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Breaking the Cycle of Recurrent Nervous System Collapse: Thoughts on Attracting Private Investment for Transmission Network Renewal

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Those in charge, including, NERC[1], can be accused of seemingly failing to pause and contemplate the transformative impact of electricity on human existence – given the centrality of electricity in nearly all facets of life of any society today; and the assumed fact that:

> *"...the absence of electricity would lead to a quick decline in the quality of life, and human technological progress would probably come to an end... It enhances our quality of living, ensures safety and security, facilitates transportation, and contributes to medical progress... It contributes to a more fulfilling, secure, and content existence. It enables businesses to enhance production and lower the cost of goods."* [2]

This is so because of the unimaginable level of abject electricity poverty in Nigeria, and the outsize weight this penury places on our economy. The broad subject of ***power*** is not the object of this paper, rather the aim is to demystify a segment of it: ***transmission of power*** – said to be the backbone or central nervous system (CNS) of the Nigerian Electricity Supply Industry (NESI). [3]

There is no gainsaying the importance of the backbone to the body, and more so the importance of the central nervous system. What we see is akin to a disease, if not terminal, of the CNS of NESI, and no doubt if we do not move quickly, by the best and quickest means possible, we will see a complete, disastrous, and irreversible collapse of the NESI and the attendant failure it will bring upon society. Such is the existential nature of the problem that we urgently need to find a solution to - the embedded power system that controls the NESI and directs the operations of transmission of power in the nation.

NERC needs to adopt a new energy strategy, otherwise itself and the industry will become useless, if not electrocuted to death by the power losses from inefficient and dilapidated transmission lines. In this regard, one can do no better than refer to a UNDP Report on the subject thus:

1. *Nigerian Electricity Regulatory Commission*
2. *https://group.met.com/en/media/energy-insight/importance-of-electricity*
3. *NESI is primarily made up of the Generation Companies (GenCos), the Transmission Company of Nigeria (TCN), the Distribution Companies (DisCos), and the consumers.*

> *"At the core of any sustainable energy strategy is a vision for improving the provision and use of energy so that it contributes to sustainable development. For that to happen, policies must widen access to reliable and affordable modern energy supplies and reduce the negative health and environmental impacts related to energy use. Increased energy supplies and more efficient allocation of resources for sectoral investment will also be required to support economic development. The key requirement is that steps be taken to make markets work more effectively, or to help build energy markets where they do not exist. A competitive market is the most efficient allocator of resources and is capable of providing high levels of consumer service and satisfaction. Thus, a key element of a sustainable energy strategy should be to strive for, and to maintain, competitive market conditions. But the market alone cannot be expected to meet the needs of the most vulnerable groups, to protect the environment, to ensure energy security in the face of politically motivated disruption, and to support other public goods, such as basic research that underpins the innovation and diffusion of new technologies. In general, however, given the proper framework set by government— with competitive pricing and effective regulation—markets can achieve many of the objectives of sustainable energy. Where markets still fail to protect public benefits, targeted government interventions are indicated. The need should depend on whether government intervention will produce the desired results. Government interventions tend to be less efficient than market approaches and often have unintended consequences at odds with their original aims. Moreover, the introduction of sound policies does not prevent backsliding. For these reasons there is a need to adopt a pluralistic approach, to try different approaches, to learn from the experiences of other countries, and to be prepared to adjust policies in light of lessons learned domestically and internationally."* [4]

In sum, we need to bring in private capital, discipline of the market, and efficiency of the private sector to bear on NESI but in particular the transmission network,[5] which as noted above is very critical, and can be likened to the central nervous system of the human body. [6]

As things will be, the NESI, is in a very poor state in Nigeria, and over the years, the Nigerian transmission network has experienced systematic collapse due to several factors which have contributed to the degradation of the transmission network. Some of these factors include the negligence of the transmission service providers, overloaded transmission lines and the lack of cost reflective transmission tariffs. Accordingly, it has been rightly pointed out that the current transmission infrastructure and its operation is the weakest link in the electricity value chain.[7]

4. *See Chapter 12 - Energy Policies for Sustainable Development https://www.undp.org/sites/g/files/zskgke326/files/publications/chapter12.pdf*
5. *The NESI transmission network is used for the bulk movement of electrical energy from a generating site, such as a power station or power plant, to a substation where voltage is transformed and distributed to consumers or other substations. The interconnected lines that enable the movement of electrical energy are known as a 'transmission network'. All of these, form an electrical power transmission system or, as is more commonly known, the power grid. See Oluwafemi Omisanjo, 'The NESI Components: Exploring the Transmission Sub-Sector' (02 May 2023). Retrieved from https://www.businessday.ng Accessed on 19 November 2024.*
6. *See Olivia Guy-Evans, 'Structure and Function of the Central Nervous System' (17 January 2024). Retrieved from https://www.simplypsychology.org Accessed on 19 November 2024. The central nervous system (CNS) of a human body consisting of the brain and the spinal cord, acts as the body's control center which processes sensory information, directs responses, coordinates voluntary activities like movement and involuntary activities like breathing and heartbeat. CNS communicates with the rest of the body through the nerves, which are bundles of fibers that transmit signals to and from the CNS. The CNS is also referred to as the coordinated processing center of the body. Accordingly, just like how the CNS coordinates, integrates and controls the human body, the transmission network also coordinates and integrates the various aspects of the NESI.*
7. *Adeyinka Adebayo, Gbenga Apata and Priye Kenneth Ainah, 'The Insight and Foresight of the Nigerian Power Transmission System: An Overview' (October 2020). Retrieved from https://www.researchgate.net Accessed on 19 November 2024.*

Just in 2024, Nigeria National Grid (the Grid) experienced over 10 collapses consisting of both major and partial collapses, causing widespread outages, strained access to electricity by the public and disruptions to businesses. This is an embarrassing state of affairs, particularly when compared to the state of the transmission networks of other emerging economies like Ghana, (where the grid last collapsed in March 2021[8]), and India (where the last experienced grid collapse occurred on 30 and 31 July 2012[9]). The frequency of the collapse of the Nigerian power grid has over the years made catastrophic impact on the Nigerian economy with DisCos, industries and companies experiencing significant financial losses.

In this paper, we analyze the current state of the nation's transmission system, the age long challenges it faces, the need for private capital, the critical success factors to accessing the finance required to meet the transmission deficit as well as key next steps for NERC.

8. *Mudashiru Mahama, 'Power Crisis in Ghana: The Past, Present and the Way Forward'. (10 March 2021). Retrieved from https://www.modernghana.com Accessed on 19 November 2024.*
9. *Anubhav Rath, 'Indian Blackouts of July 2012: What Happened and Why?' (30 November 2016). Retrieved from Indian Blackouts of July 2012: What Happened and Why? | by Anubhav Rath | Clean Energy for Billions | Medium Accessed on 19 November 2024.*

SECTION 1: CURRENT STATE OF THE GRID

In this part, we discuss the constraints faced by the transmission network and the impact of these on the electricity market and overall economic development of the sector. There are several factors which led to the present state of the transmission infrastructure. We have taken the liberty to highlight a few below:

HISTORICAL UNDERFUNDING

The chronic lack of investment remains a persistent problem in Nigeria's transmission sector and this significantly contributes to the inadequate, outdated and unreliable state of the country's electricity transmission system. Over the years, the Transmission Company of Nigeria (TCN) has had to battle with insufficient funding to complete projects or carry out necessary maintenance and upgrades on the existing system. Statistics show that NERC approved the sum of NGN210.14 billion for TCN as the investment requirement for 2024. However, in the 2024 budget, TCN was only allocated NGN112 billion out of the total sum of NGN344 billion allocated to the power sector, thus indicating an investment shortfall.[10]

LIMITED COVERAGE

Africa has fewer kilometers of transmission lines per capita than any other continent. Currently, the length of Nigeria's electricity transmission system is about 5,528.8 km of 330kV lines and 6,801.49 km of 132kV lines.[11] This is insufficient to cater to the electricity needs of the country compared to the transmission lines per capita of other emerging economies.[12] As a result, many parts of the country continue to wallow in darkness despite the enormous vast energy resources available in the country.

10. *Robert Ipogah, '2024 Budget: N344 billion Power Sector Allocation and Prospect of Electricity Supply in Nigeria'. Retrieved from https://www.continentaleconomy.com. Accessed on 27 November 2024.*
11. *Akpojedje, F. O., & 2Mormah, E. C , "Transmission System and Rural Electrification Scheme in Nigeria: Issues, Challenges, Constraints and Way forward" Journal of Advances in Science and Engineering, ISSN: 2636-607X Volume 2 Number 2 (2019): 9-28.*
12. *For instance, between 2014 and 2020 the Egyptian Electricity Transmission Company commissioned over 3,600 km of 500 KV transmission lines. At the end of 2020, the length of their 500 KV transmission system was 2.5 times its length in 2014. This portrays the impact of large-scale private sector investment in scaling up the transmission system of Egypt unlike the case in Nigeria. Ryan Ketchum and Chris Flavin, 'Private Investment in Transmission', (21 January 2022). Retrieved from https://www.huntonak.com Accessed on 19 November 2024.*

PRIVATISATION DECISIONS:

The transmission network has always been regarded as a sensitive aspect of the NESI and usually centrally planned and organized to a very high degree by the government or state-owned entities. For reasons such as national security, the nascent nature of the electricity market, and limited private sector interest, the government still retains complete control of the transmission network and this has constituted a stumbling block to attracting private investment in the transmission sector.[13]

LACK OF INTEGRATED PLANNING:

The lack of proper integration of power projects has led to the current poor state of the transmission system. Heavy focus has been placed on the generation system while the transmission system has been largely abandoned, resulting in the imbalance in accessing electricity. There is also the problem of mismatched capacity between generation and transmission. For example, despite having installed generation capacity of over 12,000MW, TCN can only evacuate an average of about 5,500MW due to inadequate transmission infrastructure. Poor planning can also be gleaned from the concentration of transmission substation in specific regions, leaving other areas underserved, leading to overloading and frequent outages. The lack of clear planning continues to hamper efforts to expand transmission networks to rural and underserved areas, slowing progress towards universal electricity access.

CORRUPTION

Corruption remains a significant issue undermining the efficiency, reliability and growth of Nigeria's transmission network and affects every part of the sector from policy formation to project execution. More specifically with respect to the transmission value chain, corruption rears its ugly head in the aspect of mismanagement of funds, inefficient procurement process, lack of accountability, sabotage of reforms, poor maintenance culture, delay in project completion, amongst others. For instance, several World Bank supported projects aimed at improving Nigeria's transmission network have faced delays due to governance and transparency issues.

