A Review of the Power Sector in Nigeria

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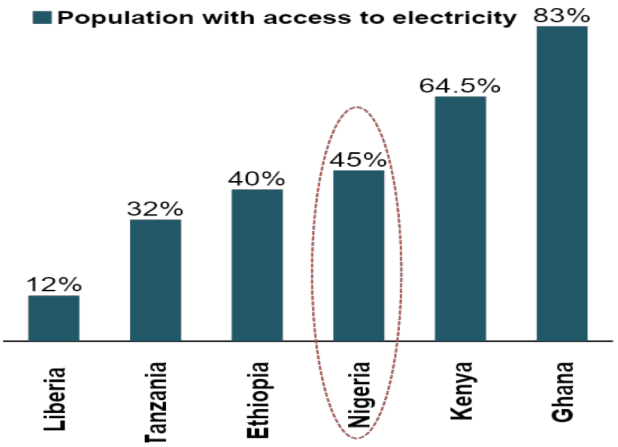
Overview

Nigeria is the largest economy in sub-Saharan Africa with a GDP of approximately USD397 billion (NBS, 2018). Despite being one of the largest oil and gas producing countries in the world, it struggles to provide power to its 198 million population (NPC, 2018). With only 45% electrification rate, the country falls behind Ghana and Kenya who have an electrification rate of 83% and 64.5% respectively.

The power sector is plagued with structural issues across its value chain. These issues include:

i. Low operational capacity compared to its installed capacity;
ii. Chronic vandalism that has crippled gas pipelines, creating gas shortages at power plants;
iii. Underinvestment in infrastructure and poor maintenance that has affected transmission.
iv. High collection and commercial losses that have impacted on the financial viability of the privatised distribution companies.

Electricity theft and vandalism causes up to 35% energy loss in Nigeria yearly

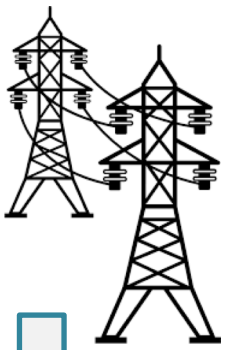


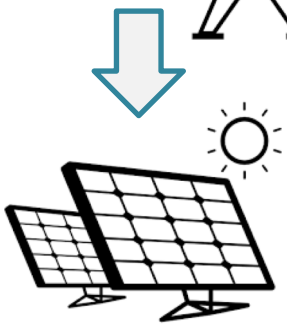
The Nigerian government has taken steps to try and address the challenges faces across the power generation value chain. They include the introduction of a power regulatory body – the Nigerian Electricity Regulatory Commission (NERC) in 2005 - the unbundling of power assets and the implementation of the National Integrated Power Project (NIPP) formed to address issues of insufficient electricity generation. In 2018, Meter Assets Provider (MAP) was introduced by NERC to encourage the development of independent and competitive meter services and eliminate estimated billing practices. Finally, the Electricity Theft and Prohibition Bill was submitted to the Senate committee in an effort to tackle the 35% energy losses due to theft and sabotage.

This report reviews the performance of the power sector since 2018 and maintains that power must be realistically priced in order to attract the investments required to provide electricity to parts of the nation without power. With about 60% of the country's population without access to electricity supply, the enforcement of a cost-reflective tariff system could offer an opportunity to reach more customers and provide a more sustainable solution to the distribution problems currently affecting the industry. In addition, policies that promote the adoption of alternative sources of power must be properly implemented so as to meet the rising electricity demand.

Source: Afdb, USAID, PwC, Nigeria baseline report, NPC, NBS 2018

A Snapshot of Nigerian's Power Sector

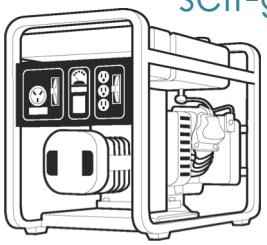




144

kWh/capita

Nigeria still ranks 2nd worst in the global electricity access charts



self-generation costs

> 2x

more than grid based power

A significant portion of electricity is generated from private generators at a higher cost of (NGN 120/kWh) while grid-based cost (NGN 4-50/kWh)

More than **50%**

Nigerians do not have access to electricity, and those that do have access experience intermittent power supply

5 - 6x

Increase in electricity consumption required to match peer countries with similar GDP per capita

25%

of potential energy reaches the end-user

Structural inefficiencies across the power value chain prevent electricity from reaching end-users

Source: PwC, The Nigerian Energy Report, Energymixreport

Advancement in the Nigerian power sector

2005

- Electric Power Sector Reform Act was introduced
- Regulator (NERC) established
- Formation of Power Holding Company of Nigeria

2006

- Unbundling of assets (transmission, distribution and generation)
- ten National Integrated Power Projects (NIPP) were implemented
- Market operations department of the transmission company of Nigeria was established
- Rural Electrification Agency (REA) was established

