

Analysis: The Nigeria Energy Sector 2018

Synterra Energy (Nig) Ltd

Femi Ogunkolati
CEO Synterra Energy

INTRODUCTION

Synterra Energy has undertaken an analysis of the Nigerian power sector with the objective of evaluating the suitability of the sector for investment in power generation. In evaluating the current state of the sector we have sought to approach the industry from the position of an Independent Power Producer (IPP) keen to understand thermal power generation (gas fired) The objective being to ascertain the most effective strategy for engagement and investment.

Much has been made of the chronic demand - supply deficit in the Nigerian energy sector, but evaluating the financial argument for investment there is a clear need to understand the market and the broader political economic factors which are crucial in determining the financial outcome of any investment.

OVERVIEW

In 2010, the Act (Electricity Power Sector Reform Act) was passed with which the electric power industry was transferred to the private sector it has ultimately turned out to be a poorly handled transition despite the Governments best intentions. When the holding company, Power Holding Corporation of Nigeria (PHCN) was privatized In 2013, 6 generating plants and 11 electricity distribution companies in Nigeria were sold. It is now clear that the participants and stakeholders were ill prepared for the Transitional Energy Market (TEM) which was conceived to ensure a smooth transition to a fully privatised and ultimately competitive market.

Since then, electricity production has reached a peak of 6,400MW. Of 137 countries recently examined in 2017, Yemen ranked as worst electricity supply nations followed by Nigeria, Haiti, Lebanon, and Malawi. Ownership has changed hands but the successor companies have demonstrated almost in their entirety that they are ill prepared and ill equipped. Though the Government must also shoulder a substantial share of the blame.

A serious problem is the shortage of the gas used by thermal power plants .There are severe liquidity issues as the number of unpaid legacy bills continues to grow. The transmission network has long been obsolete and poorly maintained with constraints frequently resulting in the loss of over 1,000MW per day. According to the daily power sector activity record published by the Federal Ministry of Power, gas constraints have led to the loss of over 1,626MW daily. Considerable investments is required to expand and modernize the means of energy transmission and distribution. The Central Bank of Nigeria (CBN) have sought to provide low interest intervention funding to the industry and have granted low interest loans in excess of \$1.1 billion.

In addition, tariffs were raised in accordance with the long-term plan approved in 2012. The cost of electricity had to be gradually increased in order to encourage private investment. There are substantial issues with the current tariff model which is broken and simply does not provide adequate yield for investors. However there clearly needs to be a balance between a cost reflective tariff and the ability of the consumers to purchase the generated power for the benefit of the market economy.

The federal government has sought to raise finances to cover costs, create an infrastructure fund for the transport and energy sectors through international and domestic debt markets. However this has created a concern over the debt burden and the cost of local debt and debt repayments. Private investors are unlikely to invest in the development of infrastructure projects, if they do not have a reasonable guarantee of a profitable return.

The current tariffs set by the regulator and influenced by the government currently make project economics marginal and unappetising to investors as the yields do not provide adequate reward for the sector risks. This is a key obstacle deterring private sector investment in participating in the development of Nigeria's electric power industry.

Investors distrust is due in part to the fact that the government did not settle domestic fuel tariffs and have not subsidized this area properly. Authorities continue to try to explain why they failed to achieve set goals against the backdrop of a market economy and talk about numerous challenges of electric power generation and distribution in Nigeria. The purpose of the privatisation was to ensure increased electricity supply in the country, through enabling and preservation of efficient industry and market structures, while also ensuring the optimal utilisation of resources for the provision of electricity services. The reform also sought the maximisation of access to electricity services, by promoting and facilitating consumer connections to distribution systems in both rural and urban areas

HOW THE MARKET OPERATES

Electricity generated by the generation companies (GenCos) flows in one direction from the GenCos down the value chain, while the revenue required to pay all the market participants flows in the opposite direction. This revenue is derived from the payment (tariff) made by the consumers to the distribution companies (DisCos) as consideration for the electricity supplied by the DisCos.

At the beginning of the value chain for thermal power plants, therefore, are the fuel suppliers that provide fuel (gas) to the GenCos for the production of electricity. Following production of electricity by the GenCos, this electricity is, contractually, sold to the Nigerian Bulk Electricity Trading Company (NBET), the central off taker for electricity connected to the grid, which in turn, sells the power purchased from the GenCos to the DisCos. The electricity from the GenCos is wheeled through the Transmission Company of Nigeria (TCN) directly to the DisCos before the DisCos then sell the electricity to the final consumers at a tariff prescribed by the sector regulator

- the Nigerian Electricity Regulatory Commission (NERC). GenCos are permitted, under applicable law, to sell electricity directly to a class of customers referred to in the EPSRA as 'eligible customers', which are a group of large consumers of electricity that the GenCos can negotiate power purchase agreements directly with outside the regulated tariff model. In May 2017, the Minister of Power declared an 'eligible customer regime' by directing the NERC to permit four categories of eligible customers to buy electricity from licensees other than DisCos. This development, which facilitates direct supply of power from GenCos to customers, continues to generate heated debate in the power sector.

The tariffs collected by the DisCos, from the consumers, provide liquidity for the entire value chain, and the funding required to settle costs associated with the generation and transmission of electricity as well as fuel transportation expenses. After the electricity is generated and consumed, the consumers pay the DisCos, the DisCos pay the NBET and TCN, NBET pays the GenCos and the GenCos in turn, pay the fuel suppliers. The effect of the foregoing, therefore, is that a disco's revenue shortfall and consequential liquidity challenge, affects the profitability of the entire value chain.

