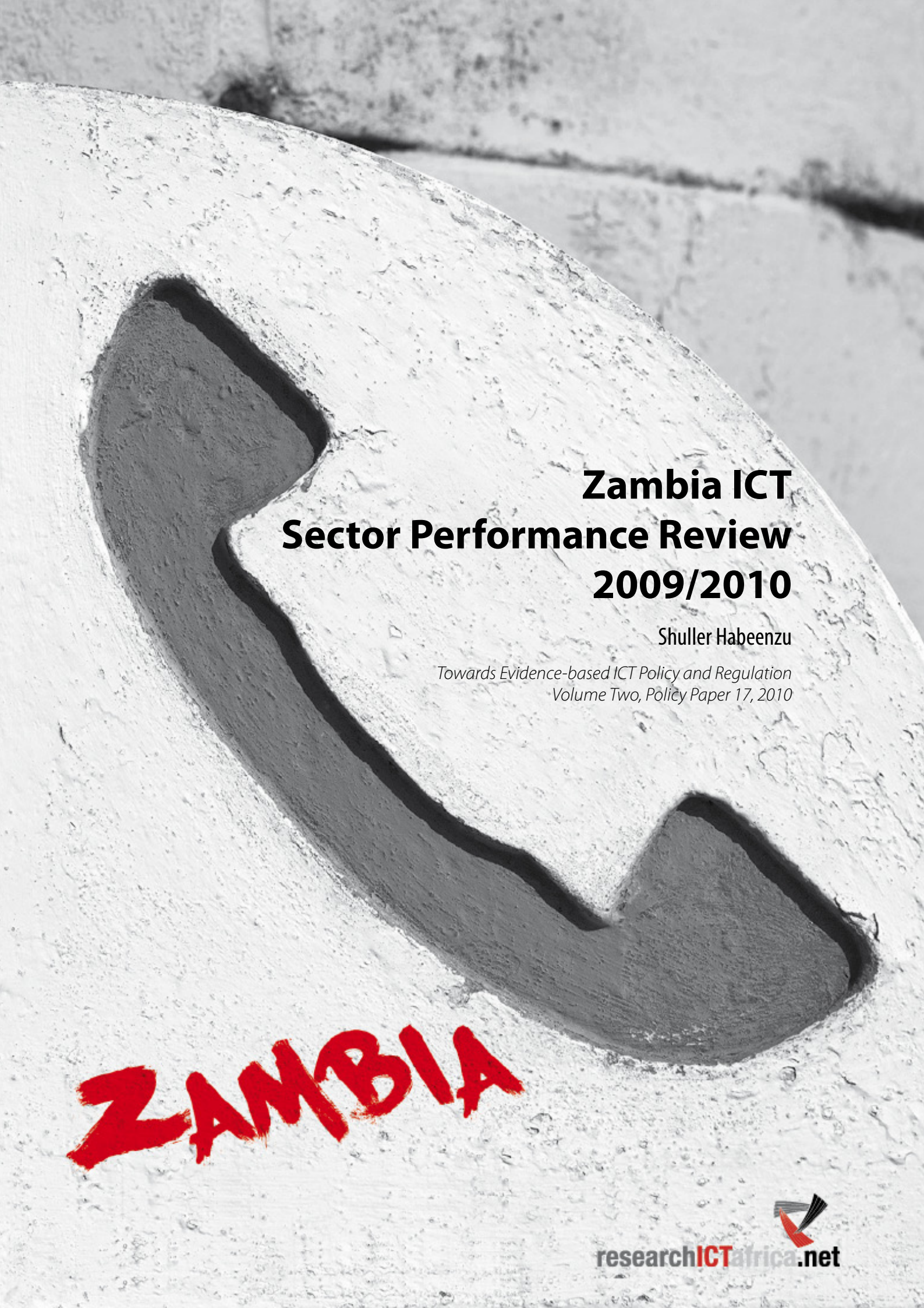

Zambia ICT Sector Performance Review 2009/2010

Shuller Habeenzu

Towards Evidence-based ICT Policy and Regulation
Volume Two, Policy Paper 17, 2010

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Research ICT Africa

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The network is based in Cape Town under the directorship of Dr. Alison Gillwald. RIA members are Dr. Augustin Chabossou (Benin), Dr. Patricia Makepe (Botswana), Dr. Pam Zahonogo (Burkina Faso), Dr. Olivier Nana Nzèpa (Cameroon), Prof. Dr. Arsene Kouadio (Cote d'Ivoire), Dr. Lishan Adam (Ethiopia), Dr. Godfred Frempong (Ghana), Dr. Tim Waema (Kenya), Francisco Mabila (Mozambique), Dr. Christoph Stork (Namibia), Dr. Alison Gillwald (South Africa), Prof. Dr. Ike Mowete (Nigeria), Albert Nsengiyumva (Rwanda), Prof Dr Abdoulaye Diagne (Senegal), Dr. Bitrina Diyamet (Tanzania), Dr. Farouk Kamoun (Tunisia), Dr. Nora Mulira (Uganda), Shuller Habeenzu (Zambia).

This research is made possible by the significant funding received from the International Development Research Centre (IDRC) Ottawa, Canada.

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Shuller Habeenzu is the former head of the national regulatory agency, the Communications Authority of Zambia (CAZ), which has since been renamed the Zambian ICT Authority (ZICTA).

Executive Summary

The Zambia telecommunications sector has achieved significant and positive development over the last decade. Building on the 1994 watershed reforms, which opened the market to new entrants, the sector has experienced rapid growth, albeit starting from a very low base. However, low penetration rates and high prices prevailing in the market place suggest that the market is still largely underdeveloped and that there is room for considerably more competition.

Despite positive development over the last decade, the Zambian market is still largely under developed and that there is room for considerably more competition.

In the recent past, there has been a renewed surge in the telecommunications reform process, which had stalled since the 1994 liberalisation of the sector. In the period 2009 to 2010, the government has undertaken major reform initiatives that are intended to further open the market to new entrants and to enhance competition. These measures include the development of a national ICT policy, enactment of the Information and Communications Act in 2009, partial privatisation of the loss-making incumbent ZAMTEL, and liberalisation of the international gateway, which has resulted in significant tariff reductions.

However, the much-anticipated further market opening is unlikely to happen soon. In the wake of the decision to privatise Zamtel, the decision to allocate a substantial capacity of ZESCO optic fibre network to ZAMTEL to make it more attractive to potential investors gives Zamtel significant dominance in the provision of broadband services. This policy drift is in sharp contrast to the core objective of the National ICT Policy and ICT Act of 2009, which is development of a competitive ICT industry in Zambia. Government should rescind the ban on issuance of new mobile and PSTN licences if the sector is to grow through new competitive investments.

The government should rescind the policy decision to restrict market entry in the mobile and PSTN segments until 2015.

In the face of these developments, the task of the Zambian ICT Authority is a very difficult undertaking. Results from a recent Telecommunication Regulatory Environment (TRE) assessment, undertaken as part of this study, suggest that additional and significant challenges remain around interconnection and tariff regulation, consumer protection and quality of services. To effectively tackle these challenges, ZICTA needs to enhance its credibility and claim the autonomy bestowed on it by the ICT Act of 2009 by building on its competences, and ensuring transparency and predictability in decision-making.

The study proposes a number of recommendations. These include the need to review the national ICT Policy with a view to mainstreaming ICTs in the national development plans as well as cultivating ICT capacity at all levels.

The study further notes that the establishment of the Independent Broadcasting Authority (IBA) has been stuck in a quagmire of political, legal and bureaucratic controversy since 2002. Given the capacity constraints that characterize the regulatory landscape in the country, and to benefit from the economies of scale emanating from the dynamics of convergence in the industry, the government should consider merging the functions of the yet to be established IBA into ZICTA.

The government should consider merging the functions of the yet to be established IBA into ZICTA .

The SPR has also highlighted the lack of adequate ICT skills to drive Zambia's envisioned progress towards a knowledge economy by 2030. Existing educational and learning facilities are inadequate to meet the market demand for ICT skills. The study recommends that the Government should:

- prioritize the development of science and technological skills in the Sixth National Development Plan;
- establish a national centre of excellence in training, research and development of all aspects of ICTs, including industry and regulatory required competencies, to be co-located at one of the nation's public universities; and
- provide incentives for companies that provide certifiable ICT training on the job for their employees

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Zambia: An Overview

Geography

Zambia covers an area of 752,614 square kilometers, with an estimated population of around 13 million in 2009 and an annual growth rate of 2.9%[1]. It is bordered by eight countries, namely the Democratic Republic of Congo, Tanzania, Angola, Namibia, Malawi, Mozambique, Zimbabwe and Botswana. An estimated sixty-two percent (62%) of the population live in rural areas and are dependent on agriculture for their livelihood.

Zambia has a relatively young population. About half (50%) of the population is aged 15 or below and almost forty-seven percent (47%) of the population is below the age of 30 years[2]. The adult literacy rate is around 70%. The official language of the country is English, but there are seven major vernacular languages and about 70 other indigenous languages and dialects throughout Zambia.

Economic Overview

After a long period of decline and stagnation (from the mid-1980s – late 90's), Zambia's economy has experienced strong growth in the past decade, averaging five percent (5%) per year. Although the mining boom has helped to propel this growth, it has also been accompanied by total factor productivity improvements, and a more diversified export base[3]. There has also been a significant increase in foreign direct investment (FDI) flows as well as gross investment as a percent of GDP, which rose steadily over the last decade to over 20% of GDP.

Despite this strong performance and uninterrupted growth over the last decade, GDP per capita remains below the historical highs of the early years after independence in 1964. In 2008, Zambians were poorer than they had been before 1985 and poverty remains widespread in the country, especially in rural areas[4]. Whereas the poverty headcount in urban areas dropped from 53% in 2004 to 34% in 2006, rural poverty rose from 78% to 80%. The main reason for a lack of inclusive growth lies in the underperformance of the agriculture sector where most rural dwellers are employed.Table 1 below provides information on selected indicators about Zambia.

Table 1: Zambia – Selected Socio-Economic Indicators

Indicator	Data
GDP per Capita in 2009	1,100 (US$ current consumer prices)
Employment	85%
Adult literacy	70%
Urbanisation	38%
Contribution to GDP in 2008	Agriculture – 5%, Manufacturing – 10.1% Construction – 11%, Mining – 8.4% Communications – 4%
Source: Zambia Central Statistical Office, National Accounts Statistics; Zambia Development Agency; 2009 values are preliminary estimates.	

[1] (Central Statistics Office, 2008a)
[2] See (Central Statistics Office, 2008)
[3] See (World Bank, 2009)
[4] See (Ministry of Finance and National Planning, Feb 2010)

Policy and Regulatory Issues

This section provides an overview of policy and regulatory frameworks and how these have affected the market dynamics over the past two decades.

Policy

From 1913 until the advent of multi-party democracy in mid-1990s, the provision of telecommunications services in the Zambia remained a state monopoly.

The history of telecommunications in Zambia (then known as Northern Rhodesia) dates back to 1913, when the first manual phone was installed in Livingstone. From 1913 until the advent of multi-party democracy in mid-1990s and the reform of markets globally, the provision of telecommunications services in the country remained a state monopoly.

From 1991 to 2005, government policy on telecommunications was informed by the general economic policy with emphasis on private sector-led economic growth and the Telecommunications Act of 1994, which provided a framework for liberalization of the sector[5].

In 2001, the Government, with assistance from the Japanese International Cooperation Agency (JICA) through the United Nations Development Programme (UNDP), embarked on the formulation of a National Information and Communications Technology (ICT) policy. The policy formulation process – which was completed in 2005, was characterized by extensive stakeholder consultations, involving private sector, civil society, academia, local government structures and professional associations. This prolonged process also served to raise general public awareness of the role of ICTs in fostering socio-economic development[6]. The ICT Policy was approved by the Government in 2005, on the eve of the World Summit on Information Society (WSIS) meetings in Tunis, and was officially launched in 2006.

The architecture of the ICT Policy in based on three core areas: capacity building, a competitive ICT sector and an effective legal and regulatory framework.

