Nigerian Economics

A Traditional Society Ready for Take-Off

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It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to fit facts.

- Arthur Conan Doyle (Sherlock Holmes)

This report has been prepared to serve a broad range of subscribers, basically, individuals and organizations interested in the dynamics of the Nigerian economy. The Nigerian Economics series is a complimentary publication of Straplan. It seeks to bring insight into trends in the Nigerian economy, its markets and industries.

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In this report we beam our radar on Nigeria's electricity power supply industry.

A community in darkness is sure to grope for growth. Modernity and civilization were built on huge consumption of energy, especially electric power. Electric power is the underlying factor in the transformation of Nigeria from a *traditional society ready for take-off* to the *take off stage* (according to the growth theory put forward by American economist, WW. Rostow, known as the five stages of economic development, and perhaps the best known non-Marxist theory to explain how economic societies evolve).

The adoption of a new tariff regime under the Multi-Year-Tariff-Order (MYTO) 2 electricity pricing model, commenced on June 1, 2012. We view this as a key milestone in the federal government's power sector reform programme. The introduction of the new tariff order will help create a sector in which entities would run as both a going concern and welfare provider. The MYTO 2 has created opportunities for return on investment in the Nigerian power sector, hitherto non-existent, thus making it more attractive for new investments.

A robust and reliable electricity power sector is the main catalyst for the long-desired social change and economic transformation in the country. Therefore, it is our opinion that Nigeria is an excellent investment destination for companies, especially in infrastructure development, to develop a business with about 40-60 year lifecycle because of the vast opportunities in the country.

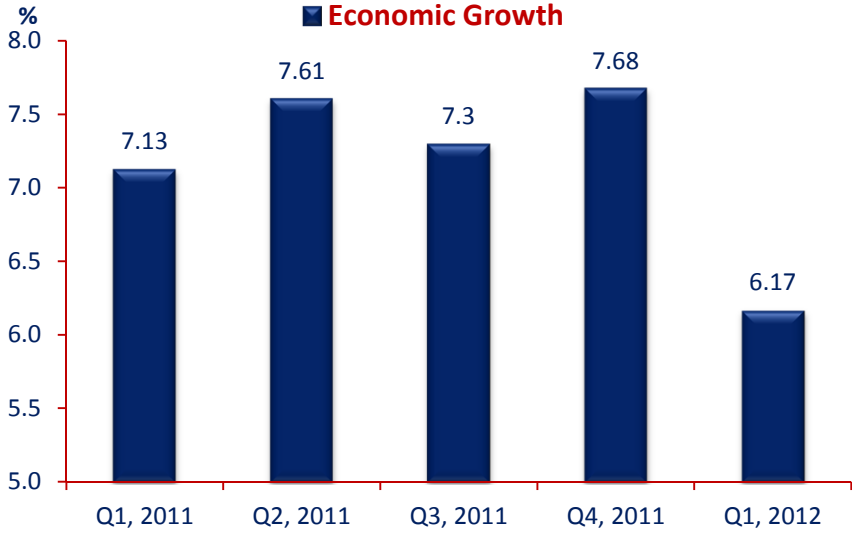
Economic Growth Theory

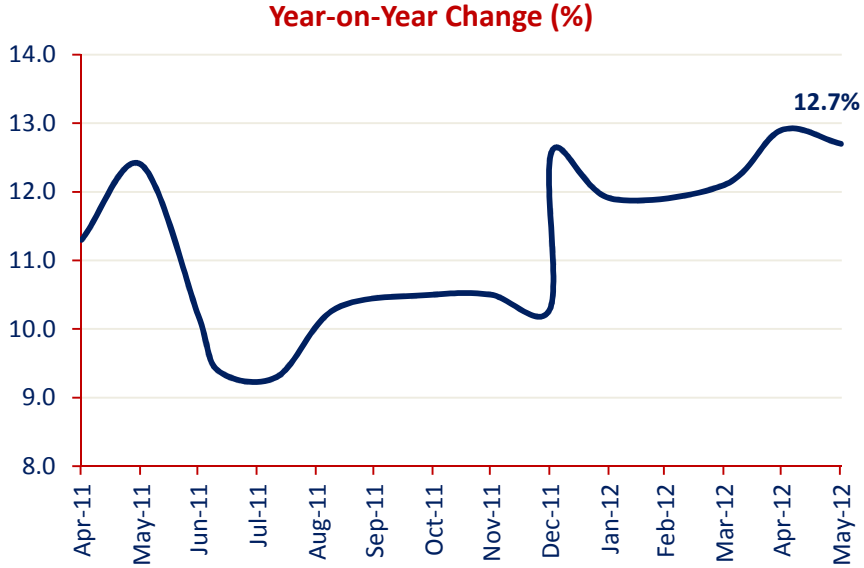
Dr Rostow's model for economic growth amongst nations in 1960. Perhaps the best known non-Marxist theory to explain how economic societies change.