13. *Ibid*

MULTIPLE ROLES OF THE TCN:

Up until the advent of the Electricity Act 2023 (the Act), the TCN performed the roles of transmission service provider, system operator, and market operator. The multiplicity of roles creates conflict of interest, operational inefficiencies and weakens the overall performance of the transmission infrastructure. The TCN continues to be distracted and is unable to focus, such that neither the physical transmission network nor grid operations are managed optimally. However, with the enactment of the EA 2023, the TCN was empowered to transfer the system operator functions to an entity to be licensed as the Independent System Operator, thereby aligning with global best practices.[14]

VANDALISM

From January to August 2024, sixty-three (63) power transmission towers across the country were destroyed[15], including the complete collapse of seventeen (17) towers,[16] with critical components like conductors and underground cables stolen. This widespread vandalism has severely disrupted electricity supply in affected regions, with significant incidents reported in the northern, southern, and eastern parts of Nigeria. The consequences of these acts are dire, undermining the Federal Government's efforts to stabilize power generation. Vandalism has become rampant because most transmission facilities lack adequate physical security or surveillance systems, making them easy targets and this is not unconnected to the fact that prosecution of vandals is rare, and the penalties are often insufficient to deter future crimes. It is useful to note that vandalism now amounts to an offence under sections 208 and 209 of the Act on theft of electricity and theft of electric lines and materials respectively.

DILAPIDATED INFRASTRUCTURE

Transmission infrastructures in Nigeria are in a state of disrepair, and fixing Nigeria's grid infrastructure is capital intensive. The infrastructure deficit results in extreme voltage dips in the Central and Northern regions because of long distances required for electricity transmission from the Southern part to the Northern regions of the country. Also, in 2024 TCN admitted that its "equipment is outdated."[17] A specific example of the impact of grid constraint is Azura Power Plant, a plant that has been unable to dispatch at full capacity, yet the Federal Government is under an obligation to "take or pay" for the full capacity of the plant. Consequently, the government seems to be losing out on both ends, it is unable to get the full power supply on one hand and on the other hand, it bears the financial burden of paying for the unutilized power.

14. *In furtherance of the provisions of the Act on the establishment of an ISO, the Nigerian Electricity Regulatory Commission (NERC or the Commission), issued an order on the establishment of the independent system operator (Order No: NERC/2024/45) dated April 30, 2024.*
15. *https://theelectricityhub.com/vandals-destroyed-63-power-transmission-towers-in-nigeria-from-january-to-august-2024-severely-impacting-electricity-supply-in-affected-regions/ Accessed 25 November 2024*
16. *Ibid.*
17. *Oluwatosin Ogunjuyigbe, 'Grid Collapse: 'Our Equipment is Outdated,' says TCN MD' Business Day (21 October 2024) < https://businessday.ng/energy/article/grid-collapse-our-equipment-is-outdated-says-tcn-md/ > accessed 27 November 2024.*

SECTION 2: DANGERS OF NOT FIXING THE GRID

Over the years, the Grid has remained unreliable. It is reported that the Grid has collapsed 105 times in the past 10 years[18], in just 2024 alone, the Grid is reported to have collapsed about 10 times[19]. Some historic data will be helpful to show how unreliable the Grid has been.

TABLE[20]

Year	2000	2005	2010	2015	2020
Partial Collapse	6	15	20	4	1
Complete Collapse	5	21	22	6	3
Total	11	36	42	10	4

TABLE[21]

Year	2022	2023	2024*
Partial Collapse	-	-	1
Complete Collapse	5	3	1
Total	5	3	1

In terms of the economic impact of current state of the Grid, according to Africa Trade Barometer by Standard Bank, seventy-nine percent (79%) of surveyed business in Nigeria feel that power outages are the major or severe obstacle to their operations, and the economic business losses attributable to power outages in Nigeria in a year is about USD29billion.[21] Also, the Manufacturers Association of Nigeria raised an alarm over the constant power outage in Nigeria, particularly complaining that most manufacturers are now unable to operate beyond 8 hours in a day.[22]

18. *Sami Tunji and Dare Olawin, 'Grid Collapses 105 Times in 10 Years Despite $1.4bn Loans' (Abuja, 21 October 2024) < https://punchng.com/grid-collapses-105-times-in-10-years-despite-1-4bn-loans/ > accessed 20 November 2024.*
19. *Dare Olawin et al, 'Nationwide Blackout as Grid Suffers 10th Collapse in 2024' (Abuja, 6 November 2024) < https://punchng.com/nationwide-blackout-as-grid-suffers-10th-collapse-in-2024/ > accessed 20 November 2024.*
20. *Table 1 and Table 2 are extracted from Mojisola Jimoh and Bello Raji's article 'Electricity Grid Reliability: An Assessment of the Nigerian Power System Failures, Causes and Mitigations' (2023) Covenant Journal of Engineering Technology (CJET) Vol. 7, No. 1.*
21. *The information in Table 3 is extracted from NERC Quarterly Report and more reliable than any other sources. Note that the report for 2024 is only up to Q2 as released by NERC and this excludes the several grid collapses in the months of October and November 2024.*

Over 85 million Nigerians, or 43% of the population, remain unconnected to the national grid, significantly hindering economic growth, social progress, and environmental sustainability.[23] Industries, from manufacturing to small-scale enterprises, suffer from frequent power outages, leading to job losses and hindering economic growth. Additionally, the lack of grid connectivity deters investors due to increased operational costs and risks. [24]

The educational sector in Nigeria is also affected. Students, particularly in rural areas, are deprived of quality education as schools often lack electricity for lighting and digital learning tools.[25] This is besides the fact that hospitals and clinics in the deprived areas struggle to provide essential services, including surgeries and the preservation of vaccines, blood, which eventually leads to increased mortality rates and poor health outcomes.[26]

It is also true that not fixing the Grid will continue to have the domino effect it presently has on other sub-sectors of the NESI. The nation's limited transmission capacity is a significant hindrance to the effective utilization of the already existing power generation capacity. As explained earlier, where the existing power generation capacity exceeds the transmission capacity, it results in overloaded transmission lines which cause voltage drops, increase energy losses, and results ultimately in system stability issues.

Furthermore, without robust transmission, large-scale renewable energy projects cannot be implemented or connected to demand centers. The absence of a robust transmission infrastructure poses significant challenges to the development and integration of large-scale renewable energy projects in Nigeria. As mentioned earlier, renewable energy sources, such as solar and wind power, are often located in remote areas with abundant natural resources but cannot be fully harnessed owing to limited existing infrastructure.[28] To harness the full potential of these resources and embark on large scale renewable energy projects, there is an urgent need to strengthen the country's transmission network.

22. *Standard Bank, Africa Trade Barometer 2023 issue 3 accessible from https://www.stanbicibtcbank.com/static_file/Nigeria/nigeriabank/Business/FileDownloads/SBG%20Africa%20Trade%20Barometer%202023_Nigeria%20Report.pdf*
23. *Arinze Nwafor, 'Power Crises: Manufacturers Reduce Production Time to Eight Hours Daily' Punch (Lagos, 22 November 2024) < https://punchng.com/power-crisis-manufacturers-reduce-production-time-to-eight-hours-daily/ > accessed on 22 November 2024.*
24. *World Bank, "Nigeria to Improve Electricity Access and Services to Citizens" [2021] (https://www.worldbank.org/en/news/press-release/2021/02/05/nigeria-to-improve-electricity-access-and-services-to-citizens) accessed 20 November 2024.*
25. *Ukoima Nkalo, Ogbonnaya Ekwe, Kelvin Agwu. " Review of the Impact of Electricity Supply on Economic Growth: A Nigerian Case Study." [2019] IOSR Journal of Electrical and Electronics Engineering. 28-34 <https://www.researchgate.net/publication/326812316_Impact_of_Electricity_Supply_on_Economic_Growth_A_Nigerian_Case_Study> accessed 20 November, 2024.*
26. *Abdulrahman Olaniyan, Stéphane Caux, Pascal Maussion, "Rural electrification in Nigeria: A review of impacts and effects of frugal energy generation based on some of e-waste components" [2024] 10(11) Heliyon <https://www.sciencedirect.com/science/article/pii/S2405844024073316> accessed 20 November, 2024.*
27. *Ibid*
28. *Qusay Hassan, Sameer Algburi, Zuhair Sameen, Hayder Salman, Marek Jaszczur, "A review of hybrid renewable energy systems: Solar and wind-powered solutions: Challenges, opportunities, and policy implications" [2023] 20 Results in Engineering <https://www.sciencedirect.com/science/article/pii/S259012302300748X> accessed 20 November, 2024.*

SECTION 3- THE PATH FORWARD: PRIVATE SECTOR INVESTMENT IN NIGERIA'S TRANSMISSION SYSTEM

BENEFITS OF PRIVATE SECTOR INVESTMENTS IN THE POWER SECTOR

The Federal Government's decades-long stewardship of the transmission system has been marked by gross inefficiencies as highlighted above. Thus, to address these persistent challenges, the government must acknowledge its limitations and embrace private sector participation and create a conducive environment to foster private investment.

While private investment in power generation has been a mainstay for decades, the critical role of private capital in transmission infrastructure is now evident because an efficient transmission network is essential for a reliable and sustainable power system. Private sector participation in transmission has been pursued by developed and developing countries as a means of addressing critical challenges in the power sector generally with one or more of the four overlapping objectives: (i) introduce competition; (ii) attract fresh capital; (iii) improve financial and operational performance; and (iv) depoliticize the sector and reduce government influence.[29]

One of the most immediate advantages of private sector participation is the injection of capital. Governments often face financial constraints that hinder the expansion and modernization of power infrastructure. Private sector investments fill this gap by providing the necessary funding for constructing new power plants, upgrading existing facilities, and developing efficient transmission and distribution networks. This financial boost is vital for meeting the growing demand for energy and ensuring the reliability of electricity supply, particularly in developing nations

29. https://documents1.worldbank.org/curated/en/815021468042283537/pdf/More-power-to-India-the-challenge-of-electricity-distribution.pdf Accessed 23 November 2024

In addition to financial resources, private sector involvement brings invaluable project management expertise. Private investors are experienced in the planning, execution, and monitoring of large-scale infrastructure projects and have a host of experienced technical partners to work with. This expertise ensures that power projects are delivered on time, within budget, and to high-quality standards. Moreover, their emphasis on efficiency helps reduce delays and cost overruns, which are common in public sector-led initiatives.

Cost control techniques are another significant contribution of the private sector. By optimizing resource allocation and employing advanced management strategies, private players ensure that projects are implemented cost-effectively. This approach minimizes wastage and delivers maximum value, making electricity more affordable for end users. Furthermore, private sector entities often leverage sophisticated risk mitigation strategies, which help anticipate and address potential disruptions, ensuring a reliable and sustainable power supply and profitability of the projects.