The architecture of the ICT Policy in Zambia is premised on three core thematic areas and thirteen pillars. The three core areas are capacity building, a competitive and efficient ICT sector and an effective legal and regulatory framework. The thirteen pillars of the ICT policy are outlined in Table 2 below.

However, implementation of the policy has lagged significantly behind market expectations and developments. This can be attributed to a number of factors, which include the following:

- the lack of institutional leadership and capacity in the Ministry of Communications and Transport[7];
- the lack of skilled human resources to spearhead the implementation process; and
- the lack of coordination in the planning and budgeting process and hence lack of funding to implement programmes.

Implementation of the ICT policy has significantly lagged behind market expectations and developments

[5] See (Habeenzu, 2003)
[6] See (Munsaka, 2009)
[7] (Ministry of Communications and Transport, 2009)

Table 2: Thirteen Pillars of the ICT Policy[8]

Pillar	Objectives
Human Resource Development	To attain sufficient and world-class human resource capacity in critical and relevant ICT skills required for developing and driving Zambia's Information and knowledge based society
Agriculture	To improve productivity as well as competitiveness of the agricultural sector through the use of ICTs.
Education	To integrate ICTs in the education systems and nations' research and development (R&D).
Health	To improve access to quality healthcare as close to the family as possible through the deployment and exploitation of ICTs.
Youth and Women	To leverage the use of ICTs to mainstream youth and women issues in all activities of the economy and society.
Tourism	To integrate ICTs in the development of the tourism industry and facilitate the conservation of Zambia's natural resources and heritage.
Telecommunication Infrastructure	To increase access and promote widespread deployment of ICT services through the expansion of the national telecommunication infrastructure
e-Government	To improve public sector management as well as efficient and effective delivery of public goods and services.
e-Commerce	To promote Zambia's full and effective participation in national, regional and global trade.
Legal and Regulatory Framework	To develop appropriate institutional, legal and regulatory systems in order to support the development of a competitive local ICT sector.
Security in Information Society	To safeguard national, institutional and individual security concerns.
Access Media, Content and Culture Heritage	To promote public access to information and promote the national cultural heritage.
ICT Services	To develop a competitive local ICT industry

Legal & Regulatory Framework

Legislation

In 1994, the government enacted the Telecommunications Act, which provided the legal framework for the liberalisation of the telecommunications sector in Zambia. At the core of this transformation was the separation of the postal and telecommunications functions in the then Posts and Telecommunications Corporation (PTC), resulting in the creation of two commercial entities, namely; the Zambia Telecommunication Company (ZAMTEL) and the Zambia Postal Corporation (ZAMPOST). The regulatory functions, which until then were performed by the PTC, were deposited in newly established and independent regulatory agency, the Communications Authority of Zambia (CAZ). Furthermore, the Radio Communications Act of 1994 mandated the CAZ to administer and regulate the utilisation of the frequency spectrum.

The liberalisation opened up the market to new entrants in almost all segments with the exception of the Public Switched Telephone Network (PSTN) and the international gateway (IGW), which have been a preserve of ZAMTEL.[9]

[8] See (Ministry of Communications and Transport, 2005)

[9] On 27 May 2010, the government issued Statutory Instrument No 34 of 2010 which effectively ends Zamtel's monopoly on the international gateway by reducing the licence fee from the previous $12 million to about $340,000.

New Legal Framework

In November 2009, the Zambian government enacted new legislation to enforce the principles and objectives of the National ICT Policy to establish a new institutional, legal and regulatory environment. The new legislation consists of the following:

- The Information and Communication Technologies (ICT) Act of 2009, which provides for the economic and technical regulation of information and communication technology; facilitates access to ICTs; "protects the rights and interests of service providers and consumers"; and regulates and manages radio spectrum. The ICT Act also renamed the CAZ to the Zambia ICT Authority (ZICTA).
- The Postal Services Act of 2009, which provides for the regulation of the postal and courier services by ZICTA. Previously, the Ministry of Communications and Transport regulated the postal and courier services.
- Though the new legislation recognises the trends towards convergence, the licensing regime is yet to embrace the concept of unified licensing.
- The Electronic Communications and Transactions (ECT) Act No. 21 of 2009, which provides for the development of a safe, secure and effective environment for the consumer, business sector and the Government to conduct and use electronic communications; promotes legal certainty and confidence, and encourages investment and innovation in the electronic communications industry; facilitates the creation of secure communication systems and networks; and allows the legal interception of electronic communications and admissibility of intercepted communications.

Though the new legislation recognises the trends towards convergence, the licensing regime is yet to embrace the concept of unified licensing.

The new legal and regulatory environment is a significant improvement on the previous legislation and over time should enable the emergence of a competitive market place. However, though it recognises the trends towards convergence, the licensing regime is yet to embrace the concept of unified licensing. For example, the current set of ICT laws do not include regulation of the broadcasting sector, which is under a separate legal framework (see below).

Zambia information and communications technology authority (ZICTA)

Under the ICT Act of 2009, the Communications Authority, which was established under the Telecommunications Act of 1994, has been re-named as the Zambia Information and Communications Authority (ZICTA). Although the intention is that the law aligns with international reform models, making the Minister responsible for policy and making the regulator an independent and legally autonomous entity under the Ministry of Communications and Transport, the Minister is still responsible for oversight over the regulator, including the appointment of members and the Chairperson of the Board of Regulators. The Minister may also issue general directives, which the Board is obliged to effect[10].

The overall objective of the ICT Act is to provide a conducive and enabling regulatory environment that will foster a competitive and efficient ICT sector in Zambia. The stated objective of ZICTA is

> *"to regulate the provision of electronic communication services and products and monitor the performance of the sector, including the levels of investment and the availability, quality, cost and standards of electronic communication services."*

The mandate of ZICTA is to promote the development of a competitive and efficient ICT sector,

The above notwithstanding, ZICTA is mandated to:

- promote the development of a competitive and efficient ICT sector;
- administer the licensing system;
- promote universal access, establishment and administration of a universal access and service fund;
- regulate tariffs and interconnection rates;
- set and monitor standards for regulated services in the ICT and postal sectors;
- manage and ensure efficient use of scarce resources i.e. frequency spectrum and numbers;
- promote the development and provision of e-service;

[10] See Section 6(3) of the ICT Act No.15 of 2009

- protect the interest of consumers; and
- promote research and development in ICTs

In addition to the above, the ICT Act also provides a new framework for resolving disputes in the sector. This is an important improvement given the past history of litigations and numerous unresolved disputes in the sector.

Broadcasting

Broadcasting in Zambia dates back to 1941[11], when the colonial government opened a radio station in Lusaka. For nearly half a century, radio and television broadcasting was a preserve of the state. The early 1990's saw the re-emergence of plural politics in the country and subsequently the liberalisation of the media industry. The result has been a proliferation of private-owned newspapers, private radio stations and community radio stations[12]. The Ministry of Information and Broadcasting Service (MIBS) is responsible for policy and oversight over the regulator. However, in view of the non-existence of the regulator, MIBS exercises both policy and regulatory functions in the sector.

The key legislation that governs the regulatory framework for the broadcasting sector in Zambia consists of the following:

- Zambia National Broadcasting Corporation (ZNBC) Act of 1987
- Zambia National Broadcasting (ZNBC) (Licensing) Regulations (1993)

In 2003, the Government provided further stimulus for the liberalisation of the broadcasting industry through the enactment of the following laws:

- Independent Broadcasting Authority Act No 17 of 2002
- ZNBC Amendment Act of 2002

In 2007, the Government enacted the Independent Broadcasting Authority (IBA) Act that provides for the establishment of the Independent Broadcasting Authority (IBA) to regulate the broadcasting sub-sector. However, the establishment of the IBA has been mired in a legal controversy[13] and the regulatory agency has not yet been established as of mid- 2010.

The establishment of the Independent Broadcasting Authority has been mired in a legal controversy and the regulatory agency has not yet been established as of mid-2010.

Licensing Regime

The ICT policy and the new 2009 legislation recognises the trends towards convergence and provides for a corresponding technology-neutral licensing framework with two main categories of authorisations, namely:

- a network licence which authorises its holder to construct, own or make available an electronic communications network, or to provide a network service; and
- a service licence which permits its holder to provide one or more electronic communications services.

In the ICT Act, an "electronic communications network" is defined as a transmission system that permits the conveyance of information irrespective of the technology used or the type of information conveyed. An "electronic communications service" is defined to mean, "*A service provided by means of one or more electronic communications networks.*"

The above new licences are further classified into two categories, namely; individual and class licenses.

License Categories

i. Individual Licenses

Individual licenses are major network or service licences with significant economic and social impact as well as regulatory obligations. These licenses, which may also require the use of radio frequency spectrum and other scare resources such as numbering, shall be issued through

[11] See (Mulozi, 2008)
[12] See (Shuller2004)
[13] (MISAMEdiareport)

competitive processes. A holder of an individual licence is required to provide essential electronic communications services (such as emergency numbers) twenty -four hours a day, seven days a week, at the prescribed level of quality, without discrimination.

ii. Class Licenses

These are types of licenses, which have lesser social economic impact than individual licenses and can be applied for through an open (i.e. non-competitive) application process.

The Table 3 below provides summary information on the categorisation of the new licence system.

Table 3: Type and Categories of New License System[14]

License Category	Network	Service
Individual	Mobile Cellular Fixed Internet Fixed Fibre/Cable Public Radio Paging Network Service/ Carrier of Carriers	Mobile Cellular International Voice Fixed Voice
Class	Wireless Internet Public Data Network Public Payphone Private Network	Internet Services (ISP) Microwave Citizen Band Value Added Services

Further, ZICTA is authorised to grant certain individuals or activities exemptions from the requirement to hold an individual license or a class license.

Transitional Arrangements

The ICT Act of 2009 provides clear transitional arrangements from the repealed Telecommunications Act of 1994 to the new regulatory environment, within six months of the ICT Act coming into force. In addition to the new terms and conditions emanating from the ICT Act of 2009, the transition arrangements include the grandfathering of rights of existing licensees. All the licences issued under the new licensing regime to replace the previous ones shall:

- be of the same duration as the unexpired portion of the previous licence;
- contain fee payment obligations no less favourable than those provided for in the previous licence; and
- not derogate from the allocations and rights to radio frequency or numbers provided for in the previous licence.

Finally, all licenses issued under the previous Acts shall cease to be valid and enforceable six months from the commencement date of the ICT Act.

Universal Access

Legal Framework on Universal Access and Service

ZICTA has commissioned a Universal Access Programme (UAP) to ensure that ICTs are deployed to rural and unserved areas of the country using public funds.

Universal access and service is one the thirteen pillars that characterise the ICT policy. The ICT ACT of 2009 mandate to ZICTA clear functions and responsibilities in the design, implementation and financing of universal service programs. It also provides for the establishment of the Universal Access and Service Fund, to be administered by ZICTA, which shall be used for the financing of a universal access and service programme.

In this regard, ZICTA has commissioned a Universal Access Programme (UAP) to ensure that ICTs are deployed to rural and un-served areas of the country using public funds[14]. In identifying the un-served or under-served areas, ZICTA will have to consider the level of competition and availability of services, as well as the commercial viability of providing electronic communications services in particular areas or places.

ZICTA's UAP consists of the following components, namely:

[14] See (ZICTA, 2010)

- construction of shared passive infrastructure (i.e. communication towers) in rural and under-served areas
- establishment of multi-purpose community telecentres (MPCTs)
- Internet Points of Presence (PoPs): The implementation of MPTCs is complemented by a project to extend internet service provision to under-served and un-served (rural) areas of Zambia through establishment of PoPs for Internet Service Providers (ISPs)

The overall aim of ZICTA UAP is to provide and expand communication and information facilities in order to improve people's quality of life in rural and underserved areas, which in itself is a complex undertaking.

Lessons from various ICT initiatives (including a range of pilot projects, such as tele-centres, multipurpose community access centres and information kiosks) in the developing countries of Africa and Southeast Asia[15] suggest that more often the main focus of the interventions has been on the implementation of ICT projects themselves, rather than on understanding their impacts at the community level. As a result, many of these initiatives have not achieved desired social impact and levels of sustainability[16]. At very best, most MPTC initiatives have ended up as a symbolic gesture and service to a handful of people only.

