

# 5G Networks In Nigeria

*- On your marks, set, go*



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## BACKGROUND

Nigeria's journey to the deployment of the fifth generation (5G) network technology gathered momentum in December 2021 when the National Communications Commission (NCC) conducted the auction of two lots of 100 MHz TDD slots of 3.5 GHz band for the deployment of 5G networks in Nigeria.

Three companies participated in the auction process and the bidding commenced at \$199.37m, as against the reserve price of \$197.4m (75 billion naira) set by the NCC.<sup>1</sup> After 11 rounds of bidding, the auction ended at \$273.6m for each available lot with MTN Nigeria Communications Plc (MTN) and Mafab Communications Limited (Mafab) emerging as preferred bidders. The preferred bidders are expected to pay the winning bid price, less the Intention-to-Bid Deposit, no later than February 24, 2022. MTN is to pay an additional sum of \$15.9m to be assigned the preferred Lot One (3500-3600 MHz), while Mafab was assigned Lot Two (3700-3800 MHz), at no extra cost. In addition, Mafab is required to acquire a Unified Access Service License, which is the operational license for the frequency spectrum at an additional fee of N374.6m (approximately \$905,000).

The Information Memorandum (IM) provides for a validity period of 10 years<sup>2</sup> for the awarded spectrum and further requires licensees to roll out service in at least one state in each geo-political zone within the first two years from the effective date of the license. Further roll out is expected in six additional states in the 3<sup>rd</sup> and 5<sup>th</sup> years. The technology is expected to have been fully deployed nationwide between the 6<sup>th</sup> and 10<sup>th</sup> year of the award of the license. Roll out in each state is expected to be a minimum of five sites per state.

<sup>1</sup> Might just be worth noting that in the auction for GSM licenses that took place in January of 2001, reserved price was \$100Million but winning bids were \$285 million.

<sup>2</sup> Important to mention that the validity period of the GSM licenses issued in 2001 was for 20 years and MTN in commenting on the Information Memorandum had requested the extension of the validity period for the 5G licence to 20 years

## THE GLOBAL JOURNEY TO 5G



The first generation of mobile networks (1G) was launched in Tokyo in 1979. However, 1G technology was poor in sound and coverage quality. There was no roaming support between various operators and no compatibility between systems leaving calls unencrypted, such that anyone with a radio scanner could intercept conversations. Despite these shortcomings the technology attracted over 20 million subscribers by 1990.

The success of 1G paved the way for the introduction of second generation (2G) in 1993 which allowed for the transformation from analog to digital communication. This switch to digital communication allowed for the introduction of multimedia systems such as SMS text messaging, MMS multimedia messaging and picture messaging. It also allowed for call and text encryption that provided privacy for users. Most importantly, the improvement in speed from a maximum of 2.4Kbps for 1G to 14.4Kbps for 2G made browsing the web and downloading data possible for the first time.

The term “mobile broadband” was first used on the introduction of 3G in 2001. Web browsing, enhanced audio and visual streaming, global roaming, video conferencing and GPS were all possible with the introduction of 3G technology which had a significantly higher maximum speed in comparison to 2G technology thereby allowing users to browse the web, download and upload data at higher speeds.

Improving speeds, security and connection even further, 4G technology was introduced in 2009 and is still widely used today. 4G with a maximum speed of 300Mbps<sup>3</sup> supports the same applications and services as 3G but it is also capable of handling applications that need better speeds and connection, such as gaming, streaming media in high resolution and wearable technology including fitness trackers.

