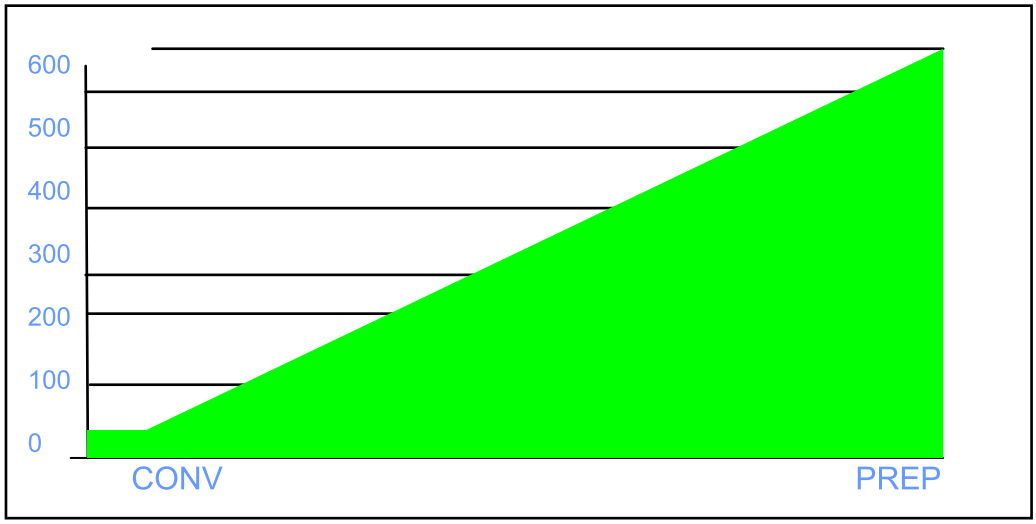


Source: Adenikinju & Oluwayemisi, 2011.

Consumer Preferences:

Prepaid and Conventional Billing Methods. Collectively, 90% of respondents prefer the prepaid method, while the remaining 10% favour the conventional method of billing. This is because the former gives an exact amount of kWh-worth of electricity that is consumed; hence consumers can relate their electricity charges directly to the amount of energy consumed. The remaining 10% who preferred conventional metering are based in Osogbo. The reasons for their choice vary: first, fear that prepaid meters would lead to increase in rates for power consumed, second, some consumers are able to negotiate a more reduced electricity payment with corrupt PHCN staff, and, third, electricity is relatively stable in Osogbo compared to most parts of the country.

Figure 4. Billing Method Preference



Source: Adenikinju & Oluwayemisi, 2011.

Conclusion and Policy Implication

Generally speaking, it is observed that the prepaid billing method of electricity payment in Nigeria has had a positive impact on electricity consumption. Prepaid service has significantly reduced electricity consumption thereby enhancing energy efficiency.

Hence, a better understanding of the impacts of prepaid metering programmes and their effects could lead to better policy development. Widespread prepaid metering could significantly reduce the nation's residential energy consumption, increase its energy security, and generate positive health benefits for residents. Education and public enlightenment should accompany installation of prepaid meters. This would help to alleviate the fears and reservations some consumers still have about the merits of their use.

In addition, local manufacturing of prepaid meters would not only reduce current shortages but also create additional jobs. Finally, for a country to derive maximum benefit from prepaid meters, predictable electricity supply must be guaranteed. Therefore, government should find a solution to the epileptic supply of power in Nigeria.

References

Adenikinju, A. and O. Oluwayemisi, "Billing Methods and Electricity Consumption: Tale of Two Nigerian Cities". Paper Presented at the NES Conference, Abuja, September 2012

Aidan, K., "Prepayment Meters," Commission for Energy Regulation Consultation Paper CER 03/291, 2003

Beck, R. W., "Prepaid Electric Service". White Paper, 2009

Etiosa, U., "National Dialogue to Promote Renewable Energy and Energy Efficiency in Nigeria". Community Research and Development Centre Benin City, Nigeria, 2008

Krishnan, R., "Remote Disconnect and Prepayment Metering". Metering International issue 3, 2006.

Nexant, "Metering Strategies for NEPA", Prepared for the U.S Agency for International Development (USAID), Contract LAG-1-02-98-

Adeola Adenikinju holds a PhD in Economics from the University of Ibadan, where he is currently a Professor of Economics. He is also a Research Professor at the Centre for Econometrics and Allied Research. Adeola was a Visiting Scholar to the International Monetary Fund (IMF) in 1996 and 2005. He has served in several senior policy positions, including Senior Special Assistant to the President, Office of the Chief Economic Adviser to the President between 2010 and 2011. He is currently the Director, Centre for Petroleum, Energy Economics and Law (CPEEL), a MacArthur Foundation Regional Centre of Excellence at the University of Ibadan, Ibadan, Nigeria.

