Open Spectrum for Development

Nigeria Case Study

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Background

With hundreds of telecommunications and broadcasting licenses granted since 1992, Nigeria is arguably the leading country in Africa with respect to spectrum deregulation and licensing. Table 1 below shows that there are over currently 350 licensed broadcast stations in operation in the country. Simultaneously NCC has licensed over 300 telecoms licenses to private companies in Nigeria, though unlike for broadcasting, this study could not independently verify the utilization of these licenses.

Table 1: Operational Licenses in Nigeria (Broadcasting & Telecommunications)

Telecommunications[1]					**Broadcasting[2]**				
Carriers	**GSM[3]**	**UAS L[4]/FWA[5]**	**ISP[6]**	**Community**	**Radio**	**TV**	**Cable**	**DTH[7]**	**Satellite**
2	5	29	151	27	156	147	35	5	4

Since the issuance by the Nigerian Communications Commission of digital mobile licenses to MTN Nigeria, Econet (now Zain) and MTEL in 2001, information and communications services in Nigeria have made a huge impact on the domestic economy. With over 85 million mobile lines[8] connected as at April 2010, the growth of telecommunications in Africa's most populated country has been nothing short of phenomenal.

This rapid growth and the resulting ripple effect by way of job creation, improved business productivity, and more, can be credited largely to the deregulation and liberalization of the markets by the Nigerian Government which has made the local environment generally conducive for private local and foreign direct investments. Market reform has resulted in the rapid roll out of telecoms networks across the vast national landscape with access to basic telecommunications services now virtually obtainable everywhere. With more companies offering services, there is evidence of increasing pressure and scarcity of frequency spectrum for communications in Nigeria.

This brief report seeks to thus discover issues relating to spectrum regulation in Nigeria and is biased towards telecommunications frequencies per the Project Terms of Reference.

[1] Source: Nigerian Communications Commission. Excludes sales of equipment,

[2] Source: Nigeria Broadcasting Commission; All Media and Products Survey Nigeria (AMPS)

[3] Global System for Mobile Communications

[4] Universal Access Service

[5] Fixed Wireless Access

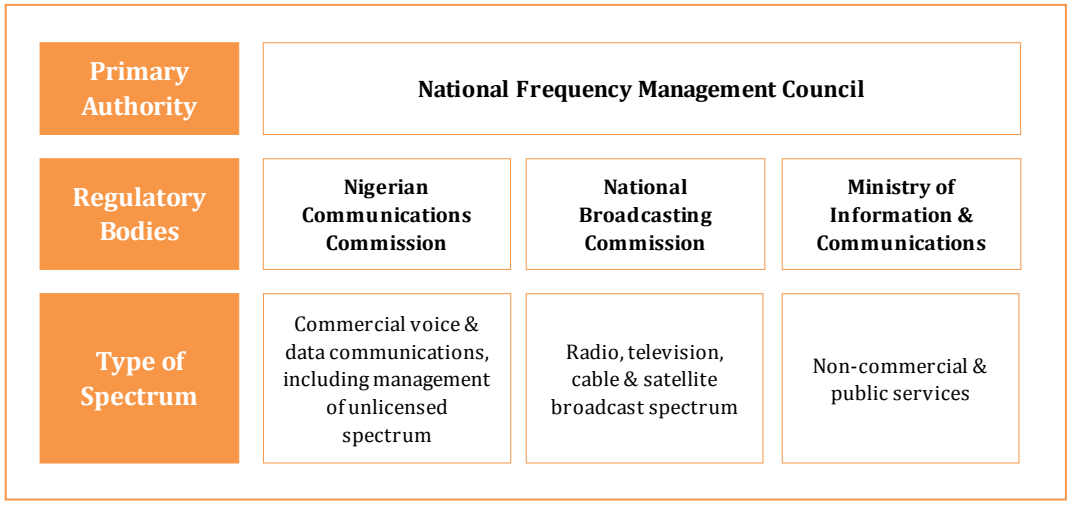
[6] Internet Service Provider

[7] Direct-to-Home

[8] Source: Industry Statistics, Nigerian Communications Commission (www.ncc.gov.ng)

Policy & Regulatory Framework

The regulatory framework for the management of radio frequency spectrum in Nigeria consists of the National Frequency Management Council ("NFMC"), the Ministry of Information and Communications ("MoIC"), the Nigerian Communications Commission ("NCC"), and the National Broadcasting Commission ("NBC"), as shown in Figure 1 below:



- National Frequency Management Council[9]: The National Frequency Management Council (NFMC) is the apex body for radio frequency spectrum management in Nigeria. Established by Section 26 of the Nigerian Communications Act 2003 and located within the Ministry of Information & Communications, NFMC is the primary sponsor and influence on the Government's frequency spectrum policies and legislation. The Council is responsible for the planning, coordination and bulk trans-sectoral allocation of radio spectrum to the regulatory bodies, namely the National Communications Commission, the National Broadcasting Commission and the Ministry, and acts as the focal coordinator of all frequency spectrum activities in Nigeria. The Council also advises the Minister on Nigeria's representation at international and multi-lateral frequency spectrum bodies. NFMC is chaired by the Minister of Information & Communications and consists of high-level representatives of the Ministries of Aviation, Transport, Science & Technology, NCC, NBC and the Security Services, and meets at least four times in a year.

- Nigerian Communications Commission[10]: NCC is the regulator of the telecommunications industry and has wide discretionary powers to plan, manage, assign and monitor the use of spectrum by commercial users of telecommunications services. The roles of NCC also includes: the encouragement of competition; the removal of market entry barriers; interconnection of new operators with incumbents; the monitoring of tariffs and quality of service; the protection

[9] See http://nfmc.gov.ng

[10] Source: *Nigerian Communications Commission Act 19 of 2003.*

of consumer rights; and the overall promotion of affordable telecommunications services. The Commission develops and publishes radio frequency regulations and standards for the industry.

