LICENSING IN THE ERA OF LIBERALIZATION AND CONVERGENCE

THE CASE STUDY OF THE FEDERAL REPUBLIC OF NIGERIA

INTERNATIONAL TELECOMMUNICATION UNION

The Case study was conducted by Simon Moshiro.

During the field study the author was able to meet and interview the Nigerian Communication Commission, Ministry of Communications, industry and consumer representatives. It is hoped that, this study will be useful not only to regulatory authorities but also to others concerned with the telecommunications market.

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The views expressed in this report are those of the author and do not necessary reflect the views of the ITU or its members or the Nigerian Government.

1 Introduction

1.1 Purpose of the study

This case study forms part of a series on licensing in the era of liberalization and convergence. Conducted by the Regulatory Reform Unit (RRU) of the Telecommunications Development Bureau (BDT) of the International Telecommunication Union (ITU), this series of case studies aims to respond to a growing demand from the ITU Membership for best practices guidelines on this crucial policy and regulatory aspect that could be of assistance to regulators who are considering a shift from a monopoly or limited competition environment to a fully liberalized one. The case study will also form part of the 6th edition of the ITU publication of "Trends in Telecommunication Reform 2004 – Licensing in an Era of Convergence" and will be showcased at the 5th annual Global Symposium for Regulators (Geneva, 8-10 December 2004).

The Federal Republic of Nigeria was selected because of its rapid development of the telecommunication sector through the implementation of private sector participation policy including innovative approaches. This transformation has raised the telephone profile of Nigeria from a teledensity of 0.34 in 1998 to 3.25 in 2003. This reflects not only the policy changes that are taking place in African countries but also in telecommunication markets world-wide. Nigeria is one of the African countries that have adopted a clear policy for the development of the telecommunication sector, supported with a flexible regulatory framework.

This case study report looks at Nigeria's progress from a monopolistic telecommunication market towards a fully liberalized market. The report will particularly examine Nigeria's policy and regulatory framework and its implementation via imaginative licensing approaches. It will also highlight benefits and challenges.

1.2 Country background.

Situated in West Africa, Nigeria is a member of the Economic Organization of West African Counties, ECOWAS.

It has a landmass of 923,800 square kilometers and an estimated population of 132,800 million. The country is endowed with natural resources and it is leading in Africa in exportation of oil. Its GDP was US$ 49,160 million in 2003.

At the end of 2003 there were 724,790 fixed telephone subscribers and 3,149,000 mobile subscribers. This compares with 438,619 telephone lines and 20,000 mobile subscribers at the end of 1998.

2 Development objectives and structure

This section summarizes Nigeria's telecommunication development objectives stated in the National Telecommunications Policy. It also looks at the industry structure adopted for the implementation of the Policy.

2.1 Policy objectives and strategies

The transformation of the telecommunications sector in Nigeria started with the establishment of the Nigerian Communications Commission (NCC) by the Communications Act, of 1992. The Act gave the Commission a broad mandate for economic regulation of the telecommunications sector.
After its inauguration in July 1993, the Commission set about implementing liberalization. It issued a number of licences for telecommunications services including a licence for the provision of fixed telephony services by a private operator in each of the 36 states. However, by 1998 the fixed public network had a capacity of 700,000 lines, and 400,000 connected subscribers only. The only mobile cellular telephone network, provided by the Nigerian Mobile Telecommunication Company Ltd (NITEL), had a capacity of 210,000 lines with 26,500 connected lines. The government found this performance of the sector unacceptable and moved to correct it by developing a policy which was formulated in 1998, adopted and published in mid 2000.

The overriding objective of the National Telecommunication Policy is to achieve the modernization and rapid expansion of the telecommunications network and services in order to:-

- Enhance national economic and social development and integrate Nigeria internally and into the global telecommunications environment.
- Make telecommunication services efficient, affordable, reliable and available to all.

The policy set short-term and medium term network development objectives and strategies. For example, to achieve and exceed the minimum teledensity of 1 telephone to 100 inhabitants recommended by ITU, within three years, and to promote widespread access to advanced communications technologies and services, including the Internet and related facilities.

Strategies include the promotion of competition to meet growing demand through the liberalization of the telecommunication market and providing a new regulatory environment that is sufficiently flexible to take into account new technological development and the international trend towards convergence.

Also, the National Telecommunication Policy defines the structure for achieving the objectives, with particular emphasis on the independence and impartiality of the Nigerian Communications Commission. The Policy provides guidelines on key regulatory issues like licensing, interconnection, allocation of scarce resources, tariff regulation and universal access and service. Legislation is being adopted progressively to give effect to the Policy, where necessary. In 1998 the Communications Act was amended to strengthen the role and powers of the Commission. In 2003 a new and more comprehensive Communication Act was passed to implement the strategies set out in the National Telecommunications Policy.

3 Industry structure

3.1 Policy and Regulatory Institutions

In line with the National Telecom Policy, a well defined policy and regulatory structure has been put in place. The structure comprises the Ministry of Communications, the National Frequency Management (NFM) Council and the Nigerian Communications Commission.

3.1.1 Responsibilities of the Minister

The Minister is responsible for formulation, determination and monitoring of policy and international treaties and representation of the country in international organizations and fora. The law requires the Minister to indicate general policy direction to the Commission while ensuring the protection of its independence.

Box 1: Minister's relationship with the Commission

Section 25 of the Communications Act, 2003:

(1) Subject to subsection (2) of this section, the Minister shall, in writing, from time to time notify the Commission of and express his views on the general policy direction of the Federal Government in respect of the communications sector.

(2) In the execution of his functions and relationship with the Commission, the Minister shall at all times ensure that the independence of the Commission, in regard to the discharge of its functions and operations under this Act, is protected and not compromised in any manner whatsoever.

3.1.2 The functions of the National Frequency Management (NFM) Council:

The functions of the Council are:

a) assist and advise the Minister on the representation of Nigeria and at international and regional spectrum allocation bodies;
b) assist and advise the Minister on the preparation and negotiation of bilateral and multi-lateral spectrum allocation treaties;
c) assist and advise the Minister on the preparation, negotiation and adoption of spectrum coordination agreements that are applicable to cross-border spectrum uses;
d) in consultation and conjunction with the Commission, prepare, update and publish on a regular basis a national frequency allocation table;
e) carry out bulk allocation of spectrum to statutory bodies that are authorized by enabling laws to allocate spectrum to end-users; and
f) receive and collate returns and statistics on spectrum allocation to from the statutory bodies and coordinate their respective activities.

3.1.3 The Nigeria Communications Commission

The Communications Act, 2003 has vested a wide range of functions and powers in the Commission.