Innovation is another hallmark of private sector investments in the power sector. Driven by competition and a focus on efficiency, private companies are at the forefront of adopting cutting-edge technologies. These advancements enhance the performance and reliability of power systems while reducing environmental impacts in accordance with the present climate conservation needs. For instance, private sector players have been pivotal in developing renewable energy solutions, such as solar in integrating energy storage systems to balance supply and demand effectively.

Private investments will also facilitate the expansion and modernization of transmission and distribution networks. A robust power grid is essential for ensuring equitable energy access and minimizing transmission losses. The private sector's ability to deploy advanced technologies and implement modern operational practices will significantly improve the efficiency and reliability of these networks.

Additionally, private sector participation brings access to technical and operational expertise. This knowledge transfer not only improves current power operations but also builds local capacity, enabling long-term sustainability in the sector. Private investors often introduce global best practices, which elevate the standards of the entire energy sector.

Private sector involvement will also have a catalytic effect on other segments of the power sector value chain. Beyond electricity generation and distribution, investments in ancillary services such as energy storage, demand-side management, and energy efficiency initiatives will create a more resilient and adaptive power sector. These developments further enhance the overall efficiency and reliability of electricity delivery.

The benefits of private sector investments extend well beyond the energy sector. Improved electricity reliability and affordability stimulates economic growth by attracting industrial and commercial investments. This creates jobs, enhances productivity, and improves the quality of life for citizens. A stable and efficient power supply is a critical enabler of development, fostering innovation, education, and health services.

ILLUSTRATIVE MARKETS

Several countries have successfully harnessed private investment to bolster their transmission networks.[30] **Brazil**, for instance, stands out as a prime example. A 2017 World Bank report highlighted the country's remarkable achievement in attracting nearly US$16 billion in private sector investment for its transmission network over a 20-year period.[31] Between 2018 and 2022, around US$11 billion have been invested in transmission from private investors and the Brazilian Development Bank (BNDES).

The Brazilian transmission industry is open to the private sector through concessions obtained in public auctions. In 2023 and 2024, Brazil organised three mega transmission auctions for around US$12 billion USD and conducted studies that helped clarify the need for hydrogen infrastructure.[32] This influx of capital fueled the expansion and modernization of Brazil's transmission infrastructure, significantly enhancing the country's power delivery capabilities.[33]

India, another notable case, has embraced public-private partnerships (PPPs) to address its growing electricity demand. Private sector involvement in transmission projects has accelerated the development of new transmission lines, improved grid reliability, and reduced transmission losses. In the Philippines, private investment has played a crucial role in upgrading the country's aging transmission system with the investment of close to US$4.2billion in a concession deal that closed in 2007. In Peru, 18 transmission projects of 220kV and 500kV lines for a total of 7,560km were implemented through private sector investment under a Build Own Operate and Transfer Model. By leveraging private sector expertise and capital, the Philippines has made significant strides in enhancing the efficiency and capacity of its power grid.

30) https://african.business/2023/05/energy-resources/africas-race-for-transmission-investment Accessed 23 November 2024
31) https://initiatives.weforum.org/playbook-of-solutions/case-study-details/brazil-country-platform/aJYTG0000000HaL4AU Accessed 24 November 2024
32) https://african.business/2023/05/energy-resources/africas-race-for-transmission-investment Accessed 24 November 2024

DERISKING THE SECTOR

Having established the benefits of private capital in the transmission value chain, however, to unlock the potential of private sector participation, it is critical to de-risk the transmission sector. Investors will be hesitant to commit capital unless structural issues are addressed, and market confidence is restored. The NESI has faced significant challenges in attracting and retaining private sector investment, particularly in the transmission segment. A key deterrent for investors is the inherent risk associated with the wire side of the industry.[34]

The privatization of Distribution Companies (Discos) and subsequent events have highlighted the complexities and risks involved in operating within the Nigerian electricity market. These challenges, including regulatory uncertainties, lack of cost reflective tariffs, payment defaults, foreign exchange fluctuations, inflation, insecurity and lack of ease in doing business have led to investor apprehension.

To successfully attract and retain private sector investment in the transmission sector, it is imperative to address these underlying risks. This requires a comprehensive approach that involves regulatory reforms, institutional changes, and financial sustainability measures. Fixing Nigeria's transmission grid requires bold steps toward embracing private sector investment. The government's acknowledgment of its limitations, coupled with strategic policies to attract and de-risk private capital, can unlock a new era of growth and stability in the power sector. By learning from global successes, Nigeria can chart a path forward that not only modernizes its transmission system but also accelerates the nation's economic development.

34) *https://www.tandfonline.com/doi/full/10.1080/23311916.2022.2157536#d1e337 Accessed 24 November 2024*

SECTION 4: OPTIONS FOR ATTRACTING PRIVATE SECTOR CAPITAL

PROLOGUE

As the preceding analysis has shown, Nigeria's power transmission network is in urgent need of investment to enhance and expand its infrastructure. This subsection explores three potential models for attracting private sector capital: (i) improving the existing network through concessions; (ii) developing new lines via independent power transmission projects; and (iii) privatisation.

Whilst the first solution involves implementing concessions to boost the efficiency and capacity of the current transmission network, the second solution centers on Independent Power Transmission (IPT) projects designed to extend the Grid to underserved areas. Privatisation simply involves transferring full ownership of transmission infrastructure to private entities. These strategies have the potential to draw in private investment, leverage advanced technology, and enhance service delivery.[35]

This subsection will also examine case studies from Peru and other countries that have successfully employed these models to provide valuable insights. Furthermore, it will assess Nigeria's legal framework to identify opportunities and challenges in attracting private sector investment for power transmission. By analyzing these solutions, this section aims to offer a roadmap for mobilizing private sector capital to transform Nigeria's power transmission landscape.

CONCESSION OF EXISTING NETWORKS

To attract private sector investment for the existing transmission network, Nigeria can consider breaking up the existing state-run transmission grid into zones or regions and concessioning these zones to private investors. This approach involves dividing the national grid into severable operable segments, with the operation of each to be undertaken by a different private entity under a concession agreement. The concessionaire would then have the obligation to develop, construct, operate and maintain the transmission network that falls within its purview in accordance with the terms of the concession agreement. Unbundling the Grid into smaller, more manageable zones would allow each concessionaire to concentrate on optimizing operations within their specific area. The introduction of multiple concessionaires increases accountability and competition among entities. In a landscape where each concessionaire strives to outperform its peers, service delivery improves overall, leading to enhanced consumer satisfaction. This structure would enable the Nigerian Electricity Regulatory Commission (NERC) exercise more effective regulatory oversight over smaller regional entities.

34) *PPI_2020_AnnualReport.pdf accessed 22 November 2024*

Advantages

This model can enhance efficiency, improve service delivery, and attract the necessary capital for infrastructure upgrades. At its core, it offers the state the opportunity to leverage private capital, expertise and innovation to enhance the performance and operational efficiency of the transmission sector.

In addition to these advantages: the state is able to transfer risks to private entities; free up its capital for investment in other aspects of national life; retain long-term ownership of the transmission assets, thus ensuring that public control over essential infrastructure is maintained, all whilst being assured of the hand-back of a better developed and rehabilitated network at the conclusion of the concession.[36]

Legal Framework

The enactment of the Nigerian Electricity Act 2023 lays the foundation for the implementation of a concession arrangement in the transmission sector as it permits the National Electricity Regulatory Commission to consider long-term concessions of old or new transmission lines under concession or commercial arrangement with private parties.[37]

The Electricity Act encourages private sector investment in Nigeria's transmission network by allowing private entities to participate in the development and operation of transmission infrastructure, aiming to enhance the network's efficiency and capacity[38] as well as enabling both the Federal and State Governments to enter into public-private partnership (PPP) arrangements with private companies to facilitate investment in the transmission network, promoting collaboration between the public and private sectors to improve and expand the infrastructure.[39] The Act supports the creation of a competitive electricity market and encourages private sector participation across the electricity value chain. This legal framework is essential for implementing a concession model.

The Electricity Act also provides for the unbundling of the transmission sector into separate entities by allowing for the demarcation of the operating system of a transmission licensee into a National Control Centre, Supplementary National Control Centre, and Regional Control Centres as may be necessary to facilitate interconnections and coordination of efficient transmission of generated power through the national grid.[40] This structure will be useful for facilitating the disaggregation of the national grid into component zones as may be required for the purpose of zonal/regional concessions.

36) *The Concession Model: A Very European Approach to Infrastructure | The National Interest accessed 22 November 2024.*
37) *Section 109(2), Electricity Act.*
38) *Section 109 of the Electricity Act 2023*
39) *Section 112 of the Electricity Act 2023*
40) *Section 108 of the Electricity Act 2023*

Ensuring Effective Concession Management

Beyond the existence of a framework for transmission, the approach by NERC and other relevant agencies in relation to concession must be reassessed if the participation of the private sector investors will yield the desired results.

Under a concession model, a private investor assumes responsibility for the operation, maintenance, refurbishment, and expansion of transmission infrastructure within a designated zone. To ensure that the concessionaire has sufficient control to manage the transmission system without undue government interference, several measures can be implemented.

Firstly, it is crucial to define clear contractual terms in the concession agreement. These terms should explicitly outline the roles and responsibilities of both the concessionaire and the government, ensuring that each party understands its obligations and limits.

Additionally, regulatory independence is essential. NERC must operate independently and transparently to provide fair oversight and regulation. This independence helps to maintain a balanced and unbiased regulatory environment, fostering trust and stability in the sector.

Moreover, robust performance monitoring and evaluation mechanisms should be implemented. These mechanisms are vital to ensure that concessionaires meet their obligations. Performance monitoring can include self-reporting procedures, independent audits, regular meetings, and the use of intelligent systems to automate data collection and reporting. By adopting these measures, the concession model can effectively enhance the efficiency and reliability of Nigeria's power transmission system.[41]

Further, to incentivize private investors to consider the concession model, it is important that the transmission charges dictated by the terms of the concession agreement are cost reflective and sufficient to facilitate a reasonable return on the concessionaire's investments over time. To this end, effective indexing of the regulatory asset base (RAB) is essential. The RAB encompasses all the infrastructure that the concessionaire expertly manages and reflects the aggregation of the value of investments that the concessionaire has made in connection with the network over time.[42] This base is vital for setting cost-reflective tariffs, the absence of which is currently one of the biggest problems plaguing the NESI.[43]

In addition to the foregoing, the concession model will be better enhanced and deployed, if there is some harmonization between the relevant state agencies involved in the concession process, including the Nigerian Electricity Regulatory Commission (NERC), the Bureau of Public Enterprises, and the Infrastructure Concession Regulatory Commission in relation to the procurement process..