- National Broadcasting Commission: The Commission derives its powers from the NBC Act 38 of 1992 as amended by the National Broadcasting Commission Act 55 of 1999 and is the sole body charged with regulating the broadcast industry, setting broadcast standards and upholding equity and fairness in broadcasting. NBC assigns broadcast frequencies it receives from NFMC to private & public radio & TV stations[11], monitoring for compliance with administrative procedures, the broadcast code and technical standards. NBC processes applications for the ownership of all types of radio and television stations and has licensed over 350 operational stations in several categories including private, public, satellite, network, campus and community radio & TV stations. The Commission regulates broadcasting through 27 state & zonal offices and regularly publishes updates of the radio frequencies it assigns on its website.

- Ministry of Information & Communications: The Ministry, through the Department of Spectrum Management, is responsible for the formulation and monitoring of communications policies, international treaties and national representation in international organizations, including the International Telecommunication Union (ITU), International Civil Aviation Organization (ICAO), International Telecommunication Satellite Organization (ITSO), International Maritime Organization (IMO), among others. With the establishment and increased legislative empowerment of both the NCC and NBC, MoIC's function has gradually been limited to the management and assignment of frequencies to Government and non-commercial users including the military, security services, diplomatic missions, voluntary organizations and non-profit groups. The Ministry raises revenue for the Government through the sale of amateur radio communication license application forms, issuance and renewal of licenses, and type-approval testing of radio communication equipment. MoIC is the secretariat of NFMC and acts as the custodian of all frequencies in Nigeria.

Within this framework, NCC seems to be the most dominant regulator partly due to the significantly larger market size of the telecommunications industry vis-à-vis both broadcasting and public services, but also partly due to the perceived or real impact of that sector on the national economy. Thus, NCC would appear to be playing a central role in the development of frequency spectrum policies as the defacto manager of the NFMC.

This research sought to further investigate the inter-relationships between these bodies to some detail but further information here was impossible to access and thus could not be incorporated into this report. Nevertheless, it would appear that there is some overlap between the functions of MoIC, NFMC and NCC in particular especially as it relates to the formulation and sponsorship of spectrum policies. The NBC is also inter-related to the Ministry and requires the Minister's approval for most of its functions. Perhaps a future study may seek to investigate these issues in order to help understand the regulatory space better.

[11] Including Multichannel Multipoint Distribution Service (MMDS) & Direct-to-Home (DTH) systems

Regulatory Convergence

Of late, there have been general discussions towards unifying the regulation of frequency spectrum in Nigeria[12] though the Government has made no pronouncement in this regard. NCC on its part is in favour of a "common and harmonized law" as opposed to the establishment of a single regulator for broadcasting and telecommunications[13]. It thus would seem that unifying the regulators would require strong political will by the Government as there are entrenched interests and (natural) self-protectiveness.

Primary Laws & Regulations

Nigeria's frequency spectrum allocations follow ITU standards. The main laws and regulations governing spectrum assignment, allocation and monitoring are contained in the following documents:

- National Radio Frequency Management Policy[14]: Issued by the National Frequency Management Council, this document outlines the general framework of, and the broad policies that will govern radio frequency spectrum in Nigeria. It recognizes that spectrum-based services will continue to yield significant economic benefits, contribute to the Gross Domestic Product, and provide the platform by which future demand for spectrum resources for new technologies, applications and services can be met. It describes the general policies that will guide the assignment of radio frequencies including assignment procedures, fees, eligibility, access to records, and renewals, among others and specifies the range of sanctions for the wrong use of frequency allocations.

- The Nigerian Communications Act 2003: The Nigerian Communications Act 2003, which repealed and replaced the NCC Act No 19 of 1992, is the primary law governing the allocation of frequency spectrum to telecommunications operators for commercial purposes. It conferred on the Nigerian Communications Commission sole and exclusive powers to license and manage frequency spectrum for the telecommunications sector. The Act also made NCC a fully autonomous body and vested in the Commission all the powers of the Minister of Information & Communications as they relate to the sector, including the power to issue licenses and assign frequencies. NCC now has extensive and independent powers to regulate the sector and uses this broad authority to create licenses and determine conditions relating to, among others, the assignment and usage of frequencies, interconnection, tariffs, access to facilities and consumer protection. Other Government bodies recognized by the Act are the Ministry of Information & Communications and the National Frequency Management Council. In assigning frequencies, NCC is deemed by the Act to be acting for and on behalf of the Council.

[12] See Emmanuel Okoegwale, *"NCC vs. NBC in the Emerging Convergence Regulations in Nigeria"* (http://www.nigeriavillagesquare.com/j/index.php?option=com_content&view=article&id=9131:ncc-vs-nbc-in-the-emerging-convergence-regulations-in-nigeria&catid=219:nigerian-ict-with-emmanuel-okoegwale&Itemid=46). Also Obi Igbokwe, *"12 Steps – Communications: Nigerian Media Reforms"* (http://newnigerian.blogspot.com/2009/01/12-steps-communications-nigerian-media.html).

[13] See http://allafrica.com/stories/200502081064.html.

[14] Source: http://www.ncc.gov.ng/SpectrumIssues/National_Radio_Frequency_Spectrum.pdf.

- The National Broadcasting Commission Act 38 1992 (as amended by Act 55 of 1999) [15]: This Act created the National Broadcasting Commission as the government regulator responsible for all aspects of broadcasting in Nigeria, including licensing, policies, spectrum assignments and the establishment and monitoring of ethical and technical standards of the broadcast industry. The legislation effectively ended the State's 50-year monopoly of broadcasting and allowed for private businesses, organizations and communities to own broadcast stations. The 1999 amendment further brought radio & TV stations owned by the Government under the regulatory control of NBC. NBC may apply "sanctions, including revocation of licenses of defaulting stations" where it determines that the "public interest" is not being upheld. Historically this power has often been used to deal with the (perceived) opponents of the government of the day[16]. However, unlike NCC, NBC is dependent on the Ministry. Section 6 of the Act unambiguously allows the Minister to give directives to the Commission, which must be complied with, on "particular matters with regard to the exercise by the Commission of its functions". Also, according to the Act, the Commission can only issue licenses based on the recommendation of the Minister to the President who has the final approving power. The Minister has to approve technical and editorial guidelines regulating the operations of licensed broadcast stations.