	Stages of Economic Development		Features
●	1	**Traditional Society**	Primitive and usually poor, equipment and production techniques are usually crude and limited; led by the agricultural sector (primarily subsistence). Little changes occur from generation to generation as tradition and generally accepted customs dominate.
●	2	**Traditional Society Preparing for Take-Off**	Preconditions for a productive and advanced society begin to appear and steps toward industrialization become feasible. Acceptance of possible changes become rife. The scope for robust commerce and trade becomes more visible along with developed financial and banking institutions which engender effective mobilization of savings and investments.
○	3	**Take-off stage**	The watershed in the life of modern economies, self-sustaining growth propelled by industrial revolution (as manufacturing sector expands significantly). New class of entrepreneurs direct/redirect investments towards the expansion of the industrial sector with new manufacturing plants and capacities. Emergence of technological improvements lead to significant increase in productivity across all sectors.
○	4	**The Drive to Maturity**	All sectors of the economy are functionally efficient on wider use of advanced technology and improvements in production techniques. Resources are efficiently used and growth and development are magnified. Maturity signifies that the economy has both technological and entrepreneurial skills to produce anything it chooses.
○	5	**Age of High Mass Consumption**	The final stage of economic development, although interrupted by economic crisis such as depressions and wars, the maturity levels of the economies sustain them. At this stage, per capita income has risen above basic necessities of life, allocation of government resources for social welfare and security reasons is rife and the work force becomes more sophisticated

- ***Economic output in Nigeria grew by 6.17% in the first quarter of 2012 ….*** headlining a moderation in the 7% growth level consistently recorded over the last four quarters. The decline is a reflection of the depressed mode of the economy sparked by the increase in the price of petrol and subsequent softening of consumer demand across the sectors.

- **At 12.7%, inflation figures (Y-o-Y) released up to May 2012** reflected the increase in the price of petrol, while month-on-month inflation figures indicated that consumers are beginning to adjust and inflationary pressure abates relative to year start. Other factors, such as the recent increase in electricity and import (rice and wheat) tariff, and local currency movement give concern over inflation trend in the medium term. We align with the projection of the Central Bank of Nigeria (CBN) that though inflation rate might further rise, it will finally moderate by year end.