GAS SUPPLY

Nigeria has the 6th largest proven gas reserves in the world, despite never having actively explored for it. Yet the wrong Government price policy has led to its shortage and limitation of the operation of thermal power plants. Since 2010, prices have gradually increased to expand the capacity of gas firms, but the process has been tardy and dysfunctional. Payment arrears to the gas suppliers on legacy debt and the occasional sabotage of the gas infrastructure have also led to erratic gas supply and further deterioration of electricity service delivery. Nigeria regularly loses over 3,000 megawatts of electricity daily as six gas-fired power generation plants have not been able to generate electricity to the national grid as a result of operational challenges and gas supply constraints according to operational records obtained from the Advisory Power Team (APT)

The main power plants, which regularly do not have gas to operate are the 634.5 megawatts (MW) Calabar National Integrated Power Project (NIPP) plant built in the Odukpani area of Cross River State by the Niger Delta Power Holding Limited (NDPHC); 754MW Olorunsogo NIPP plant; and 504MW Alaoji NIPP plant. However, the reasons for the shutdown of three other plants – 270MW AES power plant; 180MW Rivers IPP and ASCO plant were not stated but suspected to be attributed to the same cause. Other plants such as the Omoku in Rivers State; Omotosho NIPP in Ondo State; Geregu NIPP in Kogi State; Omotosho II; Olorunsogo in Ogun State; Geregu 1; Afam VI; Azura Edo; Egbin in Lagos State; Delta; have similar sporadic gas challenges.

The Nigerian Electricity Liability Management Company (NELMCO) was established to enable the government to inherit and be responsible for settling the legacy debts,

which accrued as a result of unsettled invoices and payments due to gas suppliers that had been supplying gas to the defunct PHCN. Given that NELMCO has remained largely unfunded and was unable to perform the functions for which it was established, the electricity market participants inherited and assumed the responsibility for satisfying these legacy debts, which ought to have been settled by the government.

NNPC GAS PROJECTS

In an attempt to remedy this issue the Nigerian National Petroleum Corporation (NNPC) has initiated the seven Critical Gas Development Projects (7CGDP) to deliver about 3.4 billion standard cubic feet of gas per day (bscfd) to bridge the foreseen medium term supply gap by 2020 on an accelerated basis. The 7CGDP is an integral leg of the gas development strategy designed by NNPC to leverage the full potential of gas to meet the target of generating at least 15 gigawatts (GW) of electricity by 2020.

The 7CGDP includes development of the 4.3 trillion cubic feet (TCF) Assa North/Ohaji South field; development of the 6.4 TCF Unitized Gas fields (Samabri-Biseni, Akri-Oguta, Ubie-Oshi and Afuo-Ogbainbri); and the development of 7TCF NPDC's OML 26, 30 & 42. Others include: development of 2.2 TCF Shell Petroleum Development Company (SPDC) JV Gas Supply to Brass Fertilizer Company; cluster development of 5 TCF OML 13 to support the expansion of Seven Energy Uquo Gas Plant; and the cluster development of 10 TCF Okpokunou/Tuomo West (OML 35 & 62).

However NNPC and the Ministry have a poor implementation record for such initiatives. In recent years there have been a number of abortive attempts under the Gas Masterplan (GMP) to increase gas investment. The much awaited Petroleum Industry Bill (PIB) and Gas Infrastructure Development Plan have also failed to ignite the necessary investment in gas infrastructure.

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GAS SUMMARY

For domestic natural gas utilisation to increase significantly, the International Oil Companies (IOC's) will have to meet their domestic gas supply obligation (DGSO) targets.

The Nigerian Gas Master Plan (GMP) stipulated a revised transitional pricing structure for gas to power projects in 2010, and ultimately a price of \$2.50 per MMBTU was set in 2014 for contracts that are supplied under the DGSO scheme. The GMP also imposed penalties for non-compliance with the DGSO which includes: payment for volumes not supplied, or a penalty price of \$3.50/Mscf, whichever is higher; and disqualification from supply of gas to any export projects.

However, the relevant government agencies have not been able to successfully impose the penalties. The non-compliance IOCs claim that they are unable to fulfil

their obligations due to inadequate gas infrastructure, and sub-optimal pricing for gas deliveries.

The economics of natural gas development and utilization in Nigeria are driven by the high cost of gas production/transport facilities, and the need for economies of scale. The failure of Government to drive an increase in private-sector investment and execute the gas infrastructure blueprint as contained in the GMP has resulted in tardy progress. An initial phase of about 2,500km of gas pipeline infrastructure was planned to be completed by the end of 2018. This target, if achieved, will boost investor's confidence in natural gas market in the country.

To achieved this target, the plan to expand the Escravos-Lagos Pipeline System (ELPS) from 1.1 Bscf/day to 2.2 Bscf/day needs to be executed. The Trans Nigeria Pipeline Project (TNPP)¹ has to be completed. TNPP aims to connect the gas pipeline systems in Nigeria to create an inter-connected system that will provide flexibility and better management of gas supplies. The framework of this system is an integration of the three gas pipeline systems: Obiafu-Obrikom-Oben (OB3) system with a flow capacity of 2.0 Bscf/day, the Calabar-Ajeokuta-Abuja system with flow capacity of 3.0 Bscf/day, and the Abuja-Kaduna-Kano system.

