



The Case for a Parallel Electricity Market (PEM) in Nigeria

An option for improving liquidity in the Nigerian electricity supply industry through the introduction of competition in the wholesale electricity market

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Summary

- a. A debilitating liquidity crisis has persisted in the Nigerian electricity supply industry (NESI) since the sector was liberalised in 2013. This liquidity crisis has constrained new investments across the entire sector, including over USD 2 billion of on-grid renewable energy investments.
- b. According to research conducted at the Centre for Development, Environment and Policy (CeDEP) in London, there are three specific challenges that sustain the liquidity crisis and constrain new investments in the NESI. These challenges are (i) the *Nigerian Bulk Electricity Trading's (NBET) monopsony*, (ii) *NESI's retail subsidy regime* and (iii) the *distrust between consumers and NESI operators*.
- c. This policy brief recommends that the government of Nigeria introduce a Parallel Electricity Market (PEM) that allows on-grid generation companies to trade directly with a select category of creditworthy consumers, and prioritise supply to these consumers to a reasonable extent.
- d. High levels of liquidity in a prioritised PEM would unavoidably increase liquidity in the entire sector, and provide a basis for trust to improve between NESI operators and consumers. It will also relieve, partially, the fiscal burden on NBET and the Nigerian government.
- e. New investors, including on-grid renewable energy investors, would no longer require guarantees from the government or NBET because they will be more inclined to compete for credit-worthy consumers in a prioritised parallel market.
- f. Increased competition in the NESI should not be seen as the next phase of reforms nor the inevitable outcome of solving the liquidity crisis. Rather, it should be seen as the solution to the crisis.

Introduction

This policy brief is based on a doctoral thesis entitled, “*Overcoming the constraints to on-grid renewable energy investments in Nigeria*,” conducted at the Centre for Development, Environment and Policy (CeDEP) at the University of London’s School of Oriental and African Studies (SOAS). The policy brief summarises its findings and conclusions.

Over the past 6 years, since the privatisation of the Nigerian Electricity Supply Industry (NESI), policymakers and industry stakeholders have directed numerous efforts to tackle the liquidity crisis in the NESI. NESI operators are unable to meet their revenue targets due to high levels of aggregated technical commercial and collection (atc&c) losses and a non-cost reflective retail pricing regime.

The distribution companies (DisCos), which are the first in contact with sector revenues are unable to generate sufficient revenues for themselves and for remittance to the generation companies (GenCos) and gas companies (GasCos). In its first quarterly report in 2019, the regulator – Nigerian Electricity Regulatory Commission (NERC) – recorded a remittance performance of only 26.5% from the eleven DisCos.

Adjusted for the tariff shortfall, the average remittance performance of the DisCos is recorded at 63%.

The liquidity crisis in the NESI remains the biggest challenge to new investments. Paradoxically, the sector requires new investments to improve its performance.

How can the constraints to additional investments in the sector be overcome? Government intervention is necessary; however, the mode of intervention is a critical determinant of success or failure. This policy brief puts forward an option to overcome the constraints to additional investments in the NESI.

The next few sections of this policy brief present (i) the method behind this analysis, (ii) three critical issues that sustain the liquidity crisis in the NESI, (iii) recommendation of the parallel electricity market, and (iv) conclusion and next steps.

Method

The research work upon which this policy brief is based was conducted using the Structure-Conduct-Performance-Regulation (SCPR) Framework developed by Peng and Poudineh at the Oxford Institute for Energy Studies (OIES) in 2016. It is based on the traditional Structure-Conduct-Performance (SCP) framework. The datasets analysed during the research were collected through one-to-one semi-structured interviews with 24 industry and political stakeholders in Abuja, Lagos and Oshogbo. Other data sources included questionnaires, industry reports, and numerous policy and regulation documents.

Findings

Three specific challenges have emerged as a result of the market structure of the NESI. These three challenges sustain the liquidity crisis and constrain new investments in the NESI.

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The next three subsections present the three challenges and show how they help to sustain the liquidity crisis and constrain new investments.

1. NBET's Monopsony

The Nigerian Bulk Electricity Trading (NBET) Plc. was established to increase GenCo investor confidence in the NESI by shielding the GenCos – and by extension, shielding the natural gas producers – from the significant at&c losses at the retail end of the NESI.

However, NBET has been unable to shield GenCos and gas producers from the liquidity crisis. In the first half of 2019, NBET, on its own, met only 21% of its USD 914 million obligation to GenCos. Not only has NBET's task proved undoable and unsustainable, it has also created an inhibitive and unproductive monopsony at the wholesale end of the NESI.