Box 2: The functions of the Commission

The functions of the Commission listed in the Communications Act 2003 include:-

a) the facilitation of investments in and entry into the Nigerian market for provision and supply of communications services, equipment and facilities;
b) the protection and promotion of the interests of consumers;
c) the promotion of fair competition in the communications industry;
d) granting and renewing communications licenses;
e) the development and monitoring of performance;
f) making and enforcement of regulations;
g) management and administration of frequency spectrum for the communications sector and assisting the National Frequency Management (NFM) Council in developing a national frequency plan;
h) development, management and administration of a national numbering plan and electronic addresses plan;
i) proposing, adopting, publishing and enforcing technical specifications and standards for the importation and use of communications equipment;
j) the formulation and management of Nigeria's inputs into the setting of international technical standards for communications services and equipment;
k) carrying out type approval tests on communications equipment and issuing certificates therefor;
l) encouraging and promoting infrastructure sharing amongst licensees and providing regulatory guidelines thereon;
m) examining and resolving complaints and disputes;
n) preparation and implementation of programmes and plans that promote and ensure the development of the communications industry;
o) designing, managing and implementing Universal Access strategy and programme
p) advising the Minister on the formulation of the general policies for the communications industry and generally on matters relating to the communications industry;
q) implementation of the Government's general policies on communications industry
r) generally advising and assisting communications industry stakeholders and practitioners with a view to the development of the industry and attaining the objectives of this Act and its subsidiary legislation;
s) representation of Nigeria at proceedings of international organizations and fora on matters relating to regulation of communications and matters ancillary and connected thereto; and
t) general responsibility for economic and technical regulation of the communications industry.

3.2 Operators and Service Providers: Overall market Status.

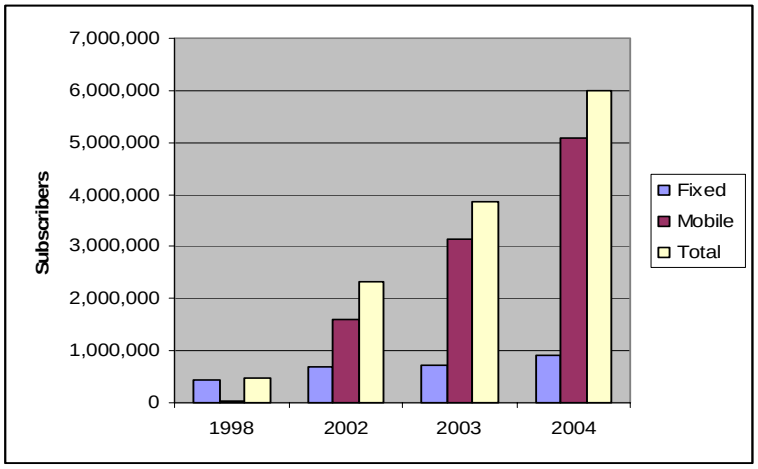
The Nigerian Communication Commission adopted a phased approach to the liberalization of the telecommunications sector, via different licence mechanisms and schemes. The targets and guidelines set out in the National Telecommunication Policy inspired the Commission in its operations. Table 1, Figure 1 and Figure 2 below depict the effect of regulatory action taken during 1998 to 2003 on service growth.

Table 1: Number of Fixed and Mobile Lines 1998 – 2004

	1998	**2002**	**2003**	**Aug. 2004**
Fixed Telephone Lines	438,619	702,000	724,790	900,000
Mobile Lines	20,000	1,607,931	3,149,000	5,100,000
Total	458,619	1,309,931	3,873,790	6,000,000

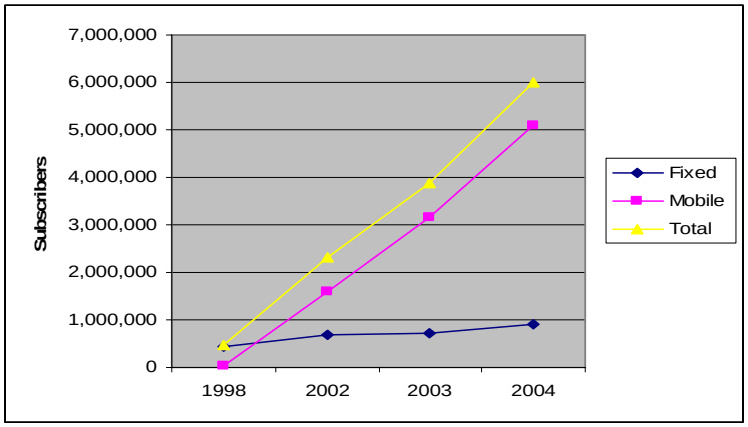
Source: Adopted from NCC, ITU NB: Figures for 2004 are estimated

Figure 1: Fixed and Mobile Subscribers growth



Source: Adopted from NCC, ITU NB: Figures for 2004 are estimated.

Figure 2: Fixed & Mobile subscribers growth



Source: Adopted from NCC, ITU NB: Figures for 2004 are estimated

3.2.1 Fixed Telephony

The Nigeria Communications Commission started with the liberalization process initially with the fixed telephony market. In 1996 onwards the Commission licensed private owned telecommunications operators (PTOs) to compete with the state-owned monopoly operator, NITEL, in providing fixed telephone services. However, by December 2001, the newly licensed PTOs had been able to add only 146,500 subscribers to the fixed telephone network. This represented 18.9%[1] market share, compared with NITEL's 81.1% share. The reasons for the unimpressive performance of the PTOs are varied. Among them are lack of access to transmission infrastructure and capital. Most of the licensees are small and medium enterprises. Also, the selection process did not guarantee that the firms that were given licences could meet the required roll out of services.

[1] Source; NCC

The formulation of the National Telecommunication Policy in 1998 and its adoption and publication in mid 2000 along with specific targets for improving telephone penetration set the stage for major licensing decisions by NCC. After a process that started in 2000 the Commission licensed a Second National Carrier, Globacom in 2002. To extend service more evenly throughout the country NCC also issued licences for Fixed Wireless Access (FWA) operations on a state-by state basis; but a company could be issued with licences to operate in several states. NITEL was issued a new licence with conditions comparable to Globacom including roll-out obligations. The fixed telephony market status in service provision as at 2003 is depicted in Table 2.

Table 2. NITEL and PTO Fixed lines.

	1998	**2002**	**2003**
NITEL	434,119	555,056	556,590
PTO's	4,500	146,944	168,200
Total	438,619	702,000	724,790

Source: NCC, ITU

3.2.2 Mobile Telephony

The monopoly service operator, NITEL, pioneered the provision of cellular mobile telephony services using analogue technology. But by 2000 there were less than 26,500 lines connections out of a capacity of around 210,000 lines. To meet and exceed the short term and long-term targets set by the National Telecommunication Policy the Commission, initiated in year 2000, a process that led to the licensing of three GSM operators in July 2001: Econet Wireless Communications Limited, MTN Limited and M-Tel Limited, NITEL's subsidiary. The fourth GSM mobile operator, Globacom, was licensed in September 2002. The licensing of the GSM mobile operators changed the Nigerian telephone market profoundly. Within less than a year there were 1.6 million subscribers, exceeding the three year target of 1.2 million subscribers set in the National Telecommunications Policy. In 2003 mobile subscribers surpassed fixed telephone subscribers. These results revealed the pent up demand and the high potential of the Nigerian market. The operators are aggressively expanding their operations to increase market shares.