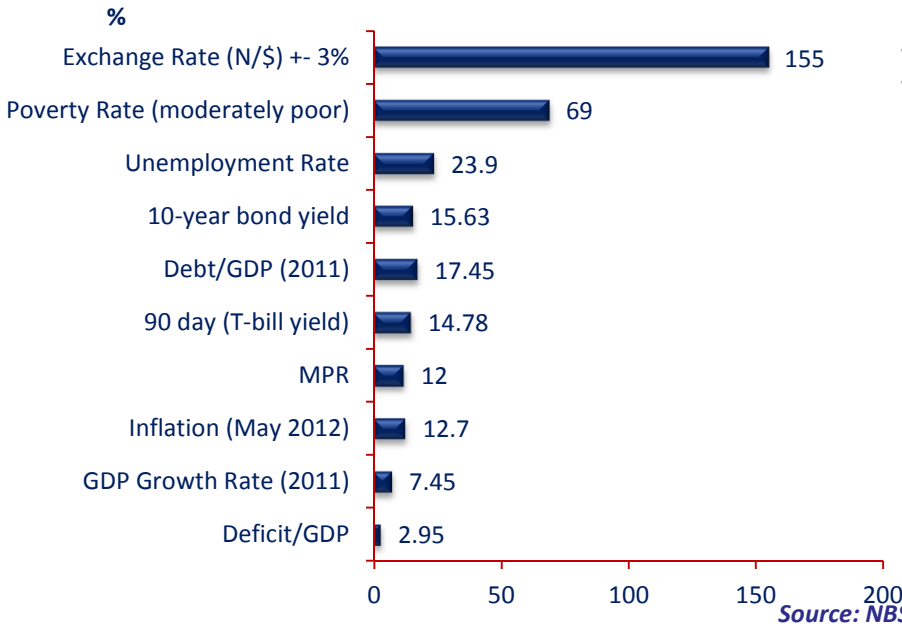


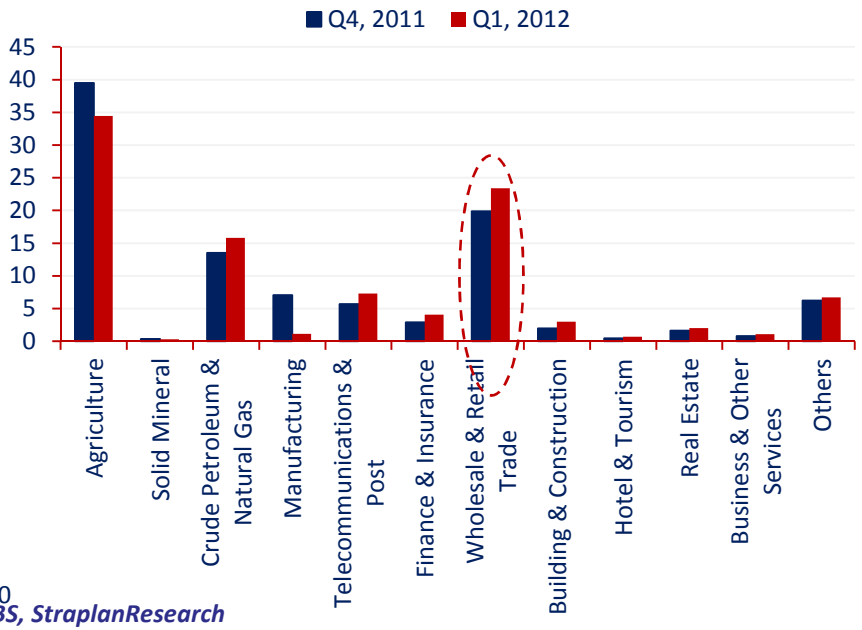


Source: NBS

The paradox continues… the trade sector continues to drive the economy while the manufacturing sector remains weak…

- Most of the goods traded in Nigeria are not produced locally because industry infrastructure is fragile. An active wholesale and retail trade market without a strong local manufacturing sector reduces the value of Nigeria's exports. As such, the country continues to lag its potential of being one of the strongest economies in the world.
- Unavailability of regular, sufficient and affordable electric power supply is a major constraint to businesses, especially in the industrial sector in Nigeria. Self generated electricity power accounts for bout 30-90% of the operating costs of most businesses in Nigeria.





Source: NBS, StraplanResearch

Electricity Power Industry – *beyond the rhetoric*

Electricity power supply is at the heart of all socio-economic goals of the Nigerian Nation

Nigeria's output is estimated at N37.3 trillion ($241 billion) in 2011, while attendant losses to electricity power failure is estimated to exceed N20 trillion by 2020. We believe that a vibrant electricity sector will potentially double the country's current GDP level and transform it into one of the world's largest economies.

Electricity supply is key to economic goals such as:

- Industrialization and enterprise development
- Employment generation
- Poverty reduction and improvement in cost of living
- Diversification from oil as key export and source of input

Past failure holds sway for much skepticism…

- There's apparent mistrust in the ability of the government to meet set targets because of the failure of previous government administrations to successfully implement various established plans and achieve significant progress in the country's electricity supply industry.

Focus irrespective of political interference and disturbances….

- Electric power sector improvement requires a punctilious approach towards implementation (effective project management) and thus takes time, requires huge capital outlay and up-front fixed costs
- Power providers and policy makers often face the dilemma of promoting economic efficiency and promoting societal well-being through appropriate pricing
- We are optimistic that commitment and ability to demonstrate capability to fix the country's power sector would be a key success factor in forthcoming government elections