41) *https://rosap.ntl.bts.gov/view/dot/64176/dot_64176_DS1.pdf accessed 22 November 2024*
42) *https://www.aer.gov.au/system/files/Fact%20sheet%20-%20Indexation%20of%20the%20regulatory%20asset%20base.pdf*
43) *https://energyforgrowth.org/article/what-will-cost-and-service-reflective-tariffs-mean-for-the-nigerian-electricity-sector/ accessed on 22 November 2024*

It is also important for NERC to draw useful lessons from the previous privatization efforts which is yet to achieve the desired results. For instance, we have observed that in the past, it has been typical for government entities acting as grantor parties in a concession to select the bidder that offers the most attractive commercial terms to the government in terms of financial bid. This, however, has often proven to be an ineffective approach as many of these bidders sometimes do not have a reliable and sustainable funding source nor the required technical capacity to undertake the project.

As such, it is important for the government to redefine its priorities in concession arrangements and place greater emphasis on the pathway that leads to optimal operational efficiency of the transmission sector. This may require ensuring that the preferred bidder displays world-class technical capacity and provides sufficient evidence of sustainable funding sources – comprising both long term debt financing and equity capital.[44] Where the project is ultimately operational and profitable, the government's financial interest in the project will be realised in the long term through (a) taxes imposed on the earnings of the concessionaire (b) taxes imposed on employees of the concessionaire (in addition to the benefit of employment generation) or (c) annual concession fee payments paid out of the revenue of the concessionaire.

As an offshoot of the foregoing, investors are also more likely to be willing to make direct investments into the sector if the state offers attractive commercial terms and arrangements, as opposed to a hefty upfront concession fee which may increase the financial demands on the private investors at the outset and therefore increase the barrier to entry.

Another means of enhancing the effectiveness of the concession model is the introduction of clearly defined benchmarks and key performance indicators (KPIs) to be satisfied by the concessionaire over the lifespan of the project. These obligations may be backstopped by: (a) performance security in favour of the grantor parties that may be encashed in the event of a failure of the concessionaire to meet the KPIs; and (b) a bond that may be encashed by the grantor parties in the event of a breach by the concessionaire of any of its payment obligations under the concession agreement that give rise to liquidated damages.

Case Study on Successful Concession: The Philippines' Concession Model

The privatization of the Philippines' power transmission sector was driven by the need to improve efficiency and reliability in the electricity supply. This process began with the enactment of the Electric Power Industry Reform Act (EPIRA) in 2001. In 2008, the Power Sector Assets and Liabilities Management Corporation (PSALM) and the National Transmission Corporation (TransCo) entered into a Concession Agreement with the National Grid Corporation of the Philippines (NGCP), granting NGCP the right to operate and maintain the transmission network.

44) *It is worth noting that one of the problems encountered by Discos was that a significant portion of the funding obtained by the distribution companies were short term funding. The failure to repay these debts has resulted in some of these Discos being taken over by creditors. The Abuja Electricity Distribution Company (AEDC) was taken over by the United Bank of Africa (UBA) and the Benin Electricity Distribution Company (BEDC), was taken over by Fidelity Bank and Afreximbank in 2022.*

Under the Concession Agreement, NGCP is responsible for the operation, maintenance, and expansion of the transmission network. The agreement, which commenced on January 15, 2009, is for 25 years and is renewable for another 25 years. NGCP paid an initial fee of $987.5 million and has continued to make semi-annual payments for over 20 years.[45]

TransCo retains ownership of the transmission assets, while NGCP handles the day-to-day operations and ensures compliance with regulatory standards set by the Department of Energy (DOE) and the Energy Regulatory Commission (ERC).

Today, NGCP continues to operate the transmission network under the terms of the Concession Agreement. The concession has been generally successful in improving the reliability and efficiency of the power transmission system as it now boasts of more than 21,000 circuit kilometers of lines, 20,000 transmission towers, and 140 substations.[46]

The concession model has significantly transformed the power transmission sector in the Philippines. Since the National Grid Corporation of the Philippines (NGCP) took over operations, there has been a substantial increase in investment. NGCP has committed billions of pesos annually to upgrade and expand the transmission network, ensuring that the infrastructure keeps pace with growing demand. Reliability has also seen marked improvements. The frequency and duration of power outages have decreased significantly, providing a more stable power supply to consumers.[47]

Operational efficiency has been another area where there has been significant progress. NGCP has implemented advanced technologies and best practices, which have streamlined operations and enhanced the efficiency of power transmission.

45) *Elyssa Lopez, "Developers ready to build more solar farms — they just can't connect them to the grid" https://pcij.org/2023/03/21/developers-ready-to-build-more-solar-farms-they-just-cant-connect-them-to-the-grid/ (Accessed November 28 2024)*
46) *https://www.ngcp.ph/operations#scope*
47) *https://www.coa.gov.ph/download/755/power-sector-assets-and-liabilities-management-corporation/7428/national-transmission-corporation-executive-summary-2018-2019.pdf accessed on 22 November 2024.*

INDEPENDENT POWER TRANSMISSION (IPT) FOR NEW LINES

Another option available for promoting greater private sector investment in the transmission network is the IPT model. This model, which bears some resemblance to the independent power producer (IPP) model, allows private entities to develop and operate transmission infrastructure independently of the main grid. Under the IPT model, the private investor engages in independent designing, financing, construction, operation, and maintenance of power transmission lines. [48]

The IPT model may prove useful for Nigeria in meeting its transmission infrastructure needs in view of Nigeria's significant transmission line deficit, particularly in the rural areas.

This is particularly true because TCN has previously estimated that it will require approximately US$ 4.2 billion dollars over a five-year period to rehabilitate and modernize existing facilities, complete projects already under construction and expand the network to 10GW.[49] Clearly, this is a financial need that a state-run entity will be unable to meet on its own, thus requiring significant private sector capital which may be provided via the IPT model.

Overview of the IPT model

The IPT model is undertaken via a contract which may adapt any of the alternative structures discussed subsequently in this paper. Once the contract is finalised, the private investor is responsible for building and operating the line or package of lines as set out in the contract. The private investor has no rights or responsibilities for the existing network or for new transmission investment other than the rights or responsibilities defined in the contract. The government, by allowing private investors to take responsibility for specific transmission projects, can therefore accelerate infrastructure development while focusing on regulatory and policy oversight. Under this model, the private investor is responsible for the availability of the transmission line on its own but is not accountable for the performance of the integrated transmission grid.[50]

IPTs derive their revenues from the annual payment made for the use of the lines. The annual payment to be received over the term of the contract is often a key bid parameter which is specified and established in the winning bid. While there may be limited scope for regulatory review of some payment aspects, the primary financial structure is set by the initial bid.[51]

IPTs are widely used globally, including in countries such as Mexico, Brazil, Chile, Colombia, Peru, and India.[52] Negotiations for an IPT in Pakistan are also underway.[53] Additionally, IPTs are increasingly being adopted in countries

48) *https://energyforgrowth.org/article/business-models-to-unlock-private-investment-in-sub-saharan-africas-electricity-transmission-sector/#:~:text=Independent%20Power%20Transmission%20(IPT)%3A,asset%20under%20a%20tendered%20contract.*
49) *https://pdf.usaid.zgov/pdf_docs/PA00MQ6N.pdf*
50) *https://documents1.worldbank.org/curated/en/794221496411403495/pdf/115521-WP-P152573-PUBLIC-June-6-SUPTAEnglishReportWeb.pdf*
51) *Ibid*
52) *Ibid*
53) *https://profit.pakistantoday.com.pk/2024/11/02/khyber-pakhtunkhwa-to-build-its-own-power-transmission-line/*

that previously granted exclusivity to private transmission companies. The United Kingdom, Canada, Australia, and the United States have introduced IPTs alongside existing private or government-financed transmission companies that previously had regional exclusivity.

In Peru, the use of IPTs have facilitated the installation of more than 6,000 km of transmission lines designed, built, and operated by the private sector under build-own-operate-transfer (BOOT) contracts, whereas in India the private sector has developed over 21,000 km of lines between 2006 and 2016.[54]

Structuring Options for IPT

In deploying IPTs under public-private partnerships, it is important to ensure that the contract delineates clear and effective arrangements that govern the financing, ownership, construction, operation, and maintenance of transmission projects. Some of the public-private partnership structures that may be employed in this regard include:[55]

Build-Own-Operate (BOO) Model

Under the BOO model, the private investor is responsible for building, owning, and operating the transmission line indefinitely. Here, the private investor bears the financing obligations as well as the construction, operations and maintenance risks. The private entity owns the assets and earns revenue through annuity payments regulated by the government or long-term contracts with grid operators and power producers.[56] Essentially, the private investor is not obligated to transfer its ownership to the government but will remain regulated in term of use of the lines, third party access, performance standards or key performance indicators (KPIs).

54) *https://documents1.worldbank.org/curated/en/794221496411403495/pdf/115521-WP-P152573-PUBLIC-June-6-SUPTAEnglishReportWeb.pdf*
55) *Ibid.*
56) *This model is applied in Chile for IPT contracts.*

Build-Own-Operate-Transfer (BOOT) Model

Under the BOOT model, the private entity also earns revenue through annuity payments regulated by the government or long-term contracts with grid operators and power producers. Similar to the BOO model above, the private investor in the BOOT Model bears the financing obligations as well as the construction, operations and maintenance risks. The ownership of the IPT resides in the private investor, who also has the obligation to operate and maintain the IPT for the fixed period determined under the contract, and upon the expiration of the fixed period, ownership is transferred to the state.[57] As with BOO, a portion of the annuity payments may be conditioned on the transmission infrastructure meeting pre-defined KPIs

Build-Operate-Transfer (BOT) Model

Here, the private entity builds and operates the transmission line for a fixed concession period as determined under the contract. During the period of this contract, ownership may reside in the state or its relevant entity whilst possession resides in the private investor. Upon expiration of the fixed period, possession of the IPT is then transferred to the government or public utility agency. Under the BOT Model, the private investor also bears the financing obligations as well as the construction, operations and maintenance risks.

Build-Transfer-Operate (BTO) Model

This model is similar to the BOT model above, save for the fact that the ownership of the asset is transferred to the state at a much earlier stage in the life of the Project, such as at the post commission stage. However, the private entity may still be engaged to merely operate and maintain the lines whilst ownership remain vested on government agency.

The Mantaro-Socabaya Transmission Project[58]

The Mantaro-Socabaya Transmission Project in Peru serves as a particularly exemplary case of utilizing private sector involvement in developing critical energy infrastructure through the IPT model. This project highlights several best practices and challenges associated with designing, financing, and operating large-scale transmission systems, particularly in emerging markets.