Recently, the (NNPC) signed EPC (Engineering, Procurement and Construction) contracts to develop a 614 km Ajaokuta-Kaduna-Kano (AKK) trans-Nigeria gas pipeline project. The first lot of 200km has been awarded. The name of the bid winners for the second lot of 193 km is yet to be announced at the time of writing. The third lot would be 220 km. However, the AKK is expected to connect with the OB3 gas pipeline project (which is yet uncompleted). The AKK project, when completed, will be the largest gas pipeline in Nigeria, and is expected to improve connectivity between the eastern, western and northern regions of Nigeria.

Furthermore, the anchor gas processing facilities need to be completed, particularly the Gas Revolution Industrial Park (GRIP)² at Ogidigben in Delta State, and the Deep Sea Port to be located at Gbaramatu. The GRIP was planned to warehouse a petrochemical plant, a fertilizer plant, an Independent Power Plant (IPP) and a Central Processing Facility (CPF). These projects will have to be completed in order to achieve the three strategic themes of the gas revolution agenda launched in 2011. They are ambitious and unlikely to be completed in a timely fashion.

For instance, the Nigerian Liquefied Natural Gas Company Ltd (NLNG) sale of LPG to the domestic market is based on the international benchmark price for LPG. Consequently, domestic gas development, supplies and transportation infrastructure

¹ The Ajaokuta-Kaduna-Kano (AKK) pipeline is a 614km-long natural gas pipeline. It is set to form phase one of the Trans-Nigeria Gas Pipeline (TNGP) project

²A planned \$20b project covering over 2,700 hectares of land with fertilizer, methanol, petrochemicals, & aluminium plants

will have to be dependent on our domestic oil and gas companies as reliance on the IOCs will continue to fail this country.

The implementation of the GMP has been largely unsuccessful. The ultimate price of \$2.5/MMBTU has not motivated the gas suppliers. The IOCs prefer a more market-led approach. As a result, they have fallen short of their DGSO targets. The Gas Infrastructures are at different levels of development. Moreover, progress on gas pipeline infrastructure is still agonizingly slow.

TRANSMISSION COMPANY OF NIGERIA (TCN)

The Transmission Company of Nigeria (TCN) is one of the successors of the unbundled PHCN and is currently an asset held under the custodianship of the Federal Ministry of Power. It will initially remain publicly owned. TCN has the responsibility for the management of operation, maintenance and expansion of the 132kV and 330kV transmission system. The Bureau of Public Enterprise (BPE) initially appointed a Management Contractor, Manitoba Hydro International (MHI) for TCN which took over the functions of Transmission Service Provider, System Operator and Market Operator to undertake the overall management of TCN.

The System Operations (SO) function was established as a sector within the defunct Power Holding Company of Nigeria under the Transmission sector. The SO has now evolved into a semi-autonomous sector under TCN and upon acquiring its license will operate as an independent company in future.

The main responsibility of the System Operator is to operate the transmission network and the connected installed generation in a safe and reliable manner. SO is also responsible for the overall security and reliability of the grid system, economic dispatch of available generation resources and maintaining system stability. SO has seven functional departments namely; Operations/Control, System Planning, SCADA, Communications, Technical Services, Transitional Electricity Market and System Performance. SO is headed by the Executive Director (System Operation). The operational control hierarchy is as follows:

In February 2018 the World Bank approved an International Development Association (IDA)* Credit and an IDA Scale Up Facility Credit in the total amount of \$486 million equivalent for rehabilitation and upgrading of electricity transmission substations and lines.

The investments under the Nigeria Electricity Transmission Project will increase the power transfer capacity of the transmission network and enable distribution companies supply consumers with additional power. Together with other investments and policy measures, the project will contribute to ensuring adequate and reliable electricity supply that is necessary for Nigeria's continued economic development. It will also support private sector participation, capacity development and better governance in Transmission Company of Nigeria and sector institutions.

The TCN is prone to complete system collapses and in its current configuration does not possess the transmission assets to provide a constant service. It is incapable of transmitting more than 5,000MW at any one time which is substantially less than the installed generating capacity reported as circa 12,000MW.

The Nigerian Electricity Regulatory Commission (NERC) has reportedly given the Transmission Company of Nigeria its approval to procure extra power to serve as spinning reserve that could stabilise Nigeria's electricity grid when there are unforeseen disturbances.

Given the position of the TCN until it increases efficiency which will require substantial time and investment, a question mark exists over the commercial desirability of relying on a network that is incapable of evacuating the energy produced by a generating company.

NIGERIA ENERGY REGULATORY COMMISSION (NERC)

The Commission was created by and performs its operations based on the guidelines as stipulated in the Electric Power Sector Reform Act 2005. Since the completion of the privatisation process, NERC has, in our opinion, been ineffectual in discharging its regulatory functions. The power sector is still faced with regulatory risks arising from regulatory uncertainties, government's continued influence in the affairs of the regulator culminating in the ineffective regulation of the sector by NERC.

The technical and operational capabilities of NERC need to be further strengthened to address obvious gaps in the Commission's regulation of the power sector so far, which can be described as being reactive rather than proactive. For instance, NERC has no means of independently validating (Aggregate Technical, Commercial and Collection (ATC&C) loss reductions claimed by DisCos. This perhaps is most crucial against the backdrop that ATC&C loss levels form a critical component of electricity tariffs and, in addition, is the main criteria for measuring the performance of core investors in DisCos. In this regard, the Bureau of Public Enterprises (BPE) has been complacent in its monitoring of the terms of the performance agreements with DISCO core investors.

NERC are responsible for setting tariffs for generating companies. There is an existing template, the Multi Year Tariff Order (MYTO) which is widely accepted as being broken and is currently under review. Each new entrant Independent Power Plant (IPP) that requires a tariff beyond the MYTO benchmark must apply to the Commission for approval and an individual (site-specific) Long Range Marginal Cost (LRMC) model will be utilised.