- Wireless Telegraphy Act 1990 (as amended 2004)[17]: Up to 1992, the Telegraphy Act was the principal legislation for the operation of telecommunications services in Nigeria which was then only available from the monopoly operator, NITEL. The Act also empowered the Ministry to manage the national radio frequency spectrum. Licenses for services and frequencies could only be granted at the discretion of the Minister and private operations of communications services were strictly forbidden. However, the NBC Act 38 of 1992 and the NCC Act 19 of 1992 (both as later amended) wrested regulatory oversight in the broadcasting and telecommunications sectors from Government agencies and transferred these to the NBC and NCC respectively.

- Commercial Frequency Management Policy, Administrative Procedures and Technical Guidelines[18]: Developed by the NCC and largely drawing from the National Radio Frequency Management Policy, this document outlines broad guidelines, administrative procedures and technical guidelines on national frequency spectrum management including conditions and eligibility for frequency assignment, limitations, pricing, transfer of assigned frequencies, administrative procedures and technical guidelines among others.

[15] Quoted on http://www.nigeria-law.org/National Broadcasting Commission Decree 1992.htm. Amendment Act No 55 of 1999 can be found at http://www.nigeria-law.org/National Broadcasting Commission (Amendment) Decree No 55 of 1999.htm

[16] For instance, Channels TV license was withdrawn within hours of broadcasting inadvertently the false news of the death of the then President, Umaru Musa Yar'Adua. The license was eventually restored after intense lobbying and numerous appeals by the civil rights groups and the public. http://allafrica.com/stories/200809180711.html.

[17] Quoted on http://nigeriacommunityradio.org/legal_framework.php. The first Wireless Telegraphy law, promulgated in 1935 by the colonial government, was finally replaced by the Wireless Telegraphy Act No. 31 of 1961, as later amended. However, there is intense debate on the applicability of the Wireless Telegraphy Act as it was omitted from the Laws of the Federation of Nigeria 1990, though it continues to be cited by recent laws and amendments. See Page 41 of Reference (2) for an extended discussion of this legislation.

[18] Source: http://www.ncc.gov.ng/SpectrumIssues/Frequency_mangt_policy_07.pdf.

- Frequency Spectrum Fees and Pricing Regulations[19]: This NCC document seeks to standardize and make transparent fees and pricing for frequency spectrum in Nigeria. It established what it dubbed "fair and non-discriminatory pricing procedures" that allowed NCC to utilize a wide range of competitive award mechanisms including, among others, auctions and beauty contests in awarding licenses and assigning frequencies. The pricing of spectrum was also made directly proportional to the size on offer and is discussed further in the *Pricing of Spectrum License Fees s*ection below.

Key Policies Governing Radio Frequency Spectrum

Regulators are generally guided by the National Radio Frequency Management Policy document which outlines the essential issues with respect to frequency assignment, management, monitoring and sanctions/revocations. The main objectives of radio frequency management in Nigeria include:

(a) Promotion of efficient radio communication systems and services through equitable and fair allocation and assignment of spectrum for the benefit of the maximum number of users;

(b) Spectrum resource planning, management and monitoring in accordance with international agreements;

(c) Adoption of advanced spectrum allocation and management techniques for the optimal use of spectrum resources;

(a) Protection of national interests and the coordination of Nigeria's spectrum policies in bilateral and multi-lateral arrangements; and

(b) Innovation, research and development in new radio communication techniques, spectrum-based services and applications.

The National Spectrum Policies[20] are broadly anchored on five prime elements as follows:

- **Economic Value**: Commercial rates are charged for frequency spectrum to cover costs and to generate revenue for the Government. Fees are usually determined by the regulatory bodies either directly or indirectly through auctions, etc. Prior to liberalisation, spectrum was administered by the Ministry and pricing was often arbitrary and generally inefficient as the basis for determining fees was the number of subscribers that would be on the network. Both NCC and NBC have adopted this policy which is anchored on market or economic value. MoIC however maintains non-commercial rates in frequency assignments to public & non-commercial organizations.
- **Competitiveness**: Competitive licensing is thus utilized for commercial frequencies in processes as determined by the regulators. These processes include auctions, so-called beauty contests, etc and, where direct applications for spectrum are made to the Ministry by non-commercial users, frequency assignments would be on first-come-first-served basis.

[19] Source: http://www.ncc.gov.ng/RegulatorFramework/Frequency spectrum Fees and Pricing Regulations.pdf

[20] As contained in the document referred as well as in the *Frequency Spectrum: Fees Pricing and Regulations 2004 (NCC*).

- **Spectrum Efficiency**: The promotion of spectrum efficiency and usage including the sharing of frequencies among a large number of users, as may be found in DECT[21], point-to-point UHF/VHF radio networks, among others. Spectrum efficiency is also achieved through national spectrum planning and the assigning of frequencies on the basis of usage, rather than to particular users, ensuring greater access among broader number of users. Regulators are to sanction licensees for unutilized usage and speculative trading or transfer of assigned frequencies.
- **Long Tenor & Assurance**: Encouragement of long-term frequency spectrum licenses of up to 15 years in many cases, which should provide for tenure security and sufficient planning. Standard term for most telecommunication licenses is however 5 years. Permits are frequency licenses that are below 1 year.
- **Universal Access & Service**: Frequency assignments are based on geographical distribution to promote universal access and service. For telecommunication frequencies, the country has been divided into tiers of licensing areas, which correspond to the 36 states and the Federal Capital Territory. Licenses and frequency assignments are thus issued on the basis of these licensing areas with spectrum fees varying from one tier to the other (See the *Pricing of Spectrum Licensing Fees* section). For broadcast frequencies, spectrum fees are classified based on the economic viability of an area and are typically issued as part of the broadcast license.