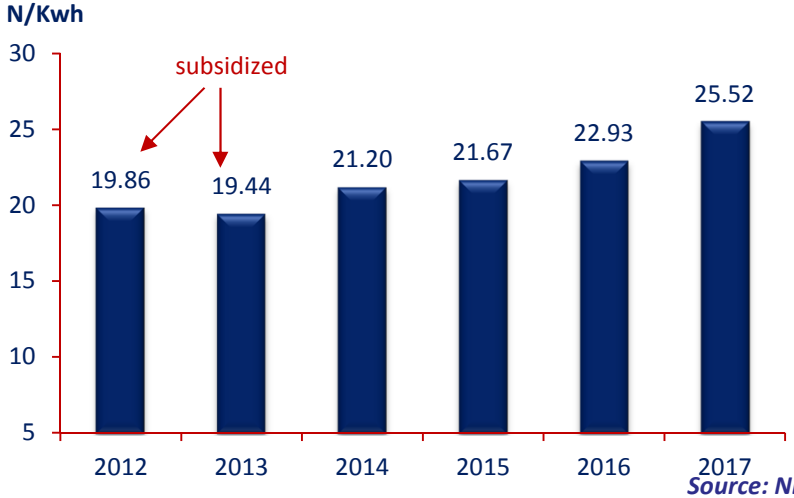
Electricity Pricing

The Nigerian government introduced a new tariff regime, under the Multi-Year-Tariff-Order (MYTO) 2 electricity pricing model, on June 1, 2012.

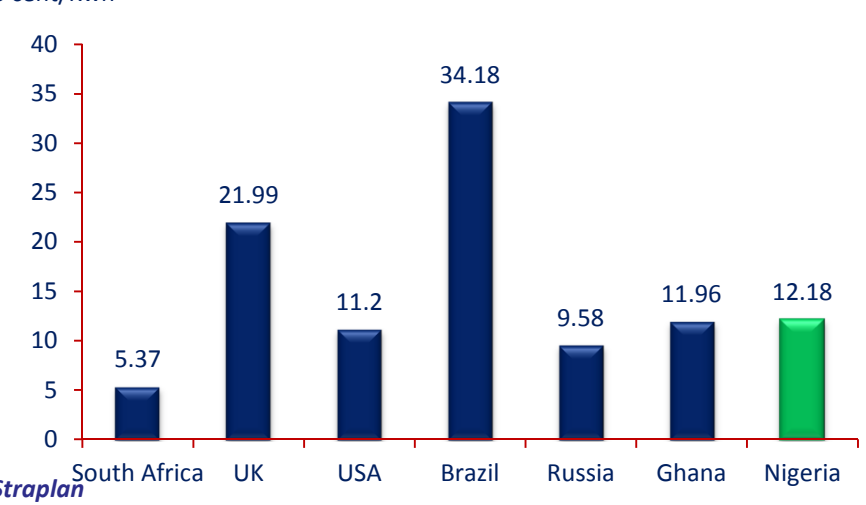
- The tariff order modeled electricity pricing for the next 15 years and is subject to review every five years
- Prior to the introduction of the new tariff regime in Nigeria, average cost of electricity per kilowatt hour (Kwh) was N8.50, one of the cheapest in the world. Electricity consumers through the national grid will not be paying the full amount of N22.2 and N20.8/Kwh respectively in 2012 and 2013 due to govt. subsidy.
- The MYTO is indicative of the costs of supplying electricity to end-users through the electricity value chain (sourcing of inputs-gas, hydro, coal, etc.; generation of electricity power, transmission, distribution, metering and billing) with considerations for return on investments.
- Other economic and financial considerations include, the rate of inflation, exchange rate, asset valuation and depreciation, as well as operating and maintenance costs.

New Electricity Tariff MYTO 5-year (N/kWh)

*** Average Tariff before classification**



Electricity Tariff in Selected Countries (US Cent/Kwh)



Source: NERC, Straplan

Electricity Pricing

The tariff system is tiered and price of electricity varies across distribution companies and consumer classes

- *There are 14 sub-classes (previously 19) under the five classes of electricity consumers – Residential, Commercial, Industrial, Special and Street Lights, with varied tariff across the sub-classes.* Some consumer sub-classes subsidize others in a progressive pricing system (the more you consume the more you pay)
- Lowest sub-class (R1) to pay as low as N4.00 (2.4 Us Cents) and highest (R3/R4) ranging between N22.84 (14.01 US Cents) and N27.72 in 2012 (varied per Disco)
- Variation in tariff amongst Discos is a function of their management and retail efficiency, while sub-class determination is based on metering capacity – single-phase, three-phase, LV, HV maximum demand meters. However, R1 customers have a maximum average usage of 50Kwh of electricity over a three-month period.