In this respect, predicting the success of ZICTA's MPTC programme and the specific gains to the local communities is rather difficult. Nevertheless, it is interesting to speculate what might be achieved in terms of sustainability if the funds for MPTC programmes were instead used to support local entrepreneurs in setting up their own ICT-related businesses in the targeted areas.

Predicting the success of ZICTA's Multi-purpose telecentres programme and the specific gains to the local communities is rather difficult. Most MPTC initiatives elsewhere have ended up as a symbolic gesture and service to a handful of people only

Human Capital

Human Resources Development

Zambia has recognised the need for development of human resource capacity to facilitate the development of an information society. The government has acknowledged that Zambia's ability to seize the opportunities of the emerging information society will largely depend on the country's capacity to develop and mobilise its human resources.

A number of educational institutions provide ICT training programmes ranging from certificate to degree courses offering specialised subjects including Computer Science, Telecommunications/ Electronics Engineering, Media training/information sciences, Vocational ICT programmes and skills development. These institutions include the University of Zambia, Copperbelt University, ZAMCOM, ZAMTEL Staff Training College and Evelyn Hone College. A number of other public and private sector institutions offer various ICT training programmes.

According to an ICT industry skills survey, there were three hundred (300) people with graduate qualifications in ICTs in 2008[17]. This underlines the lack of adequate formal ICT training facilities at tertiary education level in Zambia.

In 2008, Zambia had less than three hundred (300) people with graduate qualifications in ICTs, which underlines the inadequacy ICT training facilities

In this respect, the Government's overall policy goal is to ensure that the country attains sufficient human resource capacity in critical and relevant ICT skills required for developing and driving Zambia's information and knowledge-based society and economy.

In order to achieve the above goal, Government has committed itself to:

- facilitating the creation of Centres of Excellence for training/education in Electronic Engineering (Telecommunications), Computer Science/Information Technology, Media/ Information Science etc;
- facilitating the implementation of a comprehensive human resource development programme targeting critical skill areas across key sectors of the economy in order to accelerate the development of Zambia's information society and economy; and
- mainstreaming youth and gender issues in human resource development activities.

The National ICT Policy has identified various objectives and strategies to achieve the above. These include the following:

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[15] (Ashraf, 2007)
[16] (Parkinson, 2005)
[17] Collins Chinyama: Presentation at the Trade in Services Workshop at InterContinental Hotel, April 2010

Objectives

- increasing the institutional capacity in terms of infrastructure and human resource in public and private colleges/universities that offer ICT courses;
- increasing annual enrolment and output of students in key professional skills areas such as telecommunications/electronics engineering, computer science, media/information sciences etc.; and
- addressing the human resource requirements in key sectors of the economy targeting critical managerial, technical and operator skills.

Strategies

- develop and implement short, medium and long-term ICT human resource development plans;
- create favourable conditions for public and private sector organisations to invest in ICT skills development;
- enhance general public ICT awareness and literacy, especially among the youths and women;
- provide adequate access to education and training resources for the physically challenged and vulnerable groups;
- promote and facilitate the integration of ICTs in the teaching and learning process at basic (primary), high school and tertiary levels; and
- allocate a significant percentage of the national budget to integration.

While these are all laudable, the challenge will be in the leadership commitment and provision of requisite resources to ensure successful implementation of the stated goals and objectives.

Telecommunications Regulatory Environment (TRE)

The telecoms regulatory environment is perceived to be generally ineffective. This is evidenced by the results of the Telecommunications Regulatory Environment (TRE)[18] survey conducted as part of the sector performance review, which shows below average results for fixed, mobile and broadband/internet market segments.

The telecoms regulatory environment in Zambia is perceived to be generally ineffective.

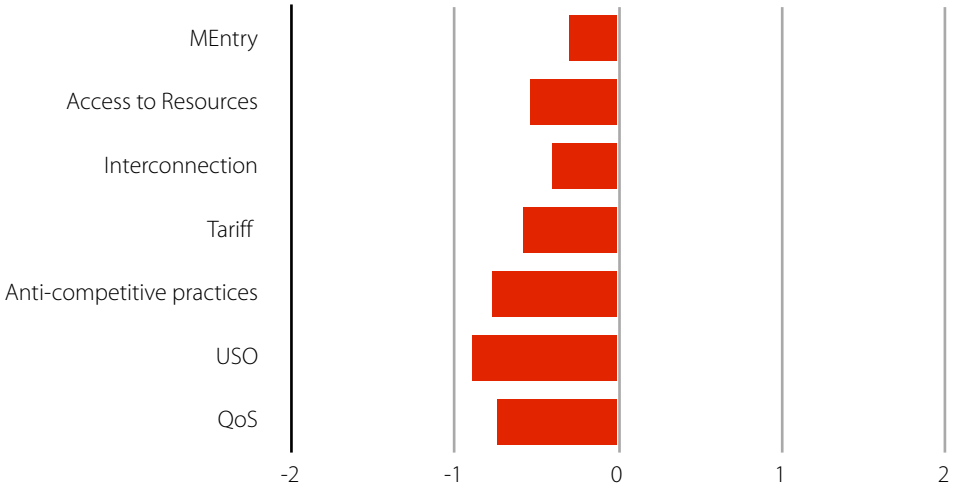

Figure 1: Telecommunications Regulatory Environment Scores

In light of recent positive and highly significant developments in the sector, both at policy, legal and regulatory levels, the results that suggest low perception are rather unexpected and hence need to be assessed against actual performance of the sector. The results may have been negatively influenced by the government's procrastination in effecting its commitments to liberalise the international gateway, litigations on the licensing of a fourth mobile operator and the highly publicised court proceedings regarding allegations of corrupt practices in the divesture of seventy-five percent (75%) shares in state-owned Zamtel.

The general perception of an ineffective policy and regulatory environment as captured in the TRE assessment clearly suggests that much work remains to be done to ensure higher levels of confidence in the legal and regulatory framework in order to nurture an environment that stimulates increased investment in the sector. Going forward, the following areas will continue to be major issues of concern:

Much work remains to be done to ensure higher levels of confidence in the legal and regulatory framework work to nurture an environment that stimulates increased investment in the sector

- Ease of market entry
- Consumer protection & Quality of services
- Frequency Spectrum management
- Interconnection regulation
- Tariff regulation
- Equitable and open access to broadband infrastructure

A more detailed assessment of the telecommunication regulatory environment in Zambia is provided on page 30 of this paper.

[18] The TRE is a diagnostic tool for analysing investment risk in the telecommunications sector arising out of the policy and regulatory environment administered by the government.

Market Structure Analysis

Access to information and the capacity to communicate have significantly increased with the advent of the Internet, digital satellite and mobile networks over the last decades.

The telecommunications sector in Zambia has experienced significant changes since the mid-1990s. Access to information and the capacity to communicate have significantly increased with the advent of the Internet, digital satellite and mobile networks over the past two decades.

Table 4 below provides an overview of the telecommunications sector market structure in Zambia. With the exception of fixed-line and international voice services, the telecommunication sector is open to competition, with no restrictions on foreign ownership.

Table 4: Telecommunications Market Structure[19]

Sub-Sector	Status
PSTN	Monopoly
International Voice	Monopoly
National Voice	Competitive
Local Loop – Voice	Competitive
Mobile	Competitive
Internet	Competitive
Private Data Networks (VSAT & Leased Lines)	Competitive

Interestingly, the monopoly on the international gateway has prevented Zain, the dominant operator in Zambia, from joining Zain's One Network and ending roaming charges between its Zambian operations and the dozens of countries in Africa and the Middle East on Zain's One Network. As in other markets, Zain's termination of mobile charges would have been likely to be followed by other operators (had they all had cost-based access or ownership of an international gateway license), with positive effects on consumer welfare.

As of 2009, the Authority had issued 53 licences as shown in the table below.

Table 5: Type and Number of Licenses Issued

LICENCE TYPE	LICENSEES
Mobile Cellular	03
Internet Service Provision	19
Private Network	24
Carrier of Carriers	03
PSTN	01
Basic Voice Services	01
Public Payphones	01
Public Data Transport	01
Total Licenses	**53**
Source: ZICTA	

Fixed Line and International Voice Services

Though private and foreign ownership are permitted, entry has been severely curtailed by prohibitively high license fees, leaving ZAMTEL as the only provider of fixed lines and international voice services in Zambia.

Mobile Telephony

There are three licensed mobile cellular service providers, namely Zamtel (CelZ), MTN (formerly TELECEL Zambia) and CELTEL (formerly ZAMCELL)[19].

Mobile Network Operators	
Cell Z	100% state owned – due for privatization
Zain Zambia	80% privately owned/controlled 20% publicly held & listed on Lusaka stock Exchange
MTN Zambia	100% foreign owned

As shown in the figure below, the mobile sector is dominated by Zain Zambia with slightly over 70% of the market share at the end of 2009, followed by MTN at a distant second place with 26%, and lastly CelZ with small share of less than 4%. Looking ahead, Zain is expected to continue dominating the mobile market in 2010 as MTN seeks to build its market share at the expense of both Zain and CelZ.

The mobile sector is characterised by high prices and low penetration levels – a feature usually identified with high concentrated but underdeveloped markets.

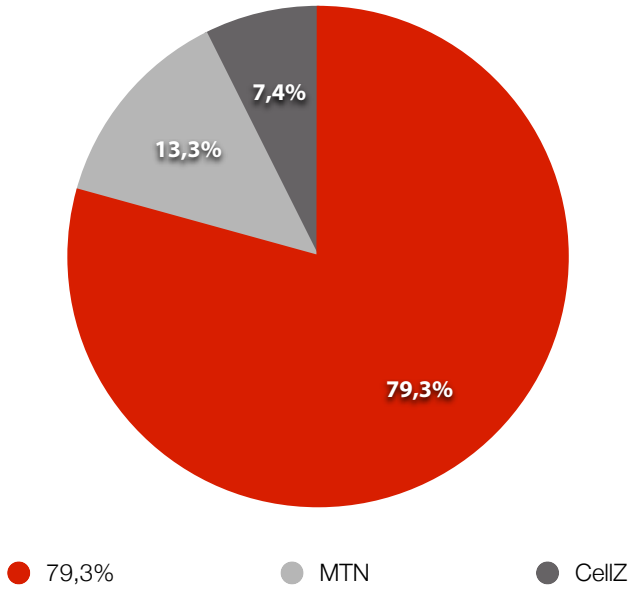

Figure 2: Mobile Market Share in Zambia 2010

The mobile sector is characterised by high prices and low penetration levels – a feature usually identified with highly concentrated but underdeveloped markets.

As noted above, in December 2009 the government issued a statutory instrument to restrict the number of players in the mobile and PSTN market to the current three operators for the next five years, i.e. until 2015. It is widely believed by industry observers that the moratorium on licensing additional players is intended to provide a window of opportunity for the would-be investors in ZAMTEL to acquire sufficient market share and realise positive returns on their investment in the shortest period possible.

In December 2009, the government made a policy decision to restrict the number of players in the mobile and PSTN market to the current three operators until 2015

[19] There are new entry barriers. Recently the Government issued a Statutory Instrument prohibiting new entrants in the Mobile/PSTN subsectors till 2015

Telecom, Internet and Broadcasting Market Analysis

Fixed-line Network

ZAMTEL, a 100% state-owned company, is the only provider licensed to operate a public switched telephone network (PSTN) in Zambia. Its range of services includes local, national, and international fixed telephone services where it enjoys monopoly privileges. In addition to its GSM network, under the CelZ brand name ZAMTEL is also in the process of installing fixed wireless infrastructure based on WIMAX technology to provide both wireless voice and data services.

Table 6: Fixed-line Subscribers

Year	Number of Fixed Lines	Per 100 Inhabitants	Growth Rate (%)
2001	85,680	0.849	2.83
2002	87,674	0.842	2.33
2003	88,561	1	1.01
2004	90,663	0.818	2.37
2005	94,665	0.827	4.41
2006	93,427	0.807	-1.31
2007	91,789	0.784	-1.75
2008	90, 600	0.761	-1.29
2009	90,341	0.70	-0.28

Source: ZICTA

In 2009, Zamtel's fixed line network had an installed capacity of 162,000 fixed telephone lines out of which slightly above 90,000 lines were active. This translates to a capacity utilization of approximately 56% and fixed-line teledensity of 0.7 phones per 100 people across the country.