In such case, the IPP will be required to open its plans, accounts, and financial model to scrutiny by NERC, which will then apply prudence and relevance tests to determine whether such plant- and site-specific costs should be allowed in the tariff. The stated objective is that, in setting bulk electricity prices the vesting contracts are able to cover the costs of existing plant and allow for their efficient maintenance

and on-going investment programs whilst ensuring that an appropriate price for bulk electricity supplied by generators under vesting contracts is the unit price an efficient new plant would require in the Nigerian Electricity Supply Industry (NESI).". NERC typically would provide a tariff that delivered an IRR of 18% however this is a negotiated process.

A report by the World Bank called the Environment and Social Systems Assessment (ESSA) report, has disclosed that the financial deficit that Nigeria's electricity market recorded between 2015 and 2016 when the NERC failed to allow the market to charge cost-reflective tariff was US\$1.4 billion.

It also stated that on the average, the country's electricity market recorded \$1 billion annually in financial deficit for operating with tariffs that are not reflective of market realities. The report was obtained from the secretariat of the Power Sector Recovery Programme (PSRP) which the World Bank is running with the federal government to revive the country's electricity market. The report further explained that: "The causes for the crisis are interlinked and self-reinforcing. The inconsistent application of the tariff policy (the Multi-Year Tariff Order or MYTO) resulted in the deterioration of the financial situation of sector companies, especially DisCos.

In addition, the report highlighted that the operational and financial troubles of the sector have been aggravated by weak governance and inadequate enforcement of contracts. The World Bank report also stated that the power market now functions on a 'best effort' basis with a resulting lack of accountability and poor service delivery. It said the government was however committed to subsidising power consumption in the country for four years, starting from 2017 to 2021.

NIGERIAN BULK ENERGY TRADER (NBET)

The Nigerian Bulk Electricity Trading (NBET) Plc. is the manager and administrator of the electricity pool ('The Pool') in the Nigerian electricity supply industry (NESI). It was incorporated on the 29th day of July 2010 and is 100% owned by the Federal Government of Nigeria.

In anticipation of, and to address revenue shortfalls and short-term illiquidity that is characteristic of a transitional market, NBET was created to act as a credible and credit worthy off-taker of power and seller of power to DisCos. NBET's key role is to generate market confidence through well negotiated and well aligned contracts with fair risk allocation that protects market participants from credit risks and systemic risks. NBET is one of the many interim measures put in place to address market weaknesses during the transition period and has a life span of 10 years.

More than eight years after the establishment of NBET, what is evident to both international and local investors in the power sector is that NBET is deficient in the required capitalisation to meet its obligations. It also lacks the ability to provide adequate and sustainable payment securities backed by the Federal Government under PPAs.

In the light of these glaring deficiencies, international organisations like the World Bank and the African Development Bank have had to create credit enhancement/payment support instruments in the form of partial risk guarantees to protect investors in greenfield IPPs against NBET's potential inability to meet its payment obligations under PPAs. Keep in mind these instruments and interventions are not free and come at a cost to the Nigerian Government.

A capitalised and credit worthy NBET, fully backed by the Federal Government is what is most required in this transitional period to ensure there is liquidity and market confidence across the power sector value chain

NBET had an initial capitalisation of about US\$800 million dollars to meet its obligations under the PPAs. It currently owes GenCos in excess of NGN1 Tr (USD\$3.2b). The level of illiquidity has been caused by a fundamentally dysfunctional system which was improperly established and is now broken.

DISCO remittances to NBET for energy consumed has fallen from an average of 65 percent in February 2015 to less than 36 percent currently, most DisCos actually remit less than 30% percent of their energy invoices to the market.

Though monthly revenue shortfalls in the power sector have increased from an average of N9 billion in 2015 to more than NGN20 billion (USD\$6.5m) every month. To give an idea of how bad the revenue shortfall situation is, the total energy invoice to the market for the month of February 2016 was N30.5 billion. The total amount received from DisCos was only about N10 billion, leaving a revenue shortfall of more than N20 billion owed to GenCos and other market participants.

The losses incurred in Nigeria's power sector have been on a persistent rise as the Federal Government and electricity distribution companies continue to disagree over issues affecting the industry.

Latest data obtained from the Advisory Power Team in the Office of the Vice President showed that between January 1 and July 19, 2018, the sector lost N268.4bn(USD\$880m). This represents an increase of N67.1bn when compared to the N201.3bn lost by the sector from the first day of this year to June 5, 2018.

Outlining some of the causes for the persistent losses being recorded in the sector in their report , the Advisory Power Team said insufficient supply of gas, poor distribution and transmission networks, as well as water reserves constraint contributed to the losses. "The estimated amount lost to insufficient gas supply, distribution, transmission and water reserves to date in 2018 is N268,374b," the team said.

Following the devaluation of the naira, the liquidity challenge has further negatively impacted the ability of the DisCos and GenCos to meet their debt service obligations and implement the necessary infrastructure upgrades required to improve efficiency. Sector costs including the price of gas, Capex and Opex are denominated in USD. Investors obtained USD denominated financing when they invested in the GenCos and DisCos during the privatisation programme. In contrast, the revenues accruing to the sector through tariff payments are in naira. The

implication of this, is that the wider the gap in the exchange rate between the naira and the USD, the greater the increase in the amount in volumes of naira that is required to satisfy the USD obligations in the sector. When the sector privatisation was concluded, in 2013, the acquisition finance documents were negotiated on the basis of an exchange rate of N197 to \$1. Currently, the Investor and Exporter exchange rate hovers around N360 to \$1.