3.2.3 Benefits and Challenges

This extensive liberalization of the telecommunications sector has benefited the country. The contribution of the sector to GDP was US$ 1.23 million in 2002, the second highest after oil and gas.

Total penetration increased from 0.38 per 100 inhabitants in 2001 to 4.5[2] for 100 inhabitants by August 2004. While prices for local fixed calls have been going up due to rebalancing, NITEL's rates, which were heavily subsidized, competition has been driving down the retail tariffs for mobile services. When MTN started operations in 2002 it charged 20,000 Naira (US$ 198.41) for a prepaid mobile line, but by the end of August 2004 the rate was about 5,000 Naira (US$ 39.68). Globacom's rate for a prepaid mobile line was 4,000 Naira (US$ 31.75) at the end of August 2004[3]

- The multiplicity of operators in the sector also posed a number of challenges. The lack of adequate telecommunications infrastructure has been a significant constraint to the new entrants

[2] ITU (The Study)

- The monopoly operator NITEL, has not been able to meet its duty of providing adequate infrastructure. The GSM operators have to install their own infrastructure, diverting investment that could be devoted to rolling out services.

The PTOs experienced difficulties in interconnecting with NITEL's network, particularly before NITEL was subjected to oversight by the NCC. With the intervention of a new management at NITEL, there has been considerable improvement in interconnection matters not only with the network of NITEL but with all networks.

The Fixed Telephony and FWA licences allow limited mobility, within sites. Technologies being used by the PTOs and FWA operators enable them to extend mobility beyond authorized limits. The GSM operators have concerns that the PTOs go beyond the allowed limits to encroach on the limited competition reserved for the GSM mobile operations. The major operators claim that some PTOs carry third-party traffic (refile) on their networks, which they are not authorized to do although the PTOs deny doing so.

When the GSM operators started rolling out the quality of service was poor, with many calls dropping out. The situation has since improved but requires continuous monitoring.

All these issues require the attention of the regulator. The operators and consumers commend NCC for the effective way it has presided over the liberalization of the sector and handled some of these issues. But they expect more from the Commission in terms of effectiveness particularly in the area of enforcement and compliance. The Commission is increasing its capacity in this and other fields of its regulatory mandate.

4. Enabling legislation

4.1 Situation before 2003

Clear legislation is a prerequisite for a credible regulatory framework. It gives stability to policy and, consequently, certainty. The Telegraphy Act 1990 provides for the operation of telecommunications services mainly by the monopoly operator, NITEL and for the management of the radio frequency spectrum.

The passing of the Communications Act in 1992 marked the beginning of the evolution of the enabling regulatory environment for private sector participation in the telecommunications sector in Nigeria. It is this Act, as amended in 1995 and 1998, which established the Nigerian Communication Commission and gave it a general mandate for the economic regulation of the sector. The Commission used this broad authority to establish licences and licence conditions relating to, among others, interconnection, tariffs, access to facilities and consumer protection. The Commission has also been developing guidelines on these issues.

4.2 Communications Act 2003

The adoption of the National Telecommunications Policy in mid 2000, paved the way for the passing of a new legislation. The Communications Act, 2003 became effective in July 2003. Like the Policy, the new Act addresses regulatory issues comprehensively. The statement on the objectives of the Act, (Box 2) gives an idea of the range of matters with which it deals.

The regulatory issues on which the Act touches include licensing, general competition principles, investigations and appeals. Others are dispute resolution, interconnection, and access to facilities, universal service, spectrum management, numbering and technical standards.

Finally, there are transitional provisions relating to the protection of existing rights and modification of licences to conform to the Act.

4.3 Regulatory intervention and Deregulation

In general, the Communications Act sets the stage for extensive intervention that may be necessary during the transition to full liberalization. At the same time, the Act gives the Commission the discretion to effect further deregulation consistent with open competition without the necessity of adopting new legislation.

Below are examples of provisions authorizing regulatory interventions coupled with the possibility of lessening the extent of ex-ante regulation.

4.3.1 Licence Requirement

The Act makes the possession of a licence mandatory, for the operation of a telecommunication system or service. But the Commission is empowered to issue individual and class licences or to make regulations exempting categories of services from licensing altogether[4]. The Commission has deregulated a number of services[5]**.** A liberal use of this measure would further reduce barriers to entry, and accelerate the achievement to full liberalization.

4.3.2 General Competition Practices

The Act gives the Commission exclusive competence to deal with all competition issues relating to the communications market under the country's laws and regulations[6]. The Act authorizes the Commission to publish guidelines and regulations on anti-competitive behavior including determining dominant operators. These powers enable the Commission to regulate a fully liberalized market, unhindered by the conflicts that often accompany the sharing of responsibilities in this area in some jurisdictions.

The Commission has not yet declared the licensees that are dominant operators. But it has set the parameters and criteria for doing so in guidelines on interconnection published in 2003[7]. Under the guidelines a licensee having 50% market share is automatically considered a dominant operator. A licensee with 30% market share is presumed to be a dominant operator until it proves the contrary. Under the guidelines, NITEL qualifies as a dominant operator in the fixed telephone market.[8]. In the GSM mobile market, MTN, Vee Networks (formerly Econet Wireless Communications Ltd) and Globalcom are rolling out their networks aggressively and it is difficult to tell at this time which of them will meet the criterion for dominant operator.

4.3.3 Interconnection

Interconnection between network services or facilities is mandatory under the Act. The Act declares that the terms and conditions of interconnection agreements are primarily to be agreed upon among operators. The Commission is empowered to intervene and make binding determinations at the request of either or both parties to interconnection negotiations or where the parties fail to agree; or on the Commission's initiative in the public interest[9].

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[4] Sections 31and 32 Communications Act, 2003
[5] See Section 5.2.2 of this report
[6] Section 90 Communications Act, 2003
[7] Paragraph 4, Guidelines on Interconnection of Telecommunications Networks, 2003
[8] See Table 2
[9] Sections 96 and 97 Communications Act, 2003

The Act also authorizes the Commission to publish guidelines and regulations addressing the matters relating to interconnection, such as time frames and procedures for negotiations; level of service, rate methodologies; provision of facilities and sharing of technical information.