Since 2006, the fixed line market has experienced a slow but gradual decline

From 1995-2005, the number of lines grew from 76,000 to 94,665, at an annual average growth rate of 2.4%. However, since 2006, the fixed-line market has experienced a slow but gradual decline, averaging 1% annually, to 90,341 lines in 2009. The decline is mainly due to lack of investment in network maintenance and expansion on the one hand and increased public access to mobile telephony on the other.

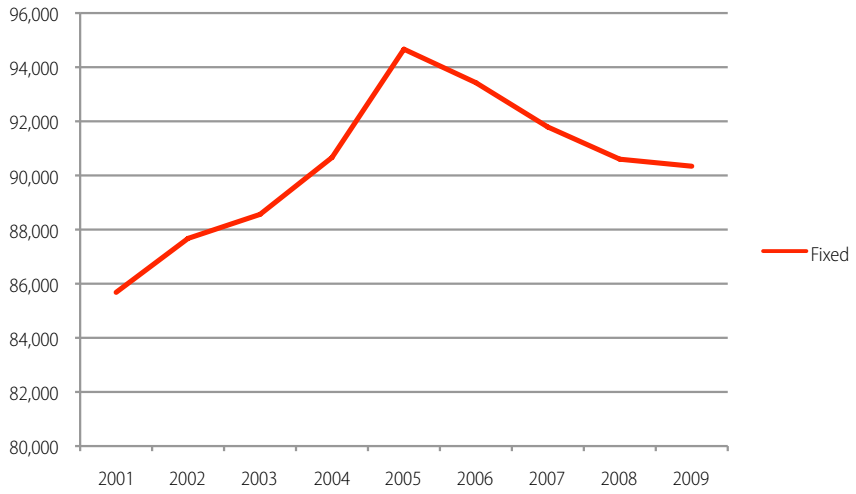

Figure 3: Fixed-Line Customer Trends

The poor quality and lack of timely replacements or upgrades from analogue telephone exchanges to digital systems has contributed to the substitution of fixed-line telephony with mobile cellular communications, leading to the current trend of steady decline in the number of fixed lines available in both urban and rural areas of Zambia.

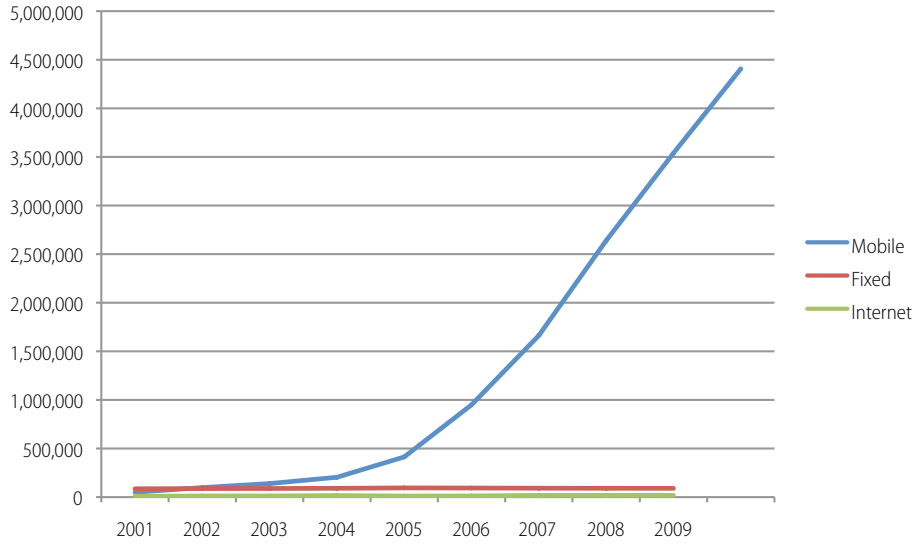

Figure 4: Mobile, Fixed and Internet Customer Growth Trends

The fixed-line network is highly skewed towards urban areas, which account for close to 90% of the PSTN subscribers, but only 55% of the country's population. The network is concentrated in Lusaka and Copperbelt areas, which account for around 50% and 30% of fixed lines, respectively, but less than 38% of the national population. The rural areas, with more than 60% of the population enjoy less than 10% of the fixed lines available. At present, the active fixed lines in Zambia are evenly distributed between commercial and residential subscribers.

The fixed-line network is highly skewed towards urban areas, which account for close to 90% of the PSTN subscribers, but only 55% of the country's population.

More than 80% of ZAMTEL's transmission network is digital. A number of microwave trunk routes carry traffic to major provincial centers. A digital optic-fiber backbone linking Lusaka and Livingstone is being installed as part of ZAMTEL's network upgrade. Traffic to medium-sized towns and rural areas is carried via microwave links that also provide interconnection with neighboring countries where applicable.

Chinese equipment supplier Huawei has been building the company a fibre backbone, but it is far from complete. Financing constraints have delayed completion of the project considerably.

In spite of its monopoly status, as at end of 2009 ZAMTEL had fewer than 100,000 fixed and fixed-wireless subscribers over the last 40 years and, since 2006, it has lost over 10,000 subscribers. While the two major private operators, namely Zain and MTN, had over 3.5 mobile million subscribers between them, Zamtel has fewer than 200,000 mobile customers. In 2008, Zamtel registered a ratio of 110 subscribers per employee compared to 586 – the average subscriber base per employee for sub-Saharan African telecommunication operators.

Zamtel's bloated cost base, largely because of its large headcount, has led it to insolvency.

Zamtel's bloated cost base, largely because of its large headcount, has led it to insolvency. In order to save the company from liquidation, the government opted to privatise Zamtel (see below).

Privatisation of Zamtel

The Government has recognised that the ICT sector in Zambia has the potential to make significant contributions to economic growth. As a result, it has resolved to fully liberalise the telecommunications sector and is taking further steps to promote Zambia's international competitiveness by removing barriers to doing business as part of the private sector development reform programme. These actions include eliminating Zamtel's monopoly on the PSTN and international gateway as well as reducing license fees to regional averages.

In December 2008, the government announced its intention to partially privatise Zamtel through the sale of 51% to 75% shares in the company's equity.

In December 2008, the government announced its intention to partially privatise Zamtel through the sale of 51% to 75% shares in the company's equity. The government intends to retain a minimum of 25% of Zamtel's equity, and reserves the right to list some, or the entire stake on the Lusaka Stock Exchange.

In a speech to Parliament in August 2009, the Minister of Communication and Transport revealed that Zamtel had an annual operational deficit of US$17 million, liabilities in excess of US$125 million

and owed Government over K300 billion as at December 2008[20]. Despite its poor subscriber base, the company had maintained a cost structure that is out of proportion with its commercial performance. For example, in the 2007-2008 financial year, staff costs – generated because of the company's more than 2,500 workforce – accounted for over 70 percent of revenues.

Despite the earlier controversy surrounding the privatisation process, the prospect that a new investor in Zamtel could stimulate competition and bring down prices across the board, could popularise the process.

Following a request for an expression of interest, to which thirty (30) entities responded, eight companies were shortlisted to submit bids for Zamtel. The eight pre-qualifying bidders included South Africa's Telkom, Portugal Telecom, and the two Indian state-owned telecoms operators Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL). The rest entered as consortia and include VimpelCom of Russia with Altimo Holdings, Libya's LAP Greencom with LAP Green Networks, Unitel of Angola and Angola Cables, and finally Egypt's Orascom Telecom and its subsidiary Telecel Globe.

After conducting due diligence on Zamtel, five of the pre-selected bidders withdrew, leaving VimpelCom of Russia with Altimo Holdings, Angola's Unitel and Libya's LAP Green Networks in the final bidding process. Angola's Unitel and Libya's LAP Green Networks were later selected for initial sale negotiations[21].

As with most privatizations, there is considerable public discontent and controversy surrounding the process. Resistance to the privatisation centers on a suspicion of the entire process, with many accusations of alleged corruption flying around, as well as a deep-seated suspicion of the new potential investors. However, the prospect that a new investor in Zamtel could stimulate competition and bring down prices across the board could popularize the process.

ZAMTEL's attraction for international investors is to gain access to Zambia's mobile market, despite CelZ only having a 4% market share in 2009, way behind the market leader Zain and second-ranked MTN. Investments of around US$25mn in 2008 to expand its network have done little to help CelZ catch up to its rivals, and it will require significantly greater funding to secure new subscribers.

An aggressive price competition and going after subscribers new to the market will help Zamtel grow its market share and challenge its competitors.

Nevertheless, high mobile tariffs and a low penetration of 32% presents an opportunity for the buyer. Aggressive price competition and going after subscribers new to the market will help Zamtel grow its market share and challenge its competitors. A price reduction strategy is likely to be a very efficient way of gaining access to that growth. Such a strategy could eventually lead to a price war, which would effectively lower prices across the board. Such a move would make a new shareholder in Zamtel very popular with consumers, given that the government has so far failed to achieve this.

In addition to the mobile network, the company offers additional attractions to a new investor. Zamtel is the fixed-line incumbent, and though the fixed-line infrastructure is minimal in the country, it does have the beginnings of a fibre backbone, and a WiMAX network is in the process of being rolled out. Furthermore, in the run-up to the privatization of Zamtel, the Government decided to transfer a significant proportion of ZESCO optic fiber assets (i.e. 7 of the 12 fibre pairs) to ZAMTEL. Whilst this is clearly an attempt to "fatten the goose" before any sale price is agreed, it will also entrench ZAMTEL's near de-facto monopoly on national fibre infrastructure.

This development has met with some opposition from other market players, who are contemplating investing in alternate routes to ensure competitive access to submarine cables landing all over the African coast.

Mobile

Since the watershed Telecommunications Act of 1994, one of the most significant outcomes of the liberalisation of the telecommunications sector has been the accelerated development of mobile telephony. Zambia has made great strides in widening access to telecommunication services in the mobile voice segment of the market with eighty percent (80%) of the population within the range of a mobile signal in 2009. An estimated 99.6% of customers across all networks are on pre-paid billing.

[20] See (Ministerial Statement on Privatisation of Zamtel, 2009)

[21] The 75% share equity in Zamtel has since been acquired by the Libyan parastatal company LAP Green Networks

Mobile Subscription Growth Trend in Zambia

Year	Subscribers	Per 100 Inhabitants	Growth Rate (%)
2000	49,957	0.505	31.5
2001	97,900	0.97	96.0
2002	139,258	1.338	42.2
2003	204,150	1.895	46.6
2004	413,120	3.725	102.4
2005	949,558	8.299	129.8
2006	1,663,051	14.369	75.1
2007	2,639,026	22.539	58.7
2008	3,539,003	26.955	34.06
2009	4,165, 101	32.28	17.67

Source: ZICTA

At the end of December 2009, the mobile sector recorded a total of 4,2 million subscribers, representing an annual growth rate of 17.67% compared to 21.5% in 2008. In terms of nominal figures, the mobile subscriber base grew by 626,098 in 2009 compared to 899,977 in the previous year. However, with only 32% penetration rate, the mobile cellular market remains largely underdeveloped and there is ample space for more competition.

However, with only 32% penetration rate, the mobile cellular market remains largely underdeveloped with ample space for considerably more competition.

The favorable macro-economic performance of the Zambian economy during 2009 and the expected continued performance in 2010 indicates that the mobile cellular communication market segment will continue to grow steadily in the next few years ahead.

It is anticipated that the aggressive infrastructure roll-out by MTN Zambia as it tries to play catch up with Zain, coupled with the potential deployment by the new investors into Zamtel, will provide further growth stimuli in the mobile segment during 2010.

MNO Market Share & District Coverage as at 31/12/09

Service Provider	Total Subscribers	Market Share	Prepaid	Post Paid	Roaming	District Coverage
Cell Z	152,581	3.5%	152,015	566	-	44
Zain Zambia	3,089,270	70.1%	3,076,377	12,893	3,089,270	72
MTN Zambia	1,164,831	26.4%	1,159,657	5,174	1,164,831	72
Sub-total	4,406,682	100%	4,388,049	18, 633	3,254,101	-

Source: ZICTA

Geographical coverage of the mobile signal was spread to 72 districts in the country, with an estimated 80% of the population within a mobile telephony signal.