DISTRIBUTION COMPANIES (DISCOS)

Financial auditors engaged by some of the electricity Distribution Companies (DisCos) such as PricewaterhouseCoopers (PWC) have expressed uncertainty over the continued existence of the companies as they declared huge operational losses in two consecutive years ended December 31, 2015 and 2016 respectively.

In their separate submissions to the companies, copies of which were submitted to the Nigerian Electricity Regulatory Commission (NERC), they noted that they had doubts over the DisCos on their ability to continue as business entities as they were heavily indebted. As at December, 2017, the 11 DisCos said their financial shortfalls in the electricity market had reached over N1 trillion due to non payment of legacy debts, MDAs bills and ATC & C losses.

Through the regulatory and policy actions that have been principally driven by the Minister, the DisCos have been forced to sell their product which should retail for an average retail tariff that is more than N80/kWh, at an average retail price of N32/kWh," the DisCos have asserted.

The power distributors collect electricity bills directly from consumers, make payments to the NBET and the bulk trader in turn pays the generation companies.

The privatization programme was premised on the provision of a cost reflective tariff – as relates to every business endeavour, having the right pricing is an essential requirement for success. Balancing between a cost reflective tariff and an affordable tariff is one of the biggest challenges facing the Nigeria Electricity Supply Industry (NESI) today.

Multi Year Tariff Order (MYTO) is the methodology used to set wholesale and retail prices in the NESI. It is a unified way to determine total industry revenue requirement in a building block approach; total cost associated with generation – total cost associated with transmission – total cost associated with distribution as well as regulatory charges.

Nigeria Electricity Regulatory Commission (NERC), being the regulator for the industry has the mandate to approve tariffs. In an effort to make electricity tariffs more affordable, NERC adopted sculpting of the tariff such that DisCos are required to under-recover now (by charging less than the cost reflective tariff) and are allowed to recover in the future. This model, while bringing temporary ease on the retail tariff,

comes with attendant challenge of how to manage the huge shortfall resulting from the sculpted tariff. The sculpted average tariff for Kaduna Electric in 2016 was N30/KWH while the actual cost reflective tariff was N48/KWH. This was approved based on economic indicators (inflation, exchange rate, gas prices) prevalent in 2015 and the resulting shortfall from the sculpted tariff in 2016 amounts to more than N25 Billion.

The MYTO model also requires bi-annual review of these economic variables which has not been done since January 2016. By the time the exchange rate variable is adjusted in the model, the average cost reflective tariff for Kaduna Electric will be around N74/KWH. Charging a cost reflective tariff of more than N70/KWH during periods of economic recession is not only irrational but detrimental to the growth of the economy

The Nigerian Electricity Regulatory Commission (NERC) has stated it would be taking a deeper look at how the 11 electricity distribution companies (DisCos) have utilised the capital expenditure allowed for them in their respective existing tariffs before agreeing to sign off a new tariff for them, a quarterly report of the commission has disclosed.

The Minister of Power asserted that because of the source of funds, conditions such as the opening of Letters of Credit were attached to secure performance of the purpose for which the money was meant; some DisCos have not taken the money and instead have gone to court thereby frustrating full disbursement, and recently the NERC has revealed unauthorized use of the money by Ibadan DISCO and taken some regulatory actions."

METERING

The provision of meters for customers is deemed a critical component of an effective and efficient market. The use of meters as opposed to the 'estimated billing model' provides DisCos positive cashflow, enhances Collection efficiency and provides an effective mechanism for managing cashflow and finances.

The provision of meters to electricity customers to ensure efficient billing and collection of electricity tariffs became the statutory responsibility of the electricity distribution companies (DisCos). The DisCos have been unable to finance the acquisition and installation of meters, which in turn has allowed high commercial and collection losses to continue to plague Nigeria's electricity sector. This has created a cashflow and liquidity event for the whole industry and the prospect of systemic failure. Furthermore, the DisCos have perpetuated the practice of billing electricity customers on an estimated basis and not on the basis of actual electricity consumed. This practice is used as justification by customers for failing to pay their electricity bills, ever enforcing a downward spiral of payment receipts.

In a bid to eliminate the estimated billing practices in the Nigerian Electricity Supply Industry (NESI), attract private investment into the metering services industry, close the metering gap through accelerated meter roll out and enhance revenue assurance for the NESI, in 2018 the NERC issued regulations for the award of Meter

Asset Providers (MAPs). Under the Regulations, the NERC shall licence pre-qualified Meter Asset Providers (MAP) who will finance, install, maintain and where necessary, replace end-user electricity meters.

The introduction of the Regulations is an excellent step towards closing the metering gap, which itself is necessary for the efficient collection of electricity payments and reducing the illiquidity in the sector.

This contractual flexibility inherent in the agreements between DisCos and MAPs could guarantee more investor confidence than a regime where the respective obligations, liabilities and rights will be determined and curtailed by regulation.

The Regulations also provide for specific timelines for the DisCos to undertake the procurement and engagement of the MAPs. The DisCos are required to conclude the procurement process and engagement of MAPs within an approximate period of 4 months. The Nigerian Government has announced a NGN34bn (USD\$105m) grant to MAPs for pre paid meters

GENERATING COMPANIES (GENCOS)

While the process of the privatisation of the PHCN Successor GenCos has been relatively successful when compared to the DisCos, the fact that GenCos are owed billions in energy sold to DisCos threatens their ability to recover more generation capacity, their credit worthiness and their continued existence as going concerns. The revenue shortfalls threaten the survival of the entire power sector.