In addition, the policies encourage regulators to hold public consultations with stakeholders for inputs in relation to spectrum policy formulation and provide for free spectrum particularly in the ISM[22], Amateur and Citizens bands - though users are to abide by the regulations applicable to the licenses or permits.

Classification of Frequency Spectrum Licenses

Frequency spectrum licenses in telecommunications are categorized into short-term permits with tenure of 4 months; medium-term permits lasting one year; or long-term licenses with a tenure of 5, 10 or 15 years. While regular licenses range from 5 to 15 years, permits are frequency spectrum licenses with tenure of one year or less. NCC reserves the right to the duration, terms and conditions of any frequency spectrum licence. Nearly all frequency spectrum licenses are automatically renewable as long as they are being utilized and the licensee is up-to-date in fee payments.

Broadcast licenses have a renewable life span though, as part of the renewal process, the Commission conducts a public hearing where the licensee's audience are invited to freely comment on the quality of the operator's service and the desirability of renewing the licence. The licensee is also required to clear any outstanding financial and administrative obligation to the Commission.

Spectrum Assignments

The Nigerian Government considers frequency spectrum as a high-value yet scarce national resource and thus makes it a major source of revenue. However, it is a relatively free, natural resource for

[21] DECT – Digital Enhanced Cordless Telecommunications. UHF – Ultra High Frequency. VHF – Very High Frequency

[22] ISM - Industrial Scientific & Medical (ISM) band

radio communication services utilized by agencies of Government, diplomatic missions, security, defence, aviation and maritime services, aeronautical and amateur radio.

As discussed earlier, spectrum assignments in Nigeria is handled by three separate regulatory bodies as follows:

- Nigeria Communications Commission – for commercial providers & users of telecommunications equipment & services;
- National Broadcasting Corporation – for public and private broadcasting organizations; and
- Ministry of Information and Communications – for government bodies and non-commercial users of spectrum.

Telecommunications

Since 2001, all the fees for spectrum licensing and assignment received by the Nigerian Communications Commission have gone into the national treasury for distribution to the three tiers of Government, namely federal, state and local. Frequency assignments are conditioned upon the issuance of a communications license. The mode by which the Commission awards licenses and assigns frequencies appear to have been based on a combination of commercial value, optimal usage, uniform development across geographies and, to some extent, universal access and service. These policy objectives have led to competitive methods of licensing and frequency assignment, including open or selective auctions (either by way of lotteries or "beauty contest"), tenders, and fixed price as determined by the Commission. Over the past decade, NCC has generated in excess of US$2.3b from licensing and frequency assignments to commercial operators[23].

The main frequencies that have been assigned by the Commission since 2001 for various types of licenses including Digital Mobile, Fixed Wireless, and Unified Access, among others have been for the following frequency bands:

- 800MHz
- 900MHz
- 1800MHz
- 2.0GHz
- 2.3GHz
- 3.5GHz

The success of the GSM mobile licenses awarded in 2001 through what has been said to be "the world's first ascending clock spectrum public auction" [24] has been globally acknowledged and is

[23] See Appendix A for more details.

[24] See, for instance, http://www.itu.int/osg/spu/ni/3G/resources/licensing_policy/cd_pm-CRA%20UK-2001Aug29.pdf.

perhaps the most apt illustration of the use (or even effectiveness) of commercial licensing methods by the Commission.

In spite of NCC's seeming success at licensing, it is not specifically known to what extent the assigned frequencies are being utilized by the respective operators. Additionally, as a number of licenses have been issued behind closed doors, there may be questions whether all licensing and frequency assignments have been completely public, transparent or competitive as evidenced, for instance, by the private award of a GSM license and the assignment of the 900 & 1800MHz frequencies to Mubadala Development Company of the United Arab Emirates in January 2007[25], though it must be said that NCC does have sufficient legal powers to use any method to fix prices, award licenses and assign frequencies. NCC is empowered by the enabling law to "fix and collect fees for communications licenses and other regulatory services provided by the Commission"[26].

One other point to mention here is that it is rare to find the transfer of an assigned frequency spectrum by one operator to another; though the transfer of licenses (including spectrum) on commercial terms between operators subject to the approval of NCC is not so rare. Examples of the latter activity include the acquisition of the FWA license of Independent Telephone Networks by Visafone Ltd in 2006, the acquisition of Alheri Engineering Ltd's 3G licenses by Etisalat Nigeria in 2009, among others.

The majority of licenses contain standard terms that are published on the NCC website. Intending operators are required to submit an application on the relevant NCC application forms together with a feasibility study on the proposed service. The Commission will review the application and conduct due diligence which may require that the applicant produce additional evidence or information demonstrating its capacity to operate the proposed service. Most applications for basic licenses tend to be granted by NCC once there is full compliance with its procedures and requirements. For major licences, the Commission may choose to advertise the proposed service and invite existing or prospective operators to compete in a public auction or similar process.

Broadcasting

For broadcast services, the National Broadcasting Commission is responsible for receiving, processing, considering and recommending applications for broadcast licenses to the Minister of Information and Communications for the final approval of the President - at his solitary executive discretion. While the procedures for applying for radio and TV licenses have been publicly disclosed by the National Broadcasting Commission on its website[27], the actual process which the Commission uses in awarding licenses and assigning frequencies to private broadcasters is secret and veiled to the public.

[25] Other instances of controversial license awards include the award of 2.3GHz to Multilinks, Spectranet and Mobitel and the alleged surreptitious declaration of Phase 3 Telecom as the winner of bids up to US$35m for NCC's Wire Nigeria (WiN) initiative.

[26] Section 4(g), NCC Act 38 of 2003: *Functions of the Commission*

[27] See the section *How Does one get a Broadcasting Licence for Radio and Television* on http://www.nbc.gov.ng/faq.php.