2008

- Appointment of a body to oversee progress of unbundled generation and distribution companies
- Multi-year tariff order was approved

2010

- Introduction of the national power road map – established the Nigerian Bulk Electricity Trader (NBET)

2012

- Transmission Company of Nigeria enters into a management contract with a utility and asset management company
- Nuclear energy Memorandums of Understanding (MoUs) signed

2013

- Improvement in hydro-electric power stations. US$1.72bn outlayed for the construction of three stations)
- MoUs signed for coal power partnerships

2014

- Strengthening of renewable energy programmes
- Seven out of ten NIPP generation asset sales have been completed

2015

- Transitional power market was established

2016

- In 2016, the NERC directed Discos to conclude the metering of all maximum electricity customers in their network on or before November 2016

2017

- The NERC issued the Eligible Customers Regulation in November 2017
- The Federal Government introduced the Power Sector Recovery Program (PSRP) in March
- The Mini-Grid Regulations was adopted by the NERC

2018

- The Meter Asset Providers Regulation was approved by NERC

Source: PwC, EnergyMixReport

At a Glance (2018 – 2019)

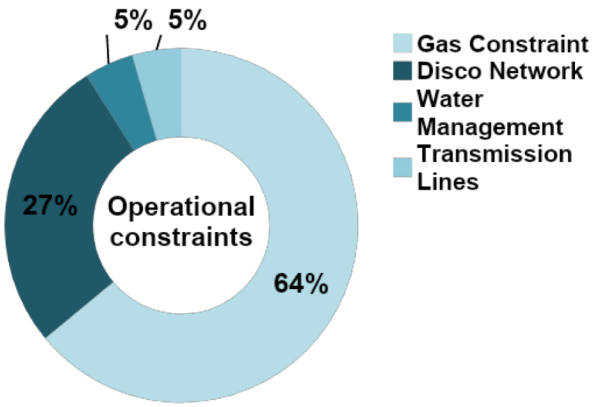
Electricity generation capacity: Current reality

3 HYDRO PLANTS

1,930MW

22 GAS PLANTS

10,592MW



INSTALLED CAPACITY

12,522MW

AVAILABLE CAPACITY

7,652.6MW

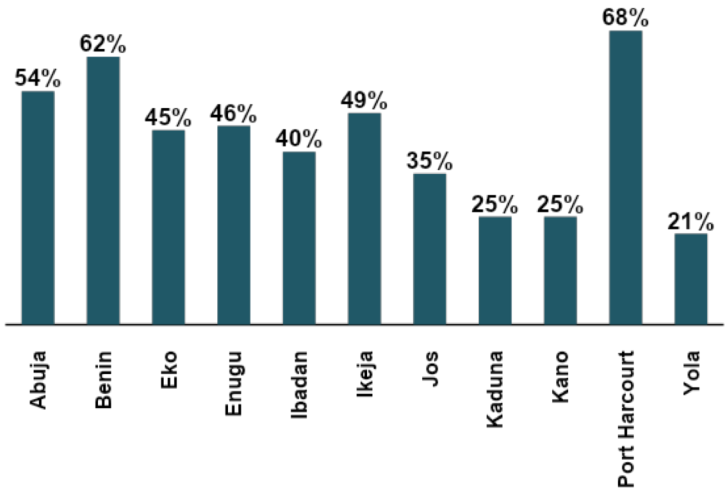
OPERATIONAL CAPACITY

3,800MW

As at September 2018

Metering Status

Of the 8,310,408 registered electricity customers, only 3,704,302 (45%) are metered



As at September 2018

Financial Performance

Tariff Collection

Out of the NGN517.7bn in total bills issued by the Discos, only NGN324.8bn was recovered representing 62.7% collection efficiency. Disco's legacy debt to NBET now exceeds NGN1trillion

Source: Power Infrastructure Wrap up, PwC, The Nigerian Energy Report

Review of the Power Sector 2018 - 2019

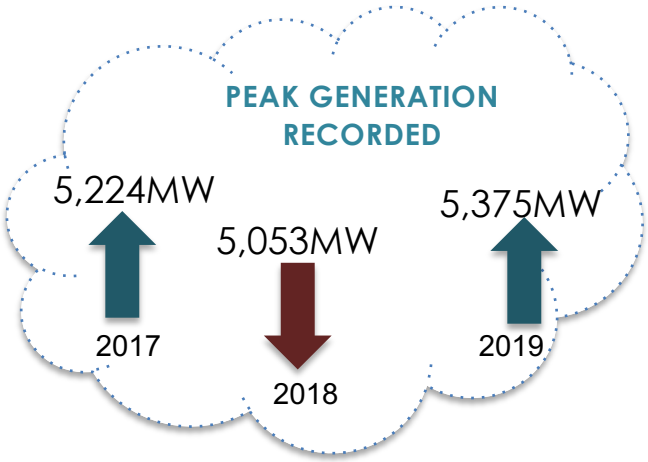
The performance of the power sector has been quite underwhelming in last two years. Despite an increase in the regulatory and market activities across the sector, many of the expectations set out have still not been realised.