Oluyemisi Olatokunbo is a graduate student in the Department of Economics, University of Ibadan.

How can I join the EI?

energy institute Nigeria

You can apply now for a pre-professional grade of membership online at www.energyinst.org/membership or by completing an application form available from:

Energy Institute Nigeria
19, Bishop Kale Close
Off Saka Tinubu Street,
Victoria Island, Lagos.
+234 (0) 909 3367 333
+234 (1) 295 6299

Take the first step in your energy career by joining online today.

Whatever your background qualifications, experience o age, the EI offers membership options for anyone in the energy industry.

The Energy Institute (EI) is the professional membership organisation of choice for thousands of energy professionals worldwide who want to demonstrate their commitment to professionalism in their work.

100 A century of energy professionalism

EI membership offers:

- learning opportunities to support career development
- recognition of skills and expertise
  access to knowledge and information on every aspect of the energy industry
- facilities to share experience with fellow energy professionals
- opportunities to shape the industry's efforts to deliver a safe, secure and sustainable energy system for the benefit of society.

Join the EI today to become a member of the only professional membership organisation dedicated to supporting all parts of the energy industry.

The EI is licensed by the Engineering Council, Science Council, Society for the Environment and is an Investor in People organisation.

www.energyinst.org

NIGERIAN BULK ELECTRICITY TRADING PLC

A Nigeria where electricity is taken for granted.

Our Vision

To learn more about the **Bulk Trader**: www.nbet.com.ng

ALP SEMINAR SERIES

The Next Seminar is scheduled to hold in February 2015.

www.akindelano.com/alpseminars.php
E-mail: alp@akindelano.com

AKINDELANO
LEGAL PRACTITIONERS

Akindelano Legal Practitioners (ALP) is a corporate law firm with offices in Lagos Abuja and Ibadan. Founded in 1972, ALP has established itself as one of the leading lawfirms in Nigeria. We have an impressive client-list spanning the public and private sectors and comprising of medium to large Indigenous companies as well as major international corporations.

We have a keen interest in the Energy industry. Our client list includes Oando Plc and Niger Delta E&P Plc. With more than 40 years experience, we draw on a rich heritage of excellence to create a dynamic and successful business firm which sets the highest professional standards. Our clients' progress remain at the core of our practice and our goal is to achieve a good understanding of their business environment thereby ensuring innovative and commercially viable solutions to issues.

We strive to minimize the turn- around time of every transaction and maintain our competitive edge by dealing with our clients legal needs promptly, decisively and efficiently.

Akindelano Legal Practitioners is a member of a number of professional associations including:
The Energy Institute (E.I.)
The International Bar Association (IBA)
The Chartered Institute of Arbitration (CiArb)
The International Project Finance Association (IPFA)
The Nigeria South Africa Chamber of Commerce (NSACC)

ALP SEMINAR SERIES

ALP Seminar Series was conceived as a forum to evoke discourse regarding practical, commercial and legal issues facing executive decision-makers engaged in business in Nigeria. It aims to stimulate innovative strategies and outline pragmatic solutions. We expect the Seminars to strengthen existing synergies and help create new ones. The Seminar series is now a yearly event propelled by an advisory committee of professionals with diverse business expertise.

The Seminar Advisory Committee consists of Mr. Omamofe Boyo (Oando Plc), Boma Ozobia (Sterling Partnership), Ajibola Olomola (KPMG), Kayode Akinkugbe (FBN Capital), John Delano (ALP) and Oluyele Delano (SAN) (ALP).

The topic for the 2015 Seminar is still under consideration. Please email us, if you have suggestions. With regard to our discourse on Energy in 2015, we will be collaborating with the Energy Institute to host a forum on Power.

Please feel free to register your interest in attending by emailing alp@akindelano.com. To access papers presented at previous seminars please visit www.akindelano.com/alpseminars.php

Akindelano Legal Practitioners
21 Military Street, Onikan, Lagos
01-9504742, 08069334178

AKINDELANO

LEGAL PRACTITIONERS

Lagos:
21, Military Street,
Onikan-Lagos
Tel: 01-4605511, 0806-933-4178

Ibadan:
Ile Ori Detu
1, Shell Close
Onireke

Abuja:
Plot 215 Cadastral Zone
Km 10 Ring Road
Airport Road

www.akindelano.com/alpseminars.php