



Nigeria's Digital Economy

National Policy on Fifth Generation (5G) Networks

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Background



Fifth Generation (“5G”) technologies offer numerous advantages and Nigeria is keen to benefit from the great inter-connectedness 5G technologies offer other nations that have already deployed them. 5G supersedes previous mobile communication technologies; 4G and 3G.

The National Policy on Fifth Generation (5G) Networks for Nigeria’s Digital Economy (“the policy”) offers a roll-out plan which seeks to ensure that all major cities across the country benefit from 5G. The adoption of 5G technologies is intended to improve access to services in the digital economy and to sign post Nigeria as a more attractive hub for foreign investors. The implementation plan is to be overseen by the Nigerian Communications Commission (“NCC”). The policy was approved by the Federal Executive Council on September 8, 2021. The policy was approved following a trial phase and extensive stakeholder engagement. Following the preliminary trials in November 2019, the trial reports were studied by stakeholders to better understand the effects of deploying 5G in Nigeria including the health and security implications. The reports of leading international organizations such as the World Health Organization (WHO) and other advisory bodies within the United Nations, all affirm that the deployment of 5G would not lead to adverse health effects in the Nation.

Some of the significant benefits of 5G include:

1. Reduced latency or in simple terms, the time it takes to transfer data from its original source to its destination,
2. Higher bandwidth which allows greater storage and transfer of data.
3. Greater device density.
4. Longer battery life for nodes; and
5. Greater network flexibility.

5G networks can positively improve different industries in Nigeria including but not limited to agriculture, manufacturing, education, healthcare, and transportation. Some nations that have deployed 5G include South Africa, United States of America, United Kingdom, China, and Lesotho. The policy seeks to create the enabling environment in which 5G can be deployed.

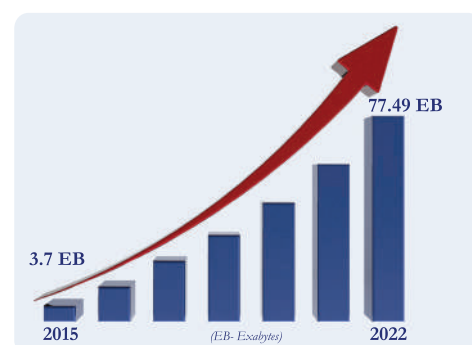


It also seeks to support the National Digital Economy Development and Strategy (NDEPS) in achieving a digital Nigeria. The policy was designed to achieve the following:

- i. To ensure effective deployment of 5G to cover major urban areas by 2025.
- ii. To ensure security of the 5G ecosystem and protection of data.
- iii. To ensure that international best practices and globally accepted standards and specifications are entrenched in Nigeria's ecosystem.
- iv. To ensure that the required infrastructure needed for the successful deployment of 5G networks such as data centers, power, etc., are established for the deployment of 5G networks

Statistics

It is estimated that by 2022 global mobile data traffic would reach a monthly rate of 77.49 exabytes, as compared to 3.7 exabytes in 2015. Each mobile communications technology brings with it, new capabilities that transform both work and interpersonal communications. Some of the technologies already being supported by 5G include automated cars, Internet of things (IOT) which will enable thousands of connected devices (such as smart energy meter), to work together and share information, with minimal human interference.



According to Information Handling Service (IHS), by the year 2035 5G will enable \$12.3 trillion of global economic output, the global 5G value chain will generate \$3.5 trillion in output, and support 22 (twenty-two) million jobs, and the 5G value chain will invest \$200 billion dollars annually in research and development to continually expand and strengthen the 5G technology within network and application infrastructure base.

Trial Stage

In November 2019, the NCC using MTN Nigeria Communications PLC (MTN) as an operator, undertook a trial or (“proof of concept) phase for the 5G network in six locations across the country: Abuja, Calabar, Lagos, Kano, Abeokuta and Ibadan. Some of the key data observed during the trials included throughput latency, co-channel interference, types of models of 5G used for the test, types of services (voice, data, video, etc.), health and safety (emf radiation).



NCC Midwives Non-commercial Trial of 5G in Abuja -
Dr. Isa Ali Ibrahim Pantami, Honourable Minister of Communications and Digital Economy (Source - ncc.gov.ng)

Stakeholder Engagement

The Policy was developed under the leadership of the Honorable Minister of Communications and Digital Economy in line with the provisions of the Nigerian Communications Act 2003 (NCA 2003). The Policy formation process involved engagement of stakeholders from public and private sectors. The engagements were multi-phased. A draft policy was shared with stakeholders to obtain their comments and harmonize their views into the outcome. Some of the phases of stakeholder engagement included:

- i. Public hearing at the National Assembly
- ii. Directive of the Minister to NCC for further engagement in which over 50 institutions were invited
- iii. Advice of the office of National Security Adviser (ONSA) on study group as part of stakeholder engagement.
- iv. National Frequency Management Council (NFMC) directive to NCC to involve security agencies
- v. Trials from the 25th of November 2019, along with stakeholders; and
- vi. Report of trials and recommendations.