57) *This model is applied in Brazil, Peru, and India.*

58) *World Bank Institute, "Best Practices in Public-Private Partnerships Financing in Latin America: the role of innovative approaches" https://www.ppiaf.org/sites/default/files/documents/2012-01/BestPracticesroleofinnovativeapproaches.pdf (Accessed November 23 2024); https://ppi.worldbank.org/en/snapshots/project/mantaro-marcona-socabaya-montalvo-transmission-line-8990 World Bank Institute, "Best Practices in Public-Private Partnerships Financing in Latin America: the role of innovative approaches" https://www.ppiaf.org/sites/default/files/documents/2012-01/BestPracticesroleofinnovativeapproaches.pdf (Accessed November 23 2024); https://ppi.worldbank.org/en/snapshots/project/mantaro-marcona-socabaya-montalvo-transmission-line-8990*

The project underscored the significance of competitive bidding in attracting private investment while ensuring cost efficiency. The concession for the Mantaro-Socabaya transmission line was awarded through a transparent auction process, with clear guidelines for evaluation and award.[59] The project's success was also partly attributed to Peru's stable and predictable regulatory environment. The energy regulator, Osinergmin, ensured clear tariff-setting mechanisms and monitored compliance with contractual obligations.

The Mantaro-Socabaya project also demonstrated the importance of appropriately allocating risks between the government and private developers to enhance bankability. Construction risks, operational risks, and certain financial risks were transferred to the private concessionaire, while the government mitigated risks related to land acquisition and regulatory approvals.

The involvement of multilateral institutions, such as the Inter-American Development Bank (IDB), played a crucial role in financing and de-risking the project. These institutions provided concessional financing and technical assistance to ensure the project's success. Ultimately, the Mantaro-Socabaya Transmission Project demonstrates how well-structured IPT models can attract private sector investment, enhance grid reliability, and support national energy goals.

From the foregoing, an adoption of the IPT model should address the long-standing issues of inefficiency, grid unreliability and inadequate capacity because the private investor undertakes the construction, operation and maintenance of the transmission networks, while the government focuses on regulation and oversight.

PRIVATIZATION

Privatization relates to the transfer of full ownership in the transmission infrastructure to a private-sector party. This may occur in relation to a single transmission corridor, by region or in respect of the entire transmission system in a country. Upon completion of the privatization process, the transmission company is typically restructured, management processes are re-aligned, and the government's role will be limited to regulatory activities except in scenarios where the government retains some shareholding in the new transmission company.

The privatization model can be implemented in any of the following ways:

Share Sale:

This is where all or the majority of the shares of the existing transmission company are transferred to a private entity. With this structure, the existing transmission company and its licenses remain unchanged and the transfer is effected only at the shareholding level.

59) *https://www.investinperu.pe/RepositorioAPS/1/2/JER/PC_ELECTRO_MANTARO_MANCORA/PPT_MANTARO_MONTALVO_ENG.pdf*

Asset Sale

By this structure, there is a sale of the transmission business as a going concern to the private entity. Thus, the private party would be expected to form a new transmission company and acquire the relevant transmission licenses in the name of the new entity; or

Statutory Transfer

This is where legislation is passed authorizing the transfer of the transmission assets or shareholding, to a private party. With this option, the transfer procedure, the rights and obligations of the parties, the treatment of legacy liabilities etc. would be prescribed by the legislation

The major push back for this model is that most governments prefer to retain the power to control the electricity supply of their country as well as the fear that the privatization process will result in increased tariffs. However, a carefully managed privatization effort with appropriate regulation will ensure that the expected results in terms of improved and resilient transmission network is achieved.

Key Challenges in Attracting Financing for Transmission Financing

Some of the most fundamental challenges likely to be encountered in effecting the mechanisms proposed above in Nigeria include:

Regulatory and Policy Uncertainty

As illustrated above with the Peruvian experience, regulatory certainty plays a significant role in attracting private partners as well as financiers to participate in the offerings of the government in the power sector. Frequent changes to energy policies and lack of a stable regulatory framework will deter private investment. This fear is common amongst investors in Nigeria who have over time seen a change of administration result in a change of policy.

At times, a change in administration has also led to a change of posture in respect of contracts, as is the case with the dispute between the government and Sunrise Power and Transmission Ltd in connection with the US$6 billion Build, Operate and Transfer contract for the development of the 3050mw hydroelectric power project Mambilla power project, as well as the dispute in connection with the terminated Ajaokuta steel concession agreement. Even more recently, the Ministry of Aviation and Aerospace Development announced a purported cancellation of the airport concessions undertaken by the Buhari administration. These instances of disregard for sanctity of contracts increase the risk profile of investments in Nigeria and discourage both domestic and foreign investment.

Further, since the enactment of the Electricity Act and the advent of sections 75(4), 77 and 78 of the Electricity Act, there has been increased concerns in the market as to the risk of expropriation of investments in electricity undertakings. These sections jointly empower the National Electricity Regulatory Commission to cancel the license of a failing licensee,[60] sell the undertaking and vest same in the selected purchaser.[61]

Economic Issues

In addition to the foregoing, the current macroeconomic instability in Nigeria has also served to discourage investment. In recent times, the economy has been hit by:

- soaring inflation rates (which increased to 34.2 percent in June 2024, marking a 28-year high)[62] having a significant impact on project returns and the ability of projects to repay financing;
- exchange rate volatility and illiquidity in the foreign exchange market which saw many investors face the challenge of trapped funds arising from the inability to repatriate their capital, thereby increasing the foreign exchange risk considerations of investors and financiers;
- rising interest rates in Nigeria create financial uncertainty and increase project costs (especially as interest rates hit an all-time high of 27.25 percent in September 2024); [63]
- low credit ratings which increase the country's risk and reduce the value of government support to projects;[64] and
- significant level of indebtedness in the power sector leading to an extremely high level of legacy debt in the sector,[85] hence, investors remain sceptical about lending to projects within the Nigerian power sector.

Social Issues

Nigeria's insecurity issues have persisted for years, and the nefarious activities of vandals continue to sabotage what little progress the sector manages to record. This often takes the form of cable theft, transformer vandalism and other similar activities. In August 2024, it was reported that about 20 towers were pulled down by vandals.[66] These acts also serve to increase the obstacles to doing business in Nigeria and discourage investment in the power sector.

60) *Section 75(4), Electricity Act.*
61) *Section 77 and 78 of the Electricity Act.*
62) *https://nesgroup.org/blog/Nigeria%E2%80%99s-inflation-rate-rose-to-a-28-year-high-in-June-2024*
63) *https://tradingeconomics.com/nigeria/interest-rate*
64) *https://businessday.ng/news/article/moodys-cuts-nigerias-credit-rating-further-into-junk/*
65) *As at July 2024, there was a N1. 3 trillion debt owed Generation Companies (Gencos) which the government has now taken steps to reduce. https://www.thisdaylive.com/index.php/2024/08/20/electricity-supply-fg-pays-n205bn-from-n1-3tn-owed-power-generation-companies.*
66) *https://punchng.com/electricity-woes-deepen-as-vandalism-surges-across-power-infrastructure/#google_vignette*

SECTION 5: CRITICAL SUCCESS FACTORS

Having analyzed the Grid constraints and the diverse issues plaguing the transmission network in the NESI and the options for investment in transmission infrastructure moving forward, it has become imperative to consider the factors that are critical for the success of any potential investment and/or reforms in Nigeria's transmission network infrastructure

LEGAL FRAMEWORK

A robust legal framework is the backbone for attracting investment for transmission infrastructure in several ways, from defining the rights and obligation of all parties involved in a transmission project to providing for cost reflective tariff structures that guarantee investors return on investment. Investors are generally wary to make investments in countries with unstable and unpredictable legal frameworks, thus it is critical that applicable laws and regulations must be one that establish rules, protections, and incentives necessary to ensure project viability and bankability. Beyond the enactment of laws, the relevant agencies and indeed the government itself must be seen to implement and enforce the laws as required.[67] Investors need assurance that policies and regulations will be consistently enforced, free from political interference. For Nigeria, strengthening the NERC to operate autonomously and implementing predictable policies could build investor confidence.

Presently, the Act provides for various arrangements for investment in the transmission network in Nigeria. The Act permits NERC to approve an application by a non-licensee for the following investment arrangements:

- A long-term concession of old or new transmission lines under any concession or commercial arrangement with the TSP as may be deemed necessary;
- Any concession or commercial arrangement between concessioners and successor transmission licensee for expansion of the transmission network; and
- Project finance by private investors whereby such investors finance, build, own and maintain parts of the transmission network.[68]

Further, the Act provides that Federal or State Governments may enter into a public-private partnership arrangement with private companies for investment in the transmission network in accordance with section 109 of the Act and other relevant framework on infrastructure concessions and public-private partnership.[69]

67) *https://nerc.gov.ng/wp-content/uploads/2015/02/NERC%20INVESTMENT%20IN%20ELECTRCICITY%20NETWORKS%20REGULATION%202015.pdf Accessed 21 November 2024*
68) *Section 109(2) of the Electricity Act*
69) *Section 112 of the Electricity Act*

Another important legislation is the NERC Regulations for Investments in Electricity Networks in Nigeria 2015 (the Regulation) which provides a framework for investing in the transmission network in Nigeria. The objective of this Regulation to create strong incentives to encourage the TCN and the Discos to make appropriate and sustainable investments in capacity expansion.[70] However, a good read of the Regulations only goes to show that its provisions dwell majorly on the procedure for investing in electricity networks without providing detailed incentives as expected.[71]

Thus, the extent and the manner in which laws/regulations are implemented will determine, to a large extent, the level of interest from prospective investors.

RISK ALLOCATION

While private funding offers numerous advantages, it also introduces specific constraints and requirements that governments must carefully navigate. Opting for a private funding model to finance electricity transmission infrastructure requires the government to engage in the negotiation of complex commercial transactions, often guided by well-established market standards. This complexity is particularly pronounced in project finance, which is the primary financing approach for Independent Power Transmission (IPT) projects.

A critical determinant of the success or failure of a privately funded transmission project lies in the allocation of risks. Effective risk allocation involves identifying and assigning each risk to the party best equipped to mitigate and manage it. This principle underscores the importance of adhering to the "golden rule" of risk management which is to allocate risks to the party with the optimal capacity to control, reduce, and handle them. In other words, it means such party has the best opportunity to reduce the likelihood of the risk materializing and to control the consequence if the risk does materialize.

Typically, design, construction, commissioning, operations, maintenance, revenues, and financial risks are to be generally borne by the private party while political, legal, land acquisition risks are typically borne by the state party.

Shifting risks to private investors without consideration of their ability to manage those risks can lead to unintended consequences. Such an approach often results in higher project costs or, in the worst-case scenario, renders the project unbankable.[72] Conversely, assigning risks appropriately by ensuring that each party handles the risks within its domain of expertise—helps to de-risk the project. This not only reduces overall costs but also contributes to more affordable final tariffs, making the project financially sustainable and socially equitable.