In addition to standard GSM, both Zain and MTN operate GPRS/EDGE data services across their networks and are poised to launch their 3G service, which they are currently trialing as part of the transition arrangements to the new licensing regime.

Average ARPU

Despite having a pretty low GDP per capita, Average Revenues Per User (ARPUs) reported by Zain were US$8 in June 2009, twice that of those in Kenya and Uganda[22], indicating both how untapped the market is and how much less competitive pressure there is on prices. In 2008, MTN reported an ARPU of $11, which it says increased to $6 in March 2009[23]. The Table below shows the ARPU for the three mobile network operators in 2009:

[22] See (Zain Zambia, 2009)
[23] See (MTN, 2009)

Service Provider	ARPU on air time per year	ARPU on air time per month
Zain Zambia	US$ 87.15	US$7.26
MTN Zambia	US$ 61.77	US$ 5.15
Zamtel/Cell Z	US$ 40.91	US$ 3.41

Internet

Zambia was among the pioneers of Internet in Sub-Sahara Africa in the early 1990s. Experimentation with internet services – focused around the University of Zambia and the NGO community – began in 1991 with dial-up store-and-forward email services, and shortly afterwards by experimentation with low-earth orbiting satellite technology. This effort received a significant boost following the liberalisation of the communications sector, and specifically in 1996 when the regulator authorised Zamnet – Zambia's first ISP – to establish its own VSAT-based data gateway. This enabled the nascent ISP sector to bypass the ZAMTEL satellite based network, which was charging astronomical satellite access fees.

The Internet sub-sector is the most competitive in the telecommunications services industry in Zambia. At the end of 2008, there were nineteen (19) authorised Internet Service Providers of which only fourteen (14) were operational (see table below).

The table below provides a state of play in the Internet market in Zambia in 2008 as far as data is available[24].

Growth of the Internet sub-sector has however been hampered by the high cost of bandwidth and in turn retail uptake has been negatively impacted due to the resultant high prices

Growth of the Internet sub-sector has however been hampered by the high cost of bandwidth, and in turn retail uptake has been negatively impacted due to the resultant high price of the retail services. The lack of expansion investment in the fixed network during the 1990s, coupled with increased deployment of broadband internet, has resulted in the drastic reduction of the number of dial-up internet subscriptions. As a result, Internet subscription penetration figures fell by 2.9% in 2009 as indicated in the table below.

However, this perceived decline is misleading when viewed against increasing bandwidth capacity and the combined revenues of ISPs. Indeed, reliable data on actual numbers of people using the Internet is hard to estimate. Table 7 below shows the trends in Internet subscribers in Zambia from 2001 to 2009.

Table 7: Internet Subscriber Trends

Year	Total Subscribers	Per 100 Inhabitants	Type of Internet Connectivity		Growth Rate (%)
			Dial Up	Broadband	
2001	8,248	0.082	7,627	621	
2002	11,647	0.112	10,826	821	41
2003	12,000	0.111	10,857	1,143	3
2004	16,288	0.147	15, 334	954	36
2005	10,882	0.095	10,179	703	-33
2006	11,996	0.104	10,067	1,929	10
2007	17,946	0.153	12,578	5,368	49.6
2008	18,289	0.152	12,586	5,703	1.9
2009	17,754	0.137	6,684	10,702	-2.9

Source: ZICTA, 2009

[24] See (Ministry of Communications and Transport, 2009)

Table 8: Number of VSATs Licensed

Year	Number of VSATs licensed
2004	9
2005	24
2006	23
2007	103
2008	11
2009	24

The above figures do not take into account the number of direct VSAT links that provide the only form of Internet access, particularly in rural areas. The table below shows the number of VSAT licenses issued annually. This does not include a significant number of VSATs that are not licensed by the regulator.

The increasing growth of broadband Internet, as evidenced by the growth in broadband subscribers and usage of VSATs, strongly suggests that there is increased Internet utilization among corporates and small and medium enterprises. This is supported by the continuing growth of Africonnect – a WIMAX ISP that has become the first ISP in Zambia to establish Point of Presence in all provincial administrative and key business centers. In May 2010, Africonnect was in negotiation to be acquired by Vodacom[25].

Probably the growth trends in bandwidth usage provide a better proxy for measuring internet growth. As shown in the table below, total bandwidth usage has on average grown six-fold in the four year period, between 2005–2008. This is despite the high cost of satellite connectivity that most ISPs are using due to lack of or limited access to affordable terrestrial optic fiber internet links.

Table 9: Bandwidth Usage (Mbps)

Year	Bandwidth Usage	
	Outgoing (Mbps)	Incoming(Mbps)
2004	8.76	20.316
2005	10.096	24.408
2006	34.79	79.884
2007	46.478	119.96
2008	48.834	197.523

Despite a growing demand for broadband internet, the majority of Zambians are unable to make individual subscriptions due to high retail costs of the service brought about by the high infrastructure investment costs including high cost of bandwidth and internet access fees.

Despite a growing demand for broadband internet, the majority of Zambians are unable to subscribe to Internet services due to high access fees

Schedule of Revenues for ISPs in ZMK (Millions)

ISP	2009	2008	2007	2006
AFRICONNECT	22,845	15,232	8,800	4,362
MICROLINK TECHNOLOGIES	12,087	9,619	7,650	4,142
ZAMNET	17,218	12,585	9,263	9,258
PRONET AFRICA	4,963	3,185	2,750	3,229
REAL TIME	N/A	6,405	3,063	166
COPPERNET SOLUTIONS	N/A	14,247	11,326	10,417
UUNET ZAMBIA	N/ A	7,697	5,960	5,728
QUICK EDGE	1,835	1,132	1,158	745
BRINGCOM	N/A	1,216		

Source: ZICTA

[25] Postscript: Africonnect has since been acquired by Vodacom Business Africa

The above notwithstanding, mobile internet penetration is likely to increase with the launch of 3G services in 2010 and the increasing availability of affordable internet-enabled handsets.

Currently, the ISP market in the country is very competitive and is the only one in the ICT industry without a significant dominant player (see Schedule of Revenues for ISPs above). The ISP market can be divided into two distinct but overlapping market segments, namely dial-up and broadband Internet. Whereas the dial-up Internet access market is shrinking, the broadband segment is increasing. Dial-up is slowly but gradually being replaced by WiMAX, GPRS, EDGE, CDMA as well as optic-fibre networks.

Service Provider	Internet Subscribers				District Coverage	International bandwidth capacity (Mbps)			Internet Hosts
	Total	Market Share (%)	Broad-band	Dial Up		Total	Outgoing	Incoming	
Africonnect	2250	12.67	2250	-	12	107	30	77	-
Zamtel	5167	29.1	169	4998	8	141	60	81	4
Realtime	344	1.93	344	-	6	10	2	8	340
CopperNet	1215	6.8	848	367	11	49	9	27.5	-
Zamnet	2606	14.67	1433	1173	7	68	29	40	-
Microlink	1428	8	1005	423	6	30	6.99	23.108	-
UUNet	130	0.73	68	62	26	10.6	3.6	6.8	-
BringCom	300	1.7	300	-	1	7.2	2.2	5	-
Zain	2752	15.5	2752	-	72	26.4	2.4	24	-
MTN	1562	8.8	1562	-	72	3	1	5	-
TOTALS	**17754**	**100**	**10731**	**7023**	**-**	**455.2**	**157.792**	**297.408**	**344**

Source: ZICTA, 2009

Broadcasting

Broadcasting in Zambia, which started as far back as 1941, is predominantly analogue and free-to-air. The Zambia National Broadcasting Corporation (ZNBC), established under the ZNBC Act of 2002, is the official broadcasting organ of government and operates both radio and television services.

Until 1994, ZNBC was the only broadcaster in Zambia. However, since the advent of multiparty democracy in 1991 and deregulation in 1994, Zambia has made significant advances in liberalizing the airwaves and allowing private sector participation in the sub-sector. This has resulted in the opening of a number of commercial and community radio stations.

By 2008, there were 48 radio stations countrywide, with five free to air and two satellite-based subscription television broadcasters.

By 2008, there were 48 radio stations countrywide, with five free-to-air and two satellite-based subscription television broadcasters. Among the free-to-air television broadcasters, only ZNBC is authorized to broadcast nationwide[26]. The others are restricted to a defined transmission coverage area of around (100-150km) in radius.

Zambia national broadcasting CORPORATION (ZNBC)

The Zambia National Broadcasting Corporation is the national public broadcaster that provides both radio and television services. The ZNBC Radio services are provided through Shortwave and FM transmissions. Currently, FM transmissions only cover the Line of Rail and some Provincial centers.

Until 2006, ZNBC television services were only receivable in the main provincial centers, as distribution was solely dependent on Zamtel's Terrestrial Microwave Network. In 2005, ZNBC entered into a partnership with Multichoice Zambia to distribute the ZNBC TV signal as part of the DSTV bouquet. Under this arrangement, the ZNBC signal is transmitted via satellite and received in

[26] In mid-2010, Muvi TV was awarded a licence to broadcast nationwide

a number of rural districts where it is re-distributed using local terrestrial TV transmitters. This has enabled ZNBC to expand terrestrial television services to the rural parts of the country. The expansion programme is being funded by the government through the Rural TV Project that is designed to allow more people access to television broadcasts.

As a result, the total number of television transmitter relays increased from 12 to 63 transmitters in 2008. It is estimated that 65% of Zambians are able to receive the ZNBC TV signal. This growth of television reach into the rural areas has coincided with the similar growth and expansion in GSM coverage, creating new channels for communication and access to information for people in these areas. At the present, ZNBC has only one TV channel. It is planning to launch a second channel in the first half of 2010[27].

Table 10: Television Subscribers

Total Number of TV receivers	850,000
Number of Households with TV	571,983
Total Number of home satellite antennas	45,464

Source: Ministry of Communications and Transport, 2009

Digital Migration

The greatest challenge ahead for the broadcasting sector in Zambia is the imminent digital migration and the overall state of preparedness with regard to policy and law, infrastructure, funding, and content. Digitization has many potentials including creating a digital divide between those who can and those who cannot afford the requisite equipment. It will not only change the state of broadcasting as we know it today, but also dramatically affect regulation based on rationales of scarcity. The switch over to digital broadcasting is going to stimulate new business opportunities in areas such as content creation, distribution, transmission, delivery and provision of support services for various distribution models. The key challenge will be on how to ease the cost of migration for the majority of consumers who may not be able to afford the appropriate equipment upgrades.

Zambia, like other countries in the SADC region, has committed itself to the SADC migration plan, which has set 31 December 2014 as the switchover date, in order to meet the ITU 2015 deadline. A National Task Force on Digital Migration has been set up by the Zambian government to prepare a national roadmap, make recommendations and generally oversee the national digital migration process. The Task Force is composed of the Ministry of Information and Broadcasting Services (MIBS), Zambia Information and Communications Technology Authority (ZICTA) and the Zambia National Broadcasting Corporation (ZNBC).

Backbone

Zambia is a landlocked country with no direct access to any landing point either on the eastern or western coasts of Africa. The biggest challenge in this respect is the limited availability of terrestrial backhaul cable linking the country to the submarine cables and affordable charges from the landing station at the coast to the country, which are often higher than the price of the submarine cable component.

Currently, the country has a single entry point for optic-fibre network via Namibia through the ZESCO network. Access to international submarine capacity through an alternative terrestrial route will enable diversity and reduce the current levels of vulnerability and lack of competitive pricing that is usually associated with a single monopolistic source.

The drive to build a fibre-optic national backbone has been led by non-traditional communication companies in Zambia, especially those in the energy sector leveraging existing infrastructure and rights of way. The state-owned power utility company, ZESCO, has laid fiber-optic cable along the earth wire of its pylon infrastructure on the main grid linking Sesheke in the south (on the border with Namibia), to Lumwana/Solwezi in the north (near DRC) through Lusaka and the Copperbelt at an estimated cost of US$ 13 million. In 2009, Zesco partnered with PCCW Global to create an international fibre route to Europe via Namibia and South Africa to provide backhaul Internet

[27] ZNBC launched a second Television Channel in June 2010

Services. Though it is not cheap, it is much less expensive than satellite connectivity and it has begun to undercut and erode Zamtel's previously protected international revenues.