To ensure widespread implementation, the NCC worked closely with relevant agencies under the Ministry of Communications and Digital Economy and all other stakeholders.

National Coverage (Obstacles)

To ensure national coverage, key roadblocks to larger goals were identified and these factors included the following:

The deployment plan, legal and regulatory framework, network roll-out, security, coverage and capacity, spectrum allocation and assignment, 5G technology standards, emerging technology trends, health safety and environment (HSE).

The NCC ensured that Nigeria drew lessons from other Nations by participating in international engagements/workshops which focused on enabling 5G. The NCC also invested in 5G trials. The Nigerian National Broad Band Plan (NNBP) 2020 - 2025 came into effect in March 2020 and it provides a detailed plan to enable the widespread deployment of 5G.

The NCC also must ensure that operators comply with the regulatory requirements for the deployment and marketing of 5G technologies across Nigeria. The NCC is empowered to create laws and subsidiary legislations to create an enabling environment in which 5G technologies can grow. A key focus of the regulatory environment was to lower barriers to entry for investors, encourage long term investment in digital infrastructure, cyber security issues and supporting coverage enhancements in collaboration with the relevant agencies of government. Encouraging investment in 5G is crucial to the NCC especially at the trial phase to ensure a broad understanding of the capabilities of 5G and the associated risks.

5G Networks facilitate a transition away from centralized, hardware-centric switching to one that is distributed and utilizes software-defining digital routing. To attain this, more attention needs to be placed on the design, deployment, configuration, and maintenance of 5G networks to ensure true end to end cyber security. The NCC seeks to ensure that the deployment of 5G in Nigeria is in line with international security standards. Other relevant standards complied with include the Network Equipment Security Assurance Scheme (NESAS). 5G relies heavily on cloud services and virtualization. The NCC sought to mitigate the security risks imposed by 5G by working closely with relevant agencies such as the Federal Ministry of Communications and Digital Economy to identify and mitigate for security risks.



Prof. Umar Garba Danbatta, Executive Vice Chairman/CEO, NCC and
Engr. Ernest Ndukwe, Chairman MTN Nigeria.
at the Non-commercial Trial of 5G in Abuja (Source - ncc.gov.ng)

The security protocol for cyber operations and 5G infrastructure were observed and applied in the trial phase and inputted in the regulatory framework. In the development of threat response systems, the counsel of the National Information Technology Development Agency (NITDA) and Central Bank of Nigeria (CBN) were sought.

Rural areas remain poorly serviced by mobile communications infrastructure with most rural residents, still mainly having access to only 2G and 3G mobile networks (if any). 5G with its larger bandwidth will increase broadband penetration and over time reduce the cost of data which will improve the access to modern communications for the average Nigerian citizen. The NCC to stimulate economic growth, focused on the building blocks of society such as Educational, Health and Industrial institutions in the roll out plan. Operators and technocrats in the mobile communications space were guided to ensure that the required infrastructure which would allow 5G technologies to operate optimally were put in place such as the appropriate radio frequency and satellite stations.

Why 5G



5G technology will support the development of new applications which connect devices and allow innovative applications and business models to thrive due to its software virtualization abilities. The faster rate of and capacity for data transfer will allow for the simultaneous connectedness of multiple devices. 5G will enhance the development of many technologies such as: the Internet of Things (IOT); Artificial Intelligence (AI); Robotics, Drones, Simulation/Imaging and Gamification and 3D Printing. These technologies will create significant improvements in Manufacturing, Transportation, Public Services, Health, Logistics, Media and Entertainment, Mining and Quarrying. The NICC partnered with NITDA and other relevant agencies to facilitate adoption of these technologies. Support in the way of grants and favorable policies were also rendered to MSMEs with a core focus on innovative technologies which can foster improved rates of production/output in many industries.

Nigeria has a large youthful population with about 70% under the age of 30. As such, the NCC along with relevant mandates such as NITDA seeks to improve the digital literacy of the masses which in turn will boost their skill set, self-confidence, and employability. The NCC has invested heavily in initiatives which support digital literacy training and skills acquisition for youths. Improved access to broadband services on university campuses is also a means through which the quality of education for youths can be improved.

Nigeria will look to be yet another success story post deployment of 5G much like China which already rolled-out 5G across the nation. Use of 5G technologies in China is driving the next phase of its digital economy with companies in its manufacturing sector benefiting tremendously from the introduction of innovative technologies which are radically upscaling the rate of commercial production for industrial endeavors and consumers in turn are now enjoying more sophisticated goods and services. Manufacturing companies in China which are using 5G technologies are experiencing higher profits and the entire Chinese economy is growing.