To encourage investment in the sector, it is important that the state party retains a reasonable portion of financial and revenue risks by offering relevant viability gap funding to the private party alongside provisions of guarantees and/or indemnities as may be necessary based on the dynamics of the specific project and the financial complexities.

72) *Second Edition PPA.pdf pp 57*

Ultimately, successful financing of electricity transmission through Public-Private Partnerships (PPPs) requires striking a delicate balance in risk allocation. Governments must ensure that while private investors are incentivized, the risk-sharing framework promotes efficiency, affordability, and bankability. By adhering to these principles, Nigeria can attract the necessary private investment to expand and modernize its transmission infrastructure, paving the way for enhanced energy access and economic growth.

LAND ACQUISITION AND RIGHT OF WAY

Another critical success factor for a bankable transmission financing, especially as regards grid extension projects, is the process and framework for the acquisition of land and right of way. Given that transmission lines may span hundreds of kilometers, large stretches of land are required, and these may be owned by national/state/local governments or private individuals or communal lands.

Therefore, to implement an IPT, the risks associated with land acquisition/right of way should be borne by the government or a public sector entity as these are largely within their control. For instance, under the Land Use Act 1978 (LUA), lands in urban areas are under the control and management of the Governor of each State[73]. In the same vein, the government has the power to compulsorily acquire land for overriding public purposes and provide adequate compensation to the affected party.[74] It is useful to note that in some instances, a private party may be charged with the responsibility for procuring land rights. However, in this instance, the government will be required to provide the private entity with the necessary authorizations or support to execute same.[75]

In addition to ownership and local opposition, funding for acquiring the land and compensating the various stakeholders may be an obstacle too. Investors can play an important role, working with the government, to ensure that adequate funding is available to make payment, and the compensation is fair and is done promptly. Land issues should be resolved before the agreement with the private investor is concluded.

73) *Section 1 of the LUA*
74) *Sections 28&29 of the LUA*
75) *US Department of Commerce, "Understanding Power Transmission Financing" Retrieved from www.cldp.doc.gov Accessed on 25 November 2024*

GOVERNMENT SUPPORT

While private capital available for deployment is at historic highs, investors remain hesitant, particularly in markets burdened by construction and merchant risks. This hesitation is even more pronounced in emerging economies like Nigeria, where political, regulatory, and currency risks compound the challenges of financing electricity transmission infrastructure. These risks inflate the cost of financing, deterring private investors from committing to essential projects. However, strategic interventions such as government-backed credit enhancements and risk mitigation instruments can transform the investment climate. By government retaining specific risks or transferring those risks to third parties—such as financial institutions, sovereign entities, or multilateral organizations—credit enhancements can stabilize cash flows, improve recovery potential, and bolster project ratings, making transmission infrastructure investments more appealing to private capital.

The involvement of multilateral institutions in providing credit enhancements plays a pivotal role in de-risking projects. Instruments like partial guarantees or guarantees for recovery not only enhance investor confidence but also provide much-needed resilience to project finances in the face of sovereign or economic stress.

WORLD BANK GUARANTEES

Guarantees issued by the World Bank have facilitated investments in high-risk renewable energy projects by offsetting political and operational uncertainties.[76] A good example that comes close to home is the Azura-Edo independent power plant.[77] In Azura, NBET's payment's obligations were backstopped and guaranteed by the World Bank thus effectively derisking the project for the project sponsors and lenders. Such initiatives highlight the potential for Nigeria's government to leverage its sovereign balance sheet, alongside support from multilateral lending institutions, to attract private sector participation in electricity transmission.

INDEMNITIES

This refers to a contractual agreement where one party (usually the sponsor or the government) agrees to compensate another for any losses or damage incurred. In the context of transmission networks, indemnity can protect investors from specific risks, such as construction delays or regulatory changes, thereby making investments more secure. In PPPs, the state party is usually better equipped to provide indemnities against damages caused regulatory risk (such as land acquisition or permit approvals) and demand risk (such as revenue shortfall etc.), thereby reducing investors' exposure to project risks. Accordingly, states like Nigeria that intends to attract fresh investment in the sector should consider providing relevant indemnities or guarantees (where not estopped by law) in PPP arrangements to ensure the bankability of these transmission projects and to bolster investor confidence in the sector.

76) *A notable example is the US$500 million partial guarantee provided by World bank to Argentina's RenovAr program to develop the country's renewables sector. https://blogs.worldbank.org/en/ppps/credit-enhancement-boost-private-capital-infrastructure accessed 21 November 2024*

77) *Nigeria's first true project-financed independent power plan which received funding of about $900 million, provided by 20 equity providers and international*

PUT AND CALL OPTION

This provides termination payment assurances by providing a safety net for investors by offering the right (but not the obligation) to sell or purchase equity at predetermined prices. This mechanism helps to mitigate the risk of early termination and ensures financial stability for investors. This credit enhancement option has also been employed by the federal government in the Azura-Edo IPP in enhancing the bankability of the project, with the Nigerian government agreeing to a put and call option agreement to address termination risks.[78] The PCOA structure was successful in this instance and is also very commonly employed in concession arrangements other jurisdictions in Africa and beyond.

OFFTAKE RISK GUARANTEES

These guarantees ensure that the transmission infrastructure built will be utilized and paid for by a reliable offtaker, typically a government entity or utility company. This mechanism involves securing guaranteed revenues by ensuring that the expected revenue will always be paid, even when demand fluctuates. This helps to reduce the revenue risk for investors, as they are assured of a steady income stream from the provision of transmission services.

This could also be structured as revenue shortfall guarantee or indemnity and through this approach, the government shares the demand or revenue risk in the project. Basically, the government will undertake to compensate the private developer of a transmission infrastructure for the deficit, if the actual revenue received from the operationalization of the project is less than the projected revenue, thus removing the risk and uncertainty of the annual revenue.

CAPITAL CONTRIBUTIONS

This is a form of financial support provided by the government to cover the shortfall between project revenues and costs, making otherwise unviable projects attractive to private investors. This usually involves a grant to cover a portion of the project costs, thereby reducing the financial burden on private investors.

Usually, this support bridges the shortfall between a project's revenues and whole-of-life-cycle costs, after providing for reasonable returns to private investors. The ultimate goal here is to make projects commercially viable to private investors while also managing user affordability.

While credit enhancements are not the total solution, their strategic application, coupled with sound project planning and governance, could close critical financing gaps, ensuring that much-needed transmission infrastructure is developed to support Nigeria's energy transition and economic growth. Over time, as the electricity market become stabilized, investors will be less inclined to request less for government support.

78) *This ensured that in the event of termination, investors could recover their investments with no negative impact on FGN's balance sheet. This PCOA allowed the project company to put the plant (or its shares) to the FGN in nearly all circumstances where the PPA is terminated early and obliges FGN to pay a purchase price.https://thedocs.worldbank.org/en/doc/629011518200593880-0100022018/original/BriefsGuaranteesNigeriaAzuraEdo.pdf Accessed 25 November 2024*

RESOLVING LIQUIDITY IN THE SECTOR

The power sector operates with a one-directional flow of electricity from generating companies (Gencos) to consumers, while the corresponding revenue flows in the opposite direction, starting with consumers' payments to distribution companies (Discos). Unfortunately, Discos often fail to remit full payment for power supplied due to high aggregate technical, commercial, and collection (ATC&C) losses, inadequate generation and transmission infrastructure, lack of cost-reflective tariffs, and low collection efficiency. These issues are compounded by mounting debts owed by government entities and significant distribution losses, which recent studies show exceed fifty percent (50%). This means that more than half of the power generated is either lost or unpaid, creating a systemic financial strain that no industry can withstand without intervention.

To stabilize the sector and further attract investors, the Nigerian government implemented measures such as creating the Nigerian Bulk Electricity Trading Plc (NBET) as a creditworthy intermediary to de-risk the market and ensure Gencos are insulated from Disco payment risks, which unfortunately hasn't been successful in de-risking the market. A sustainable solution which has now been implemented by the NERC is the issuance of trading licenses to phase out the NBET regime. Further, the government could explore strengthening NBET's liquidity through a proposed medium-term bond program with guarantees to address payment risks and ensure market stability. Without such long-term funding mechanisms, the power sector risks further financial distress, threatening its viability and ability to attract necessary investments.[79]

From the foregoing, it is clear that adopting mechanisms to improve the liquidity the sector is imperative if the country must attract investment in transmission infrastructure because investors must have a clear line of sight on the consistent flow of revenue. Some of these initiatives include:

GOVERNMENT FUNDING INTERVENTIONS

Direct financial support from the government can bridge funding gaps and indicate commitment to the sector. This would provide immediate relief and stability, encouraging private investors to invest in the power sector.

79) *This ensured that in the event of termination, investors could recover their investments with no negative impact on FGN's balance sheet. This PCOA allowed the project company to put the plant (or its shares) to the FGN in nearly all circumstances where the PPA is terminated early and obliges FGN to pay a purchase price.https://thedocs.worldbank.org/en/doc/629011518200593880-0100022018/original/BriefsGuaranteesNigeriaAzuraEdo.pdf Accessed 25 November 2024*

COMMITMENT TO COST-REFLECTIVE TARIFFS

Cost-reflective tariffs will help to provide a predictable revenue stream and investors are more likely to invest in a sector where they can expect a reasonable return on their investment. Also, where consumers are charged based on the true cost of the infrastructure, they are incentivized to use same more efficiently. This can lead to reduced overall demand and lower peak loads, which in turn reduces the strain on the transmission network. Given that electricity is a social investment, it is however critical that the revised tariffs are truly cost reflective and not a mechanism for profiteering. In Nigeria, similar reforms, backed by political will to implement and stick to it, could incentivize private investments by ensuring predictable and sustainable revenue streams.

PRIVATE INVESTMENT MOBILIZATION

Some mechanisms that can be employed to encourage private entities to invest in transmission infrastructure include the increased adoption of PPP arrangements, provision of de-risking instruments like guarantees, insurance and hedging mechanisms by the government, provision of fiscal incentives like tax breaks, subsidies and other financial incentives. Further, private investment may be mobilized by creating a stable and predictable regulatory environment through transparent policies and processes, consistent enforcement, providing technical assistance and capacity-building programs that enhance the skills and knowledge of local stakeholders.

A good example of a private investment mobilization strategy is the Nigerian Electrification Project which is a project supported by the world bank and the African Development Bank aimed at connecting rural communities to the Grid and improve electricity access. This project has mobilized significant private sector participation, enhancing the reach and reliability of Nigeria's transmission network. Although this model may not fit wholistically for transmission infrastructure, however, implementing a bespoke scheme that is tailored towards attracting certain categories of investors in the development of transmission networks will be helpful.