The application checklist requires the submission of corporate documentation (incorporation, taxation & profile), feasibility study on proposed station and the appropriate licence fee, which currently stands at:

- Radio – USD$135,000
- Television – USD$100,000
- Cable TV – USD$70,000
- Satellite – USD$200,000[28]

Motivations for recommending license applications include the promotion of culture, the availability of broadcast frequencies and national security though it is unclear how the latter is specifically defined. For instance, the process by which over 350 licenses have been awarded to public and private broadcasts since 1992 is shrouded. Successful companies are required to pay both for the license and the allocated frequencies and there is no guarantee that an application will be successful even if all the conditions have been met. The enabling act also forbids the NBC from considering applications from religious bodies and political parties, though this exclusion is considered by many to be at variance with the Federal Constitution which allows freedom of thought and expression. Licenses have a renewable life span and, as part of the renewal process, the Commission conducts a public hearing where the licensee's audience are invited to freely comment on the quality of the operator's service and the desirability of renewing the licence. The licensee is also required to clear any outstanding financial and administrative obligation to the Commission.

Positively, the NBC recently auctioned its second national radio & TV network license to Silverbird Communications for USD$32.7m[2930]. The "first" radio & television network licenses had previously being awarded separately to the government-owned Federal Radio Corporation Nigeria and the Nigeria Television Authority respectively. The new license was meant to promote local content, improve the rural/urban divide, and consolidate existing network licenses previously issued to DAAR in 1995 and Silverbird in 2001.

The tedious bidding process commenced September 2009 and involved two other private companies, DAAR Communications and Megalectrics. DAAR operates 22 stations across Nigeria while the latter is relatively unknown. However, the auction is being vigorously contested by DAAR at the Federal High Court Abuja on allegations of lack of transparency, an action which the regulator responded to by curiously revoking the company's existing network license on the grounds of a "breach of the broadcasting code"[3132]! The Commission still awaits the President's final approval to grant the license to the winning bidder[33].

[28] This study could not confirm whether the licensing of broadcast services is also dependent on geography.

[29] http://www.nbc.gov.ng/broadcast.php?menu=1&submenu=4.

[30] http://www.nbc.gov.ng/highlight.php?id=27.

[31] http://www.punchontheweb.com/Articl.aspx?theartic=Art20091221253328

[32] http://www.nbc.gov.ng/highlight.php?id=28

[33] See http://www.punchng.com/Articl.aspx?theartic=Art201008257121018.

Public Spectrum

During the period of monopoly, the Ministry of Information and Communications was solely responsible for managing the radio frequency spectrum for both telecommunications and broadcasting in Nigeria. With liberalization, the Ministry's powers and functions have been extensively whittled down and ceded to the sector's twin regulatory bodies, NCC and NBC. Through the Department of Spectrum Management, the Ministry now regulates and assigns frequencies only to Government and non-commercial users, and represents the country's national spectrum interests at numerous international organizations including the ITU, ITSO, IMO, ICAO, CTO, among others.

The application for public spectrum at MoIC is relatively simple. Prospective end-users would purchase an application form at a cost of US$20[34], complete and submit to the Ministry with documents describing the technical characteristics of the equipment to be utilized, aircraft/vessel registration and corporate information.

The standard fee for Radio Frequency License Fee is approximately $350 per station and applies to private non-commercial radio users, Government Ministries, Departments and Agencies, Diplomatic Missions, Security Services, Maritime, Aeronautical, and Amateur Radio. Income from frequency licensing, assignments and type approvals go directly into the Federal Treasury.

In summary, frequency assignments for telecommunications services in Nigeria appear to be open and based on competitive methods. Use of spectrum by government bodies and other non-commercial users is also fairly straight-forward. On the contrary, the processes for awarding broadcast licenses and assigning frequencies are shrouded in secrecy and thus less open to the public.

Pricing of Spectrum License Fees

Regulations that govern the pricing of commercial frequency spectrum for telecommunications were published by the Nigerian Communications Commission in 2004 as amended in 2009[35]. With these rules, NCC sought to establish a transparent, impartial, and competitive pricing system for the acquisition of frequency spectrum that encompassed auctions, pageants and other globally accepted methods of bidding. Additional objectives of the pricing framework are as follows:

- a simple, uniform, consistent and efficient spectrum management in Nigeria by standardizing frequency spectrum fees and pricing;
- market value for frequencies proportional to spectrum size being acquired;
- efficiency and competition in the usage of frequency spectrum;
- uniform geographical development of telecommunications infrastructure across Nigeria and the universal service goals.

[34] Currently

[35] See Nigeria Communications Act 2003 No. 19, Frequency Spectrum Regulations November 16, 2004 (amended 2009).

For the purposes of determining the market value of spectrum licensing, the 36 states of Nigeria and the Federal Capital Territory have been classified into five licensing groups as shown in Table 2 below:

Table 2: NCC's Zoning System for Pricing Frequency Assignments & Allocations

Tier	States	Population [36]	% of Total Population	Area[37] (km^2)	% of Gross Area	Annual Unit Price per MHz (US$)
Tier 1	Lagos	9,113,605	6.5%	3,671	0.4%	20,000.00
Tier 2	Delta, Federal Capital Territory – Abuja, Kaduna, Kano, and Rivers	26,232,191	18.7%	98,051	10.8%	10,000.00
Tier 3	Abia, Anambra, Edo, Ogun, and Oyo	19,588,608	13.9%	71,582	7.9%	8,000.00
Tier 4	Akwa Ibom, Bauchi, Benue, Borno, Cross River, Enugu, Imo, Kogi, Kwara, Niger, Ondo, Osun, and Plateau	46,786,785	33.3%	378,407	41.6%	4,000.00
Tier 5	Adamawa, Bayelsa, Ebonyi, Ekiti, Gombe, Jigawa, Katsina, Kebbi, Nassarawa, Sokoto, Taraba, Yobe, and Zamfara	38,710,601	27.6%	357,909	39.3%	2,000.00

It would appear from a cursory glance that the groupings have been done with Tier 1, representing the geography with the highest access to communications infrastructure, having the most expensive pricing and scarcity of spectrum resources. At the bottom of the scale, Tier 5 appears to represent those geographies with the least developed telecoms structures and probably more available frequency resources. Spectrum here would be cheapest. If this is accurate, then pricing for frequencies in the more rural parts of the country would seem to be cheaper than in the more urban areas. While it is of interest to understand the official basis for the groupings above, this study was unable to access this information from the regulator during the period of the research.