5G User experience globally

5G technologies became available to South Africans circa May/June 2020 following deployment by telecommunication companies – Vodacom and MTN. Notably, 5G technologies are only accessible by devices enabled to receive the required frequency. South African users with 5G enabled devices are now able to obtain contracts for data plans directly from their service providers. Specifically, Johannesburg, Capetown and Pretoria have deployed the required infrastructure to support 5G usage. Some of the benefits of 5G deployment enjoyed by South Africans include better livestreaming, gaming capabilities, and video calling, more cost-effective data plans, increasingly reliable network connectivity, and greater bandwidth which results in faster downloads of images and media files. In the wake of the post-lockdown era, 5G technology has supported remote working and working from home. Another benefit of 5G use in South Africa is enabling doctors and medical professionals to collaborate more efficiently and thereby reducing the need for inter-hospital transfers. Additional benefits of 5G technology are improved distance learning and security surveillance.

In South Africa, there were fears surrounding the potentially adverse effects of 5G deployment. However, in response, stakeholder engagement directed that the national 5G infrastructure policy and the Department of Health creates public campaigns to address these misconceptions.

Health Safety and Environment

Health and Public safety are often of great concern regarding frequency-based technologies. The World Health Organization (WHO) and other international agencies in their focus on public health and safety, developed and published guidelines for the safe deployment and operation of 5G technologies. There will be a continuous need to keep the public informed of health and safety concerns as regards mobile communications which are of particular concern. At present, the WHO has not provided any infirmities which are causally linked to the use of or exposure to wireless technologies.

The NCC shall ensure that:

- i. All equipment to be installed as part of the infrastructure for 5G are subjected to maximum scrutiny
- ii. Circulars and guidelines as regards health risks posed by the technology are made available to the public
- iii. Ensuring deployment and installation of the technologies is done in line with international best practices.
- iv. Ensure that infrastructure is deployed in a structured and all-inclusive manner to prevent duplication.



It is worth noting that the citizens of Dewey beach, Delaware, recently complained about the unsightly nature of gargantuan cell sites and 5G towers associated with 5G infrastructure. Conservationists feel that the 5G towers installed too close to peoples' homes mar the beauty of the environment and may lead to health care concerns in future. Local governments are also reluctant to act by directing telecoms companies to remove 5G towers or restricting their ability to make further installations for fear of being sued by telecoms companies who already have licenses or permits to expand their business interests. Greater stakeholder engagement between operators of 5G cells, regulators and citizens will be necessary to allow a convergence of opinion on environmental concerns.

Furthermore, in the US, major airlines have voiced their fears over the safety risk created by interference of 5G infrastructure with airplane instruments such as altimeters and low visibility equipment. In the wake of telecom giants AT&T and Verizon being given approval for widescale deployment of 5G in early 2022, following auctions last year, many airlines such as American Airlines and Delta Airlines are already anxious as the adverse impact the interference of 5G will have on their operations. It is expected that several flights for most airlines will be postponed while the status quo for flight operations remain under scrutiny with particular focus on safety concerns. The Federal Aviation Administration (FAA) has also issued warning as regards the adverse impact of interference on airline operations. A representative airline: Airlines for America has written on behalf of other Airlines to the White House National Economic Council expressing their concerns over the impact of interference. AT&T and Verizon have undertaken to buffer zones around airports to improve safety requirements for airlines, however continued stakeholder engagement is required to resolve safety concerns comprehensively.



Conclusion

5G Technology has enormous potential to improve output for commercial processes, increase the resources available to students, and in turn improve their capacity individually to add value in their schools, institutions, and jobs in their adult lives. The compounded effect of improved human capital and more efficient commercial processes is economic growth and improved living standards across the nation. 5G technologies will be particularly impactful in medical services by improving the quality of medical devices used to treat patients and in financial services by facilitating more transactions at a faster rate. Furthermore, by enabling 5G deployment, Nigeria is better placed to attract foreign investors who require such technological infrastructure to operate efficiently.

Nigeria also seeks to harness its capacity to grow significantly in the future by improving the digital literacy of its largely youthful population. Notwithstanding the plethora of opportunities offered by modern technologies, the NCC, Ministry of Health and other relevant agencies mandated to protect the interests of the public in respect of health concerns must pay close attention to the emergence of any health and safety risks that may be associated with exposure to 5G technologies and its surrounding infrastructure both locally in Nigeria and across the international community. The NCC will work continuously and collaboratively with all relevant stakeholders to facilitate the safe uptake and deployment of 5G across Nigeria with a view to increasing economic growth and boosting living standards.

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