Interconnection is a crucial issue for operators and a challenging one for regulators. An interconnection determination issued by the Commission in December 2003 is a case in point[10]. In this determination the Commission fixed the following termination rates:

- 11.52 Naira (9 US cents) for cellular mobile services and
- 5.52 Naira (4 US cents) for fixed telephone networks. Refer to tables 3 & 4 below.

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Table 3: Determination of Interconnection rates: parameters and rates for Mobile Operators

Parameters	**Starting**	**Adopted**
Amortization of capital investment per subscriber (recovery of 350 US over 10 years using capital recovery formula)	95.06 US$	105 US$
O&M at 30% of value capital investment	105 US$	105 US$
Average cost per subscriber	200.06 US$	210.00 US$
Average cost per minute of Calling before common cost	11.1 US cent	11.67 US cent
Average cost per minute of Calling after adding common cost of 10%	12.83 US cent	12.83 US cent
Cost per minute of terminating incoming call (71% if 12.2 & 12.83	8.7 US cent 11.0 Naira	9.11 US cent 11.52 Naira

Source: NCC, Interconnection Rate Determination, 200 3

Table 4: Interconnection rates: Parameters and Rates for Fixed Network Operators

Parameters	**Starting**	**Revised/ Adopted**
Amortization of capital investment per subscriber (recovery of 812.50 US over 10 years using capital recovery formula)	220.68 US$	105 US$
O&M at 15 & 20% of value capital investment	121.88 US$	162.50US$
Average cost per subscriber (sum of figures in first two lines)	342.55 US$	390.07 US$
Average cost per minute of Calling before common cost	5.3 US cent	6.5 US cent
Average cost per minute of Calling after adding common cost of 10%	5.8 US cent	7.15 US cent
Cost of interconnection: L,S,& D tandems L,S & D tandems	1.9, 3.0 & 5.6 cents 2.4, 3.8, 7.1, Naira	2.29, 3.65 & 6.87 US cents 2.95, 4.71 & 8.87 Naira
Average	3.17 US cents 4 Naira	4.38 US cents 5.52 Naira

Source: NCC, Interconnection Rate Determination, 200 3

[10] Interconnection Rate Determination, December 2003

The operators participated in a workshop in which a report prepared by a consultant appointed by the Commission, was discussed. They also provided written input on the report, which was used by the Commission as a basis for arriving at the rates. Some of the operators raised concerns on some of the parameters that the consultants used. The Commission was able to take into considerations some of their concerns but not all. However, all the operators that participated appeared to have agreed with the revised rates that were proposed and later adopted by the Commission in the determination. But MTN has challenged the determination in court.

The GSM operators, including MTN, had a termination rate of 18 Naira for their networks which had been set by the Commission earlier. This has been reduced to 11.52 Naira under the general determination.

One of the concerns raised by the GSM operators during the consultative process was the non-inclusion of the US$ 285 million one-off spectrum fee they paid when they were licensed. The Commission said this was a sunk cost and could not be taken into account in a rate determination based on forward looking long run average incremental cost (FL/RAIC) standard. However, the Commission indicated that the US$ 285 million could be recovered from retail tariffs, during the 15-year licence period.

The mobile operators also queried the bottom-up cost estimation method that the Communication Consultants proposed and were subsequently adopted by the Commission. In this approach, the physical networks of the operators were simulated on a computer. The mobile operators preferred the bottom-down estimation model which uses information from the accounting records of the relevant operator and adjusted to the required FL-L RAIC standard. The Commission said it was unable to use this model because of lack of reliable accounting records in Nigeria in 2003, when it dealt the issue. One operator had claimed it had the required records, but the Commission observed that it was unable to verify their accuracy. It advised the operators to install systems that would ensure the availability of the required information in the near future.

MTN asked the court to delay the implementation of the determination until the judicial proceedings are concluded. The court ruled in favour of the Commission, that implementation should continue. But it indicated that MTN could recover damages from the Commission if its appeal is upheld.

This court matter not only highlights, the challenges that regulators can face in the execution of their responsibilities but also the concerns of investors in recouping their investments, especially where they pay large sums of money in licence fees.

4.3.4 Consumer Protection

The Act requires operators to meet minimum standards of quality set by the Commission and to adopt codes on handling consumer issues. The Act enjoins the Commission to establish procedures or guidelines on handling of consumer complaints, to institute alternative dispute resolution procedures and to designate an industry body to serve as a consumer forum.[11] The Commission has established a "Parliament" consisting of operators, consumers and NCC itself. The forum meets monthly. In the tripartite meetings which are facilitated by NCC participants exchange views and answer questions on different aspects of service provision. The meetings reach consensus on actions to be taken by relevant parties and reports on implementation are provided at subsequent sessions. NCC has also published an Alternative Consumer Dispute Resolution Scheme.

[11] Sections 104-106 Communications Act, 2003

Both operators and consumers have lauded the Commission's facilitation of good relations between them. However, the consumers appear to be very well organized and determined to take action on their own to achieve their ends.

On 19th September 2003 consumers boycotted the use of mobile services for 24 hours in protest against quality and high tariffs and forced the operators to adopt per second billing instead of per-minute billing. This action effectively reduced tariffs by 25%, according to a representative of the Telecommunications Consumers Association.

4.3.5 Tariff Regulation

The Act makes the regulation of tariffs by the Commission mandatory for services or facilities provided under individual licences. This applies even to markets like cellular mobile in which there is sufficient competition at present. But the Commission could deregulate this area using its discretion under the Act to move a service from the category of individual licence to class licence.

4.3.6 Universal Service

Since its creation the Nigerian Communications Commission has, through various licensing approaches sought to ensure the availability of services throughout Nigeria. In addition to licensing private-owned telecommunications operators (PTOs) and Fixed Wireless Access (FWA) operators, the two national carriers, NITEL and Globacom are required to achieve installation of 1% of their lines in rural areas by the 5th year of their licences (from 2002).

The Communications Act 2003 has addressed universal service provision in a more structured and comprehensive manner. It places on the Commission the responsibility of designing and determining a system that will promote widespread availability and usage of network services and application services in the country by encouraging the installation of network facilities and the provision of services to institutions, in unserved and underserved area as well as for underserved groups within a community. The Act authorizes the Commission to make regulations for the implementation of universal service provision, and to define "institutions" "unserved" and "underserved" areas, and "underserved groups" within a community. A Universal Service Provision (USP) Fund established under the Act with its own Board of Directors will supervise and give policy directions on the implementation of the Fund. The members of the USF Board are appointed by the President. They comprise the sector Minister, members of the Commission, representatives of the Ministry of Finance and of the National Planning Commission as well as persons of professional standing from the private sector[12].

The USP Fund will be funded from parliamentary appropriations, a portion of the annual fees that the Commission receives from licences and aid. The Act prescribes a separate and transparent administration of the Fund, including management by fund managers.

The Commission has determined, based on a study, that the crucial requirement for successful implementation of universal access and service provision in Nigeria is the installation of an extensive transmission backbone. The Commission is implementing a pilot project that will enable the design of such a backbone.