Another model for harnessing private investment will be a government-led initiative to raise funds from the capital market by way of creating special funds for investing in electricity infrastructure. This will also help with resolving foreign exchange issues given that the funds will be naira denominated.

IMPROVED REGULATORY OVERSIGHT

Strengthening NERC's capacity and independence is crucial for creating a stable regulatory environment that attracts private investment. Enhancing the capacity and independence of regulatory bodies like NERC ensures that regulations are enforced consistently and transparently and this would help build investor trust as there is a stable and predictable regulatory environment. Further, engaging in stakeholder engagement with NERC during regulatory processes ensures that the concerns of the stakeholders are addressed and that regulations are designed to meet the needs of all parties, further improving the attractiveness of the sector to investors. It is also important that state governments setting up their relevant state regulatory body take a cue from the failures and successes of NERC.

POLITICAL WILL AND STABILITY

The conduct of the government and, indeed, non-state actors may pose substantial risk to projects in the sector, examples of such conduct including the implementation of policies that may have a negative impact on the viability of the relevant projects, introduction or amendment of fiscal regimes, as well as the revocation of relevant authorizations granted with respect to the projects, including rights of occupancy in respect of real property. Against this backdrop, a stable political climate and political will of the government to favour and ease investments in the power sector becomes a critical catalyst for attracting private investment into Nigeria's transmission network.

Given the long-term nature of transmission projects, it is important that the electricity sector is duly insulated from political influence and occurrences that could be occasioned by regime change and subsequent administrations with agendas adverse to existing policies and regulations.

In the context of transmission PPP arrangements, it is critical that government support granted to private investors in the form of guarantees, indemnities etc. are properly done with valid legal instruments to ensure that that a regime change will not affect the issuance and/or continued validity of these instruments.

Whilst acknowledging the sensitivity of public policy issues especially in relation to tariff regimes, it is also important that government not allow the fear and repercussions of public outcry on sensitive issues like implementing cost-reflective tariffs, affect or hinder the financial sustainability in Nigeria's electricity sector.

FOREIGN EXCHANGE STABILITY/AVAILABILITY

Stable foreign exchange rates influence investment decisions. Given that the power sector often relies on imported equipment and international financing, the stability of foreign exchange rates and availability are a critical part of investment decisions because volatile exchange rates can deter investors as they face the risks of eroded returns and increased the cost of financing. Foreign investors should be confident in their ability to repatriate profits without losses to currency depreciation. Therefore, maintaining macroeconomic stability is key to making the sector more attractive to foreign investors. Whilst it may be impossible to commit to and ensure that forex and exchange rates will be stable throughout a project's lifecycle, the provision of guarantees, commitments and/or assurances in relation to forex availability, convertibility and repatriation is possible for the government and will go a long way in boosting investor confidence.

ENFORCEMENT OF TECHNICAL AND OPERATIONAL PERFORMANCE STANDARDS

They include grid stability, quality of service and environmental compliance requirements, that invariably ensure the quality and reliability of the transmission network. Weak enforcement in Nigeria's electricity sector has led to grid collapses, discouraging investments in generation and transmission infrastructure. Enforcing technical standards helps maintain the reliability and safety of the network, which is crucial for investor confidence. Operational performance standards drive efficiency and reduce operational risks and losses, thereby improving the financial performance of the network and enhancing investor trust.

DISPUTE RESOLUTION

Establishments of Specialized Rules

As the power sector develops, it is becoming increasingly necessary to establish specialized court divisions for addressing conflicts and resolving disputes expeditiously and efficiently. Investors are more likely to invest in a legal system which is predictable and efficient and unfortunately, the current judicial system in the country does not offer much comfort in that regard especially in relation to adjudicating of specialized electricity issues. We do not think the creation of specialized courts is the solution (as this could open up more jurisdictional issues), however, it could be helpful to create specialized electricity divisions and rules of court in the existing court hierarchies. This will be helpful in ensuring that the courts adjudicate electricity-related matters in a commercially effective manner. Accordingly, there will also be a need to conduct and engage in extensive training and sensitization programs for judges and legal practitioners on the technicalities of the sector.

Strong Contractual Mechanisms

Age long disputes in the power sector have created bottlenecks, discouraging new investors. A strong contractual and dispute resolution mechanism will have a reassuring impact on investors. Well-defined contracts with robust dispute resolution mechanisms are essential to protect the interests of investors and reduce perceived investment risks. This could entail the use of international arbitration rules and the provision for expert determinations as opposed to the use of the courts.

SECTION 6: WHAT NERC CAN DO: NEXT STEPS AND ACTION PLAN

PREAMBLE

As the primary regulator of the Nigeria's electricity sector, NERC is crucial to fostering a stable, transparent, and investment friendly environment for investors within the transmission value chain. Beyond setting tariffs, NERC's role extends to establishing a regulatory framework that aligns with international best practices, ensuring efficient market operations, enforcing compliance, and promoting equitable access to transmission infrastructure.

Central to this mandate is NERC's independence and impartiality in administering its duties, as regulatory credibility directly influences investor confidence. Globally, power sector regulators play a critical role in attracting investments by ensuring fair competition, minimizing regulatory uncertainties and providing predictable policy environments. For Nigeria, this necessitates proactive measures by NERC to establish itself as a trustworthy and transparent regulator. To achieve this, NERC and indeed, the Federal Government of Nigeria must adopt a phased approach, encompassing short term, medium-term and long-term strategies. These should focus on enhancing institutional capacity, strengthening governance structures, and aligning regulatory frameworks with global standards.

SHORT TERM ACTION PLAN

Improved Security Across All Transmission Lines and Network

NERC should prioritize enhanced security measures to safeguard Nigeria's power transmission infrastructure, given the alarming rise in vandalism. [80]

To address this, NERC should work together with the National Security Adviser in deploying surveillance technologies such as drones and remote sensors to monitor and protect transmission lines. It will also be useful for NERC to engage local communities to serve as stewards of these assets as this can help deter sabotage and foster shared responsibility.

80) *From January to August 2024, 63 power transmission towers across the country were destroyed , including the complete collapse of 17 towers, with critical components like conductors and underground cables stolen. Notable cases include the collapse of Towers 388, 377, and 378 along major transmission lines in Bauchi, Gombe, and Damaturu, alongside damage to multiple towers in Port Harcourt, Enugu, Kaduna, Kano, and Benin. The consequences of these acts are dire, undermining the Federal Government's efforts to stabilize power generation, which recently rose to 5GW from 4GW https://theelectricityhub.com/vandals-destroyed-63-power-transmission-towers-in-nigeria-from-january-to-august-2024-severely-impacting-electricity-supply-in-affected-regions/*

Rebirth of NERC

A call for pro-activeness has been made and there is a need for a paradigm shift in the philosophy, ethos and working systems of the NERC as an institutional body.

It is important for NERC to move from a regulator focused on imposing and enforcing obligations and sanctions alone to an enabler of industry who can be seen by private players as being bold and protective of the participants in the NESI.

Staff Training and Re-Orientation

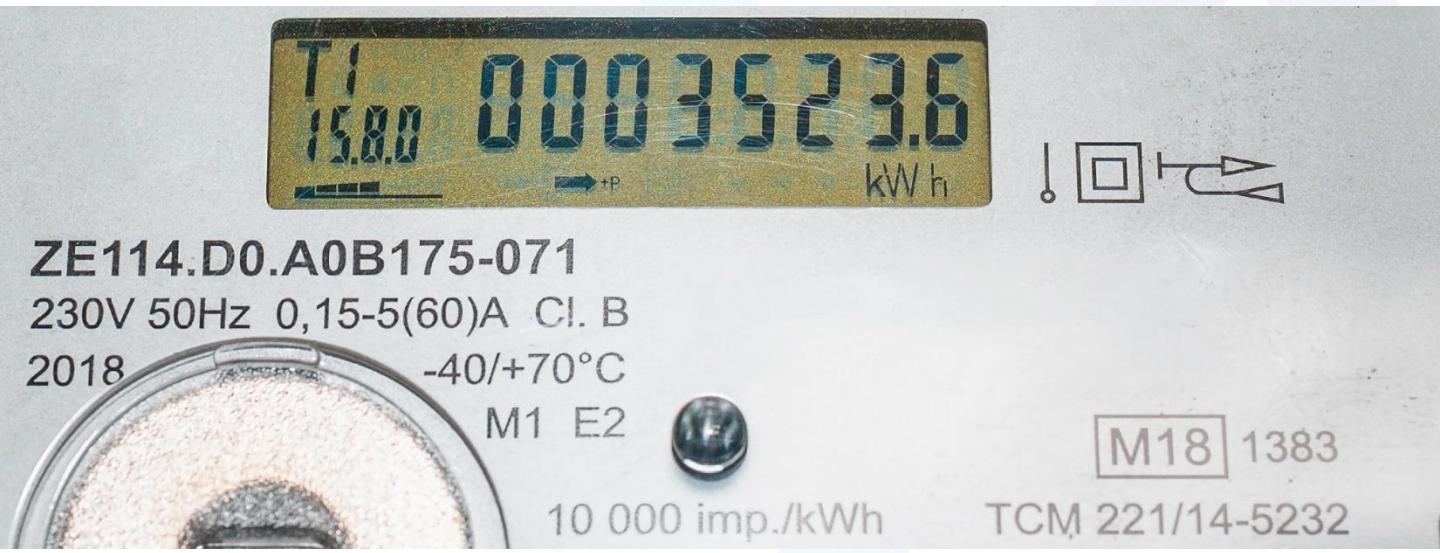
Building institutional capacity through targeted training programs to equip personnel with the skills required to handle complex transmission systems.

NERC and other stakeholders should collaborate with international organizations, technology providers, and academic institutions to design training modules focusing on critical areas such as advanced grid diagnostics, renewable energy integration, and regulatory best practices.

knowledge-transfer initiatives, where international experts train local staff, can help bridge the gap between existing practices and global standards including grid optimization strategies, safety protocols, and modern operational frameworks.

Tariff Framework

NERC should adopt a Regulatory Asset Base (RAB) model that aligns tariffs with investments in transmission infrastructure. Establishing predictable, cost-reflective tariffs will reassure investors of viable returns.



Comprehensive Order/Regulation on the Implementation of PPPs in the Transmission Sector

As mentioned earlier, the Act[81] already lays the foundation for a framework for the provision of various arrangements for investment in the transmission network in Nigeria. However, there is no ancillary regulation made pursuant to these provisions to specifically regulate the implementation of PPPs in the transmission sector. Notwithstanding the existence of general regulations and laws in relation to PPPs in the country, it would be helpful for NERC to consider issuing subsidiary regulation for the implementation of PPPs for transmission infrastructure thus offering a well thought out and clearly laid out plan for the sector to this effect.