The generating plants were NOT called GenCos until after the privatisation in 2013. Setting aside the relative efficiency of the GenCos, the illiquidity of NBET and their failure to comply with their payment obligations means that the GenCos are unable to meet their obligations to gas suppliers but more importantly loan repayments and financial commitment to bond holders and investors.

As a measure of a broken market the vast number of GenCos do not have executed project agreements which would normally be a fundamental prerequisite for investment and funding. A status report of the Power Purchase Agreements (PPAs) and Gas Supply Agreements (GSAs) of electricity generation companies (GenCos) published by the Nigerian Electricity Regulatory Commission (NERC) has indicated that 20 GenCos do not have active PPAs, while 18 do not have GSAs.

The report claimed that the country's hydro GenCos – 600 megawatts (MW) Shiroro hydro plant; 578.4MW Jebba hydro plant; and 760MW Kainji hydro dam, have active PPAs.

It also stated that eight of the 10 GenCos built under the National Integrated Power Projects (NIPPs) – 500MW Omotosho NIPP; 750MW Olorunsogo NIPP; 504MW Alaoji NIPP; 500MW Sapele NIPP; 435MW Geregu NIPP; 450MW Ihovbor NIPP; 625 Calabar NIPP; and 225MW Gbarain NIPP do not have active PPAs or GSAs.

Also, five of the legacy gas power GenCos – 300MW Afam legacy thermal plant; 765MW Delta legacy thermal plant; 435MW Geregu legacy thermal plant; 720MW Sapele legacy thermal plant; 1320MW Egbin legacy thermal plant reportedly do not have PPAs and GSAs, while only two – 336.8MW Omotosho legacy thermal plant; and 336MW Olorunsogo legacy thermal plant have full active PPAs but no active GSAs.

For Independent Power Projects (IPPs) in the country, the report explained that the duo of 650MW Afam VI operated by Shell Petroleum Development Company (SPDC); and 480MW Okpai IPP operated by Nigeria Agip Oil Company (NAOC) have full active PPAs and GSAs with their gas being self-supplied. 85MW capacity Paras IPP also has an active-bilateral and fully active GSA. However, 136MW Trans-Amadi IPP; 180MW Rivers IPP; 198MW Ibom power IPP; and 150MW Omoku IPP, do not have active PPAs and GSAs, added the report.

Providing details as to why the GenCos do not have GSAs or PPAs, the report stated that the total installed generation capacity of the GenCos was 12,019.20MW, but the GenCos have not activated their GSAs and PPAs with the Nigerian Bulk Electricity Trading Plc (NBET) because they do not have payment guarantees from the federal government through the NBET.

“Reason for non- activation of the GenCos (take-or-pay) GSA is that the GenCos are yet to receive the expected payment guarantee from NBET or any other Federal Government agency. They say as soon as the guarantee is obtained, GSA will be activated under 24 hours,” explained the report

- Since privatization there has been delayed, and sometimes partial payment for the electricity generated. This has led to the industry owing IPPs about USD\$1b.

- In the absence of a cost reflective tariff that would most ideally generate revenue for the power generated, as tariff of generating companies has not been reviewed since May 2014 despite the major cost component that drive the tariff such as forex rate, inflation and Gas prices has increased significantly since the last review.

- Lack of predictability as the activation of contractual agreements such as the Power Purchase Agreement which is a key ingredient of the Transitional Energy Market (TEM) are yet to be effected, thereby creating uncertainty in the market in relation to cashflow planning and investments

A significant amount of available capacity of the GenCos is lost currently as a result of 3rd parties actions such as gas outages /quality and incessant instructions from the National Control Centre (NCC) to reduce load due to inability of transmission to wield the power

- NCC has begun issuing regular directives to GenCos decreasing the amount of power that is generated and sent out. Last quarter when lack of gas supply meant that, GenCos had substantial energy available, NCC rejected more than half of that; and DisCos were ordered to go as low as 200MW

The Minister of power recently , disclosed that between now and 2019, the country's unused electricity volume will increase to 4,130MW, an equivalent of what the 11 DisCos are currently supplied to distribute across the country. He explained the additional volumes would come from 455MW Azura-Edo plant; 215MW Kaduna plant; 240MW Afam III Fast Power; 40MW Kashimbilla hydro plant in 2018, while in 2019, the 700MW Zungeru hydro plant; and 480MW Okpai II power plant would come on stream to complete the equation. He also stated that the capacity of the country's transmission network had grown between 2015 and 2017 at an average of 1,062MW.

ELIGIBLE CUSTOMER REGULATIONS

Electricity distribution in the Nigerian power industry is based on a monopolistic structure. Electricity consumers cannot choose their electricity distributors as they only receive electricity from the distribution company (DISCO) which has the exclusive responsibility of distributing electricity in the consumer's geographical location. However, the Nigerian power sector's regulator, the Nigerian Electricity Regulatory Commission (NERC) has commenced a process that could ultimately liberalize the electricity supply market in Nigeria by recently issuing its Eligible Customer Regulations 2017 (The Regulations).

Part of the objectives of the Regulations include the provision of standard rules to facilitate competition in the quality and supply of electricity, and promote rapid expansion of generation capacity. By the Regulations, NERC also aims to encourage third party access to transmission and distribution infrastructure as a precursor to allowing full retail competition in that segment of the Nigerian electricity market. By the Regulations, NERC also seeks to improve the overall financial liquidity of the electricity industry by allowing generation companies (GENCOS) with uncontracted capacity to access unserved and underserved consumers.