[12] Sections 112 -116 Communications Act, 2003

5 Licensing regime

5.1 Purpose

Licensing is a tool for achieving the objectives of the National Telecommunications Policy. The National Telecommunications Policy envisages full liberalization as the ultimate strategy for achieving the country's telecommunications development objectives. In the past decade, and in particular, the last three years, encouraging results in infrastructure and service provision have been achieved through liberalization. But with concerns from operators and other stakeholders about lack of adequate transmission infrastructure, quality of service and indiscipline on the part of some operators, there is need for time for consolidation. The licence regime that the Communications Act, 2003 prescribes takes this need into account, while being flexible enough to enable the Commission to deregulate progressively as the country moves towards a fully liberalized telecommunications market. The Act provides the required flexibility by making licensing mandatory while allowing the Commission to adopt a simple authorization procedure through issuing class licences or to exempt categories of services from licensing or authorization altogether.[13].

5.2 Licence Terms and Conditions

Prior to 2003, the Commission issued licences with extensive conditions and guidelines on interconnection, tariffs, anti-competitive conduct and other relevant regulatory and operational issues, depending on the nature of service and type of licence. The duration of operating licences ranges from five years for a class licence like for Internet service provision to 20 years for a national carrier licence. Renewal is almost automatic, provided that an operator has fulfilled the conditions of the previous licence period. Over time, the Commission has been issuing guidelines and regulations separately setting out general conditions for the operation of telecommunications services. It is understood that, in the future some of the conditions that appear in guidelines and regulations will be cross-referred instead of being reproduced extensively in licences.

5.2.1 Individual Licences, Coverage, Service Neutrality, Technology Neutrality and Convergence

Although legislation empowers the Commission to issue class licences for the operation and provision of network services and facilities, up till now the Commission has used individual licences for most licence facilities and network services. This approach has been adopted during the transitional period when regulatory guidance is necessary in order to develop infrastructure in an orderly fashion. Individual licences are issued after evaluating applicants while, with class licences, all that an operator or service provider needs is to register with the Commission before commencing operations. In its effort to achieve the objectives set in the National Telecommunications Policy the Commission has adopted a combination of licensing approaches over time. The strategy entailed the combination of geopolitical, service, and technology considerations. In Table 5 is a list of some of the individual licences that were active in August 2004.

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[13] Section 31

Table 5: Individual/major licences active in August 2004				
Type	**Area of operation**	**Service**	**Technology**	**Number**
National Carrier	Whole country and International	Fixed voice, Data	Any	2
National Long Distance Carrier	Whole Country	Fixed voice ,Data	Any	2
Private Fixed Operator	National & Regional (a collection of contiguous states)	Fixed voice, Limited mobility	Radio, cable,	17
Fixed Wireless Access Operator	One state new licence Several licence for company	Fixed voice, Data Limited mobility	Wireless technologies	23
Fixed Local Exchange Operator	In local government area	Fixed voice, Data, Video	Radio, cable	24
GSM Land Mobile Operator	Whole country	Cellular mobile	GSM digital mobile	4

a) National Carrier Licences

A Nation Carrier, as the term suggests, covers the whole country. The licence authorizes the provision of fixed telecommunications voice, and data, facilities, network and services within Nigeria and to destinations outside using any technology. There are only two national carriers, the former monopoly operator, NITEL and Globacom which was licensed in September 2002. In addition to roll-out and universal service obligations the licences stipulate conditions that are similar to those that would be imposed on dominant operators, although NCC is yet to declare dominant operators. The conditions include interconnection, co-location and facilities sharing obligations as well as prohibition against anti-competitive behavior.

b) National Long Distance Carrier Licence.

This licence authorizes the provision of fixed telecommunication facilities and network services within the whole of Nigeria. Service and technology requirements are similar to those in national carrier licences.

c) Private Telephone Operator (PTO) Licence

This was the category of licence that was issued first in 1996 to provide fixed telephone services in one or a defined combination of contiguous states (region) of the 36 states using radio and cable. There are 17 such operators. Like the national carriers, PTOs may provide fixed voice services using radio and cable although many are using mostly wireless technology.

d) Fixed Wireless Access Licences

These licences have been issued from 2002, in another bid to extend services to geopolitical zones and rural areas using the latest wireless technologies. Use of wireless technology is mandatory. These licences are issued on a state-by-state basis, but one company may be licensed to operate in several states. Significant impact of these licences with regard to service provision is yet to be experienced.

e) Local Exchange Licence

This licence has been issued from 2003 for the provision of telecommunications services, voice, data and video using radio and cable within the administrative jurisdiction of a local government for example city, municipality, town or district council in a state. Any modern transmission facility has a video capability. But this licence specifically mentions and authorizes the provision of video network services. There are 23 active licences. It is too early for these licences to have shown impact on service provision.

f) GSM Mobile Licences

Three GSM mobile Licences were issued in 2001 to MTN Limited, Econet Wireless Limited and M-Tel (NITEL's subsidiary). A fourth licence was issued to Globacom along with the second national carrier licence in September 2002.

This licence authorizes the operation and provision of a "National Second Generation Digital Mobile Radio telephony service in the 900 and 1800MHz bands". It is service and technology specific to an extent. The licence permits the operator to install its own transmission network, as well as to lease transmission capacity from NITEL or any other authorized long distance or multi access operators and service providers to international destinations.

GSM mobile licences have transformed the telecommunications market in Nigeria. The mobile operators' roll-out targets were each 100,000 lines within 12 months of launching operations, 750,000 lines within 36 months and 1,200,000 within 60 months. Each of the operators exceeded its first target within a few months of launching service. By mid 2004 less than 2.5 years from first launch the four operators had, a total of over 5 million subscribers. This figure is estimated to more than triple within the next three years. This would suggest that there is room for more operators in the cellular mobile market. The potential appears enormous but the limitation is spectrum. It is understood that there is spectrum for one more GSM operator. The existing operators who paid US$ 285 each million for their licences would understandably want more time in which to recoup this and other components of their investment. One operator in another market segment thinks that development objectives would be better achieved through distributing the remaining spectrum to existing GSM mobile operators given the infrastructure constraints alluded to elsewhere in this report. This view warrants consideration during the periodic sector performance reviews and consultations carried out by the Commission.

g) International Gateway Licence

This licence authorizes the construction and operation of transmission and connectivity facilities for example earth satellite station, cable, VSAT, exchange or node for carrying international traffic for an operator's own use and /or for carrying third-party traffic. A national carrier licence or public mobile licence authorizes the provision of services to destinations outside the country but does not confer a right to construct and operate such facilities. A separate licence is required for that purpose. Alternatively, an international services operator has to use the facilities of another operator who is licensed to construct and operate an international gateway.