## 5G TECHNOLOGY



5G technology was introduced in 2019 with a host of improvements and upgrades from earlier mobile technologies. Increased speed is perhaps one of the major improvement that 5G provides. As stated earlier, 4G networks offer maximum download speeds of 300Mbps, but 5G offers speeds up to 10Gbps – meaning users can stream media, download and upload data and play games on the go faster than ever before.<sup>4</sup>

5G networks are critical components of the much-touted 4<sup>th</sup> industrial revolution, the digital economy and digital transformation for businesses.<sup>5</sup> More than 180 service

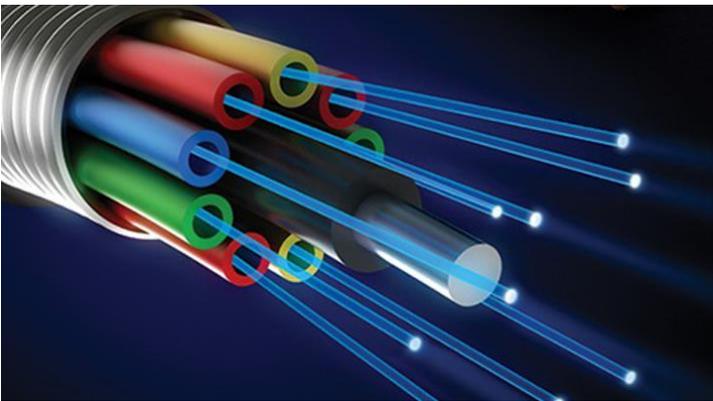
<sup>3</sup> However, 4G adoption in Nigeria was 12.2% of total connections within the same period. Mobile broadband download speed is still very low with Nigeria ranked at 104th in the world as at July 2019

<sup>4</sup> A Brief History of 5G by Ifrah Mukri 16<sup>th</sup> August 2019

<sup>5</sup> In recognition of the importance of the digital economy and its transformation benefits to Nigeria the Ministry of Communications and Digital Infrastructure has published the Nigeria Digital Economy Policy and Strategy

providers have launched 5G services globally and it is estimated that there are presently more than 660 million 5G subscriptions globally, most of which are in North East Asia followed by North America, the Gulf Cooperation Countries and Western Europe. With total subscriptions expected to hit 1 billion in two years,<sup>6</sup> Sub Saharan Africa presently has no subscriptions yet and this will undoubtedly impact its growth and the proposed economic integration through the Africa Continental Free Trade Agreement (ACFTA). The spectrum award by Nigeria is a welcome development and will no doubt help in fostering industrial growth and development.

## CHALLENGES TO THE SUCCESSFUL DEPLOYMENT OF 5G NETWORKS IN NIGERIA



Although most of the challenges are not new and they continue to hinder the roll out of 3G and 4G services nationwide, some of the identified challenges to the successful roll out of 5G networks in Nigeria include –

- i. **Low levels of Fiber Optic Infrastructure** - Nationally fibre optic cable infrastructure deployment is insufficient and mostly available in a few cities and urban areas. It is estimated that to achieve full broadband penetration, 120,000km of fibre needs to be installed, given Nigeria's land mass. Nigeria reportedly has a deficit of about 80,000 kilometres of fibre which needs to be met before effective nationwide deployment of broadband can be achieved.<sup>7</sup> Apart from low levels of fiber optic cable deployment, there are also the issues of vandalism and damage to existing fiber infrastructure from road construction.<sup>8</sup>
- ii. **Availability and affordability of Devices** - The availability and affordability of 5G devices in Nigeria will be a major consideration for the awardees of the spectrum in the deployment of the 5G network. This continues to be a major factor in the deployment of 4G networks and the position will still be the same for 5G. The effect will be the deployment of services first in major cities where there will be willing customers that can afford the devices and the cost of the service.
- iii. **Access to Forex** – The telecoms industry in Nigeria relies heavily on foreign equipment manufacturers and imported technical expertise for deployment and maintenance of networks. The cost and process of accessing forex for these purposes continues to be a challenge taking into consideration the demands on foreign exchange reserves of the country by other eligible sectors.
- iv. **Inadequate Electrical Power Supply:** The deployment and maintenance of 5G networks require higher density coverage, more base stations and additional equipment and consequentially more power demand. Just as with the roll out of previous generation networks, telecom companies will have to invest, now at much more higher levels, to meet the increased power requirements of 5G network because of the poor state of the country's power infrastructure. This will increase the cost of deployment and where not properly

<sup>6</sup> Ericsson "Mobility Report" Nov 2021

<sup>7</sup> As at December, 2020 the total on land fiber deployment was 43,898.8km.