In addition, NERC must endeavour to enforce strict compliance with existing regulatory frameworks such as the Grid Code and Distribution Code.

Immediate Improvement of Operational Efficiency and Maintenance Practices

Pending the overhauling of the current grid infrastructure, to enhance maintenance practices and reduce transmission losses and system instability, emergency repair systems should be prioritized to address faults quickly and minimize downtime. There is also a need for improved coordination between GenCos, TCN, and DisCos to achieve efficient load allocation and grid stability, preventing overloads or underutilization of transmission capacity. Additionally, the introduction of real-time monitoring systems will enable early detection of issues such as equipment failures, line disruptions, or power fluctuations, facilitating timely interventions and reducing prolonged outages or energy wastage. More practically, spare transformers should be deployed prioritizing strategic areas with high demand like Lagos and Abuja.

Undertake Quick Win Projects

Government may need to intervene to undertake some projects which are low hanging fruits and can positively impact the stability of the Grid. For instance, there should be an upgrade to critical transmission lines and prioritize projects with high impact, such as resolving bottlenecks in major transmission corridors like the Lagos-Ogun- Ibadan and Abuja-Kano lines.

Licensing

As NERC prepares to attract private capital, a comprehensive review of licensing costs is required to ensure they are investor friendly. This also extends to implementation of a transparent, efficient, and corruption -free licensing process to minimize delays and costs for investors. Further, the establishment of clear, publicly available criteria and timelines for licensing decisions is imperative to enhance the attractiveness of the electricity market to investors, as procuring requisite licenses is a critical condition precedent to accessing financing for any project.

MID-TERM ACTION PLAN:

Institutional Changes

Presently, TCN operates as both a transmission service provider and system operator, and this combined role is fraught with inefficiencies, reduced accountability and potential operational biases. Thus, the unbundling of the system operator (SO) and market operator (MO) functions from the TCN as contemplated by the Act would enhance efficiency, transparency, and accountability by creating specialized organizations focused on distinct roles. The unbundling and independence given to system operations will improve its the performance of these functions aided using systems that are technologically driven to enhance grid stability. This will help to ensure the expansion of transmission networks in Nigeria to address any imbalance in the existing transmission infrastructure thereby establishing a reliable, efficient, and cost-effective transmission system. This will also signal to the potential investors of the government's readiness to align with best practices and receive investment for the upgrade of transmission infrastructure.

Commence the Concessioning Process for New and Existing Lines

Government through the Ministry of Power must commence the actual engagement of potential investors on the concessioning of new and existing transmission lines pursuant to a transparent and credible procurement process to ensure that only qualified entities in terms of technical and financial capacity are selected to undertake the upgrade, construction, operation and maintenance of the transmission lines. Building new lines will reduce congestion and increase grid capacity, and this process can begin with the completion of delayed projects under the Transmission Rehabilitation and Expansion Program (TREP), e.g. the Abuja Transmission Ring Scheme.

Grid Resilience

In the middle term, it is important to develop contingency plans and grid redundancy mechanisms to prevent widespread outages during faults. This entails creating alternative pathways for power delivery in case of failures or disruptions, such as contingency design, provision of back up transformers and substations, incorporating renewable energy near consumption areas to reduce reliance on long distance transmission. Other mechanisms for building grid resilience include adopting looped or ring network configuration , incorporating energy storage system to provide backup energy and provide stability during disruptions,

Establishing Specialized Court Divisions and Rules

Creation of specialized electricity divisions in the existing court hierarchies to ensure that the courts adjudicate electricity related matters in a commercially effective manner.

Conduct extensive training and sensitization programs for judges and legal practitioners on the technicalities of the sector.

Development of specialized rules of court for the electricity sector to guide the proceedings to achieve their set objectives.

LONG-TERM ACTION PLAN:

Improved Legal Framework

Land Issues

The federal government and state governments can agree on frameworks through coordinated policies, harmonized land acquisition processes, and compensation models to expedite project timelines. This collaboration could be underpinned by MoUs or joint task forces to oversee land-related negotiations and approvals.

Other special regimes

Other areas for consideration will be carving out special regimes on accessibility to foreign exchange, protection from expropriation, grant of incentives, ease of procurement of licenses, through relevant legal instruments specifically designed to cater for investors in transmission infrastructure.

Grid Decentralisation and Regionalisation

NERC could enhance grid management by decentralizing the transmission network into regional sectors rather than maintaining a centralized federal structure. Regionalizing the Grid would allow for tailored management strategies based on specific regional energy demands and challenges, improving operational efficiency and enabling quicker responses to disruptions.

Moreover, decentralization would support regional investment opportunities by creating smaller, more manageable zones that private investors might find more attractive. Combined with federal oversight to ensure uniform standards and regulatory compliance, this approach could significantly enhance grid reliability, reduce bottlenecks, and improve service delivery across Nigeria.

Cross Border Interconnections

As more transmission lines are built, it is important to establish interconnections with neighboring grids to allow for electricity import and export, particularly during emergencies. Interborder connections provide additional power capacity and pathways in case of domestic failures.

Collaboration for Development Funding

NERC can leverage its powers as a regulator to drive the collaboration with financial institutions, DFIs and private asset managers to establish an infrastructure focused entity which can among other things: (i) raise local currency financing from the capital market; (ii) raise electricity bonds; (iii) provide state-backed guarantees; (iv) contingent capital arrangements etc. to finance the development of power sector infrastructure.

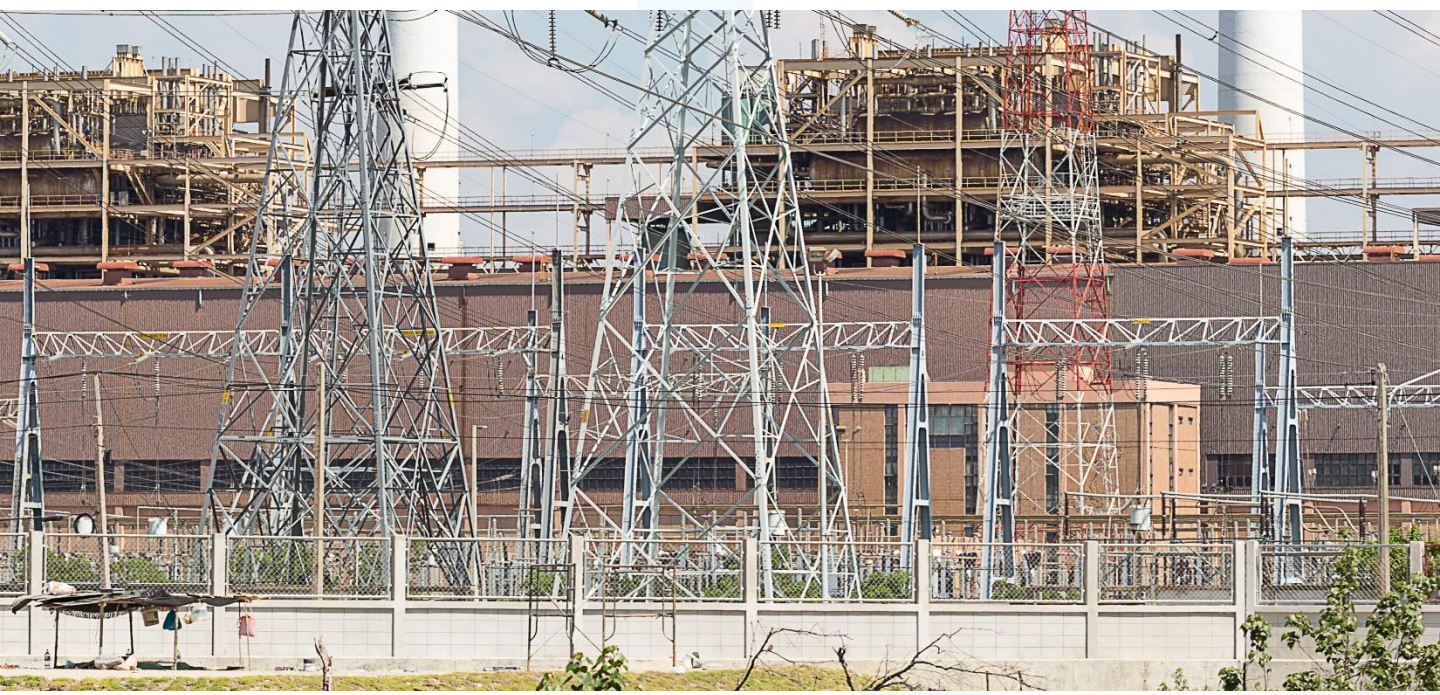
In this regard, NERC can draw inspiration from the work done by Nigerian Sovereign Investment Authority (NSIA) in establishing Infrastructure Corporation of Nigeria (InfraCorp) through a collaboration with the Central Bank of Nigeria (CBN) and other DFIs.

CONCLUSION

As has been pointed out in the UNDP Report:[83]

> *"...our world needs to change direction if the goal of sustainable development is to be achieved. Change takes time. Economic, social, and political obstacles must be overcome. The life cycle of some investments is long, and change cannot always be readily accelerated. New, environmentally friendly technologies cannot be summoned out of thin air in the quantities and in the places required. There is inertia in behaviour and consumption patterns. There is reluctance to pay now for uncertain, or even probable, future benefits. Widespread public awareness and support need to go hand in hand with sound political leadership and policy-making if successful change is to come about. Our world does not seem ready to change in the direction and to the extent required. But unless an early start is made on."*

The message here is clear and shows the need for urgent, contemplative, collaborative long-term efforts to reform the sector s and attract the right kind of private capital to revamp, upgrade and expand of Nigeria's transmission network. NERC must therefore brace up to its responsibilities as the primary regulator of the electricity sector to implement the proposed action plans in order to revitalise the transmission network and bring an end to the recurrent nervous system collapse.[84]



83) *See Chapter 12 - Energy Policies for Sustainable Development - https://www.undp.org/sites/g/files/zskgke326/files/publications/chapter12.pdf*
84) *@ Konyin Ajayi SAN (with the assistance of Chinenye Ajayi, Glory Ogunbamigbe, Felix Emmanuel, Temilola Adetona, Chidinma Oko-Egwu & Olabisi Ekundayo, all of), Olaniwun Ajayi LP.*

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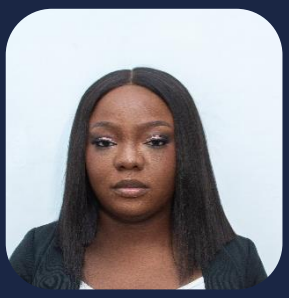

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