5.2.2 Licences for Deregulated Services

Licences are issued for applications services and some network services which are currently authorized under individual or class licences. These include:-

- Sales and Installation of Terminal Equipment (Mobile Cellular Phones, Satellite Communication and Switching Equipment)
- Public Payphone Services.
- Internet Services.
- Prepaid Calling Card Services.
- Community Telephony with Exchanges.
- Paging Services.
- Trunk and 2-Way Radio Network services.
- Fixed Telephony Services, employing Cable and Radio.
- Satellite Network Services (e.g. Domestic VSAT networks).
- Repairs & Maintenance of Telecommunications Facilities.
- Cabling Services.
- Tele-Centers/Cyber Cafes.
- Non-commercial/User Operated Radio Networks.

A total of 425 licences have been issued to Internet Service Providers as at August 2004. This indicates that the market for applications services is huge.
The licence contains standard terms published on the NCC website. All that an operator or service provider needs to do is to register with the Commission and pay the required fee. Further liberalization of the telecommunications services lies in greater use of this type of licence.

5.3 Licence Process

The Communications Act 2003 gives the Commission discretion to determine the procedure for awarding individual licences which may include auction, public tender invitation, competitive bidding or non-competitive selection process. Also, the Act requires the Commission to be guided by the principles of transparency; fairness and non-discrimination, effective use and management of radio frequencies; and the need to promote fair competition and investment.[14]

5.4 Operating Licence Fees and Levies

Fees for operating licences differ according to the type of licence (individual or class) and the size of operation. For example, a licence for an Internet Service Provision (ISP) is 500,000 Naira (US$ 4,000 at 126 N = 1 US$). At the high end is the US$ 285 million that GSM mobile operators paid for their licences. An annual levy of 2.5 of gross revenue (less interconnection and similar charges, where applicable) is payable to the Commission by all licence holders, even class licence holders. This is substantial, but it should be kept in mind that a portion of the proceeds will go to the Universal Service Provision (USP) Fund. The rationale for the fee and levies is, therefore, to meet the costs of regulation and a part of universal access and service provision.

5.5 Spectrum Management Policy and Pricing

5.5.1 Regulated Services

The Commission has the responsibility, under the Communications Act, 2003 to develop a National Frequency Plan on behalf of the National Frequency Management Council and administer the spectrum for the telecommunications sector. The frequency spectrum is considered a national resource and a source of revenue for government. All the fees for spectrum licensing and assignment go to the national treasury. When the Ministry of Communications administered the spectrum, pricing was based on number of subscribers. This methodology did not encourage efficient use of the spectrum.

[14] Sections 33, 39 and 41 Communications Act, 2003

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When the Commission took over the responsibility of administering the spectrum it adopted a policy based on a combination of market or economic value and the promotion of achievement of the policy objectives of even national development and universal access and service. In order to achieve these objectives the price of spectrum for commercial use is determined through competitive methods like auction, beauty contest or other methodology that the Commission considers appropriate.

The guiding principle is that the method employed should ensure that frequencies are allocated to those that will make the most efficient use of it. The success of the GSM mobile licences awarded in 2001 and the fixed wireless access licences in 2002, both through auctions, have proved the appropriateness of this approach. The US$ 285 million that the GSM mobile operators paid appeared overly high to some observers. There were concerns whether this would not impact consumer prices unduly or the ability of the licensees to roll out their networks, given the experience with 3G licences in Europe. First, it is worth noting that it was not the intention of the Government or the Commission to realize such a high price. The reserve price was US$ 100 million. Instead, the investors, who at the time may not even have known the full potential of the market, pushed the price up to that level. Second, thanks to the enormous demand, and competition, the fears about negative impact of the licence fee on consumer prices has not been born out. However, as indicated in section 3.2.3 above there has been a drastic reduction in ended-user prices for mobile services.

There are elements of the Nigerian spectrum assignment policy and process that may be useful to note. Among these are:-

- For the purpose of frequency licensing, the country has been divided into licensing areas, which correspond to the 36 states and the Federal Capital Territory
- Frequency licences for wireless local loop services are issued on the basis of the above licensing areas

Spectrum fees vary from state to state in accordance with market potentials and level of economic activities. For this purpose, the 37 licensing areas of the federation have been categorized into five tiers, with ‘tier 1’ being the most expensive, and in descending order. See table 6 below

Table 6: Frequency Licence Areas

Tier 1	Lagos
Tier 2	Rivers, FCT-Abuja, Delta, Kano, Kaduna,
Tier 3	Ogun, Edo, Oyo, Anambra, Abia
Tier 4	Enugu, Akwa Ibom, Benue, Ondo, Bayelsa, Plateau, Cross Rivers, Imo, Osun, Niger, Kwara, Kogi, Borno, Bauchi,
Tier 5	Nassarawa, Gombe, Ebonyi, Adamawa, Ekiti, Jigawa, Katsina, Kebbi, Sokoto, Taraba, Yobe, Zamfara

Source: NCC

- The Commission encourages long-term licences, for security of tenure and efficient planning. The standard term is five years, but deviations can be considered on case-by-case basis.

- Spectrum bands, which have possibility of being shared among large number of users, are assigned under class licences. These encompass microwave frequencies, DECT frequencies and point-to-point VHF/UHF radio channels.
- All microwave frequency licences are renewed annually and are not licensed on state basis[15].

5.5.2 Deregulation of "special" spectrum bands

To encourage the use of broadband for last mile access and final distribution to end-users the Commission has deregulated the 2.4 GHz ISM band for commercial purposes. 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 guideline[16] to ensure interference free operation by all users of the band and guaranteed grade of services to subscribers. Providers of commercial services using frequencies in this band are required to obtain an ISP licence. The guideline is in the Annex to this report.

5.6 Voice over Internet Protocol (VoIP) and other Convergence Issues

Currently, VoIP is not licensed. Internet Service Provision and Internet Exchange licences authorise the provision of data services. Some of the major licences, for instance national carrier licences, are technology and service neutral and presumably permit the provision of voice services using IP technology. But other network services, for example, Fixed Telephony and FWA licences specifically prescribe radio, cable and/or wireless technologies. The Nigerian market is highly liberalised already. There would appear to be no compelling reason to restrict the provision VoIP as this would enhance the realization of the country's declared objective of universal service and accessibility. The Commission has been consulting stakeholders on this issue. Formalizing VoIP through specific authorization could be another area of trend setting action by the Commission in the near future.

6 Transitional and Legacy Issues

Whenever there are changes in policy there are transitional and legacy issues that have impact on existing and new operations. The law usually protects the accrued rights of operators, but not indirect consequences, such as loss of market share. So far the changes that have taken place in the Nigerian telecommunication sector have had positive impact on existing operators. Competition has provided incentive for improvement and growth. There also have been opportunities for existing operators to earn revenue through termination of traffic on new operators' networks. On the other hand, the lack of adequate infrastructure that is supposed to be provided by existing dominant operators like NITEL has been a constraint to new entrants. The increased number of operators has resulted in increased radio frequency interference.