Similarly, the Copperbelt Energy Corporation (CEC) has built a 540 kilometer optic-fibre network linking all the towns in the Copperbelt province at an estimated cost of US$9 million. CEC is expanding its optic-fibre network into the Democratic Republic of Congo (DRC) with the construction of a new power transmission line into Katanga.

Challenges

Like many other developing countries in sub-Saharan Africa, Zambia is facing numerous challenges in the deployment and delivery of communications infrastructure that include the following:

- high technology acquisition and deployment costs especially in the development of the national telecommunications backbone infrastructure;
- limited coverage and poor quality of existing telecommunications and Internet infrastructure in the country;
- high cost and limited access to ICT infrastructure incurred by individuals and businesses;
- lack of special incentives for private sector participation in the development, management and operation of ICT and related infrastructure projects; and
- monopolies in wholesale and retail markets of the telecommunication services sub-sector including infrastructure.

Network Development and Infrastructure

This section focuses on the current and future network and infrastructure developments taking place in the country.

Fixed-Line Infrastructure

Zamtel's main network control and switching facilities are located in the capital Lusaka. Its fixed network connects all major population centers through 94 regional exchanges, with an installed capacity of 162,500 lines of which 90,600 lines were active, giving a utilization capacity of 56%. In some rural areas the PSTN exchanges are powered by diesel generators giving rise to high and uneconomic operational costs.

The fixed network is undergoing a substantial upgrade: over 80% of switching infrastructure is now digital, and DSL capacity is being rolled out across the network. Zamtel's primary fixed- wireless network is also being upgraded and expanded, with coverage and capacity expected to more than double by the end of 2011. Zamtel's secondary fixed-wireless network, based on WIMAX technology, is designed to cover the whole of metropolitan Lusaka, and is scheduled to go live during 2010.

In addition to the above, both Zain and MTN are expected to launch their own international voice services in the first half of 2010, following the reduction in license fees from twelve (12) million dollars to three hundred and forty thousand (340,000) dollars[28].

Mobile

As indicated earlier, there are three authorized mobile operators in Zambia, namely Zain, MTN and Zamtel's CelZ. This section highlights some of the network and infrastructure development projects that the companies are undertaking or plan to undertake in the near future.

Zamtel's mobile network is currently being expanded by over 60%, with 83 new cell sites being deployed over the forthcoming 12 months (2009-2010) at an estimated cost of $23 million. These new cell sites will all be EDGE-enabled, allowing the company to begin offering mobile internet access and other value-added services.

Zamtel is also planning to spend an additional $23 million on the installation of its WIMAX network in the country, starting with Lusaka. This project, which is in advanced stages, is expected to be completed in 2010[29].

Both MTN and ZAIN have been conducting trials for 3G services in Zambia, which they intend to roll out in the first half of 2010. In this regard, by the end of December 2009 Zain had deployed more than 200 3G base stations in key business and administrative centers in readiness for roll out. In addition, in order to ensure delivery of quality services, Zain is planning to install a 116km optic-fibre metropolitan network in Lusaka to link its base stations[30].

Backbone

The national backbone infrastructure is dominated by terrestrial microwave links. However, in recent years significant efforts have been made to expand capacity with the introduction of optic-fibre networks along the main urban north-south development corridors.

ZAMTEL[31] Optic FIBRE network

Zamtel is in the process of completing a national fibre backbone network at an estimated cost of US$48 million. The Zamtel optic fiber network is designed to connect its entire regional exchange infrastructure and provide links to neighboring countries including Tanzania, Malawi, Zimbabwe,

[28] On 27 May 2010, the Government issued Statutory Instrument No. 34 of 2010 outlining the fees for various licence categories
[29] Personal discussion with the author
[30] See (ZAIN ZAMBIA Limited, 2009)
[31] Zamtel is also a shareholder in the East African Submarine Cable System (EASSy)

Namibia and the Democratic Republic of the Congo (DRC). It will provide terrestrial backhaul links to connect Zambia to various submarine optic fiber cables on the east and west coasts Africa.

However, the completion of ZAMTEL's network deployment is severely behind schedule due to financial constraints and its completion will depend on the eventual agreement between the Government and the new investors. It is partially for this reason that the Government has decided to enhance "Zamtel's dowry" before privatization by handing over seven pairs of dark fibre from ZESCO's network to ZAMTEL.

The move to allocate ZESCO's optic fiber assets to ZAMTEL is likely to reinforce ZAMTEL dominance of fixed line infrastructure

The move to allocate ZESCO's optic-fibre assets to ZAMTEL is likely to reinforce ZAMTEL dominance of fixed line infrastructure. This scenario has prompted other operators to seek alternative independent routes to ensure competitive access various submarine cables. This is likely to spur additional investments in the national backbone.

Access & Pricing

Fixed Line

Table 9 below provides information on the prevailing tariffs for ZAMTEL fixed-line network in the country. Zamtel has progressively simplified its tariff structure over the last decade by reducing the complexity of its tariff bands from more than twenty (20) to the current three bands, with only per second billing.

For purposes of comparison with mobile tariffs, we have also shown Zamtel's per minute billing derived by straightforward multiplication. The PSTN/CelZ tariffs reflect ZAMTEL's privileged and exclusive monopoly in the fixed network segment.

Table 11: ZAMTEL Fixed-Line Tariff Structure

Fixed-Line or Public Switched Telephone Network (PSTN) Services				
Type of Service	Kwacha Per Second		Kwacha per Minute	
	Peak	Off-Peak	Peak	Off-Peak
PSTN to PSTN (Band A) Local	3.33	2.50	199.8	90
PSTN to PSTN (Band B)	16.67	12.50	1000.2	750
PSTN to PSTN (Band C)	16.67	12.50	1000.2	750
PSTN to CelZ	16.67	12.50	1000.2	750
PSTN to Other Networks	22	20	1320	1000

Source: ZAMTEL

ZAMTEL has positioned its fixed-line pricing strategy to keep national (long-distance) calls as high as possible but slightly below the lowest mobile on-net tariff (i.e. MTN at K1066 per minute). Secondly, call charges from the PSTN to ZAMTEL's mobile arm CelZ are pegged at the same rate as PSTN Band (C) call charges, while CelZ to PSTN are pegged at the CelZ on-net tariff level.

The above clearly demonstrates that ZAMTEL is engaging in price discrimination by taking advantage of its monopoly position in the fixed line segment and offering different termination rates to its mobile network (CelZ) compared to other networks.

ZAMTEL is engaging in price discrimination by taking advantage of its monopoly position in the fixed line segment and offering different termination rates to its mobile network (CelZ) compared to other networks.

Table 12 below provides information on the charges for international voice services[32]. The other operators (MTN and ZAIN) are required to route their international traffic through ZAMTEL's international gateway. ZAMTEL's call charges are lower for neighboring countries (mostly in the SADC region) followed by those with direct links to Zambia. This group of countries includes Belgium, Canada, France, Italy, the United Kingdom and United States. For example, calls to Uganda and Kenya, which are in charge Band 3, are higher than calls to the United States and Italy. Countries that are deemed to be too "hard to reach" attract the highest premium charge.

[32] The International Gateway has since been liberalised leading to significant reductions in tariffs.

Table 12: International call tariffs (Kwacha per Min)

Region	Zamtel		Zain		MTN	
	Peak	Off-peak	Peak	Off-peak	Peak	Off-peak
Band 1: SADC Region*	3 381,02	2 561,38	4845.64	3670.94	7428	6065
Band 2: Countries with direct Service	4 303,12	3 227,34	6167.17	4625.38	9541	7428
Band 3: Other Countries with no direct service	5 737,49	4 303,12	8222.90	6167.17	10836	8519
Band 4: Rest of the World	6 249,77	4 866,62	9250.76	6974.78	12199	9541
Band 5: Hard to reach countries	6 813,27	5 122,76	9764.69	7341.87	12199	9541
Satellite						
Thuraya	12 806,90	12 806,90			37483	37483
Imnsart	20 491,03	20 491,03				
Iridium	15 368,28	15 368,28				

Source: Compiled by author from respective Zamtel, Zain and MTN sources. Data for MTN and Zain derived from respective websites

For comparison purposes, the table also provides information on the corresponding charges by MTN and ZAIN. Under existing arrangements, ZAMTEL provides MTN and Zain with a 20 percent discount on all the international call charges, which they in turn are supposed to pass on to their subscribers. However, there is a huge variance between the call charges offered by Zamtel and those by MTN and ZAIN. MTN has the highest international call charges after Zain and Zamtel.

Mobile

Table 13 below provides summary information on tariffs for mobile services based on standard per minute billing. CelZ has only one tariff based on per second billing, which has been pro-rated to derive the charge per minute.

Table 13: Mobile Tariffs

Zambia Mobile Tariff (Kwacha per minute)								
	MTN		Zain		CelZ & PSTN*		Industry Average	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
On-net	1,066	615	1184	691	1320	980*	1190	762
Off-Net	1435	820	2073	1382	1320	1200	1609	1134
Family & Friends	960	554	987	592	900	600	949	582
SMS: On-net	205		296		225		242	
SMS: Off-Net	287		296		350		311	
SMS: On-net	415		542		350		436	

Source: Compiled by author from respective Zamtel, Zain and MTN sources. Data for MTN and Zain derived from respective websites

With a significant and dominant market share of over 70%, most call destinations are on-net. Zain offers a competitive on-net rate and a high premium for off-net calls. On the other hand, MTN has positioned its pricing to offer lower on-net calls, while its off-net pricing is marginally higher that CelZ but also thirty percent (30%) lower than similar tariffs for Zain.

Compared to other countries in the region, Zambia has high off-net tariffs, which are a result of Zain Zambia's pricing structure.

Zamtel's CelZ low off-net tariff during peak periods is a result of its weak position in the market, which also seeks to leverage its fixed-line network monopoly. Its higher on-net pricing means that calls within CelZ are at a premium. In other words, CelZ offers a good option for a second SIM card.

Both MTN and Zain have introduced real-time discount tariff structure (i.e. dynamic pricing), where users get discounts depending on the network traffic in a particular area and point in time.

Interconnection

Since the advent of mobile communication in Zambia in 1995, service providers have been left to decide their own interconnection rates. In the beginning the rates reflected the dominance of the incumbent (Zamtel) but now reflect the dominance of Zain – which has a 70% market share and the inability of ZICTA to regulate the interconnection market. As shown in Table 12, Zain Zambia has been engaging in discriminatory and predatory pricing to stifle competition especially from MTN Zambia. This prompted MTN, in May 2010, to lodge an official complaint with the Zambia Competition Commission (ZCC)[33].

Interconnection rates reflect market power of Zain Zambia's which has been engaging in discriminatory and predatory pricing to stifle competition especially from other market players.

Table 14: Interconnect Rates in Zambia in 2010

Contracting Parties	Termination Rates (per minute for voice calls)
Zain to MTN (mobile)	US$0.10
Zain & Zamtel (mobile)	US$0.08
Zamtel (mobile) & MTN(mobile)	US$0.063
Zamtel (PSTN) & MTN (mobile)	US$0.052

High termination costs tend to favor bigger players and stifle competition and innovation, retard growth penetration rates and prevent additional investment in the sector, while regulated interconnection fees allow smaller operators to compete based on quality of services. A significant reduction in interconnection rates is expected to result in lower costs, which will permit more widespread access mobile-phone services

A significant reduction in interconnection rates is expected to result in lower costs, which will permit more widespread access mobile-phone services

ZICTA has also announced that it will soon be stepping in to intervene in the high interconnection fees by mobile operators in order to reduce the high cost of communication and protect consumers from exploitation by mobile service providers. For this purpose, it has commissioned a cost of service study, to determine appropriate interconnection rates before the end of 2010.

Broadband

There are a variety of high-speed broadband Internet access packages on the market with different pricing strategies ranging from usage-based to fixed Internet access charges. The market is highly unregulated and lacks uniform pricing, which makes comparative price analysis difficult.