Under the Regulations, electricity consumers who fall within any of the four categories of eligibility (Eligible Customers) are permitted, subject to requirements, to purchase power directly from 'Suppliers', who are defined by the Regulations as licensees authorized by NERC to supply electricity to an Eligible Customer, i.e GENCOS and trading licensees. Under the Regulations an Eligible Customer has two principal rights: right of access and right to supplier choice. Consequently, an Eligible Customer now has the right of access to transmission and distribution networks for the purpose of delivery of electricity and the right to freely choose a supplier or suppliers, and contract the pricing, quantity, and time of supply. In addition, and in order to facilitate the exercise of an Eligible Customer's rights, under the Regulations, Suppliers shall be granted access to the Transmission and Distribution Network for the purpose of delivery of electricity pursuant to the Contract for use of network.

However, the concern widely expressed by the DisCos, is that the Regulations could bring about a significant loss of revenue to them. Shortly after the issuance of the Regulations, the DisCos issued a notice of force majeure to the Bureau of Public Enterprise (BPE), arguing that the regulations have resulted in a change of law,

which affects their capacity to fulfil their obligations under their Performance Agreements with the BPE.

The reason for the DisCos concern is that, as a result of the regulations, the consumers who will invariably qualify to be Eligible Customers are the DisCos high value customers, who the DisCos heavily rely on. In this respect, the NERC may have anticipated the DisCos' concerns in making the regulations because the regulations provide for the DisCos to perform the role of a Supplier of last resort to an Eligible Customer in the event of a failure by its contracted supplier.

Ultimately, it remains to be seen how the Nigerian electricity market will react and adjust to the implementation of the regulations, particularly in light of the opposition by the DisCos. However, there is no doubt that the innovations introduced into Nigerian electricity sector by the regulations have the potential to liberalize the electricity distribution segment of the market. The resultant competition such liberalization brings is likely to stimulate greater efficiency and the much needed investments in Nigeria's illiquid electricity industry.

CONCLUSIONS

In Synterra's opinion, the power market is significantly broken but not beyond normal repair, hence the frustration on all sides and amongst all stakeholders as solutions seem remote and beyond the parties.

The liquidity challenge is essentially caused by the revenue shortfall in the NESI, which is affecting the settlement of invoices submitted by market participants, thereby creating progressive illiquidity and increasing debt in the NESI. The illiquidity is caused by several factors, including accumulated debt arising from unpaid invoices; poor collection by the DisCos; substantial technical and commercial losses that has resulted in very high aggregate technical, commercial and collections Loss (ATC&C loss) ; the legacy debt owed to the value-chain participants, by the defunct integrated national utility, the Power Holding Company of Nigeria (PHCN) and exacerbated by the introduction of the Rules for the Interim Period between completion of Privatisation and the Start of the Transitional Electricity Market, 2013 (Interim Market Rules) in the NESI.

Exacerbating the state of the market is clear lack of enforcement. In our opinion enforcement will have a transformational effect in the sector providing confidence and certainty to all the market participants. Whilst the solution seems very simplistic enforcement of the rules (of law) is the pivot on which economic prosperity or in this case, a successful market stands. The problem of lack of meters, transformers etc are 'chicken and egg' as investments will only follow an orderly and predictable market. Enforcement of contracts; DisCos and Customers, DisCos and NBET, NBET and GENCOS is the key to repairing the market but it takes a steely will from the top of the hierarchy to address the issue.

DisCos have poor revenue collection metrics because of managerial inadequacies, dilapidated distribution networks and a lack of consequences for stealing power or avoiding payments. The enforcement of the contract between the DISCO and customers is an onerous job but very critical to the health of the market. The President needs to consider this seemingly simple issue as a priority, emphasizing to the nation the importance of payments, rallying round law enforcement and penalties on government-owned agencies and individual customers. What is a market if the rules cannot be enforced?

With enforcement of rules and contracts (fuel contracts, PPAs, Vesting Contracts, Transmission tariffs, MYTO) across the chain, losses will crystallise at the weak nodes. NBET may become insolvent, MYTO reviews may not be totally cost reflective but the process isolates the areas that need interventions and temporary subsidies. The current process of throwing subsidies across the power value chain is creating a moral dilemma and perpetuating indiscipline. The World Bank which currently supports the power sector may attach conditionalities that encourage enforcement of rules in its future interventions.

RECOMMENDATIONS

The Eligible Customer regulations subject to the creditworthiness of the customer provide the best option for an Integrated Power Project. The Federal Government issued a policy directive to Nigerian Electricity Regulatory Commission (NERC) declaring four categories of eligible customers in the Nigerian Electricity Supply Industry (NESI) in accordance with Section 27 of the Electric Power Sector Reform Act (EPSRA).

This major policy shift (though recognized by law) has been stated as a reaction to the issue of illiquidity across the entire value chain of the power sector. The illiquidity challenge has been attributed to the failure of the Successor Distribution Companies (DisCos) to adequately collect tariffs from end-users, and remit payments to other participants along the value chain.

The current liquidity squeeze has made the sector unattractive for investment, as potential investors aim not just to recover capital costs but also make a return on their investment. It has also led to two major financial interventions by the government through the Central Bank of Nigeria's (CBN) Nigeria Electricity Market Stabilization Facility of N213 billion, and the proposed CBN-NBET Payment Assurance Facility of N701 billion (USD\$2.3b).