Nigeria has about 13 Giga-Watts (GW) of installed electricity generating capacity, out of which less than half is operational due to gas constraints. Currently, these constraints and inadequate infrastructure have led to a 64% gap between the installed generating capacity and the actual generation capacity of 7GW.

According to the Power Sector Performance report in 2018, the sector posted a loss of NGN51.519bn in September 2018 due to a shortage of gas supplies. This hindered the availability of gas stations to generate sufficient amounts of electricity and coupled with infrastructure limitations along the transmission and distribution channels, had a negative impact. By the end of October 2018, a total of 15 power plants were forced to shutdown as result of gas shortages, leading to a revenue shortfall of NGN52.45bn.

Despite a current electricity demand of 98GW, the nation struggles to sustain an average daily generation of 3.8GW in the first half of 2019. Furthermore, 13 out of 36 states in the country still have an access rate below 40%.

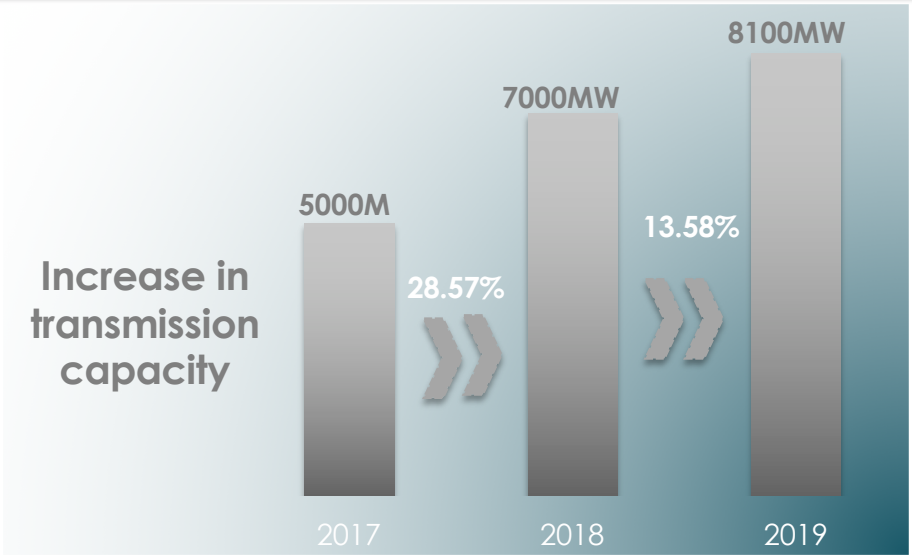
13 out of 36 states have an electricity access rate below 40%



In the month of June 2019, seven gas generation power plants were idle resulting in average on-grid power generation dropping to about 3.4GW, a significant decline from the generation peak of 5.4GW attained in February 2019. This peak is a sign of limited progress but still falls well short of what is needed.

On a more positive note, the evacuation capacity of the Transmission Company of Nigeria (TCN) has grown to 8.1GW, which exceeds current operationally available generation capacity. However, it still remains inadequate when compared with the generation potential that could be realised, if gas constraints are fully resolved.

Source: Ecobank Research, EnergyMixReport



The problems with transmission have been largely due to the insufficient financing of the TCN triggered by

i. Low operating tariff;
ii. Incomplete legacy projects and;
iii. Declining budgetary allocation.

TCN will require up to USD1.5 billion annually over the next few years to transmit the current capacity and cope with future increase in generation capacity.

The distribution phase - the final stage of the power supply value chain - wherein 90% of the transmitted power reaches electricity consumers through the electricity distribution companies (DisCos). Significant problems in the power sector are encountered at this stage. Most notably, distributors face large collection and commercial losses since more than 50% of the nation's electricity consumers do not pay for the power they consume. DisCos are faced with metering and monitoring problems that make it difficult to track electricity usage. Furthermore, tariffs remain non-reflective of market realities which makes the profitability of the sector very low for potential investors.

Limited progress has been made in the implementation of key power projects set out since 2018 as result of weak macroeconomics performance, reluctance of international donors to invest in medium-to-large IPPs in Nigeria and a growing concern about the creditworthiness of the Nigerian Bulk Electricity Trading Plc (NBET). Projects such as the 215MW Kudenda IPP in Kaduna, the 240MW Afam III IPP in Rivers State and the 40MW Kashimbilla in Taraba State were all postponed to H1 2019 due late passage of the 2018 budget as well as the prolonged, complex nature of the commercial agreements.