The broadband/ internet market is highly unregulated and lacks uniform pricing, which makes comparative price analysis difficult

For example, Iconnect provides wireless broadband Internet with access speeds of 512kbps ranging from $50 per month to $1250 per month depending on usage. On the other hand Coppernet, one of the leading ISPs, offers shared wireless broadband internet access with fees ranging from $100 for one PC per month to $350 per month depending on the number of personal computers connected.

Leased Facilities

The three tables below provide information on the charges for wholesale and leased lines in Zambia from Copperbelt Energy Corporation (CEC), ZAMTEL and ZESCO.

[33] At the time of writing, the adjudication of the case was still pending before the Zambia Competition Commission

CEC is the only company that provides leased dark fibre in the country. The Table below shows the charges per meter for leased dark fibre and last mile connection. The CEC network coverage is limited to the Copperbelt area only. There are no other operators who provide leased dark fibre elsewhere in the country.

Table 15: CEC Leased Line Charges

CEC Services	US$ per Month
Lease of Dark Fibre on CEC network per meter	50
Lease of Last Mile per meter	500

Source: Copperbelt Energy Company (CEC)

Table 16 below provides information on the cost of network and internet access at various bandwidth capacities for both Zamtel and CEC. Only CEC and Zamtel provide bandwidth below 2Mbps (i.e. an E1). ZESCO's service is limited to providing backhaul services for ISPs and mobile operators. However, because the CEC and ZESCO infrastructure is in different regions, there is no competition between them. On the other hand, ZESCO charges according to distance on a wholesale basis.

Table 16: Selected Broadband Tariffs

Internet	US$ per Month		
	CEC Tariffs	ZAMTEL Tariffs	
		Internet	Ethernet
64kbps	188.000	350.000	202.850
128kbps	328,000	695,000	255,350
256kbps	594,000	1 385,000	307,850
512kbps	1 000,000	2 765,000	360,350
1Mbps	1 625,000	5 525,000	412,850
2Mbps	2 500,000	11 095,000	607,000
4Mbps	3 500,000	n/a	762,500
6Mbps	4 463,000	n/a	n/a
8Mbps	4 900,000	n/a	867,500
10Mbps	n/a	n/a	930,500
50Mpbs	n/a	n/a	980,000
100Mbps	n/a	n/a	1 130,000
250Mbps	n/a	n/a	2 705,000
1Gbps	n/a	n/a	6 330,000

Source: Various – compiled by author

Table 17 below shows ZESCO's tariff for a 2MB and 34Mb bandwidth channel respectively

Table 17: ZESCO Broadband Tariffs

ZESCO Tariffs		
Link (Kb/s)	**Distance**	**US$ per Month**
2048	50	1 392
	100	2 030
	150	2 494
	200	2 958
	300	3 393
	400	3 300
	500	4 031
	600	4 234
	700	4 437
	800	4 640
	900	4 843
	1000	5 046
34Mb/s	400	14 875

Source: ZESCO

The variation in pricing methodologies makes a comparative analysis difficult. However, it is anticipated that ZICTA will intervene in the market and enforce a uniform pricing mechanism.

M-Mobile Applications

Legal Framework

In 2009, the government enacted the Electronic Communications and Transactions (ECT) Act No. 21 of 2009, which provides for a legal and regulatory framework for the development of a safe and secure environment for online business transactions.

E-Government

E-Government development in Zambia has been hampered by, among other factors, inadequate and fragmented ICT infrastructure and limited connectivity within the public sector.

Electronic Government (E-Government) is the provision of Government products and services through electronic technologies such as Internet, E-mail, Electronic Document Management and electronic payment systems.

Currently, a number of initiatives are being undertaken within the public sector, such as the Integrated Financial Management Information System (IFMIS) Project, Payroll Management and Establishment Control Project, the Justice Case Management System, and the building of Local and Wide Area Networks linking public sector institutions. These and similar projects are intended to provide the building blocks for the establishment of E-Government.

However, these building blocks are being implemented in the public sector with very little coordination and integration with existing systems at operational level. This has resulted in isolated projects with very little positive impact on the overall service delivery efficiency.

Some of the factors constraining E-Government development in Zambia include:

- inadequate and fragmented ICT infrastructure and connectivity within the public sector;
- lack of supportive institutional framework to coordinate and promote E- Government development;
- inadequate manpower in the area of computing and information technology in the public sector; and
- concerns about security of information as well as inadequate mechanisms for information flow within the public sector.

Other Applications

Examples of other mobile applications include the following:

a) e-health

- Smart care (CDC Patient Smart-card system): The Ministry of Health, working with the Center for Disease Control and Prevention (CDC) is rolling out a patient smart card system in the public health sector. The smart card system enables patients to carry with them their own medical records when visiting public hospitals and clinics. These are then read by smart-card readers. At present, they are not connected to any central service, and data is collected by manual transfer of memory sticks.

b) Mobile banking and payment systems

Electronic payment systems provide the cornerstone of E-Commerce development by ensuring convenience and flexibility when undertaking commercial transactions. With the increased adoption of Internet in Zambia, some financial institutions have begun offering SMS-based and Internet banking as well as online payment via electronic cards to their customers.

Leading examples include:

- XAPIT – a transformative mobile banking solution offered by the Zambia National Commercial Bank (ZANACO). XAPIT provides a low-value, low-risk banking account with an internet-enabled VISA debit card combined with SMS-banking.
- Mobile Transactions Zambia Limited (MTZL) specializes in low-cost money transfer using a network of independent small business agents across the country

- The Kwacha Mover is a basic money transfer system launched by Bayport Financial Services – one of the leading microfinance institutions. Customers are able to transfer money using more than 30 Bayport field offices.
- Celpay is one of the world's first mobile banking systems. Celpay provides mobile banking and payment solutions for banks looking to offer access to financial transaction services to their customers.

Some of the challenges in the development of E-Commerce include:

- lack of effective ICT infrastructure to support widespread use of E-Commerce solutions;
- inadequate innovative solutions from the ICT industry that can promote the spread of E-Commerce; and
- lack of supportive and integrated investments in ICT, energy and other social infrastructure projects to increase uptake, access and demand for E- Commerce.

c) Agriculture

Examples of emerging mobile applications in the agriculture sector include the following:

- ZNFU Commodity price system: The Zambia National Farmers' Union (ZNFU) operates an information service that is available by SMS to anyone with a cell phone. It is aimed at small-scale farmers and provides details of commodity prices and contact information for the buyers.
- Cropserve, a vendor of inputs to the farming community, with assisted funding, are trialling an SMS and web-based service for providing pricing and guidance for inputs such as seeds and veterinary products.
- Agritrade: This market information service can be accessed via mobile phone and via the Internet by smallholder farmers and agri-produce buyers. It is intended to facilitate transactions between buyers and sellers by providing updated market information, and to facilitate transactions between suppliers of agricultural inputs and smallholder farmers.

Telecommunications Regulatory Environment (TRE) Survey for Zambia

Methodology

The SPR study also included a TRE Survey to assess the effect of the policy and regulatory environment on the performance of the sector. The TRE is also a useful instrument for analysing investment risk in the telecommunications sector arising out of the policy and regulatory environment administered by the government. The TRE is a perception survey based on the methodology developed by LIRNEasia and applied previously by RIA and DIRSI in Latin America.

The TRE survey was based on the perceptions of key stakeholders in the telecommunications sector that were contrasted with actual developments in the sector. Based on the three categories (see table below), potential respondents were identified in advance. Two data collection agents were engaged to collect data manually. A total of 63 respondents were identified but only 46 were able to complete the survey. Other were either unavailable or did not return the completed survey within the specified period.

In the TRE assessment, the telecommunication sector was divided into three broad categories, namely fixed, mobile and broadband. In the case of Zambia, with relative underdevelopment of the broadband market, broadband was broadly interpreted to include Internet service provision, irrespective of bandwidth capacity. The respondents were asked to evaluate the above three subsectors in seven dimension drawn from the consensus achieved in the World Trade Organisation Reference on what the critical drivers of competitive markets are, namely:

- market entry;
- allocation of scarce resources;
- interconnection;
- regulation of anti-competitive practices;
- tariff regulation;
- universal service obligation; and
- quality of service

The respondents were asked to rate each of the seven dimensions on an ordered scale using five response levels from -2 to +2, with -2=Highly Ineffective and +2=Highly Effective. The results were analysed using the Likert Scale , a psychometric scale commonly used in questionnaires and in survey research.

Survey Results

The Zambia TRE scores are below average in all dimensions and subsectors. Overall, the respondents perceived regulation to be ineffective across all seven dimensions in all sub-sectors. In light of some recent positive and significant developments in the sector at policy, legal and regulatory levels, the results that suggest low perception are rather unexpected and hence need to be assessed against actual performance of the sector. The results may have been negatively influenced by the government's procrastination in effecting its commitments to liberalise the international gateway and the highly publicised allegations of corrupt practices in the divesture of 75% shares in state-owned Zamtel

Overall, the respondents perceived the TRE to be generally ineffective in Zambia.

Overall, the respondents perceived the regulator to be ineffective in all the seven dimensions across the three sub-sectors. Evidently, Quality of service, tariff regulation and anti-competitive practices, especially with regard to interconnection termination rates, will continue to be major issues for consumers and the regulator in the months ahead.

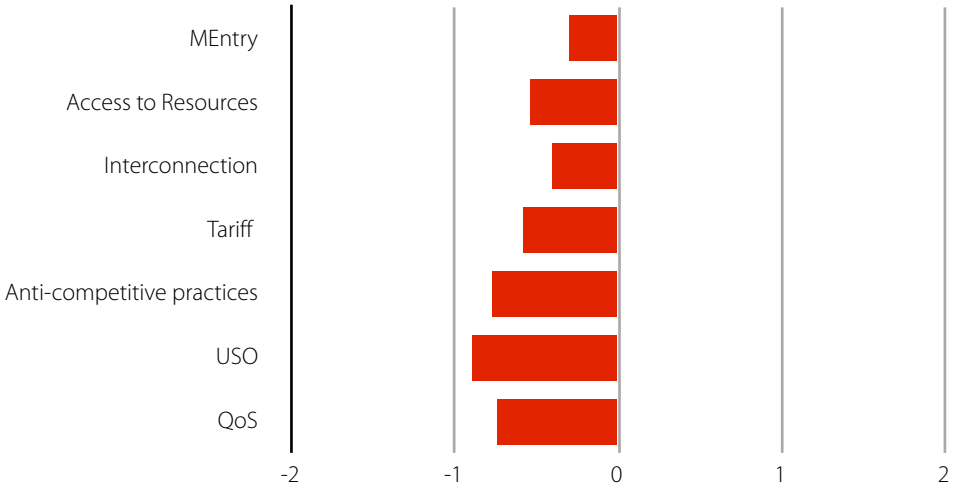

Figure 5: Summary TRE results for Zambia : 2009/2010

Market Entry

Though perceived to be ineffective, the market entry ranks highest among the seven dimensions in terms of perception by the respondents. The recent policy decision by the government to restrict the number of mobile operators to three until 2015, which is largely viewed as a protectionist measure to "sweeten" the deal for the sale of 75% shares in state-owned Zamtel, may have influenced the perception on market entry by survey respondents. The influence of time-bound events, as illustrated above, serves to emphasize the importance of timing in conducting perception surveys.

The broadband (read Internet) subsector is viewed to be the most open, though half the licences issued have remained unutilised for more than three (3) years. The fixed line subsector, which is a monopoly, is seen to be more ineffective than broadband and mobile sectors.

However, the above perception may change following the introduction of a new converged (but not yet unified) licensing framework with significant reductions in licence fees two months after this survey was conducted. In addition, the international gateway was also liberalized, resulting in 40-70% reductions in international tariffs. For example, calls to destinations such as India, USA and China are cheaper than some of the local call charges between networks.

In addition, the high license fees, which are considered to be restrictive and therefore pose a major barrier for new entrants, are likely to have contributed to the negative perception on regulation on market entry.

Access to Scarce Resources

The regulation of access to scarce resources was regarded to be ineffective. This is despite the fact that the regulator has made significant improvements in the management of scarce resources. For example, new policies, plans as well as regulations governing their use have been developed, which have led to the progressive and streamlined management of these resources. For example, the regulator has been able to resolve the haphazard allocation of spectrum to mobile operators that characterised the early days of mobile cellular networks operations in the country and expanded the numbering space for mobile and fixed line networks. In addition, in 2008, the regulator commissioned a state-of-the-art frequency monitoring system at an estimated cost of more than US$4 million. However, the negative perception is more likely associated with delays in allocation of 3G spectrum and limited access to broadband spectrum in the major urban areas.