The communications Act 2003 preserves the rights of existing licensees. It authorises the Commission to modify old licences to align them with the provisions and objectives of the Act,[17] Any such modification would be without significant negative impact on the operator concerned.

[15] NCC: Presentation on New Spectrum Fees and Pricing Strategy to Telecommunications Operators, December 2002
[16] Interference Guidelines
[17] Section 156 Communications Act.

7 Consultation

The communications Act 2003 gives the Nigerian Communications Commission extensive powers on rule making and decisions of a general nature affecting operators and consumers. The areas involved are making regulations and issuing declarations, guidelines and determinations as well as designing frequency and communications industry development plans. Associated with these powers is a requirement on the Commission to consult with stakeholders. Even before the passing of the Act the Commission consulted extensively with operators, not only on the matters on which legislation requires it to consult them, but on other issues as well.

For example, the Commission consults operators on its Strategic Management Plans (SMPs). The Commission has invited operators through a survey to give their views on its performance of its responsibilities. The operators commend the Commission for this openness but some of them think that there is always room for improvement. The Commission makes extensive use of its website in carring out consultations and disseminating information

8 Conclusion

The implementation of reforms has transformed Nigeria's telecommunications market from one of the less developed in Africa to a vibrant telecommunications market. The key enablers are a clear policy and a flexible regulatory framework that permit the Nigerian Communications Commission (NCC) to employ innovative licensing approaches. The strategies adopted by the NCC, in particular the simultaneous licensing of three GSM mobile operators in 2001 through a competitive and transparent process, not only attracted big investments; but they ensured a beneficial level of competition.

Mobile services have been substituting for fixed telephony in Nigeria like elsewhere in Africa. Continued efforts by the NCC to encourage the development of the fixed telephone market, is an acknowledgment of the contribution that fixed telephony can make to the achievement of communications development goals, because of its versatility in applications services.

In a dynamic and huge market like that of Nigeria a rapid transformation to full liberalisation is desirable. The Regulator has been using its discretion under the law to deregulate a number of services, particularly applications services, but also a few network services. Once the problem of lack of an adequate transmission backbone and enforcement are addressed, new entrants for the provision of all last mile network services could be encouraged through the class licence authorisation procedures instead of individual licences.

Competition, a large market and the vigilance of consumers are driving retail tariffs down. Although legislation gives the Regulator extensive powers over tariffs regulation, the current level of competition allows a shift from specific approval of tariffs of non-dominant operators to issuing guidelines and monitoring. This light touch approach would apply to other regulatory areas as well, as liberalisation progresses.
The lack of telecommunications infrastructure is a common observation among operators. The two national carriers, NITEL and Globacom, are taking action within their respective capabilities to discharge their licence obligation of providing infrastructure to other operators. But it will require the concerted effort of the Commission and operators to design and implement a backbone transmission infrastructure that will satisfy the needs of the country.

The former monopoly operator, NITEL and its mobile subsidiary, MTEL are yet to be privatised. Although privatisation is a good strategy, the experience of Nigeria shows that liberalising without first privatising state-owned telecommunications enterprises, can be effective in achieving development goals if appropriate licence approaches are used.

The liberalisation of a large telecommunication market has many challenges. The capacity and professional ability of the Regulator are necessary for regulatory credibility. The Nigerian Commission has met these requirements through intensive effort in building internal capacity and outsourcing of tasks. Stakeholders are satisfied about the professional manner in which the Commission has presided over the development of the telecommunications sector. However, while acknowledging that the Commission is among the best regulators in Africa, some operators would like to see it reach the level of performance of the best regulators in developed countries.

There were concerns over indiscipline among some operators resulting from the multi-operator environment now in place. This is a challenge that the NCC is addressing by strengthening its enforcement and compliance functions

.

Technology and service neutrality are laudable ideals but flexibility during the transition to full liberalisation can be useful. The judicious use of this flexibility in Nigeria is helping in ensuring the extension of services to unserved and underserved areas.

Finally, the experience of Nigeria underlines the accepted principle that to be successful telecommunications sector development strategies need to be tailored to a country's conditions.

ANNEX[18]

Nigerian Communications Commission

REGULATORY GUIDELINES FOR THE USE OF 2.4 GHz ISM BAND FOR COMMERCIAL TELECOM SERVICES

Introduction

The use of broadband for last mile access or for final distribution to end users will open up new possibilities and enable a wider range of enriched services to be provided to subscribers. It will also allow home-based users to have access to a variety of IP-based services thereby enhancing universal service objectives. Wireless Fidelity technology will ensure the attainment of the above objectives quickly and at an affordable cost to all categories of users. The Nigerian Communications Commission is hereby providing guidelines for the approved Commercial use of the ISM frequencies in Nigeria employing the Wi-Fi technology in order to ensure rapid expansion of services and accelerated increase in Internet penetration.

Purpose of Regulation

The main objectives of this set of guidelines is to ensure interference-free operation by all users of the band and to ensure that a guaranteed grade of service is available to the subscribers through established quality of service benchmarks, and consumer code of practice.

1. **OPERATIONAL GUIDELINES**

(a) Access to the spectrum will be on shared basis. There will be no exclusive assignment to any individual or organizations, whether for private, public or commercial use.

(b) All users, both private and commercial service providers will be guided by the same technical specifications and operational restrictions, with respect to Wi-Fi hotspots deployment

(c) All equipment to be deployed must be type approved by the Commission prior to importation and deployment in compliance with Section 132 of NCA 2003. Existing ISM band operators who wish to adapt their present equipment for Wi-Fi deployment must seek approval from the Commission.

(d) All sites in which commercial Wi-Fi hotspots are to be provided must be registered with the Commission.

(e) ISM band will be permitted for both indoor and outdoor use.

(f) Wide area deployment will not be allowed on the ISM bands, coverage or transmission distance from a single hotspot must be within the distance stipulated in the technical specification. Transmit power, antenna height and gain must be selected in order to keep emission within stipulated distances.

2. LICENSING CONDITIONS

2.1 All Wi-Fi Hotspots must be registered and authorised by the Commission. Such authorization shall be renewable annually.

2.2 All commercial Wi-Fi Hotspot operators shall possess an ISP Licence.

[18] Source:NCC

2.3 Tariffs of operators must be displayed within the operator's premises and registered with the Commission.

2.4 A reliable customer billing system must be installed.

2.5 All equipment to be deployed must be type approved by the Commission.

2.6 Each Hotspot shall maintain a log book for its day to day transactions. The log book shall be produced for inspection on demand by any accredited representative of the Commission.