NBET's monopsony prevents competition and stifles productivity in the wholesale market. GenCos are unable to supply electricity to willing credit-worthy buyers through the national grid because the existing regulatory regime does not support it. The current regulatory regime requires all on-grid electricity trade to occur through NBET. However, NBET does not have the fiscal capacity to facilitate all wholesale electricity trading because of the unsustainable at&c losses and non-cost reflective retail tariff. NBET's unsustainable fiscal position became clearer when the privately-financed 450 MW Azura-Edo power plant began electricity production and trading with NBET on a take-or-pay contract.

As shown in *Figure 1*, when Azura-Edo IPP began ramping up its electricity sale volumes between March and May 2018, there was a simultaneous

winding down of electricity sale volumes from the state-owned GenCo, Niger Delta Power Holding Company (NDPHC). Within three months in 2018, the Azura-Edo IPP's electricity sales increased by NGN 5.2 billion (USD 14.3 million) and NDPHC's electricity sales reduced by NGN 5.5 billion (USD 15.3 million).

NBET is evidently incapable of supporting current and new generation investments on the grid. It seems that the government reduced the productivity of its own power plants to accommodate the Azura-Edo IPP, which is protected by several sovereign guarantees.

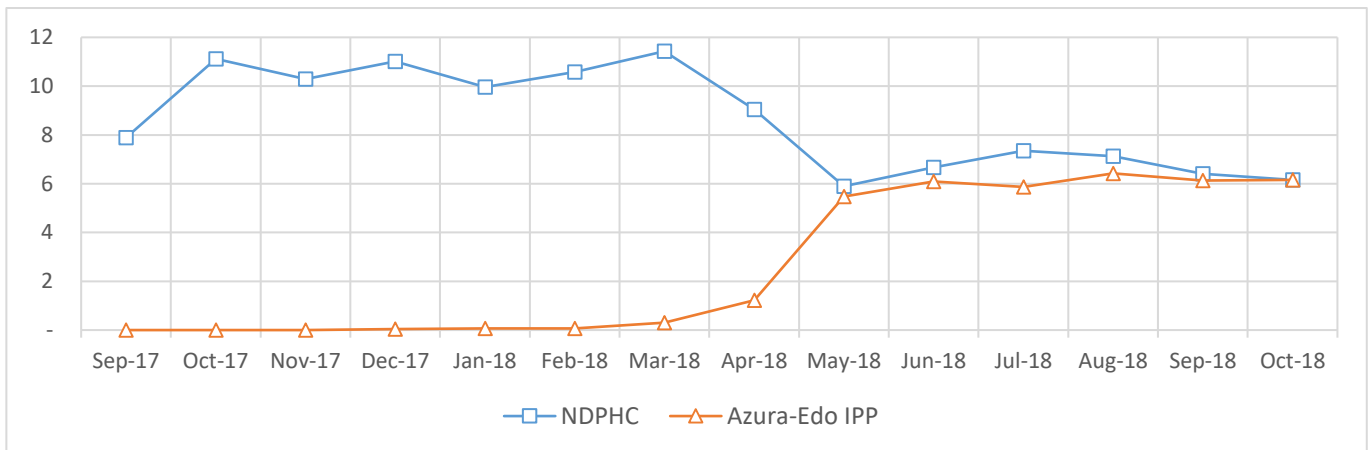
Breaking NBET's monopsony through the introduction of the parallel electricity market (PEM) recommended in this brief will help to relieve NBET of its fiscal burden and pave the way for cost-reflective electricity trading to occur directly between GenCos and willing credit-worthy consumers.

2. NESI's Subsidy Regime

Providing electricity subsidies to ease the burden of energy bills on vulnerable consumers is a necessary and moral responsibility of the state. However, it must be done efficiently. The current electricity regime sustains a retail cross subsidy, which rightly attempts to ease the burden on consumers, who consume lower quantities of electricity than others. However, the current non-cost reflective electricity tariff regime, which is effectively an electricity subsidy, is inefficient because it subsidises the entire market, including those credit-worthy consumers who are not only capable of paying a cost-reflective tariff, but are often willing.

The current regime prevents DisCos from selling electricity to consumers at a cost-reflective tariff, preventing the DisCos from reaching their required revenue targets and causing a liquidity crisis across the entire value chain in the NESI.

Figure 1: Energy bill to NBET (in billions of Naira) from Azura-Edo IPP and NDPHC between September 2017 and October 2018.
 Source: Author.



While the DisCos also have their own billing and collection inefficiencies, the non-cost reflective retail tariff remains one of the sector’s most critical issues. It not only prevents DisCos from reaching their revenue targets, it also restricts the DisCos capacity to deploy the investments required to reduce other atc&c losses.

In the first quarter of 2019, the wholesale market shortfall (DisCo remittance shortfall) generated in the NESI stood at NGN 137.3 billion. Of that total, the non-cost reflective tariff was responsible for about NGN 67 billion (48.8%) of the wholesale market shortfall.