However, the off-grid space experienced notable improvements toward the last quarter of 2018, where the relatively smaller scale grids and tariff flexibility have made projects more manageable and easier to finance.

Source: Ecobank Research, The Nigerian Energy Report, EnergyMixReport

Key Developments

Regulatory Developments

1	Introduction of the Meter Asset Provider (MAP) - March 2018	Key points: • Encourage the development of independent and competitive meter services; • Eliminate estimated billing practices • Attract private investment to the provision of metering services.
2	The Electricity Theft & Vandalisation Prohibition Bill	Key points: • NERC submitted the bill to the Senate Committee in response to its finding that the power sector suffers from 30-35% energy losses due to theft and sabotage. • Aims to curb unauthorised use of electricity and to protect electricity infrastructure – this offence is punishable by law with terms of imprisonment or a NGN100,000 fine, or both.

Market Developments

1	Small-Scale Industrial Power Projects	• Small thermal generating plants are being constructed, owned and operated by IPPs specifically for businesses or manufacturing companies. • Examples include the portfolio of gas-fired power generation plants built and operated by Cummins Power Generation and Viathan's 3.88MW Ilupeju IPP.
2	Proposed Mini-Grid for Niger Delta Region	• All On Energy, a global energy company signed an agreement that would to set up mini electric off-grids across the Niger delta to help tackle the shortage of electricity supply in region.
3	Developments in the "Light up Lagos Project	• This initiative initially commenced in 2015, but was rejuvenated in 2018 when the Lagos State Government signed a NGN2.52 billion memorandum of understanding (MoU) with Low Energy Designs Limited (LED). The agreement entails the construction of 10,000 street light and a hybrid power plant to be delivered in the last quarter of 2019.

Source: Power Infrastructure Wrap up, Energymixreport

Key Developments

Renewable Energy

Mainstream Energy Solutions Limited (MESL) to build a 500MW solar plant

- MESL in partnership with ENGIE SA aim to enhance their already existing Kainji- Jebba hydro power plants by integrating a PV solar power, with 500MW installation capacity, to their generating capacity. A successful implementation of this will complement the hydro electricity production and is welcome step towards diversification of the country's energy to more cleaner sources.

The FGN 1GW Solar IPP Project

- The federal government has requested expressions of interest for feasibility studies and project designs for a proposed solar IPP to be built in Jigawa State. This project is expected to be developed by the Rural Electrification Agency (REA) and will be backed by AfDB via the Sustainable Energy Fund for Africa (SEFA)

Import Tariffs on Renewable Energy Products

- The federal government increased import duties on solar panels to 10%, which then led the Environment Right Action (ERA) to appeal to the FGN to remove the duties and VAT on renewable energy products and the Renewable Energy Association of Nigeria to protested against the imposition of the duty as it will push up the solar products and slow down the plans of increasing electricity access in the country.

Rural Electrification

619 rural electrification projects

- The Rural Electrification Agency (REA) aims to complete 197 projects by the first quarter of 2020 and start 422 new electrification projects that have approved under the 2017 capital appropriation bill. The World Bank approved a USD350m million from the 2.1 billion concessionary loan for the country to support this initiative. The project is expected to cut across the six geopolitical zones, 93 were sited in the North-Central, 77 in the North-West, and 52 in the North-East geopolitical zones. The South-South, South-East and South-West zones had 81, 76 and 43 projects, respectively.

REA to connect 250 Rural Communities to Solar Power

- Under its new initiative Nigeria Electrification Project(NEP), REA aims to provide electricity for 250 rural communities from its solar based facilities. A total number of 67 communities from Cross River, Niger, Ogun and Sokoto State have been selected to benefit from the pilot phase of this initiative which is to completed by 2020.

Source: Power Infrastructure Wrap up

Recommendations

RECOMMENDATIONS

Although, progress has been made, major challenges still remain in all divisions of the power sector value chain. These challenges need to be carefully addressed, if electricity is to meet demand in near future.

- The long-term viability of the sector is tied to the health and sustainability of all stages of the value chain from generation to payment by end users. Thus, it is imperative for the government to implement cost reflective tariffs that reflect market realities.
- Policies that promote the adoption of renewable energy should also be implemented so as to supplement existing sources of energy.
- Frameworks that promote transparency and accountable should be adopted by energy regulatory bodies. This will help agencies such as REA, NERC be more coordinated and collaborative.
- State and local governments have key roles to play in supporting and enabling mini-grid development. They should taken up greater responsibility for driving this process forward
- Create an enabling environment for off-grid development - including clearer criteria for mini-grid development, support for skills and training and more supportive regulation to allow private players to unlock the off-grid market potential.
- Clarify provisions with existing regulations. Policies around the publication of distribution company expansion plans should be clear and properly enforced to eliminate the uncertainty power operators currently face.

Source: Power Infrastructure Wrap up, Nigeria baseline report