2.7 All customer premises equipment supplied by the operator must conform to the items listed in the section **TECHNICAL SPECIFICATIONS**.

3. TECHNICAL SPECIFICATIONS

3.1 Basic Specifications: IEEE802.11b (Industry open standard)

(a) Operating Frequency: 2.4 GHz (2,400-2,483 MHz)
(b) Maximum Data Rate: 11/54 MBps
(c) Multiple Access Method: Spread Spectrum/OFDM
(d) Digital Modulation Scheme: CCK, BPSK, QAM, etc.
(e) Maximum Coverage Distance: 200 meters indoor/outdoor
(f) Media Access Protocol: Collision Avoidance Technique
(g) Wi-Fi deployments must be IEEE 802.11a, b, and g, and newer versions must be backward compatible with 802.11b and g.

3.2 Operational Features:

Transmitter parameter limits

Transmitter Power Limits (EIRP) 1w
The peak power spectral density should not exceed 17dB in any 1MHz
(i) Equipments using FHSS modulation < -10 dBW (100 MW) per 100 KHz EIRP
(ii) Other types of modulation < -20 dBW (10 MW) per MHz EIRP.

3.3 Automatic Transmit Power Control (ATPC)

ATPC feature should be declared with the ranges and the related tolerances and subject to tests.

3.4 Dynamic Frequency Selection/Adaptive Frequency Hopping Technique

The equipment should have the capability for dynamic frequency selection from the range of hopping frequencies. The number of hopping channels should not be less than 75. Occupancy on any frequency should not be more than 0.4s in any 30s period

3.5 Bandwidth and Carrier Separation

Carrier frequencies must be separated by at least 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater.
Maximum bandwidth must not exceed 1 MHz.

3.6 Modulation

The Modulation type shall be wideband digital modulation system, using spread spectrum techniques to transmit and receive.

3.7 Adaptive Frequency Hopping/Adaptive Dynamic Polling

All systems must be capable of Adaptive Frequency Hopping/Adaptive Dynamic Polling to enable dynamic allocation of hopping channels.

FHSS modulation
Number of channels > 75
Channel separation = separated by channel bandwidth as measured at 20 dB below peak power
Dwell time per channel < 0.4 seconds
DSSS and other forms of modulation

3.8 Spectrum Mask

(i) (fH) = the frequency furthest above the frequency of maximum power where the output power drops below the level of -80 dBm/Hz e.i.r.p. spectral power density (-30 dBm if measured in a 100KHz bandwidth)

(ii) (fL) = the frequency furthest below the frequency of maximum power where the output power drops below the equivalent level to -80 dBm/Hz e.i.r.p. spectral power density (-30 dBm if measured in a 100KHz bandwidth)

3.9 Spurious emissions

The spurious emissions of the transmitter shall not exceed the values in tables 1 and 2 in the indicated bands.

Frequency range	Limit when operating	Limit when in standby
30 MHz – 1 GHz	- 36 dBm	- 57 dBm
Above 1 GHz – 12.57 GHz	- 30 dBm	- 47 dBm

Table 2: Transmitter limits for wideband spurious emissions

Frequency range	Limit when operating	Limit when in standby
30 MHz – 1 GHz	-80 dBm/Hz	- 107 dBm/Hz
Above 1 GHz – 12.75GHz	- 80 dBm/Hz	- 90 dBm/Hz

3.10 Unwanted emissions

Emission outside the Band should be less than -27dB.

3.11 Coverage Diameter

The Distance for outdoor/indoor use should not exceed 200 m.

3.12 Media Access Protocol

This shall be based on Collision Avoidance Technique. Duty cycle should be listen before talk.

3.13 Data Rate

The data rate should be adjustable to a maximum of 11 Mbps for the case of IEEE802.11b and a maximum of 54 Mbps for IEEE802.11a/g. Automatic Data Rate Selection: variable from 1 – 54 MBits/sec in steps of 1 – 6 MBps.

3.14 Frequency stability

The frequency stability shall be better than 10ppm.

4 QUALITY OF SERVICE

4.1 Interference

No interference shall be caused to any systems operating in any of the primary allocations in the band (e.g. FSS and Radiolocation)

4.2 Availability of Connection

The Service provider is to guarantee 95% availability of its service to its subscribers.

4.3 Security

The provider should take adequate measure to protect the data traffic to uphold the subscriber's right to privacy, as entrenched in the constitution of the Federal Republic of Nigeria. Minimum Standard specified by Wired Equivalent Privacy (WEP) /WPA benchmarks must be met.

4.4 After-sale Support and Maintenance

There shall be adequate support system to the subscriber in terms of repairs of equipment, upgrade facilities and other service failure reports on mutually acceptable terms and conditions.

4.5 Service Agreement

The Service Agreement between the provider and subscriber shall be subject to approval by the Commission.

4.6 Bit Error Rate

BER objective: 10^{-5} Max.

4.7 Hotpots

The number of permissible hotspots in any given area will take cognizance of acceptable quality of service, and the interference factor.

5 TYPE APPROVAL

5.1 All equipment must be type-approved by the Commission before commissioning.

5.2 Manufacturers can type approve equipment on behalf of the vendors.

5.3 Where necessary the vendor may be required to make a presentation to the Commission on the service to be provided with the equipment.

5.4 The time frame for the type approval will be a maximum of 4 months after application.

6. BACKHAUL FREQUENCIES

For the purpose of connecting Wi-Fi hotspots to the nearest switch/router for onward connection to the internet or other global/national networks, the under-listed point-to-point backhaul methods will be permitted.

6.1 Exclusive (FWA) Backhaul Frequency

FWA licensees or other operators with frequency licences consisting of multiple channels/slots are free to reserve one of the slots for Point-to-Point backhaul links. This can be used to backhaul their Wi-Fi hotspot traffic or to service ISPs and cyber-cafés. The rest of the slots can then be used for Point-to-Multipoint broadcast channels.

6.2 Microwave Backhaul Frequencies

Operators requiring secured high-capacity backhaul links are free to apply for additional microwave link frequency licence under the same conditions applicable to telephone network backhaul in the 15 GHz band.

6.3 Satellite Backhaul

Operators with existing domestic satellite licences can use satellite backhaul to concentrate Wi-Fi hotspot traffic.

6.4 Leased Backhaul Links

Operators, private individuals or organizations can lease bandwidth from Long Distance Operators or from domestic satellite providers for the purpose of linking their hotspot to internet access points or for concentrating hotspot traffic.

7. APPLICABLE INDUSTRY STANDARDS

The above specifications are broadly based on ITU recommendations, IEEE standards and Wireless Internet Compatibility Alliance (WECA) guidelines.

Dated 12th of May, 2004.

ENGR E. C. A. NDUKWE *FNSE, FNIM, OFR*
Executive Vice Chairman/CEO
Nigerian Communications Commission