Instituting sector-wide cost reflective tariffs is a critical part of the solution to the liquidity crisis. The introduction of the PEM regime, recommended in this brief, would move willing credit-worthy consumers into a parallel electricity market, where they will pay above-cost prices.

3. Consumer-NESI Distrust

Billing and collection losses in the NESI are major problems that sustain the liquidity crisis in the NESI. The DisCos sometimes attempt to solve this by using estimated billing systems, which unfairly charge paying consumers for electricity theft and unpaid electricity bills caused by others consumers.

Despite this unfair practice, DisCos still do not meet consumers’ expectations of electricity supply. In turn, this causes consumer apathy and energy theft, leading to lower collection rates and commercial losses. This circular causal loop is, paradoxically, a cause and effect of a lack of sufficient trust between the NESI operators and consumers.

The proposed PEM can be used to improve trust between NESI operators and consumers. The revenue generated from the proposed PEM will ease the liquidity crisis, and can be used to improve critical parts of the grid infrastructure that will help solve some of the problems in the NESI incrementally. As liquidity improves, so too should investment, performance, and consumer trust. The PEM will also provide a useful demonstration effect as consumer trust may increase if evidence of reliable supply to PEM consumers in the parallel market is observed.

Recommendation

Parallel Electricity Market (PEM)

In order to tackle the three aforementioned challenges, this brief recommends the introduction of a parallel market – a new competitive wholesale electricity market that will

run parallel to the existing single-buyer electricity market. The introduction of the PEM will improve market liquidity by tackling the three main challenges that sustain the liquidity crisis.

Features of the PEM

- 1. Constant reliable electricity supply** will be delivered by the PEM to its prioritised consumers, who will all pay a premium for the priority they receive over other consumers. As PEM consumers pay a premium for reliability, NESI operators will bear the risk of any energy cost incurred by unsupplied PEM consumers.
- 2. Only large productive credit-worthy consumers** will be allowed to buy electricity from the PEM initially. This would make the PEM operate at near-zero commercial and collection losses, improving liquidity in the entire sector. Other credit-worthy consumers will be allowed to join the PEM in phases, until all consumers in the NESI are included in the PEM.
- 3. A cost-reflective tariff plus two extra charges** will be instituted in the PEM. The first extra charge will be a *competition transition charge (CTC)* that compensates

DisCos for losing their ability to trade with these large productive consumers. Section 28 of the Electric Power Sector Reform (2005) Act allows DisCos to be compensated through a CTC for any shortfall in their capacity to “earn permitted rates of return on their assets” if that shortfall is a result of the government introducing competition policies.

service (TUoS) fee for operating the grid and transmitting electricity to the distribution end of the network as it currently does. In the PEM, DisCos will not trade electricity, they will only transport electricity and charge a distribution charge or a distribution use of service (DUoS) fee plus a CTC.

IPPs, including renewable energy companies to compete for PEM consumers without requiring government guarantees.

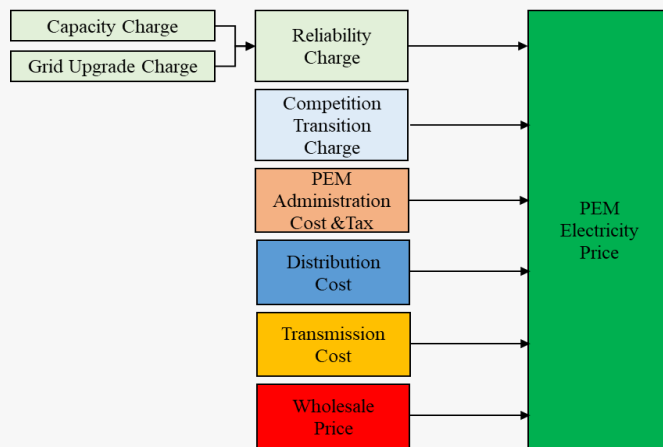
2. The PEM will help to build trust between the DisCos and consumers as NESI consumers will observe reliable electricity being supplied to participating PEM consumers, who will be paying above-cost prices. This could make non-participating consumers more willing to pay higher electricity prices and join the PEM in subsequent phases.

This assumes that the consumer’s willingness to pay is constrained primarily by a trust deficit. However, there may also be economic constraints to the consumers’ ability to pay.

3. The progressive expansion of the PEM will phase out the retail subsidy regime in the electricity sector gradually. As trust between the consumers and the electricity sector is built, consumers will be enabled to transfer to the PEM in phases. Although vulnerable consumers may still require government support as foreseen in the EPSR (2005) Act, which allows the FGN to set up a vulnerable consumer subsidy fund.