Retail Tariff Structure in Abuja and Eko Distribution Companies (fixed & energy charges) N/Kwh

Subclass	2012	2013	2014	2015	2016
R1	4.00	4.00	4.00	4.00	4.00
R2	11.96	12.85	13.53	14.29	15.15
R3	22.84	22.85	24.03	25.31	26.71
R4	22.77	22.76	23.92	25.16	26.50
C1	16.73	16.74	17.60	18.54	19.58
C2	21.48	21.51	22.65	23.94	25.42
C3	21.13	21.12	22.19	23.34	24.57
D1	17.18	17.13	18.01	18.97	20.02
D2	22.72	22.56	23.77	25.15	26.73
D3	22.21	22.18	23.34	24.54	25.83
A1	16.25	16.25	17.06	17.92	18.82
A2	17.44	17.33	18.37	19.65	21.32
A3	16.47	16.45	17.30	18.24	19.29
L1	12.48	13.41	14.08	14.79	15.53

Subclass	2012	2013	2014	2015	2016
R1	4.00	4.00	4.00	4.00	4.00
R2	13.10	13.13	13.21	13.36	13.37
R3	23.98	24.02	24.11	24.13	24.19
R4	26.69	26.31	26.18	26.29	26.64
C1	16.03	16.06	16.12	16.24	16.25
C2	22.43	22.38	22.38	22.41	22.48
C3	22.32	22.27	22.26	22.27	22.30
D1	17.83	17.83	17.85	17.86	17.86
D2	24.71	24.45	24.38	24.44	24.62
D3	23.22	23.20	23.20	23.20	23.22
A1	17.04	17.05	17.05	17.06	17.06
A2	17.08	17.07	17.06	17.07	17.07
A3	17.07	17.06	17.06	17.06	17.07
L1	13.08	13.08	13.08	13.09	13.09

Residential
R1=Life-Line (50kWh)
R2= single/3-phase
R3= LV Max. Demand
R4=HV Max. Demand (11/33KV)
Commercial
C1= Single/3-phase
C2= LV Max. demand
C3 =HV Max. Demand (11/33KV)
Industrial
D1= Single/3-phase
D2= LV Max. demand
D3 =HV Max. Demand (11/33KV)
Special
A1= Single/3-phase
A2= LV Max. demand
A3 =HV Max. Demand (11/33KV)
L1= Single/3-phase

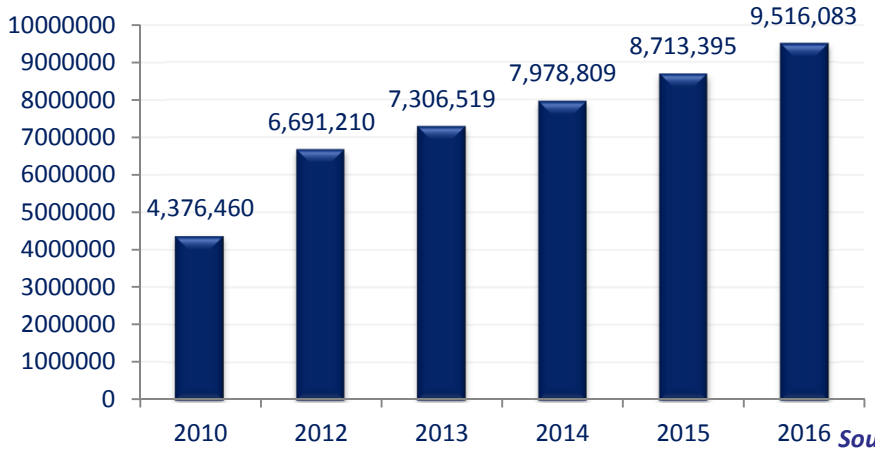
Source: NERC, StraplanResearch

Electricity Consumption

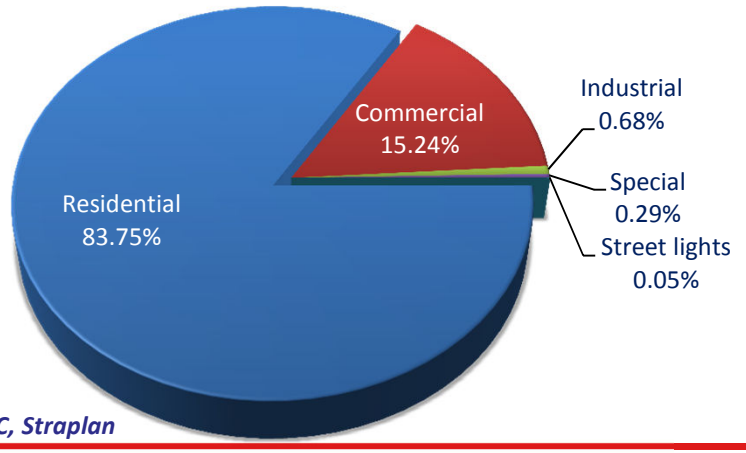
Electricity demand is relatively inelastic as it is synonymous with modernity and industrialization...