An eligible customer is a customer that can purchase power from a licensee, other than a distribution licensee (Section 100 of EPSRA). The categories of customers who can now buy power directly from the Generation Companies (GenCos) as stated by the Act are:

(a) Eligible customers comprising of a group of end-users whose consumption is no less than 2MWhr/h, and are connected to a metered 11kV or 33kV delivery point on

the distribution network, subject to a distribution use of system agreement for the delivery of electrical energy;

(b) Eligible customers who are connected to a metered 132kV or 330kV delivery point on the transmission network under a transmission use of system agreement for connection and delivery of energy;

(c) Eligible customers with consumption in excess of 2MWhr/h on monthly basis and connected directly to a metered 33kV delivery point on the transmission network, under a transmission use of system agreement. Eligible customers in this category must have entered into a bilateral agreement with the distribution licensee licenced to operate in the location, for the construction, installation and operation of a distribution system for connection to the 33kV delivery point;

(d) Eligible customers whose minimum consumption is more than 2MWhr/h over a period of one month and directly connected to the metering facility of a generation company. Such eligible customers must have entered into a bilateral agreement for the construction and operation of a distribution line with the distribution licensee licenced to operate in the location.

Based on the above classifications, eligible customers have been conferred with the legal right to have direct bilateral relations with power generators, and would not rely on a Disco for procurement of power, except for the requirement to connect to the distribution or transmission lines (as may be applicable) for the wheeling of power.

The recent policy directive presents an opportunity for potential investors in power plants to supply power to single eligible customers (especially in the manufacturing sector), and groups of such customers who may be within the industrial clusters. The eligible customers would sign up to distribution or transmission use of system agreements, depending on the applicable categories under the policy directive.

The new policy directive is expected to bring to the fore bilateral contractual arrangements between GenCos and eligible customers for the purchase of such stranded generation capacities.

We however, note that the policy directive makes a statement which may appear to contradict its intention to tackle issues of stranded power. The directive states that at least 20% of the generation capacity added by the existing or prospective generation licensees for supply to the eligible customer must be above the requirement of the eligible customer(s). The rationale for this statement is unclear, as it does not give an indication of the potential off-takers for the 20% excess.

The illiquidity issues currently affecting the GenCos are mainly based on inadequate remittances by the DisCos. The new policy directive resolves this issue, as GenCos may now contract with, and collect tariffs directly from eligible customers. The

GenCos now bear collection and payment risks. GenCos would, therefore, need to put in place adequate mechanisms to ensure optimal collection and guarantee of revenues.

However, the DisCos are still permitted to impose a wheeling charge in the form of a Distribution Use of System Charge on other categories of eligible customers who would use the DisCos' network.

The policy directive mandates that agreements should be executed with the DisCos to wheel the power generated to the eligible customers. This has similar implications with embedded generation.

Another potential impact of the policy directive on the NESI is with respect to Independent Electricity Distribution Networks (IEDN). The directive requires eligible customers in categories (c) and (d) above, to enter into a bilateral agreement for the construction and operation of distribution lines with the distribution licensee licenced to operate in the location. This may imply that where there is no distribution network in the location, distribution networks may be developed to feed into the networks of the existing Disco for supply of power to the end-users. This aptly describes the Embedded IEDN as defined under the NERC IEDN Regulations of 2012. The eligible customers connected to an IEDN are required to pay a distribution use of system charge to the IEDN Operator (Section 21 (8) of the IEDN Regulations 2012).

The policy directive also seeks to peg the price of electrical power supply to eligible customers by stipulating that the price cannot exceed the average wholesale price of electricity charged by NBET. Thus, the prevailing MYTO Tariffs would ordinarily apply to these eligible customers. However especially for industrial users there is the option to negotiate and thereby encourage willing-buyer, willing-seller arrangements for which parties would be free to set and agree cost-reflective tariffs outside of the MYTO.

The NERC Procurement guidelines (2014) are to the effect that buyers of electricity (in this case both the DisCos and NBET) can only procure power from a competitive process and not from unsolicited bids, unless it is for a good cause as approved by NERC. To the extent that the Minister's declaration can be interpreted as expanding the scope of buyers of on-grid power, the status of the procurement guidelines would have to be reconsidered by the regulators.

The policy directive is a good step in deepening the market and re-establishing confidence in the NESI. GenCos (on-grid, captive and off-grid) can now trade directly with end-users for the supply of power without necessarily contracting with the DisCos except with respect to the use of DisCos' network (as may be applicable). This significantly improves the project economics and the possibility for the investor to obtain a desirable project yield.

Clearly, issues around (i) the potential impact of the directive on the DisCos' revenues; (ii) pricing of power to be supplied to eligible customers by GenCos; (iii)

contractual structures between GenCos, eligible customers, DisCos and/or Transmission Company of Nigeria; and (iv) pricing for use of the distribution and transmission networks; amongst others would need to be clarified and tested.

We are of the opinion that there were always going to be difficulties in the transitional phase and those challenges would serve to drive sensible regulation and promote realistic policy formulation. The investors in the successor companies both underestimated risk and the quantum of investment that was required which resulted in them mispricing the risk. It is our submission that given the insolvency of many of the actors in the industry and the need for investment and increased liquidity .

The Nigeria Government have launched an Economic Recovery and Growth Plan (ERGP), a medium-term structural reform to diversify Nigeria's economy, with a specific emphasis on expanding power sector infrastructure. It is a belated but welcome acceptance that reform is required in the sector and such reforms must be based on market rules, stimulate investor confidence and provide adequate yield

This is a good time for institutional investors or power companies to consider the Nigerian energy sector. Our advice would be a Greenfield project with a dedicated gas asset into a group of Eligible Customers



SynTerra Energy Assets

TRADING : PRODUCTION : EXPLORATION