[36] Nigeria 2006 official population figures. Source: National Population Commission (http://www.population.gov.ng/files/nationafinal.pdf)

[37] National Bureau of Statistics (www.nigerianstat.gov.ng)

Using Table 2 as its main reference, NCC has adopted an empirical pricing formula which it believes reflects the economic value of frequency spectrum within the context of the level of development of telecommunication infrastructure and services across the country. This formula makes the price of frequency spectrum directly proportional to the size of the frequency spectrum assigned and takes into account the level of congestion, market demand and the relative cost of deploying network infrastructures within the target geographies.

The price of spectrum for a licensing region is subsequently calculated as follows:

SPECTRUM FEE = (unit price) (B) (K1) (K2) per State

WHERE **B** = assigned bandwidth in MHz or spectrum size in MHz

K1 = Band factor[38]

2.0 for 450 MHz

1.4 for 800/900 MHz Band

1.6 for 1.8/1.9 GHz Band

1.2 for 2.0 – 2.5 GHz Band

1.0 for 3.5 GHz Band

0.5 for 5.0 GHz

0.33 for 10.5 GHz Band

0.12 for 26 GHz[39]

K2 = Tenure Duration Factor

0.3 for 3 months

1 for a 1 year license

4 for a 5 year license (standard)

7.2 for a 10 year license

10.4 for a 15 year license

This study could not discover the basis for pricing broadcast frequencies and spectrum for public and whether such basis even exists.

Conditions Governing Spectrum Utilization

There are four major conditions governing the use of assigned frequencies by telecommunications licensees as outlined in the NCC's Commercial Frequency Management Policy document.

1. First is the use-or-lose condition which stipulates that all frequency licenses have to be put to use within the time stipulated in the license, otherwise it will automatically lapse.

[38] For simplex channels, Unit Price per State will be half of the equivalent duplex channel.

[39] The Commission determines the K1 Band factor for frequencies below 800MHz and above 26GHz

2. The second condition is the automatic forfeiture of the frequency license at the end of the second year of an operator going out of business, even if renewal fees have been paid.
3. The regulator forbids itself from issuing large quantities of spectrum as may be requested by any operator who seeks to put in place spectrum inefficient technologies.
4. The final condition is the strict non-transferability of a license to third parties either in whole or in part without the approval of NCC.

For broadcast stations, the use of spectrum is conditioned on strict compliance with the Broadcasting Code and NBC may apply a wide range of sanctions for any infringement thereof. For instance, the Commission applied fines ranging from USD$350 to $3,500 in sanctioning 35 broadcast stations in January 2010 for breaches of the Broadcasting Code[40]. The Commission also freely revokes licenses where it determines that a breach has occurred.

Proposed Frequency Allocations

Telecommunications

NCC has announced plans to allocate new spectrum mainly to support the deployment of broadband services. Table 3 below[41] outlines the exclusive, shared and license-free frequencies proposed by the Commission in 2007 for immediate assignment to commercial operators, though it is still unknown when these resources would be released and what processes would be adopted in assigning them to operators. Perhaps the appointment of a new helmsman at NCC July 2010[42] may introduce fresh momentum in the assignment of these frequencies.

Table 3: Frequency Allocation Plan (NCC)

Frequency Allocation Plan for Wireless Access

Nigeria

Band	450MHz	2.5-2.7GHz			3GTDD	3.5Ghz			5.0GHz	5.8GHz	10.5GHz		26GHz	
Frequency Range		2,500 – 2,690			1,910 – 1,920 2,010 – 2,025	3,400 – 3,600			5,120 – 5,250 5,250 – 5,350 5,400 – 5,725	5,725 – 5,825	10,500- 10,680		24,500 – 26,500	
Tx (UL)	450.525 - 456.775					3,400 – 3,500					10,500 – 10,590		24,500 – 25,500	
Rx (DL)	460.525 - 466.775					3,500 – 3,600					10,590 – 10,680		25,500 – 26,500	
Total Available Bandwidth (MHz) Duplex	6.25	1900			35	100			237	150	90		1,000	
Channel Plan MHz	1.25	5	14	28	Flexible	1.3	3.5	11	Flexible	Flexible	28	56	28	56
No. of Channels	5	950	152	38		80	28	9			3	1	35	17
License Type	Individual	Individual			Individual	Individual			Class/free	Free	Individual		Individual	
Mobility	Fixed/Mobile	Fixed/Mobile			Fixed/Mobile	Fixed/Mobile			Nomadic	Nomadic	Fixed/Mobile		Fixed/Mobile	
Technology	Neutral	Neutral			Neutral	Neutral			Spread Spectrum	Spread Spectrum/ OFDM	Neutral		Neutral	
Possible Usage	Guaranteed QoS, Rural Market	Guaranteed QoS, GSM, Broadband, 3.G, WiMAX,			Guaranteed QoS	Guaranteed QoS, Rural Market, WiMAX			Campus LAN, Public Access, Mass Market, WiMAX	Mass Market	Guaranteed QoS		Mass Market, Public Access	

Source: Nigerian Communications Commission

[40] http://allafrica.com/stories/201002222087.html.

[41] Source: Nigerian Communications Commission. See also Commercial Frequency Management Policy, Administrative Procedures and Technical Guidelines.

[42] http://allafrica.com/stories/201008090326.html.

NCC expects that the migration to digital broadcasting in 2015 will free up to 75% of spectrum resources and the following additional frequencies may then be available for utilization by service providers in the telecommunications industry[43]:

- 470 – 860MHz
- 700MHz
- 1.2 – 1.6GHz
- 2.7 – 2.9GHz
- 3.6 – 4.2GHz
- 4.4 – 5.0GHz

Of interest to this study will be the plan to open up frequencies in the 5.0GHz and 5.8GHz bands for free class and public access. Unlicensed spectrum is discussed in some detail below.