The implementation of new framework for management of scarce resources has just begun and it expected that, this will result in significant improvements in their utilisation and regulation.

The implementation of a new framework for management of scarce resources has just begun, and it is expected that with regular monitoring and strict enforcement of existing regulations, this will result in significant improvements in their utilisation and regulation.

The graph below shows the results for the overall TRE score by sector and dimension.

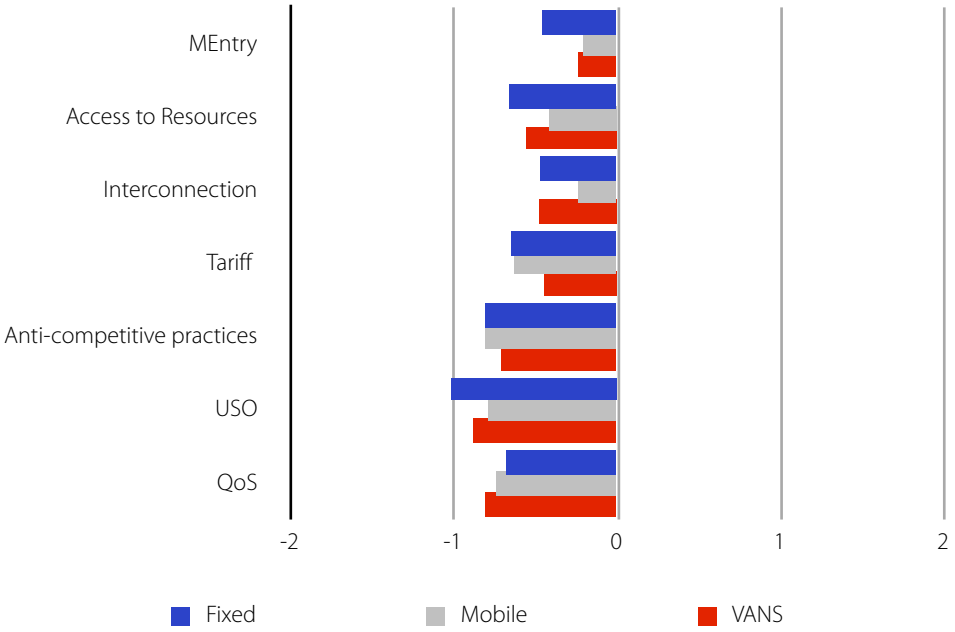

Figure 6: Summary TRE results for Zambia by market segment

Interconnection

The low perception on effectiveness of the regulatory body with respect to interconnection is aligned to the earlier observations above on interconnection and pricing which reflect ZAIN's market dominance. Due to its market dominance, ZAIN has been able to discriminate against the two other mobile operators by offering different termination rates based on perceived market threats to its dominance. On the other hand, neither the regulator nor the competition authorities have exercised their power to ensure a level playing field.

To address the above, the new Zambia ICT Act mandates all licensed public telecom operators to interconnect, and players with dominant market position are to provide facilities for physical interconnections on a cost basis. The Act also mandates the regulator to intervene in markets where there is abuse of power by operators with dominant market share. To comply with the provisions of the new ICT Act, ZICTA (working in consultation with industry) has commissioned a cost of service study to determine the appropriate interconnection regime and rates.

Interestingly, though ZAMTEL has a monopoly on fixed line telephony, it does not seem to have exploited its monopoly as its rates remain low even by regional standards.

Tariff Regulation

The negative perception (ineffective: 2.2) of this area reflects the failure or inability of the regulator to regulate mobile and Internet charges, as well as Zain's market dominance. High tariffs serve as an indicator of lack of effective competition in the mobile market segment. Interestingly, though ZAMTEL has a monopoly on fixed-line telephony, it does not seem to have exploited its monopoly, as its rates remain low even by regional standards.

Whereas the new ICT act provides for the regulation of dominant market players and grants the regulator adequate powers to regulate tariffs, it remains to be seen how the regulator will apply the provisions of the law.

Hitherto, the drawback to effective regulation of anti-competitive practices has been insufficient framework for regulating operators with significant market power.

Regulation of Anti-Competitive Practices

The regulation of anti-competitive practices is regarded as ineffective in Zambia. This is a result of the failure to regulate Zain, which, given its dominant market position, has been practising predatory pricing to effectively undermining the other market players (i.e. MTN and ZAMTEL). Complaints submitted to ZICTA and the Zambia Competition Commission regarding ZAIN's discriminatory interconnection charges have remained unresolved. Hitherto, the drawback to effective regulation of anti-competitive practices has been insufficient framework for regulating operators with significant market power. Now, a new legal framework for regulating ant-competitive practices has been provided in the new ICT Act that came into effect in December

2009 (see earlier references above). This is expected to provide the regulator and the competition authority with the necessary legal powers to institute effective economic regulation in the sector.

Universal Service Obligations

The TRE score shows that regulation of universal service obligations (USO) is regarded as highly ineffective in Zambia. This is not surprising considering that there have never been any universal service obligations imposed on operators in Zambia.

The new ICT Act of 2009 provides for the establishment of a Universal Service Fund to be managed by the regulator. Part of the annual fees charged to operators by the regulator will be allocated to the fund. With a view to effecting the provisions of the new ICT Act, the regulator has formulated a Universal Service Development Programme, as has been highlighted earlier in preceding sections.

Quality of Services

In response to massive consumer complaints, ZICTA ,in 2007 established QoS standards for mobile and fixed telephony in line with the ITU E.431 recommendation. In order to assess QoS from a consumer's perspective, ZICTA also invested in an advanced QoS monitoring system at a cost of around 500,000 Euros, independent from the operators, to continuously measure key parameters such as Call Success Rate, SMS Delivery Time and Voice Quality. However, despite these efforts, the regulation of QoS is regarded as being ineffective. The enforcement of QoS standards has been constrained by lack of an effective system of sanctions for non-adherence by operators.

As a result, the Authority initially resorted to a name and shame strategy and later to moral persuasion, in lieu of a comprehensive penalty system. This situation has now been remedied with the enactment of the Zambia ICT Act of 2009, which empowers the regulator to specify and enforce QoS standards. Failure by an operator to adhere to QoS standards will now attract a fine of approximately $150,000 and an additional $15,000 for each day during which the offence continues as well as possible revocation of the licence.

Failure by an operator to adhere to QoS standards will now attract a fine of approximately $150,000 and an additional $15,000 for each day during which the offence continues as well as possible revocation of the license.

Conclusion and Recommendations

The Zambian communications market has experienced significant improvement over the last decade. This has been characterized by rapid growth in the mobile voice market and increased investments in broadband infrastructure, broadening access and usage of ICTs. Recent developments in the sector include the liberalization of the international gateway, "privatization" of the incumbent state-owned Zamtel and the passing of the ICT Act of 2009 and Electronic and Communications Transactions Act of 2009. These, and the introduction of new licensing regulations, are likely to provide a basis for stimulating increased and new investment in the sector.

However, the widely anticipated favorable market entry conditions and enhanced competition premised on the provisions of the ICT Act of 2009's new legal and regulatory framework have been severely constrained by the government's policy decision to restrict market entry to existing players until 2015.

The foregoing serves to demonstrate that having a good ICT policy or state-of-the-art legislation is not enough. Much work remains to be done to ensure that the legal and regulatory framework works to nurture an environment that stimulates increased investment in the sector. The general perception of inefficient policy and regulatory environment as captured in the TRE assessment suggests that the following areas will continue to be major issues of concern:

- Ease of market entry
- Consumer protection & Quality of services
- Frequency Spectrum management
- Interconnection regulation
- Tariff regulation
- Equitable and open access to broadband infrastructure

ZICTA needs to enhance its credibility and realise the autonomy bestowed on it by the ICT Act by building on its competences, transparency and predictability in decision-making.

To effectively address these challenges ZICTA needs to enhance its credibility and realise its autonomy by building on its competences, transparency and predictability in decision-making.

The remainder of this chapter highlights key recommendations to address some of the findings of the study.

Policy Making

Recommendations:

- Build capacity at higher leadership and policy levels to enhance e-leadership and shared vision
- Review the National ICT Policy and design an implementation plan
- Mainstream ICTs in national development plans (with emphasis on their dual role as enabler and industry)
- Expand existing diploma and graduate programs and establish new postgraduate programs in ICTs
- Support multi-disciplinary research in ICTs to enhance evidence-based decision making at all levels

Regulatory Issues

Market Entry

The Government should rescind the policy decision to restrict market entry as this will hamper the development of a competitive environment

- The Government should rescind the policy decision to restrict market entry as this will hamper the development of a competitive environment which is the key objective of the National ICT Policy and ICT Act of 2009
- Review licensing regulations and revise licensing fees downwards to encourage local entrepreneurship in the ICT sector

Consumer Protection (& Quality of Services)

To protect consumer rights, ZICTA should consider the following:

- Revise the Quality of Service (QoS) standards
- Implement voluntary Customer Service Charters
- Implement Service Level agreement with a corresponding framework of sanctions

Frequency Spectrum Management

- ZICTA must implement transparent and non-discriminatory spectrum allocation without stifling innovative competition among market players

Tariff regulation

- ZICTA needs to extend tariff regulation from voice broadband/Internet services with a view to lowering the cost of access and stimulating increased usage

Broadcasting

The establishment of the Independent Broadcasting Authority (IBA) has been stuck in a quagmire of political, legal and bureaucratic controversy since 2002. The establishment of a separate and autonomous entity to regulate the broadcasting sector reflects the continuing traditional approach in which broadcasting and the telecommunications are still perceived as distinct silo activities.

Recommendation

- Given the capacity constraints that characterise the regulatory landscape in the country, and to benefit from the economies of scale emanating from the dynamics of convergence in the industry, the government should consider merging the functions of the yet to be established IBA into ZICTA

ICT Skills

The SPR has also highlighted the lack of adequate ICT skills to effectively drive Zambia's envisioned progress towards a knowledge economy by 2030. Existing educational and learning facilities are inadequate to meet the market demand for ICT skills.

Recommendations:

- Prioritise the development of science and technological skills in the Sixth National Development Plan
- Establish a national centre of excellence in training, research and development as well as application of ICTs to be co-located at one of the nation's public universities
- Provide incentives for companies that provide certifiable ICT training on the job for their employees

The Government must establish a national centre of excellence in training, research and development as well as application of ICTs to be co-located at one of the nation's public universities.

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List of Abbreviations and Acronyms

ADSL	Asymmetric Digital Subscriber Line
ARPU	Average Revenue Per User
ASP	Applications Service Provider
CAZ	Communications Authority of Zambia
CDMA	Code Division Multiple Access
COMESA	Community of Eastern and Southern Africa
CPE	Customer premises equipments
EDGE	Enhanced Data rates for GSM Evolution
EGPRS	Enhanced General Packet Radio Service
GDP	Gross Domestic Product
GPRS	General Packet Radio Service
GSM	Global Mobile Systems
IBA	Independent Broadcasting Authority
ICT	Information and Communications Technology
ISP	Internet Service Provider
ITU	International Telecommunications Union
MCT	Ministry of Communications and Transport
MIBS	Ministry of Information and Broadcasting Services
PDNO	Public Data Network Operator
PTC	Posta and Telecommunications Corporation
RIA!	ResearchICTAfrica!
SADC	Southern Africa Development Community
SPNP	Service Provider Number Portability
SMS	Short Message Service
TV	Television
UA	Universal Access
ULF	Unified Licensing Framework
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WTO	World Trade Organization
XDSL	Digital Subscriber Lines
ZAMTEL	Zambia Telecommunications Company
ZCC	Zambia Competition Commission
ZESCO	Zambia Electricity Supply Corporation
ZICTA	Zambia ICT Authority
ZNBC	Zambia National Broadcasting Corporation
ZMK	Zambian Kwacha (Local currency)

IDRC CRDI

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ISSN: 2073-0845