<sup>8</sup> The Cybercrime Act (Prohibition, Prevention etc.) Act 2015 envisaged the declaration of telecommunications infrastructure as Critical National Infrastructure with the attendant protection which is expected to curb these incidents. This declaration is however yet to be made by the President

dimensioned, may affect quality of service and consequential the cost will be passed on to consumers.

- v. **Insecurity** – As earlier mentioned, there is a licence requirement for deployment in at least one state in the various geo political zones in Nigeria within stipulated time lines, it is however important to note that nearly all the seven states in Northwest Nigeria are experiencing security challenges which has led to the temporary shutdown of telecom services in areas of some states in given periods. Security will therefore continue to be a challenge.
- vi. **Right of Way (ROW)** – High ROW fees continues to hinder the deployment of telecommunications infrastructure in Nigeria. Despite the government at Federal level proposing the acceptance of a uniform nationwide fee for the procurement of ROW, various states and their agencies continue to administer ROW differently with their financial demands often frustrating operators’ roll out plans. Linked to the low level of fibre optic deployment is the divergent policies and inability to obtain ROW permits from the various states.<sup>9</sup>
- vii. **Multiple taxation and regulation-** Although this challenge will not be new to the deployment of 5G technology as it currently affects ongoing deployments, it will also be an additional challenge to be dealt with by the networks. Nigeria’s case is further complicated by its operation of the federal system of government which has seen the different levels of government and their agencies imposing duplicated and often arbitrarily determined charges on telecoms infrastructure and companies.
- viii. **Regulatory and Legal issues** - Law and Regulation cannot expect to match technology in speed and complexity - arguably, this is not to be desired. The legislature and regulator will need to develop innovative regulations and stakeholder management techniques to manage the complexities, legal and regulatory issues that applications and uses that a full adoption of 5G will introduce. A legal, policy and regulatory approach that will not hinder innovation and adoption should be adopted by the appropriate authorities for users to benefit from the applications and services that will be built on 5G technology.

## CONCLUSION

The 5G spectrum award is a critical component of the achievements of the stated objectives in the Broadband Plan 2020-2025<sup>10</sup> and the National Digital Economy Policy and Strategy. Both policy documents acknowledge the pivotal role the rapid and pervasive rollout of high-quality broadband infrastructure and services plays in accelerating national socio-economic development and the transformation of Nigeria into a leading digital economy.

Internet services in the country are currently provided on 2G, 3G, and increasingly 4G mobile networks. Though 4G coverage is available to 37% of the population, download speeds in the country are noted to be generally uncompetitive with other countries in the same income bracket.

Rapid rollout of broadband services will address various socio-economic challenges faced by the country, including the need to grow its economy, create jobs, rapidly expand the tax base, and improve digital literacy and educational standards. This will also address identity management and security challenges through the effective use of technology, increase financial inclusion and deliver a broad

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<sup>9</sup> 5G Network Deployment in Nigeria: Key Challenges and The Way Forward - Cosmas Kemdirim Agubor, Nkwachukwu Chukwuchekwa and Longinus Sunday Ezema published in *EJERS, European Journal of Engineering and Technology Research* Vol. 6, No. 3, March 2021 available at <https://www.ejers.org/index.php/ejers/article/view/2068/1059>

<sup>10</sup> This broadband plan is designed to deliver data download speeds across Nigeria, a minimum of 25Mbps in urban areas, and 10Mbps in rural areas, with effective coverage available to at least 90% of the population by 2025 at a price not more than N390 per 1GB of data (2% of median income or 1% of minimum wage).

range of services to its people to improve the quality of life and work towards attainment of Social Development Goals set by the United Nation for 2030.

The 5G technology, fully explored, should have an extended impact on every industry, including transportation, education, entertainment healthcare, agriculture, and even digitized logistics. The effect of the full adoption of 5G and the use cases will lead to new ethical, policy, regulatory and legal issues that will require continuous study, analysis and rapid intervention at all levels of civilized society. Nigeria will have to develop the capabilities and structures to competently deal with these issues similar to developed countries that are already grappling with same.

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