Migration to Digital Broadcasting

Nigeria plans to revolutionize its broadcast industry by upgrading to digital terrestrial broadcasting and simultaneously switch off analogue networks on June 17 2012, three years ahead of the global deadline set by the ITU. To achieve smooth migration, the Government inaugurated the Presidential Advisory Committee on Transition from Analogue to Digital Broadcasting in Nigeria (PAC) in October 2008, a national think-tank consisting of 21 stakeholder representatives across various sectors, with the mandate to develop a comprehensive transition master plan document that includes appropriate models, policies and regulatory frameworks and that provides for the mitigation of the impact of the migration on consumers and the environment.

PAC submitted its report to the Government in June 2009[44] and recommended the creation of a single, public-owned, signal distribution company that would provide signal distribution for all stations on request on an equitable basis. The committee also recommended new legislation to support the proposed broadcast model so the transition conforms to ITU standards[45]. The Government's whitepaper on PAC's submissions is still being anticipated as at the time of writing this report. In the interim, the Commission is said to be managing the migration process and assisting the industry in the areas of studio equipment & acquisition of set-top boxes, content provision, planning for new coverage, training and public awareness. Though it is not quite clear what the Commission is actually doing and what sort of assistance would be provided for private operators.

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[43] See *"Frequency Resource and Technical Guidelines for Broadband Service Roll Out in Nigeria"* by Engr. Stephen A. Bello, Executive Commissioner (Engineering & Standards), Nigerian Communications Commission (http://www.ncc.gov.ng/speeches_presentations/Presentation by Engr Bello at NCC and IT Digest.pdf)

[44] See *"No Going Back on 2012 Deadline over Digital Broadcasting"* http://news.onlinenigeria.com/templates/?a=5336.

[45] http://www.compassnewspaper.com/NG/index.php?option=com_content&view=article&id=10491:nigeria-plans-single-signal-distributor-for-digitilisation&catid=43:news&Itemid=799

Spectrum Management and Monitoring

The purpose of spectrum monitoring is to ensure licensed users operate within specifications, discover illegal uses and harmful interference in order to optimize the scarce resource. Prior to the deregulation of the communications industry, MoIC was the body solely responsible for spectrum management and monitoring. In pursuit of this, the Ministry set up International Radio Monitoring Stations in four Nigerian states, two in the south and two in the North, though only two of these stations are currently in operation. The Ministry is planning to install a central national coordinating station in the Federal Capital Territory (FCT) though it is yet unknown whether this central station would be for the monitoring of the entire spectrum or for public services alone.

Similarly, the Nigerian Communications Commission is also implementing a Spectrum Management and Monitoring System ("SMMS") to gather detailed information from operators on continuing utilization of frequencies as assigned by the Commission. It also seeks to know operator equipment attached to those frequencies as well as the sites and locations where equipment is being deployed, etc. NCC maintains a database on the utilization of frequencies and associated information which is in turn used to resolve problems relating to interference; determine new policies for effective spectrum planning, and obtain live feedback to guide the overall spectrum management strategy of the Commission. It is mandatory for all operators to participate in SMMS.

Unfortunately, this study was unable to determine whether the Ministry and the Commission are working together (perhaps through the Frequency Council) to create a single National Spectrum Management System or whether there are in fact two separate projects in this regard. Perhaps further interactions with both bodies prior to the overall conclusion of the study may discover this vital piece of information.

Unlicensed Spectrum

The Nigerian Communications Commission (NCC) has designated the ISM frequencies of 2.4GHz, 5.8GHz and 24GHz[46] as free for diverse applications following ITU recommendations and global practices, though there are certain technical guidelines which have to be adhered to by users. These conditions include the following:

1. Applications on ISM frequencies are strictly for private use on a secondary, non-protected, non-interference, and non-exclusive basis. Third party transmissions or commercial services by private networks are strictly forbidden. Providers of commercial services using the ISM band are required to obtain a license.
2. NCC requires the registration of private networks on ISM frequencies for information purposes.
3. Equipment must comply with technical limitations on power output, tolerance, modulation and range.

The main objective is to promote rapid expansion of services and in particular to increase use of Internet services, using WiFi technologies. As 2.4 GHz is a shared band, the Commission has issued a

[46] It is not yet known when the Commission will make a formal announcement on the 5.8 and 24GHz frequencies.

guideline16 to ensure interference free operation by all users of the band and guaranteed grade of services to subscribers. Table 4[47] below shows the frequencies approved for free transmissions on the 2.GHz frequency band.

Table 4: ISM Frequencies in Nigeria (NCC)

ISM FREQUENCY (REGION 1)

Frequency Band	Frequency Range
67 KHz band	6765 – 6795 KHz
13 MHz Band	13.553 – 13.567 MHz
27 MHz Band	26.957 – 27.283 MHz
40 MHz Band	40.66 – 40.70 MHz
2.4G Band	2.400 – 2.5000 GHz

NCC published regulations in May 2004 covering the operational guidelines for ISM operators, licensing, technical conditions, quality of service and frequencies for microwave and satellite backhaul transmissions[48].

Dispute Resolution Relating to Spectrum Awards & Usage

Commercial disputes relating to spectrum awards and usage involving the telecommunications regulator on the one hand and private corporations are uncommon. In one instance, the regulator's decision on frequency assignment has been appealed at the Federal High Court:

- In March 2010, the Federal High Court Abuja reversed the cancellation by Prof Dora Akunyili, the Minister of Information and Communications, of the 2.3GHz licence issued by the Nigerian Communications Commission to Mobitel Ltd ("Mobitel")[49]. Justice Umar Garba quashed the Minister's directive on the ground that it was beyond her powers and thus null and void. He also ordered the Commission to release the frequency slot to Mobitel, an order to which NCC immediately complied. Mobitel had taken the Minister to court for cancelling NCC's licensing process which awarded the three 2.3GHz frequency slots to Mobitel, Spectranet, Multilinks Telkom for US$27.3m.