- Reinforced by the recent increase in the price of petrol, Nigerians currently spend between four to ten times the new electricity tariff on electricity consumption through self-generation.
- A great part of the country (especially the poor and rural areas) has yet to be connected to the grid, increasing the dependence on self-generation. Our conservative estimate of the country's self-generated electricity is 10,000mw, more than twice the current average grid-based output.
- Less than 5million customers were connected to the national grid in 2010, 84% residential and only 0.68% are industrial. We observe that in China and other industrialised economies, industries consume more electricity than other customer types.
- The deplorable state of Nigeria's power supply sector has been a major cause of Nigeria's low living standard, high cost of living and high cost of doing business, where the poor currently pay more than N120/kWh burning candles and kerosene; manufacturers pay in excess of N100/kWh on diesel or LPFO generation; others pay around N70-120/kWh on self-generation (diesel or petrol).

No. of Customers



Consumers by class



Source: NERC, Straplan

Electricity Supply

… potential consumption for Nigeria's 164 million people exceeds 150,000mw

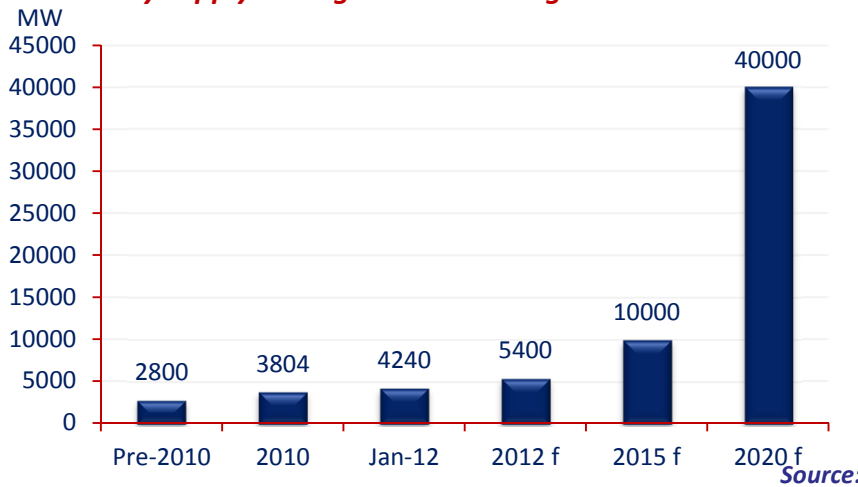
- A 'back of the envelope' calculation suggests that at least 1 gigawatt (1,000 megawatts) of electricity generation and consumption is required for every 1 million head of population in developed industrial nations.
- According to the power reform roadmap, Nigeria wants to be able to effectively generate and distribute 10,000mw by 2015 and 40,000mw of electricity by 2020, up from about 4,500mw.
- In our opinion, the target still lags the country's potential in view of its population size of over 164 million.

…. the scale of private sector led investments that will be required in the Nigerian electricity industry over the coming decades will be huge

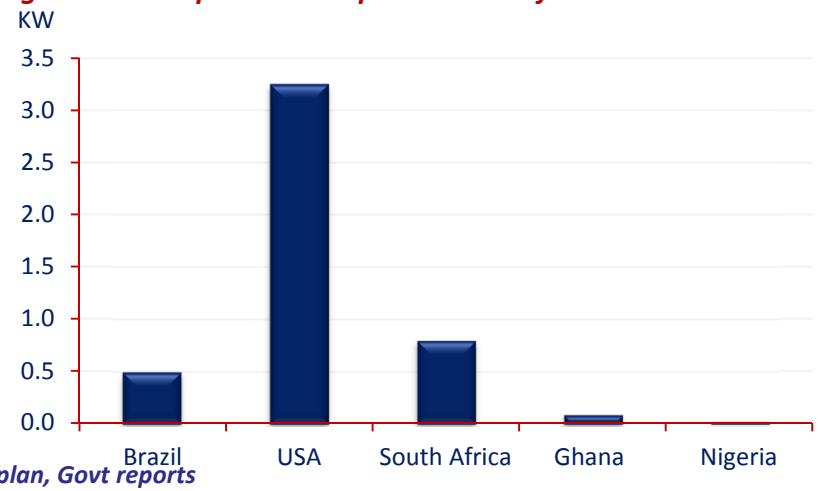
- It costs about $1.2 million to set up a power station of 1mw capacity of electricity, hence Nigeria's power sector value-chain requires over $60 billion to meet set target.