Figure 2: Indicative PEM Tariff Structure

Source: Author.



The second extra charge will be a **reliability charge** for two services; first, for capacity payments for available generation capacity that can be dispatched in the event of an unplanned shortage; second, to allow TCN and DisCos to finance grid upgrades to enable reliable supply to PEM consumers. The incentive for PEM consumers to pay a cost-reflective price plus two extra charges will be the opportunity to avoid the even higher costs of self-generation through expensive diesel-fuelled electricity generation systems.

4. The Transmission Company and DisCos will be restricted to transporting electricity in the PEM; however, they may continue trading electricity in the existing electricity market. Within the PEM, the Transmission Company will charge a transmission use of

5. Several electricity trading modes can be used between GenCos and consumers in the PEM to enable price to be set optimally by real-time demand and supply. Some trading modes can also help hedge against the market influence of dominant firms. Some of these trading modes include: an electricity spot market operated by the private sector, a bilateral trading market and a regulated electricity derivatives market.

Benefits of the PEM

1. NBET’s fiscal burden and inhibitive monopsony in the wholesale electricity market are naturally addressed if the PEM is introduced. This will open up competition in the wholesale market and enable GenCos to compete for PEM consumers. Importantly, it will enable new

PEM Risks

In addition to a sustainable electricity price, credit-worthy consumers and consumer trust, the PEM will require certain additional conditions to mitigate its associated risks.

1. The technical constraints to reaching all prospective PEM consumers simultaneously and reliably must be removed. Trade in the PEM must be high enough to encourage investment but not

too high that supply cannot be guaranteed. The trade volumes in the PEM must be sustainably controlled because the PEM would depend on its ability to guarantee supply. The technical constraints to supplying all large credit-worthy consumers simultaneously and reliably must be established, and corresponding grid upgrade investment plans developed.

2. Stakeholders must consider the potential opposition to the PEM from non-qualifying consumers.

There is a potential for non-qualifying consumers to perceive the PEM as an act of economic discrimination because qualifying credit-worthy PEM consumers will be prioritised on the grid. This risk may be mitigated by building political consensus and raising awareness among consumers about the necessity of incremental progress in the sector. Non-qualifying consumers may not be allowed to join the PEM initially, but they will also not be required to pay the higher electricity prices required in the PEM. The PEM will also have a timely schedule to phase in all consumers systematically. In addition, vulnerable non-qualifying consumers will be provided with monetary assistance from the government through credit vouchers to offset their electricity bills.

3. The regulator must enforce infrastructure upgrades by requiring operators, who participate in the PEM, to submit upgrade investment plans that facilitate the PEM. The regulator must then enforce the investment plans by ensuring that firms in the PEM execute them.

4. The government must go back to its strategy of facilitating technical industry working groups to discuss pertinent industry issues that affect the liquidity and performance of the sector. The regulator and other relevant government institutions must embed themselves within the private sector to build institutional relationships so that they can properly understand the issues that face investors, and can mediate between the concerns of investors and the policy objectives of government. The constitution of working groups by the public and private sector will be critical for the success of the PEM, especially when establishing the specific list and hierarchy of grid upgrade plans or establishing the list of industrial consumers and clusters that would qualify to become PEM consumers.

5. The PEM will also benefit from the introduction of a professional association for all private and public sector professionals in the electricity sector. It will institutionalise informal relationships between actors in the sector. This may help to reduce the antagonistic posture that too many industry actors currently have for each other. A reduction in the antagonism may create room for mutual interests to arise less strenuously.

This policy brief proposes an option for improving liquidity in the Nigerian electricity supply industry through the introduction of the PEM. To implement the PEM, there are critical next steps.

Next Steps

1. Engagement of NESI stakeholders to establish a balancing and settlement mechanism for the PEM.
2. Establishment of a cost-reflective distribution cost, DUoS, by NERC.
3. PEM tariff structure design, including CTC and reliability charge.
4. Selection of PEM consumers based on credit-worthiness, demand size and electricity supply constraints.
5. Development of a NESI-PEM consumer transfer schedule that establishes a timeline for transfer of consumers to the PEM.
6. PEM market design with the options of a private sector-led spot market, bilateral trading and a derivatives market.
7. Establishment of operator investment/upgrade plans with the specific aim of sustaining and expanding the PEM.
8. Establishment of technical industry working groups.
9. Establishment and accreditation of an energy association for all private and public sector professionals in the electricity sector.

Conclusion

Increased competition in the NESI should not be seen as the next phase of reforms or the inevitable outcome of solving the liquidity crisis. Rather, it should be seen as the solution to solve the liquidity crisis.

Figure 3: Indicative PEM Structure.
Source: Author.