- Interstella Communications Ltd ("Interstella") sued NCC by filing court process at the Federal High Court Abuja in October 2007 for allegedly interfering with its exclusive Internet Exchange Gateway license in setting up a subsidiary, Nigeria Internet Exchange Point ("NIXP")[50]. Among other reliefs sought, the company requested the court for an order compelling NCC to stop its planned auction of frequencies for the operation of NIXP and allocate these frequencies to it. The company also demanded the USD$70m in damages. Both NCC and NIXP have formally

[47] Source: NCC

[48] See Regulatory Guidelines for the Use of 2.4GHz ISM Band
for Commercial Telecom Services (NCC, 2004)

[49] http://allafrica.com/stories/201003191009.html

[50] http://www.balancingact-africa.com/news/en/issue-no-368/internet/interstella-sues-ncc-for-breach-of-exclusive-licence-to-operate-intern.

denied these allegations[51]. The dispute has been allegedly resolved by the National Security Adviser and a compensation package of USD$8m or 50% of the costs said to have been incurred by Interstella was to be paid by NCC[52]. It is unknown whether the agreements held and parties complied with settlement terms.

Often, losing bidders sometimes publicise allegations of and lack of transparency in the licensing/spectrum award process by the regulator. For example, Suburban Telecoms, a national long distance operator, petitioned the Minister alleging under-hand dealings in the selection by NCC of Multilinks Telecom and Phase 3 Telecoms Ltd to provide subsidized transmission networks for the Commission's WireNigeria (WIN) project[53]. All three parties, Multilinks, Phase 3 and have NCC denied these allegations[54].

Disputes relating to the use of broadcast frequencies are even more infrequent in Nigeria as decisions of the National Broadcast Commission are scarcely challenged by operators for (perhaps) the complete loss of the license, which would be greater. Cases that have gone to court have related mainly to content, either with respect to breaches of the Broadcasting Code or piracy[55].

Regulatory Initiatives

The Nigerian Government is carrying out certain initiatives through the NCC to stimulate private investments in the communications sector and possibly promote open spectrum usage in one way or the other. Of specific mention is the Universal Service Provision Fund (USPF) which was established in 2003 to provide ICT access to underserved rural and urban areas by availing subsidies to licensed companies. USPF has in turn launched a few initiatives to fulfil its mandate, the relevant project to this study being the:

- **Schools, Universities Access Programme (SUAP):** SUAP is planned as a national initiative to provide broadband connectivity to 360 schools, universities and neighbouring communities across Nigeria focusing on rural areas.

- **Rural Broadband Internet (RUBI) Access:** RUBI awards subsidies to private companies who are thus licensed to provide wholesale internet bandwidth to Community Communication Centers (CCC), cybercafés, and other end-users in rural communities in Nigeria.

However, it is unclear how these initiatives will impact on the availability and usage of frequency spectrum by commercial and non-commercial organizations in the country.

[51] http://itweekonline.com/print.php?news.32.

[52] http://www.balancingact-africa.com/news/en/issue-no-377/internet/nsa-intervenes-in-row-over-nigeria-s-internet-exchange-point.

[53] http://www.technologytimesng.com/wp-content/uploads/2010/04/Petition-by-Suburban-to-Minister-of-Info-and-Comms.pdf

[54] http://www.technologytimesng.com/2010/04/25/wire-nigeria-project-suburban-wants-ncc-probed-over-subsidy-to-phase-3-telecom/

[55] See for examples - http://www.punchng.com/Articl.aspx?theartic=Art201002252564123 and http://www.balancingact-africa.com/news/broadcast/issue-no70/broadcast/nigeria-chief-raymond-dokpesi-and-daar-communications-broadcasti

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9. Nigeria Communications Commission, "*National Radio Frequency Management Policy 2007"*
10. Nigeria Communications Commission, "*Regulatory Guidelines for the Use of 2.4 GHz ISM Band for Commercial Telecom Services 2004"*
11. Nigerian Communications Commission website: www.ncc.gov.ng
12. Primary interview with Abraham Oshadami[1], Principal Manager, Spectrum Administration Department, Nigerian Communications Commission, in Abuja on May 20, 2010.
13. Simon Moshiro, BDT-ITU, "*Licensing in the Era of Liberalization and Convergence: The Case Study of the Federal Republic of Nigeria",* December 2004.

Appendix A

Summary of Frequency Spectrum Assigned by NCC

2001 - 2010

S/N	Spectrum Auctioned	Date Issued	Frequency Band	No. of Applicants	Licensing Mode	Successful Firms	Amount Paid (Total US$)
1	4 slots of 20MHz	May 16 2009	2.3GHz	40	Open Auction	Mobitel Spectranet Multilinks Telkom	27,360,000
2	3 Carriers (3.75MHz)	July 13 2009	800MHz	4	Open Auction	Visafone	2,933,333
9	Unified License	August 15 2007		1	Private Award	Reitel Wireless	4,000,000
3	4 slots of 10MHz	March 19 2007	2GHz	17	Open Auction	Alheri Celtel Globacom MTN Nigeria	600,000,000
4	Unified Access Service License	January 19 2007	GSM 900MHz & 1800MHz	1	Private Award	Mubadala	400,000,000
5	Unified License	August 16 2006			Private Award	MTN Nigeria VGC Communications Dan Jay Telecoms Bourdex Starcomms Intercellular Multilinks Telkom Prestel	150,000,000
6	Second National Operator	August 12 2002	GSM 900MHz & 1800MHz	1	Open Auction	Globacom	200,000,000
7	Fixed Wireless Access (2x14MHz slots)	August 19 2002	3.5GHz		Open Auction	Various (37 in all)	100,000,000
8	Digital Mobile License	January 19 2001	GSM 900MHz & 1800MHz	5	Open Auction	Econet MTN Nigeria NITEL	855,000,000
						Total	$ 2,339,293,333