	Grid-based Generation (MW)	Population
Brazil	100,000	201,000,000
USA	1,010,172	310,571,000
South Africa	40,000	50,000,000
Ghana	2,111	23,837,261
Nigeria	4,250	164,000,000

Electricity supply through the national grid



Nigeria's Per capita consumption is one of the lowest ….



Source: Straplan, Govt reports

Electric Power Supply Issues

The power sector is characterized by large up-front fixed costs …. it takes many years for capacity to be fully utilized. All components of power must be functional before electricity can get to the end-user.

Gas supply is unreliable **Fuel supply is unconnected** Weak infrastructure No coordination in the value chain No price incentive to attract new investments

- Fuel source is limited to gas (70%) and hydro; other sources have yet to be fully explored
- Gas supply is insufficient and hydro is seasonal
- Current gas pricing is not attractive to incentivise supply to Gencos
- Non-existence of gas supply policy framework to power generating companies

- Old and weak infrastructure requiring significant overhaul
- Limited new investments
- Low capacity utilization
- Inadequate installed capacity
- Insufficient fuel supply
- No coordinated demand, ready and available (off-taker)

- Weak and fragile infrastructure
- Frequent occurrence of system collapse under increased generation
- Significant power losses due to technical weaknesses and inefficiencies
- Limited network coverage

- Old infrastructure requiring revamping
- Low capacity utilisation
- High level inefficiencies due to technical and commercial losses
- Inefficient billing and collection system

Electric Power Policy Framework – EPSRA & Reform Road Map

Hitherto 2005, there had been no comprehensive policy framework towards a full-scale solution to the knotty issues bedeviling the Nigerian Power Sector.

- The Nigerian electricity power sector reached a watershed in 2005 with the introduction of the ***Electricity Power Sector Reform Act (EPSRA)***, setting the policy framework for an efficient, reliable and commercially viable sector.
- The Power Sector Road Map was launched by President Goodluck Jonathan in August 2010 to implement the main objectives of the EPSRA, i.e.
  - *The divestiture of PHCN successor companies (through privatization and granting concessions)*
  - *The inflow of huge private sector led investments across the value chain*
  - *The ultimate development of a competitive electricity market*
- Power Sector Reform programme articulates implementation along a two-pronged strategy –
  - Strengthen existing infrastructure and service delivery in preparation for priatization
  - Increase investment and transform into a market oriented sector

Power Sector Reform Road Map key steps … a punctilious approach

- **Commercialization of the sector and divestiture from existing government owned generation and distribution companies**
- **De-risk the sector by establishing the bulk trader and a partial risk guarantee extended to generation and distribution companies respectively**
- **Incentivize and improve fuel supplies to electricity power generation companies (gas tariff increase)**
- **Establishment of an appropriate pricing regime: Instituting 'cost reflective' electricity tariff regime**
- **Commercialize and outsource management of transmission company**
- **Development of alternative sources such as coal, wind, solar etc.**

Electric Power Policy Framework – Reform Road Map

… old and weak infrastructure, poor capacity utilization, under-investments, low maintenance level, limited skilled labour, limited source of inputs, insufficient gas-input supply

- A critical problem of generating electricity in Nigeria is the supply of gas to the power stations. Although appropriate pricing is being negotiated for power companies under the National Gas Master Plan, the passage (on-going) of the Petroleum Industry Bill (PIB) will further reinforce gas availability to the power sector.
- The divestiture of the legacy generation companies is on course and would soon be completed, this is even as they are being rehabilitated to gain about 1000mw of power in the short term
- The gas-fired generating companies would be fully privatized, the hydro-powered companies would be granted concessions in view of water rights.

Generation Companies for Divestiture

		Region/State	Date Commissioned	Installed Capacity (mw)	Current Generation (mw)	Plant Type (by source)
Egbin Thermal Station		**Lagos State**	1986	**1320**	**1100**	**Gas-fired**
Shiroro Hydro Power Plc.		Niger State	1990	600	450	Hydro from the Shiroro Gorge on the Kaduna River
Niger Hydro Power Company	Kainji Hydro Power Plant	Niger State	1968	760	400	Hydro from River Niger
	Jebba Hydro Power Plant	Niger State	1985	570	450	Hydro from the River Niger
Ughelli Power Station		(Delta State)	1966	972	550	Gas-fired
Sapele Power Station		Delta State	1978	1020	200	Gas fired
Afam Power Station		Rivers State	4 phases: 1962, 1976, 1982; 2001	776	127	Gas-fired

Source: BPE; NERC

Electric Power Policy Framework – Reform Road Map

Efficient pricing of electricity is at the heart of a well-functioning power sector… hence new investments

- The National Integrated Power Project (NIPP) is expected to provide electricity to over 1,000 communities nationwide. About 4,775mw of power is expected to be delivered by the various NIPPs.
- While a capacity of over 1,000mw of electricity is expected to be delivered to the national grid by the NIPPs in 2012, availability of gas to power these plants remain a major constraint.
- About 3,300mw capacity of electricity is expected from independent power projects (IPPs) in the short to medium term, thirty-four Independent Power Projects (IPPs) have been licensed but most have yet to be built. We expect that the introduction of a cost reflective pricing would accelerate the involvement of IPPs going forward.

	NIPPs	Capacity	Status
1	Olorunshogo Generation Company Limited	676	451
2	Sapele Generation Company Limited	451	225
3	Alaoji Generation Company Limited	961	225 to be commissioned by August 2012
4	Ihovbor Generation Company Limited	451	Ready by October 2012
5	Calabar Generation Company Limited	563	225 to be ready by October 2012
6	Gbarain Generation Company Limited	225	Ready by December 2012
7	Egbema Generation Company Limited	338	112.5 by December 2012
8	Geregu Generation Company Limited	434	by December 2012
9	Omotosho Generation Company Limited	451	by September 2012
10	Omoku Generation Company Limited	225	by December 2012

Source: Niger Delta Power Holding Company

Electric Power Policy Framework – Reform Road Map

Private sector led, new investments will enhance efficiency and reduce losses

- The country's 330kva transmission capacity is weak and cannot sustain the transmission of generated electricity above 4000mw without collapsing. ***Manitoba Hydro International*** emerged, in April 2012, as the winner of the bid for the management and expansion of the transmission company.
- The on-going privatization of the distribution companies (Discos) will see the eventual transfer of majority stake to private companies while the federal government plans to hold a minority stake in collaboration with the states government and staff of the Discos.
- The introduction of pre-paid meters would solve the problem of transparency, accountability and efficiency in billing and collections, which have been the major problems of the Discos and consumers alike. Consumers are wary of paying for electricity not supplied to or consumed by them.

Distribution Companies up for Divestiture				
Disco	**Customers (2012)**	**Estimated Energy Sent Out**	**2012-13 Estimated Subsidy (million)**	**States Covered**
Abuja	635,878	11.5%	5750	FCT, Niger, Kogi , and Nassarawa
Benin	935,545	9.0%	4500	Edo, Delta, Ondo, and part of Ekiti
Eko	631,408	11.0%	5500	Lagos
Enugu	1,330,351	9.0%	4500	Enugu, Abia, Imo , Anambra and Ebonyi
Ibadan	345,923	13.0%	6500	Oyo, Ogun, Osun, Kwara and part of Ekiti
Ikeja	372,397	15.0%	7500	Lagos
Jos	454,857	5.5%	2750	Plateau, Bauchi, Benue and Gombe
Kaduna	443,754	8.0%	4000	Kaduna,Sokoto, Kebbi and Zamfara
Kano	851,971	8.0%	4000	Kano, Jigawa and Katsina
P/H	423,580	6.5%	3250	Rivers, Cross River, Bayelsa and Akwa Ibom
Yola	265,546	3.5%	1,750	Yola, Adamawa, Borno, Taraba and Yobe
			50,000	

Source: NERC

Conclusion

Going long on the Nigerian Electricity Power Sector … opportunity for companies or consortia interested in business with a lifecycle of 40-60 years

- The Nigeria electricity power supply industry has significant potential for companies looking for long term investments in a developing nation with excellent growth opportunities
- Nigerians will pay any amount below the cost of self-generation, hence viability of the sector will improve with time
- Nigeria has a an untapped coal reserve that can support over 20,000mw of electricity power production. This is equally crucial in diversifying fuel source from gas and hydro sources
- Adequate gas availability and supply to the electricity power sector is imperative, with attendant opportunities for other uses.
- The new pricing is reasonable in view of the need for new investments, transformation of the sector and creation of a viable electricity market, and attendant opportunity cost of power failure. Also, the pricing is necessary to signal the cost of marginal consumption and encourage the optimal utilization of installed capacity.
- Regional participation and development (states and local governments) is expected to rapidly increase and fast track the development of the sector in the near term.

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